

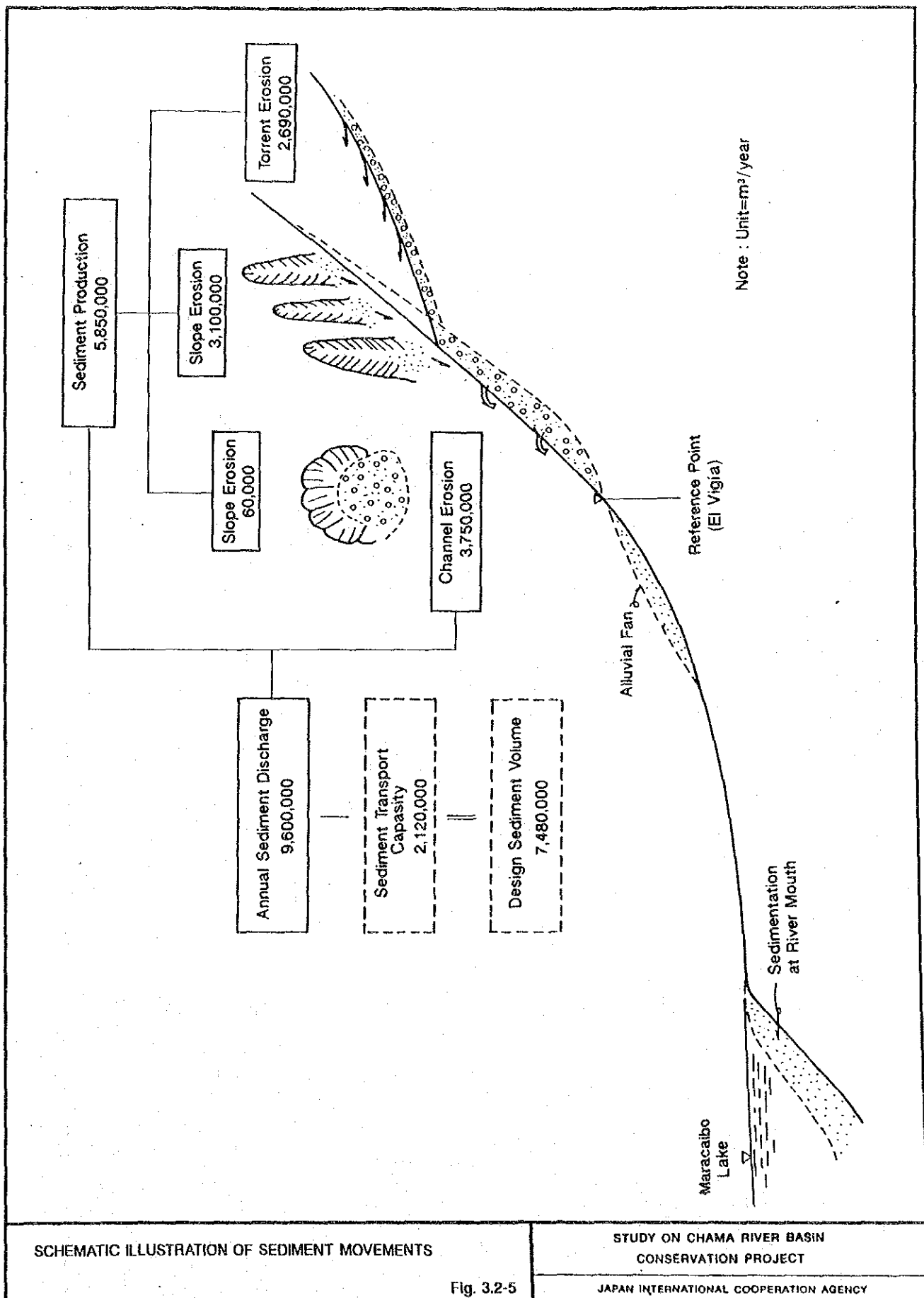
DESIGN SEDIMENT BALANCE

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

Fig. 3.2-4

JAPAN INTERNATIONAL COOPERATION AGENCY





SCHEMATIC ILLUSTRATION OF SEDIMENT MOVEMENTS

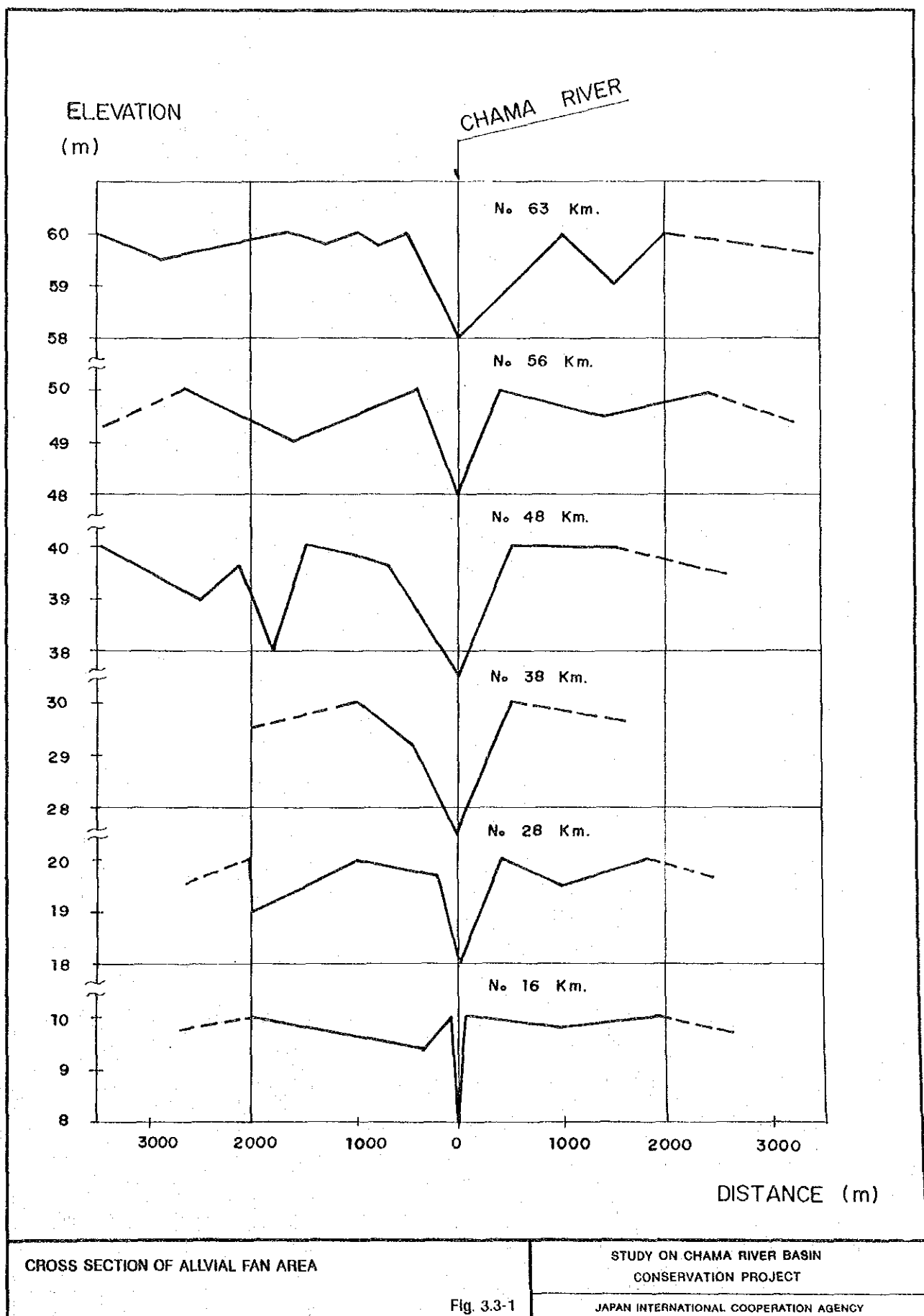
Fig. 3.2-5

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

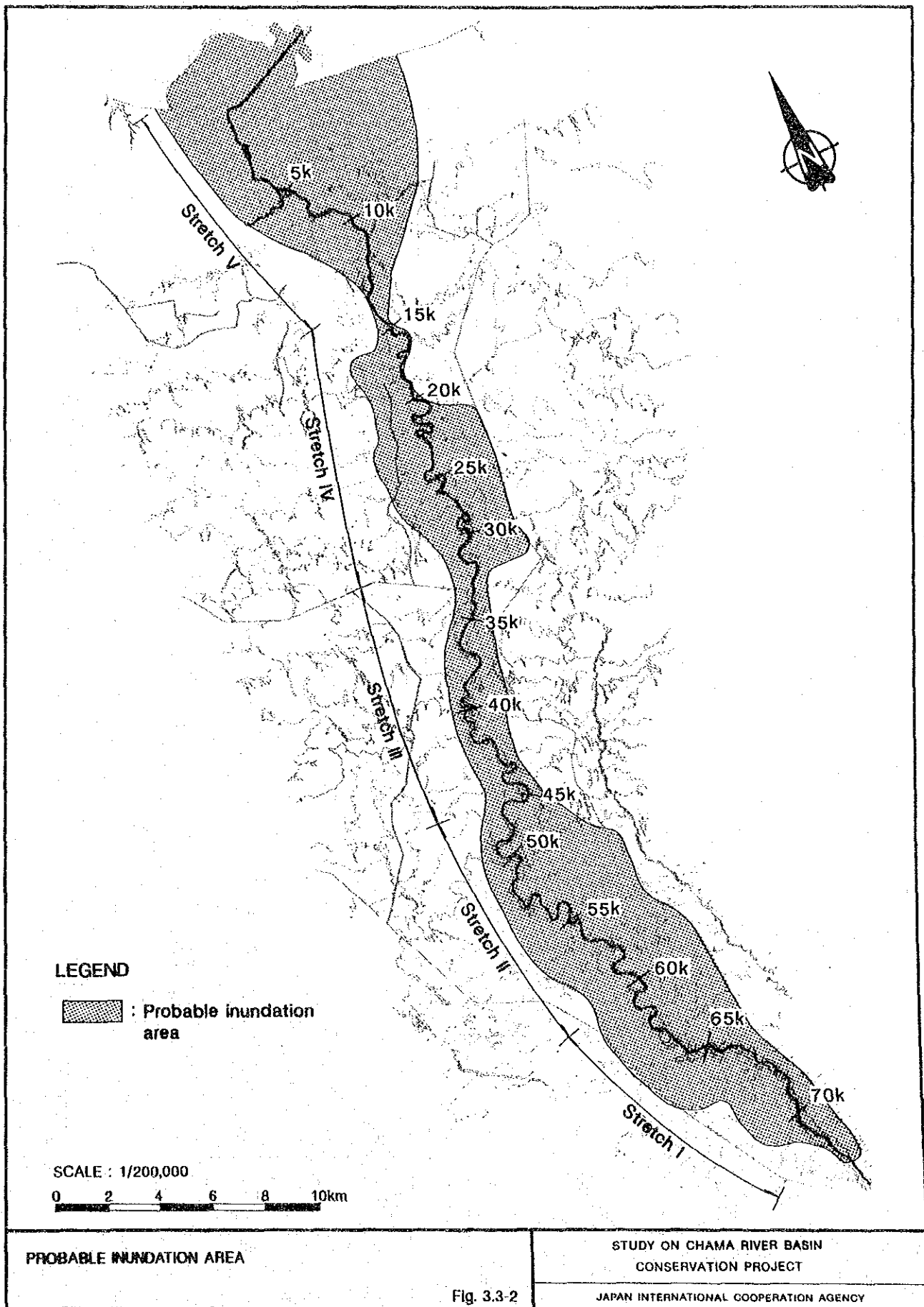
JAPAN INTERNATIONAL COOPERATION AGENCY



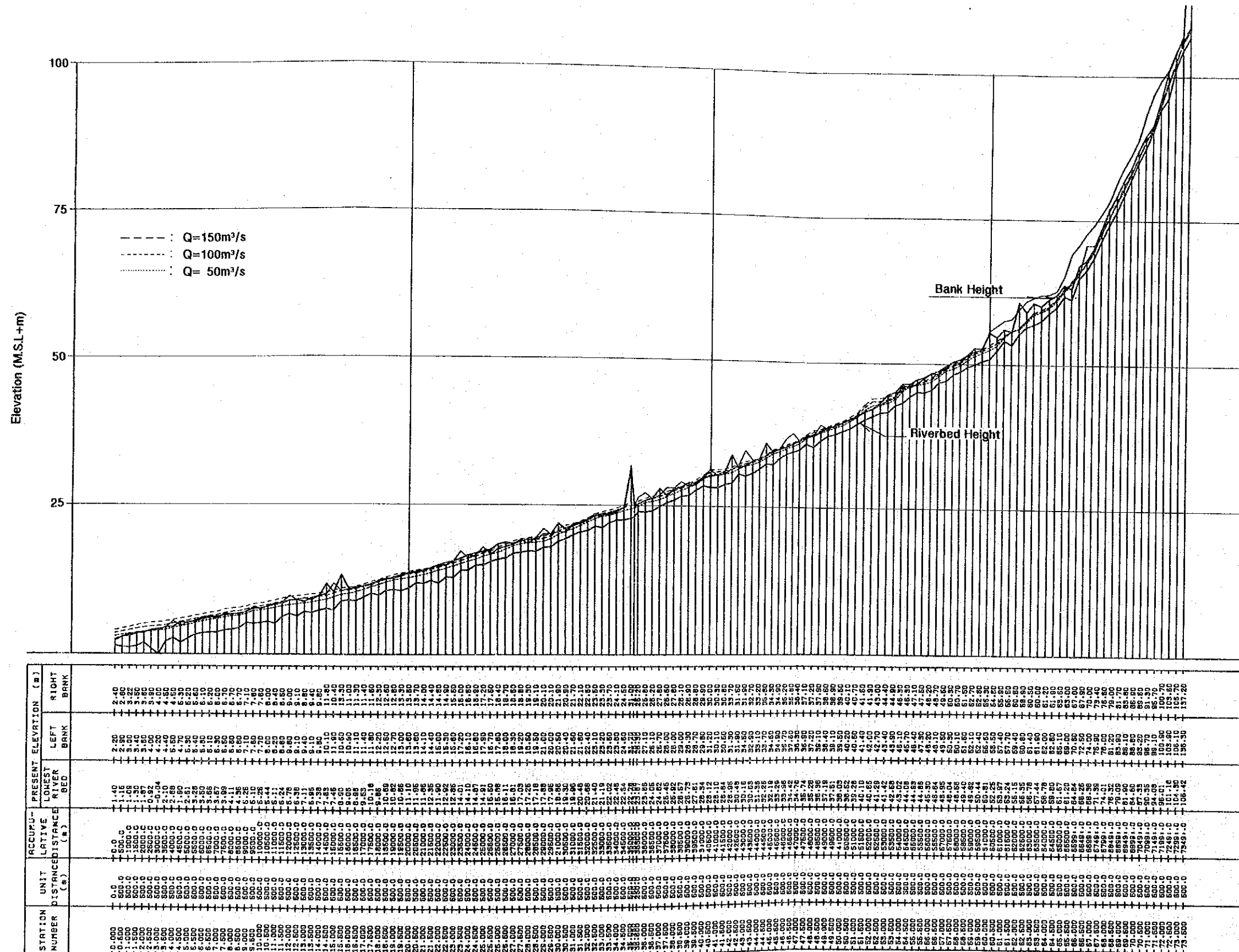




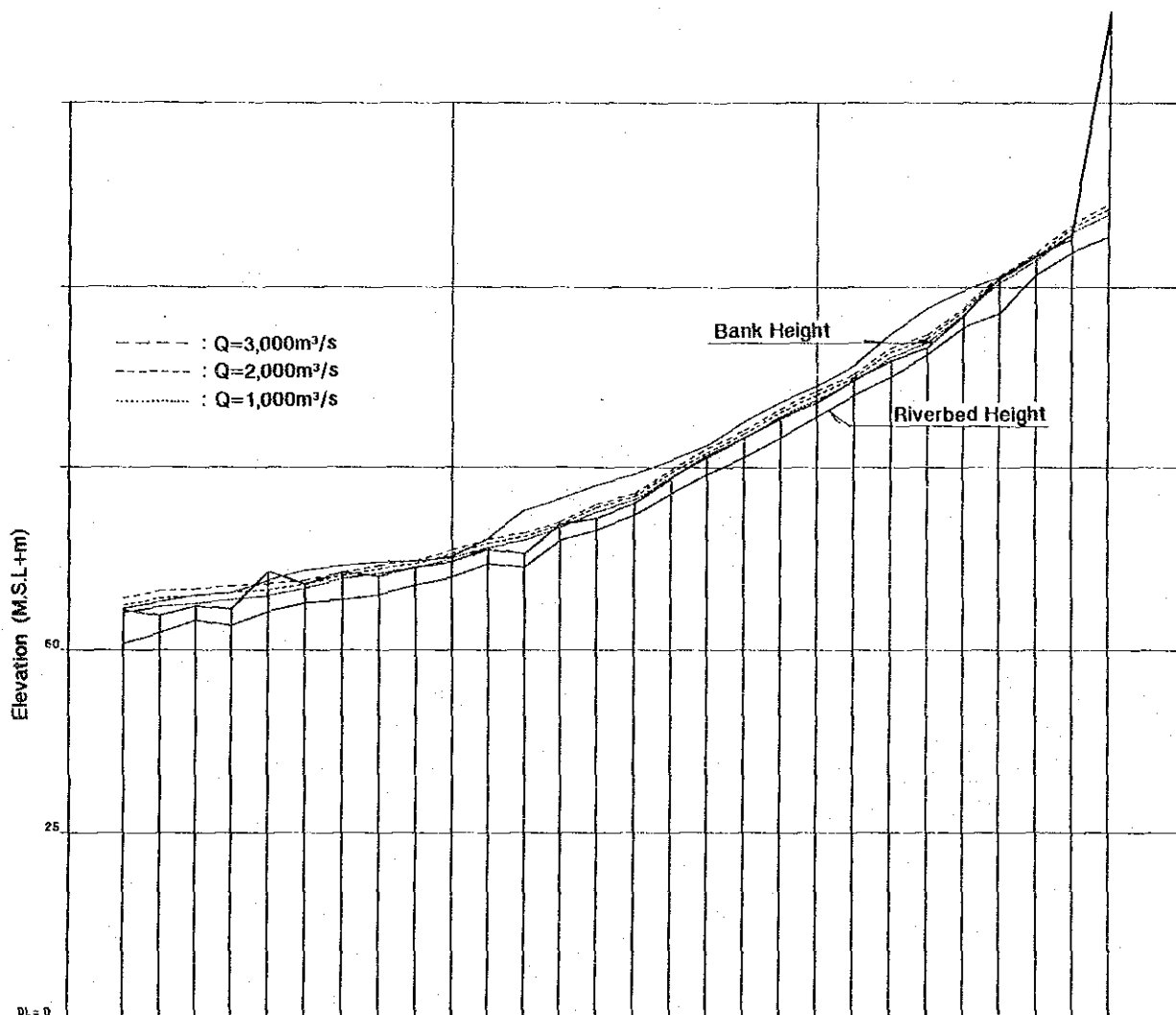












STATION NUMBER	UNIT DISTANCE (m)	ACCUMULATIVE DISTANCE (m)	PRESENT ELEVATION (m) RIVER BED	LEFT BANK	RIGHT BANK
60,000	500.0	500.0	50.21	56.80	52.30
60,500	500.0	1000.0	52.26	56.80	54.50
61,000	500.0	1500.0	53.87	57.10	55.80
61,500	500.0	2000.0	55.24	57.70	55.50
62,000	500.0	2500.0	56.15	58.40	55.80
62,500	500.0	3000.0	56.35	59.80	56.50
63,000	500.0	3500.0	58.78	61.40	57.50
63,500	500.0	4000.0	57.44	61.80	60.00
64,000	500.0	4500.0	59.78	62.00	61.20
64,500	500.0	5000.0	59.80	62.50	61.80
65,000	500.0	5500.0	61.67	65.10	63.50
65,500	500.0	6000.0	61.20	66.00	65.00
66,000	500.0	6500.0	64.84	70.40	67.50
66,500	500.0	7000.0	68.15	72.50	67.80
67,000	500.0	7500.0	69.36	74.00	70.00
67,500	500.0	8000.0	71.35	75.80	73.40
68,000	500.0	8500.0	74.01	78.00	76.50
68,500	500.0	9000.0	76.32	81.50	79.00
69,000	500.0	9500.0	78.00	83.80	81.70
69,500	500.0	10000.0	81.40	88.10	89.80
70,000	500.0	10500.0	84.80	88.80	90.50
70,500	500.0	11000.0	87.35	89.50	90.50
71,000	500.0	11500.0	89.35	89.70	91.30
71,500	500.0	12000.0	84.00	91.10	96.70
72,000	500.0	12500.0	86.01	100.80	100.70
72,500	500.0	13000.0	101.18	102.60	105.80
73,000	500.0	13500.0	104.30	105.10	107.70
73,400	500.0	14000.0	106.42	126.50	137.20

