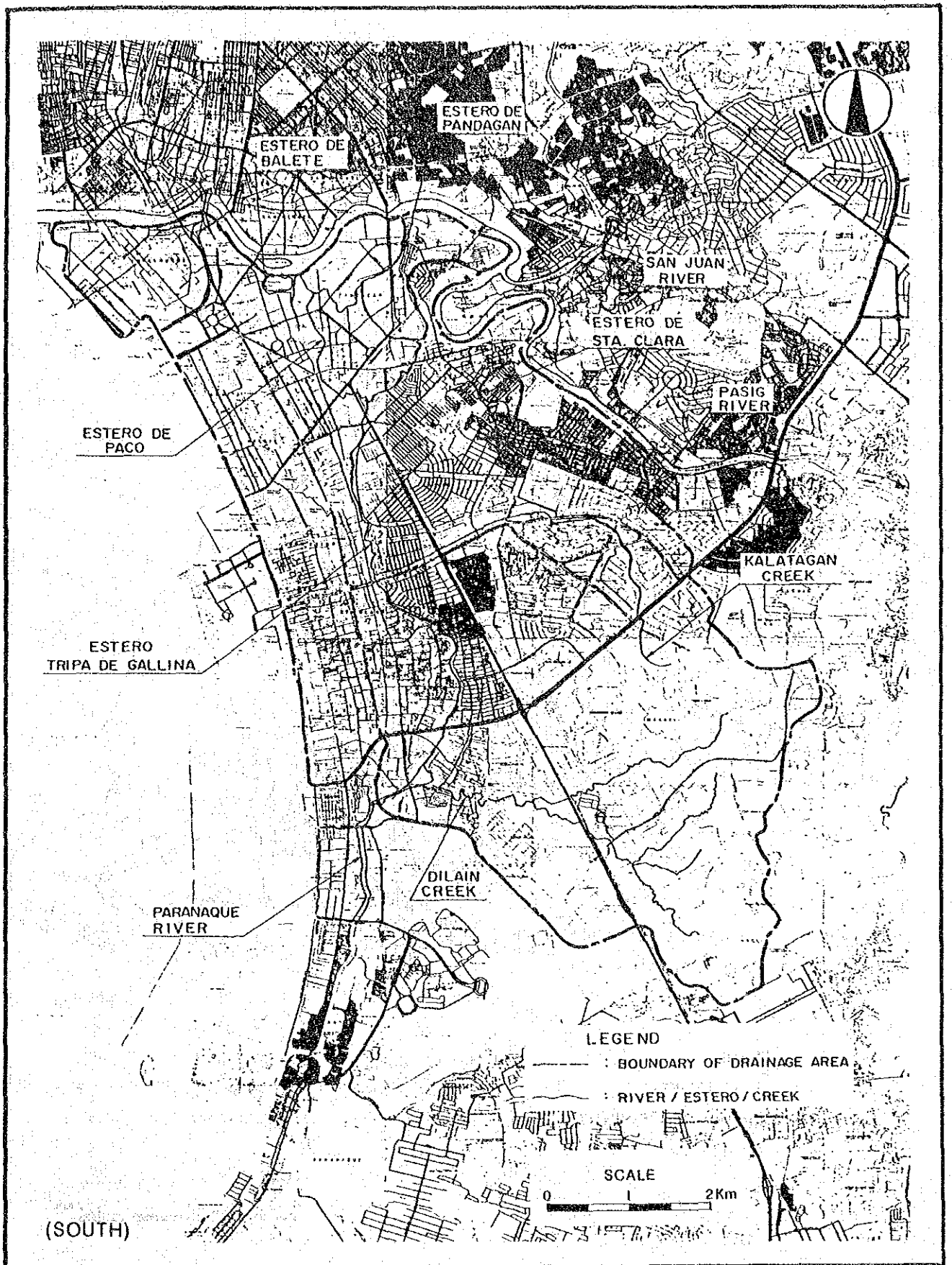


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

MANILA AND SUBURBS DRAINAGE AREA
Fig.5-2-2(1/2)

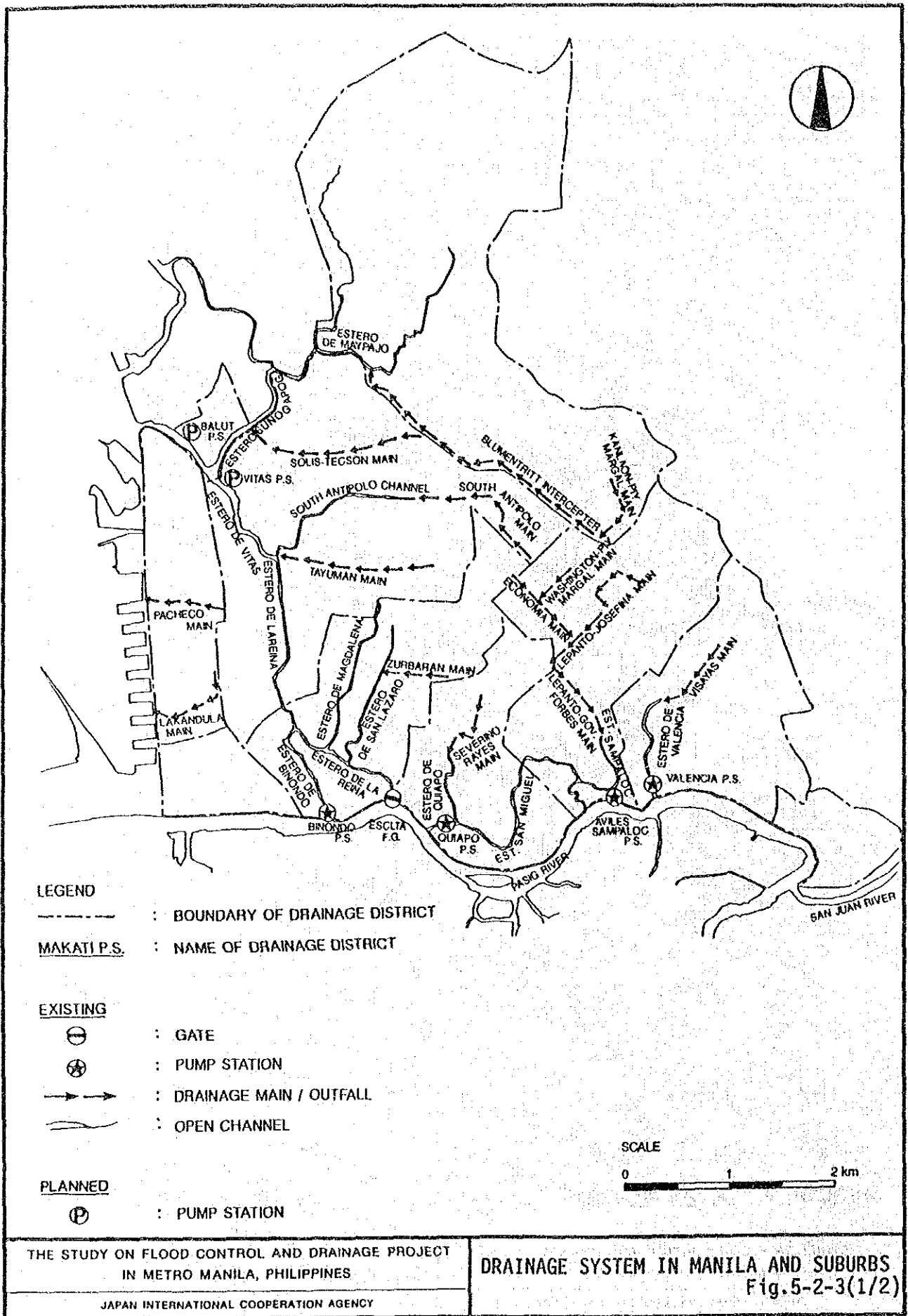


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

MANILA AND SUBURBS DRAINAGE AREA

Fig.5-2-2(2/2)



LEGEND

----- : BOUNDARY OF DRAINAGE DISTRICT

MAKATI P.S. : NAME OF DRAINAGE DISTRICT

EXISTING

⊖ : GATE

⊙ : PUMP STATION

→ : DRAINAGE MAIN / OUTFALL

~ : OPEN CHANNEL

PLANNED

Ⓟ : PUMP STATION

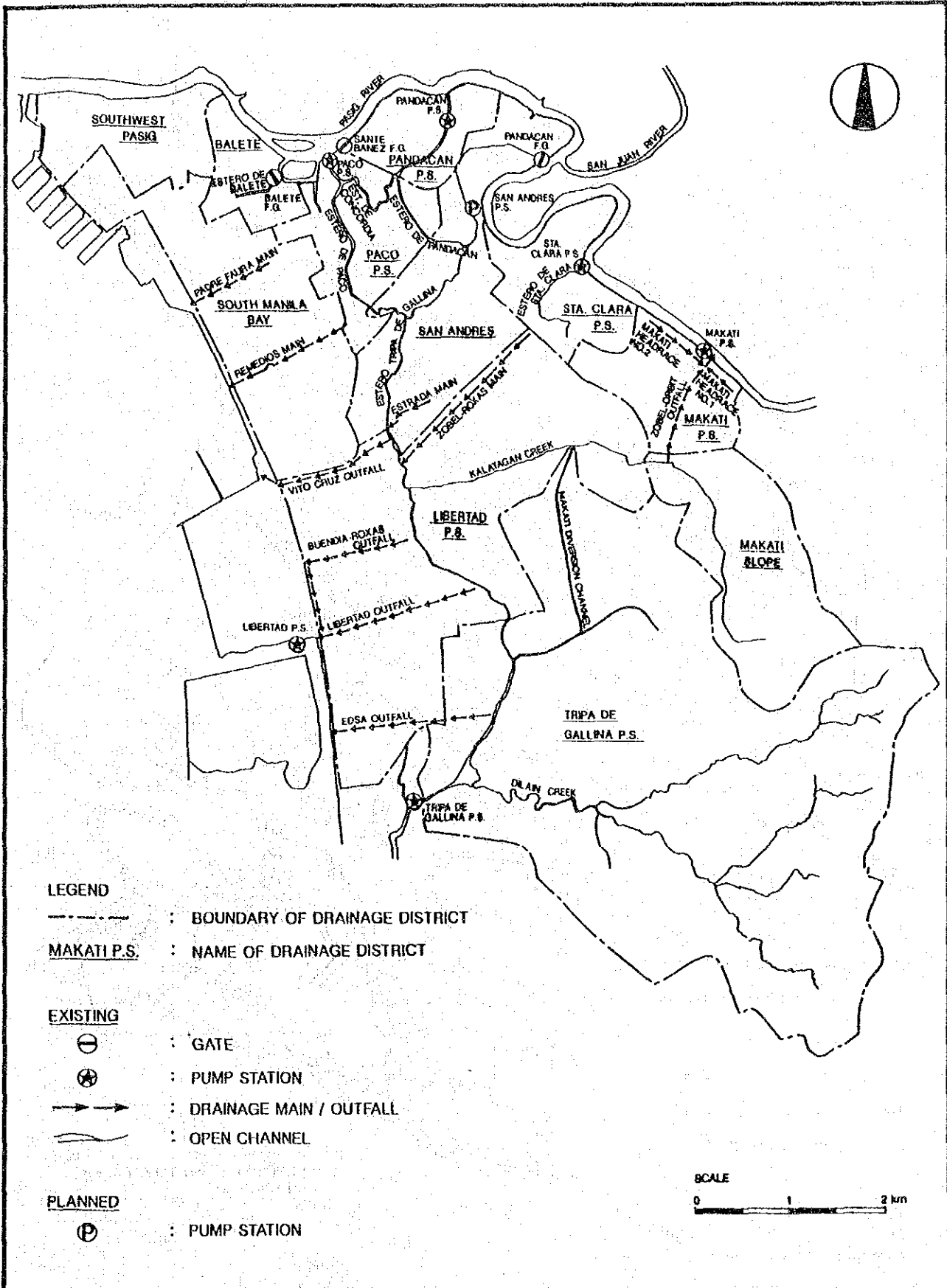
SCALE



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

JAPAN INTERNATIONAL COOPERATION AGENCY

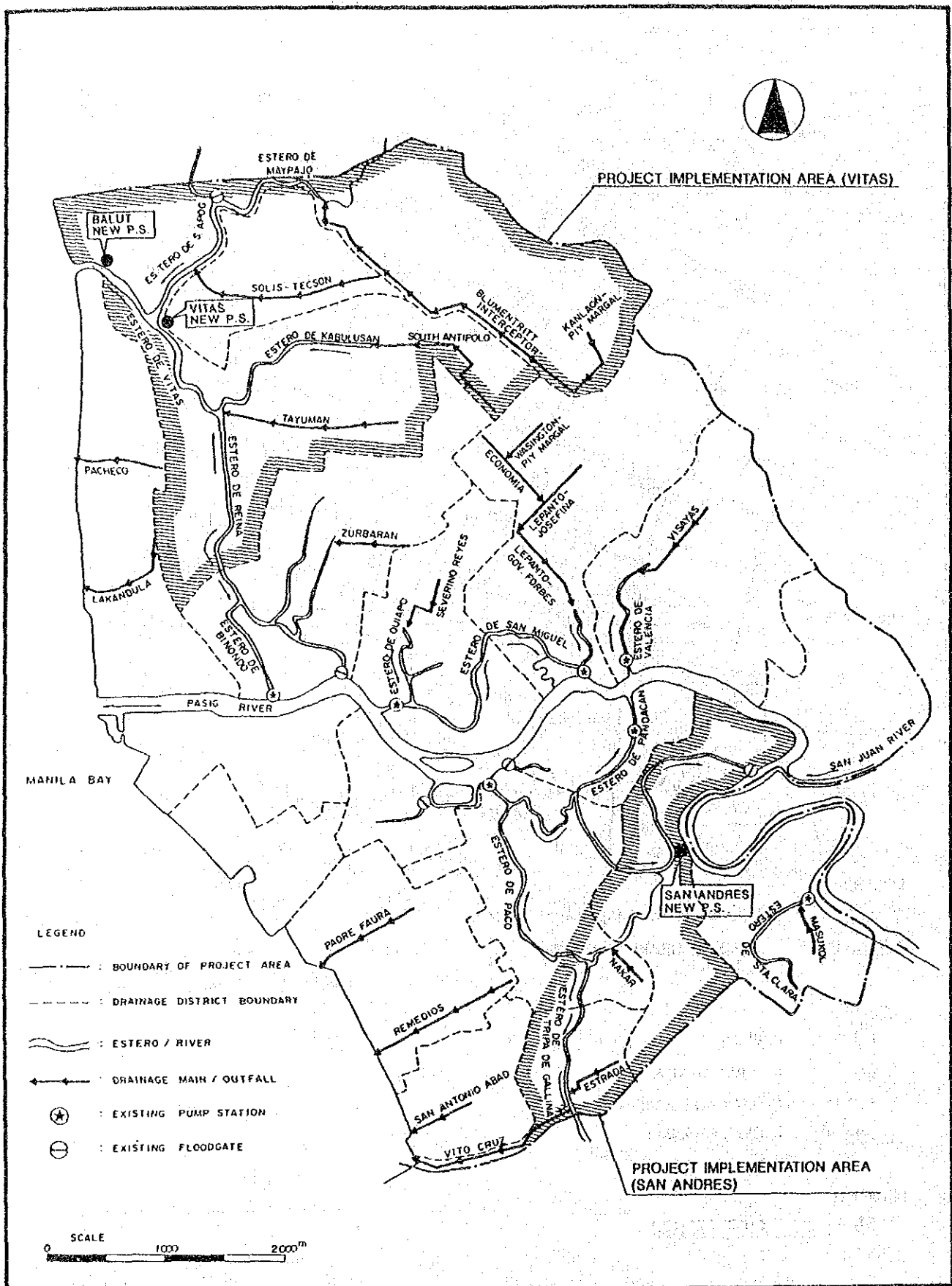
DRAINAGE SYSTEM IN MANILA AND SUBURBS
Fig.5-2-3(1/2)



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

JAPAN INTERNATIONAL COOPERATION AGENCY

DRAINAGE SYSTEM IN MANILA AND SUBURBS
Fig.5-2-3(2/2)

