

No. 002

THE PEOPLE'S REPUBLIC OF BANGLADESH  
BANGLADESH WATER DEVELOPMENT BOARD

FEASIBILITY STUDY  
ON  
THE KURIGRAM  
IRRIGATION AND FLOOD CONTROL PROJECT  
— NORTH UNIT —

VOLUME 3  
DRAWINGS

OCTOBER 1990

JAPAN INTERNATIONAL COOPERATION AGENCY

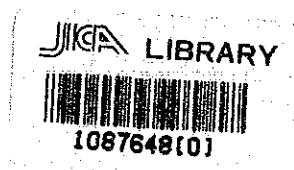
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THE PEOPLE'S REPUBLIC OF BANGLADESH  
BANGLADESH WATER DEVELOPMENT BOARD

**FEASIBILITY STUDY  
ON  
THE KURIGRAM  
IRRIGATION AND FLOOD CONTROL PROJECT  
— NORTH UNIT —**



**VOLUME 3  
DRAWINGS**

21951

OCTOBER 1990

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21.	PROFILE OF MAIN CANAL M2 (3)
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DWG.NO.

DESCRIPTION

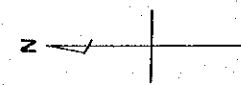
- |     |                                 |
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KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT  
- NORTH UNIT -

GENERAL PLAN



PATESWARI  
PUMPING STATION

TANGOMWARI  
PUMPING STATION  
(Reversible)

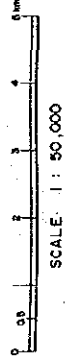
BEGONGANJ  
PUMPING STATION  
(DRAINAGE)



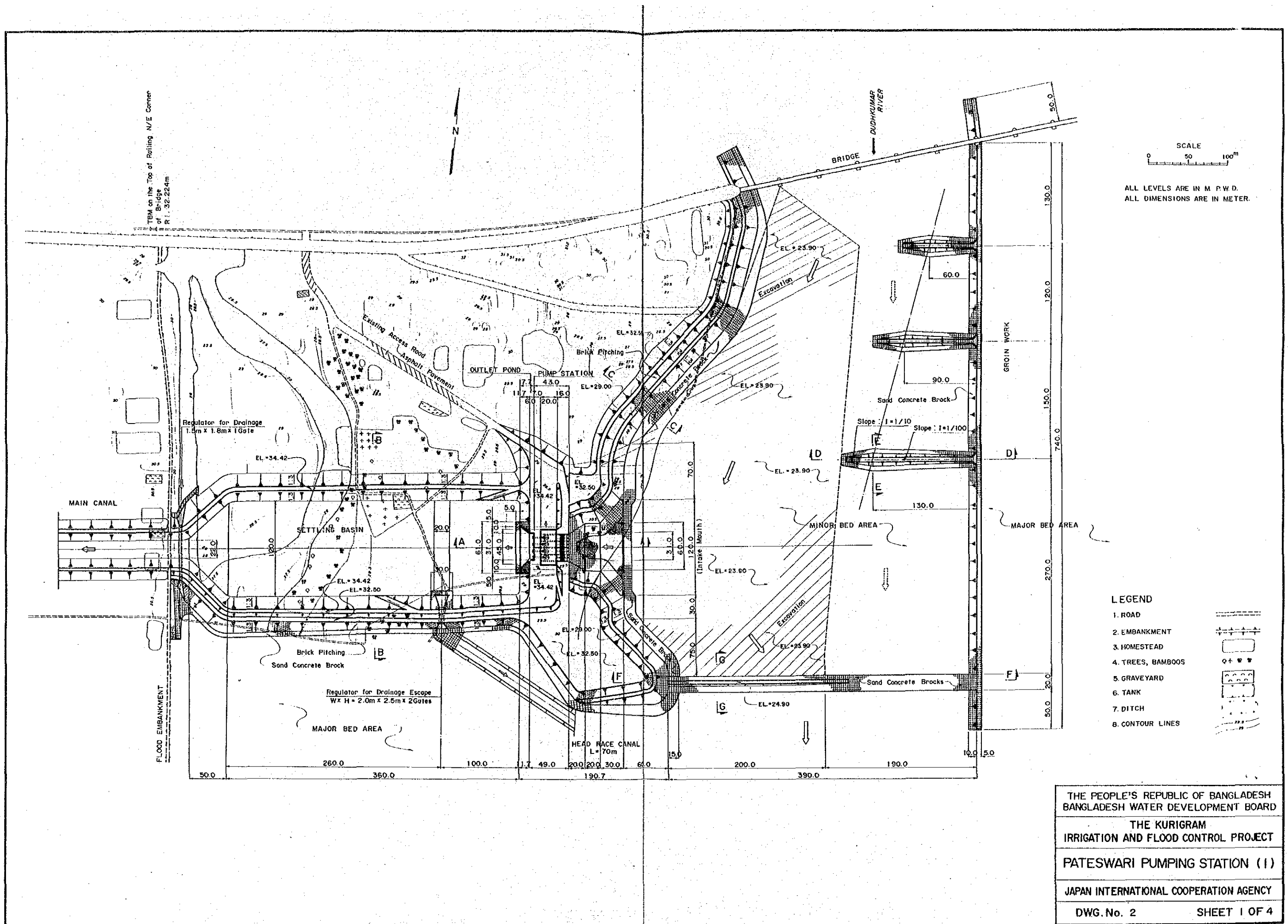
LEGEND

- INTERNATIONAL BOUNDARY
- PUMPING STATION
- MAIN IRRIGATION CANAL
- SECONDARY IRRIGATION CANAL
- TERTIARY
- DRAINAGE REGULATOR
- RIVER & WATER BODY
- FLOOD EMBANKMENT

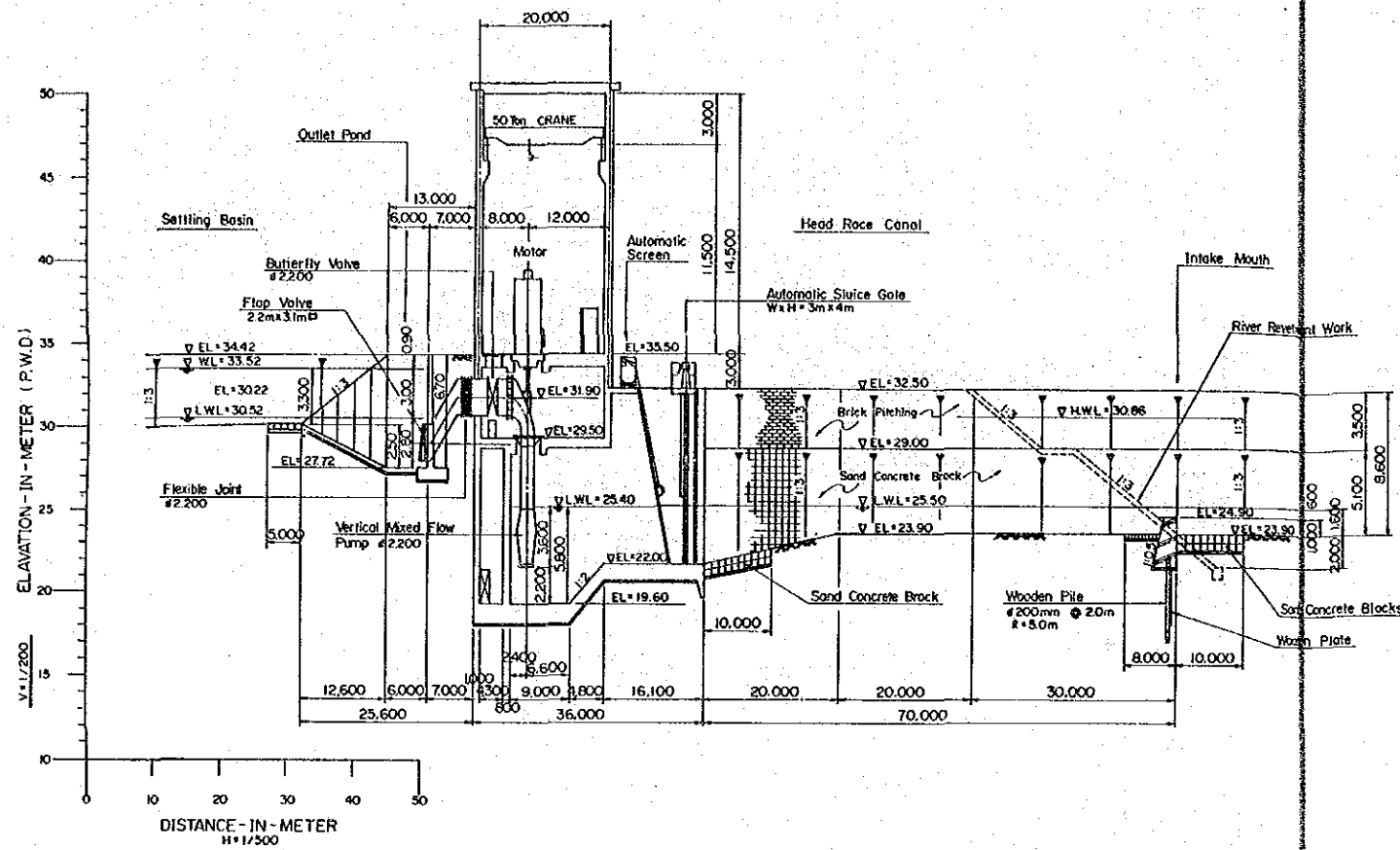
THE PEOPLE'S REPUBLIC OF BANGLADESH  
BANGLADESH WATER DEVELOPMENT BOARD  
THE KURIGRAM  
IRRIGATION AND FLOOD CONTROL PROJECT  
GENERAL PLAN  
JAPAN INTERNATIONAL COOPERATION AGENCY  
DWG. No. 1 SHEET OF



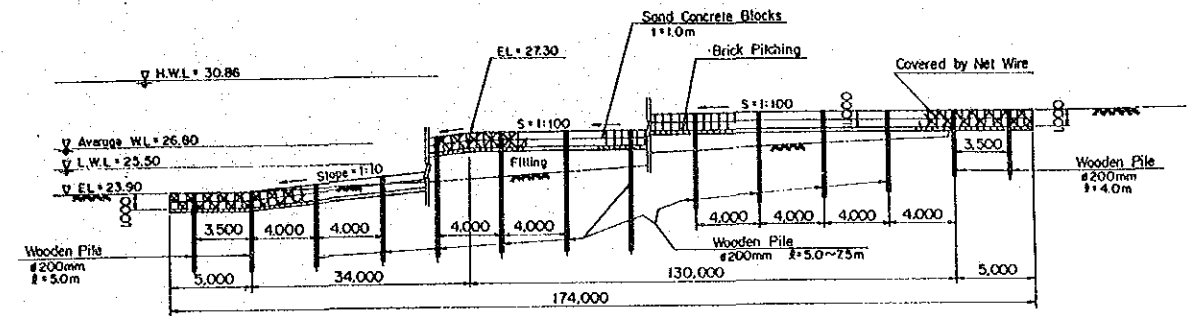
SCALE 1 : 50,000



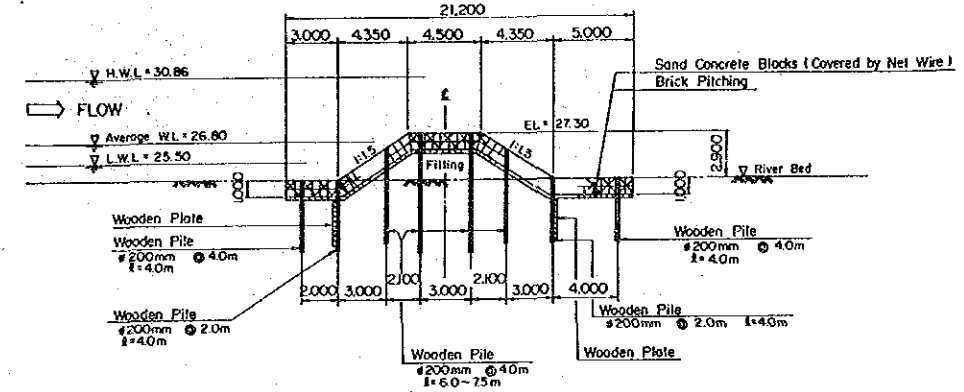
**CROSS SECTION (A-A)**



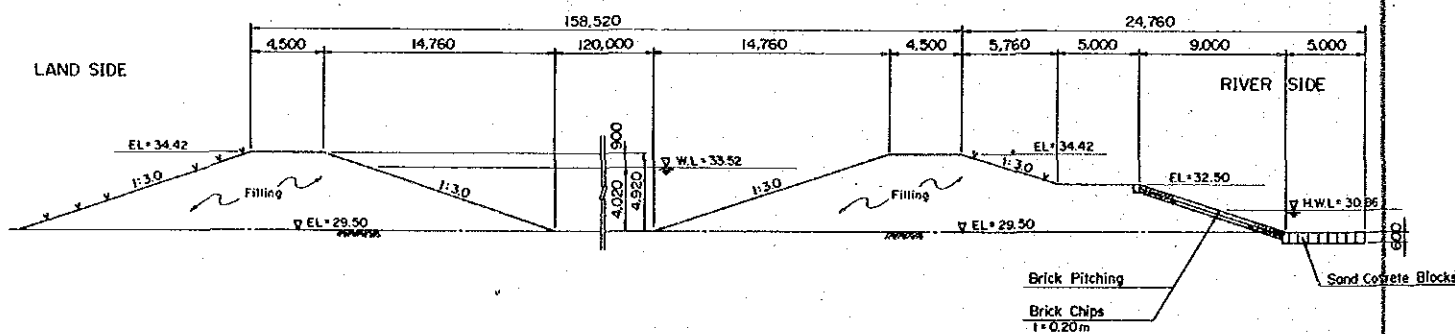
**D-D**



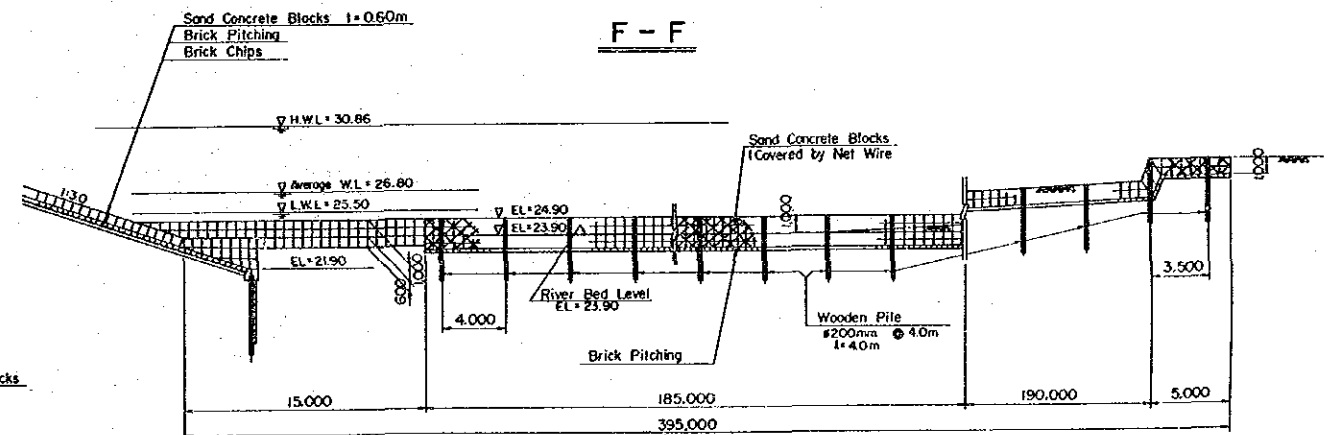
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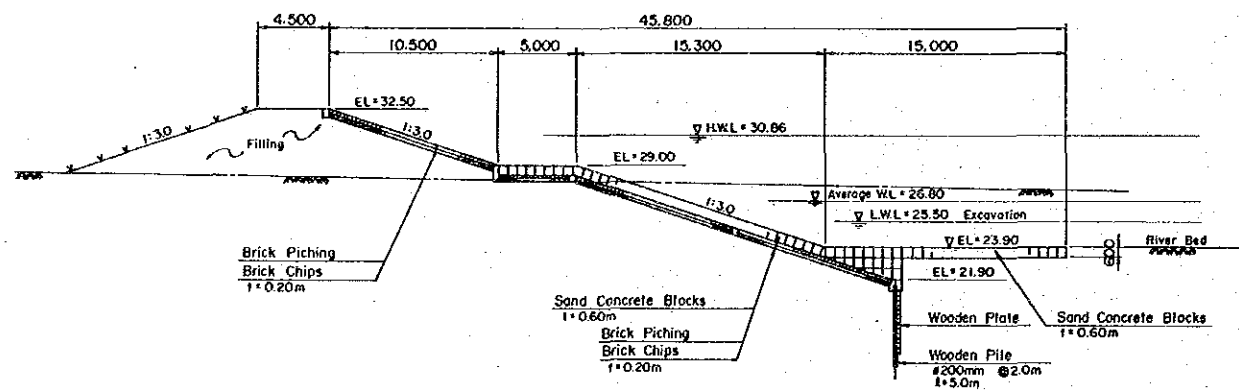
**B-B**



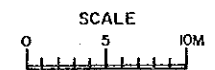
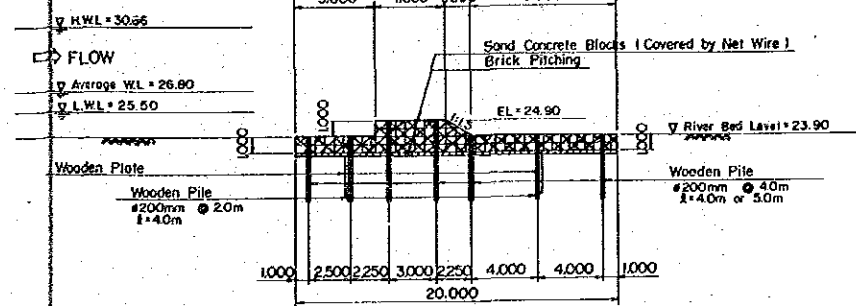
**F-F**



**C-C**



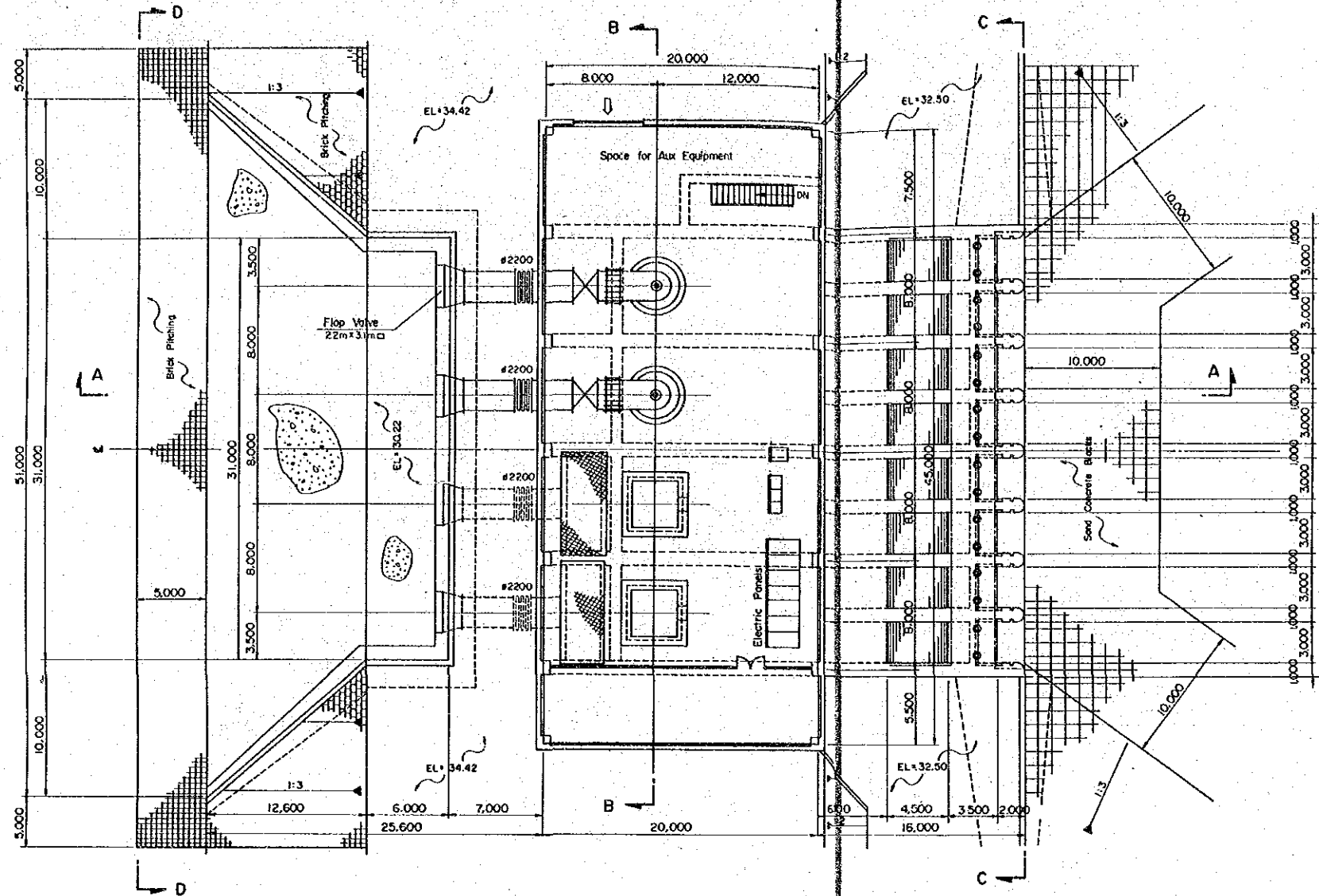
**G-G**



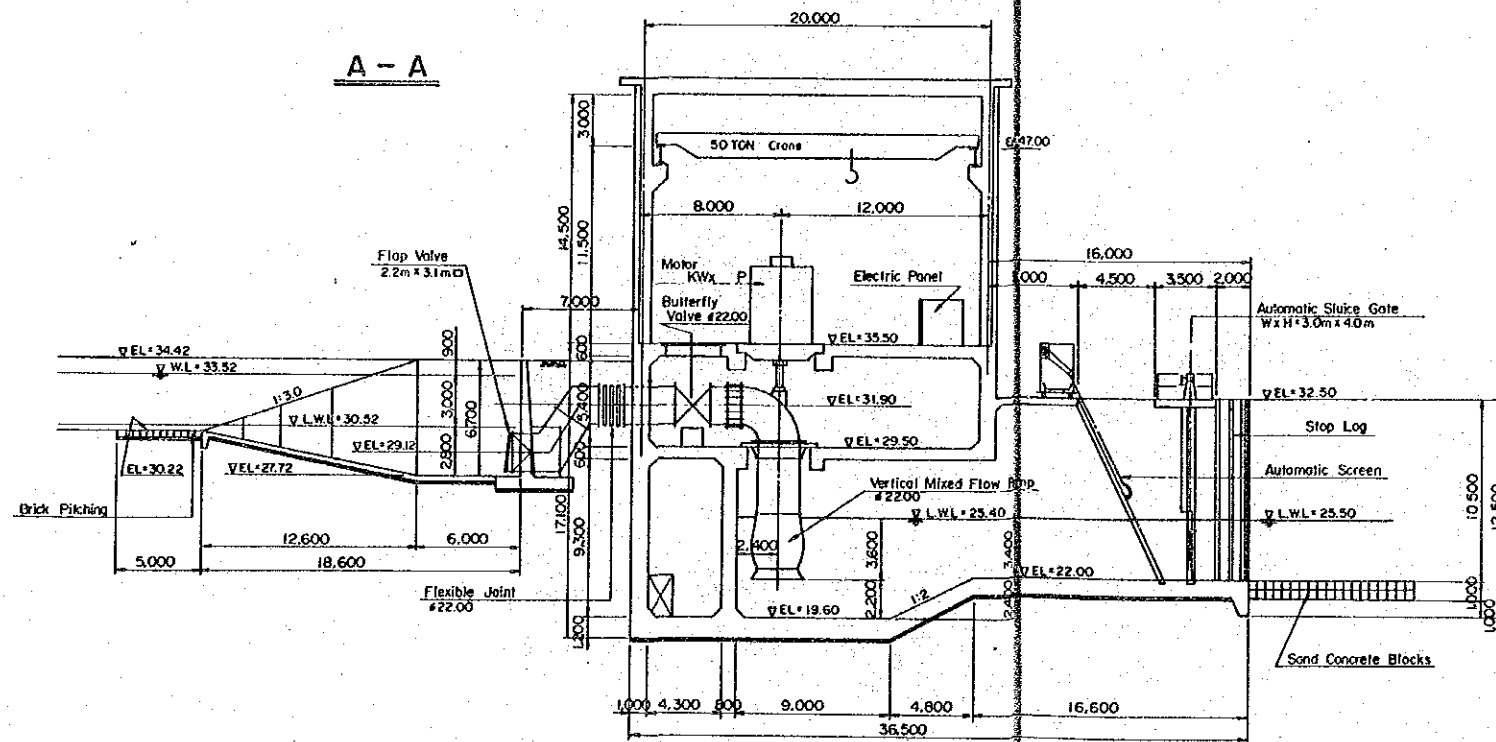
THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 PATESWARI PUMPING STATION (2)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 3 SHEET 2 OF 4