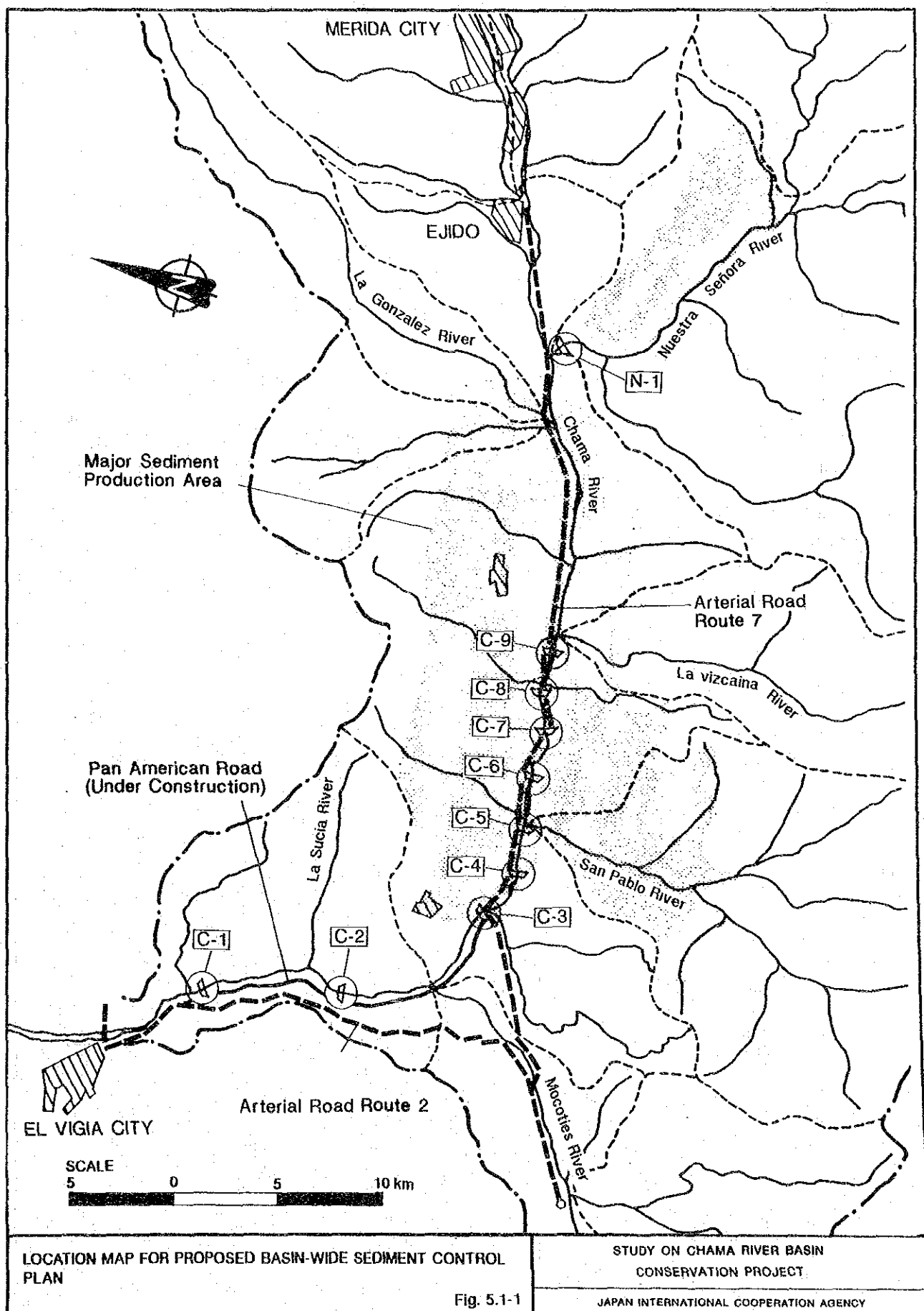
NON-UNIFORM CALCULATION RESULT IN THE STRETCH OF EXISTING  
DIKE NEAR EL VIGIA

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

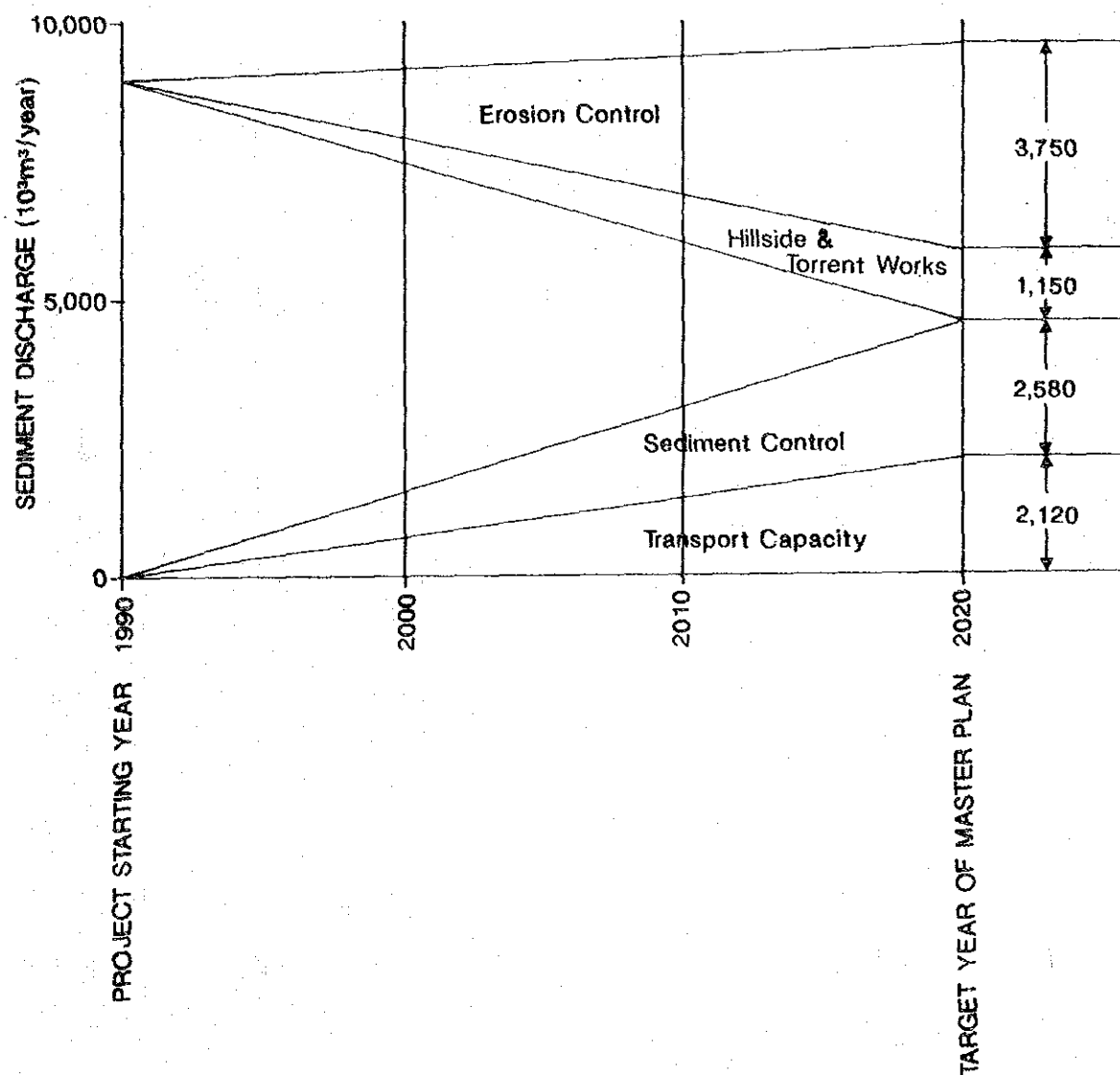
Fig. 3.3-4

JAPAN INTERNATIONAL COOPERATION AGENCY









SCHEMATIC DIAGRAM OF SEDIMENT CONTROL PLAN

Fig. 5.1-2

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





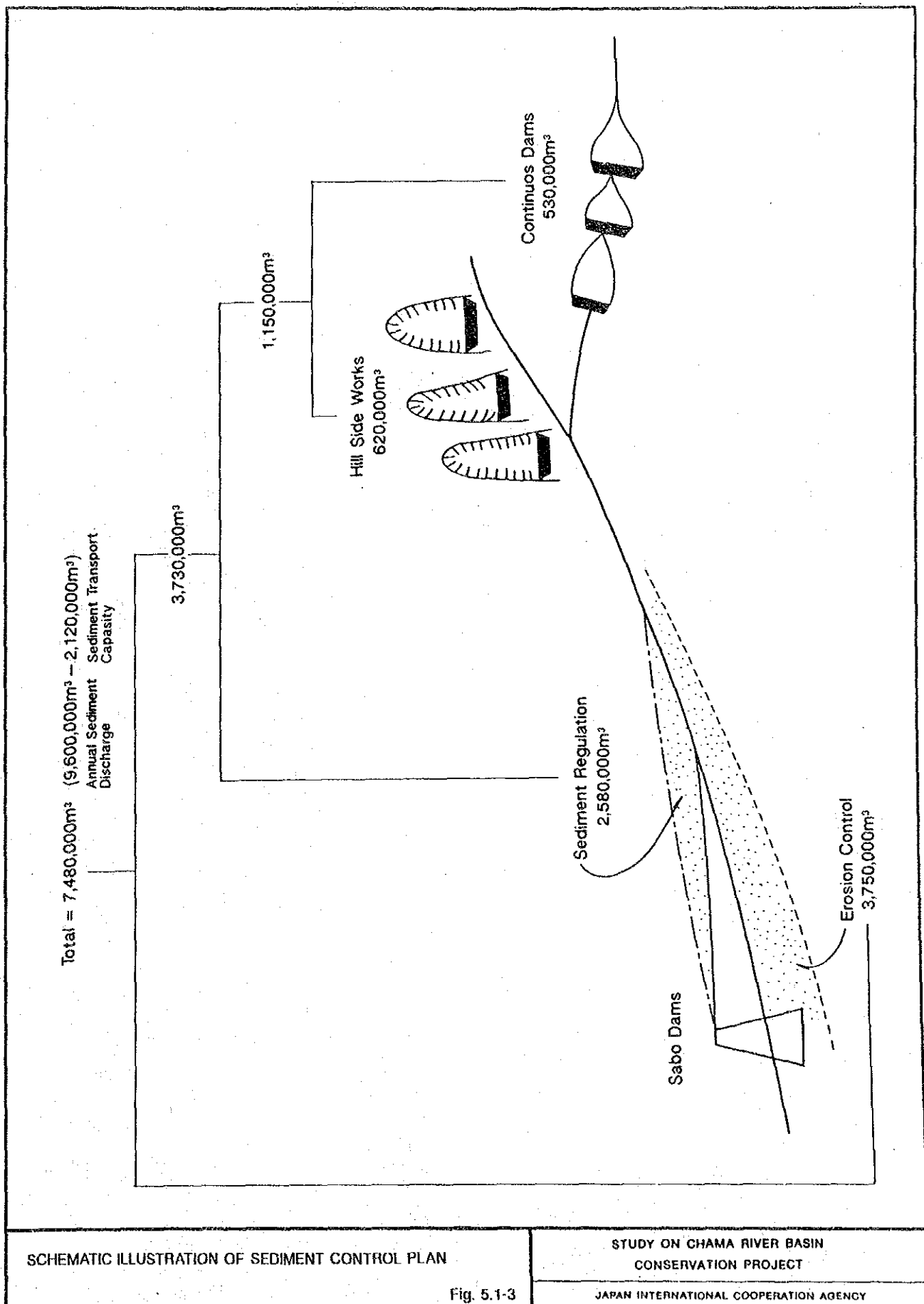
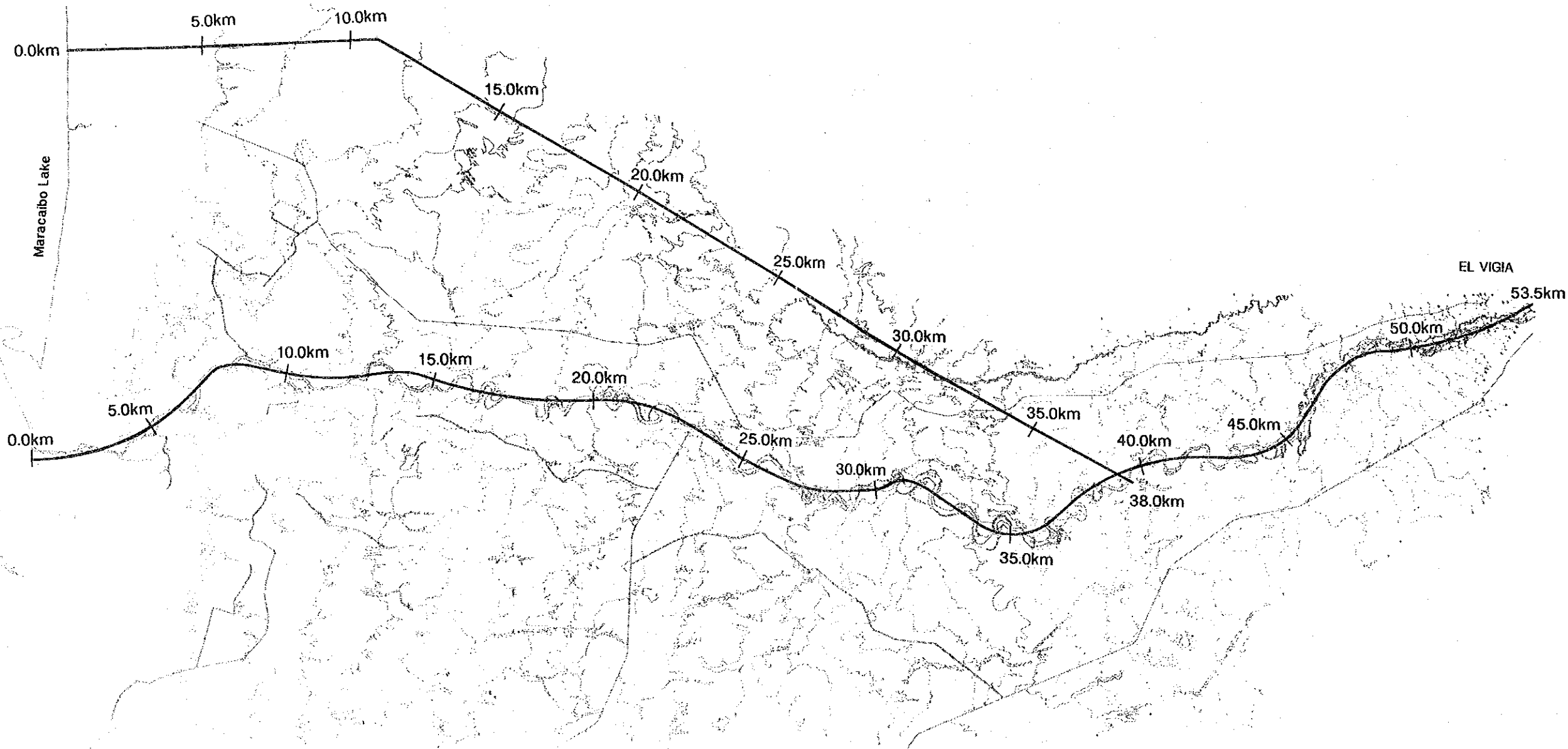


Fig. 5.1-3



SCALE : 1/140,000

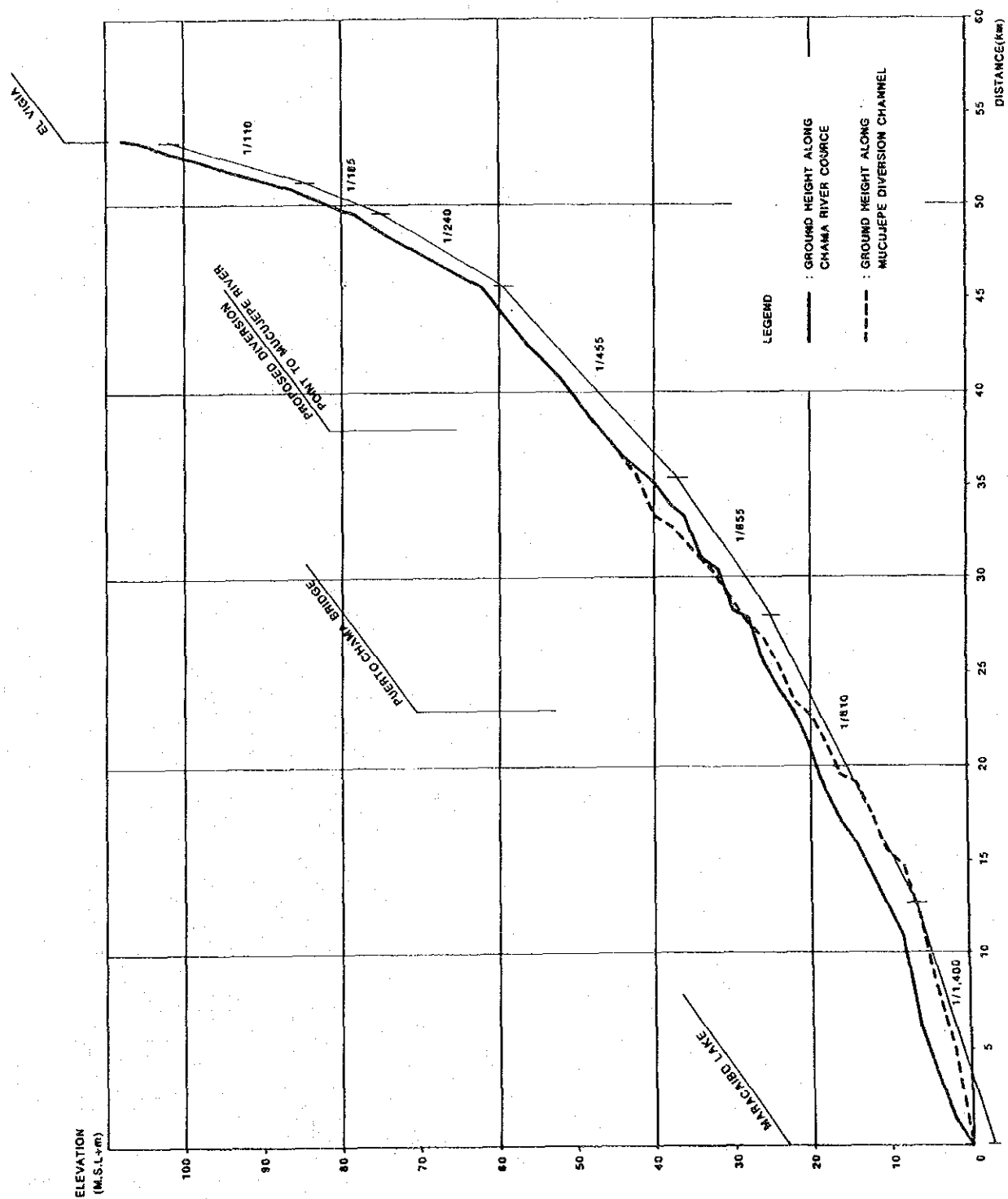


STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

CENTERLINE OF MEANDERING OF THE CHAMA RIVER  
AND PROPOSED ALIGNMENT OF THE MUCUJEPE  
DIVERSION CHANNEL

Fig. 5.1-4





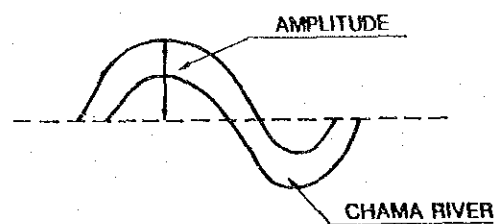
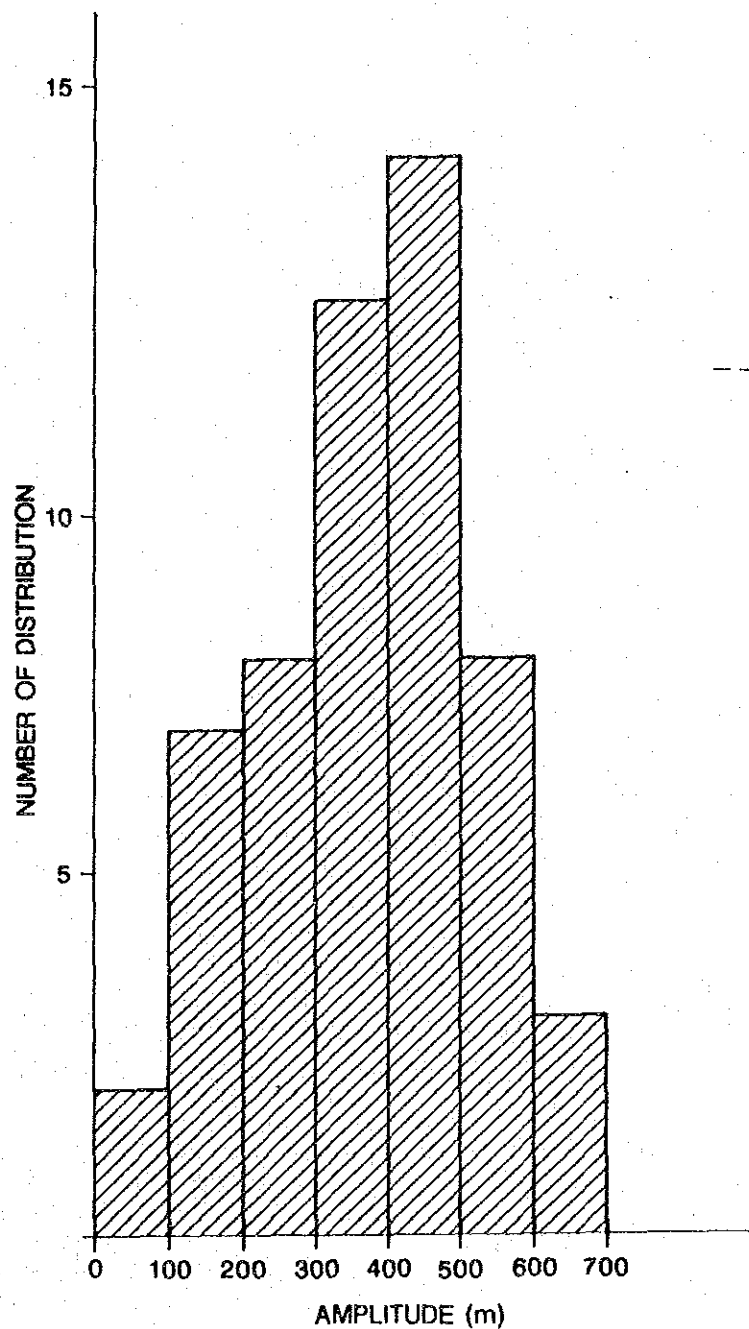
LONGITUDINAL PROFILES OF THE CHAMA RIVER AND THE MUCUJEPE DIVERSION CHANNEL