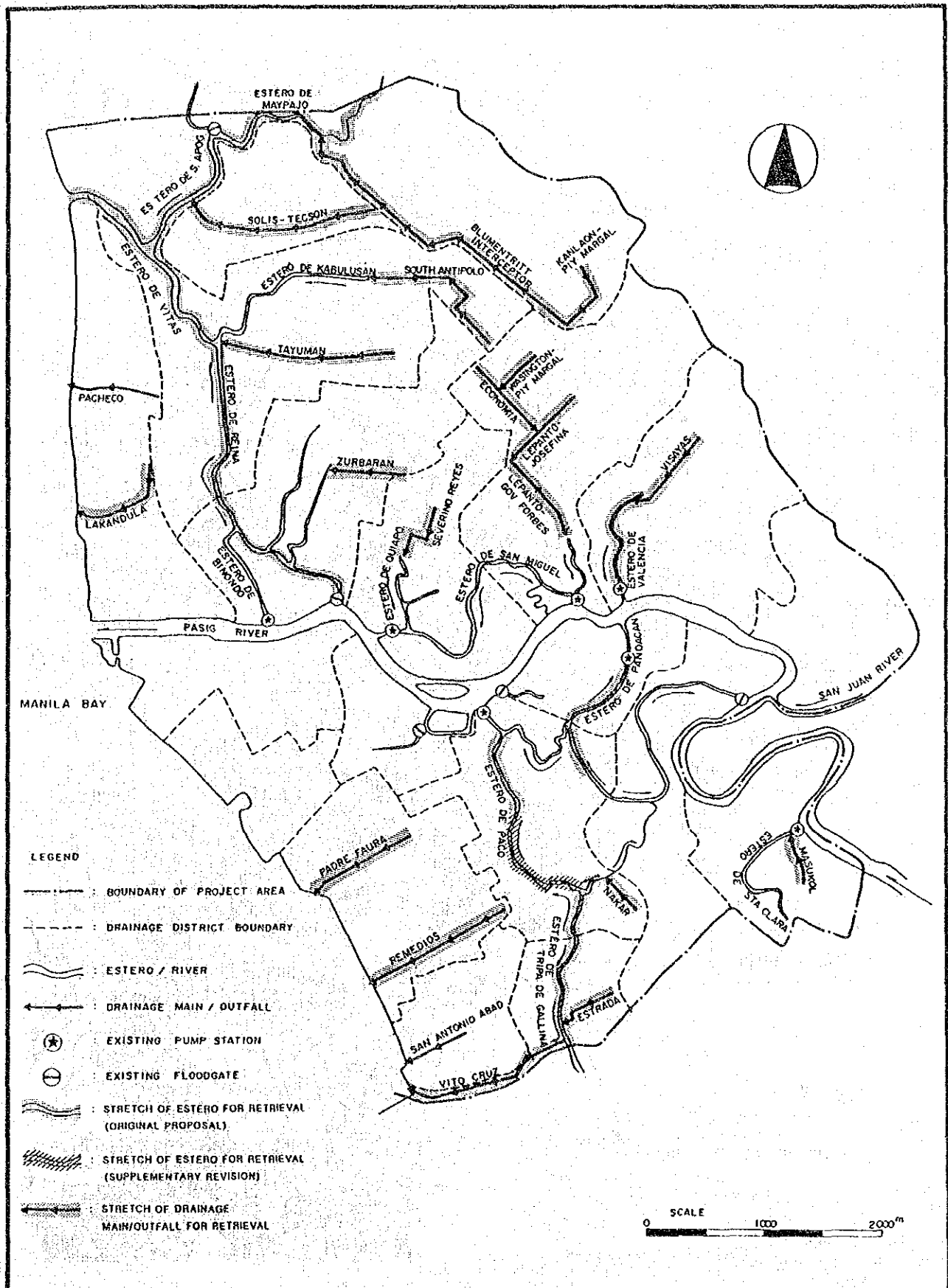


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

IMPLEMENTATION AREA OF METRO MANILA
FLOOD CONTROL PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig. 5-2-4

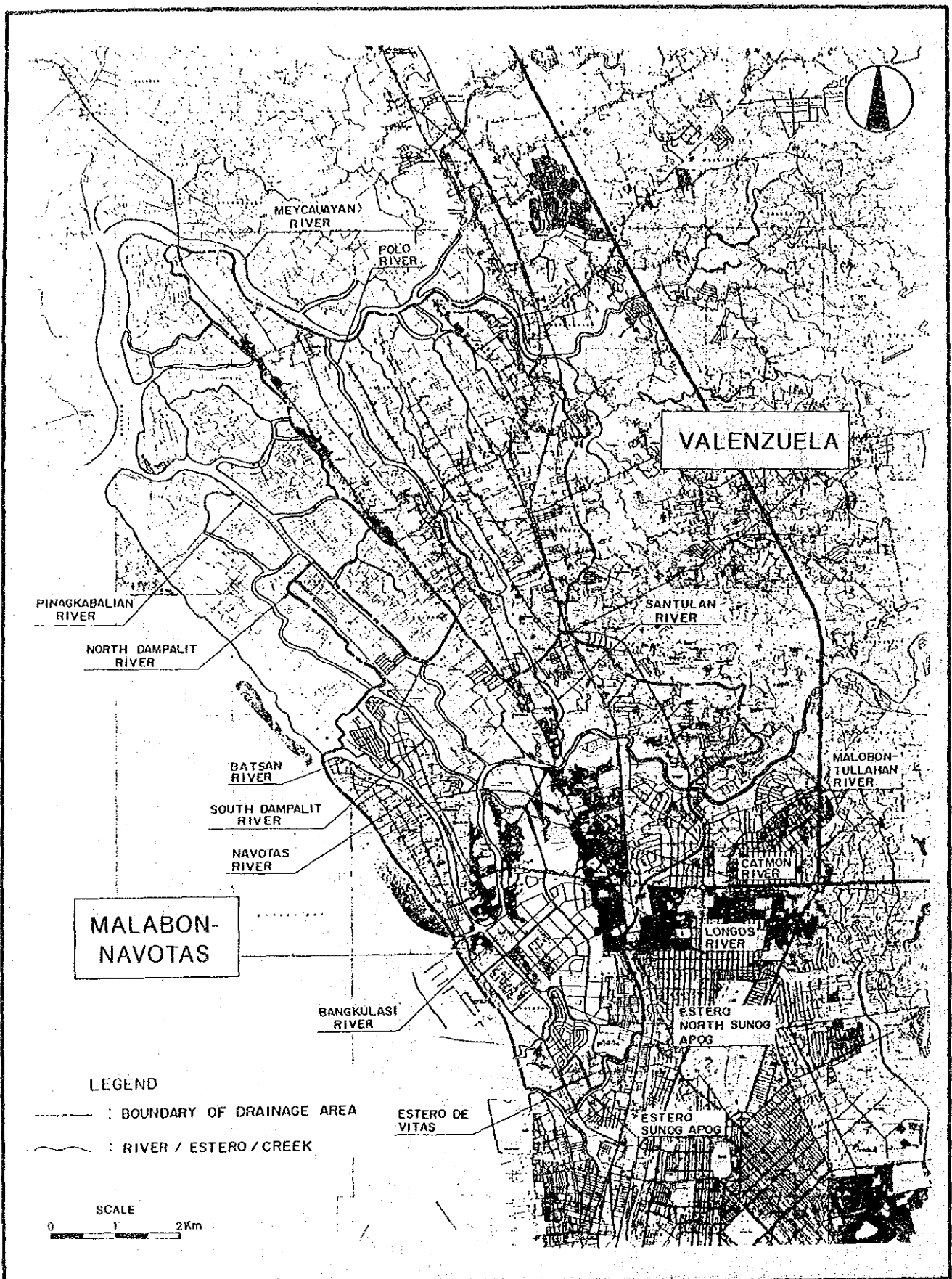


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

IMPLEMENTATION STRETCH OF PROJECT FOR
THE RETREIVAL OF FLOOD PRONE AREAS
OF METRO MANILA

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.5-2-5

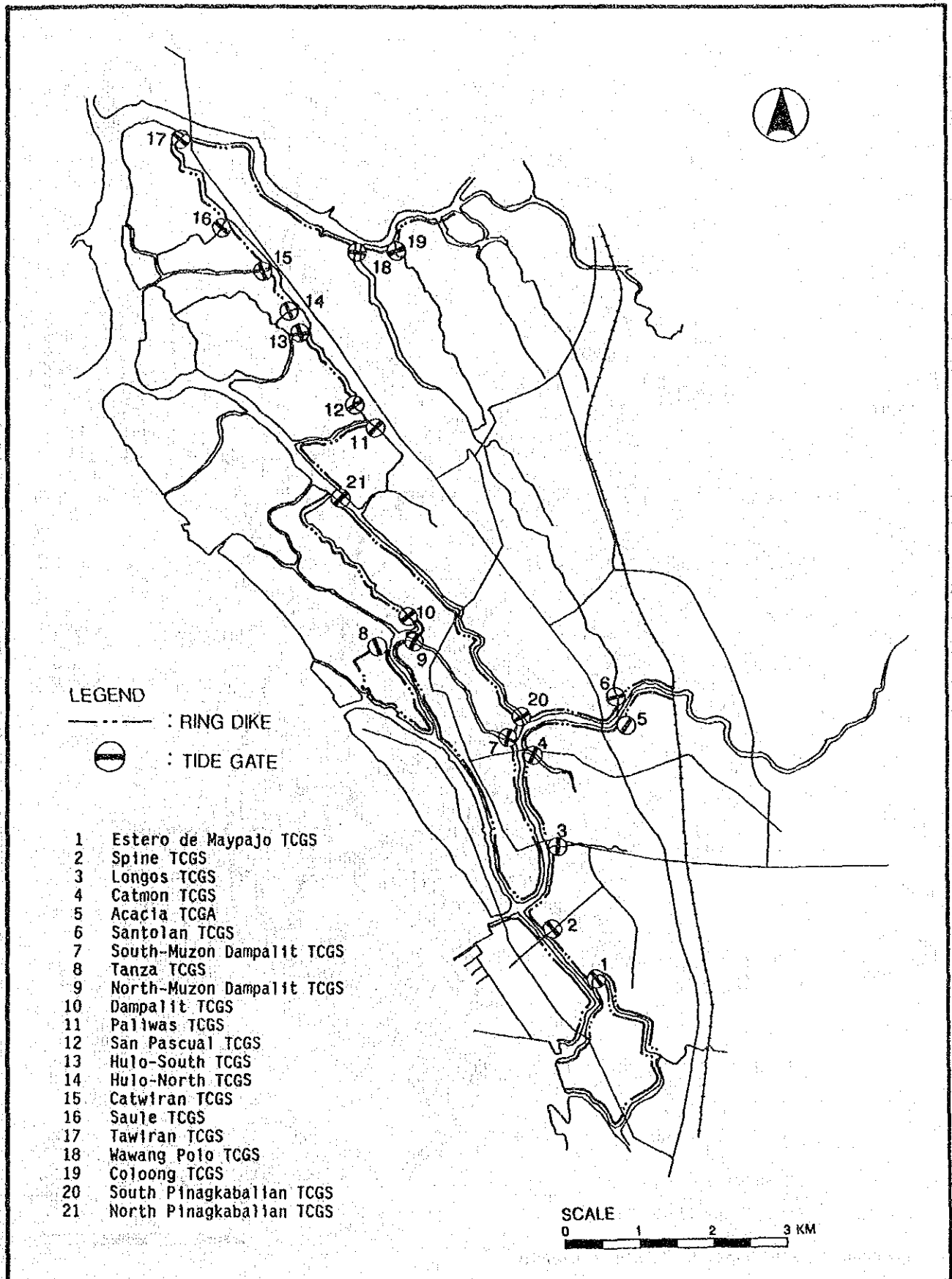


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

MALABON-NAVONTAS DRAINAGE AREA AND
VALENZUELA DRAINAGE AREAS

Fig.5-2-6



LEGEND

- - - - : RING DIKE
- ⊖ : TIDE GATE

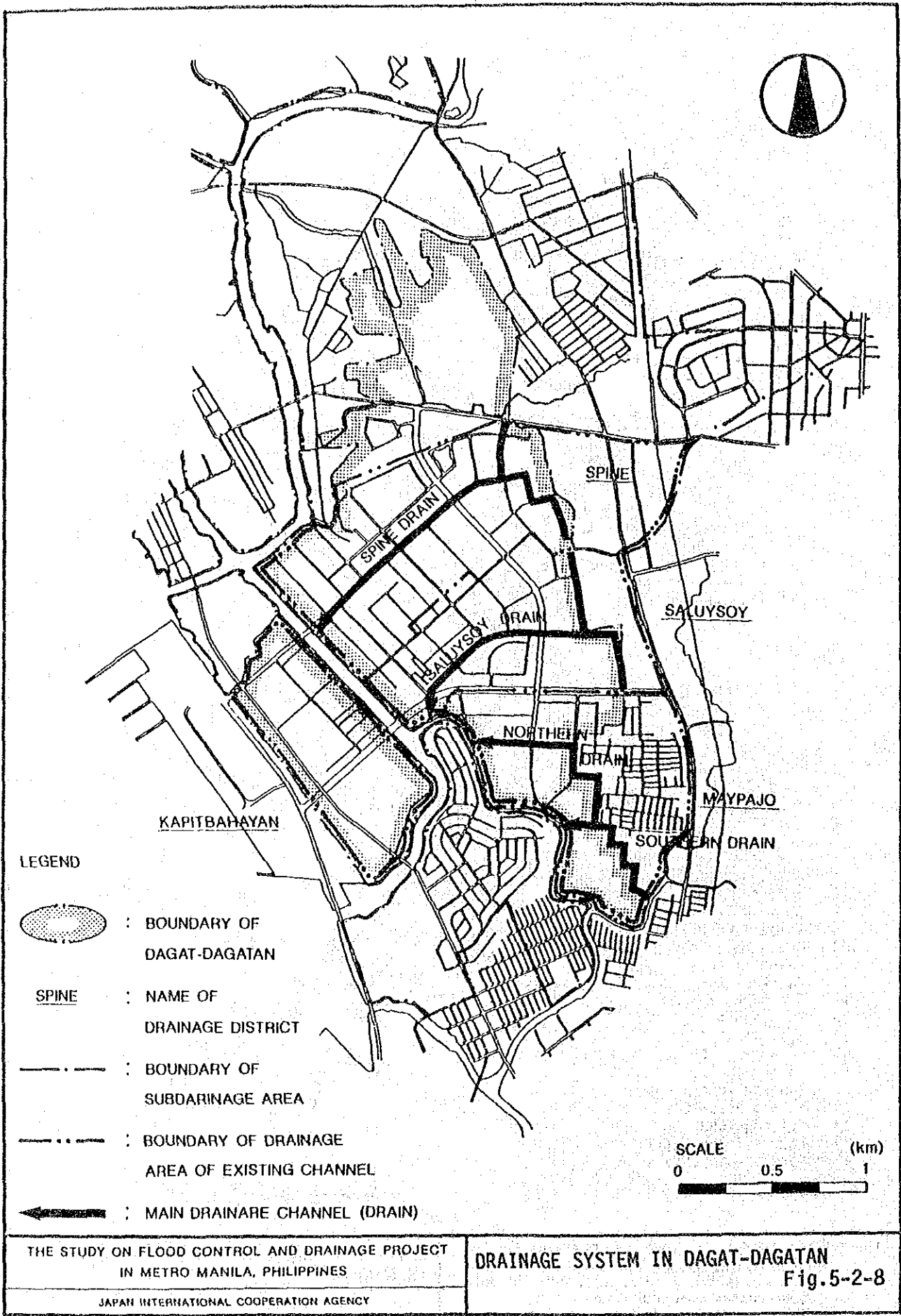
- 1 Estero de Maypajo TCGS
- 2 Spine TCGS
- 3 Longos TCGS
- 4 Catmon TCGS
- 5 Acacia TCGA
- 6 Santolan TCGS
- 7 South-Muzon Dampalit TCGS
- 8 Tanza TCGS
- 9 North-Muzon Dampalit TCGS
- 10 Dampalit TCGS
- 11 Paliwas TCGS
- 12 San Pascual TCGS
- 13 Hulo-South TCGS
- 14 Hulo-North TCGS
- 15 Catwiran TCGS
- 16 Saule TCGS
- 17 Tawiran TCGS
- 18 Wawang Polo TCGS
- 19 Cojoong TCGS
- 20 South Pinagkabalian TCGS
- 21 North Pinagkabalian TCGS




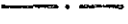


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
 IN METRO MANILA, PHILIPPINES
 JAPAN INTERNATIONAL COOPERATION AGENCY

EXISTING RING DIKES AND TIDE GATES
 IN MANAVA

Fig.5-2-7



LEGEND

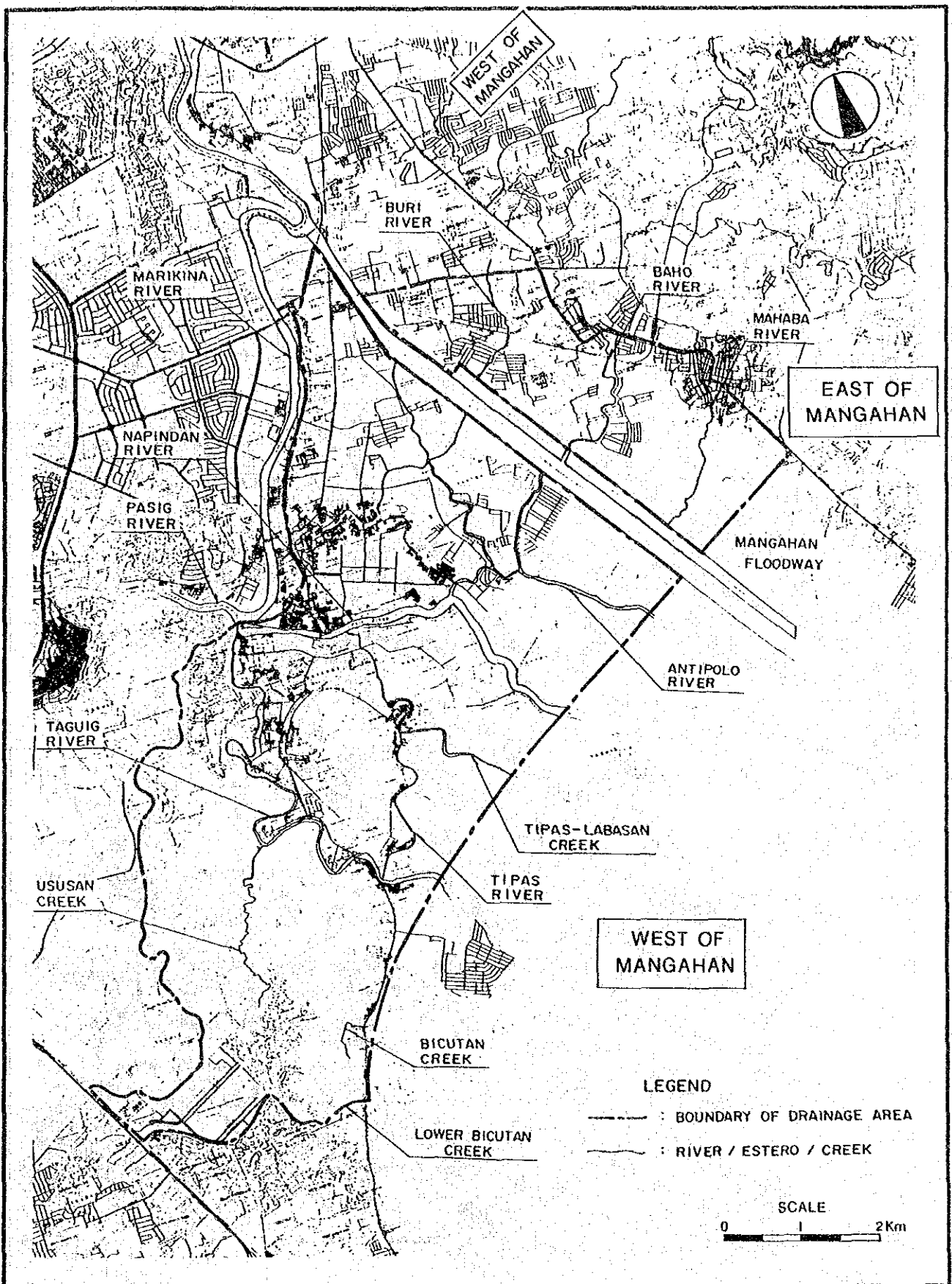
-  : BOUNDARY OF DAGAT-DAGATAN
- SPINE : NAME OF DRAINAGE DISTRICT
-  : BOUNDARY OF SUBDRAINAGE AREA
-  : BOUNDARY OF DRAINAGE AREA OF EXISTING CHANNEL
-  : MAIN DRAINARE CHANNEL (DRAIN)

SCALE (km)
0 0.5 1

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

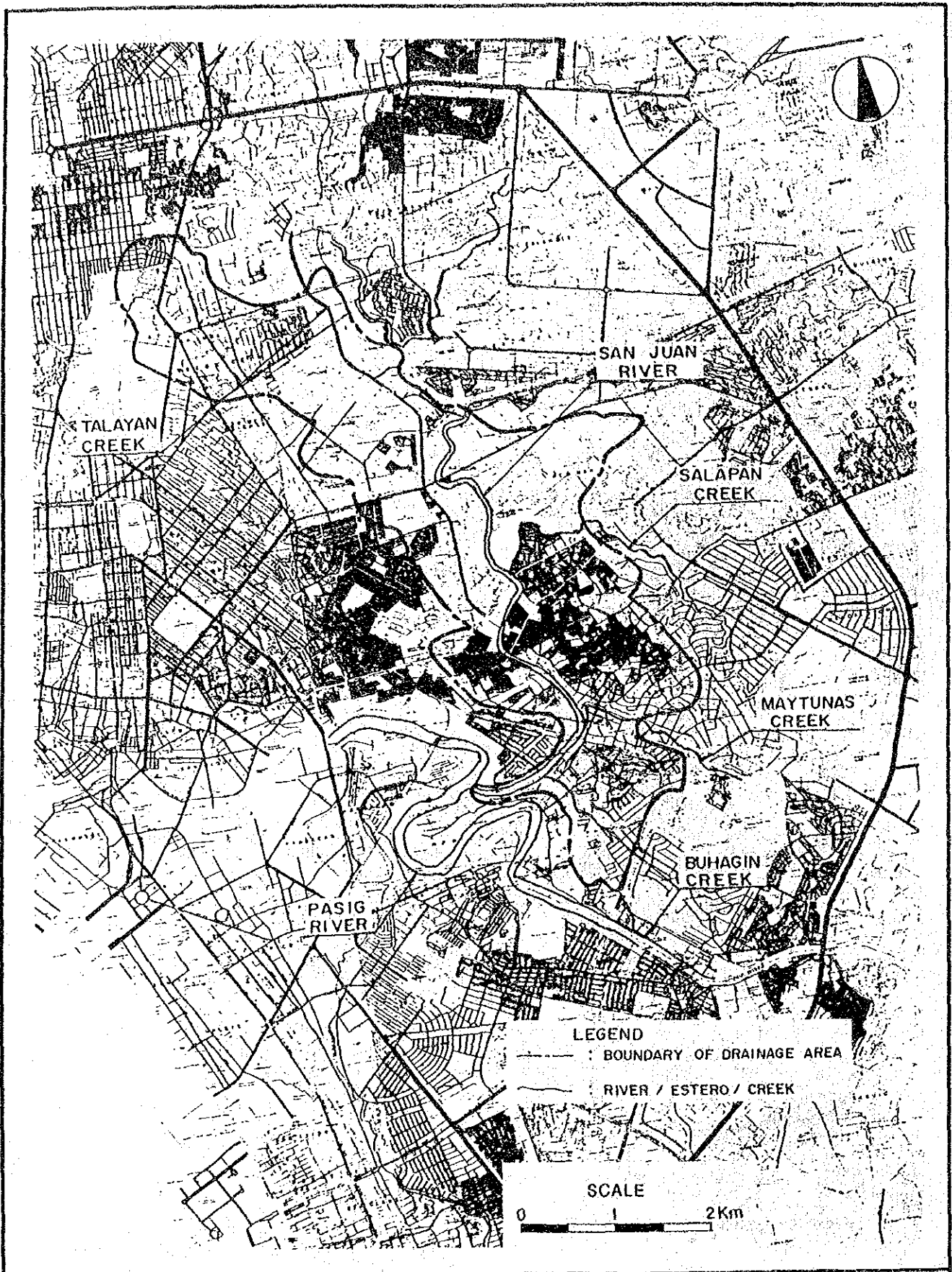
DRAINAGE SYSTEM IN DAGAT-DAGATAN
Fig.5-2-8