PLAN

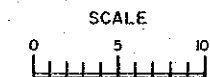


A - A



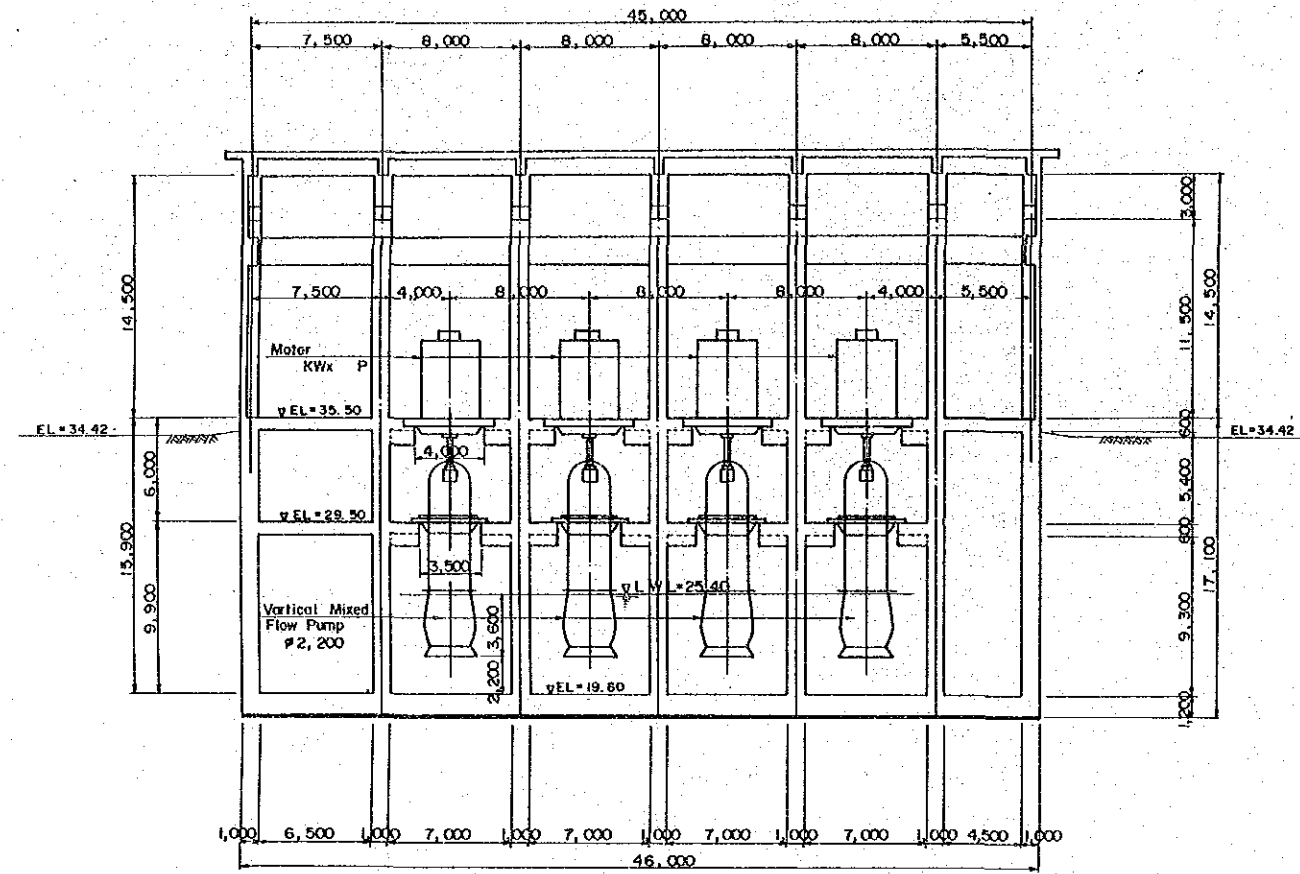
PUMP DIMENSION

TYPE	V. MIXED FLOW PUMP
BORE	# 2 200mm
CAPACITY	10.70m <sup>3</sup> /s + 642m <sup>3</sup> /min
TOTAL HEAD	8.6m
PUMP SPEED	225 rpm
MOTOR POWER	1 220 KW/one unit
UNIT	4
TOTAL MOTOR POWER	4 880 KW

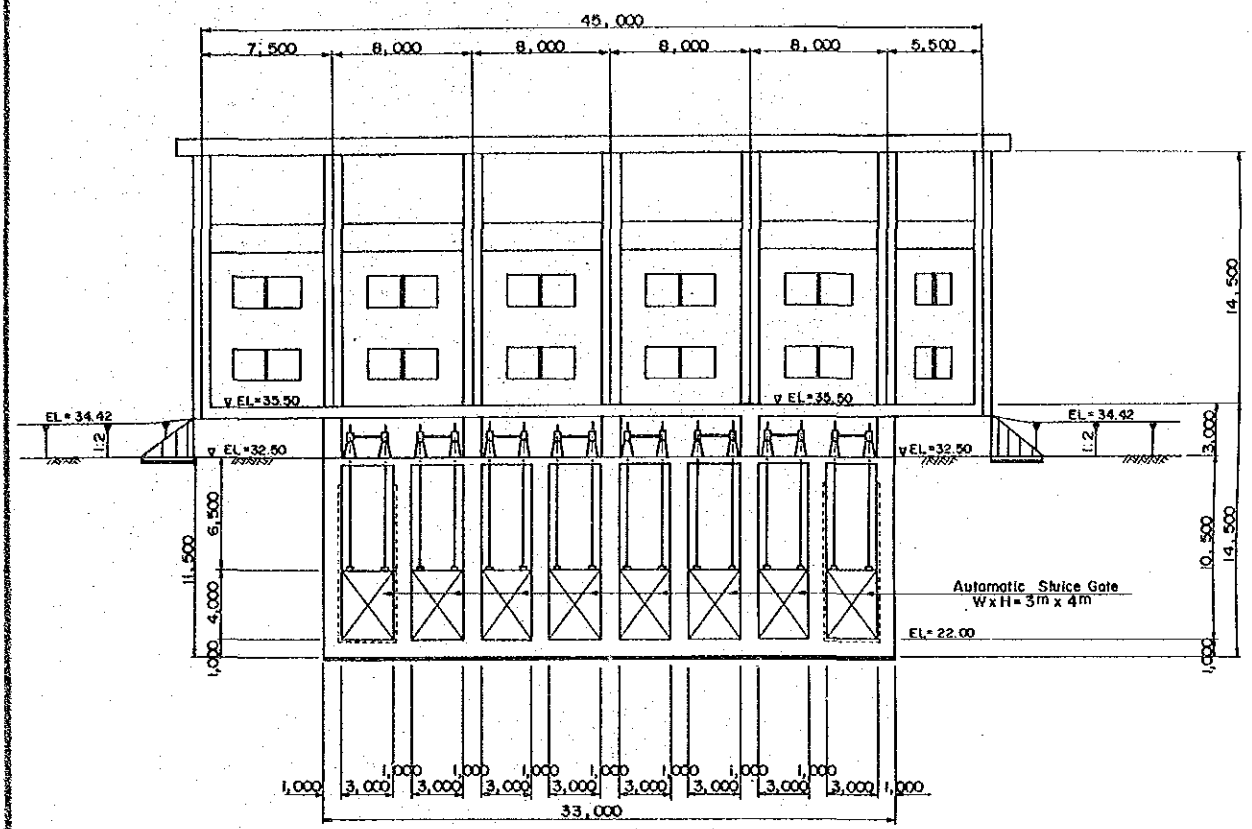


THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
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 PATESWARI PUMPING STATION (3)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 4 SHEET 3 OF 4

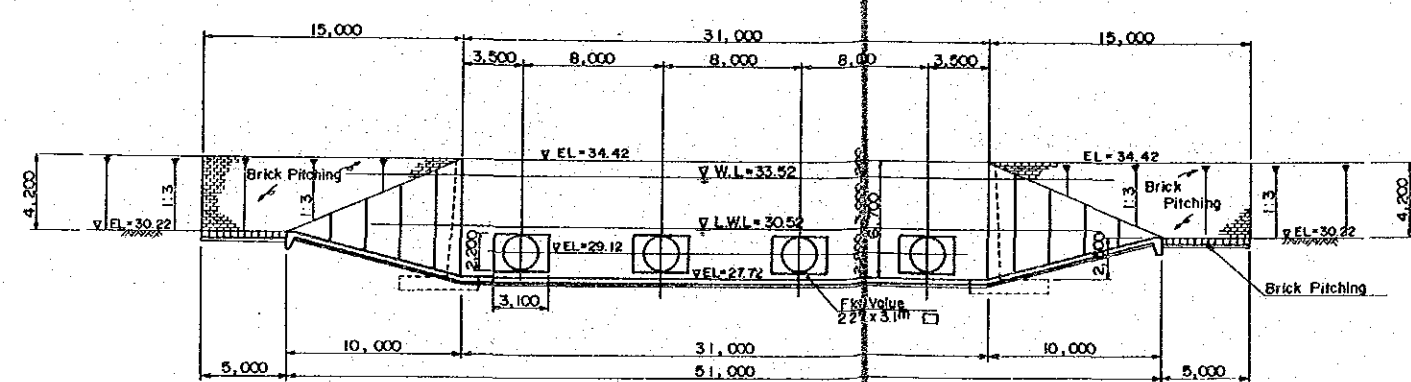
B - B



C - C

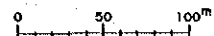


D - D

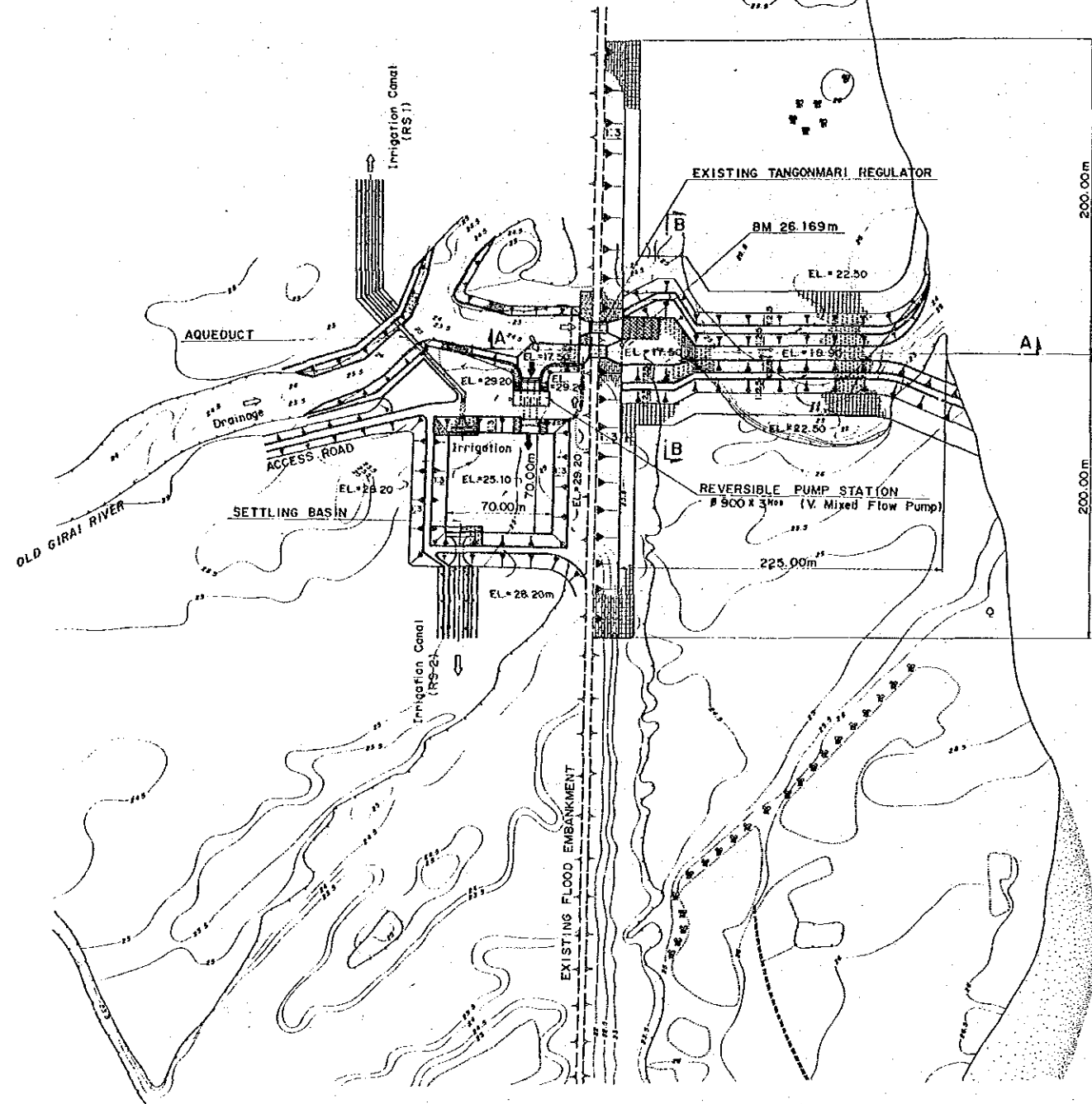


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 BANGLADESH WATER DEVELOPMENT BOARD  
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 PATESWARI PUMPING STATION (4)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 5 SHEET 4 OF 4

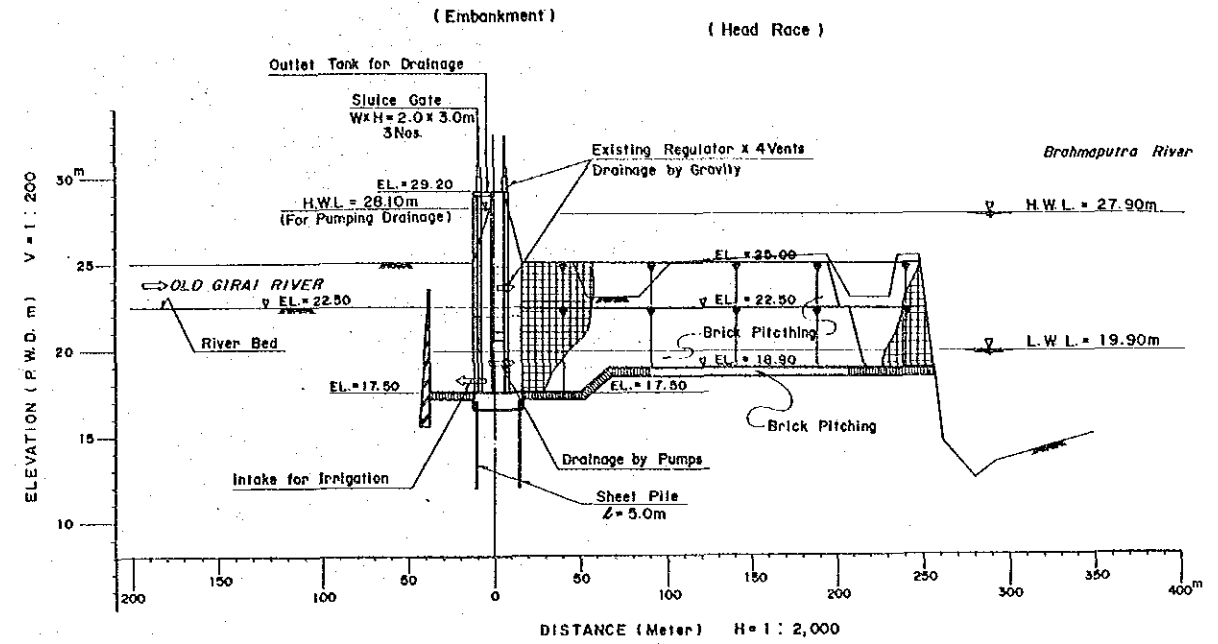
**PLAN**



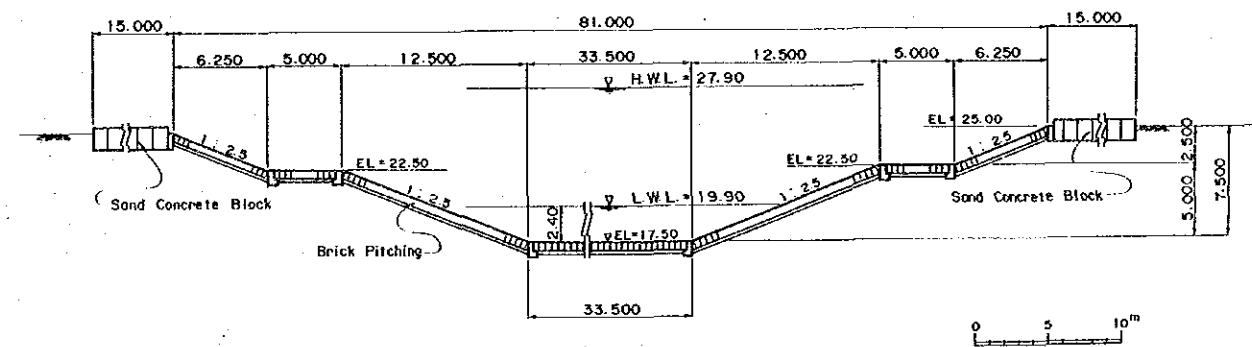
ALL LEVELS ARE IN M.P.W.D.