Fig. 5.1-5

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





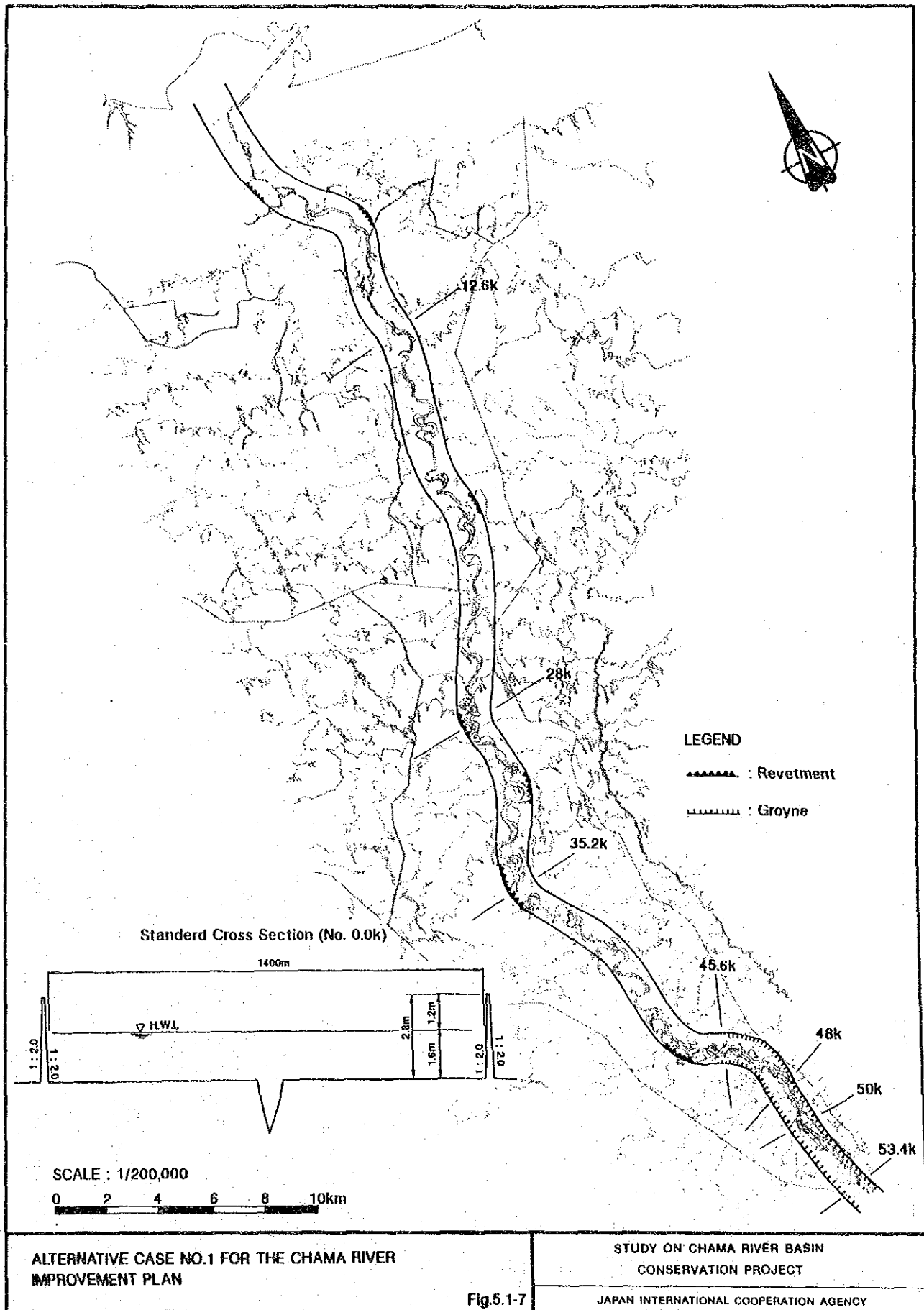
DISTRIBUTION OF MEANDERING AMPLITUDES OF THE CHAMA RIVER LOWER REACHES

Fig. 5.1-6

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY









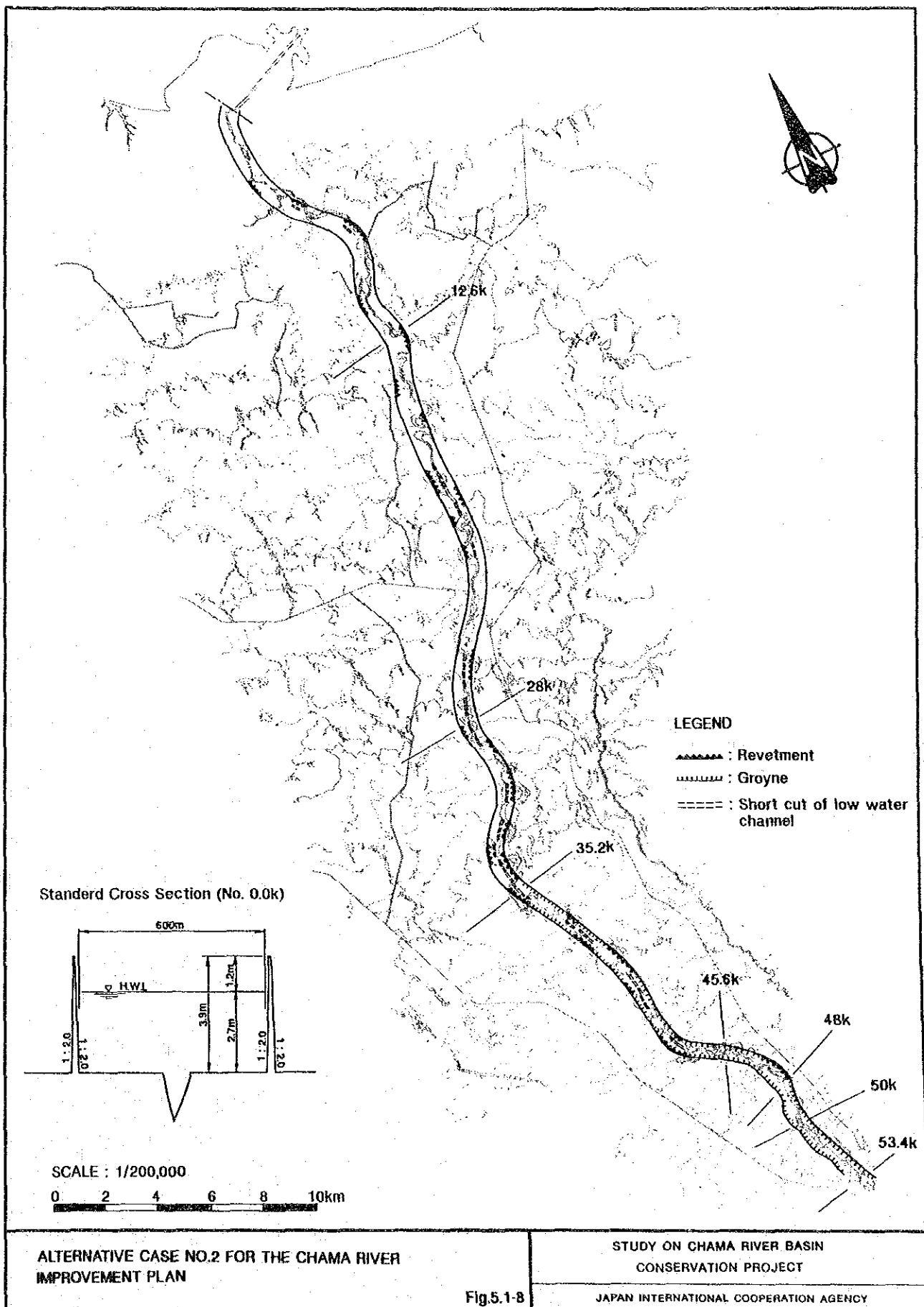
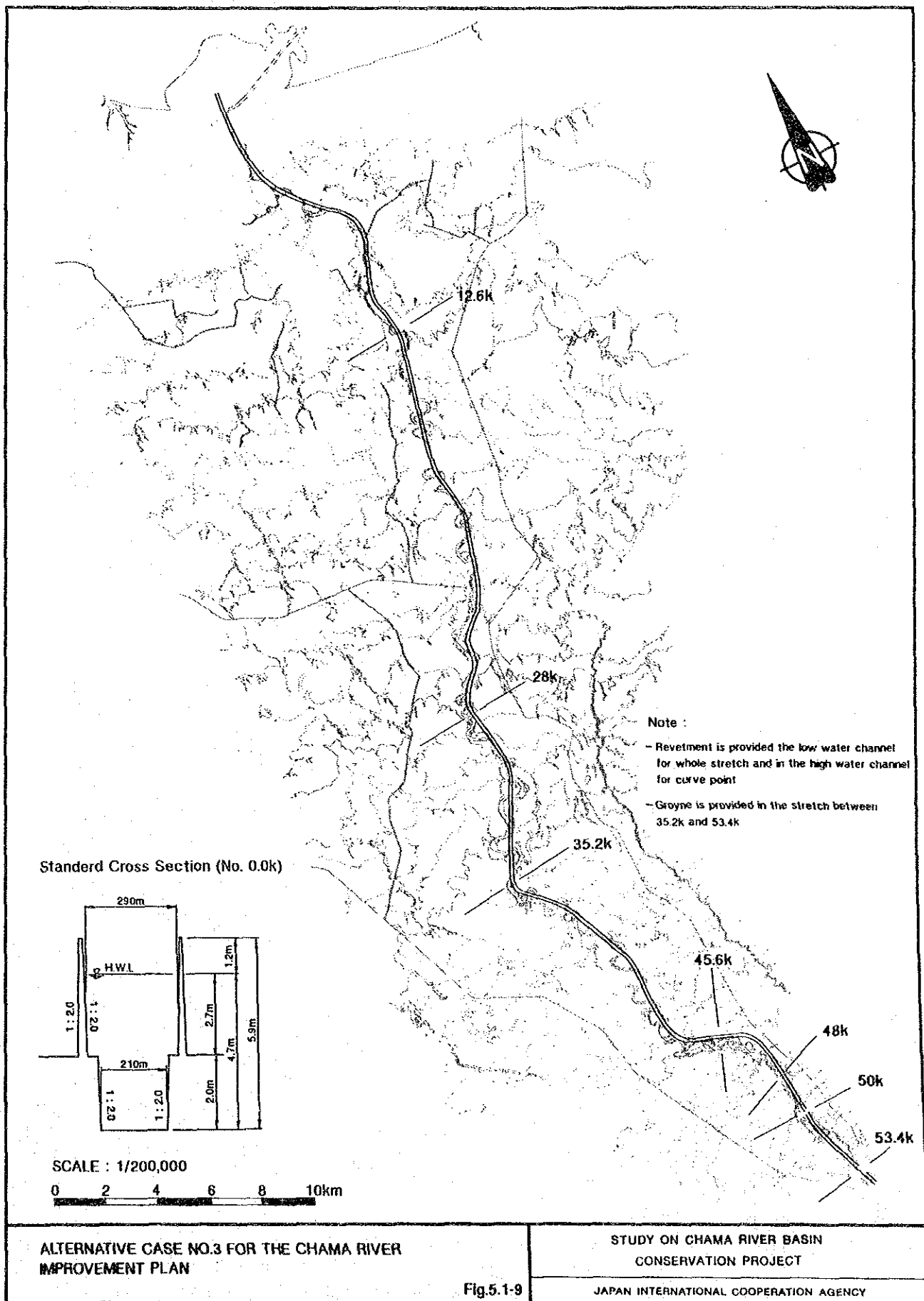
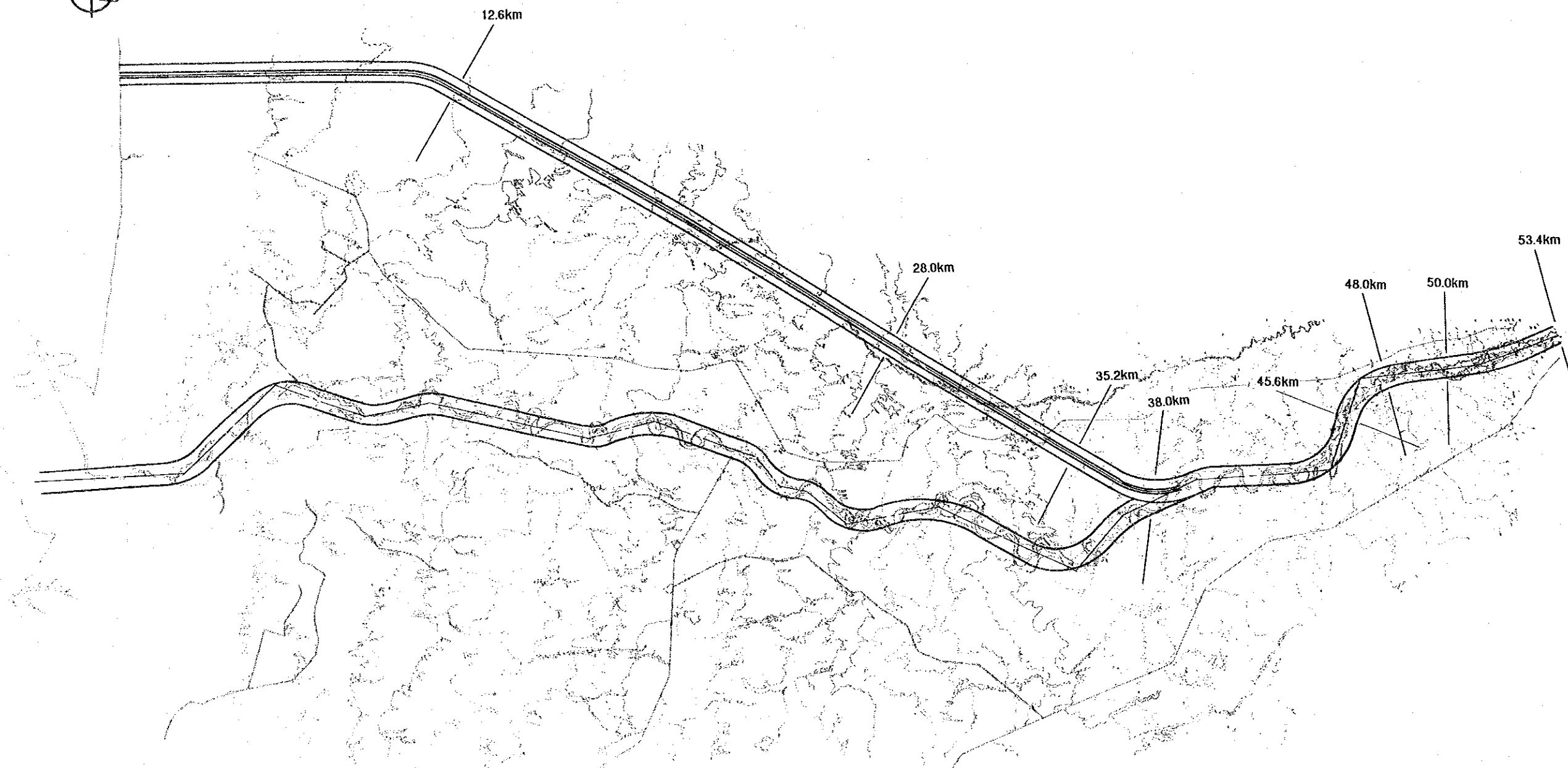