JAPAN INTERNATIONAL COOPERATION AGENCY



THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
 IN METRO MANILA, PHILIPPINES
 JAPAN INTERNATIONAL COOPERATION AGENCY

EAST AND WEST OF MANGAHAN DRAINAGE AREA
 Fig.5-2-9

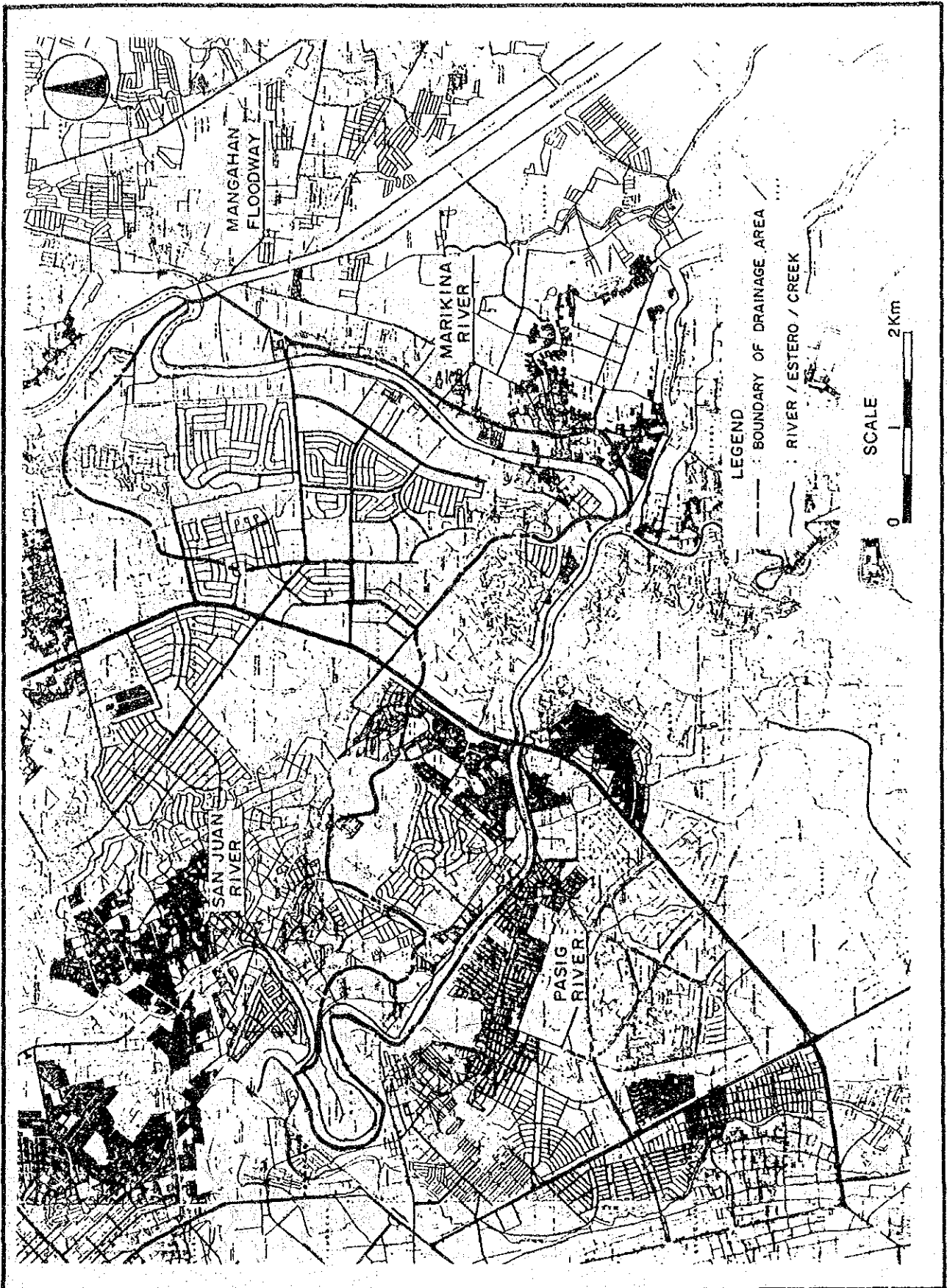


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

SAN JUAN DRAINAGE AREA

Fig.5-2-10

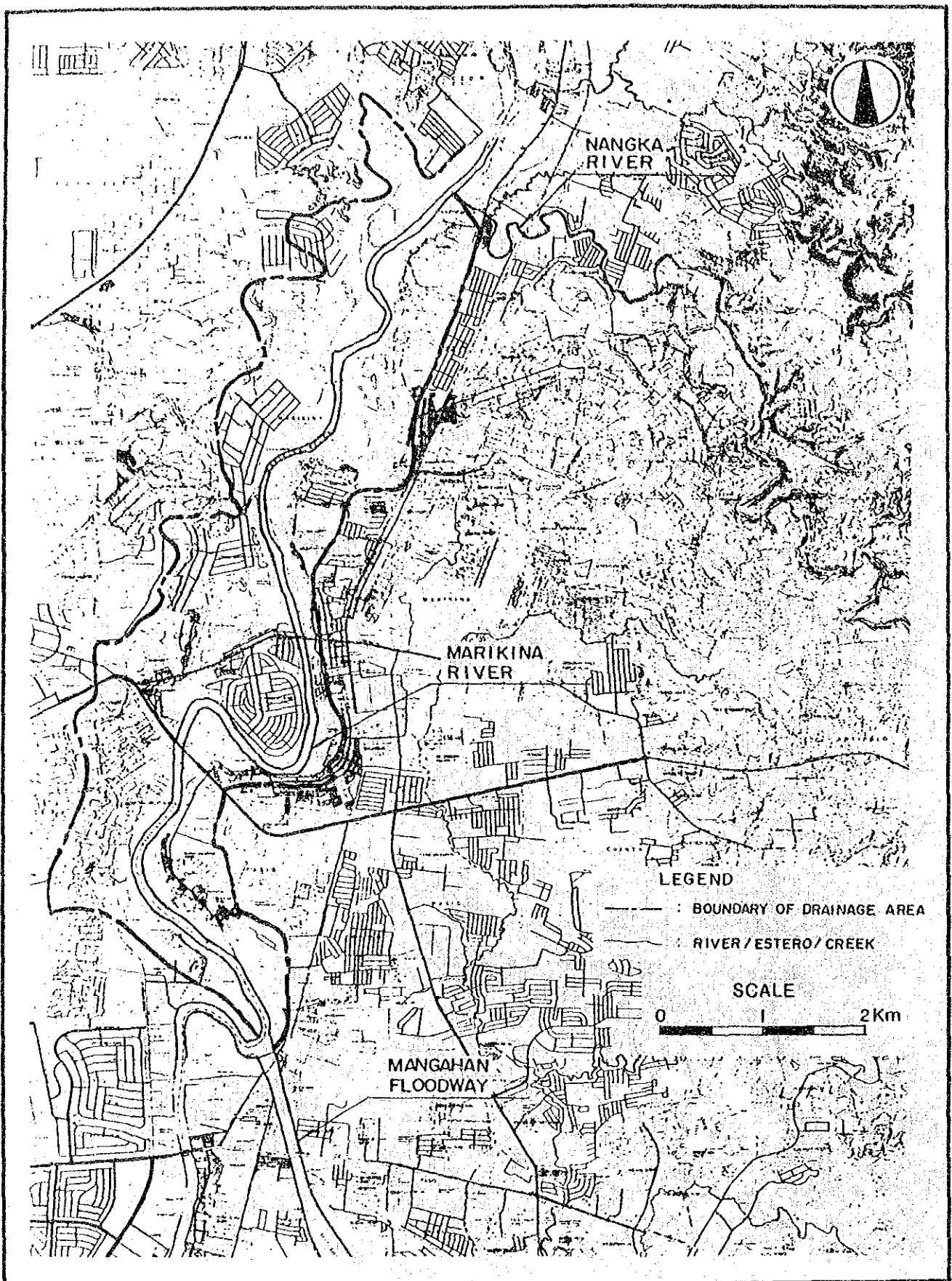


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

MANDALUYONG-PASIG DRAINAGE AREA

Fig.5-2-11

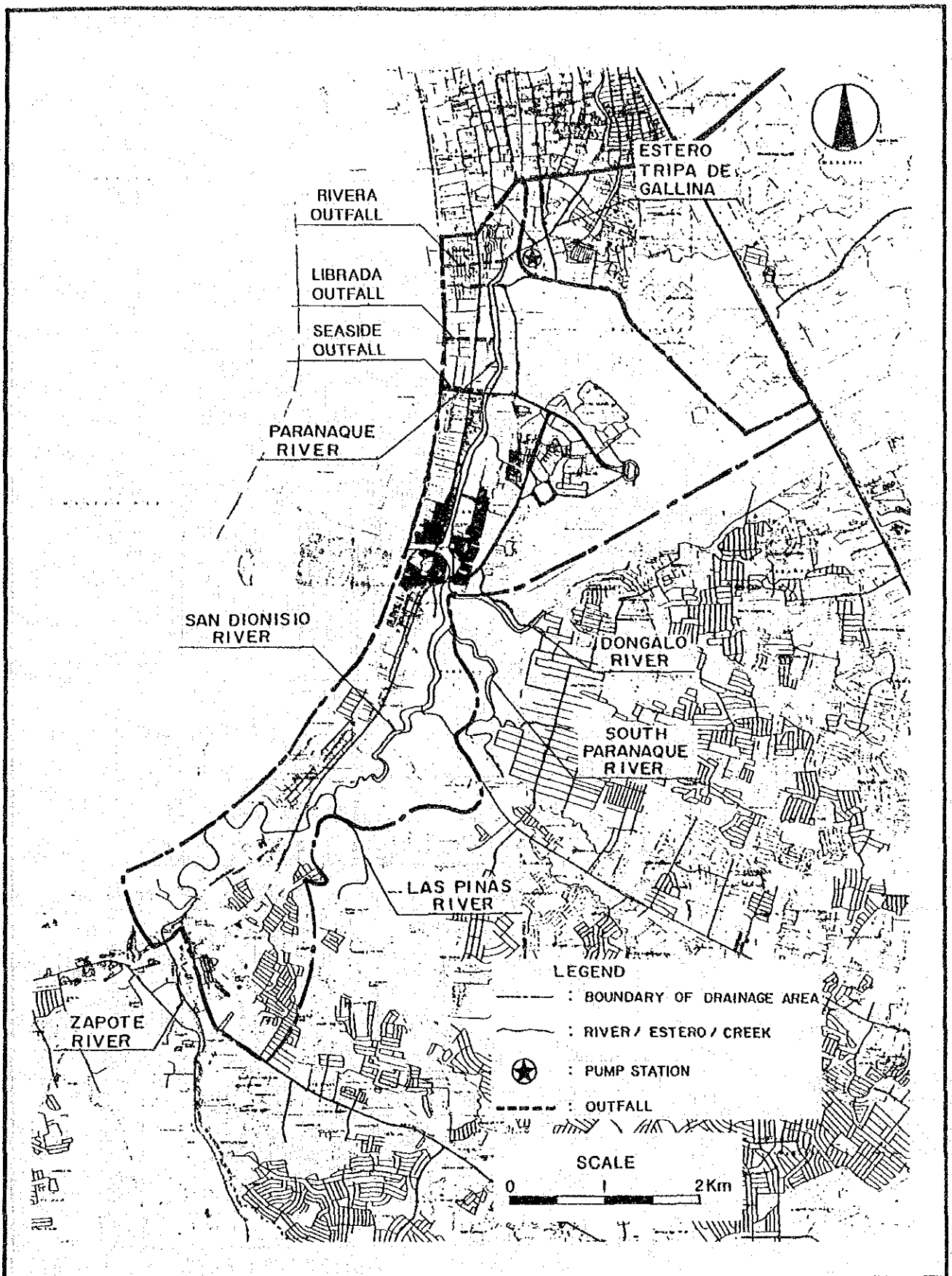


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

MARIKINA DRAINAGE AREA

Fig.5-2-12

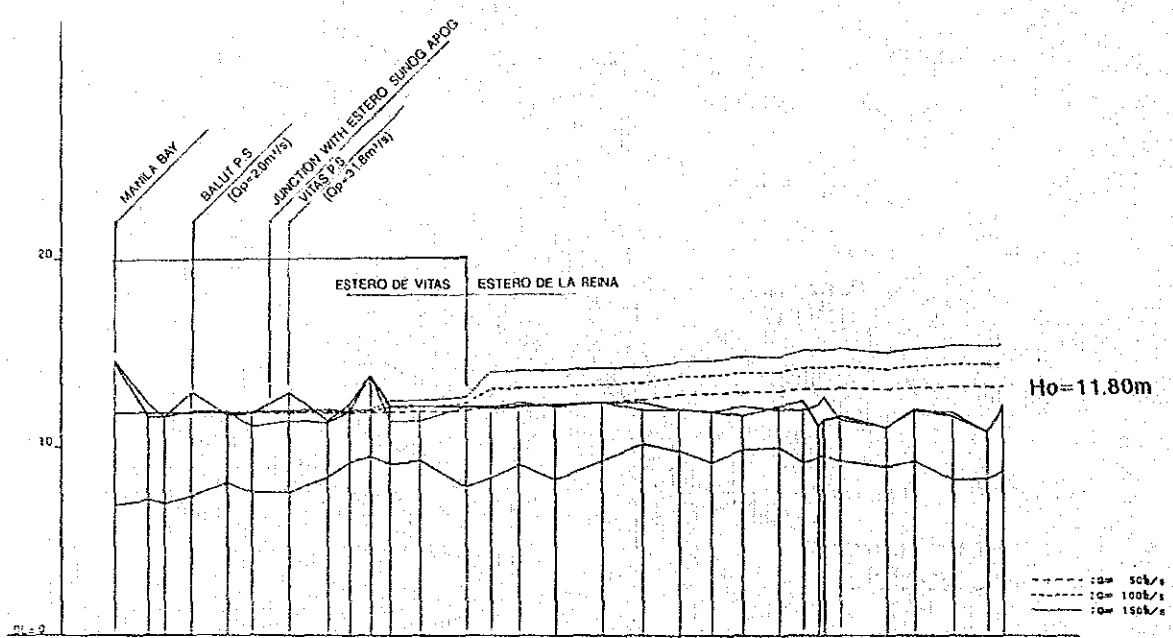


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

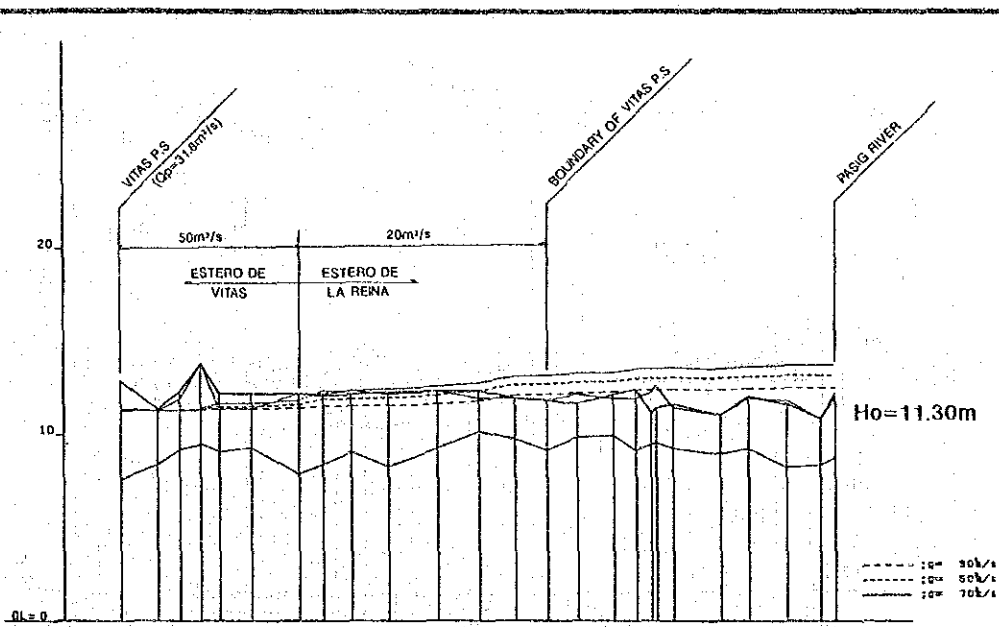
PARANAQUE-LAS PINAS DRAINAGE AREA

Fig.5-2-13

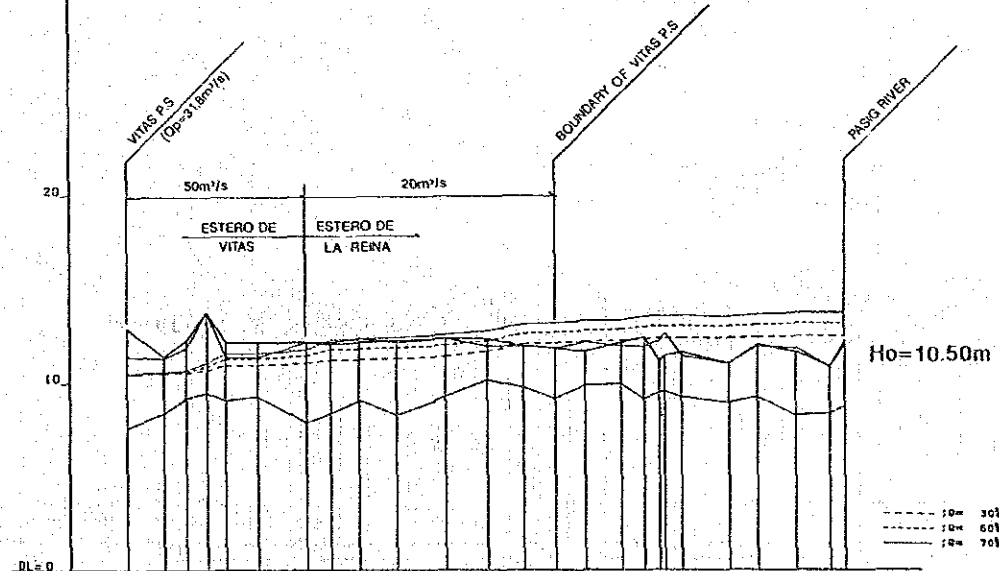


SECTION NUMBER	PRESENT ELEVATION (M) AT RIVER BED	PRESENT ELEVATION (M) AT BANK	WIDTH (M)
0.000	0.80	14.50	14.50
0.150	7.20	12.30	11.60
0.270	7.60	12.40	11.60
0.410	7.10	11.90	12.60
0.600	6.10	11.90	11.70
0.785	1.80	11.10	11.60
0.975	7.80	12.10	12.60
1.150	0.10	11.30	11.10
1.290	0.20	11.90	12.90
1.500	9.60	13.50	13.60
1.660	9.10	11.40	12.20
1.810	9.20	11.40	12.10
1.965	1.80	12.20	12.20
2.152	0.10	12.20	12.10
2.360	9.15	13.15	13.30
2.592	0.20	12.20	12.30
2.820	0.30	12.40	12.40
3.015	10.10	12.00	12.40
3.217	9.05	12.00	12.00
3.418	8.20	11.80	11.80
3.624	9.80	12.20	11.70
3.832	10.00	12.00	12.20
4.070	8.70	12.00	12.40
4.317	8.30	11.80	11.70
4.578	9.00	11.10	11.10
4.875	9.30	12.00	12.10
5.200	8.30	11.80	11.70
5.500	8.40	10.80	10.80
5.800	9.00	12.50	12.10

** VITAS - REINA **



STATION NUMBER	PRESENT ELEVATION (P)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
0.828	7.80	11.40	12.80
1.150	8.40	11.50	11.40
1.450	9.20	11.50	12.50
1.750	9.90	11.60	13.00
2.050	9.50	11.40	12.50
2.350	7.80	12.00	12.20
2.650	8.40	12.20	12.10
2.950	9.10	12.40	12.20
3.250	8.80	12.20	12.80
3.550	9.20	12.40	12.40
3.850	10.20	12.00	12.40
4.150	9.00	12.00	12.00
4.450	8.20	11.90	11.90
4.750	9.90	12.70	11.70
5.050	10.00	12.00	12.80
5.350	9.20	12.00	12.60
5.650	9.80	11.80	11.80
5.950	9.30	11.60	11.70
6.250	9.00	11.10	11.10
6.550	9.80	12.00	12.10
6.850	9.20	13.00	11.70
7.150	8.40	12.00	12.80
7.450	8.20	12.50	12.10