**A - A**



**B - B**

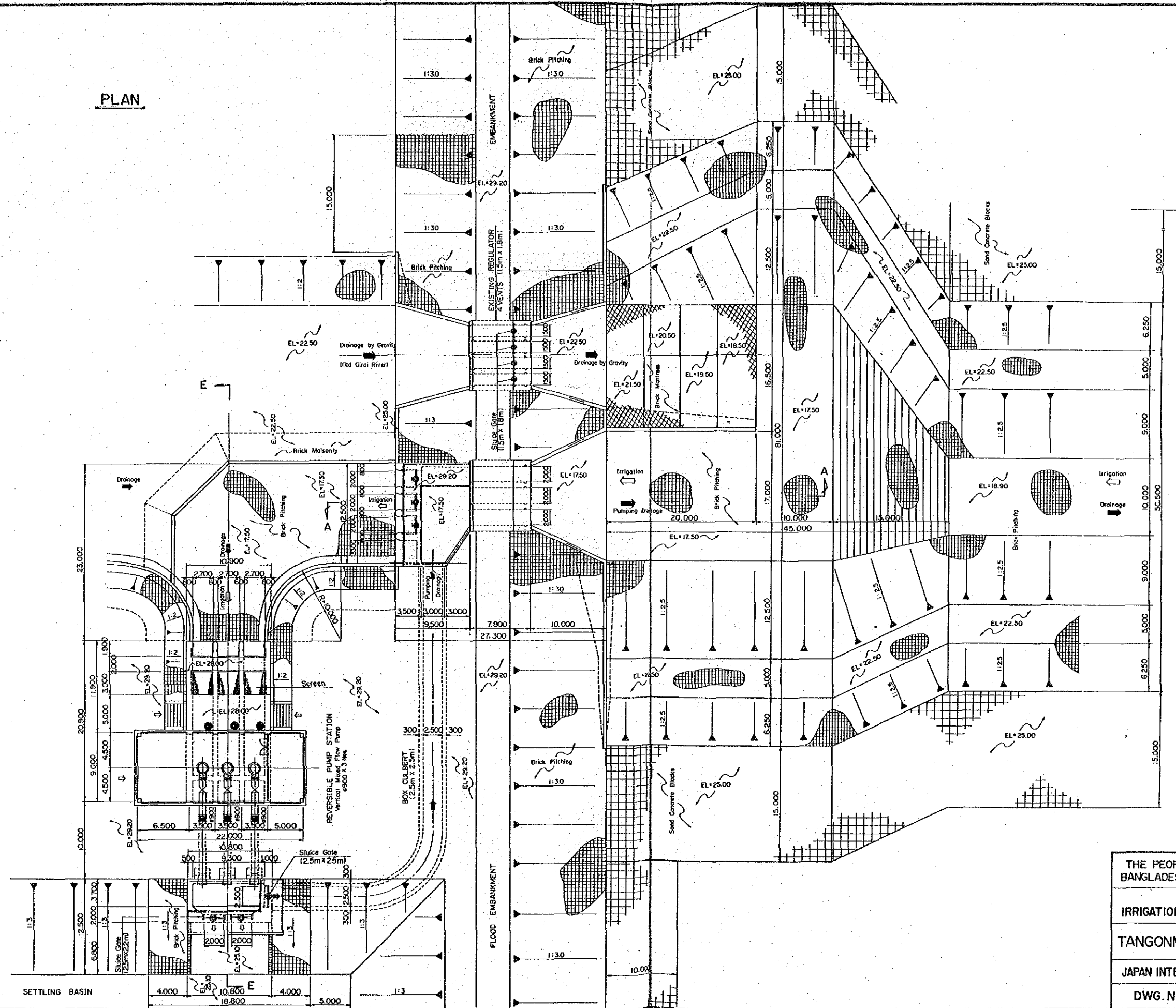


**LEGEND**

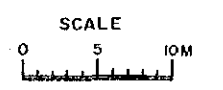
- EXISTING FLOOD EMBANKMENT
- UNMETALLED ROAD
- KHAL
- HOMESTEAD AREA
- BAMBOO CLUSTER/TREE
- POND
- CONTOUR

THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 TANGONMARI PUMPING STATION (I)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 6 SHEET 1 OF 4

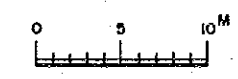
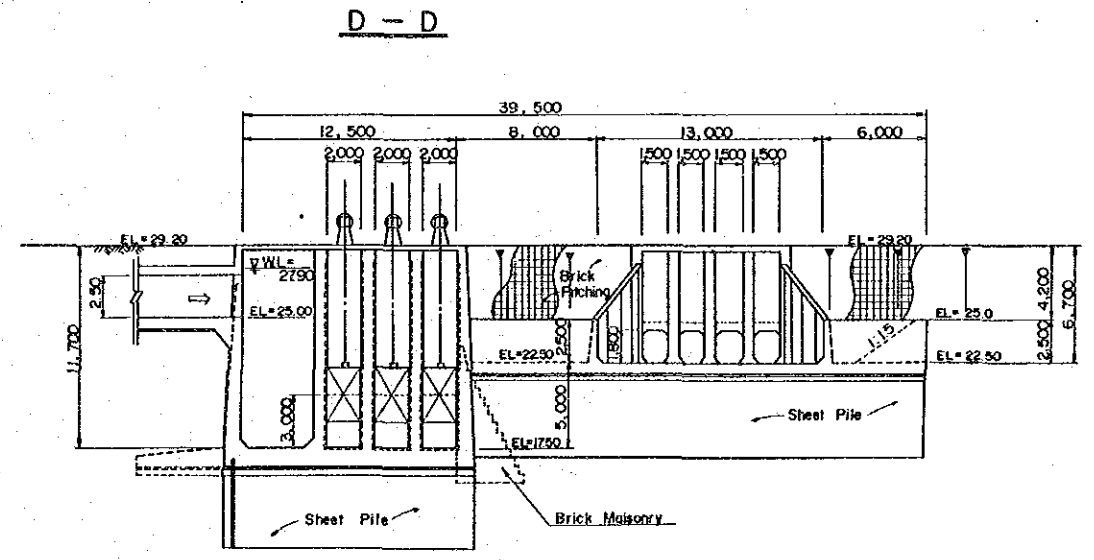
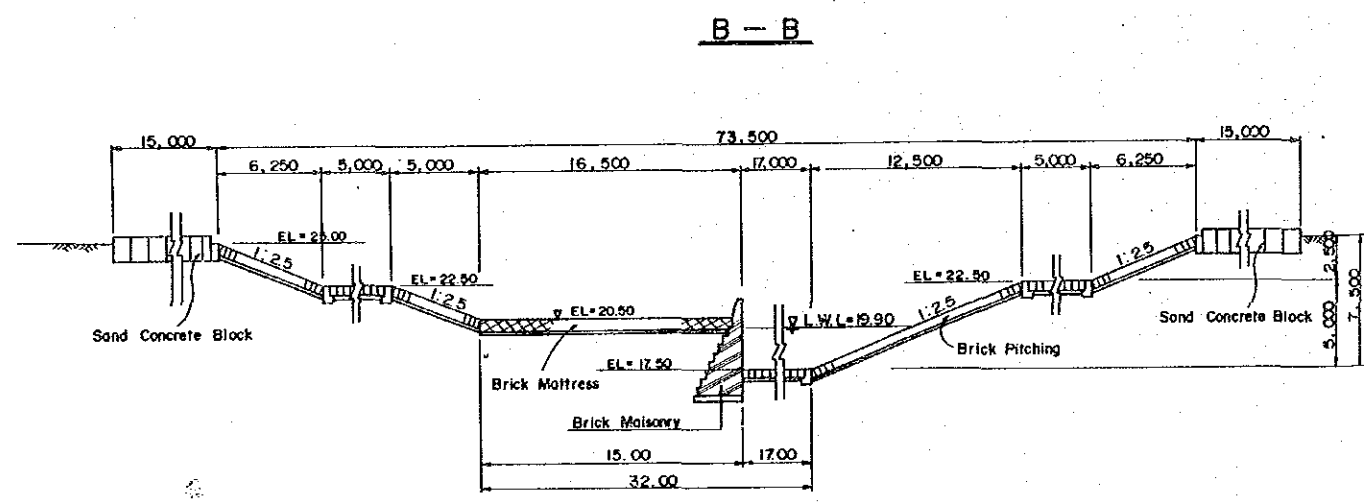
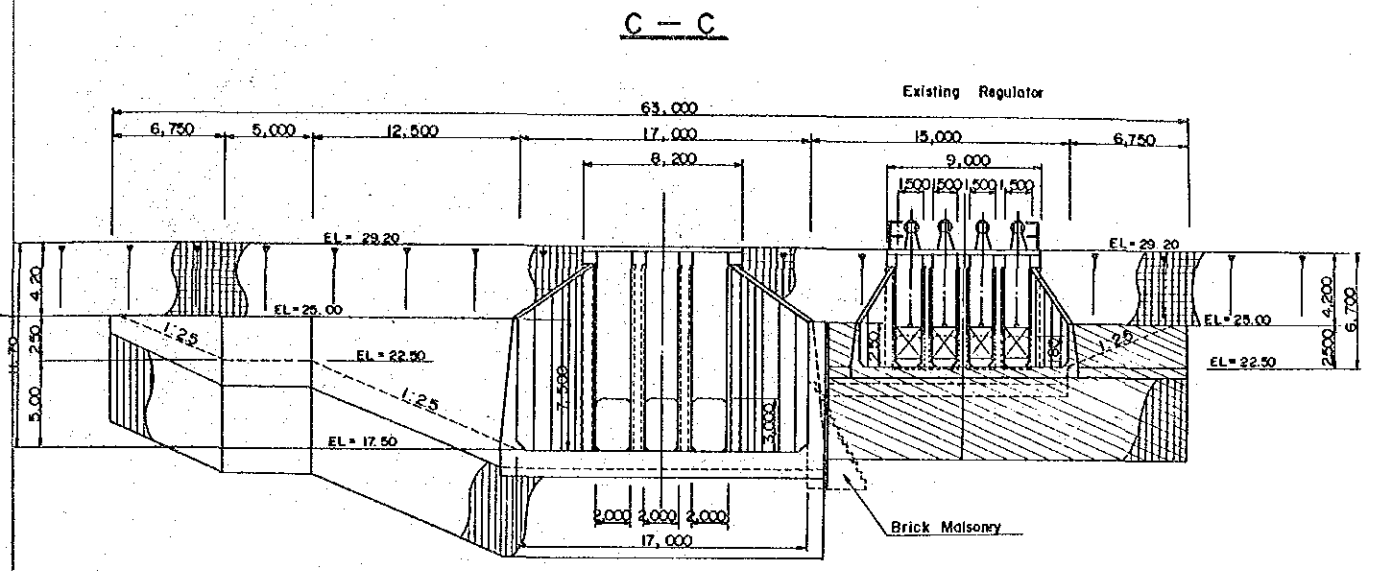
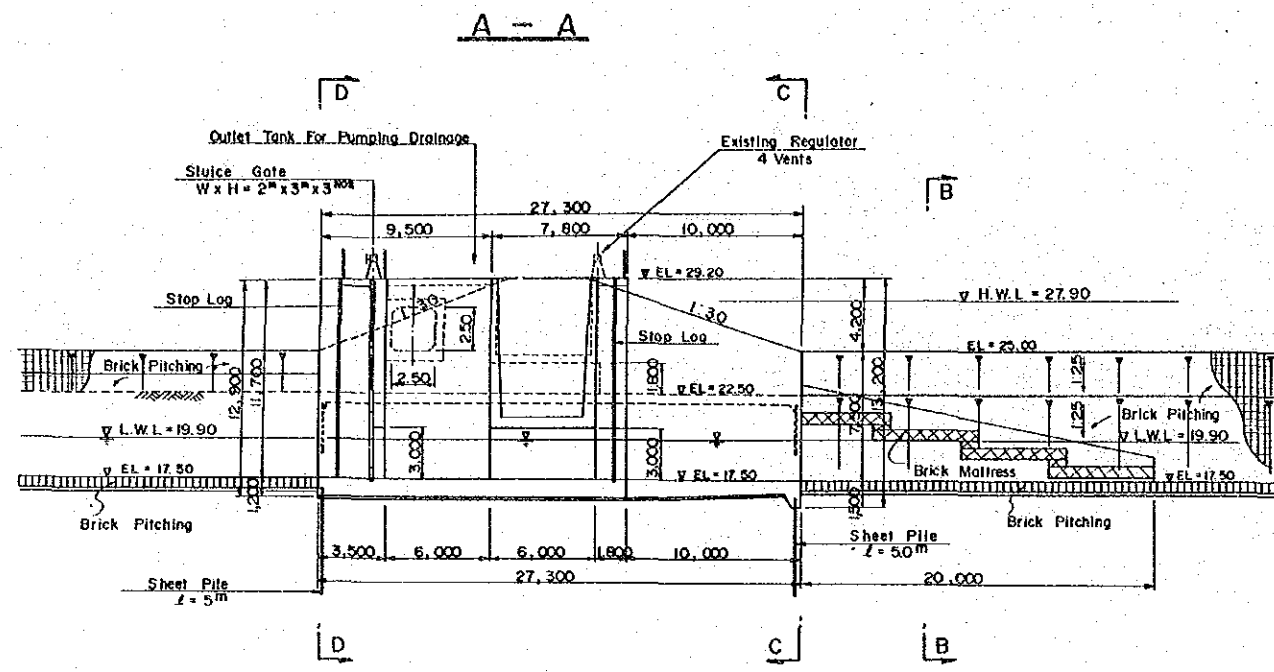
**PLAN**



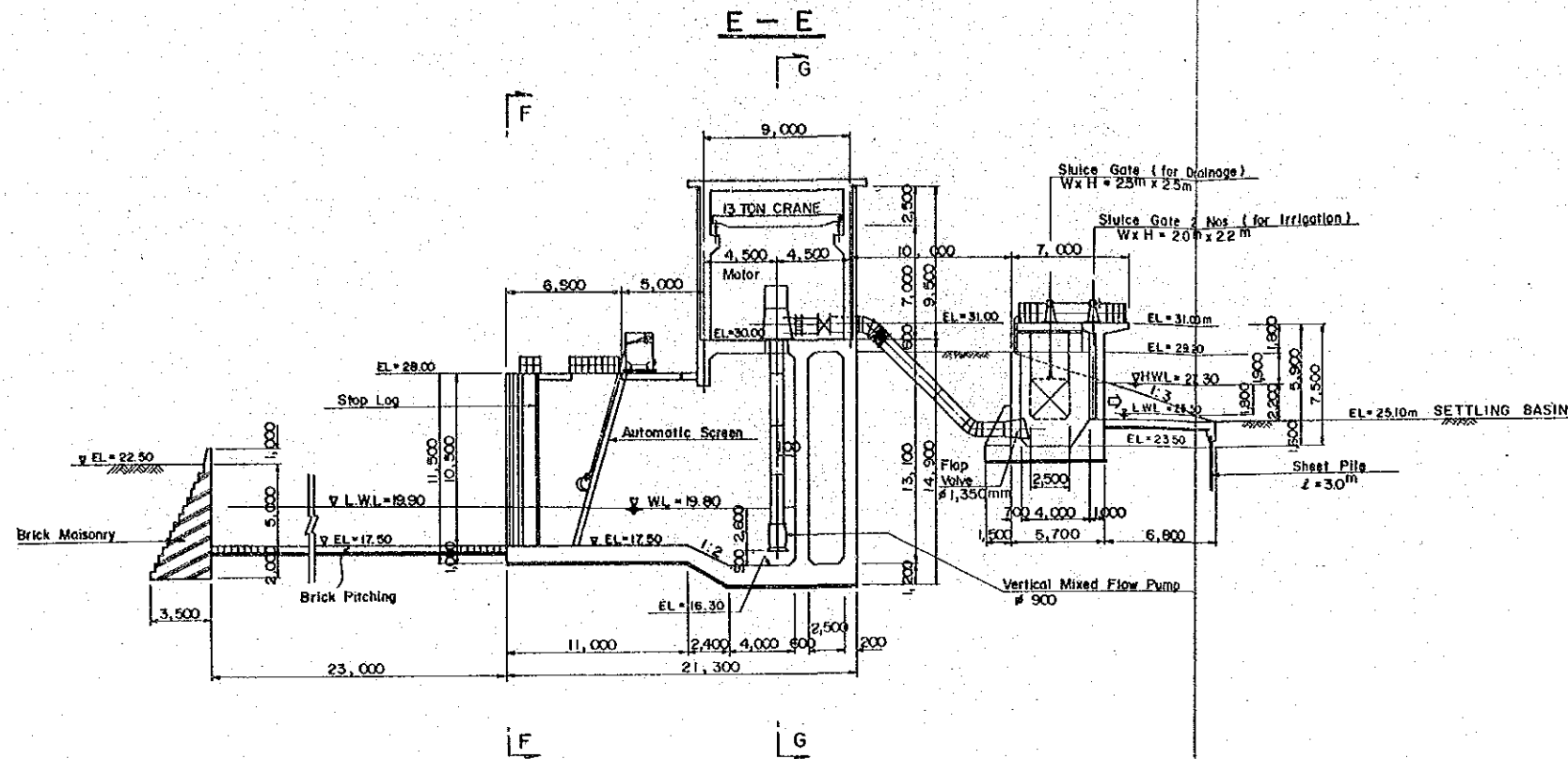
← BRAHMAPUTRA RIVER



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 TANGONMARI PUMPING STATION (2)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 7 SHEET 2 OF 4



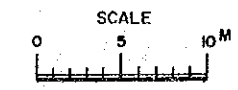
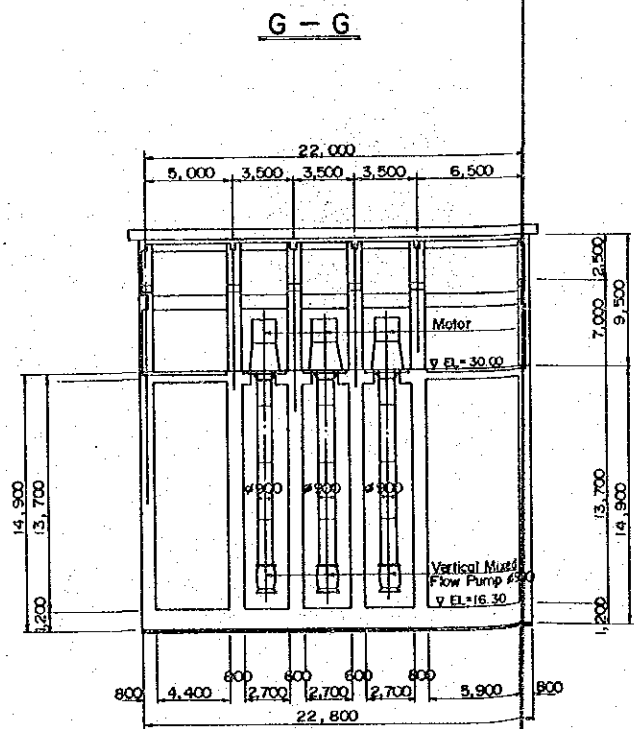
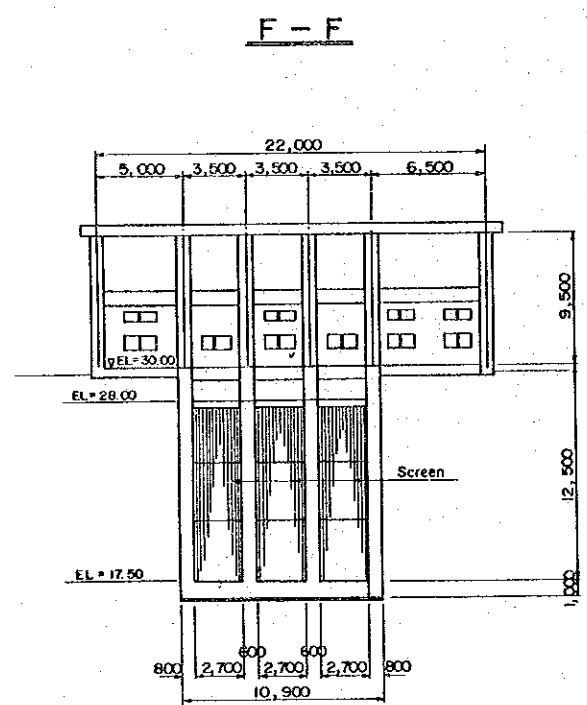
THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 TANGONMARI PUMPING STATION (3)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 8 SHEET 3 OF 4



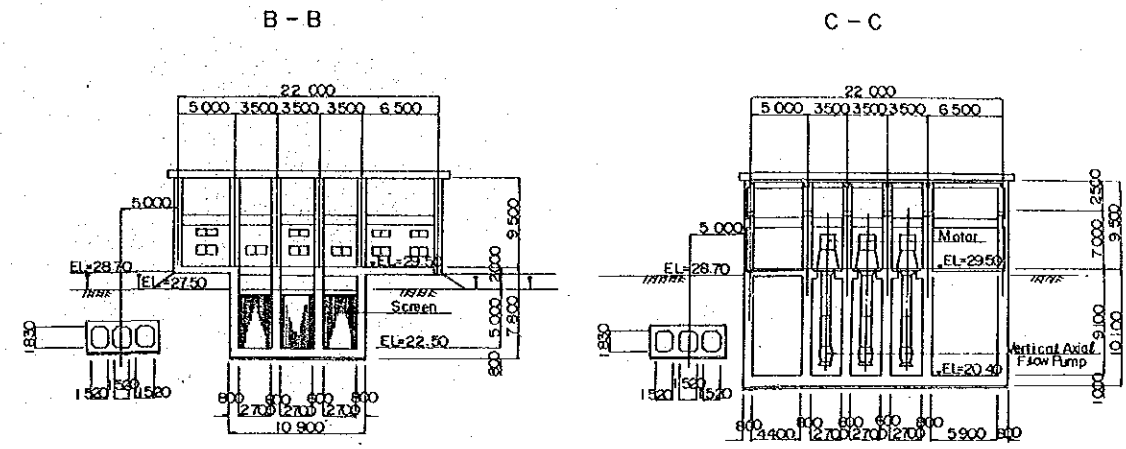
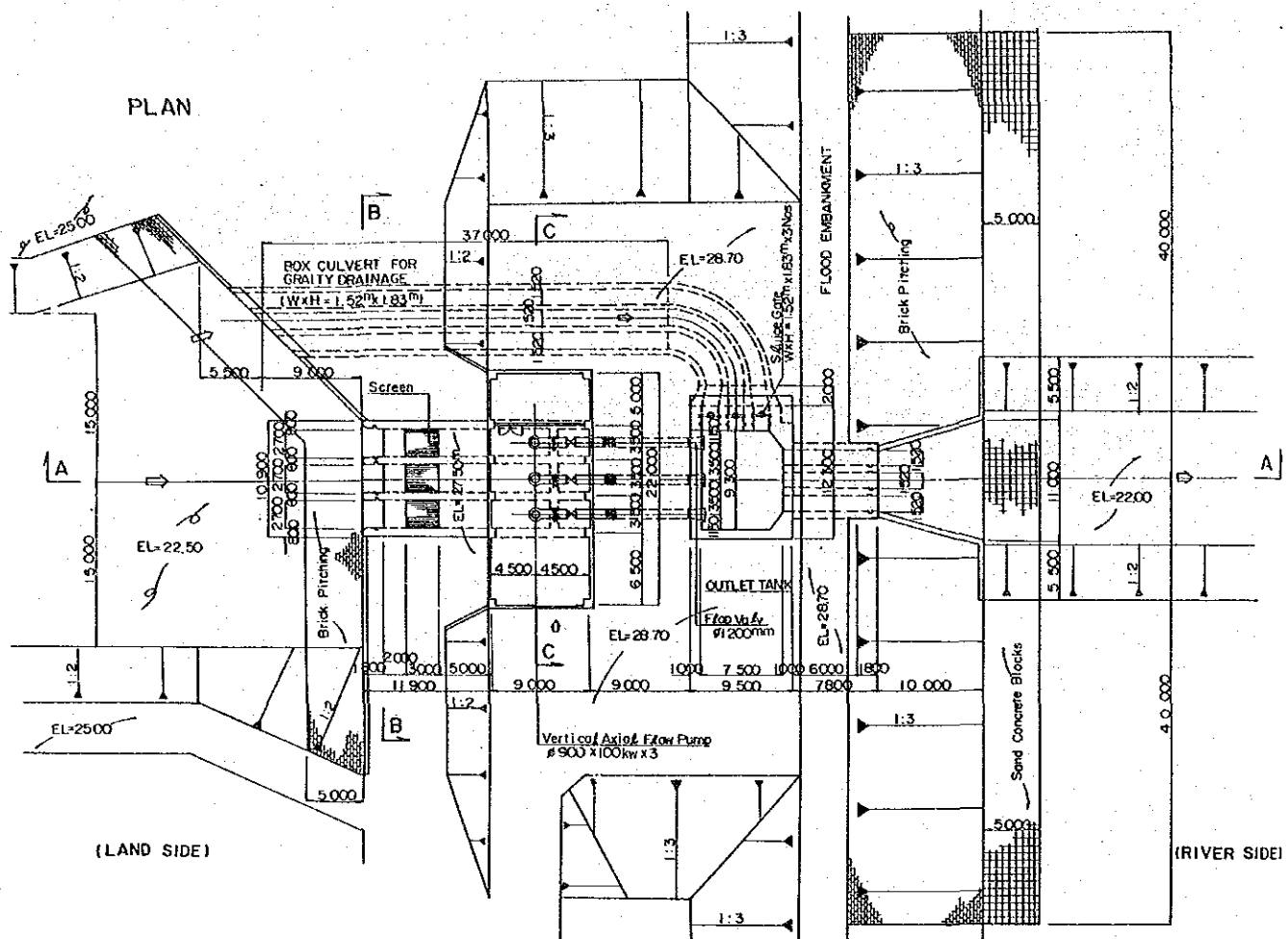
REVERSIBLE PUMP STATION