Fig.5.1-8





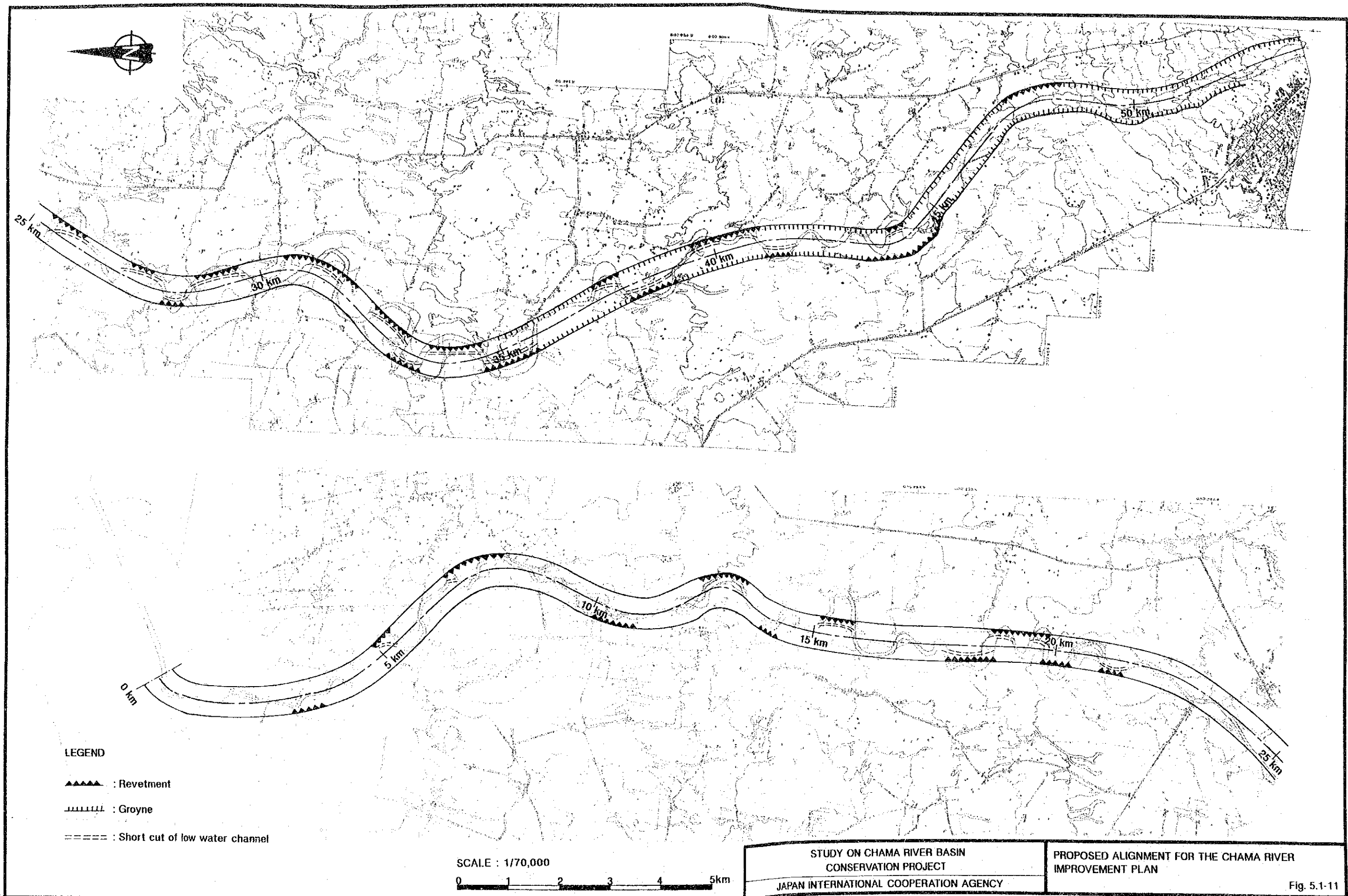


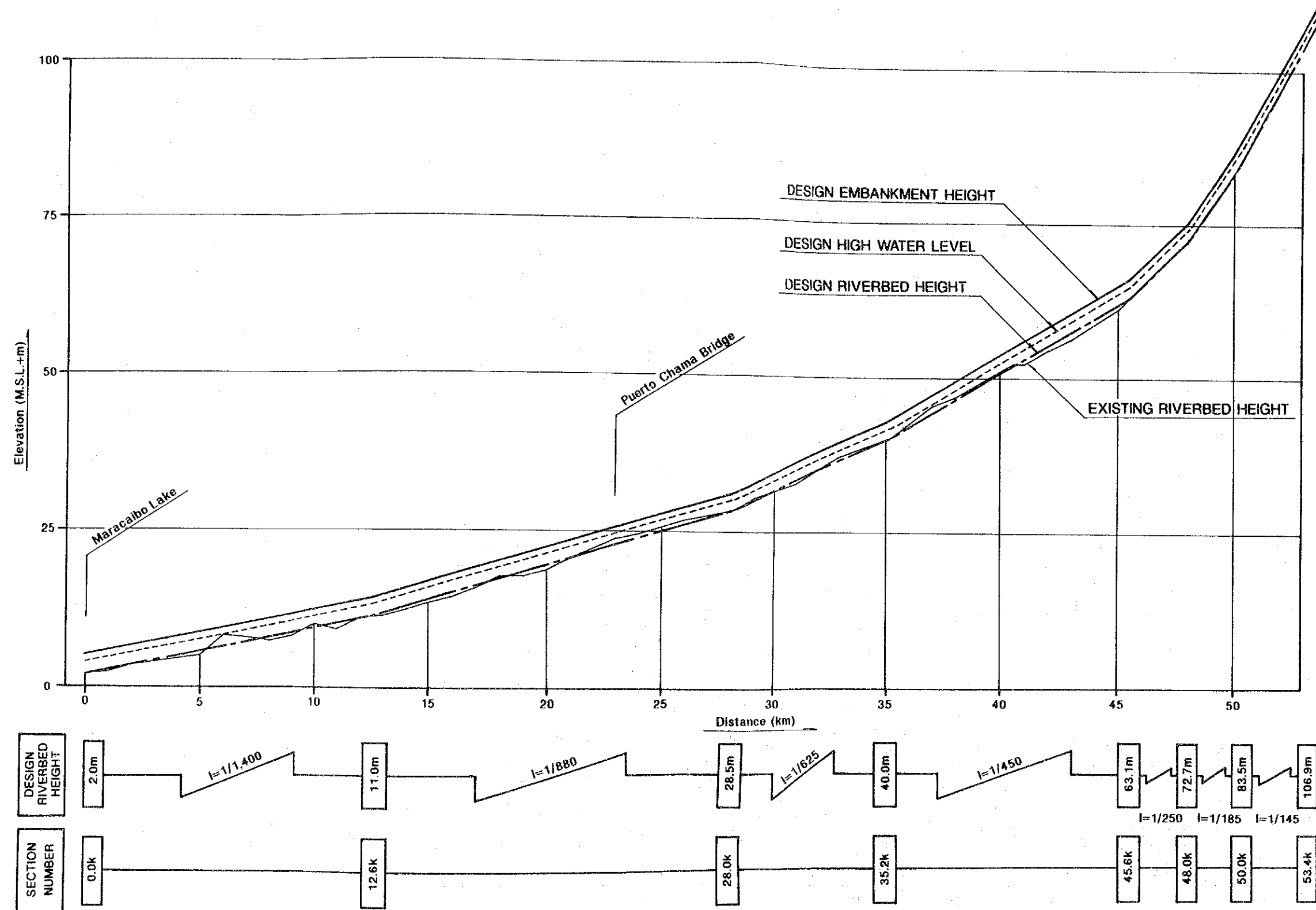
SCALE : 1/140,000  
0 2 4 6 8 10km

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

PLAN FOR THE ALTERNATIVE CASE OF THE MUCUJEPE  
DIVERSION CHANNEL

Fig. 5.1-10





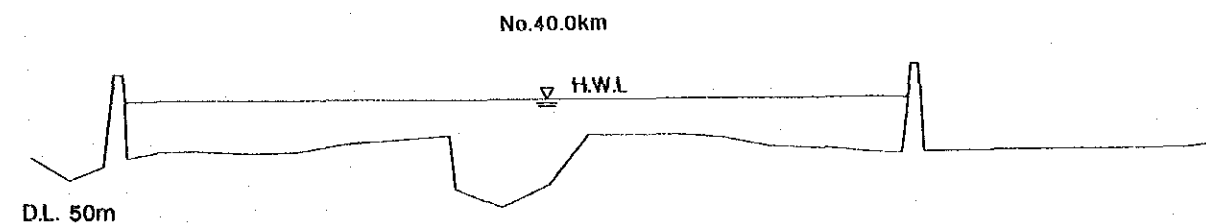
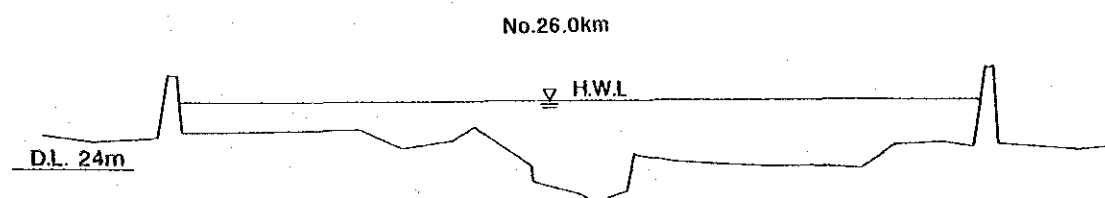
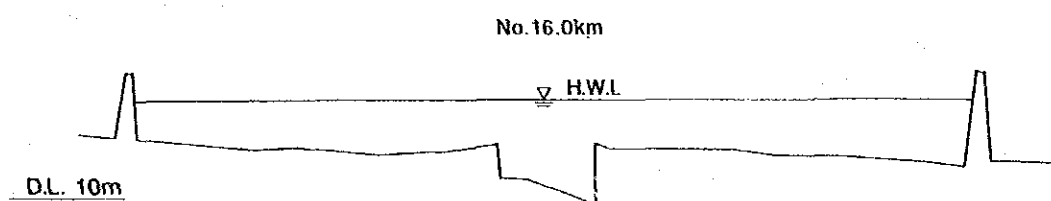
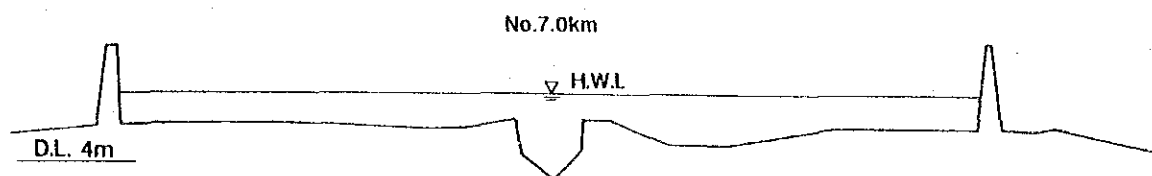
STUDY ON CHAMA RIVER BASIN  
 CONSERVATION PROJECT  
 JAPAN INTERNATIONAL COOPERATION AGENCY

PROPOSED LONGITUDINAL PROFILE FOR THE CHAMA  
 RIVER IMPROVEMENT PLAN

Fig. 5.1-12







Note :

H.W.L : Design High Water Level

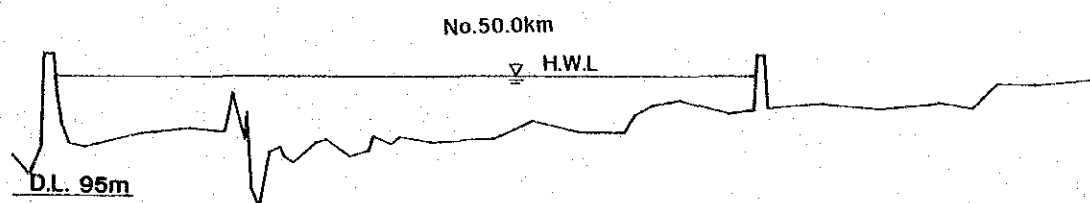
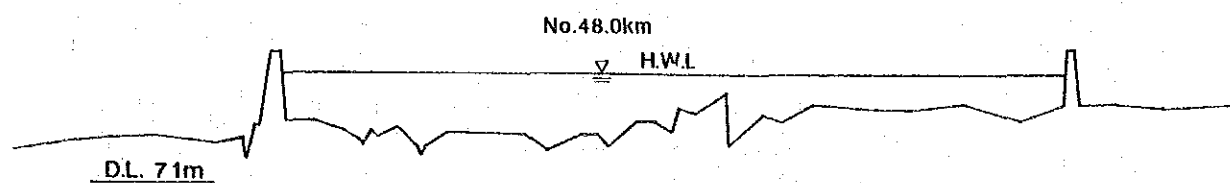
TYPICAL CROSS SECTION OF THE CHAMA RIVER IMPROVEMENT  
PLAN

Fig. 5.1-13 (1/2)

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





Note :

H.W.L : Design High Water Level

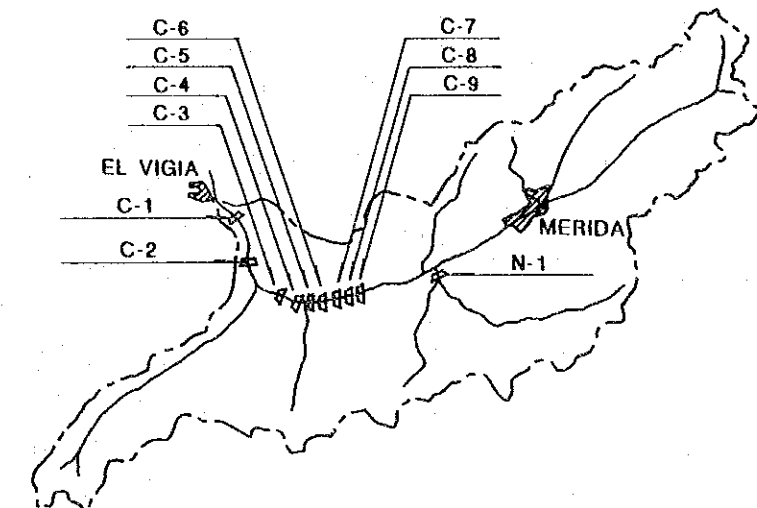
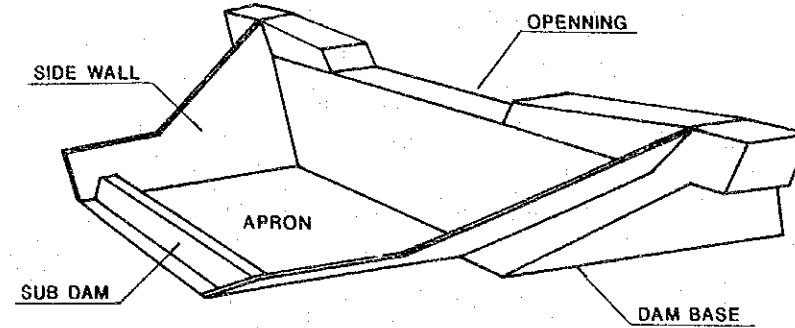
TYPICAL CROSS SECTION OF THE CHAMA RIVER IMPROVEMENT  
PLAN

Fig. 5-1-13 (2/2)

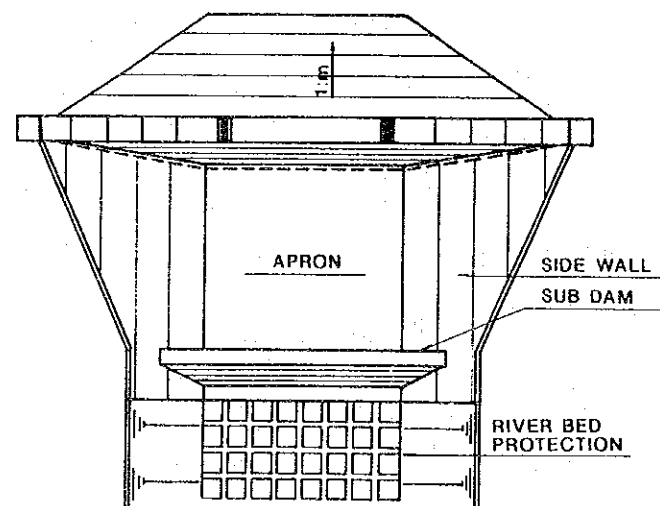
STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY

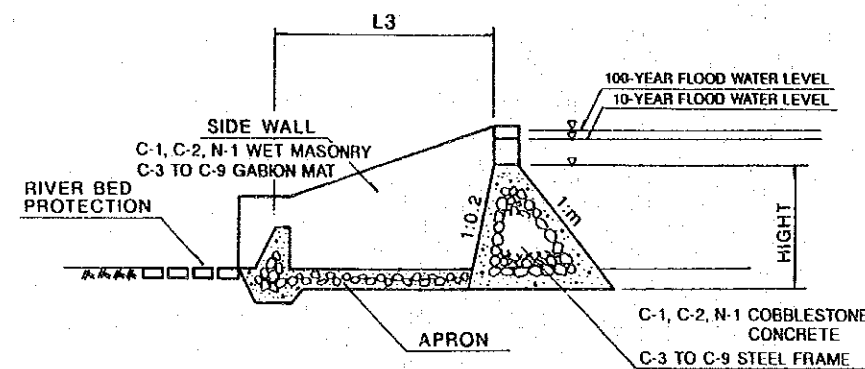
### LOCATION OF PROPOSED SABO DAMS



FRONT VIEW



## PLAN

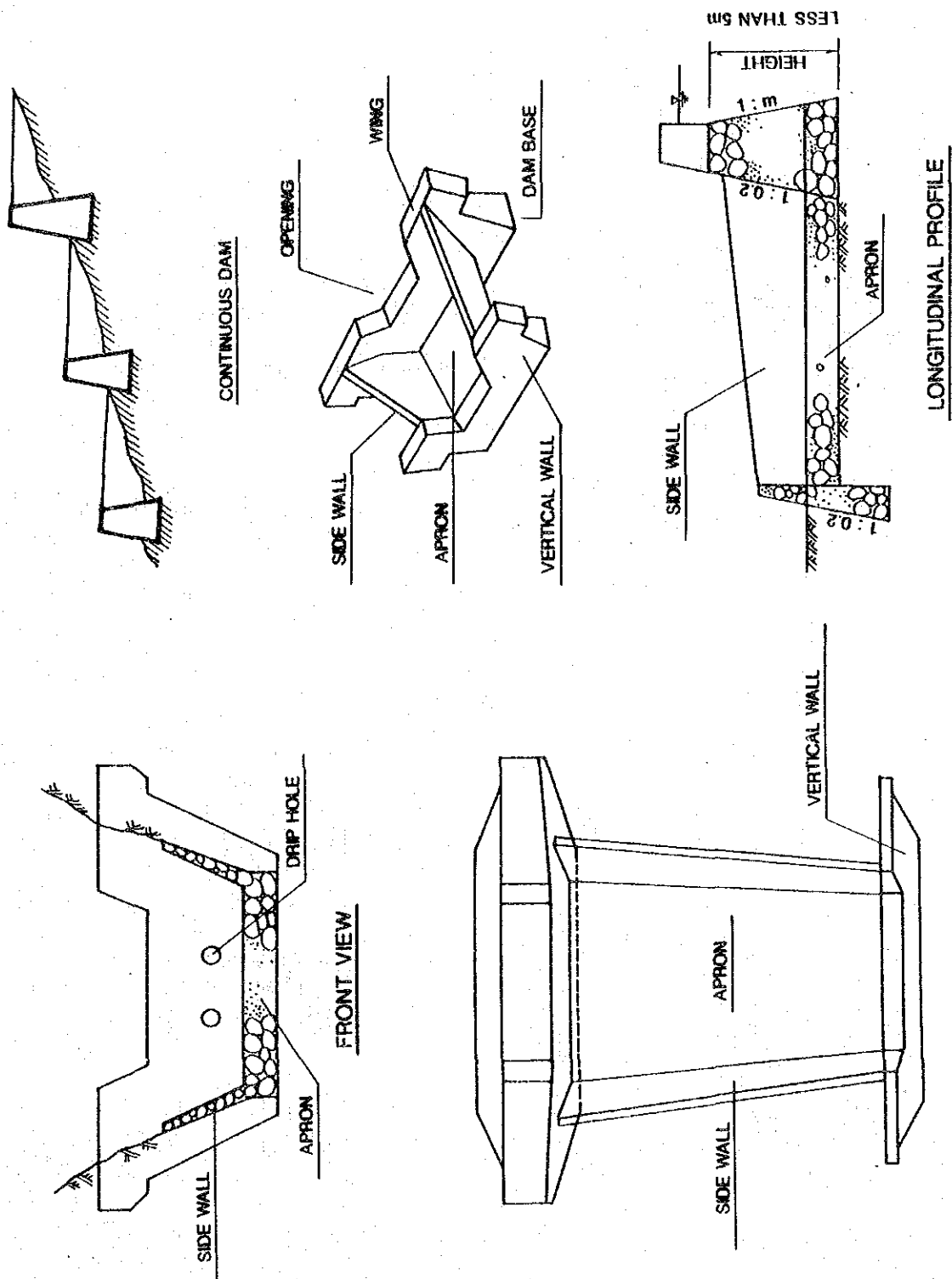


## LONGITUDINAL PROFILE

### Major Dimensions of Sabo Dam

Dam Name	Name of River	Height (m)	m	L1 (m)	L2 (m)	L3 (m)	Dam Volume (m3)
C-1	Chama River	22	1.10	170	100	50	62,500
C-2	Chama River	22	1.10	120	60	50	40,500
C-3	Chama River	11	0.75	150	80	45	17,100
C-4	Chama River	11	0.75	200	150	45	27,000
C-5	Chama River	9	0.70	230	70	45	14,600
C-6	Chama River	11	0.75	200	130	45	25,100
C-7	Chama River	11	0.75	200	100	45	22,000
C-8	Chama River	11	0.75	150	80	45	17,100
C-9	Chama River	11	0.75	250	120	45	27,200
N-1	Nuestra Senora	22	1.10	180	120	30	65,000