STATION NUMBER	PRESENT ELEVATION (P)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
0.828	7.80	11.40	12.80
1.150	8.40	11.50	11.40
1.450	9.20	11.60	12.50
1.750	9.90	11.60	13.00
2.050	9.50	11.40	12.50
2.350	7.80	12.00	12.20
2.650	8.40	12.20	12.10
2.950	9.10	12.40	12.20
3.250	8.80	12.20	12.80
3.550	9.20	12.40	12.40
3.850	10.20	12.00	12.40
4.150	9.00	12.00	12.00
4.450	8.20	11.90	11.90
4.750	9.90	12.70	11.70
5.050	10.00	12.00	12.80
5.350	9.20	12.00	12.60
5.650	9.80	11.80	11.80
5.950	9.30	11.60	11.70
6.250	9.00	11.10	11.10
6.550	9.80	12.00	12.10
6.850	9.20	13.00	11.70
7.150	8.40	12.00	12.80
7.450	8.20	12.50	12.10

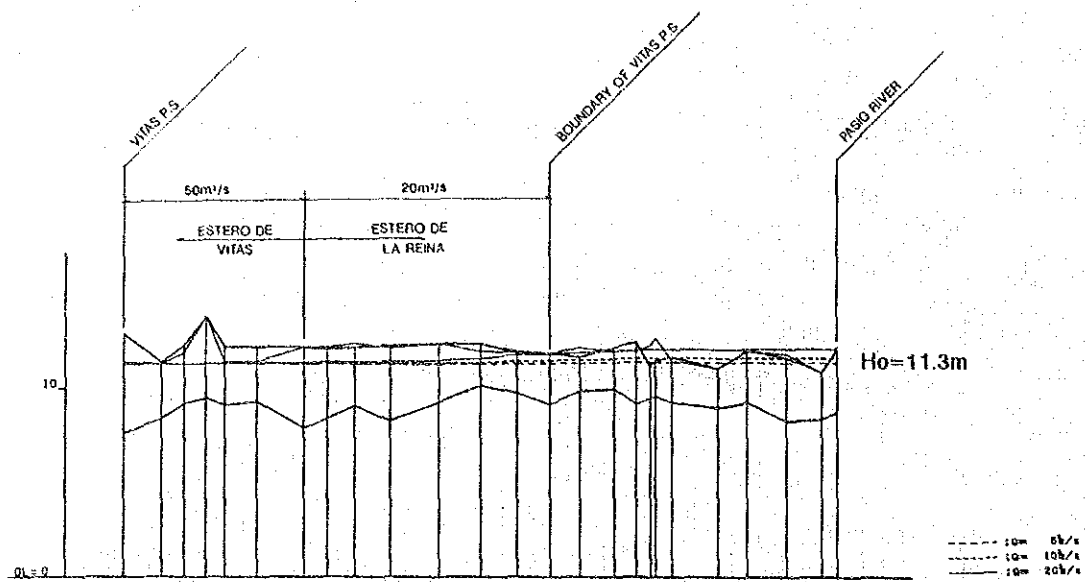
VITAS PS.-REINA

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

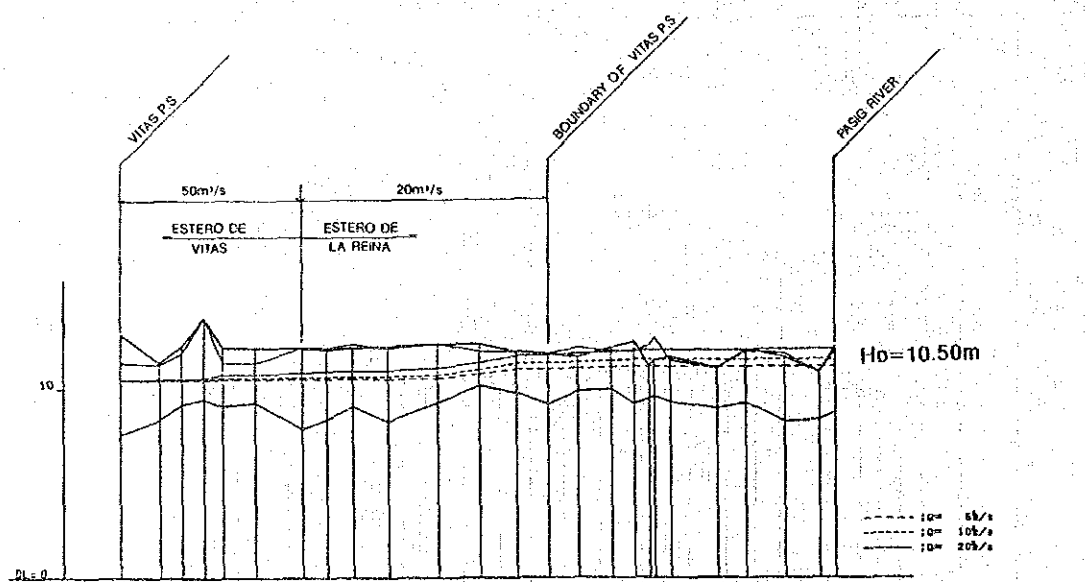
RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.5-2-14(2/17)



STATION NUMBER	PRESENT LOWEST RIVER BED	PRESENT ELEVATION (m)	
		LEFT BANK	RIGHT BANK
0+024	7.40	11.40	11.45
1+120	8.40	11.20	11.40
1+260	9.10	11.00	11.35
1+355	9.80	10.80	11.30
1+455	9.10	11.40	12.20
1+458	8.30	11.40	12.20
2+081	7.00	12.20	12.20
2+728	8.40	12.20	12.15
2+888	8.10	12.40	12.40
2+889	8.20	12.20	12.20
2+122	8.20	12.40	12.40
1+814	10.20	12.00	12.40
1+717	8.80	12.00	12.20
1+849	8.20	11.80	11.80
1+424	8.30	12.00	11.75
1+188	10.00	12.00	12.05
1+070	8.20	12.00	11.80
0+882	8.80	12.20	11.65
0+877	8.30	11.80	11.75
0+228	8.20	11.10	11.10
0+176	8.30	12.00	12.10
0+288	8.20	11.80	11.75
0+280	8.40	10.80	10.80
0+000	8.80	12.30	12.15

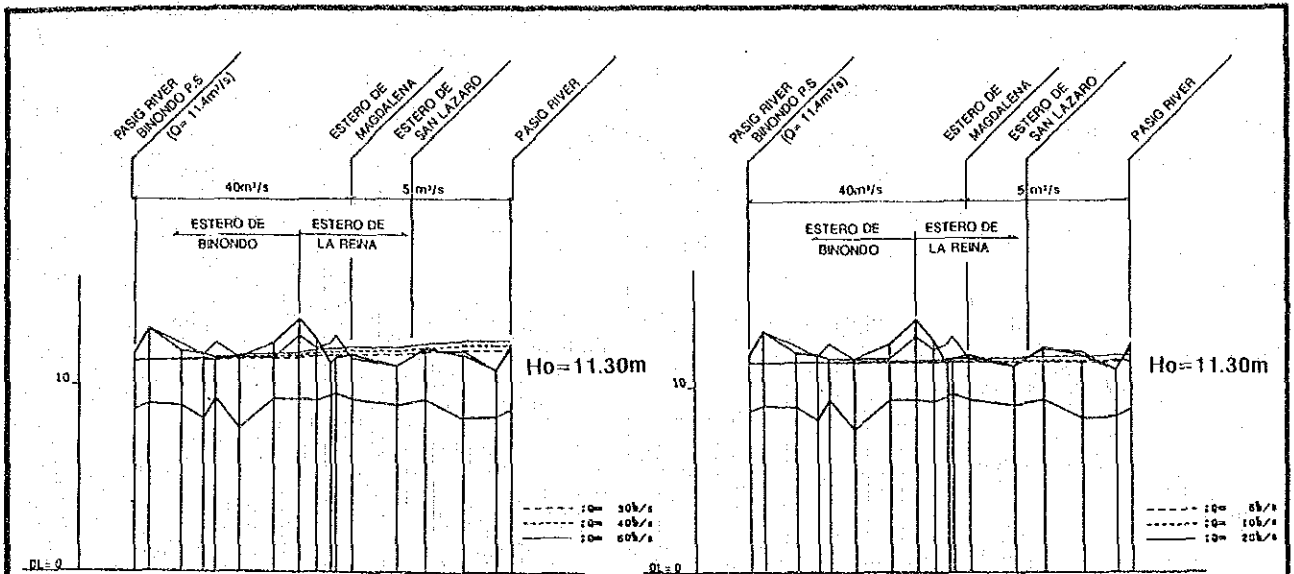


STATION NUMBER	PRESENT LOWEST RIVER BED	PRESENT ELEVATION (m)	
		LEFT BANK	RIGHT BANK
0+028	7.80	11.10	12.25
1+128	8.40	11.20	11.40
1+280	8.20	11.80	12.20
1+358	8.30	13.80	13.40
1+408	8.10	11.40	12.20
1+204	8.30	11.40	12.20
2+084	7.80	12.20	12.20
2+124	8.10	12.20	12.15
2+888	8.10	12.40	12.40
2+885	8.20	12.20	12.20
2+122	8.20	12.40	12.40
1+814	10.20	12.00	12.40
1+717	8.80	12.00	12.20
1+848	8.20	11.80	11.80
1+424	8.30	12.20	11.75
1+188	10.00	12.00	12.20
1+070	8.20	12.00	12.05
0+882	8.80	12.20	11.65
0+877	8.20	11.80	11.75
0+228	8.20	11.10	11.10
0+176	8.30	12.00	12.10
0+288	8.20	11.80	11.75
0+280	8.40	10.80	10.80
0+000	8.80	12.30	12.15

VITAS PS.-REINA

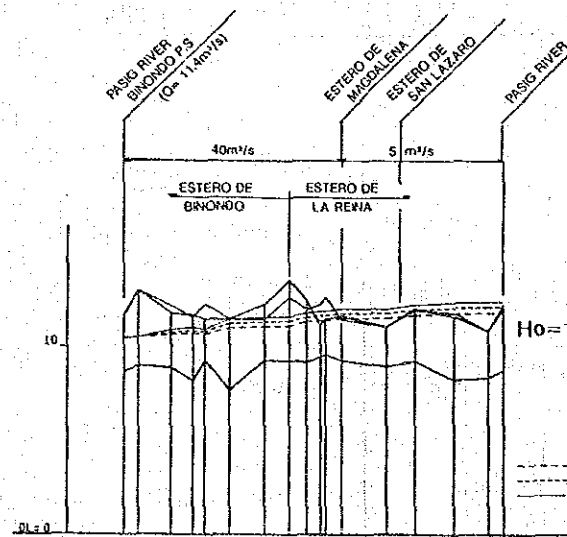
THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES
JAPAN INTERNATIONAL COOPERATION AGENCY

RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS
Fig.5-2-14(3/17)

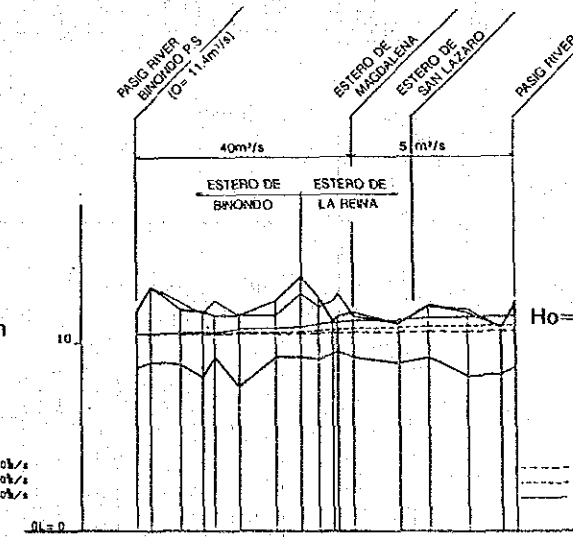


STATION NUMBER	PRESENT ELEVATION (m.)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
0.000	8.70	11.70	11.70
0.075	9.00	15.00	15.00
0.242	8.90	12.00	11.80
0.351	9.00	11.80	11.70
0.432	9.20	12.50	11.60
0.498	7.70	11.80	11.80
0.747	8.20	11.60	12.20
0.888	8.20	12.70	13.00
1.070	9.40	12.00	12.60
1.282	8.80	12.30	11.80
0.977	8.20	11.60	11.70
0.828	8.20	11.10	11.10
0.478	8.20	12.00	12.10
0.288	8.20	11.80	11.70
0.090	8.10	10.80	10.90
0.000	8.00	12.20	12.10

STATION NUMBER	PRESENT ELEVATION (m.)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
0.000	8.70	11.70	11.70
0.075	9.00	15.00	15.00
0.242	8.90	12.20	11.80
0.351	9.00	11.80	11.70
0.432	9.20	12.50	11.60
0.498	7.70	11.80	11.70
0.747	8.20	11.80	12.20
0.888	8.20	12.70	13.00
1.070	9.20	12.00	12.60
1.282	8.80	12.30	11.80
0.977	8.20	11.60	11.70
0.828	8.20	11.10	11.10
0.478	8.20	12.00	12.10
0.288	8.20	11.80	11.70
0.090	8.10	10.80	10.90
0.000	8.00	12.20	12.10



STATION NUMBER	PRESENT ELEVATION (m.)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
0.000	8.70	11.70	11.70
0.075	9.00	15.00	15.00
0.242	8.90	12.00	11.80
0.351	9.00	11.80	11.70
0.432	9.20	12.50	11.60
0.498	7.70	11.80	11.80
0.747	8.20	11.60	12.20
0.888	8.20	12.70	13.00
1.070	9.40	12.00	12.60
1.282	8.80	12.30	11.80
0.977	8.20	11.60	11.70
0.828	8.20	11.10	11.10
0.478	8.20	12.00	12.10
0.288	8.20	11.80	11.70
0.090	8.10	10.80	10.90
0.000	8.00	12.20	12.10



STATION NUMBER	PRESENT ELEVATION (m.)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
0.000	8.70	11.70	11.70
0.075	9.00	15.00	15.00
0.242	8.90	12.00	11.80
0.351	9.00	11.80	11.70
0.432	9.20	12.50	11.60
0.498	7.70	11.80	11.70
0.747	8.20	11.60	12.20
0.888	8.20	12.70	13.00
1.070	9.20	12.00	12.60
1.282	8.80	12.30	11.80
0.977	8.20	11.60	11.70
0.828	8.20	11.10	11.10
0.478	8.20	12.00	12.10
0.288	8.20	11.80	11.70
0.090	8.10	10.80	10.90
0.000	8.00	12.20	12.10

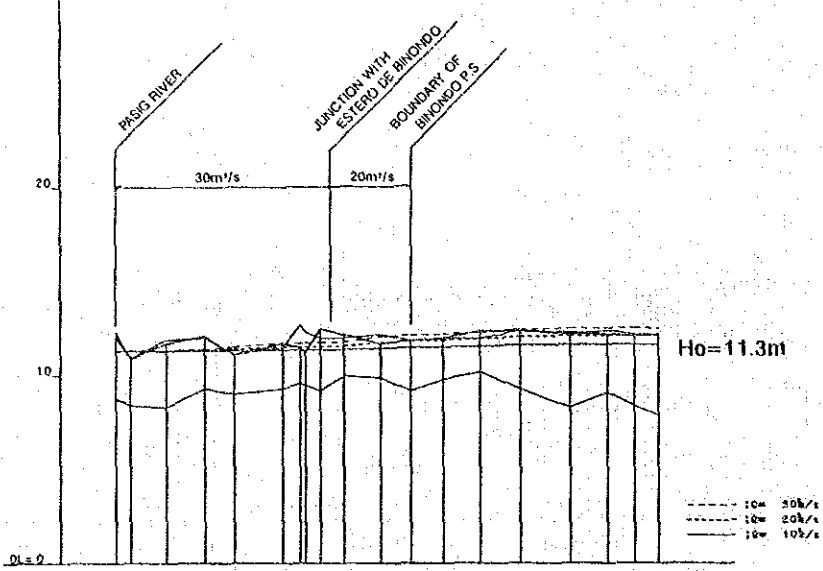
** BINONDO-REINA **

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

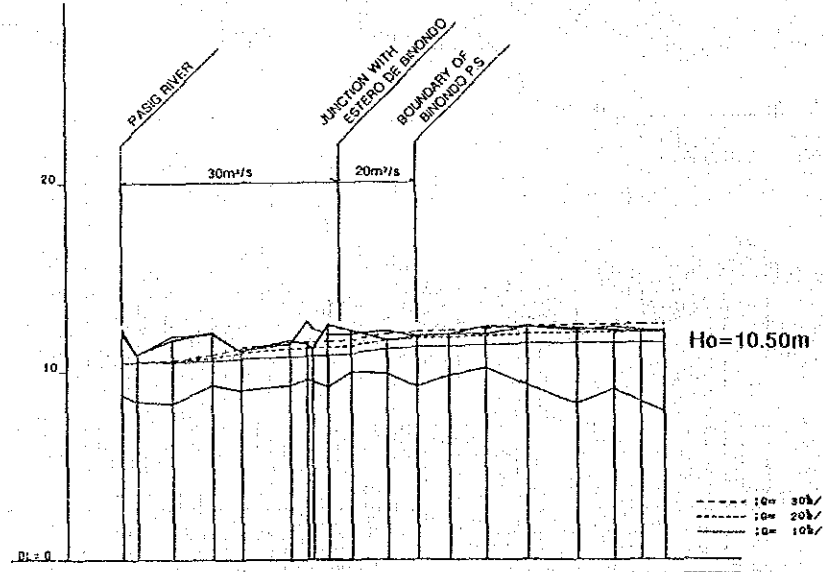
JAPAN INTERNATIONAL COOPERATION AGENCY

RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS

Fig.5-2-14(4/17)



STATION NUMBER	PRESENT ELEVATION (m)		RIGHT BANK	
	LOVEST RIVER BED	RIGHT BANK	LEFT BANK	RIGHT BANK
0.000	8.80	12.10	17.90	18.10
0.050	8.10	10.80	16.90	16.90
0.100	8.50	11.70	11.90	11.70
0.178	8.30	12.10	12.00	12.10
0.298	8.00	11.10	11.10	11.10
0.477	8.70	11.50	11.50	11.70
0.693	8.88	12.30	12.30	11.90
1.070	8.30	12.00	12.00	12.40
1.182	10.00	12.00	12.00	12.20
1.264	8.00	12.80	12.80	11.70
1.448	8.20	11.80	11.80	11.80
1.717	8.80	12.00	12.00	12.00
1.814	10.00	12.00	12.00	12.40
2.189	8.20	12.40	12.40	12.40
2.392	8.20	12.10	12.10	12.10
2.680	8.10	12.40	12.40	12.20
2.752	8.40	12.20	12.20	12.10
2.981	7.90	12.30	12.30	12.20