PUMP DIMENSION

TYPE	V. MIXED FLOW PUMP
BORE	ø 900
CAPACITY	Irrigation: 1.63m <sup>3</sup> /sec = 98m <sup>3</sup> /min one unit Drainage: 2.43m <sup>3</sup> /sec = 146m <sup>3</sup> /min one unit
TOTAL HEAD	Irrigation: 8.0m Drainage: 4.2m
PUMP SPEED	490 rpm
MOTOR POWER	Irrigation: 200KW/one unit Drainage: 300KW/one unit
UNIT	3
TOTAL POWER	600KW

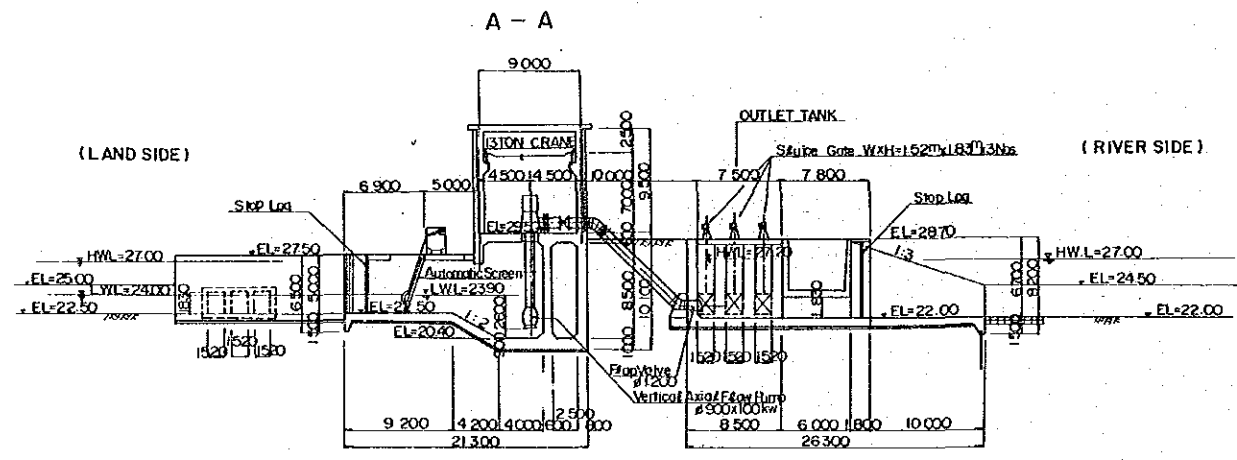
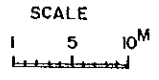


THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
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 TANGONMARI PUMPING STATION (4)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 9 SHEET 4 OF 4

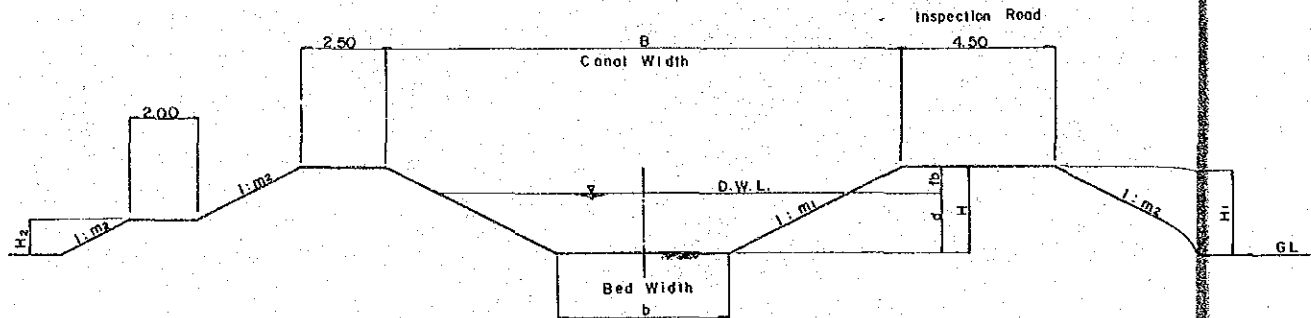


PUMP DIMENSIONS

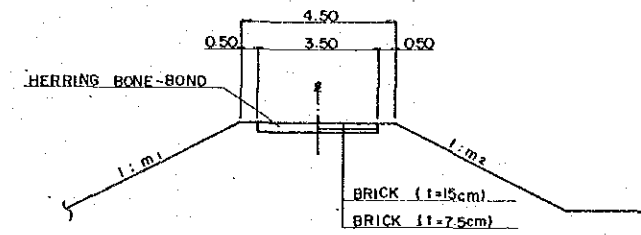
TYPE	V. AXIAL FLOW PUMP
DISCHARGE	5.00m <sup>3</sup> /sec = 300m <sup>3</sup> /min
BORE	ø900 mm
CAPACITY	167m <sup>3</sup> /sec = 100m <sup>3</sup> /min/unit
TOTAL HEAD	4.00m
MOTOR POWER	100kw/unit
UNIT	3
TOTAL POWER	300kw



THE PEOPLE'S REPUBLIC OF BANGLADESH  
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 BEGOMGANJ PUMPING STATION  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 10 SHEET OF



TYPICAL CROSS SECTION OF  
MAIN IRRIGATION CANAL



DETAIL OF INSPECTION ROAD

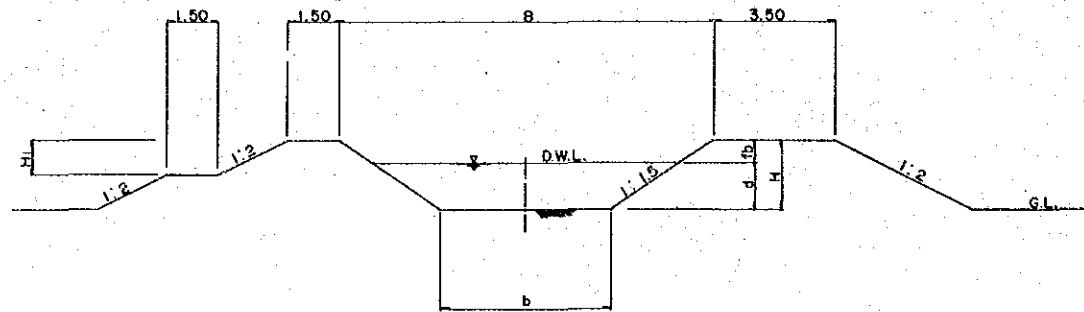
DIMENSION TABLE Unit:m

TYPE	Q (m <sup>3</sup> /s)	b	B	d	lb	H	H <sub>1</sub>	H <sub>2</sub>	m <sub>1</sub>	m <sub>2</sub>	Total Length
M - I	42.78 ~ 40.08	22.0	39.25 ~ 39.00	2.56 ~ 2.52	0.89 ~ 0.88	3.45 ~ 3.40	2.90 ~ 6.40	0.00 ~ 3.00	2.5	3.5	4,400
M - II	23.04 ~ 18.82	15.0	26.60 ~ 25.40	2.06 ~ 1.84	0.84 ~ 0.76	2.90 ~ 2.60	2.30 ~ 3.00	0.00 ~ 1.00	2.0	2.0	5,200
M - III	17.04 ~ 13.67	14.0	25.00 ~ 24.00	1.95 ~ 1.73	0.80 ~ 0.77	2.75 ~ 2.50	1.80 ~ 3.00	*	*	*	12,200
M - IV	16.27	*	24.00	1.75	0.75	2.50	2.00 ~ 2.30	0.00 ~ 0.50	*	*	1,400
M - V	14.31	13.0	20.05	1.61	0.74	2.35	2.30 ~ 2.90	0.50 ~ 1.00	1.5	*	4,200
M - VI	11.35	12.0	19.35	1.72	0.73	2.45	1.50 ~ 2.40	0.00 ~ 0.50	*	*	6,200
M - VII	9.12	9.0	15.60	1.51	0.69	2.20	2.20 ~ 3.00	0.50 ~ 1.00	*	*	4,800
M - VIII	6.79	7.0	13.45	1.46	*	2.15	1.70 ~ 2.20	0.00 ~ 0.50	*	*	500
M - IX	5.30	5.5	11.80	1.43	0.67	2.10	1.70 ~ 2.20	*	*	*	4,500
M - X	4.50	4.5	10.35	1.31	0.64	1.95	1.80 ~ 2.30	*	*	*	4,000

Note :

1. Slope M - I, II, VI 1/12,000  
M - II, IV 1/9,000  
M - V, VII, VIII, IX 1/7,000  
M - X 1/5,000

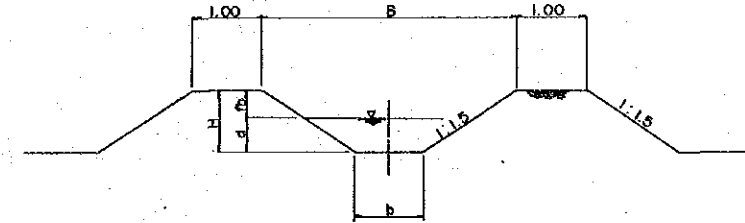




TYPICAL CROSS SECTION OF  
SECONDARY & SUB-SECONDARY CANAL

DIMENSION TABLE Unit : m

TYPE	Q(m <sup>3</sup> /s)	b	B	d	fb	H	H <sub>1</sub>	Slope
S - 1	4.50	4.5	10.80	1.43	0.67	2.10	1.50	1/7,000
S - 2	4.00	4.0	9.70	1.29	0.61	1.90	1.00	1/5,000
S - 3	3.50	*	9.40	1.20	0.60	1.80	*	*
S - 4	3.00	3.5	8.75	1.17	0.58	1.75	*	*
S - 5	2.50	3.0	8.10	1.14	0.56	1.70	*	*
S - 6	2.00	*	7.65	1.01	0.54	1.55	*	*
S - 7	1.50	2.5	6.85	0.94	0.51	1.45	*	*
S - 8	1.00	*	6.10	0.75	0.45	1.20	0.50	*
S - 9	3.00	3.0	7.95	1.09	0.56	1.65	1.00	1/3,000
S - 10	2.50	2.5	7.30	1.07	0.53	1.60	*	*
S - 11	2.00	*	7.00	0.95	0.55	1.50	*	*
S - 12	1.50	2.0	6.20	0.89	0.51	1.40	*	*
S - 13	1.00	*	5.60	0.72	0.48	1.20	0.50	*
S - 14	0.75	1.5	4.95	0.70	0.45	1.15	*	*
S - 15	0.50	1.0	4.30	0.65	0.45	1.10	*	*



TYPICAL CROSS SECTION OF  
TERTIARY CANAL

DIMENSION TABLE Unit : m

TYPE	Q(m <sup>3</sup> /s)	b	B	d	fb	H	Slope
T - 1	0.40~0.50	1.00	3.55 ~ 3.70	0.44 ~ 0.50	0.40 ~ 0.41	0.85 ~ 0.90	1/1,000
T - 2	0.20~0.30	0.50	2.75 ~ 3.20	0.39 ~ 0.48	0.36 ~ 0.42	0.75 ~ 0.90	*
T - 3	0.10	0.30	2.40	0.32	0.38	0.70	*

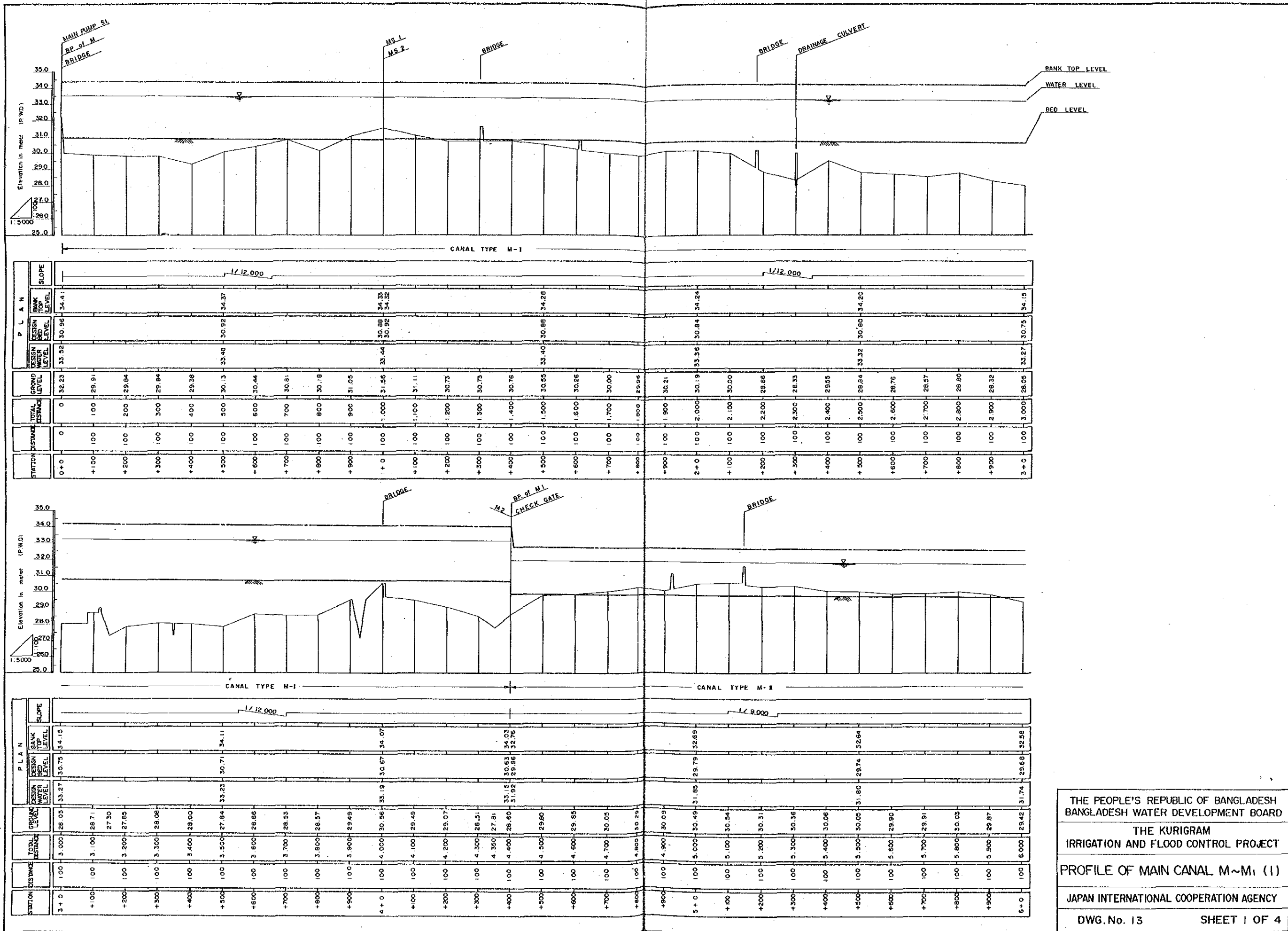
THE PEOPLE'S REPUBLIC OF BANGLADESH  
BANGLADESH WATER DEVELOPMENT BOARD

THE KURIGRAM  
IRRIGATION AND FLOOD CONTROL PROJECT

TYPICAL CROSS SECTIONS OF  
SECONDARY & TERTIARY CANAL

JAPAN INTERNATIONAL COOPERATION AGENCY

DWG.No. 12 SHEET OF



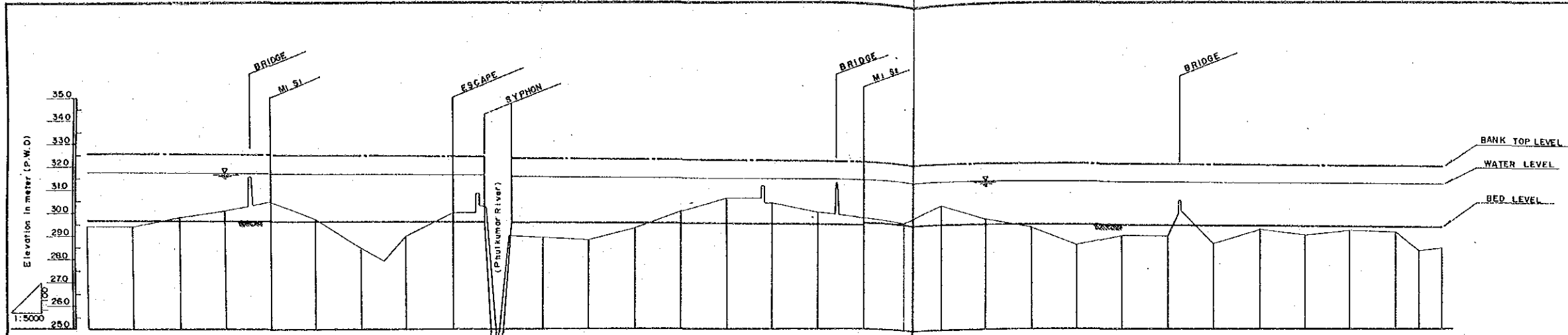
THE PEOPLE'S REPUBLIC OF BANGLADESH  
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THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT

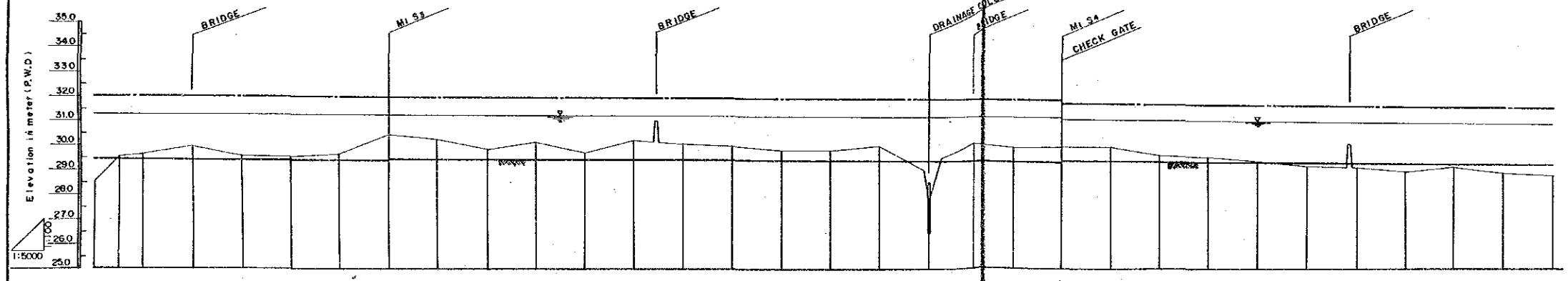
PROFILE OF MAIN CANAL M~M<sub>1</sub> (1)

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DWG.No. 13 SHEET 1 OF 4

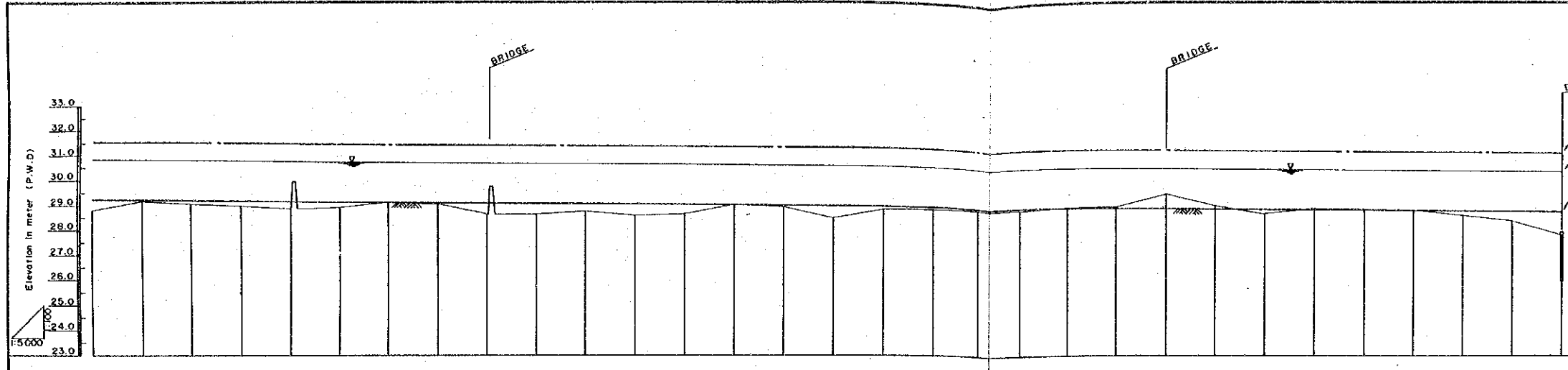


STATION	DISTANCE	TOTAL DISTANCE	GROUND LEVEL	PLAN			SLOPE
				DESIGN WATER LEVEL	DESIGN BED LEVEL	BANK TOP LEVEL	
6+0	100	6,000	29.42	31.74	29.68	32.98	1/9,000
+100	100	6,100	29.42				
+200	100	6,200	29.84				
+300	100	6,300	30.12				
+400	100	6,400	30.49	31.70	29.64	32.54	
+500	100	6,500	29.74		29.76	32.51	
+600	100	6,600	28.47				
+700	100	6,700	28.95				
+800	100	6,800	30.02				
+870	70	6,870	30.25	31.64	29.70	32.45	
+900	30	6,900	24.12				
+930	30	6,930	29.00	31.54	29.60	32.35	
7+0	70	7,000	28.92				
+100	100	7,100	28.81				
+200	100	7,200	29.35				
+300	100	7,300	30.10				
+400	100	7,400	30.66				
+500	100	7,500	30.45				
+600	100	7,600	30.06				
+700	100	7,700	29.81	31.45	29.51	32.26	
+800	100	7,800	29.66			32.21	
+900	100	7,900	30.41				
8+0	100	8,000	29.80	31.42	29.49	32.18	1/9,000
+100	100	8,100	29.43				
+200	100	8,200	28.66				
+300	100	8,300	29.08				
+400	100	8,400	29.04				
+500	100	8,500	28.70	31.36	29.32	32.12	
+600	100	8,600	29.31				
+700	100	8,700	29.09				
+800	100	8,800	29.31				
+900	100	8,900	29.22				
9+0	100	9,000	28.52	31.31	29.47	32.07	