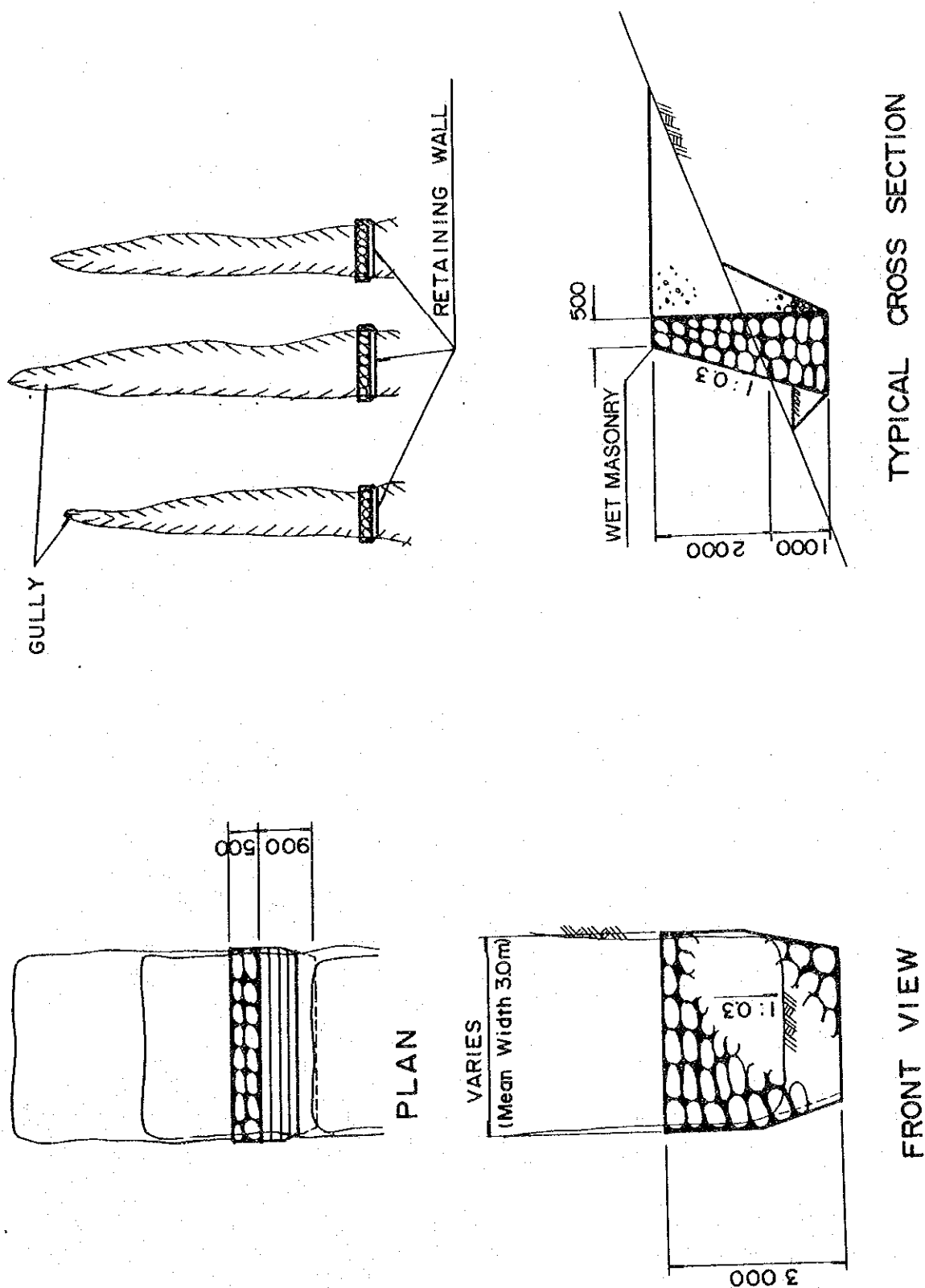
TYPICAL STRUCTURE OF CONTINUOUS DAM

Fig. 5.1-15

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





FEATURES OF RETAINING WALL FOR GULLY PROTECTION

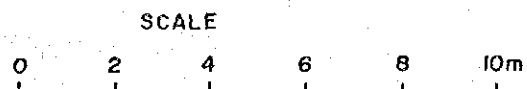
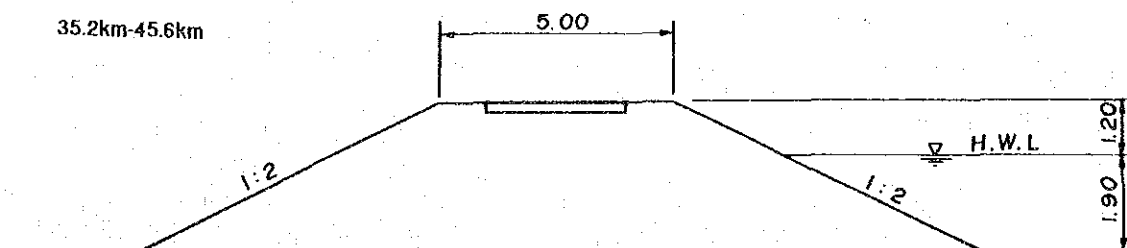
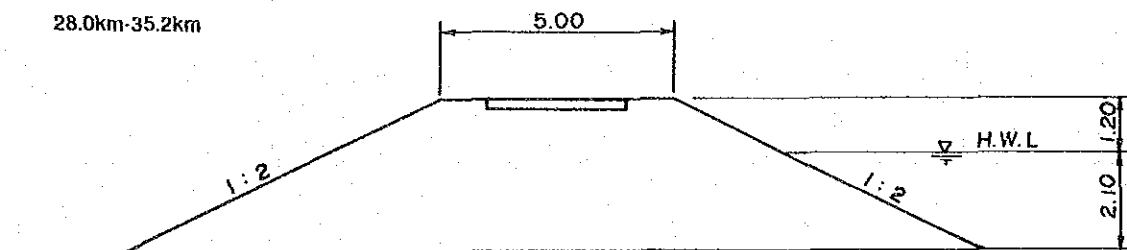
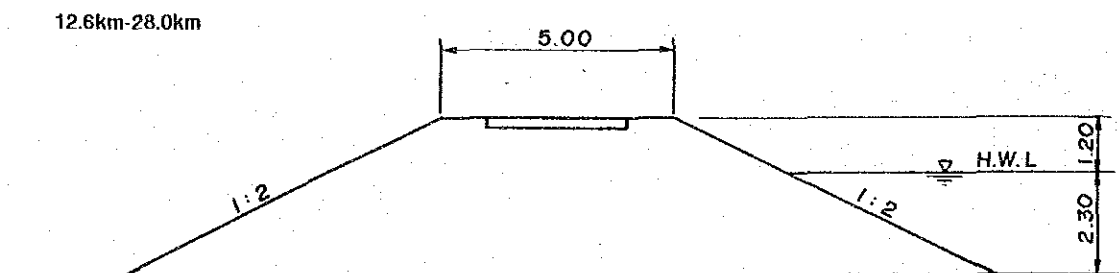
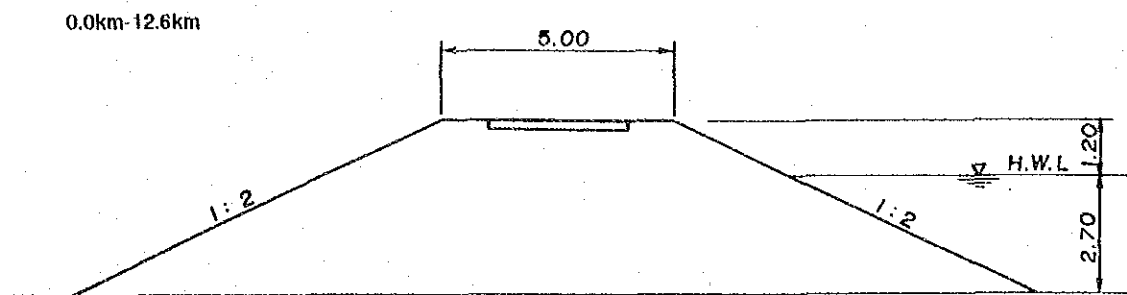
Fig. 5.1-16

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY







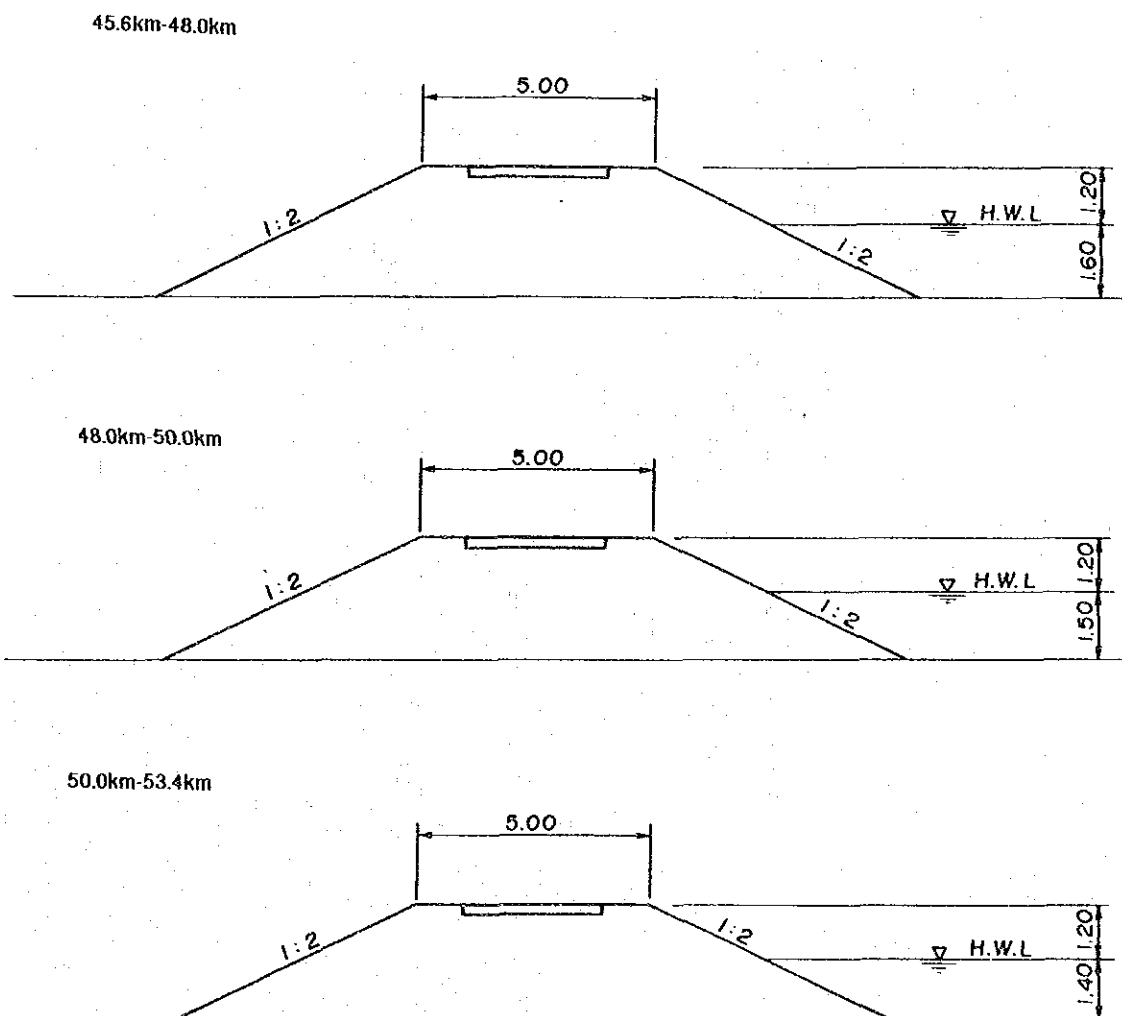
TYPICAL CROSS SECTIONS OF DIKE

Fig. 5.1-17 (1/2)

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





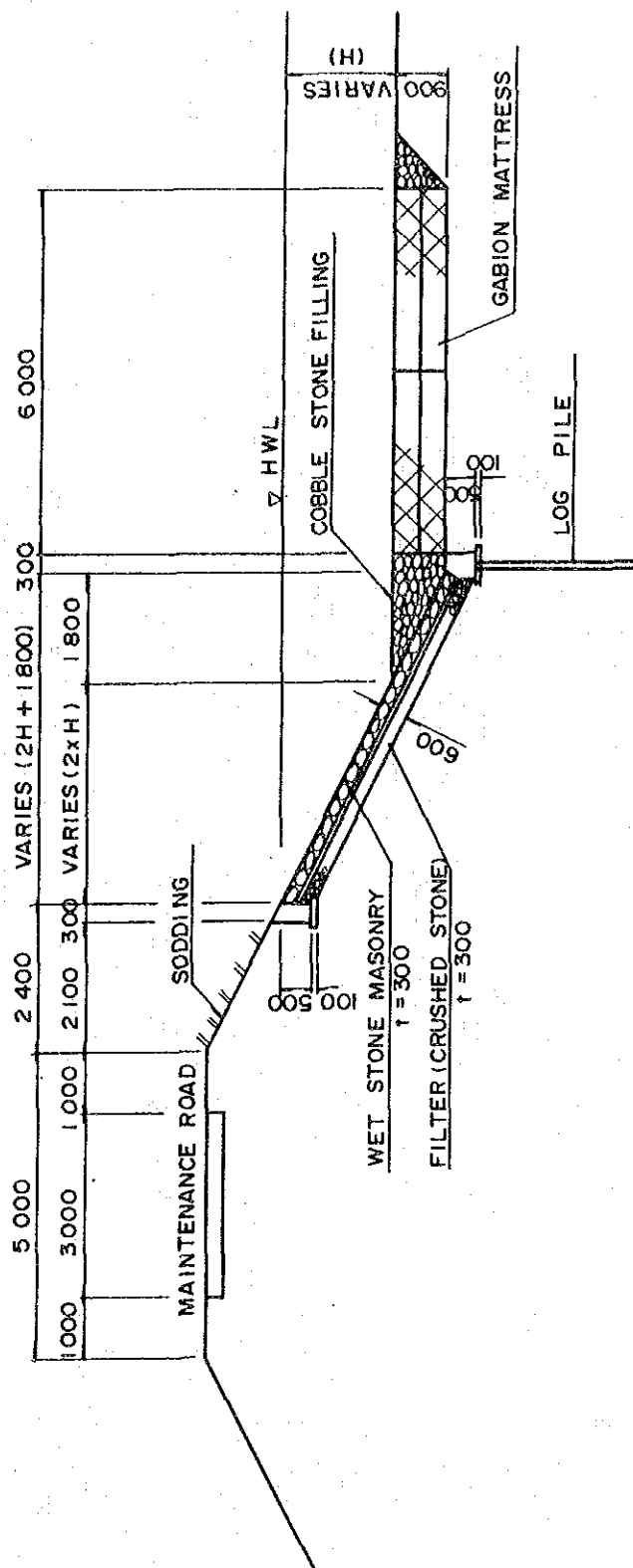
TYPICAL CROSS SECTIONS OF DIKE

Fig. 5-1-17 (2/2)