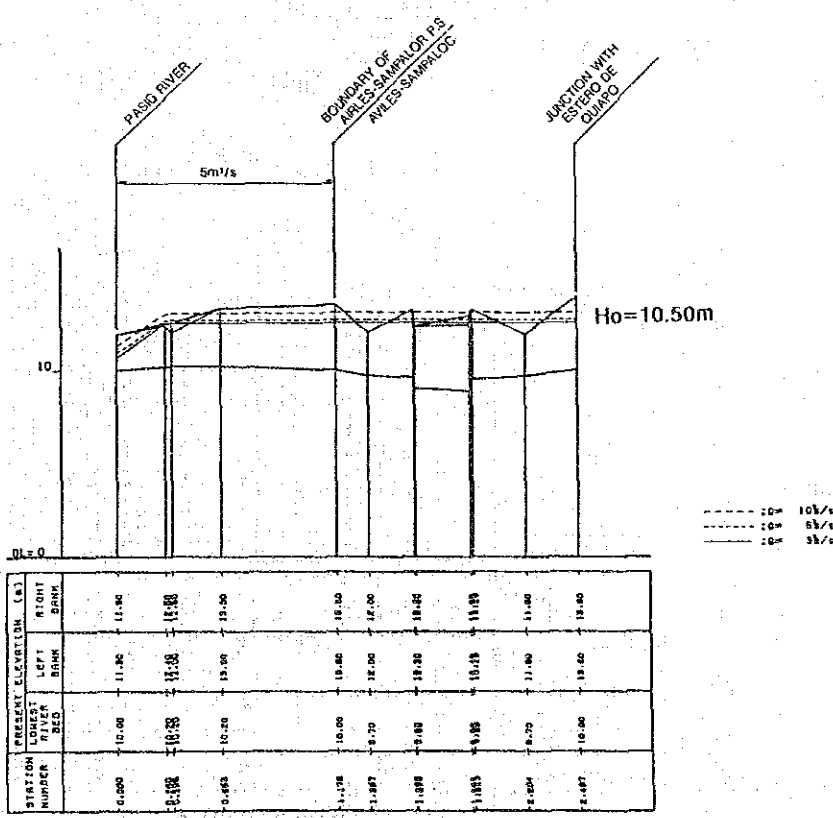
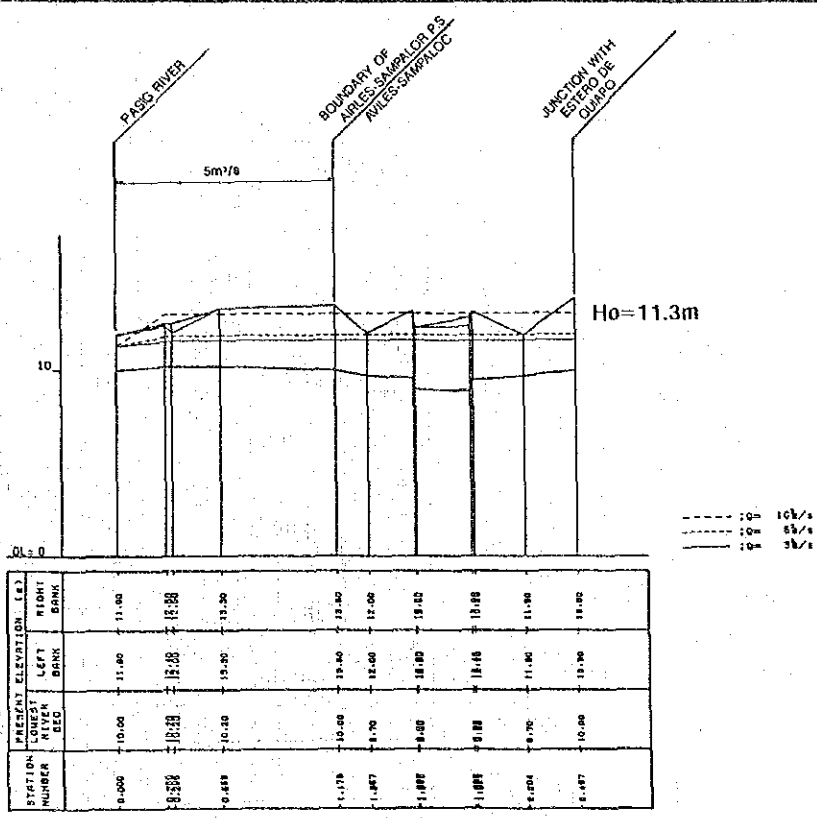


STATION NUMBER	PRESENT ELEVATION (m)		RIGHT BANK	
	LOVEST RIVER BED	RIGHT BANK	LEFT BANK	RIGHT BANK
0.000	8.80	12.10	15.10	15.10
0.050	8.10	10.80	15.90	15.90
0.100	8.50	11.70	11.70	11.70
0.178	8.30	12.10	12.10	12.10
0.298	8.00	11.10	11.10	11.10
0.477	8.70	11.50	11.50	11.70
0.693	8.88	12.30	12.30	11.90
1.070	8.30	12.00	12.00	12.40
1.182	10.00	12.00	12.00	12.20
1.264	8.00	12.80	12.80	11.70
1.448	8.20	11.80	11.80	11.80
1.717	8.80	12.00	12.00	12.00
1.814	10.00	12.00	12.00	12.40
2.189	8.20	12.40	12.40	12.40
2.392	8.20	12.10	12.10	12.10
2.680	8.10	12.40	12.40	12.20
2.752	8.40	12.20	12.20	12.10
2.981	7.90	12.30	12.30	12.20

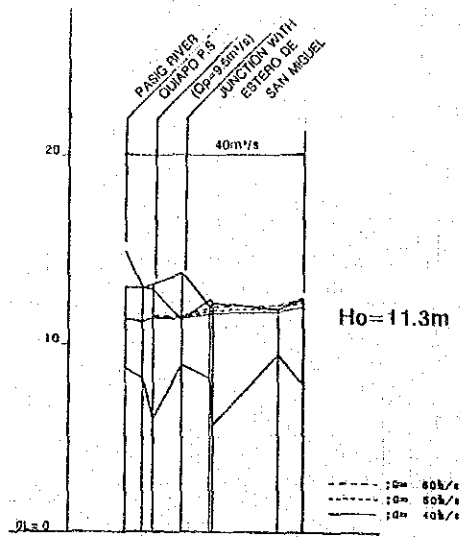
*** ESTERO DELA REINA ***

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES
JAPAN INTERNATIONAL COOPERATION AGENCY

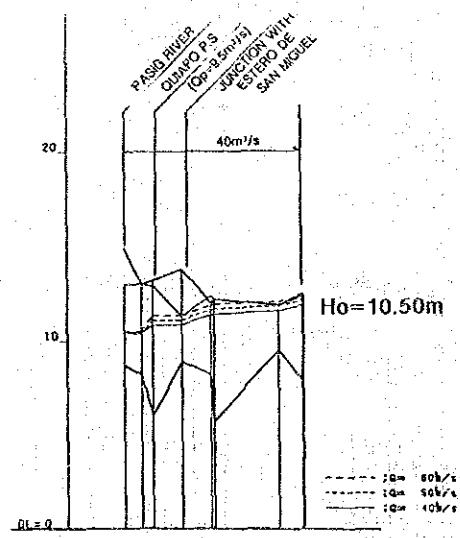
RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS
Fig. 5-2-14(5/17)



** ESTERO DE SAN MIGUEL **

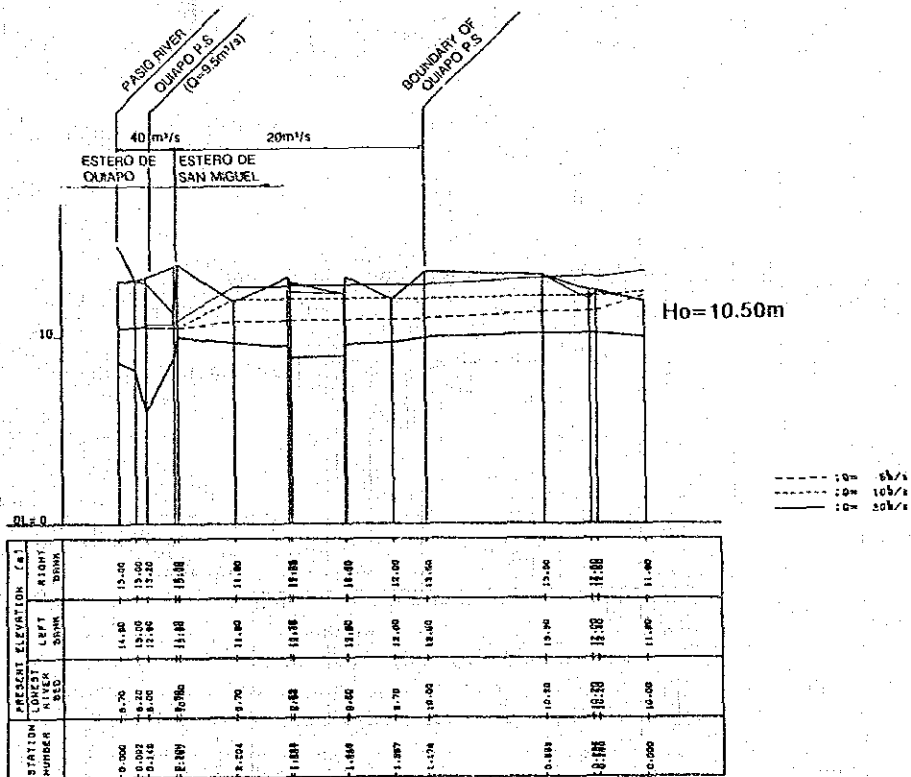
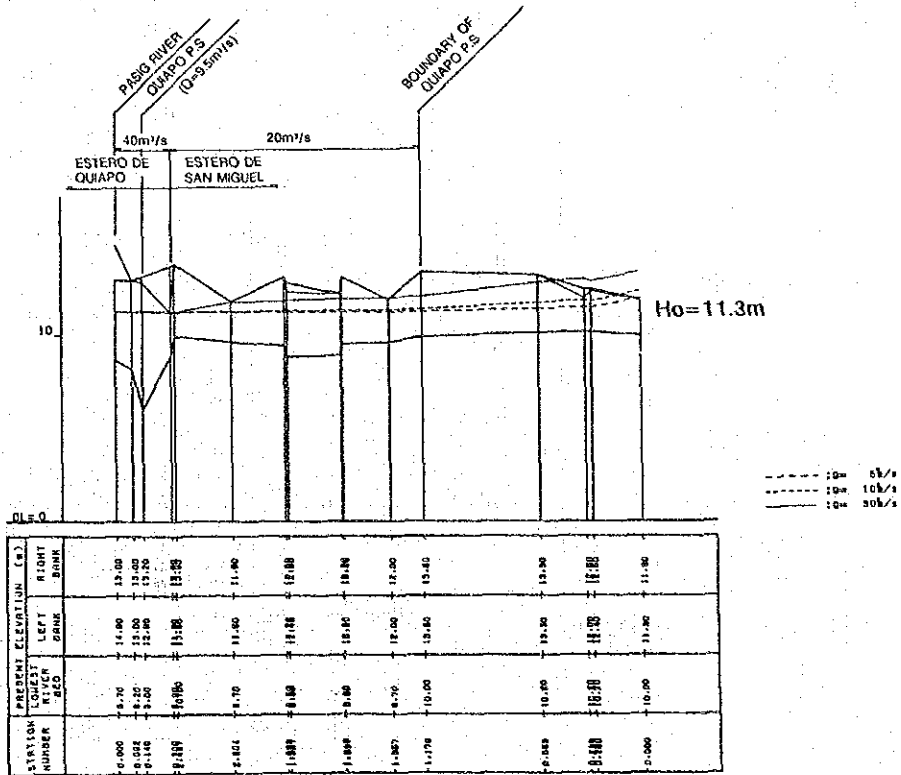


STATION NUMBER	PRESENT ELEVATION (m)	
	LOWEST RIVER BED	RIGHT BANK
0.000	8.70	13.00
0.002	8.70	13.00
0.116	8.00	13.00
0.300	8.00	13.00
0.411	8.00	13.00
0.823	8.00	13.00
0.985	8.00	13.00



STATION NUMBER	PRESENT ELEVATION (m)	
	LOWEST RIVER BED	RIGHT BANK
0.000	8.70	13.00
0.002	8.70	13.00
0.116	8.00	13.00
0.300	8.00	13.00
0.411	8.00	13.00
0.823	8.00	13.00
0.985	8.00	13.00

** ESTERO DE QUIAPO **



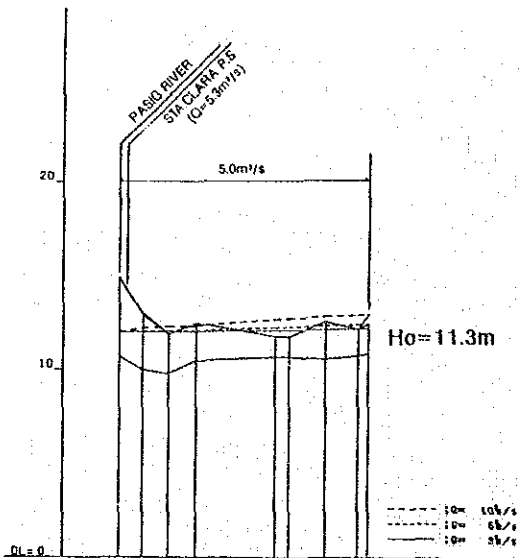
QUIAPO-SAN MIGUEL

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

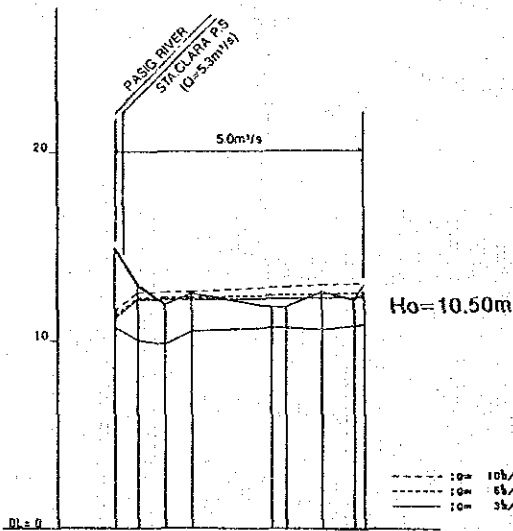
RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.5-2-14(8/17)



STATION NUMBER	PRESENT LOWEST RIVER BED	PRESENT ELEVATION (m)	
		LEFT BANK	RIGHT BANK
0.000	10.70	14.00	14.00
0.124	10.06	12.80	13.00
0.248	8.80	11.00	11.00
0.412	10.00	12.00	12.00
0.638	10.70	11.00	11.00
0.816	10.70	11.00	11.00
1.110	10.00	12.00	12.00
1.282	10.00	12.00	12.00
1.328	10.00	12.00	12.00



STATION NUMBER	PRESENT LOWEST RIVER BED	PRESENT ELEVATION (m)	
		LEFT BANK	RIGHT BANK
0.000	10.70	14.00	14.00
0.124	10.00	12.80	13.00
0.248	8.80	11.00	11.00
0.412	10.00	12.00	12.00
0.638	10.70	11.00	11.00
0.816	10.70	11.00	11.00
1.110	10.00	12.00	12.00
1.282	10.00	12.00	12.00
1.328	10.00	12.00	12.00

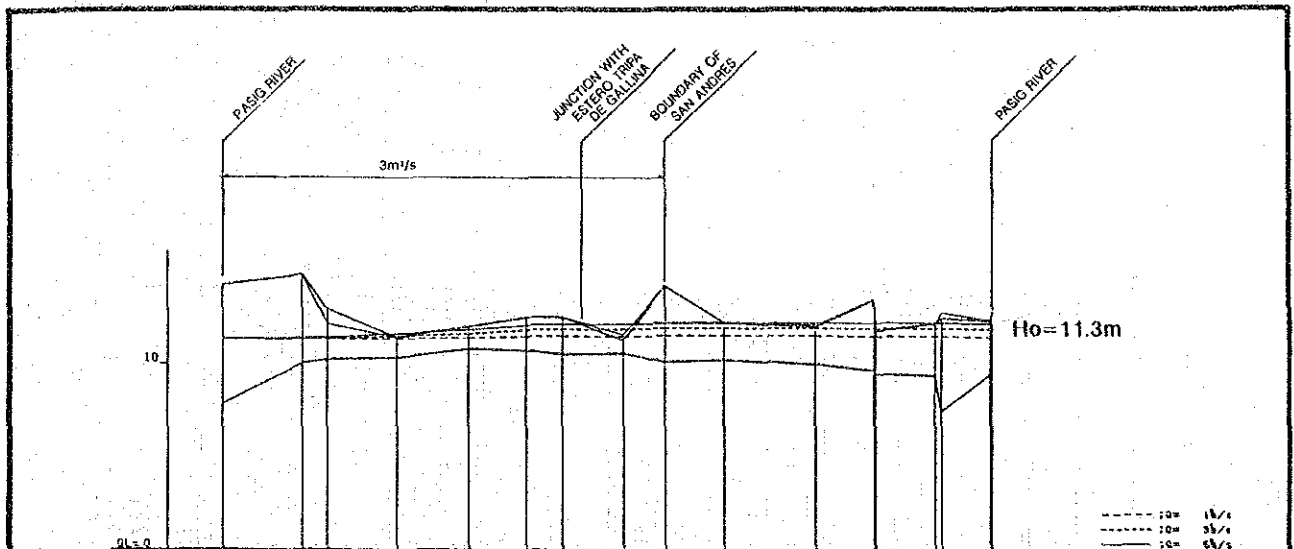
** ESTERO DE STA. CLARA **

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

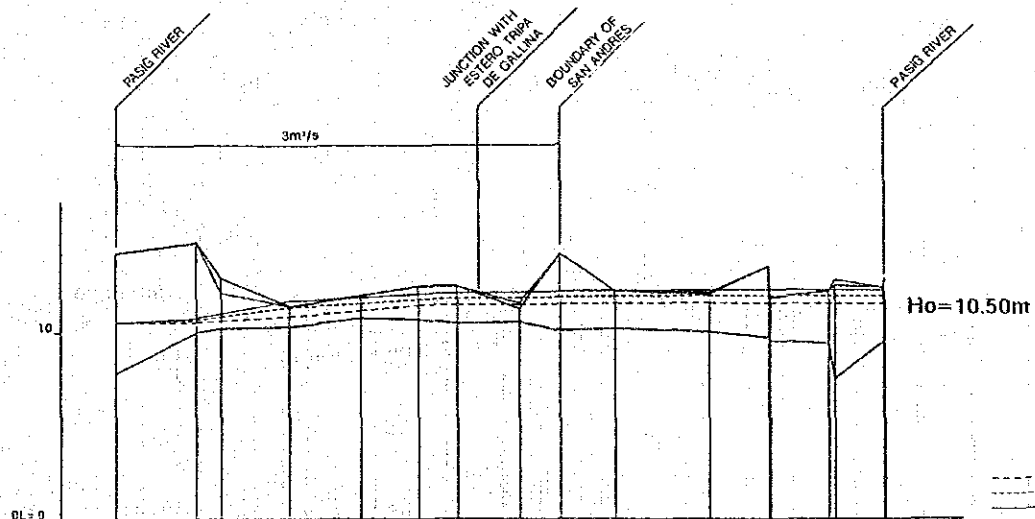
RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS

JAPAN INTERNATIONAL COOPERATION AGENCY

Fig.5-2-14(9/17)



STATION NUMBER	PRESENT ELEVATION (m)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
1.700	7.40	14.20	14.20
1.757	10.00	14.40	14.40
1.828	10.20	12.10	12.40
1.888	10.50	11.40	11.40
1.971	10.40	15.00	12.00
2.047	10.70	15.40	12.80
2.134	10.40	11.40	11.40
2.200	10.40	11.40	11.40
1.775	10.10	14.20	14.20
1.480	10.50	15.20	12.20
0.940	10.00	12.70	12.00
0.610	8.80	13.40	13.40
0.300	7.40	15.30	12.30
0.000	5.80	15.40	15.40



STATION NUMBER	PRESENT ELEVATION (m)		RIGHT BANK
	LOWEST RIVER BED	LEFT BANK	
1.700	7.40	14.20	14.20
1.757	10.00	14.40	14.40
1.828	10.20	12.10	12.40
1.888	10.50	11.40	11.40
1.971	10.40	15.00	12.00
2.047	10.70	15.40	12.80
2.134	10.40	12.40	12.40
2.200	10.40	11.40	11.40
1.775	10.10	14.20	14.20
1.480	10.50	15.20	12.20
0.940	10.00	12.70	12.00
0.610	8.80	13.40	13.40
0.300	7.40	15.30	12.30
0.000	5.80	15.40	15.40