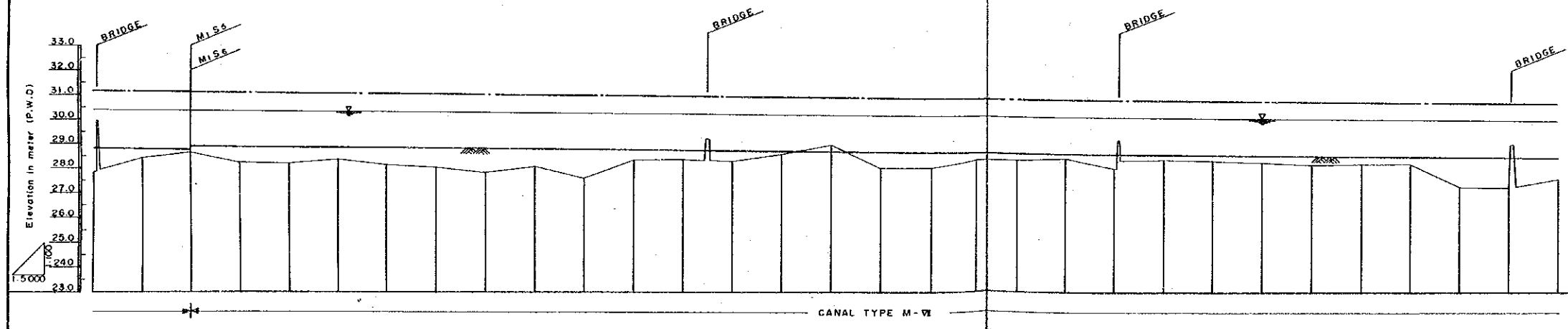


STATION	DISTANCE	TOTAL DISTANCE	GROUND LEVEL	PLAN			SLOPE
				DESIGN WATER LEVEL	DESIGN BED LEVEL	BANK TOP LEVEL	
9+0	100	9,000	28.52	31.31	29.47	32.07	1/9,000
+100	100	9,100	29.55				
+200	100	9,200	29.62				
+300	100	9,300	29.96				
+400	100	9,400	29.61				
+500	100	9,500	29.67				
+600	100	9,600	30.46	31.24	29.40	32.00	
+700	100	9,700	30.26		29.68	31.98	
+800	100	9,800	29.86				
+900	100	9,900	30.14				
10+0	100	10,000	28.71	31.20	29.45	31.95	1/7,000
+100	100	10,100	30.20				
+200	100	10,200	30.07				
+300	100	10,300	29.99				
+400	100	10,400	29.62				
+500	100	10,500	29.85	31.14	29.39	31.89	
+600	100	10,600	30.00				
+700	100	10,700	27.73				
+800	100	10,800	30.04				
+900	100	10,900	29.93				
11+0	100	11,000	29.96	31.08	29.35	31.83	
+100	100	11,100	29.97	30.98	29.37	31.72	
+200	100	11,200	29.63				
+300	100	11,300	29.54				
+400	100	11,400	29.38				
+500	100	11,500	29.20	30.91	29.30	31.65	
+600	100	11,600	28.15				
+700	100	11,700	28.94				
+800	100	11,800	29.17				
+900	100	11,900	28.92				
12+0	100	12,000	28.92	30.84	29.23	31.58	

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 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 14 SHEET 2 OF 4

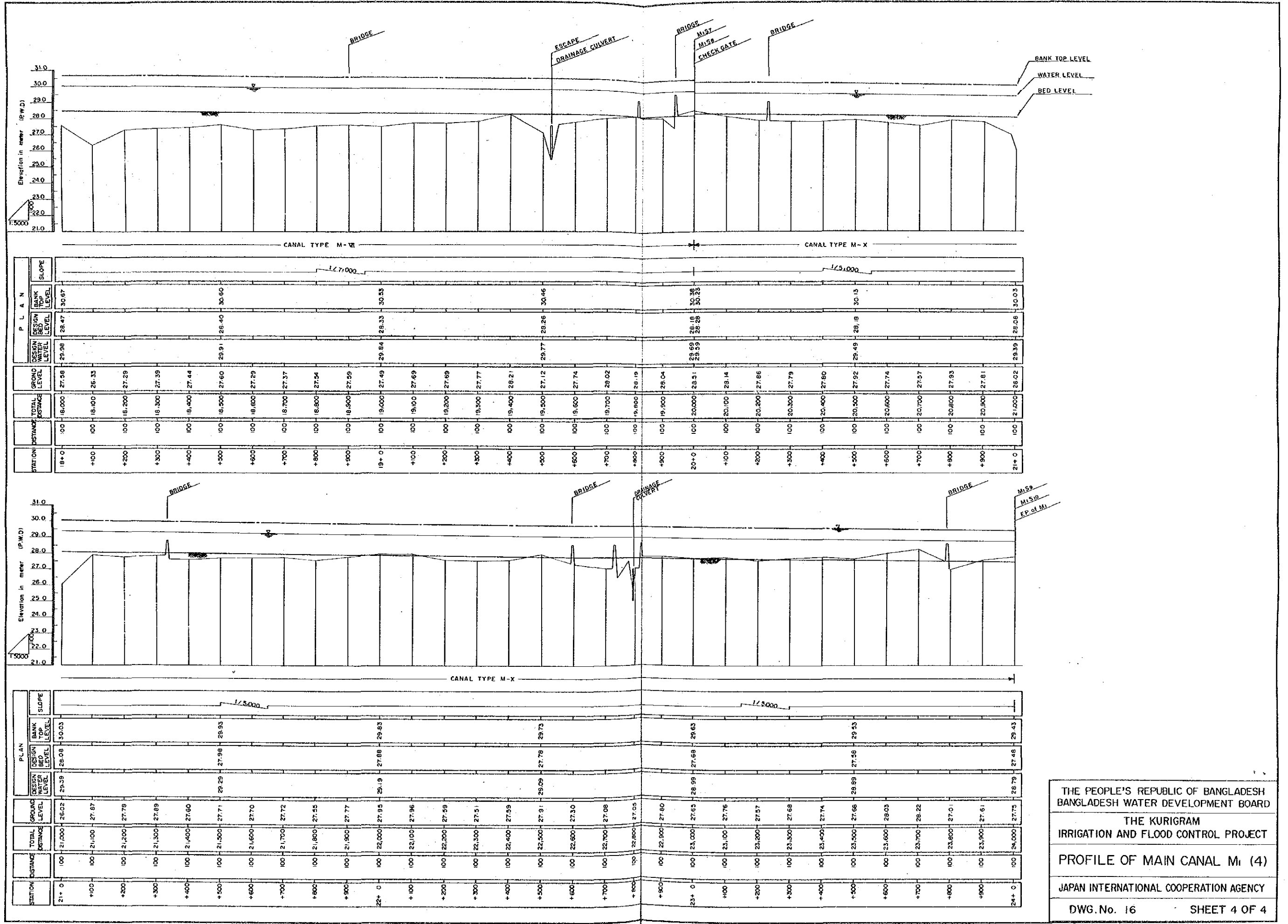


STATION	DISTANCE	TOTAL DISTANCE	GROUND LEVEL	PLAN		
				DESIGN LEVEL	DESIGN BANK LEVEL	SLOPE
12+0	100	12,000	28.82	30.84	29.23	1/7,000
+100	100	12,100	29.12			
+200	100	12,200	29.06			
+300	100	12,300	29.01			
+400	100	12,400	28.82			
+500	100	12,500	28.92	30.77	29.16	1/7,000
+600	100	12,600	29.15			
+700	100	12,700	29.04			
+800	100	12,800	28.62			
+900	100	12,900	28.62			
13+0	100	13,000	28.74	30.70	29.09	1/7,000
+100	100	13,100	28.56			
+200	100	13,200	28.62			
+300	100	13,300	29.00			
+400	100	13,400	28.96			
+500	100	13,500	28.49	30.63	29.02	1/7,000
+600	100	13,600	28.84			
+700	100	13,700	28.92			
+800	100	13,800	28.86			
+900	100	13,900	28.56			
14+0	100	14,000	28.96	30.35	26.94	1/7,000
+100	100	14,100	28.96			
+200	100	14,200	29.48			
+300	100	14,300	29.00			
+400	100	14,400	28.62			
+500	100	14,500	28.82	30.48	28.87	1/7,000
+600	100	14,600	28.82			
+700	100	14,700	28.86			
+800	100	14,800	28.62			
+900	100	14,900	28.41			
15+0	100	15,000	27.87	30.41	28.80	1/7,000

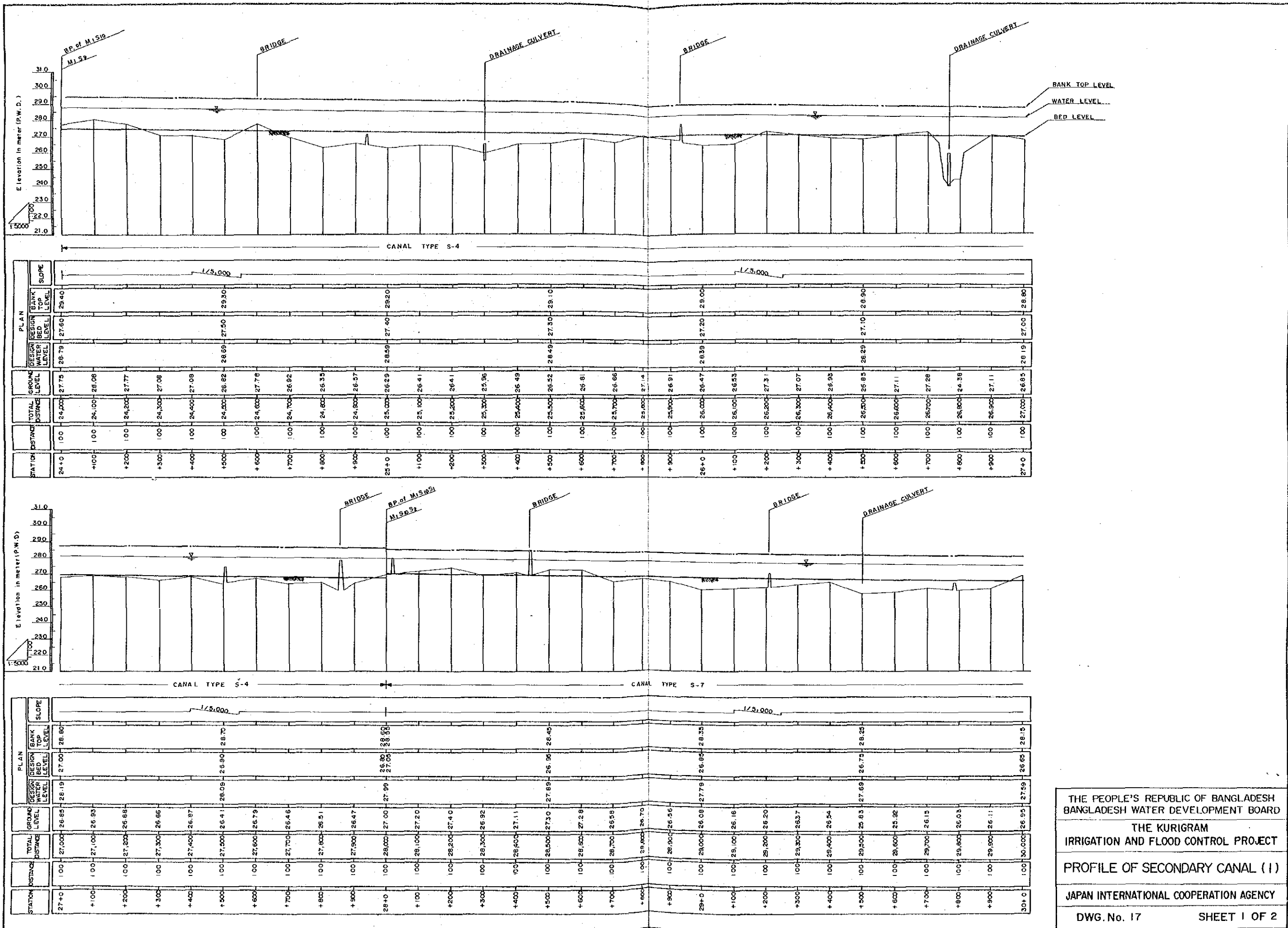


STATION	DISTANCE	TOTAL DISTANCE	GROUND LEVEL	PLAN		
				DESIGN LEVEL	DESIGN BANK LEVEL	SLOPE
15+0	100	15,000	27.87	30.41	28.80	1/7,000
+100	100	15,100	28.41			
+200	100	15,200	28.66	30.38	28.77	1/7,000
+300	100	15,300	28.25			
+400	100	15,400	28.20			
+500	100	15,500	28.36			
+600	100	15,600	28.14			
+700	100	15,700	28.04			
+800	100	15,800	27.82			
+900	100	15,900	28.08			
16+0	100	16,000	27.57	30.27	28.76	1/7,000
+100	100	16,100	28.32			
+200	100	16,200	28.34			
+300	100	16,300	28.29			
+400	100	16,400	28.52			
+500	100	16,500	28.96	30.20	28.69	1/7,000
+600	100	16,600	28.02			
+700	100	16,700	28.02			
+800	100	16,800	28.22			
+900	100	16,900	28.34			
17+0	100	17,000	28.41	30.12	28.61	1/7,000
+100	100	17,100	28.02			
+200	100	17,200	28.38			
+300	100	17,300	28.32			
+400	100	17,400	28.27			
+500	100	17,500	28.19	30.03	28.54	1/7,000
+600	100	17,600	28.20			
+700	100	17,700	28.22			
+800	100	17,800	27.27			
+900	100	17,900	27.28			
18+0	100	18,000	27.52	29.98	28.47	1/7,000

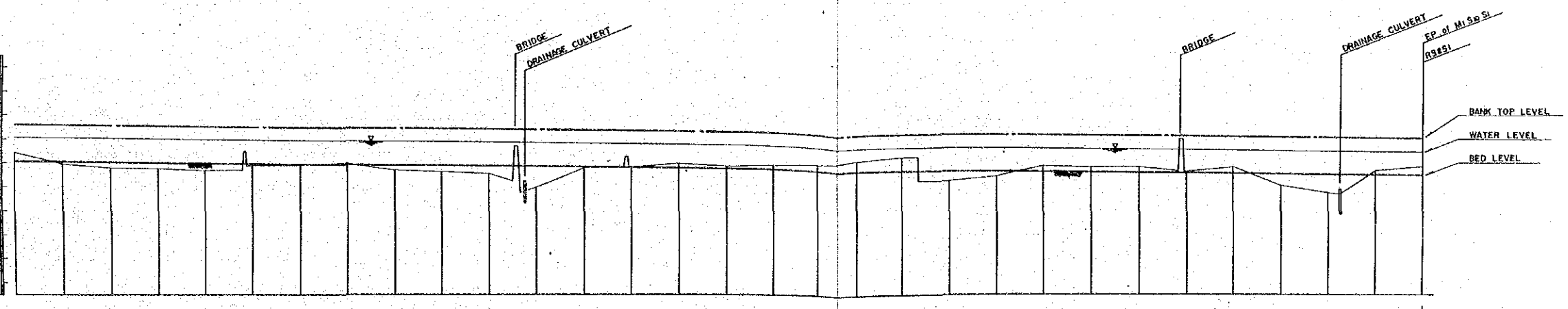
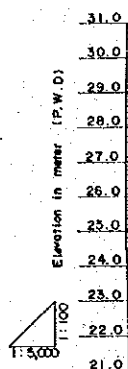
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 BANGLADESH WATER DEVELOPMENT BOARD  
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 IRRIGATION AND FLOOD CONTROL PROJECT  
 PROFILE OF MAIN CANAL M<sub>1</sub> (3)  
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 PROFILE OF MAIN CANAL M<sub>1</sub> (4)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 16 SHEET 4 OF 4

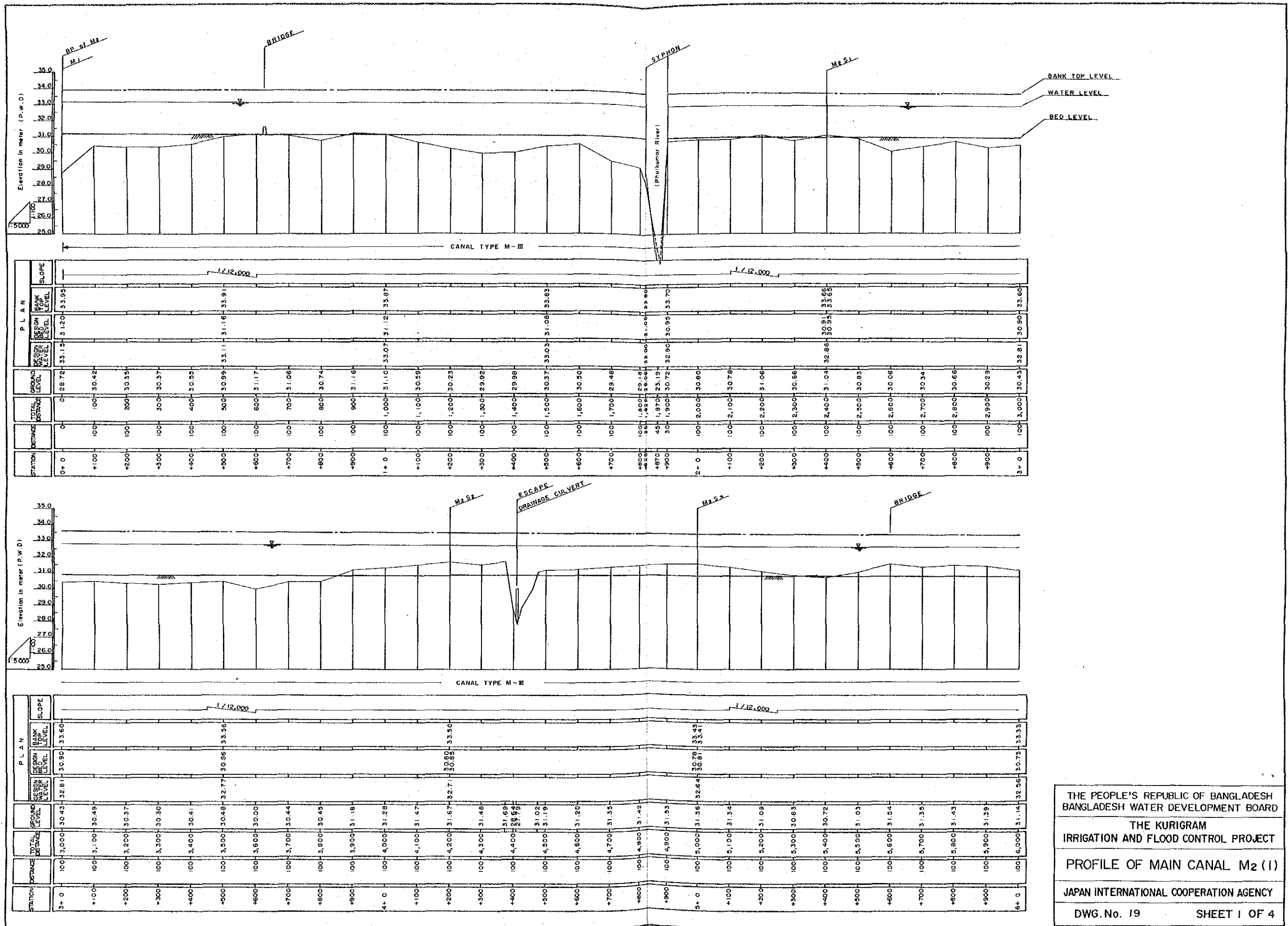


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 PROFILE OF SECONDARY CANAL (1)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 17 SHEET 1 OF 2