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





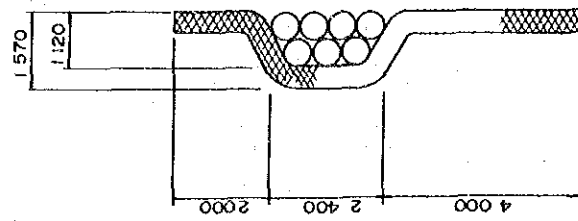
STANDARD DRAWING OF REVETMENT

Fig. 5.1-18

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

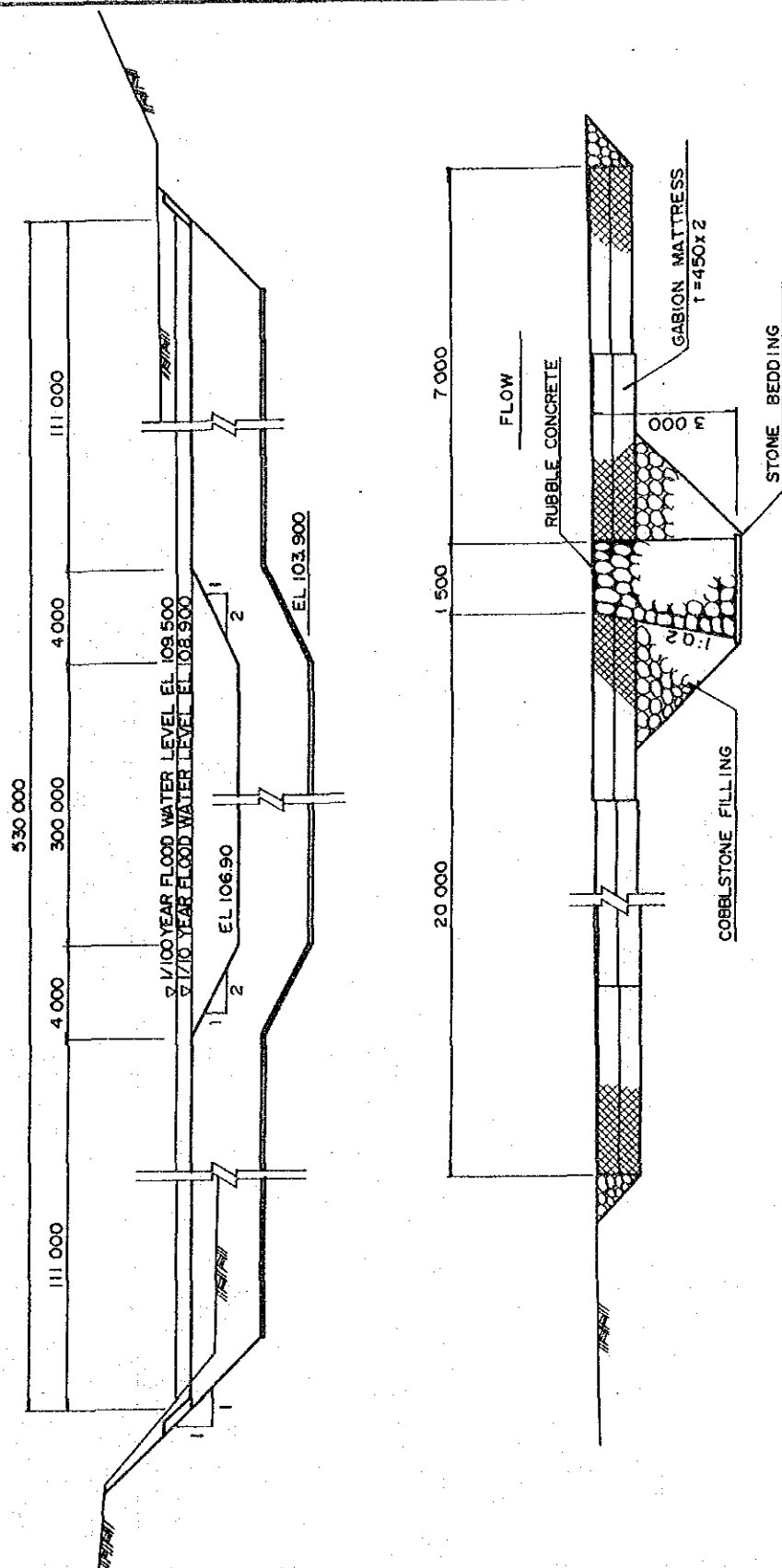
JAPAN INTERNATIONAL COOPERATION AGENCY











PROFILE AND STANDARD CROSS SECTION OF GROUND SILL

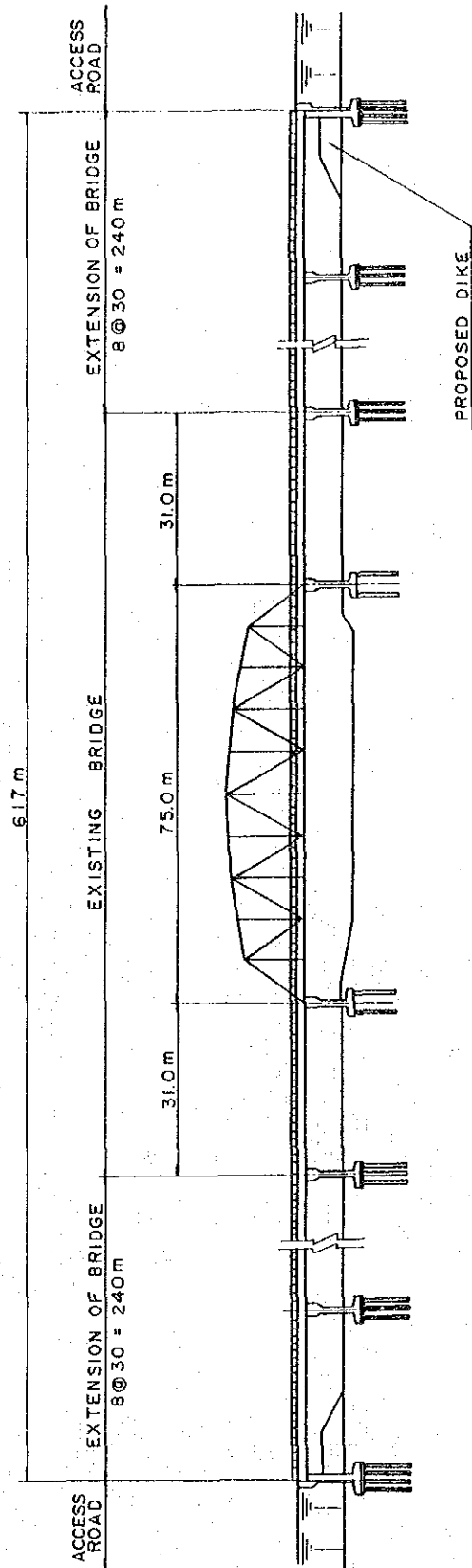
Fig. 5.1-20

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

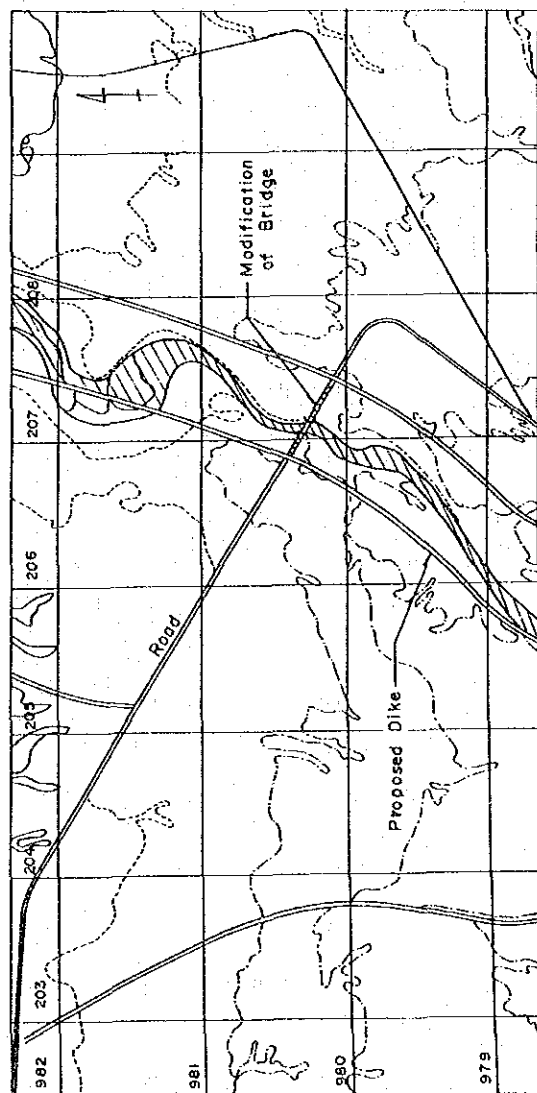
JAPAN INTERNATIONAL COOPERATION AGENCY



# LONGITUDINAL PROFILE



## LOCATION MAP



PROFILE OF THE PROPOSED PUERTO CHAMA BRIDGE EXTENSION

Fig. 5.1-21

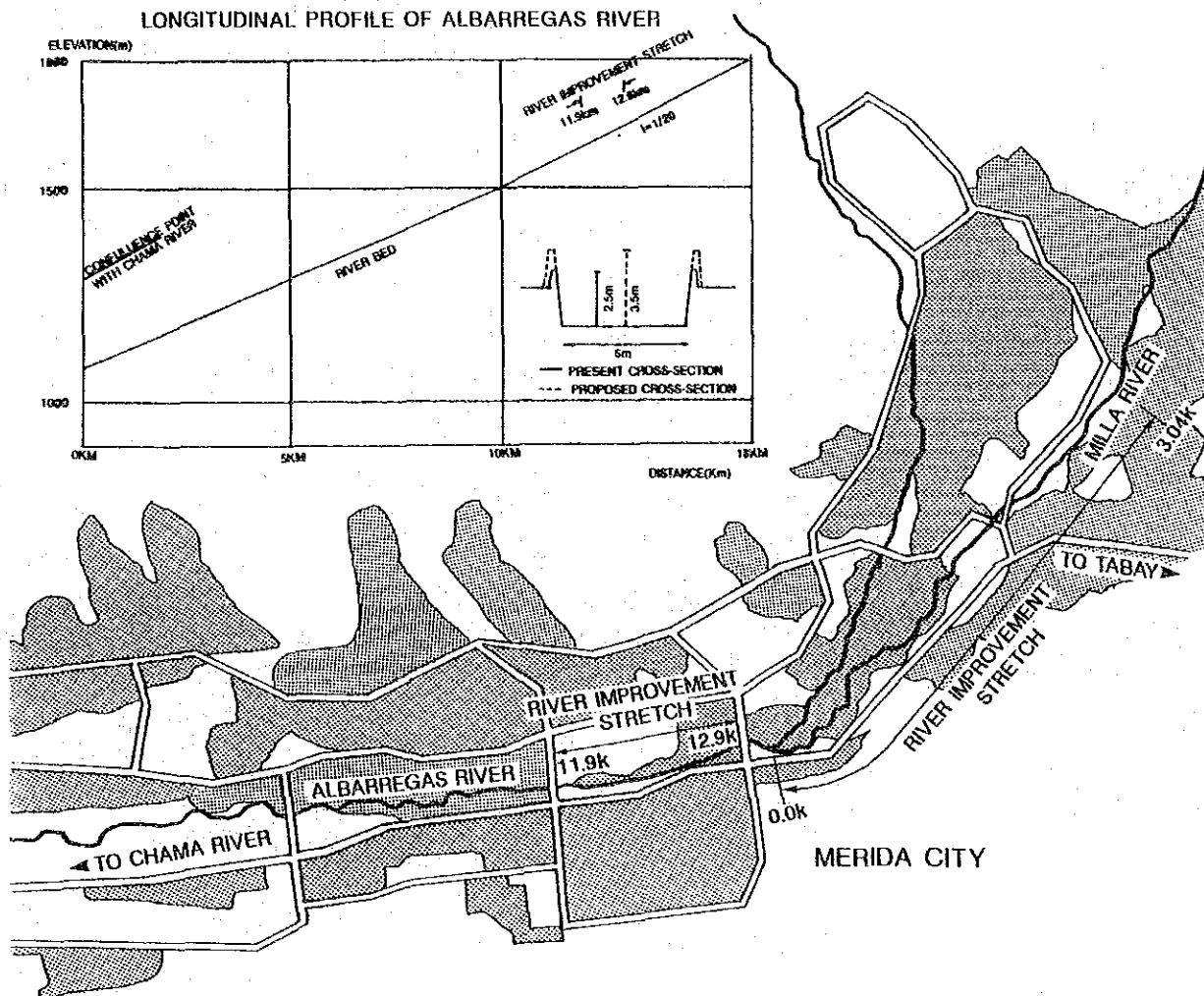
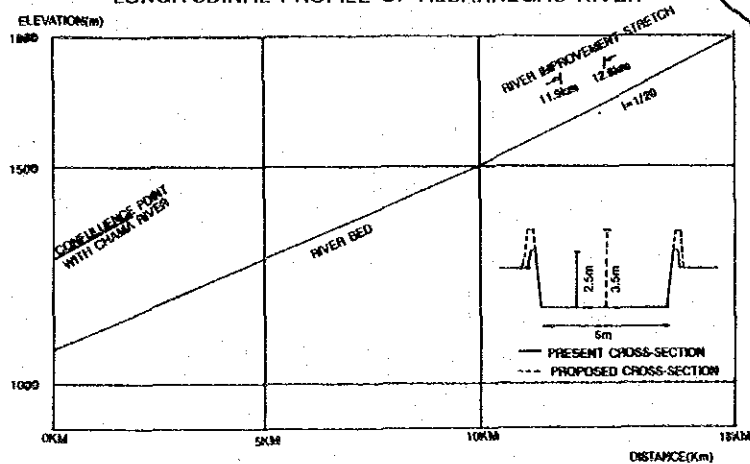
STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





### LONGITUDINAL PROFILE OF ALBARREGAS RIVER



#### LEGEND

: Urban area

#### SCALE



RIVER CHANNEL IMPROVEMENT PLAN FOR ALBARREGAS AND MILLA RIVER IN MERIDA CITY

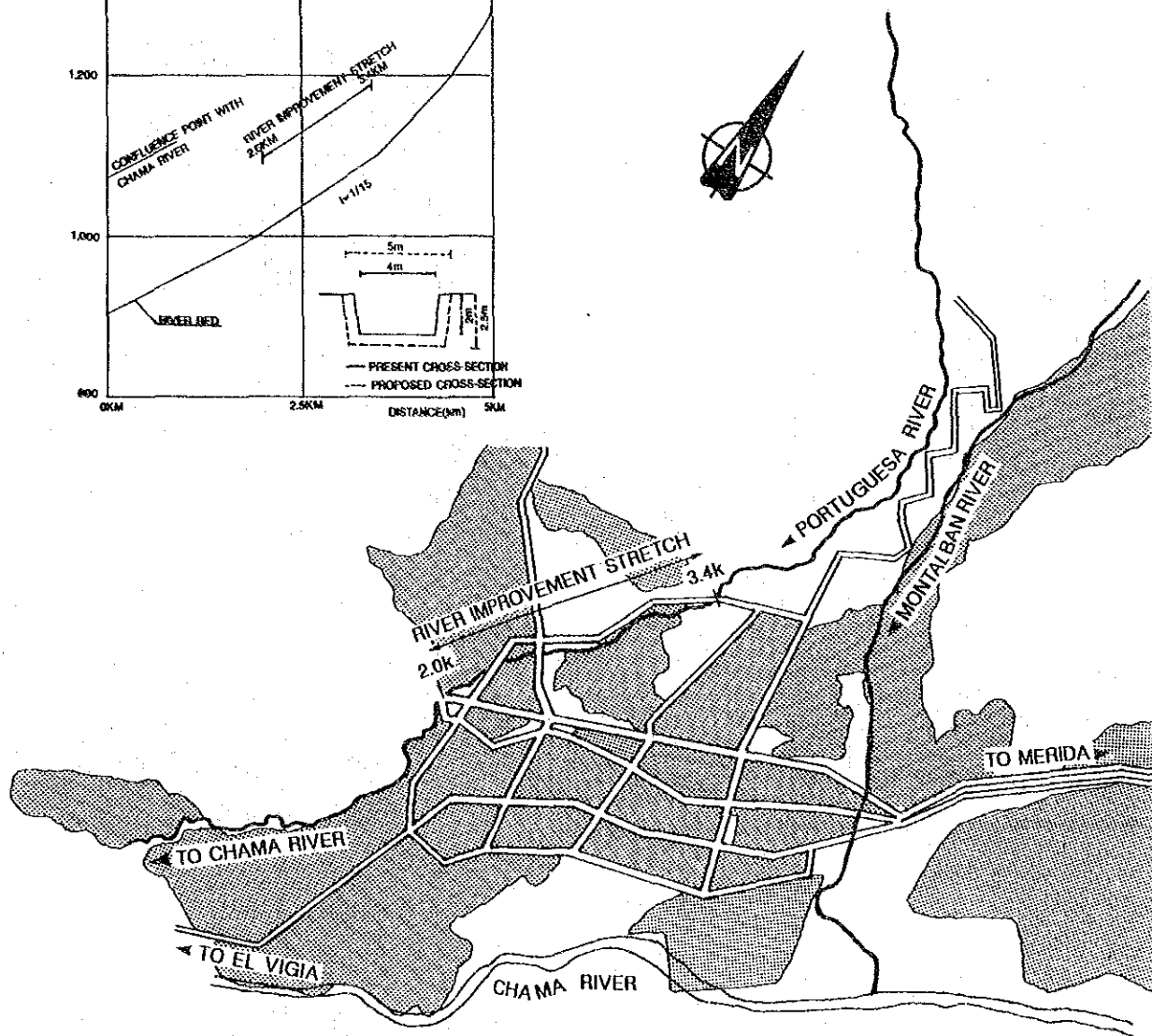
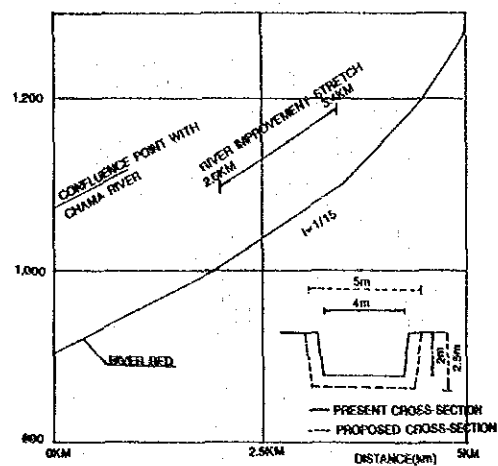
Fig. 5.2-1

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



# LONGITUDINAL PROFILE OF MONTALBAN RIVER



EJIDO CITY

SCALE



LEGEND

: Urban area

RIVER CHANNEL IMPROVEMENT PLAN FOR PORTUGUESA RIVER IN  
EJIDO CITY

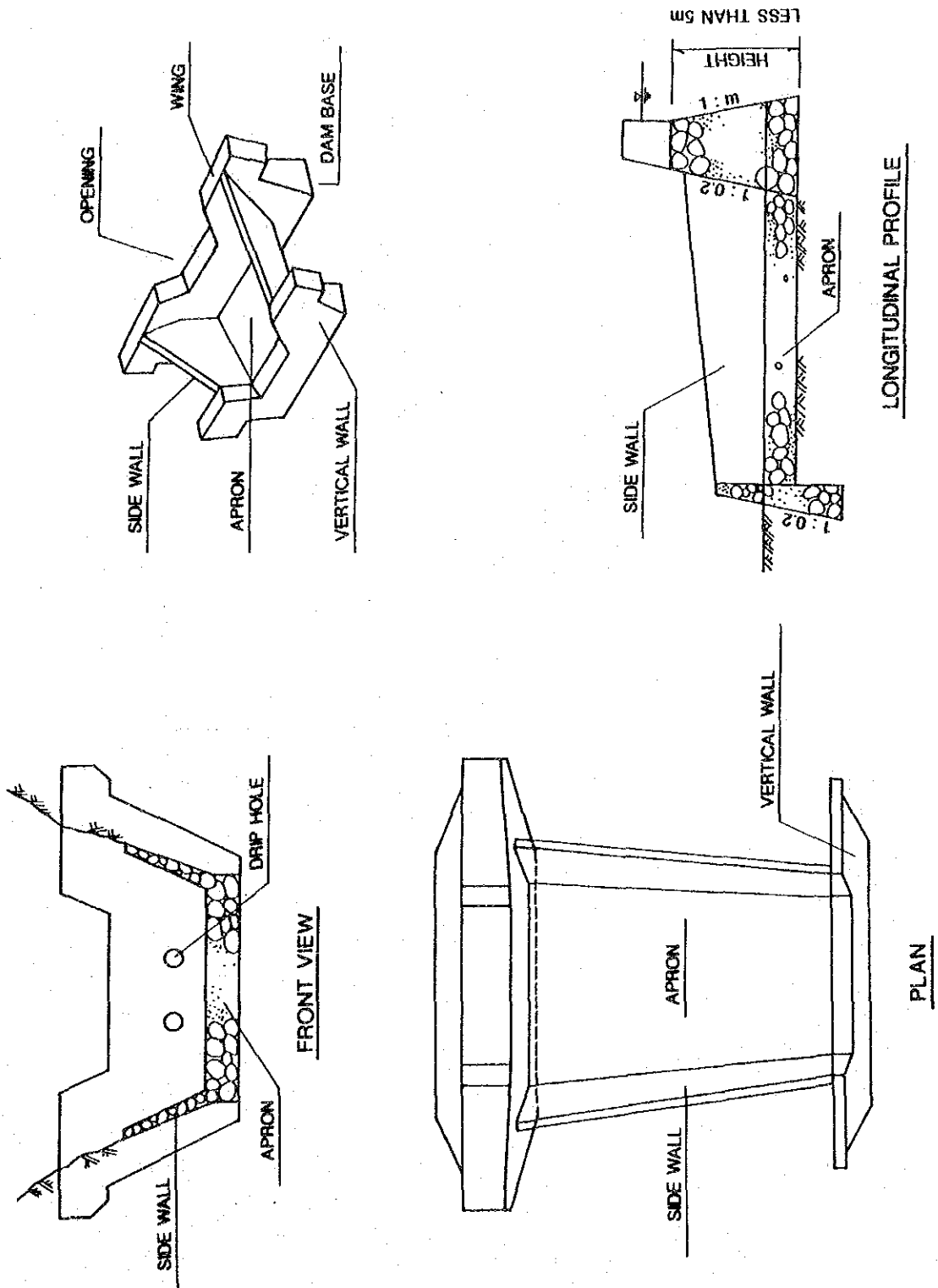
STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