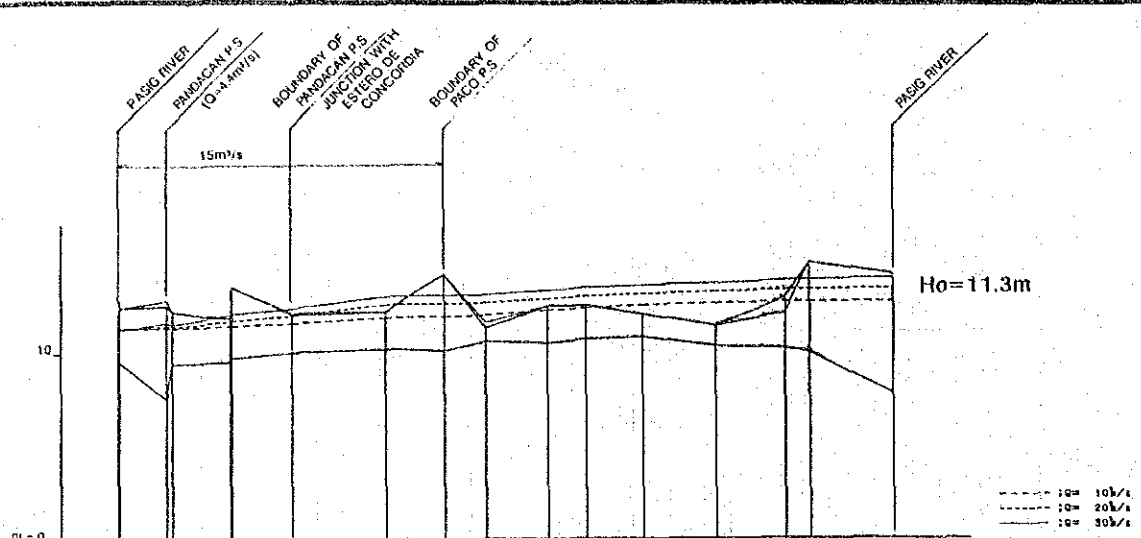
** ESTERO DE PANDACAN **

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

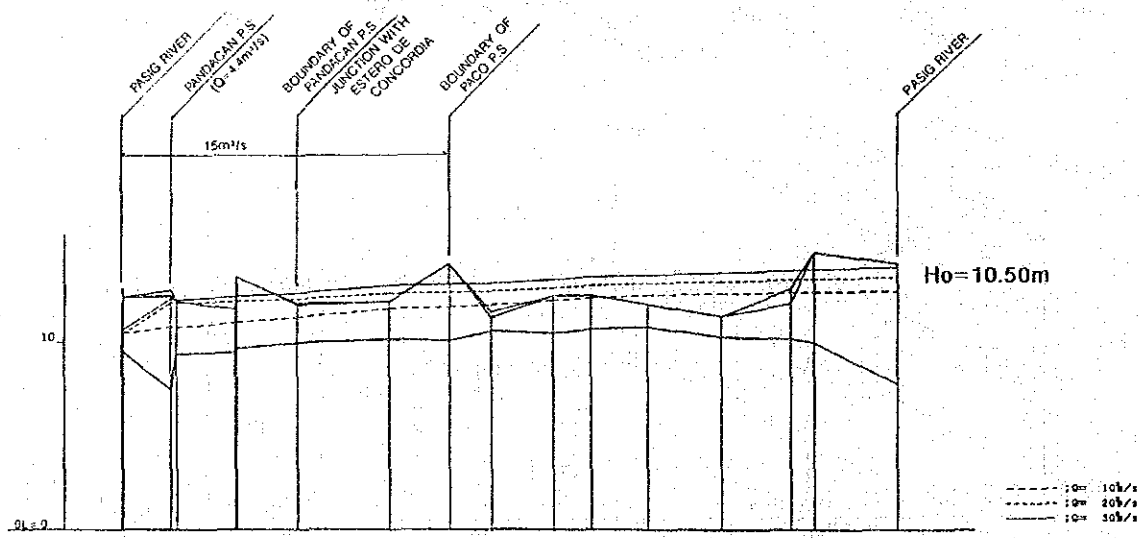
JAPAN INTERNATIONAL COOPERATION AGENCY

RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS

Fig.5-2-14(10/17)

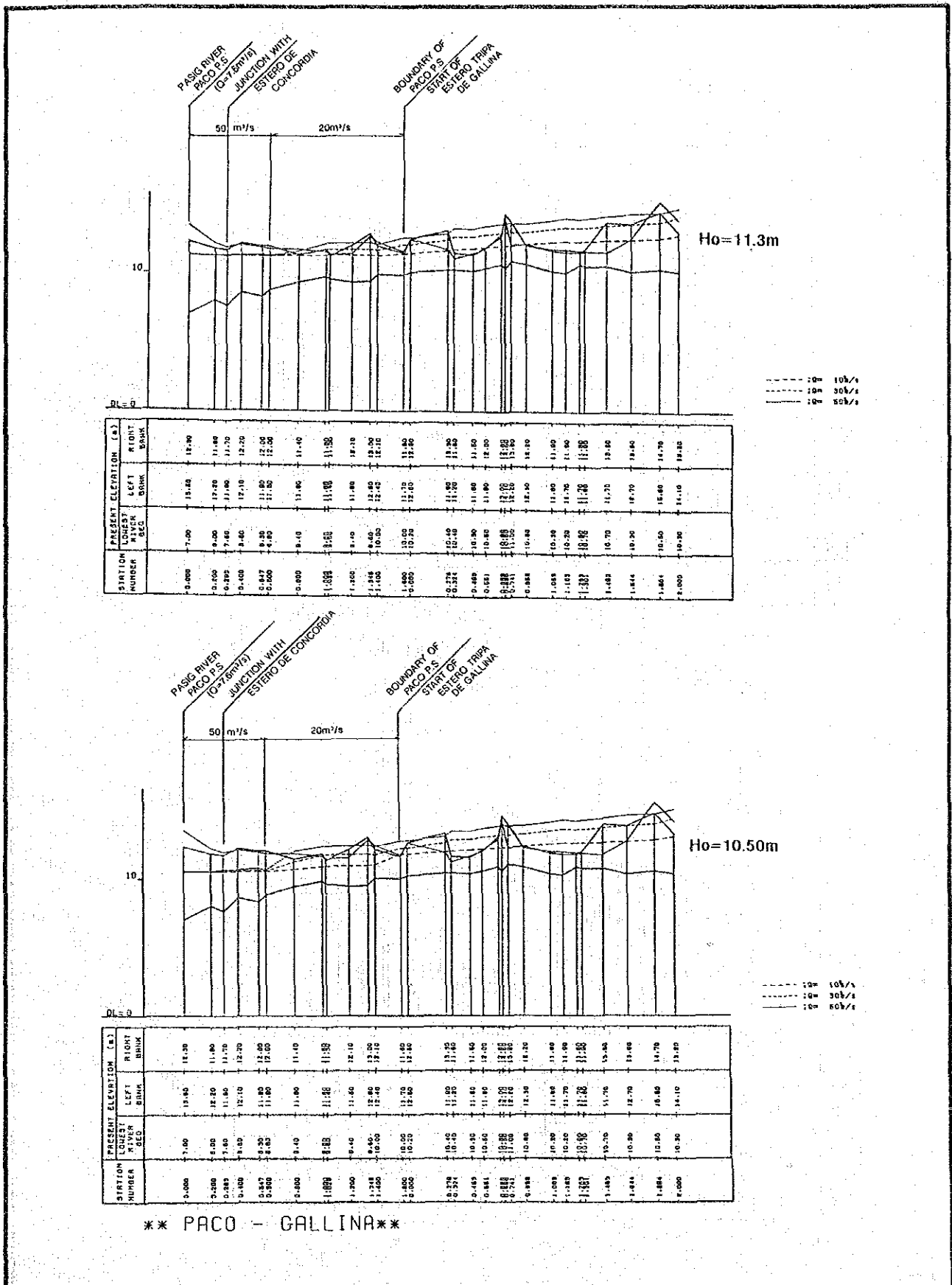


STATION NUMBER	PRESENT ELEVATION (m)	
	RIGHT BANK	LEFT BANK
0+000	12.40	12.40
0+200	12.30	12.30
0+400	12.20	12.20
0+600	12.10	12.10
0+800	12.00	12.00
1+000	11.90	11.90
1+200	11.80	11.80
1+400	11.70	11.70
1+600	11.60	11.60
1+800	11.50	11.50
2+000	11.40	11.40
2+200	11.30	11.30
2+400	11.20	11.20
2+600	11.10	11.10
2+800	11.00	11.00
3+000	10.90	10.90
3+200	10.80	10.80
3+400	10.70	10.70
3+600	10.60	10.60
3+800	10.50	10.50
4+000	10.40	10.40
4+200	10.30	10.30



STATION NUMBER	PRESENT ELEVATION (m)	
	RIGHT BANK	LEFT BANK
0+000	12.40	12.40
0+200	12.30	12.30
0+400	12.20	12.20
0+600	12.10	12.10
0+800	12.00	12.00
1+000	11.90	11.90
1+200	11.80	11.80
1+400	11.70	11.70
1+600	11.60	11.60
1+800	11.50	11.50
2+000	11.40	11.40
2+200	11.30	11.30
2+400	11.20	11.20
2+600	11.10	11.10
2+800	11.00	11.00
3+000	10.90	10.90
3+200	10.80	10.80
3+400	10.70	10.70
3+600	10.60	10.60
3+800	10.50	10.50
4+000	10.40	10.40
4+200	10.30	10.30

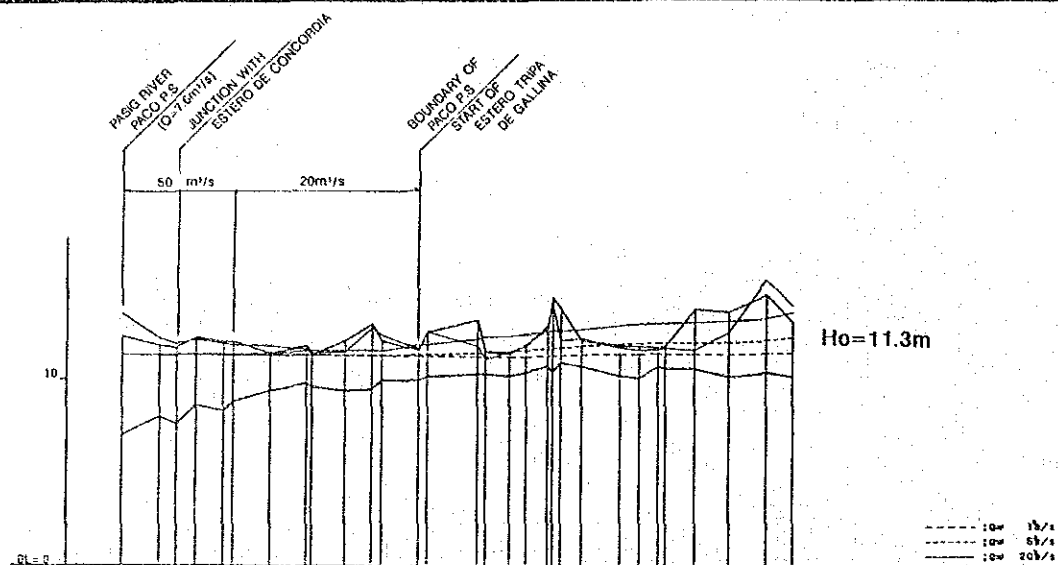
** ESTERO DE PANDACAN **



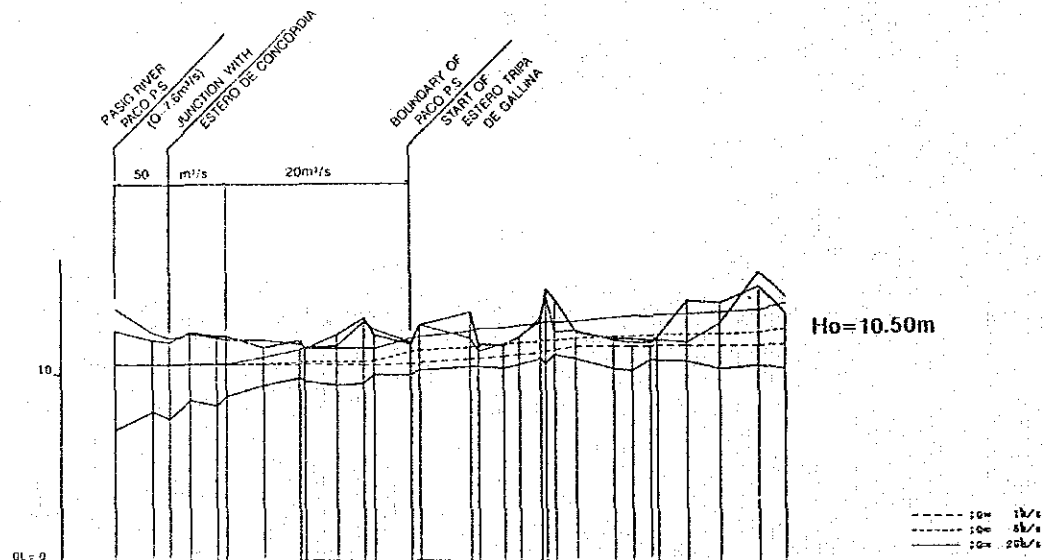
STATION NUMBER	PRESENT ELEVATION (m)	
	LEFT BANK	RIGHT BANK
0+000	15.40	12.90
0+020	17.20	11.80
0+035	17.00	11.70
0+100	12.10	12.70
0+147	11.80	12.00
0+200	11.50	12.30
0+300	11.90	11.40
1+300	11.40	11.90
1+500	11.40	12.10
1+545	12.45	12.10
1+600	10.50	12.40
1+650	12.20	11.60
1+700	11.80	12.30
1+750	11.80	12.30
1+800	12.20	12.40
1+850	12.40	12.30
1+900	11.80	12.30
1+950	11.80	12.30
2+000	11.80	12.30
2+050	11.80	12.30
2+100	11.80	12.30
2+150	11.80	12.30
2+200	11.80	12.30
2+250	11.80	12.30
2+300	11.80	12.30
2+350	11.80	12.30
2+400	11.80	12.30
2+450	11.80	12.30
2+500	11.80	12.30
2+550	11.80	12.30
2+600	11.80	12.30
2+650	11.80	12.30
2+700	11.80	12.30
2+750	11.80	12.30
2+800	11.80	12.30
2+850	11.80	12.30
2+900	11.80	12.30
2+950	11.80	12.30
3+000	11.80	12.30

STATION NUMBER	PRESENT ELEVATION (m)	
	LEFT BANK	RIGHT BANK
0+000	15.40	12.90
0+200	12.20	11.80
0+350	11.80	11.70
0+400	12.10	12.70
0+447	11.80	12.00
0+500	11.50	12.30
0+600	11.90	11.40
1+300	11.40	11.90
1+500	11.40	12.10
1+545	12.45	12.10
1+600	10.50	12.40
1+650	12.20	11.60
1+700	11.80	12.30
1+750	11.80	12.30
1+800	12.20	12.40
1+850	12.40	12.30
1+900	11.80	12.30
1+950	11.80	12.30
2+000	11.80	12.30
2+050	11.80	12.30
2+100	11.80	12.30
2+150	11.80	12.30
2+200	11.80	12.30
2+250	11.80	12.30
2+300	11.80	12.30
2+350	11.80	12.30
2+400	11.80	12.30
2+450	11.80	12.30
2+500	11.80	12.30
2+550	11.80	12.30
2+600	11.80	12.30
2+650	11.80	12.30
2+700	11.80	12.30
2+750	11.80	12.30
2+800	11.80	12.30
2+850	11.80	12.30
2+900	11.80	12.30
2+950	11.80	12.30
3+000	11.80	12.30

** PACO - GALLINA **



STATION NUMBER	PRESENT ELEVATION (m)		RIGHT BANK DUNE
	LOWEST RIVER BED	LEFT BANK	
0.000	7.00	13.50	12.30
0.200	8.00	12.20	11.80
0.283	7.80	11.70	11.70
0.400	8.00	12.10	12.20
0.447	8.30	11.80	12.00
0.600	8.80	11.80	12.00
0.800	8.40	11.80	11.40
1.000	8.80	11.80	11.80
1.200	8.40	11.80	12.10
1.245	8.80	12.80	13.20
1.400	10.00	12.40	12.10
1.600	10.00	11.70	11.80
2.000	10.70	12.80	12.80
2.278	10.40	11.80	12.20
2.324	10.40	11.80	11.80
2.483	10.30	11.80	11.80
2.681	10.00	11.80	12.00
2.840	10.60	12.00	12.80
2.940	10.60	12.20	13.80
3.088	10.80	12.30	12.20
3.283	10.30	11.80	11.80
3.481	10.20	11.70	11.80
3.687	10.70	11.80	11.80
3.888	10.70	11.70	13.80
4.044	10.30	12.70	13.80
4.244	10.30	13.80	14.70
4.400	10.30	14.10	13.80



STATION NUMBER	PRESENT ELEVATION (m)		RIGHT BANK DUNE
	LOWEST RIVER BED	LEFT BANK	
0.000	7.00	13.50	12.30
0.200	8.00	12.20	11.80
0.283	7.80	11.70	11.70
0.400	8.00	12.10	12.20
0.447	8.30	11.80	12.00
0.600	8.80	11.80	12.00
0.800	8.40	11.80	11.40
1.000	8.80	11.80	11.80
1.200	8.40	11.80	12.10
1.245	8.80	12.80	13.20
1.400	10.00	12.40	12.10
1.600	10.00	11.70	11.80
2.000	10.70	12.80	12.80
2.278	10.40	11.80	12.20
2.324	10.40	11.80	11.80
2.483	10.30	11.80	11.80
2.681	10.00	11.80	12.00
2.840	10.60	12.00	12.80
2.940	10.60	12.20	13.80
3.088	10.80	12.30	12.20
3.283	10.30	11.80	11.80
3.481	10.20	11.70	11.80
3.687	10.70	11.80	11.80
3.888	10.70	11.70	13.80
4.044	10.30	12.70	13.80
4.244	10.30	13.80	14.70
4.400	10.30	14.10	13.80

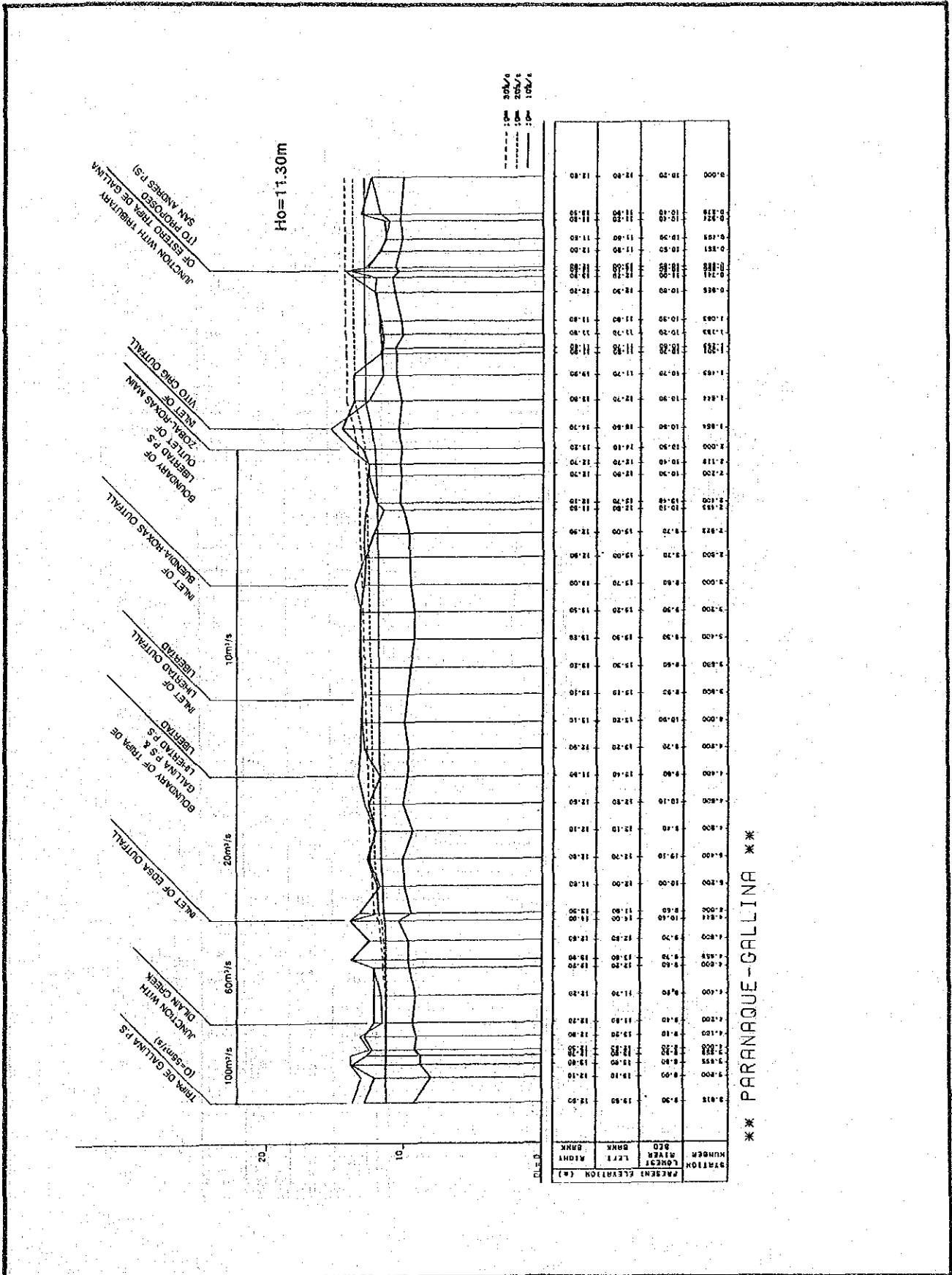
** PACO - GALLINA **

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

JAPAN INTERNATIONAL COOPERATION AGENCY

RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS

Fig.5-2-14(13/17)