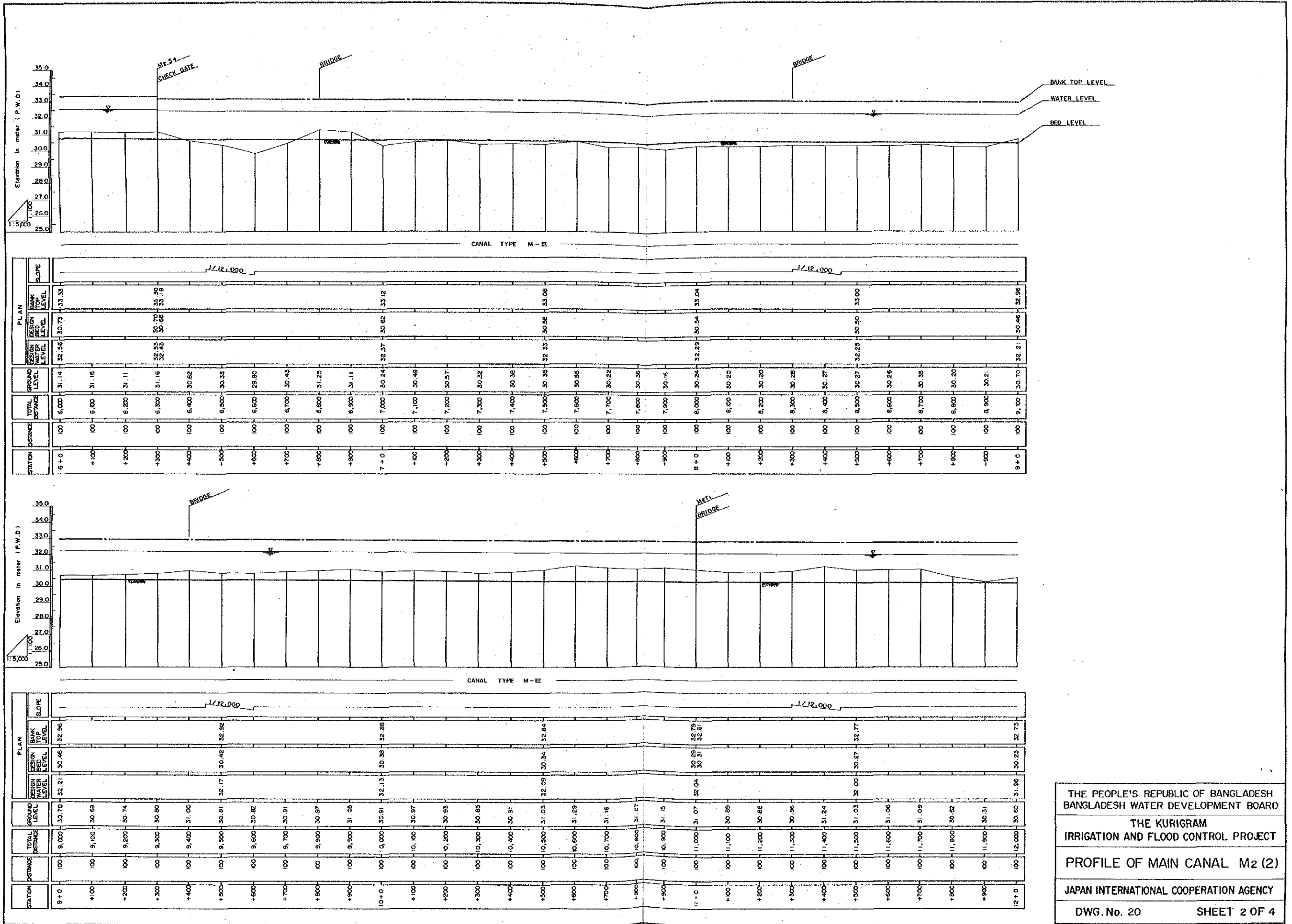
STATION	DISTANCE	TOTAL DISTANCE	GROUND LEVEL	PLAN		
				DESIGN WATER LEVEL	DESIGN BED LEVEL	BANK TOP LEVEL
30+0	100	30,000	25.95	27.59	26.63	26.15
+100	100	30,100	25.49			
+200	100	30,200	26.31			
+300	100	30,300	26.29			
+400	100	30,400	26.21			
+500	100	30,500	26.42	27.49	26.55	26.05
+600	100	30,600	25.43			
+700	100	30,700	25.49			
+800	100	30,800	26.20			
+900	100	30,900	26.12			
31+0	100	31,000	26.04	27.39	26.45	27.95
+100	100	31,100	25.49			
+200	100	31,200	26.30			
+300	100	31,300	26.31			
+400	100	31,400	26.49			
+500	100	31,500	26.39	27.29	26.35	27.95
+600	100	31,600	25.43			
+700	100	31,700	26.50			
+800	100	31,800	26.68			
+900	100	31,900	26.78			
32+0	100	32,000	23.75	27.19	26.25	27.75
+100	100	32,100	23.96			
+200	100	32,200	26.40			
+300	100	32,300	26.34			
+400	100	32,400	26.35			
+500	100	32,500	26.14	27.09	26.15	27.65
+600	100	32,600	26.33			
+700	100	32,700	25.37			
+800	100	32,800	25.28			
+900	100	32,900	26.21			
33+0	100	33,000	26.37			

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 PROFILE OF SECONDARY CANAL (2)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 18 SHEET 2 OF 2

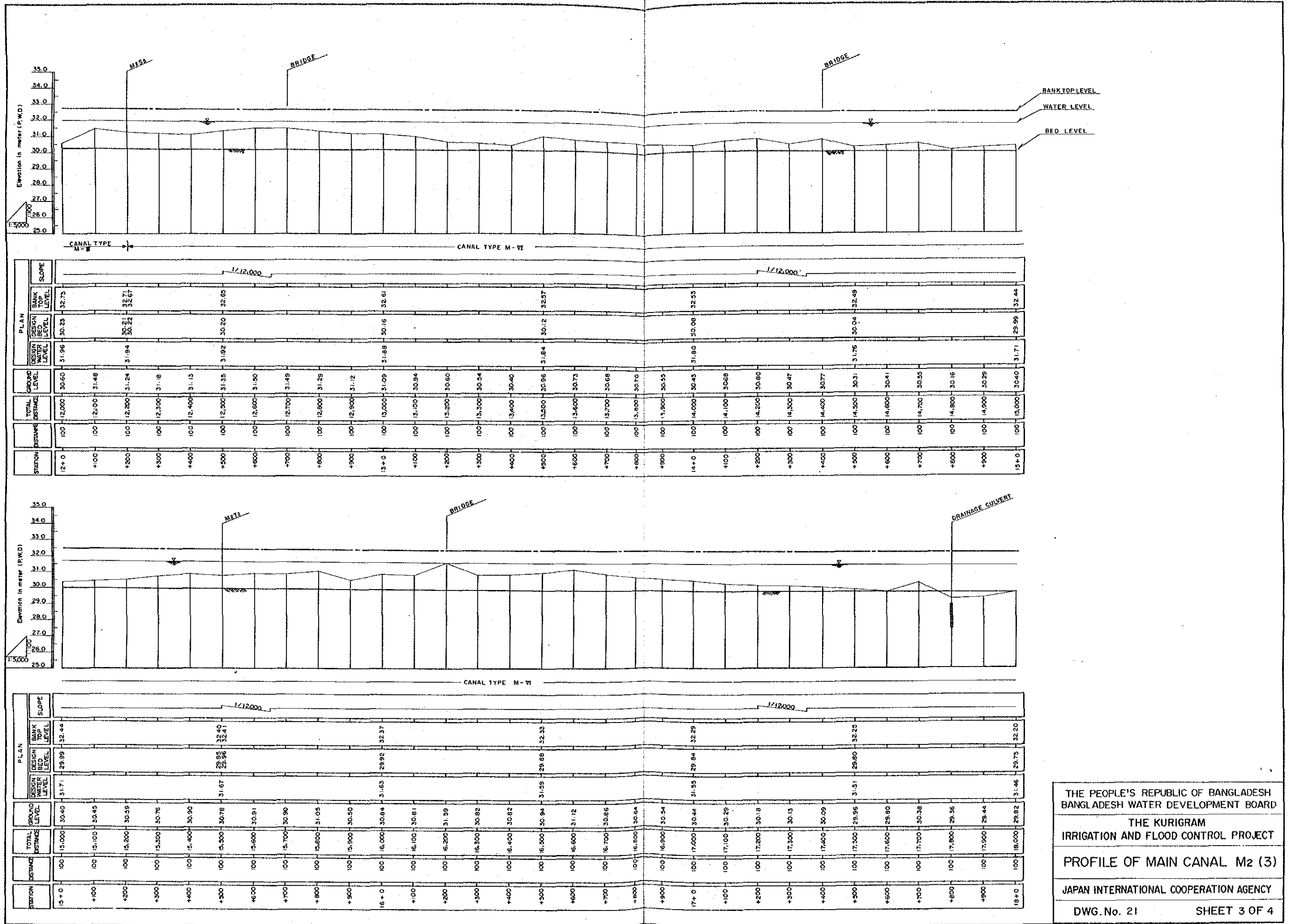


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 PROFILE OF MAIN CANAL M2 (I)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 19 SHEET 1 OF 4

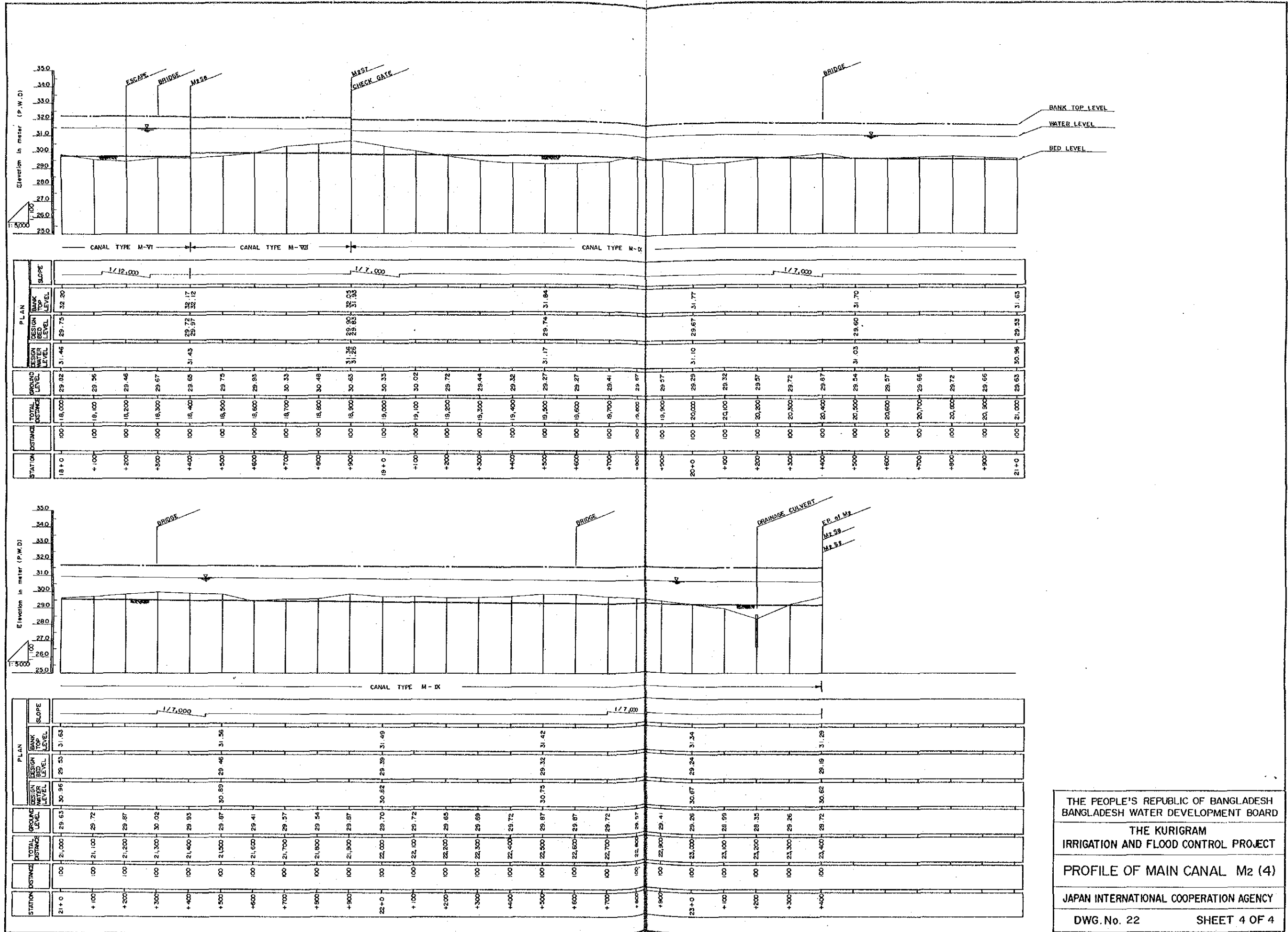




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 PROFILE OF MAIN CANAL M2 (2)  
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 PROFILE OF MAIN CANAL M2 (3)  
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 DWG. No. 21 SHEET 3 OF 4



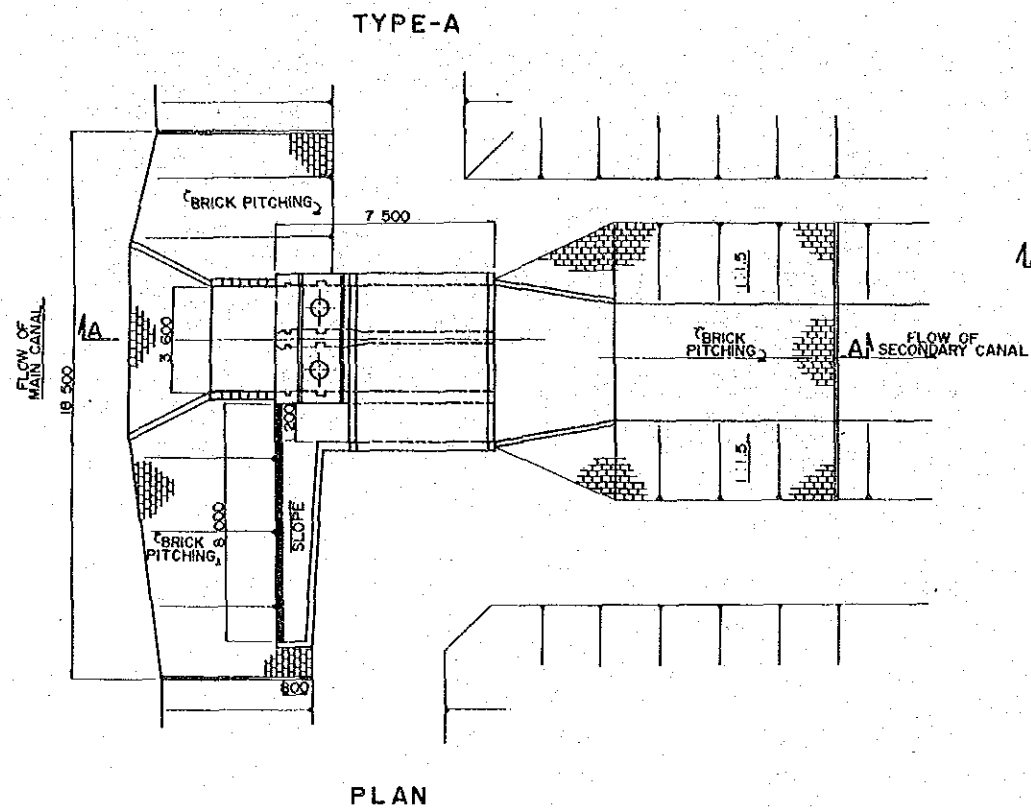
THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD

THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT

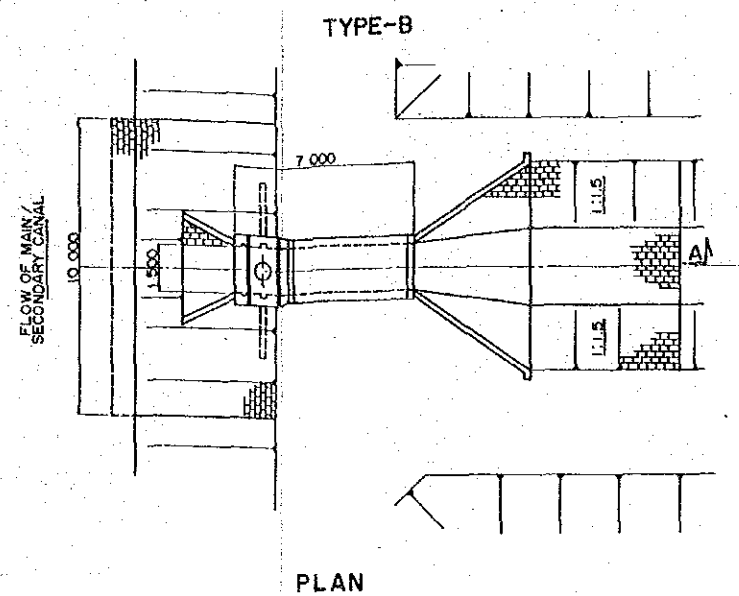
PROFILE OF MAIN CANAL M2 (4)

JAPAN INTERNATIONAL COOPERATION AGENCY

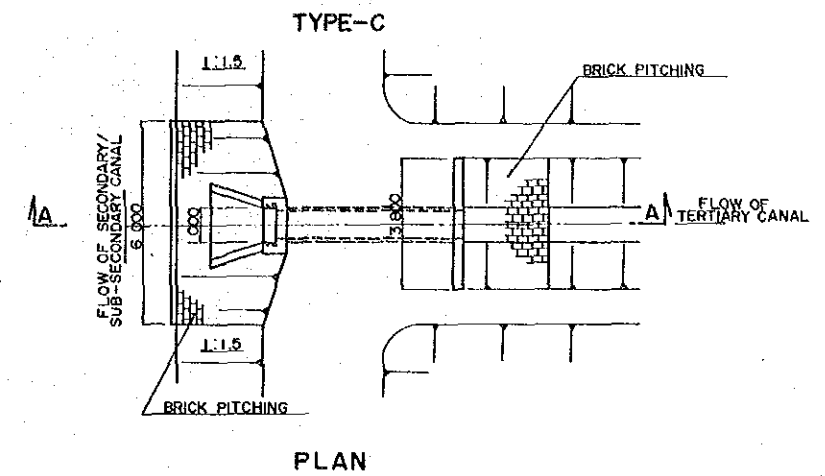
DWG.No. 22 SHEET 4 OF 4



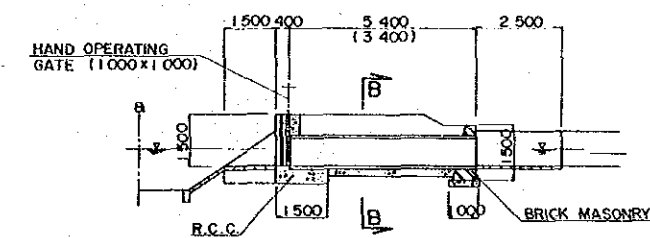
PLAN



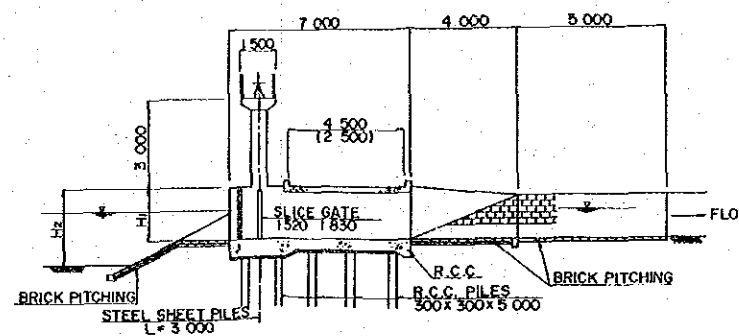
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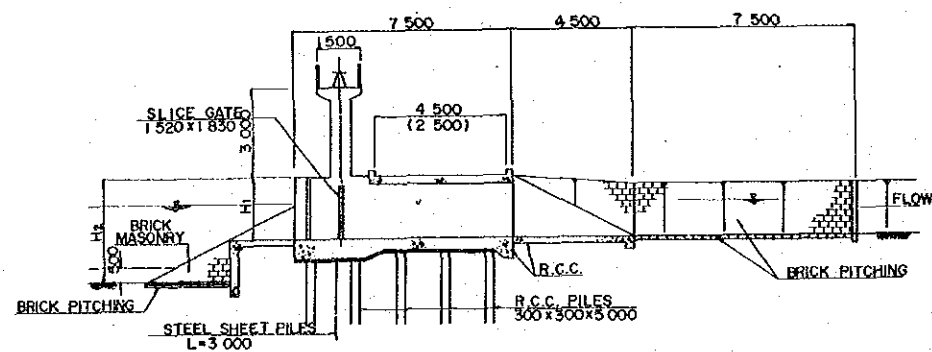
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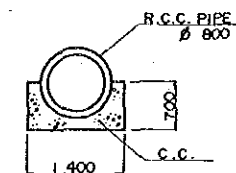
SECTION A-A