Fig. 5.2-2

JAPAN INTERNATIONAL COOPERATION AGENCY







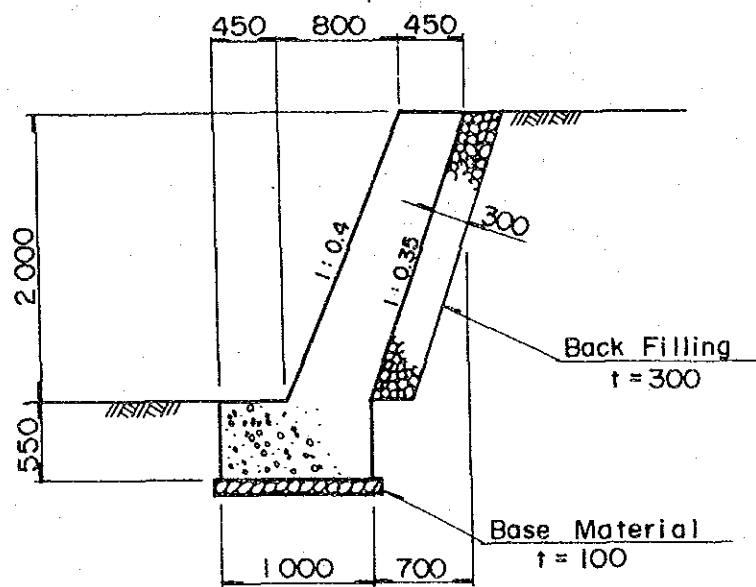
TYPICAL STRUCTURE OF CHECK DAM

Fig. 5.2-3

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





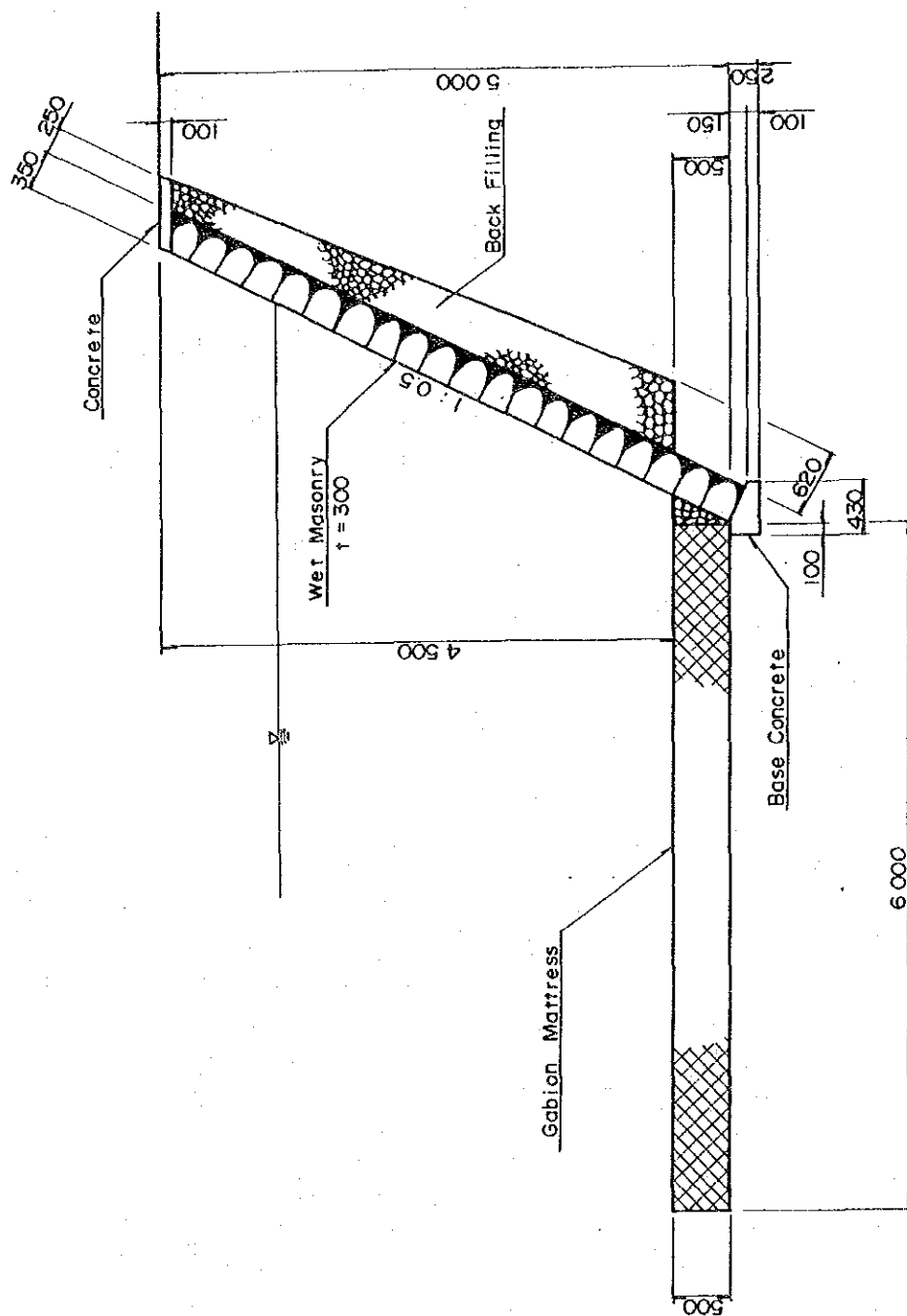
TYPICAL STRUCTURE OF RETAINING WALL FOR ROAD PROTECTION

Fig. 5.2-4

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





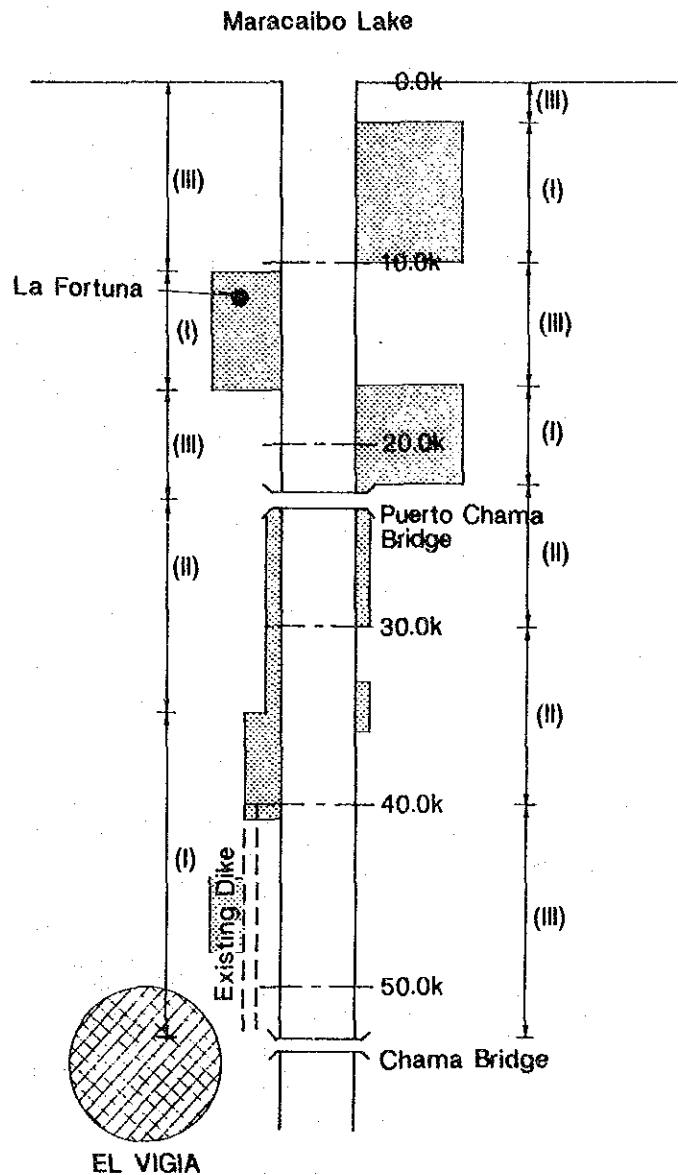
TYPICAL STRUCTURE OF REVETMENT

Fig. 5.2-5




STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY





LEGEND

-  : Plantain area in flood inundation area
-  : Village
-  : Urban area
- (I),(II),(III) : Priority of construction

PRIORITY OF CONSTRUCTION FOR RIVER CHANNEL IMPROVEMENT

STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

Fig. 5.3-1

JAPAN INTERNATIONAL COOPERATION AGENCY





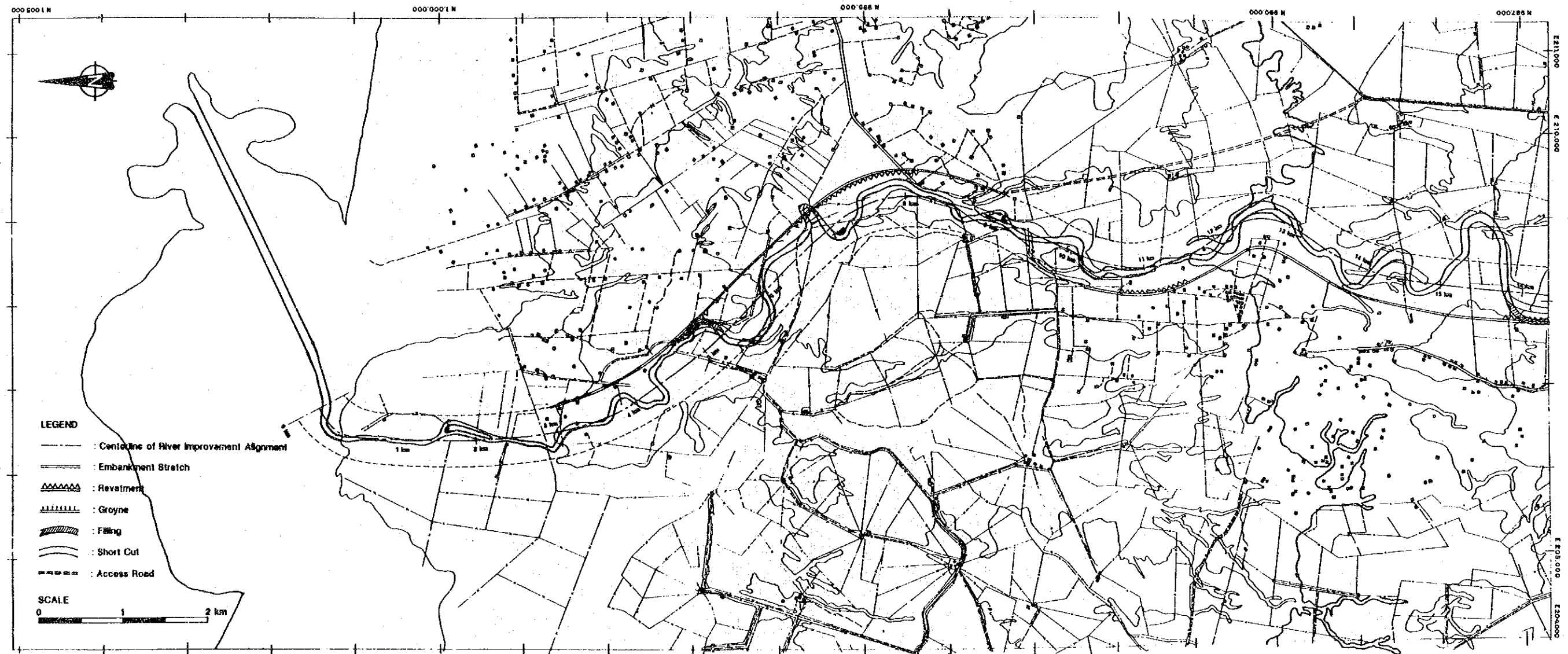
ITEM	UNIT	QUANTITY	PHASE 1 (1991-2000)	PHASE 2 (2001-2010)	PHASE 3 (2011-2020)
<b>BASIN-WIDE PROJECT</b>					
1. Sediment Control					
Sabo Dam (C-1, N-1, C-5)	m <sup>3</sup>	142,100			
(C-2 - C-4)	m <sup>3</sup>	84,600			
(C-6 - C-9)	m <sup>3</sup>	91,400			
Continuous Dam	no.	110	(18 nos.)	(44 nos.)	(48 nos.)
Retaining Wall	no.	1,400	(340 nos.)	(450 nos.)	(610 nos.)
2. Flood Control					
Reinforcement of Existing Dike	km	12.0*			
River Improvement (Phase 1)	km	24.7*			
River Improvement (Phase 2)	km	31.4*			
River Improvement (Phase 3)	km	40.3*			
Puerto Chama Bridge Extension	m <sup>2</sup>	6,100			
<b>LOCAL PROJECT</b>					
1. Sediment Control					
Check Dam	no.	88			
Retaining Wall	m	750			
Revetment	m	720			
2. Flood Control					
River Improvement of Albarregas River					
River Improvement of Milla River					
River Improvement of Portuguesu River					
* Cumulative length of both banks.			PHASE 1 = Bs1,103 million (@ Bs110x10yrs)	PHASE 2 = Bs1,415 million (@ Bs142x10yrs)	PHASE 3 = Bs1,033 million (@ Bs103x10yrs)

CONSTRUCTION TIME SCHEDULE FOR MASTER PLAN

Fig.5.3-2

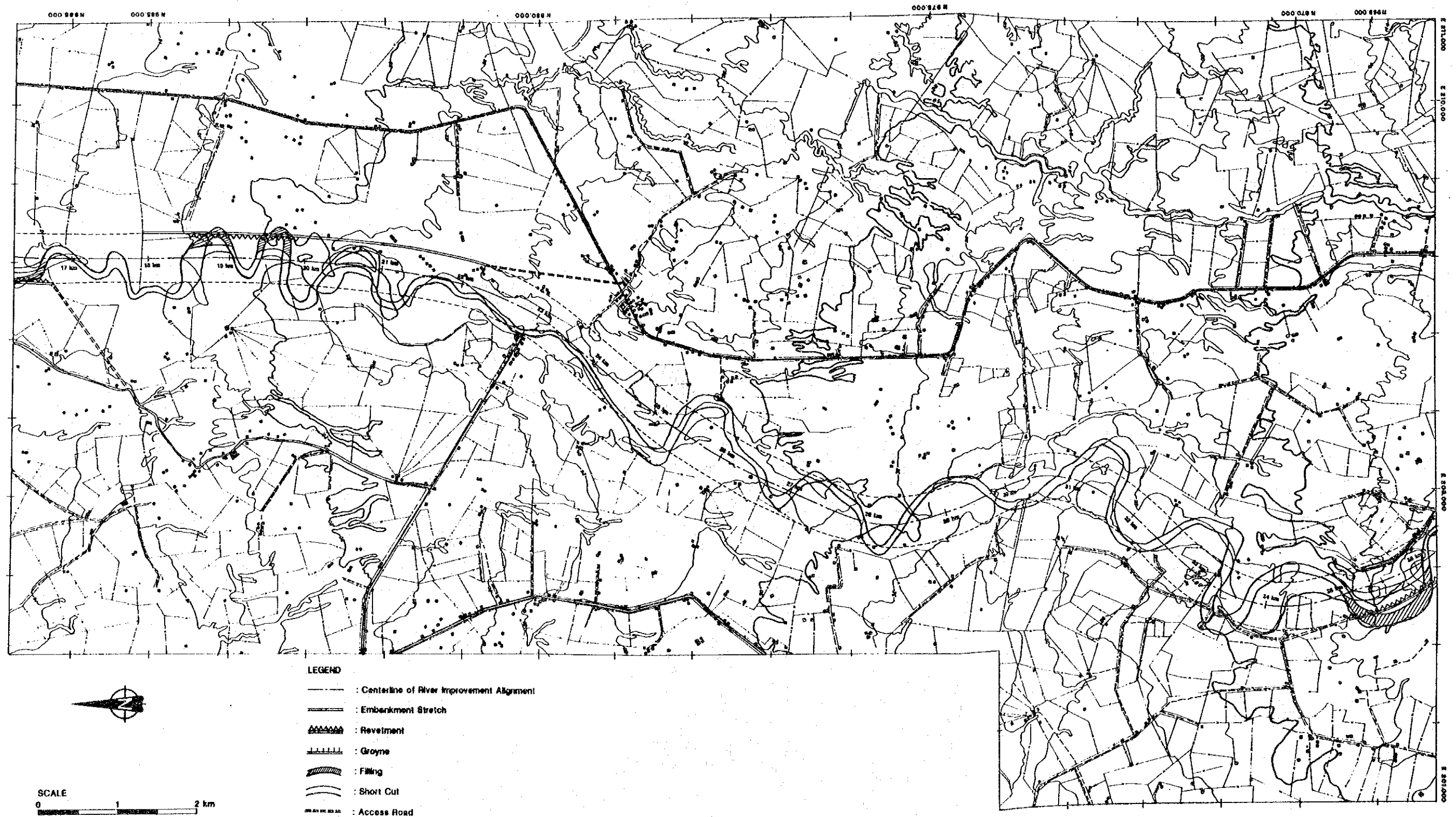
STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT

JAPAN INTERNATIONAL COOPERATION AGENCY



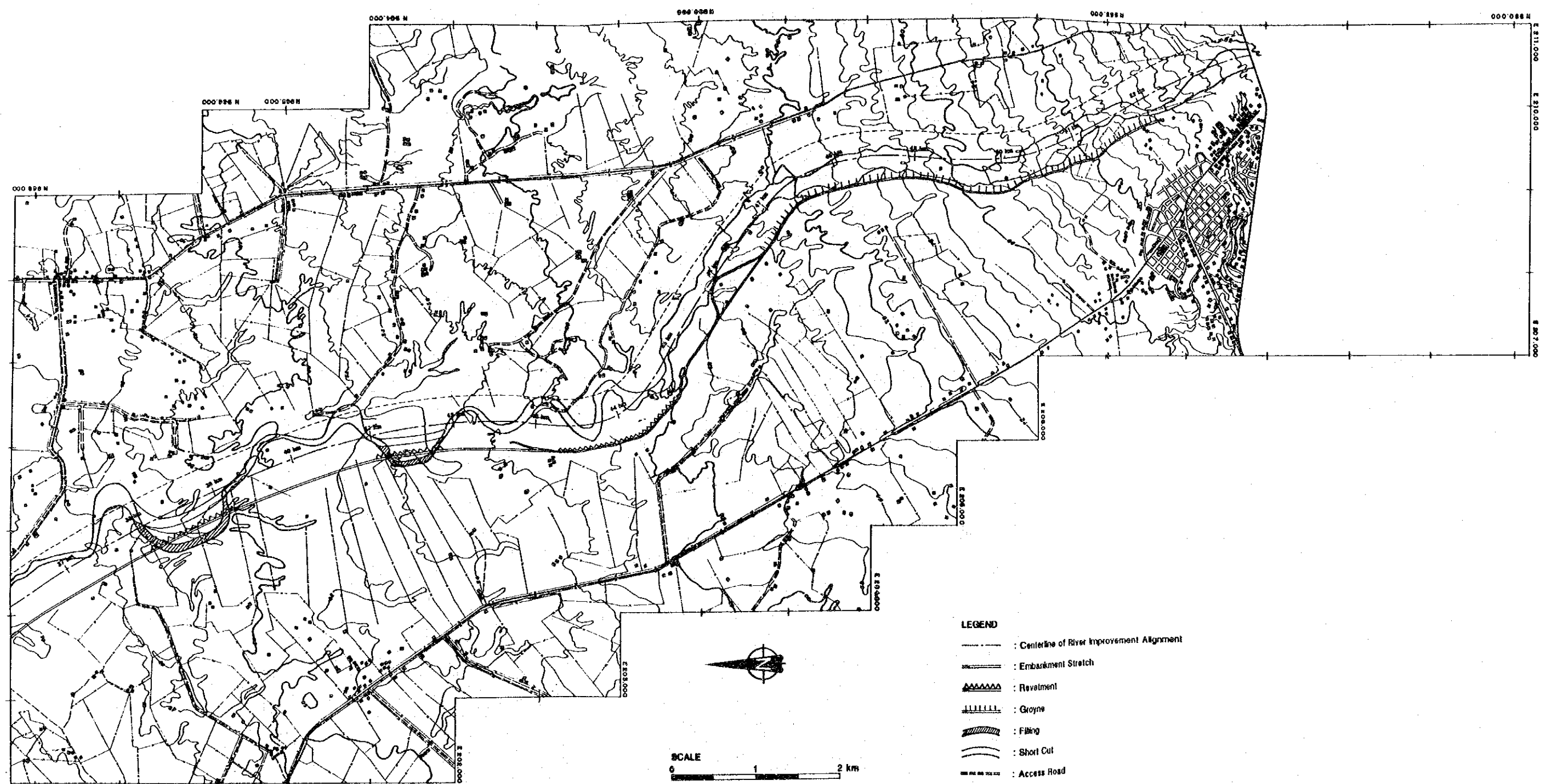
STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

RIVER IMPROVEMENT PLAN FOR ACTION PLAN  
Fig. 6.1-1 (1/3)



STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

RIVER IMPROVEMENT PLAN FOR ACTION PLAN  
Fig. 6-1-1 (2/3)

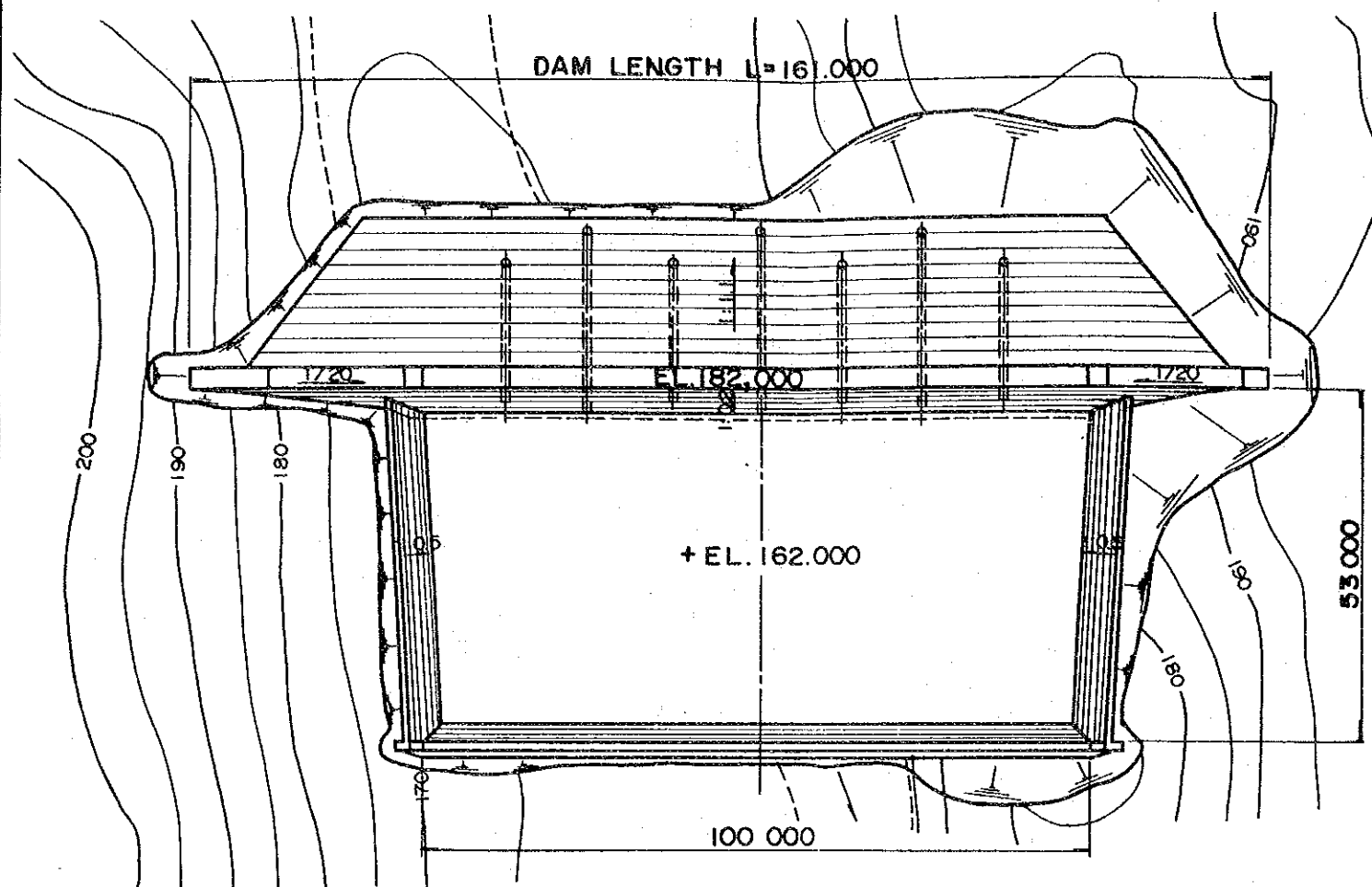


STUDY ON CHAMA RIVER BASIN  
CONSERVATION PROJECT  
JAPAN INTERNATIONAL COOPERATION AGENCY

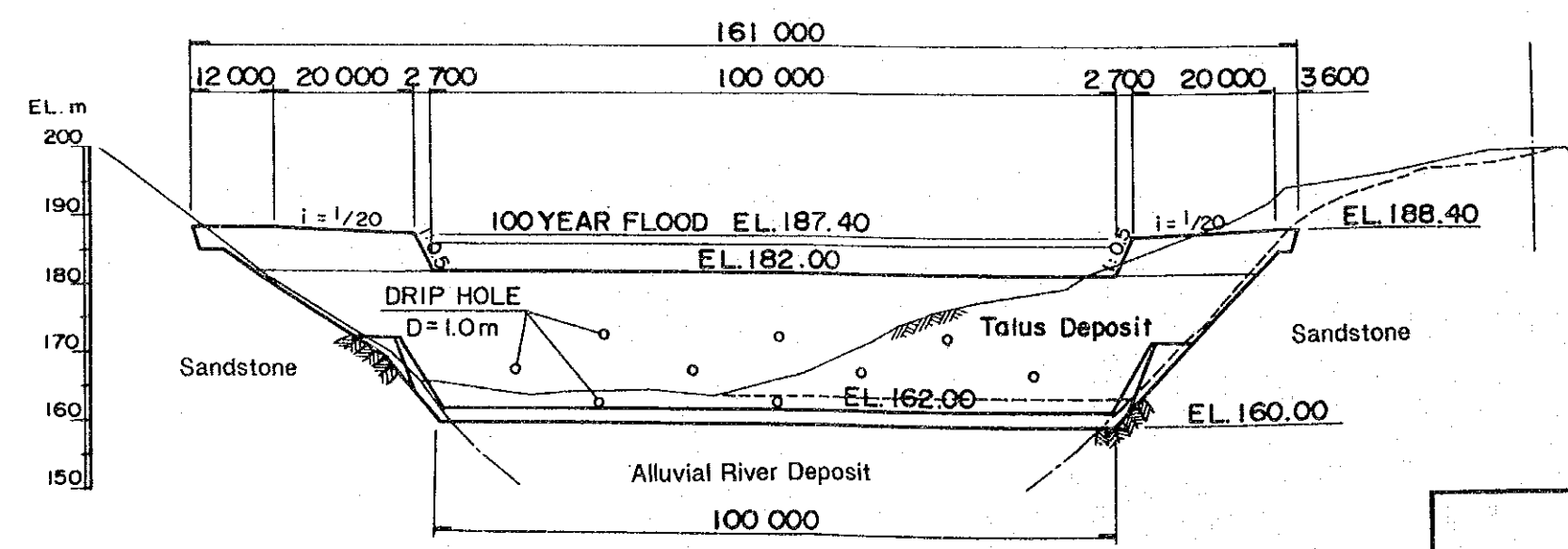
RIVER IMPROVEMENT PLAN FOR ACTION PLAN

Fig. 6-1-1 (3/3)