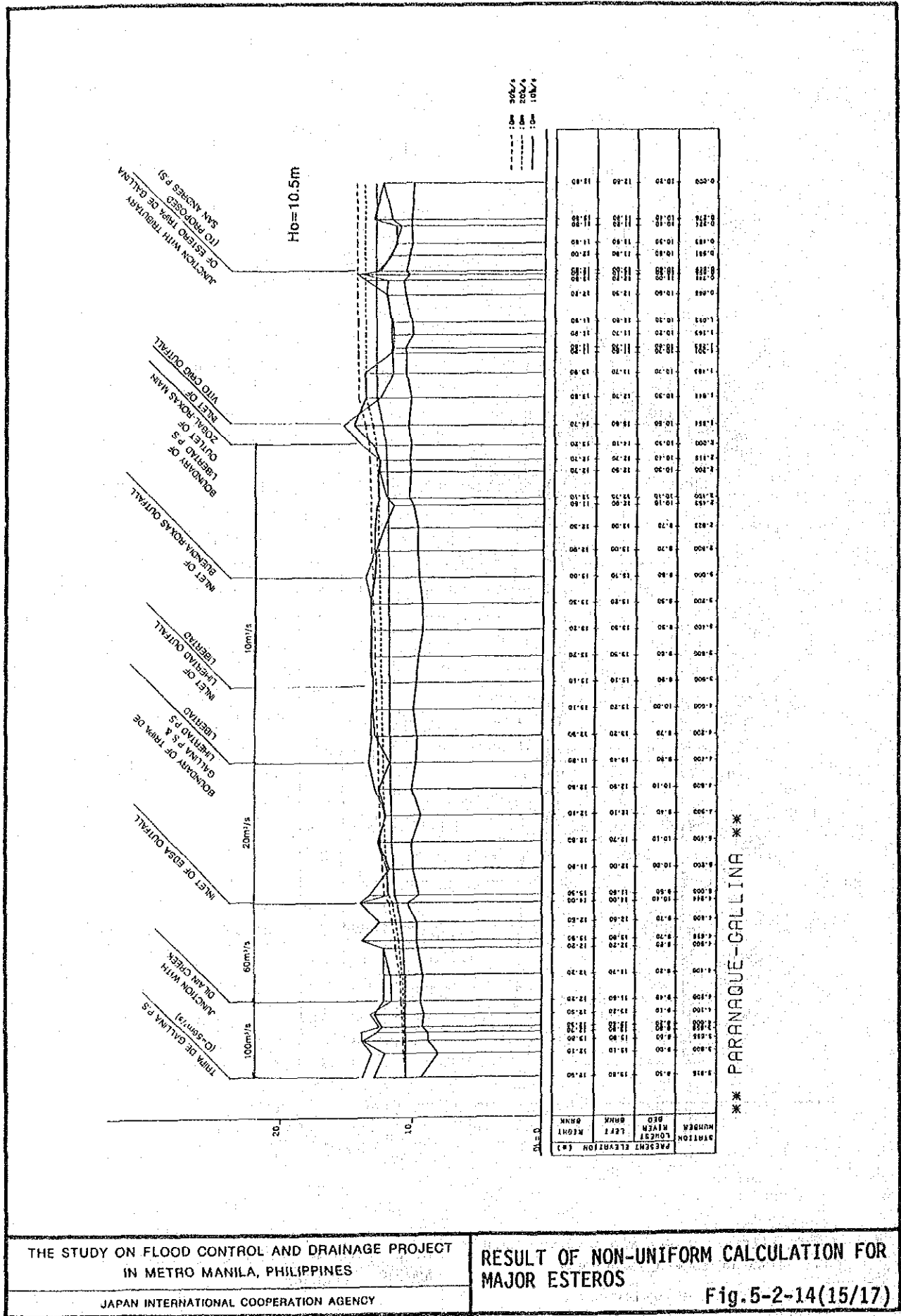


STATION NUMBER	RIGHT BANK ELEVATION (m)	LEFT BANK ELEVATION (m)	FACE (ELEVATION (m))
9.015	19.90	19.10	19.10
9.000	19.10	18.10	18.10
8.955	18.90	17.90	17.90
8.900	18.70	17.70	17.70
8.855	18.50	17.50	17.50
8.800	18.30	17.30	17.30
8.755	18.10	17.10	17.10
8.700	17.90	16.90	16.90
8.655	17.70	16.70	16.70
8.600	17.50	16.50	16.50
8.555	17.30	16.30	16.30
8.500	17.10	16.10	16.10
8.455	16.90	15.90	15.90
8.400	16.70	15.70	15.70
8.355	16.50	15.50	15.50
8.300	16.30	15.30	15.30
8.255	16.10	15.10	15.10
8.200	15.90	14.90	14.90
8.155	15.70	14.70	14.70
8.100	15.50	14.50	14.50
8.055	15.30	14.30	14.30
8.000	15.10	14.10	14.10
7.955	14.90	13.90	13.90
7.900	14.70	13.70	13.70
7.855	14.50	13.50	13.50
7.800	14.30	13.30	13.30
7.755	14.10	13.10	13.10
7.700	13.90	12.90	12.90
7.655	13.70	12.70	12.70
7.600	13.50	12.50	12.50
7.555	13.30	12.30	12.30
7.500	13.10	12.10	12.10
7.455	12.90	11.90	11.90
7.400	12.70	11.70	11.70
7.355	12.50	11.50	11.50
7.300	12.30	11.30	11.30
7.255	12.10	11.10	11.10
7.200	11.90	10.90	10.90
7.155	11.70	10.70	10.70
7.100	11.50	10.50	10.50
7.055	11.30	10.30	10.30
7.000	11.10	10.10	10.10
6.955	10.90	9.90	9.90
6.900	10.70	9.70	9.70
6.855	10.50	9.50	9.50
6.800	10.30	9.30	9.30
6.755	10.10	9.10	9.10
6.700	9.90	8.90	8.90
6.655	9.70	8.70	8.70
6.600	9.50	8.50	8.50
6.555	9.30	8.30	8.30
6.500	9.10	8.10	8.10
6.455	8.90	7.90	7.90
6.400	8.70	7.70	7.70
6.355	8.50	7.50	7.50
6.300	8.30	7.30	7.30
6.255	8.10	7.10	7.10
6.200	7.90	6.90	6.90
6.155	7.70	6.70	6.70
6.100	7.50	6.50	6.50
6.055	7.30	6.30	6.30
6.000	7.10	6.10	6.10
5.955	6.90	5.90	5.90
5.900	6.70	5.70	5.70
5.855	6.50	5.50	5.50
5.800	6.30	5.30	5.30
5.755	6.10	5.10	5.10
5.700	5.90	4.90	4.90
5.655	5.70	4.70	4.70
5.600	5.50	4.50	4.50
5.555	5.30	4.30	4.30
5.500	5.10	4.10	4.10
5.455	4.90	3.90	3.90
5.400	4.70	3.70	3.70
5.355	4.50	3.50	3.50
5.300	4.30	3.30	3.30
5.255	4.10	3.10	3.10
5.200	3.90	2.90	2.90
5.155	3.70	2.70	2.70
5.100	3.50	2.50	2.50
5.055	3.30	2.30	2.30
5.000	3.10	2.10	2.10
4.955	2.90	1.90	1.90
4.900	2.70	1.70	1.70
4.855	2.50	1.50	1.50
4.800	2.30	1.30	1.30
4.755	2.10	1.10	1.10
4.700	1.90	0.90	0.90
4.655	1.70	0.70	0.70
4.600	1.50	0.50	0.50
4.555	1.30	0.30	0.30
4.500	1.10	0.10	0.10
4.455	0.90	0.00	0.00
4.400	0.70	0.00	0.00
4.355	0.50	0.00	0.00
4.300	0.30	0.00	0.00
4.255	0.10	0.00	0.00
4.200	0.00	0.00	0.00

*** PARANAQUE-GALLINA ***

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES
JAPAN INTERNATIONAL COOPERATION AGENCY

RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS
Fig.5-2-14(14/17)

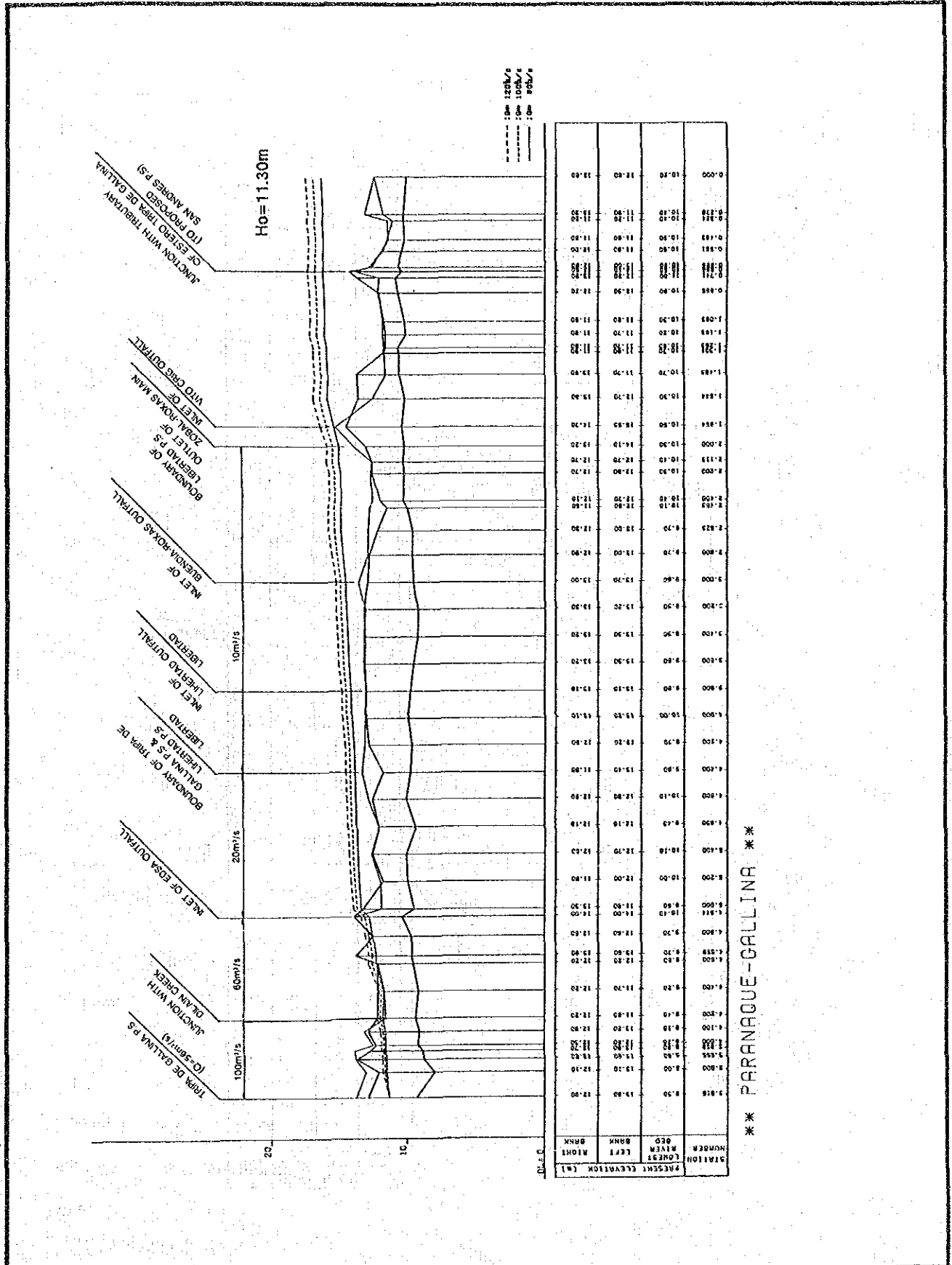


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS

Fig. 5-2-14(15/17)



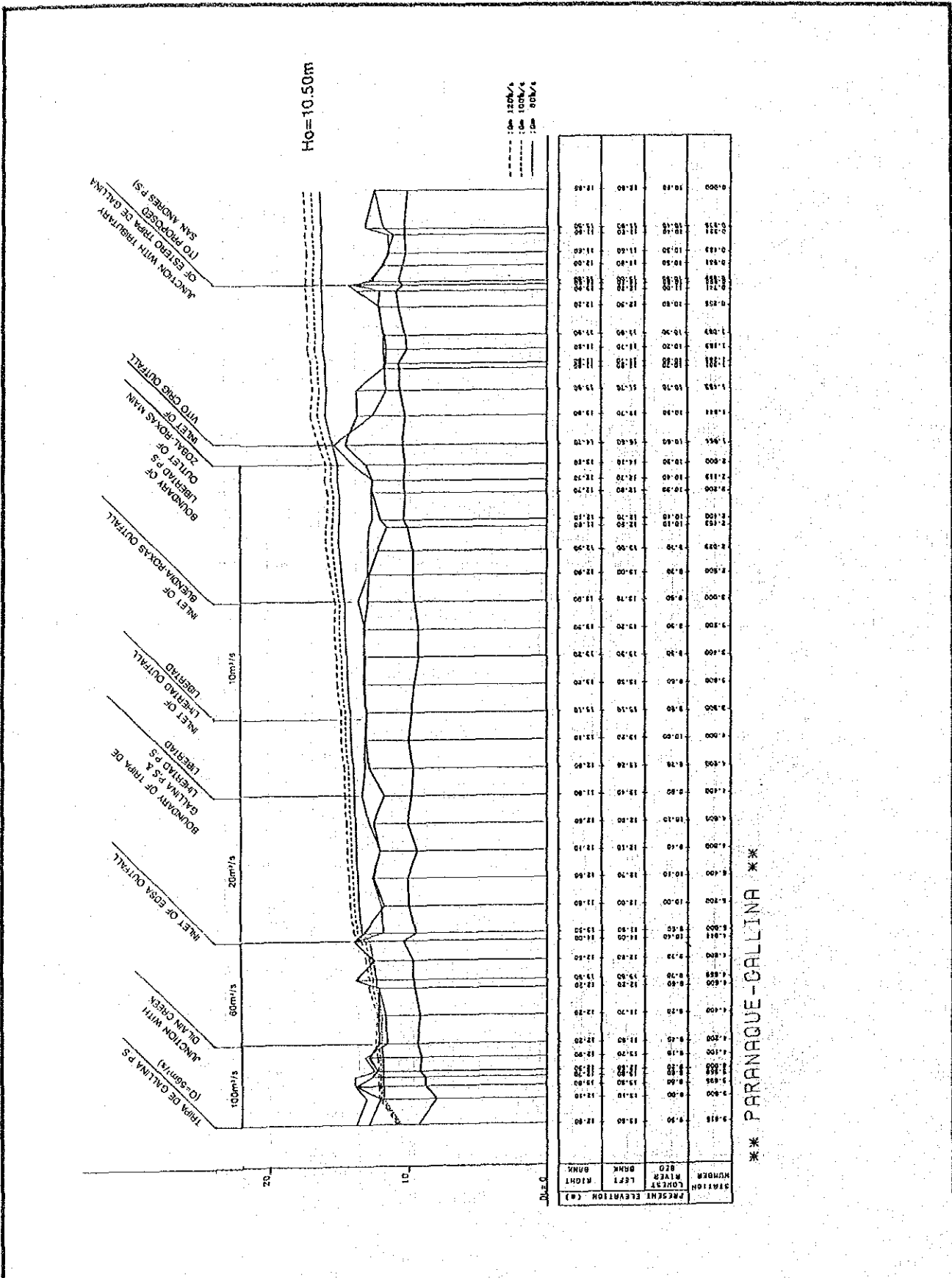
- - - - - 10m 1200/h
 - - - - - 60m 1000/h
 - - - - - 20m 800/h
 - - - - - 10m 600/h

STATION NUMBER	PRESENT ELEVATION (M)	LOWEST LEFT BRNK	LOWEST RIGHT BRNK
1.00	19.80	19.80	19.80
1.01	19.80	19.80	19.80
1.02	19.80	19.80	19.80
1.03	19.80	19.80	19.80
1.04	19.80	19.80	19.80
1.05	19.80	19.80	19.80
1.06	19.80	19.80	19.80
1.07	19.80	19.80	19.80
1.08	19.80	19.80	19.80
1.09	19.80	19.80	19.80
1.10	19.80	19.80	19.80
1.11	19.80	19.80	19.80
1.12	19.80	19.80	19.80
1.13	19.80	19.80	19.80
1.14	19.80	19.80	19.80
1.15	19.80	19.80	19.80
1.16	19.80	19.80	19.80
1.17	19.80	19.80	19.80
1.18	19.80	19.80	19.80
1.19	19.80	19.80	19.80
1.20	19.80	19.80	19.80
1.21	19.80	19.80	19.80
1.22	19.80	19.80	19.80
1.23	19.80	19.80	19.80
1.24	19.80	19.80	19.80
1.25	19.80	19.80	19.80
1.26	19.80	19.80	19.80
1.27	19.80	19.80	19.80
1.28	19.80	19.80	19.80
1.29	19.80	19.80	19.80
1.30	19.80	19.80	19.80
1.31	19.80	19.80	19.80
1.32	19.80	19.80	19.80
1.33	19.80	19.80	19.80
1.34	19.80	19.80	19.80
1.35	19.80	19.80	19.80
1.36	19.80	19.80	19.80
1.37	19.80	19.80	19.80
1.38	19.80	19.80	19.80
1.39	19.80	19.80	19.80
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1.42	19.80	19.80	19.80
1.43	19.80	19.80	19.80
1.44	19.80	19.80	19.80
1.45	19.80	19.80	19.80
1.46	19.80	19.80	19.80
1.47	19.80	19.80	19.80
1.48	19.80	19.80	19.80
1.49	19.80	19.80	19.80
1.50	19.80	19.80	19.80

* PARANAQUE-CALLINA *

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
 IN METRO MANILA, PHILIPPINES
 JAPAN INTERNATIONAL COOPERATION AGENCY

RESULT OF NON-UNIFORM CALCULATION FOR
 MAJOR ESTEROS
 Fig.5-2-14(16/17)