SECTION A-A



SECTION A-A

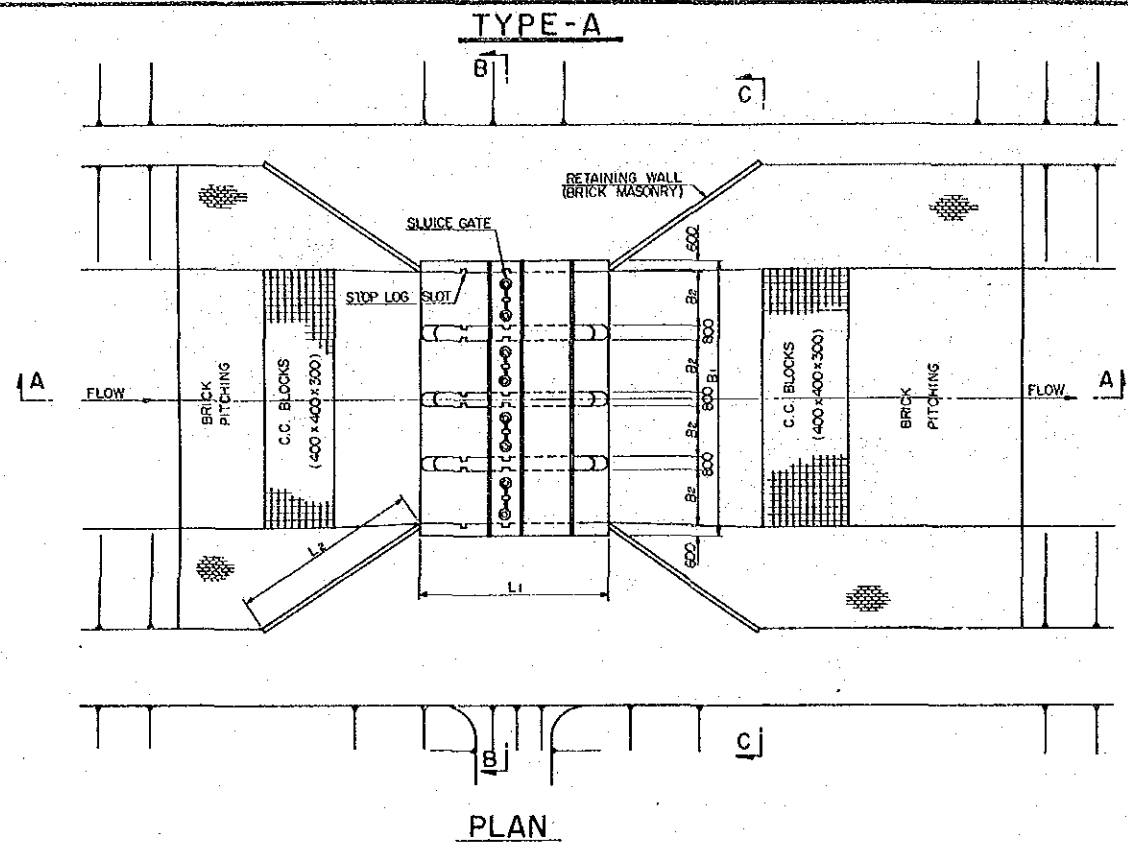


B-B

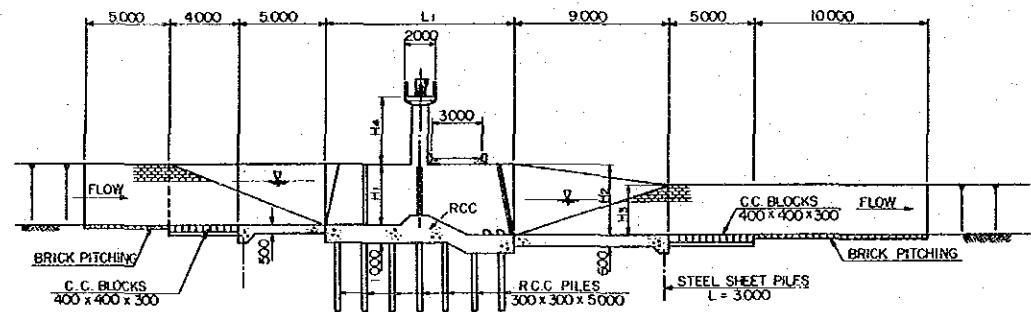
DIMENSION TABLE FOR TYPE A,B

TYPE	Discharge (m <sup>3</sup> /s)	H <sub>1</sub> (m)	H <sub>2</sub> (m)
A	2.0~4.5	1.80~2.30	2.50~3.40
B	0.5~2.0	1.80	2.0~3.95

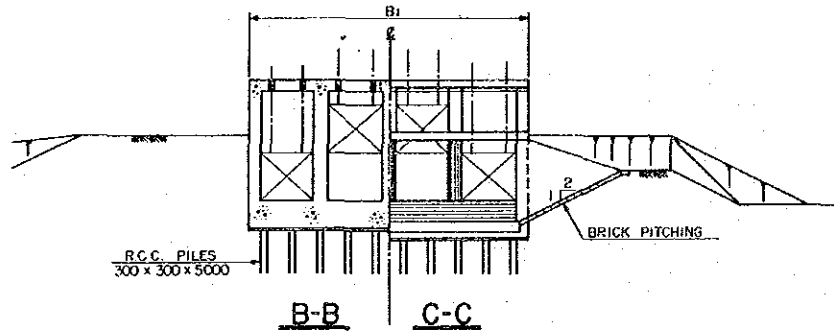
THE PEOPLE'S REPUBLIC OF BANGLADESH  
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 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 BIFURCATIONS  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG.No. 23 SHEET OF



PLAN

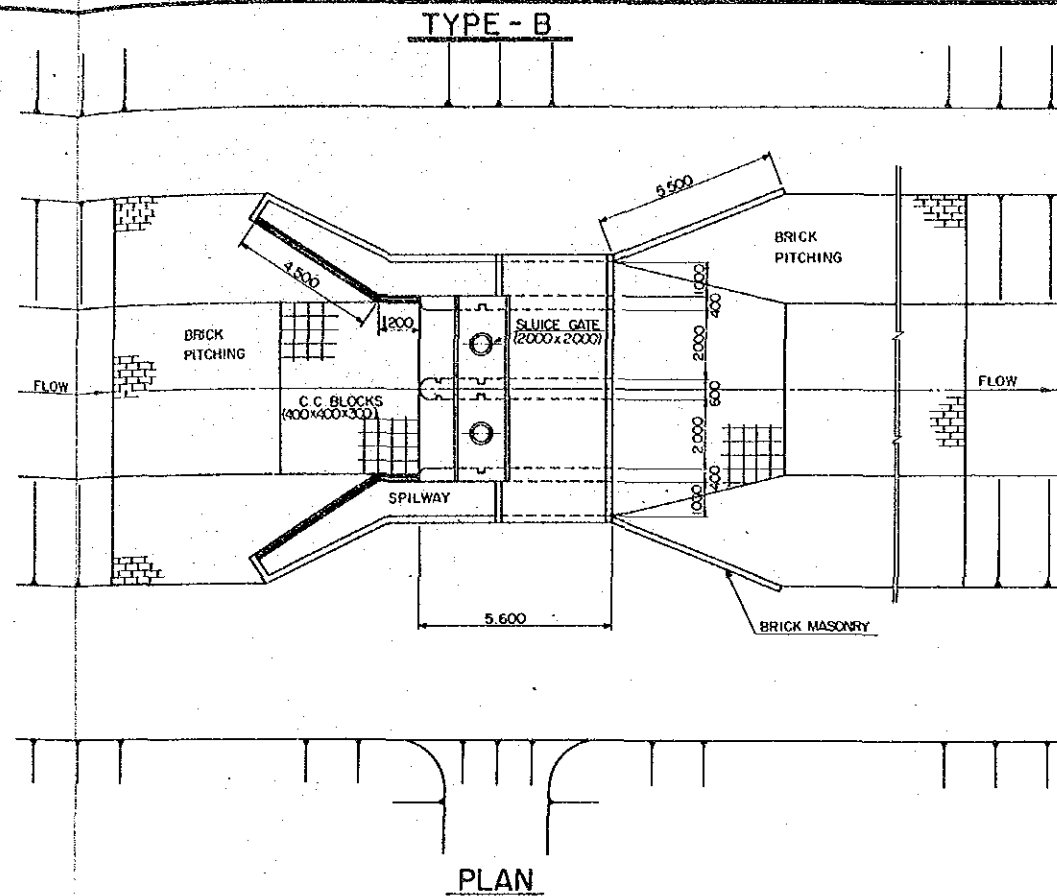


SECTION A-A

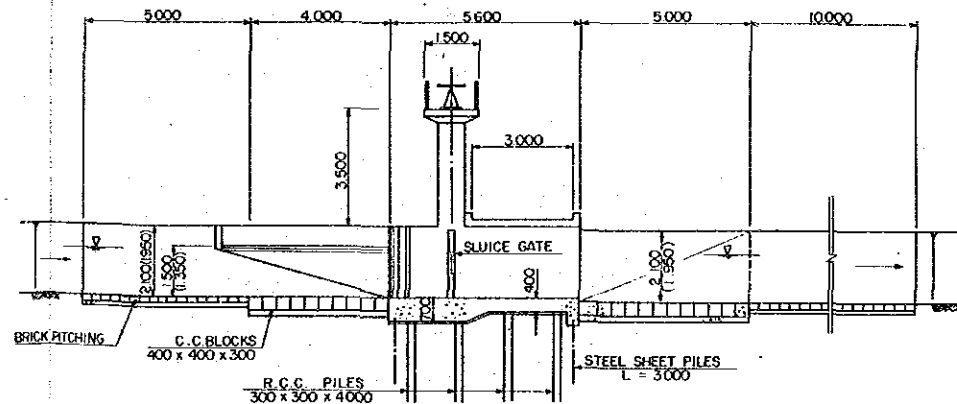


DIMENSION TABLE (Unit: mm)

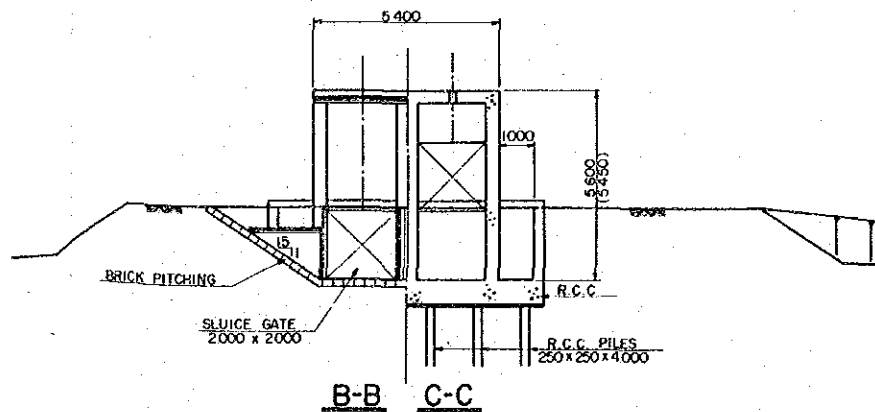
TYPE	NO of vent	Gate size	B <sub>1</sub>	B <sub>2</sub>	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	L <sub>1</sub>	L <sub>2</sub>
A - 1	4	30x30	15.600	3000	3500	4200	2950	4000	11.000	12.000
A - 2	4	25x20	13.600	2500	2800	2.900	2800	3.500	10.000	11.000



PLAN



SECTION A-A



B-B C-C

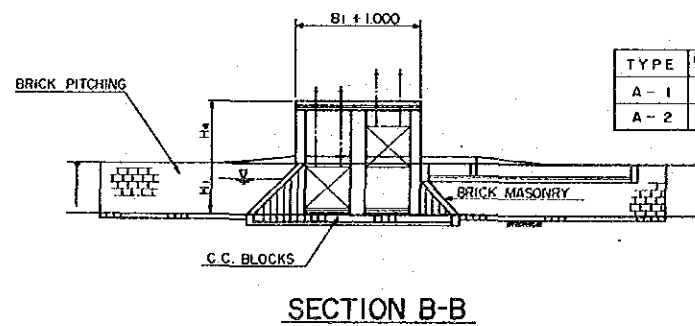
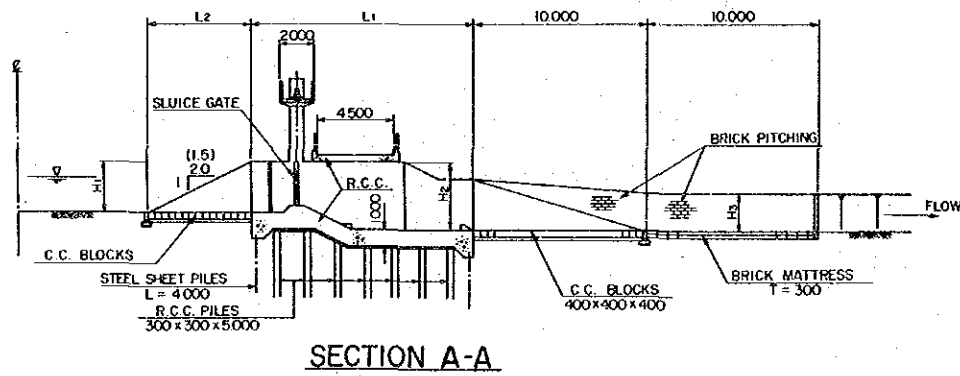
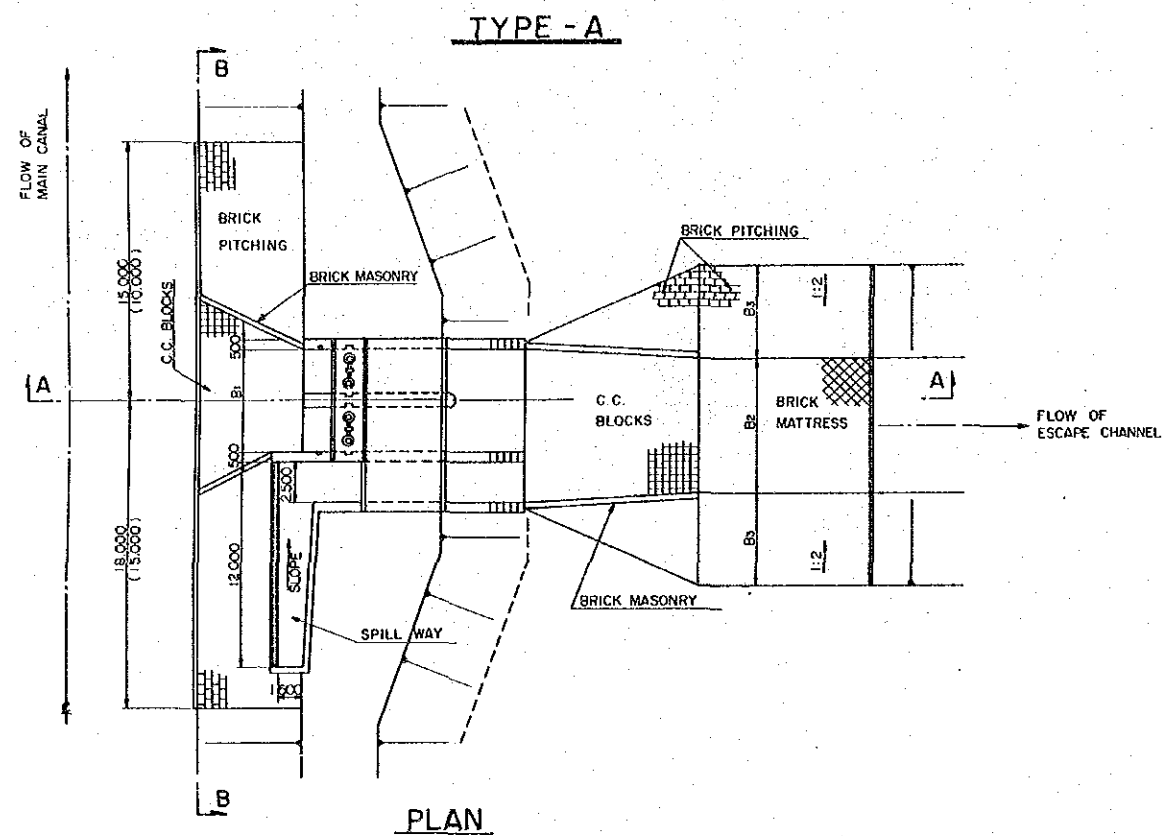
THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT

CHECK STRUCTURES

JAPAN INTERNATIONAL COOPERATION AGENCY

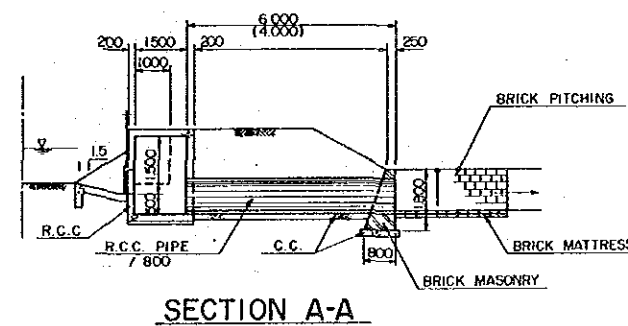
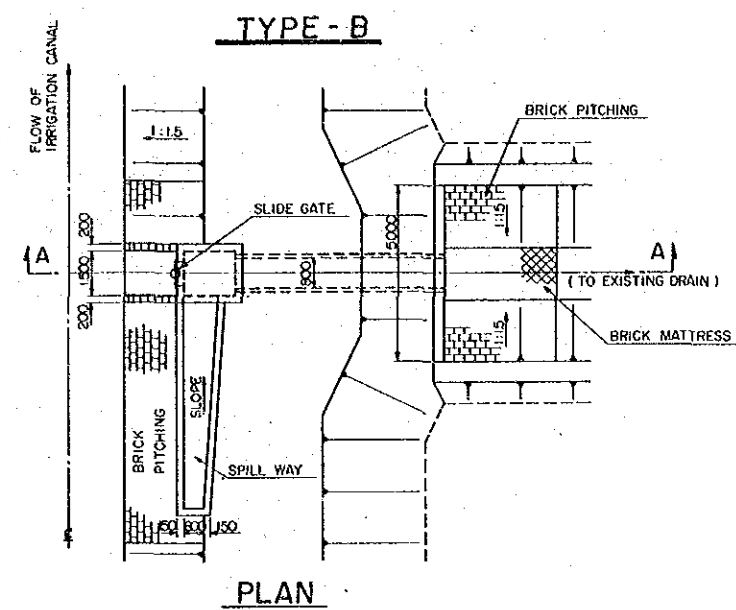
DWG. No. 24

SHEET OF



**DIMENSION TABLE** (Unit : mm)

TYPE	No. of vent	Gate Size (m)	B <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	H <sub>4</sub>	L <sub>1</sub>	L <sub>2</sub>
A - 1	2	25x25	5700	8000	4400	2950	4000	2200	3500	13000	5900
A - 2	1	25x20	2500	4000	4000	2500	3500	2000	3500	12000	3750



THE PEOPLE'S REPUBLIC OF BANGLADESH  
BANGLADESH WATER DEVELOPMENT BOARD

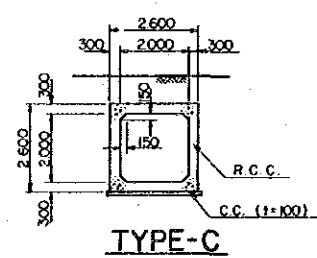
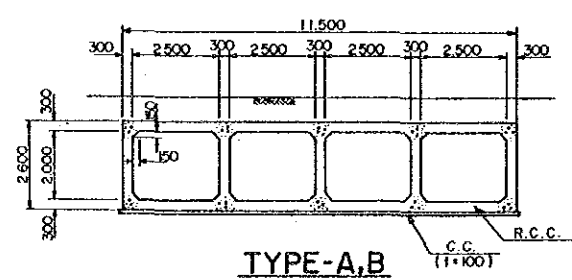
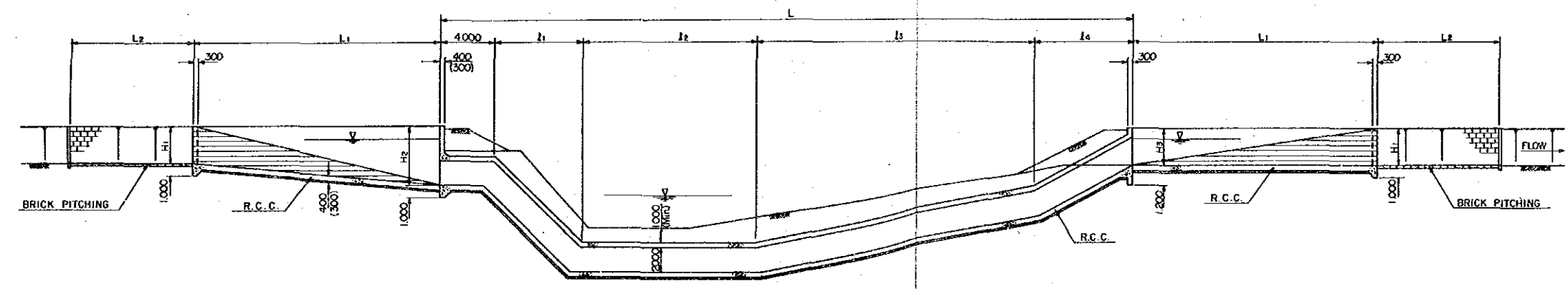
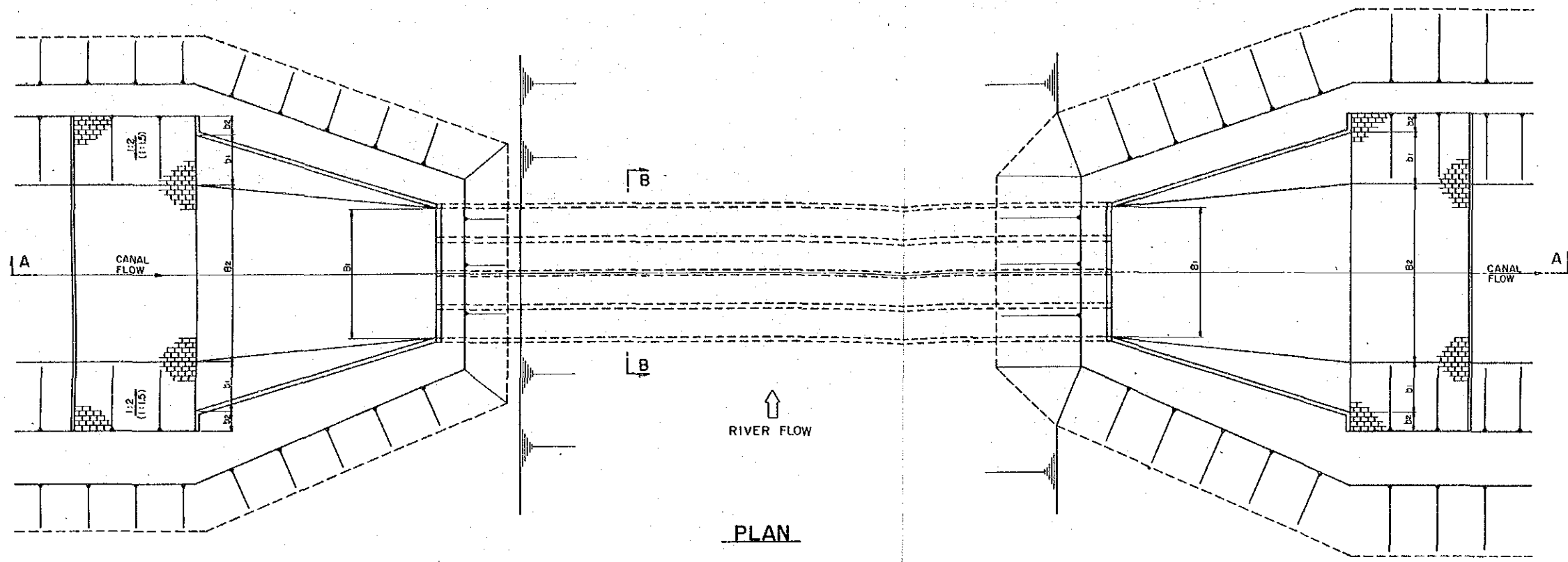
THE KURIGRAM  
IRRIGATION AND FLOOD CONTROL PROJECT

ESCAPES

JAPAN INTERNATIONAL COOPERATION AGENCY

DWG. No. 25

SHEET OF



DIMENSION TABLE FOR SYPHON (Unit : mm)