PLAN  $s = 1/1000$

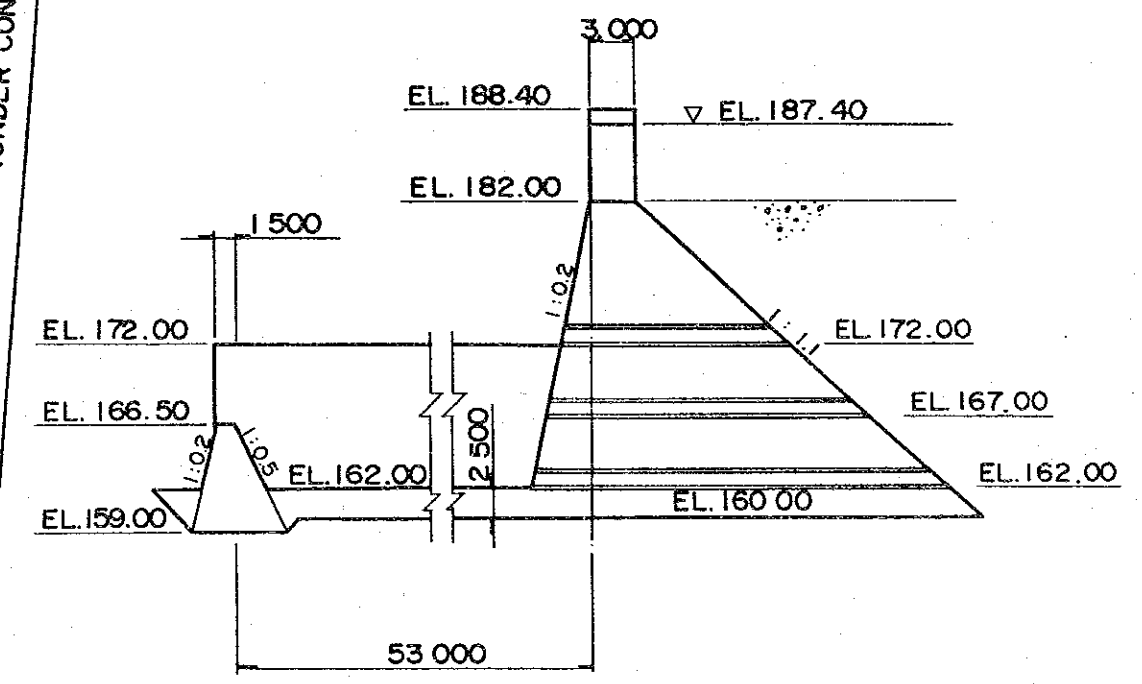


FRONT VIEW  $s = 1/1000$

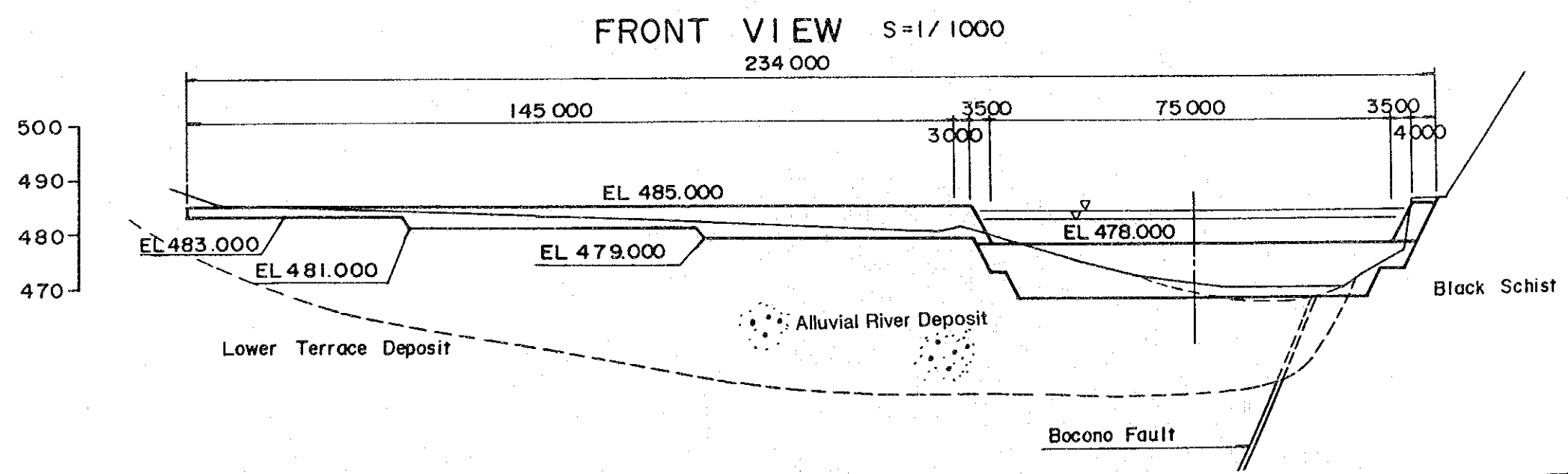
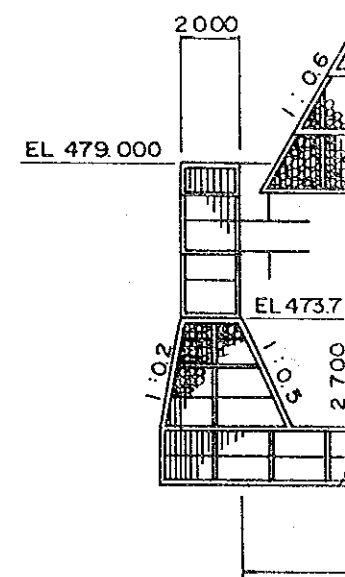
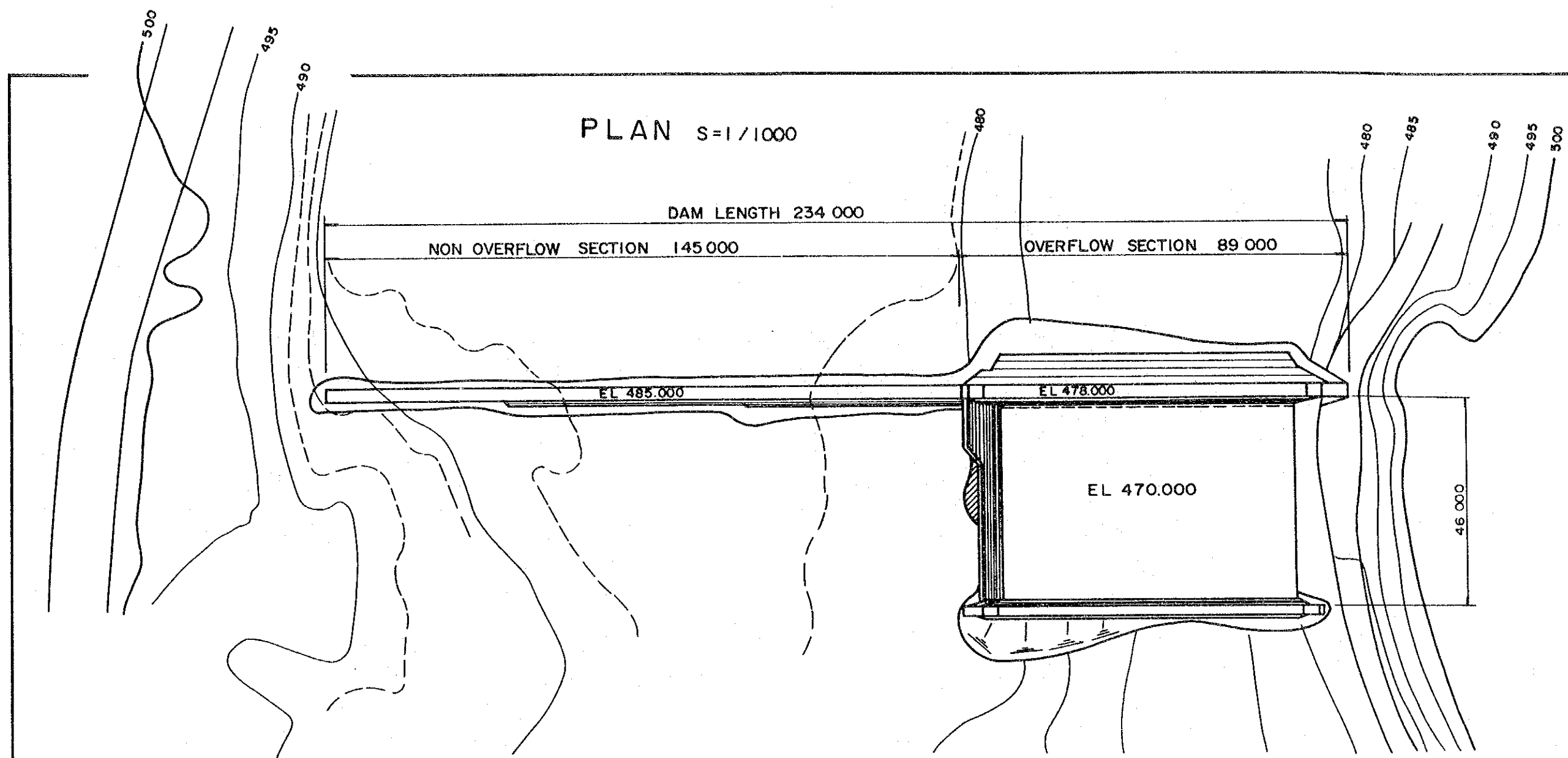


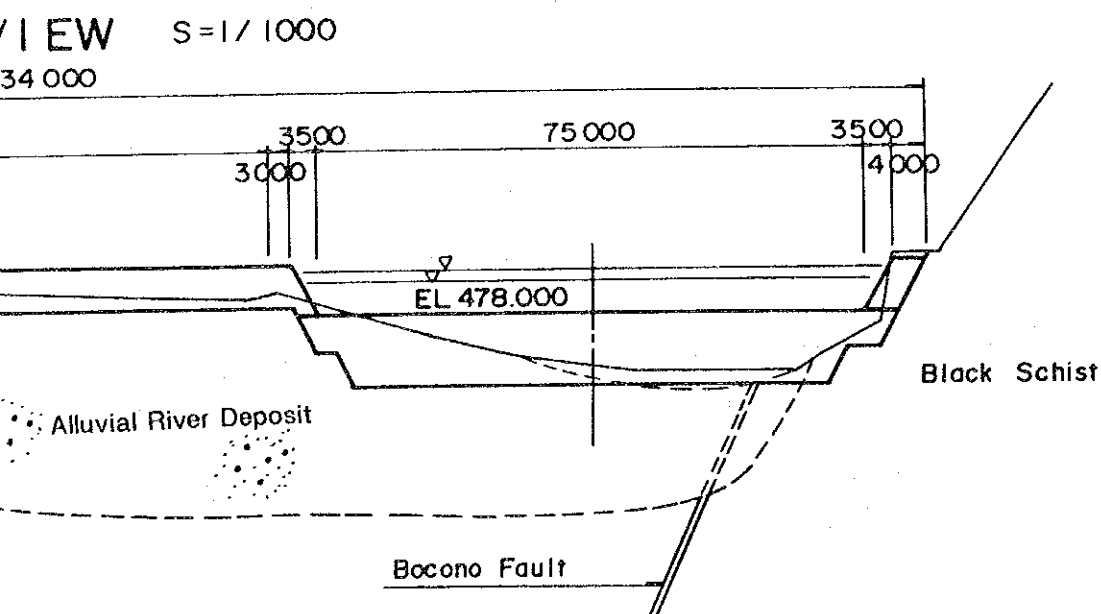
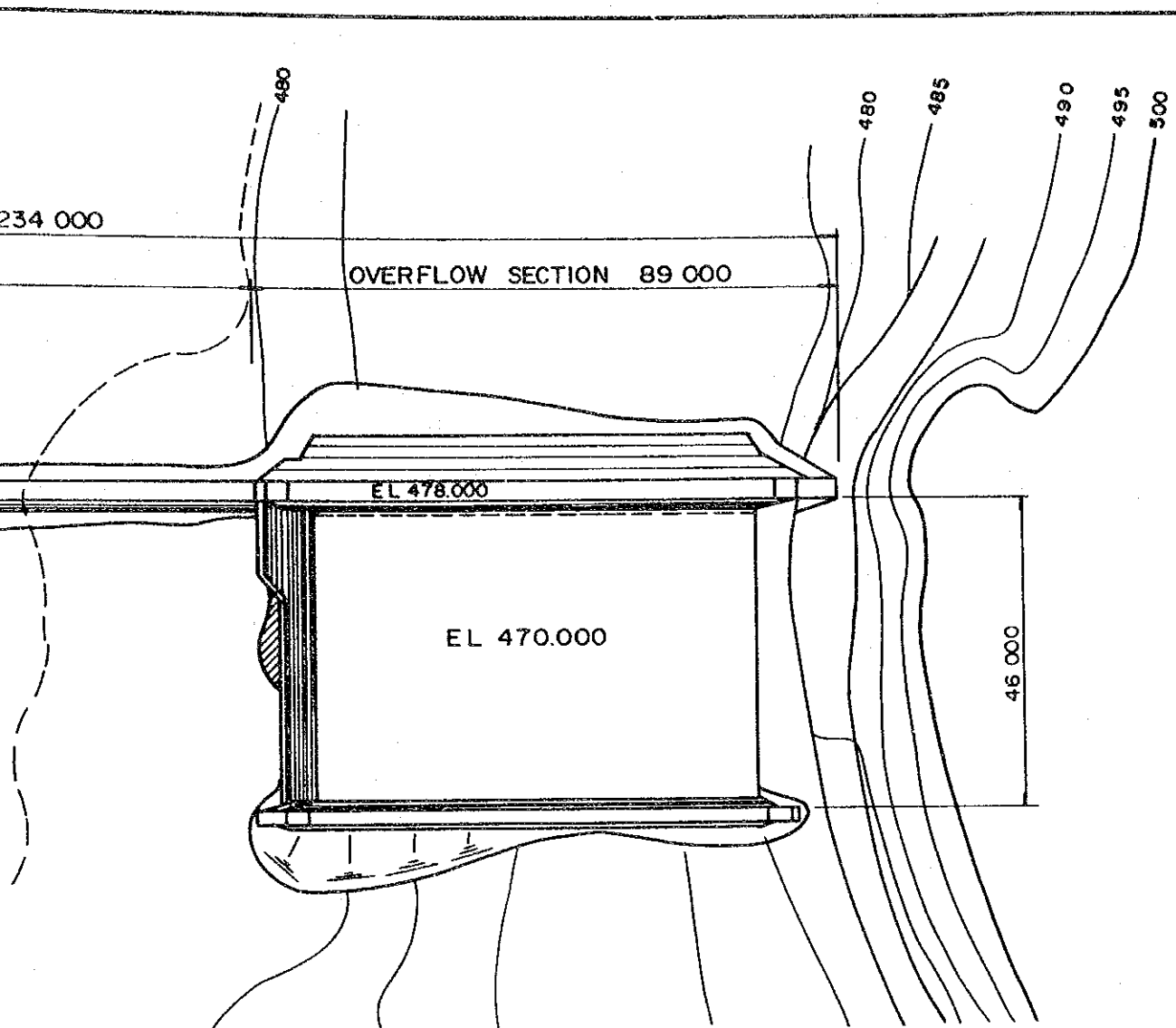
STANDARD CROSS SECTION  $s = 1/500$

(UNDER CONSTRUCTION)



STANDARD  
NON-OVERFLOW

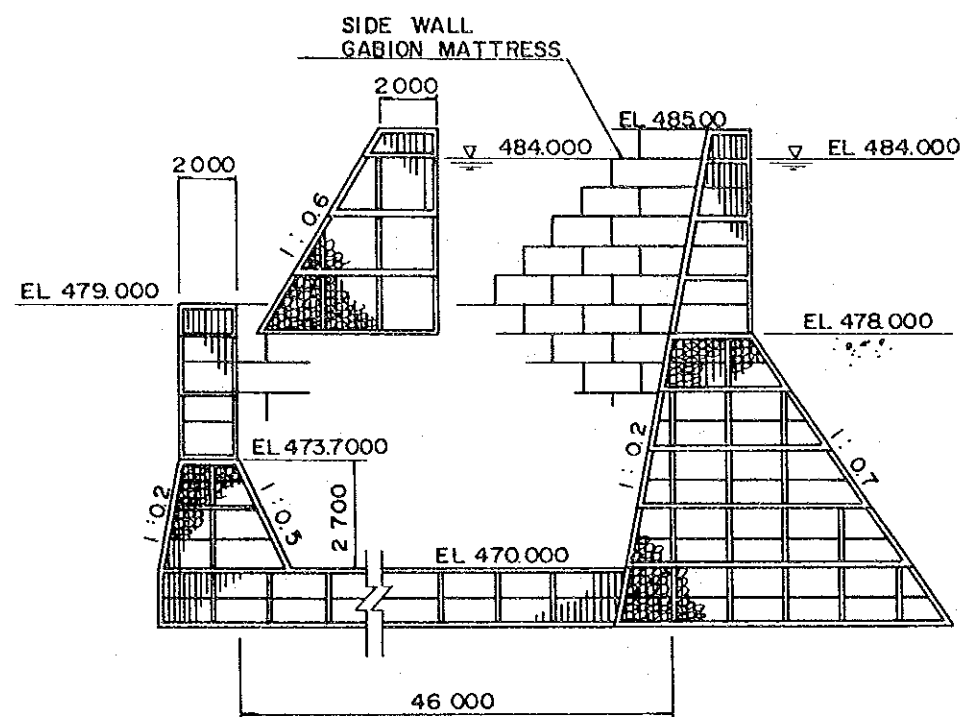




# STANDARD CROSS SECTION S= 1/250

## NON-OVERFLOW SECTION

## OVERFLOW SECTION



## SIDE WALL