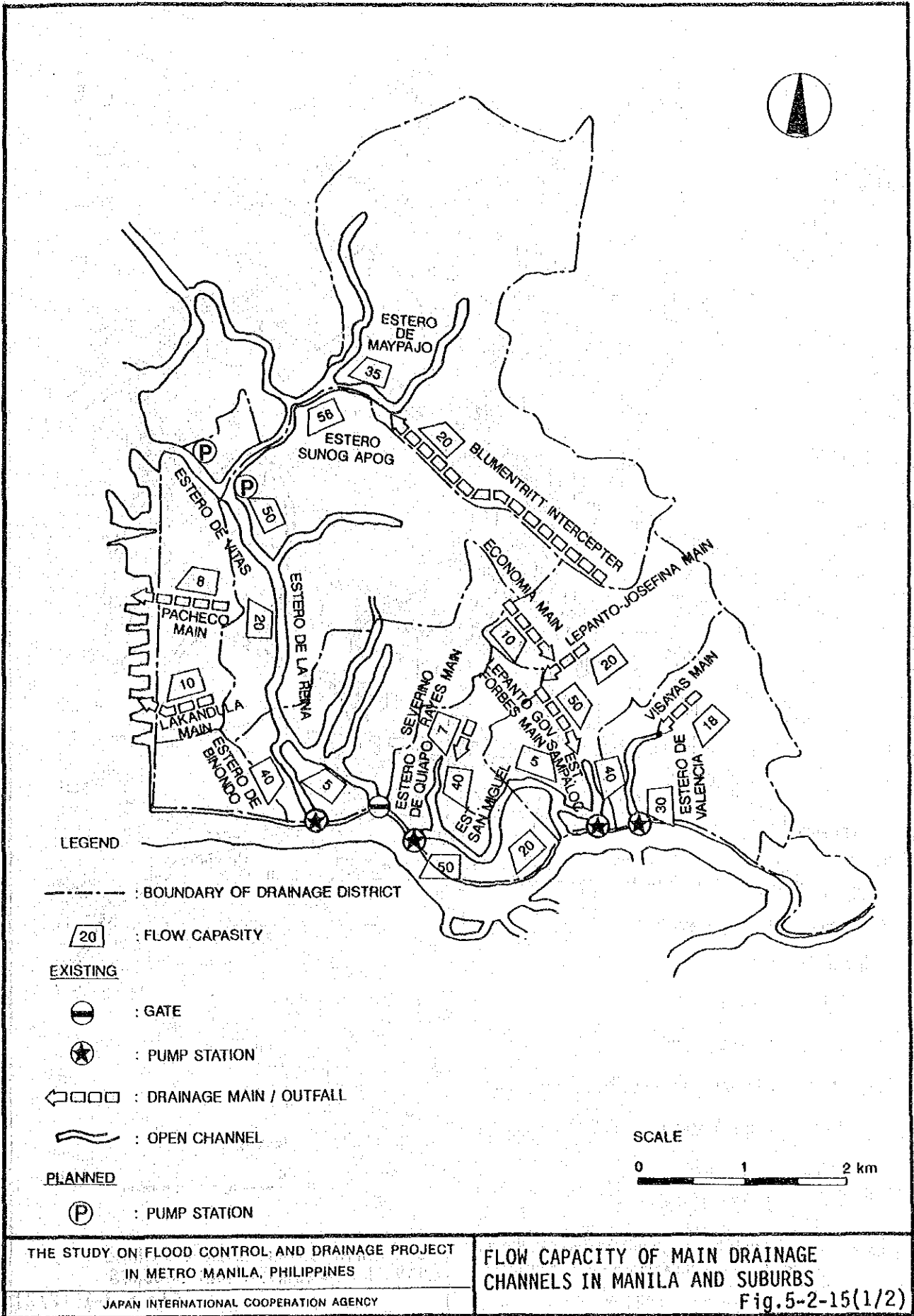


STATION NUMBER	RIGHT BANK	LEFT BANK	PRESENT ELEVATION (M)
1.000	12.80	12.80	12.80
1.001	12.80	12.80	12.80
1.002	12.80	12.80	12.80
1.003	12.80	12.80	12.80
1.004	12.80	12.80	12.80
1.005	12.80	12.80	12.80
1.006	12.80	12.80	12.80
1.007	12.80	12.80	12.80
1.008	12.80	12.80	12.80
1.009	12.80	12.80	12.80
1.010	12.80	12.80	12.80
1.011	12.80	12.80	12.80
1.012	12.80	12.80	12.80
1.013	12.80	12.80	12.80
1.014	12.80	12.80	12.80
1.015	12.80	12.80	12.80
1.016	12.80	12.80	12.80
1.017	12.80	12.80	12.80
1.018	12.80	12.80	12.80
1.019	12.80	12.80	12.80
1.020	12.80	12.80	12.80
1.021	12.80	12.80	12.80
1.022	12.80	12.80	12.80
1.023	12.80	12.80	12.80
1.024	12.80	12.80	12.80
1.025	12.80	12.80	12.80
1.026	12.80	12.80	12.80
1.027	12.80	12.80	12.80
1.028	12.80	12.80	12.80
1.029	12.80	12.80	12.80
1.030	12.80	12.80	12.80
1.031	12.80	12.80	12.80
1.032	12.80	12.80	12.80
1.033	12.80	12.80	12.80
1.034	12.80	12.80	12.80
1.035	12.80	12.80	12.80
1.036	12.80	12.80	12.80
1.037	12.80	12.80	12.80
1.038	12.80	12.80	12.80
1.039	12.80	12.80	12.80
1.040	12.80	12.80	12.80
1.041	12.80	12.80	12.80
1.042	12.80	12.80	12.80
1.043	12.80	12.80	12.80
1.044	12.80	12.80	12.80
1.045	12.80	12.80	12.80
1.046	12.80	12.80	12.80
1.047	12.80	12.80	12.80
1.048	12.80	12.80	12.80
1.049	12.80	12.80	12.80
1.050	12.80	12.80	12.80
1.051	12.80	12.80	12.80
1.052	12.80	12.80	12.80
1.053	12.80	12.80	12.80
1.054	12.80	12.80	12.80
1.055	12.80	12.80	12.80
1.056	12.80	12.80	12.80
1.057	12.80	12.80	12.80
1.058	12.80	12.80	12.80
1.059	12.80	12.80	12.80
1.060	12.80	12.80	12.80
1.061	12.80	12.80	12.80
1.062	12.80	12.80	12.80
1.063	12.80	12.80	12.80
1.064	12.80	12.80	12.80
1.065	12.80	12.80	12.80
1.066	12.80	12.80	12.80
1.067	12.80	12.80	12.80
1.068	12.80	12.80	12.80
1.069	12.80	12.80	12.80
1.070	12.80	12.80	12.80
1.071	12.80	12.80	12.80
1.072	12.80	12.80	12.80
1.073	12.80	12.80	12.80
1.074	12.80	12.80	12.80
1.075	12.80	12.80	12.80
1.076	12.80	12.80	12.80
1.077	12.80	12.80	12.80
1.078	12.80	12.80	12.80
1.079	12.80	12.80	12.80
1.080	12.80	12.80	12.80
1.081	12.80	12.80	12.80
1.082	12.80	12.80	12.80
1.083	12.80	12.80	12.80
1.084	12.80	12.80	12.80
1.085	12.80	12.80	12.80
1.086	12.80	12.80	12.80
1.087	12.80	12.80	12.80
1.088	12.80	12.80	12.80
1.089	12.80	12.80	12.80
1.090	12.80	12.80	12.80
1.091	12.80	12.80	12.80
1.092	12.80	12.80	12.80
1.093	12.80	12.80	12.80
1.094	12.80	12.80	12.80
1.095	12.80	12.80	12.80
1.096	12.80	12.80	12.80
1.097	12.80	12.80	12.80
1.098	12.80	12.80	12.80
1.099	12.80	12.80	12.80
1.100	12.80	12.80	12.80

*** PARANAQUE-CALLINA ***

THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES
JAPAN INTERNATIONAL COOPERATION AGENCY

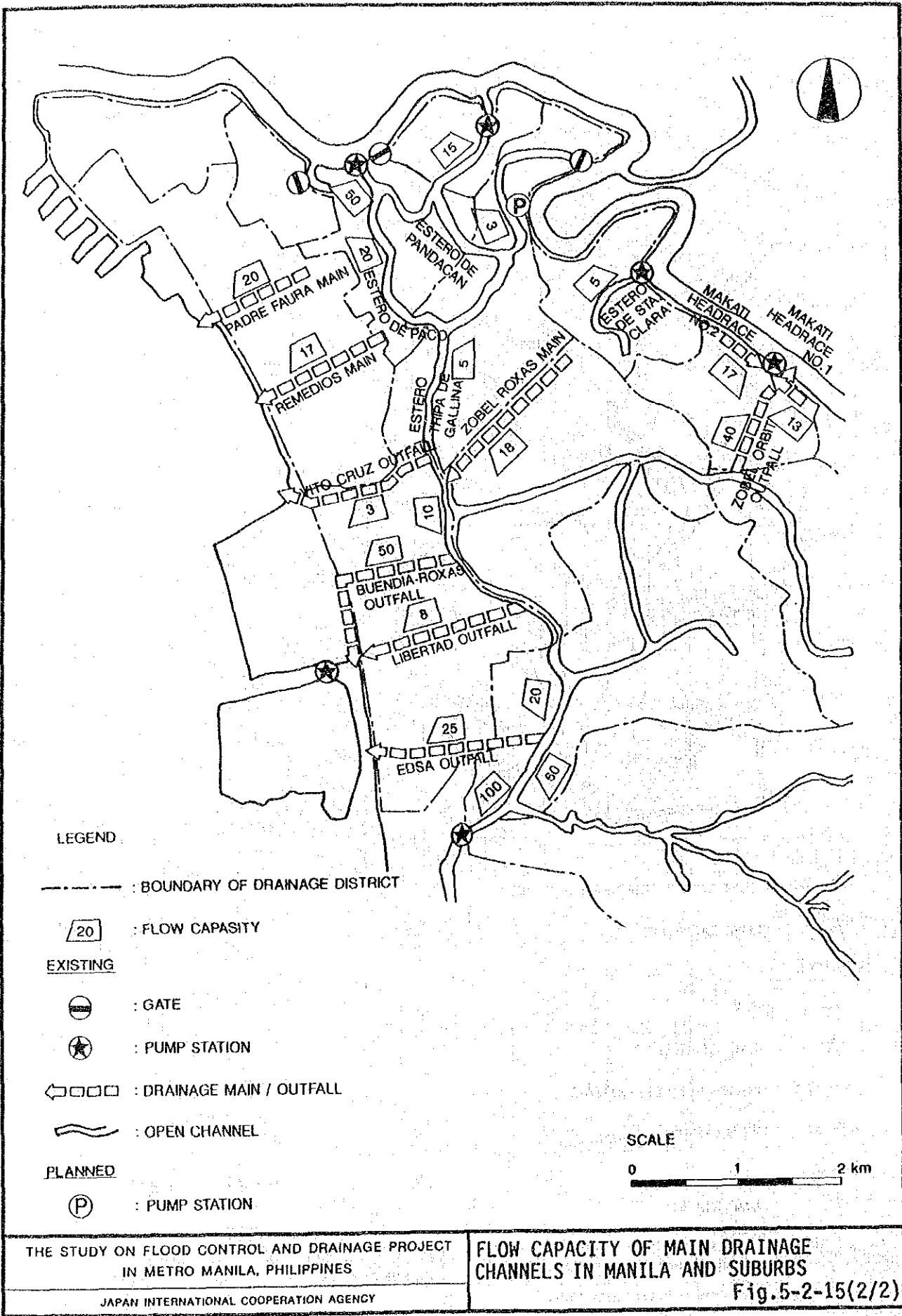
RESULT OF NON-UNIFORM CALCULATION FOR
MAJOR ESTEROS
Fig.5-2-14(17/17)



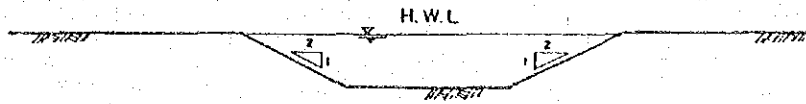
THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

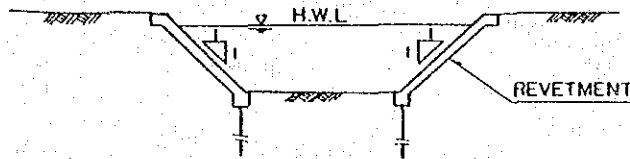
FLOW CAPACITY OF MAIN DRAINAGE
CHANNELS IN MANILA AND SUBURBS
Fig.5-2-15(1/2)



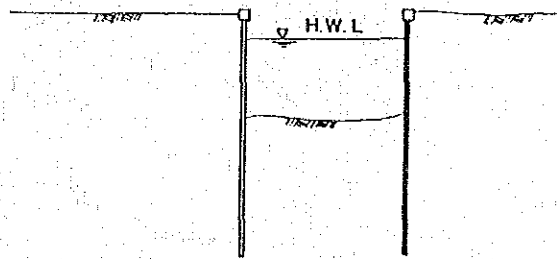
OPEN DRAINAGE CHANNEL



SINGLE CROSS SECTION

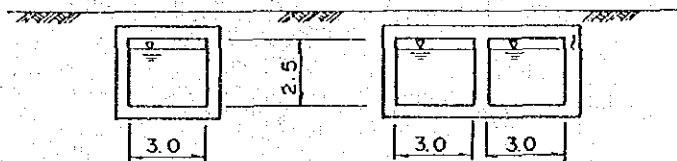


(TRAPEZOIDAL CHANNEL WITH REVETMENT)



(FOR ESTERO)

CLOSED DRAINAGE CHANNEL



(CONCRETE BOX CULVERT)



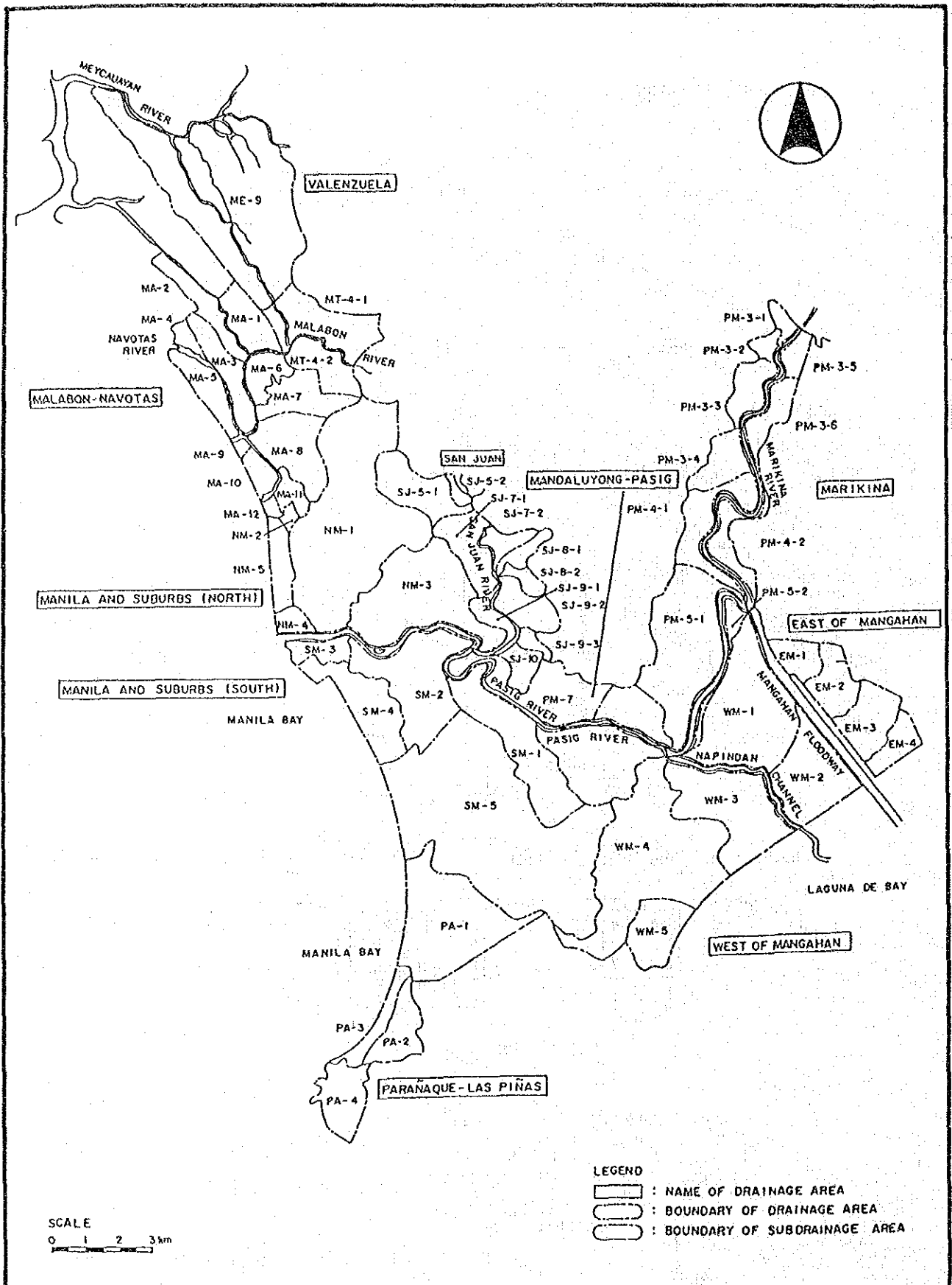
LATERAL PIPE

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

JAPAN INTERNATIONAL COOPERATION AGENCY

TYPICAL CROSS SECTION OF DRAINAGE
CHANNEL

Fig.5-3-1

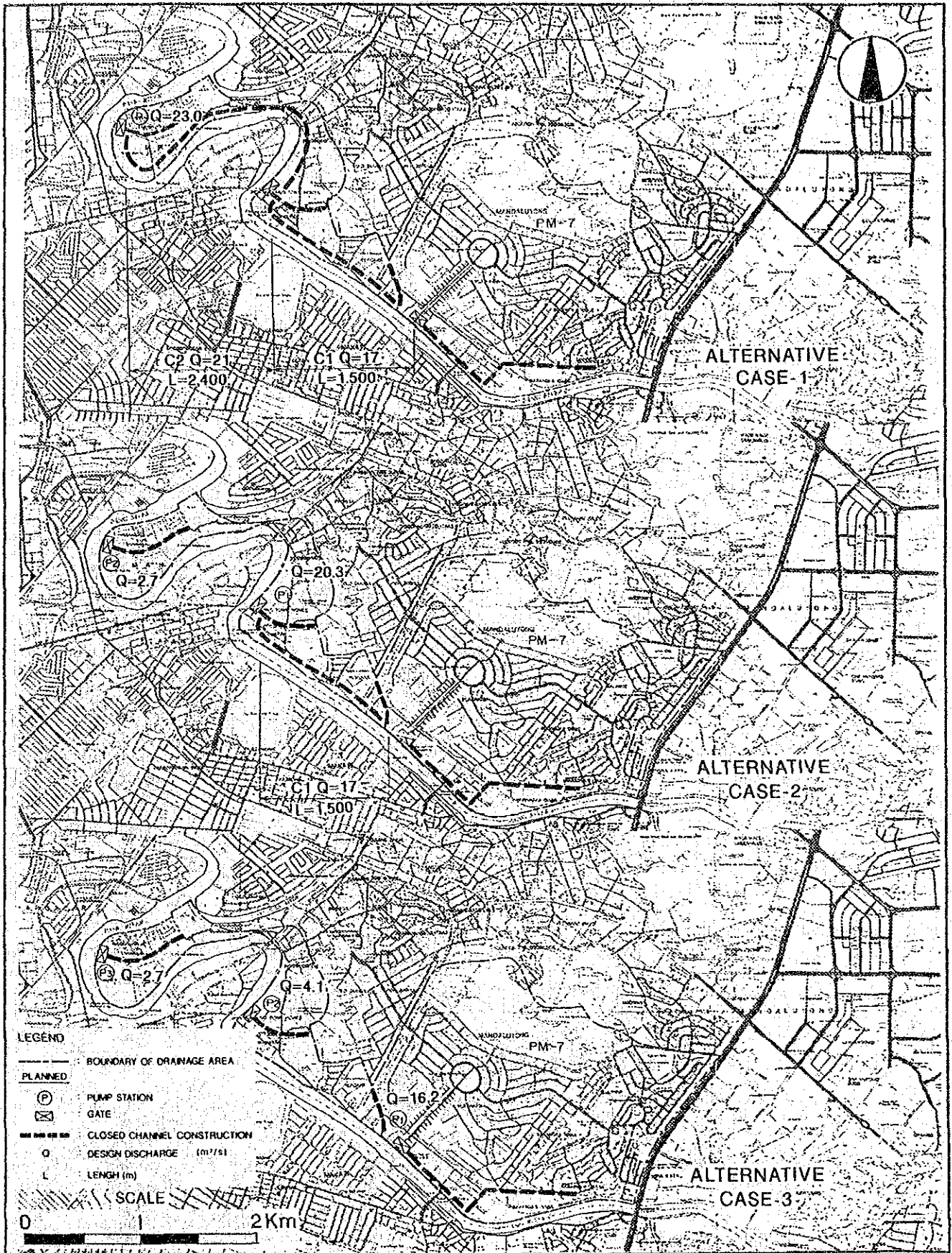


THE STUDY ON FLOOD CONTROL AND DRAINAGE PROJECT
IN METRO MANILA, PHILIPPINES

JAPAN INTERNATIONAL COOPERATION AGENCY

DELINEATION OF SUBDRAINAGE AREAS

Fig.5-3-2



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

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ALTERNATIVE DRAINAGE SYSTEMS FOR
MANADALUYONG-PASIG (PM-7)

Fig.5-3-3