TYPE	Varl NO.	H <sub>1</sub>	H <sub>2</sub>	H <sub>3</sub>	L <sub>1</sub>	L <sub>2</sub>	L	I <sub>1</sub>	I <sub>2</sub>	I <sub>3</sub>	I <sub>4</sub>	CANAL TYPE				
A	4	10500	15000	4200	1700	2950	4800	3200	20000	15000	53000	7000	14000	24000	8000	M <sub>2</sub>
B	3	8000	14000	4000	1600	2800	5000	3200	20000	15000	57000	20000	8000	20000	9000	M <sub>3</sub>
C	1	8000	4500	2200	1000	2100	4000	3000	12000	10000	32000	5000	10000	12000	5000	S-1

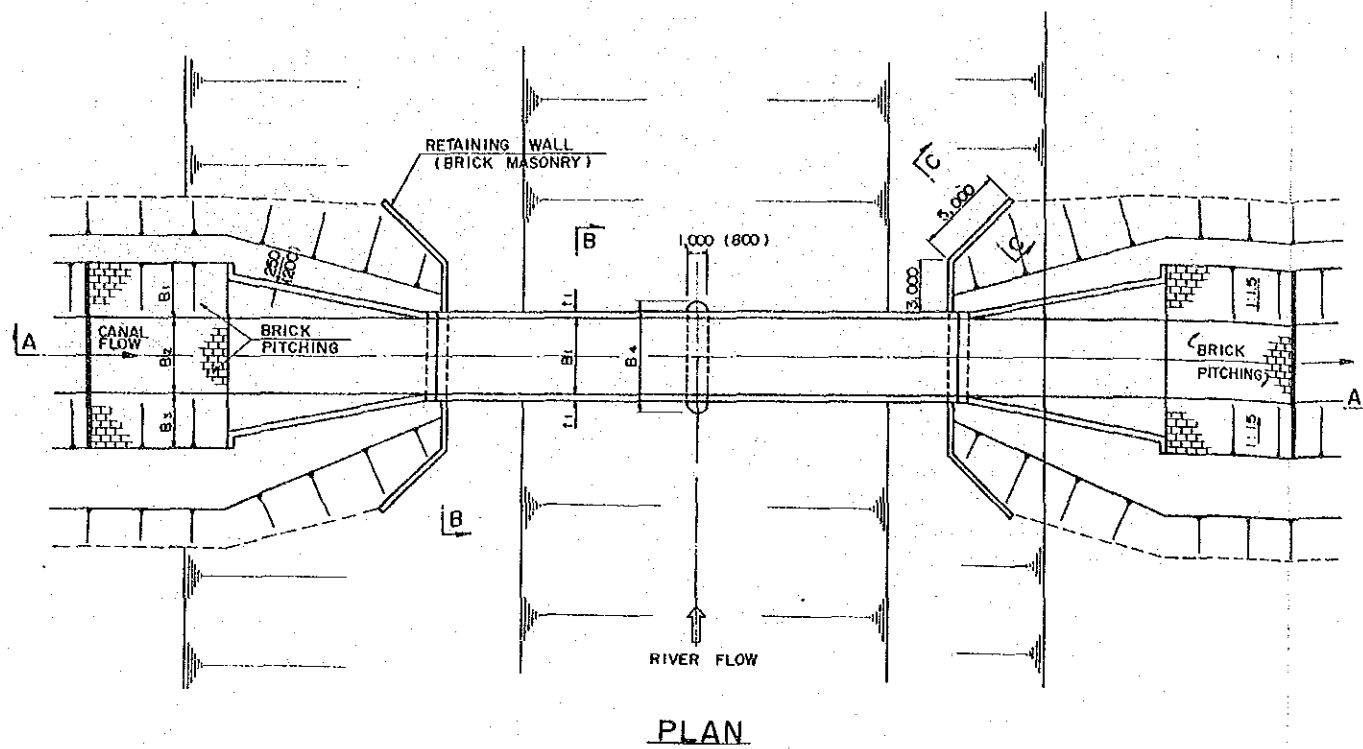
THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD

THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT

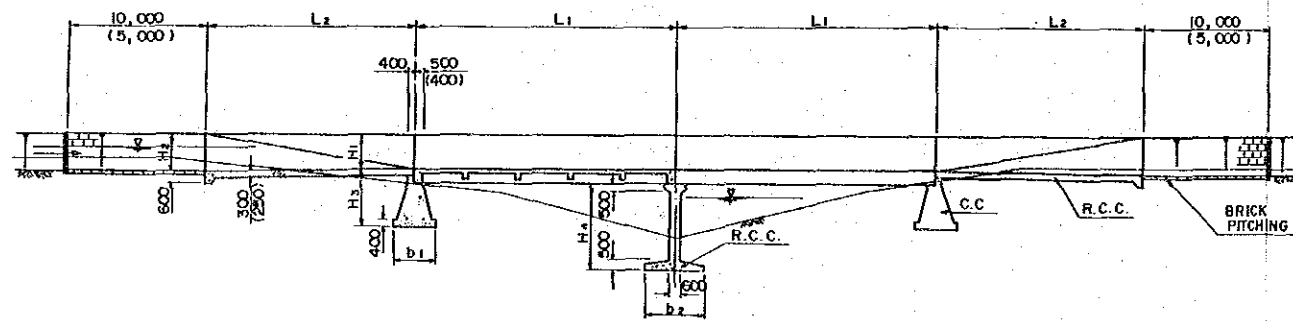
SYPHONS

JAPAN INTERNATIONAL COOPERATION AGENCY

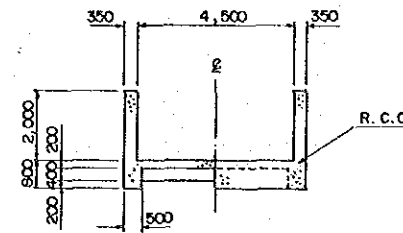
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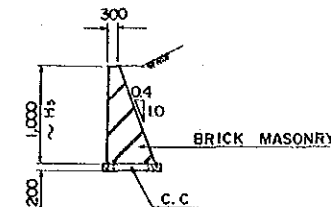
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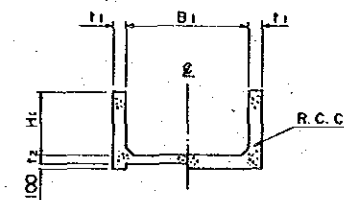
SECTION A-A



TYPE-A



SECTION C-C



TYPE-B

SECTION B-B

DIMENSION TABLE FOR AQUEDUCT (Unit : mm)

TYPE	SPAN No.	B <sub>1</sub>	H <sub>1</sub>	t <sub>1</sub>	t <sub>2</sub>	L <sub>1</sub>	B <sub>2</sub>	B <sub>3</sub>	H <sub>2</sub>	L <sub>2</sub>	H <sub>3</sub>	b <sub>1</sub>	b <sub>2</sub>	B <sub>4</sub>	H <sub>4</sub>	H <sub>5</sub>	CANAL TYPE
A	2	4,500	2,600	350	200	15,000	4,500	3,150	2,100	12,000	3,300	2,500	3,500	6,200	5,000	3,000	S-1
B-1	*	3,500	1,750	400	250	10,000	3,500	2,600	1,750	10,000	*	*	*	5,300	*	*	S-4
B-2	4	*	1,600	*	*	*	3,000	2,500	1,700	*	*	*	*	*	*	*	S-5
B-3	2	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
B-4	1	3,000	1,400	350	200	*	2,500	2,200	1,450	8,000	3,000	2,300	3,200	4,500	4,500	2,500	S-7
B-5	3	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*
B-6	2	1,000	800	300	150	*	500	1,350	900	5,000	2,500	1,800	2,600	2,400	4,000	2,000	T-2
B-7	1	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*	*

THE PEOPLE'S REPUBLIC OF BANGLADESH  
BANGLADESH WATER DEVELOPMENT BOARD

THE KURIGRAM  
IRRIGATION AND FLOOD CONTROL PROJECT

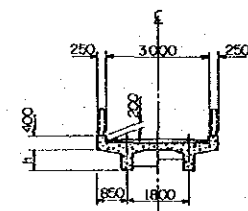
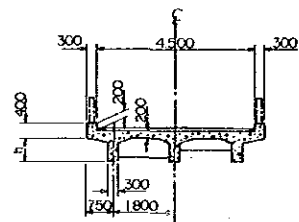
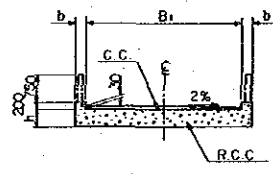
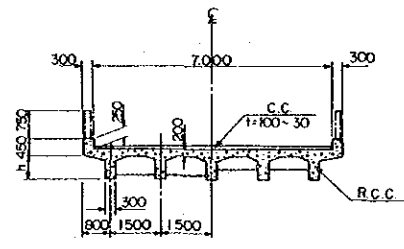
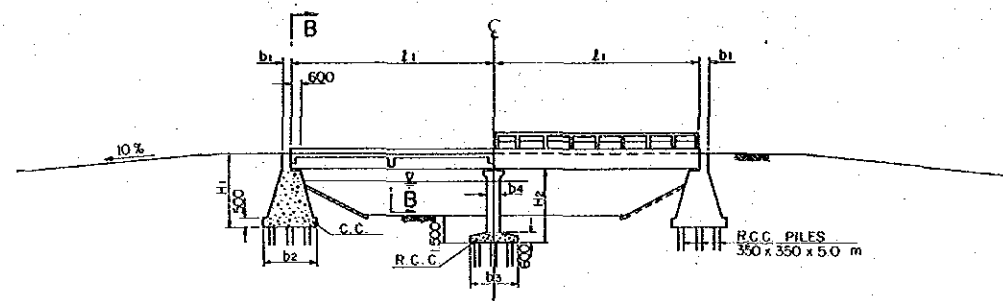
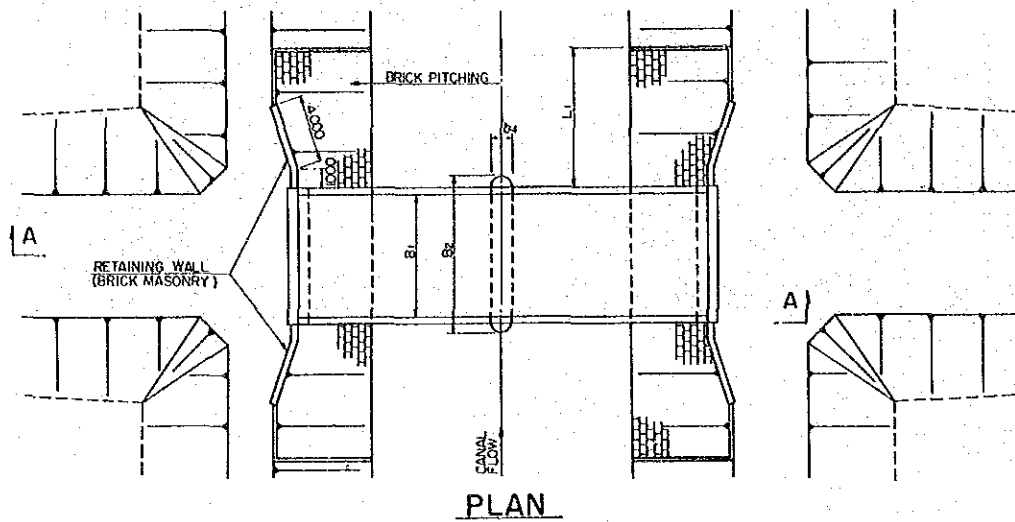
AQUEDUCTS

JAPAN INTERNATIONAL COOPERATION AGENCY

DWG. No. 27      SHEET OF

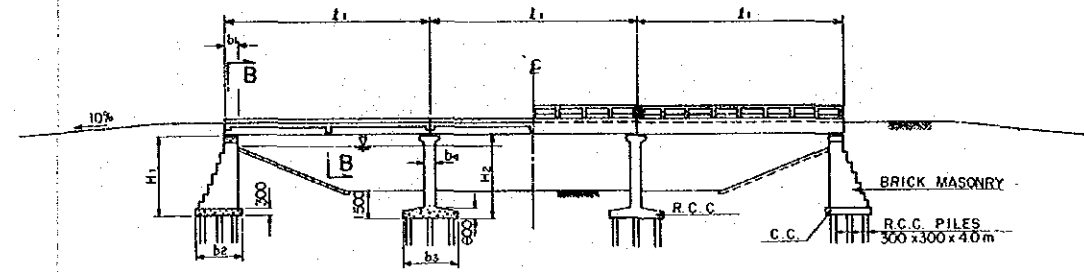
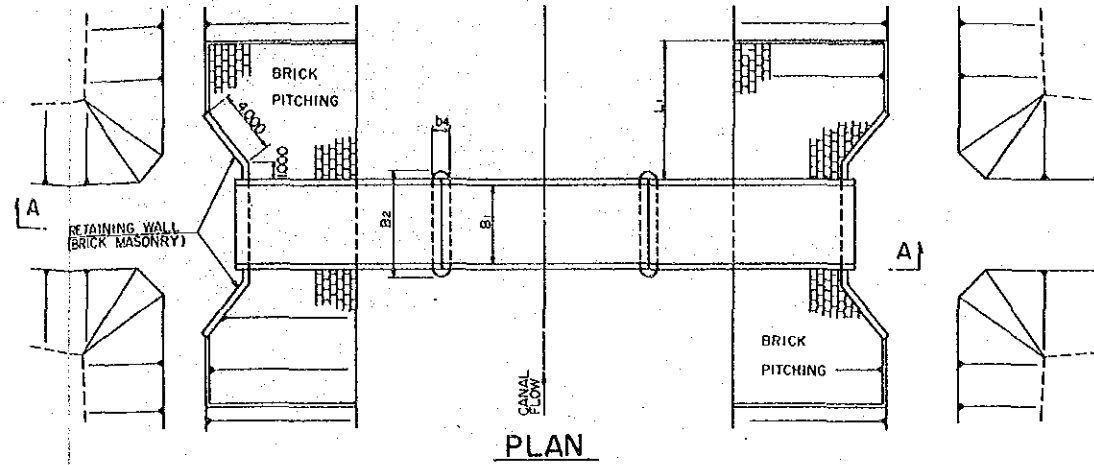


**BRIDGE TYPE-A,D**



SECTION B-B

**BRIDGE TYPE-B,C,E,F**



SECTION A-A

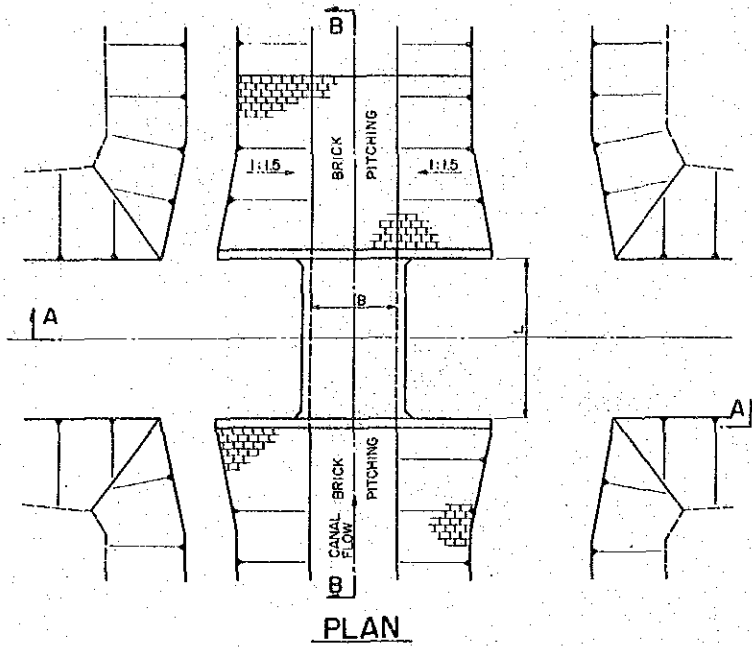
DIMENSION TABLE FOR BRIDGE TYPE

(Unit : mm)

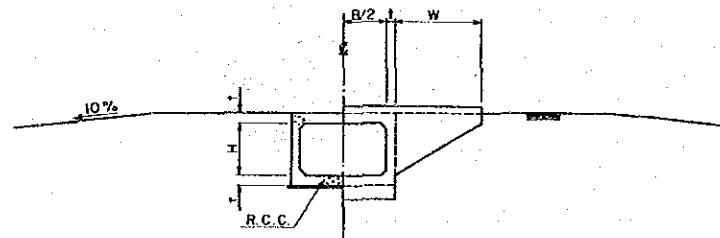
TYPE	SPAN NO.	$l_1$	$B_1$	$h$	$b$	$b_1$	$b_2$	$H_1$	$b_3$	$b_4$	$B_2$	$H_2$	$l_2$	CANAL TYPE
A-1	2	12000	7000	700	—	500	3200	4200	3000	700	8300	4200	10000	M-2,3,4
A-2	2	9000	*	600	—	*	2700	3700	2800	*	*	3900	*	M-5,6
A-3	1	*	*	*	—	*	2400	3400	—	—	—	—	8000	S-1,2,3
B-1	3	12000	4500	700	—	800	3300	4500	3200	600	5700	4700	10000	M-1
B-2	2	*	*	*	—	*	3100	4000	3000	*	*	4200	*	M-2,3,4
B-3	2	9000	*	600	—	*	2900	3600	2800	*	*	3900	*	M-5,6
B-4	1	*	*	*	—	*	2700	3200	—	—	—	—	8000	M-10
C-1	3	12000	3000	650	—	*	3300	4500	3200	600	4100	4700	10000	M-1
C-2	2	*	*	*	—	*	3100	4000	3000	*	*	4200	*	M-3,4
C-3	2	9000	*	500	—	*	2900	3600	2800	*	*	3900	*	M-5,6
C-4	1	12000	*	650	—	*	2800	3400	—	—	—	—	*	M-8
C-5	1	9000	*	500	—	*	2700	3200	—	—	—	—	8000	M-10,S-1
D	1	7000	7000	*	300	400	2200	2900	—	—	—	—	*	S-4,5,6
E-1	2	7000	4500	450	*	600	2800	3400	2600	600	5700	3700	10000	M-7
E-2	1	8000	*	500	*	*	2700	3200	—	—	—	—	8000	S-2,3,4
E-3	1	7000	*	450	*	*	2300	3100	—	—	—	—	*	S-5,6,9,10,11
F-1	2	*	3000	400	250	*	2800	3400	2600	600	4100	3700	10000	M-7
F-2	1	8000	*	450	*	*	2700	3200	—	—	—	—	8000	S-2,3,4
F-3	1	7000	*	400	*	*	2300	3100	—	—	—	—	*	S-5,6,9,10,11

THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 BRIDGES  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 28 SHEET OF

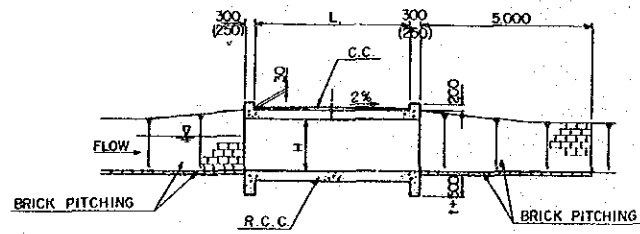
**BOX CULVERT TYPE**



**PLAN**

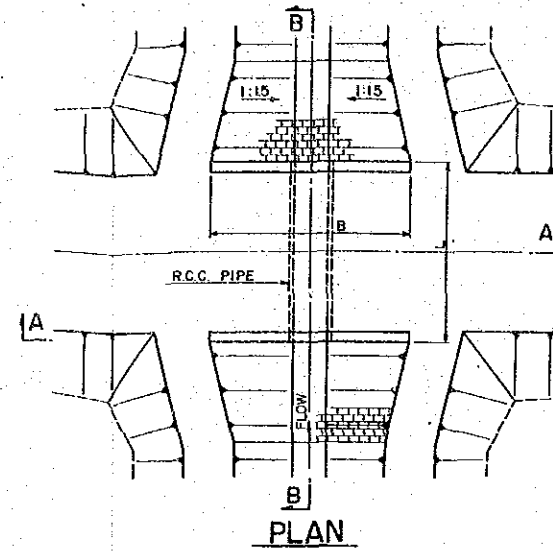


**SECTION A-A**

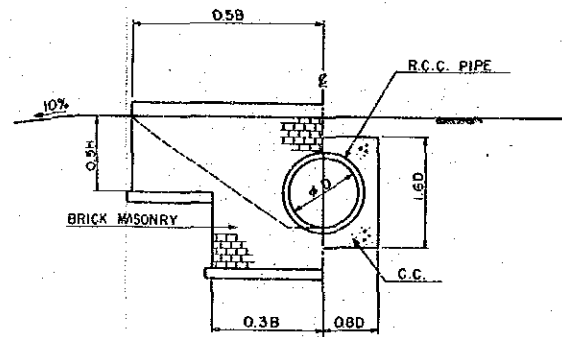


**SECTION B-B**

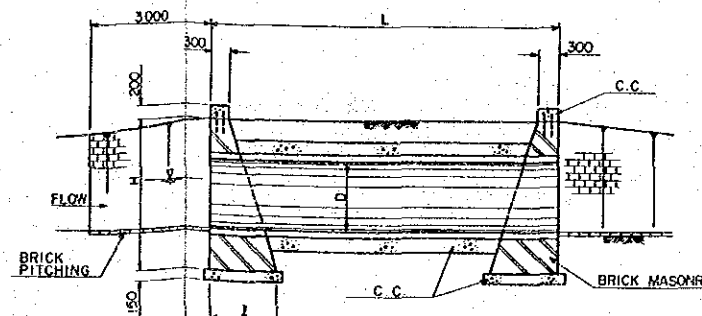
**PIPE CULVERT TYPE**



**PLAN**



**SECTION A-A**



**SECTION B-B**

**DIMENSION TABLE FOR BOX CULVERT TYPE**

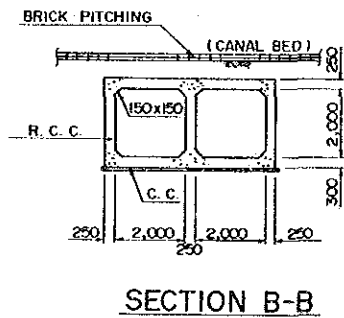
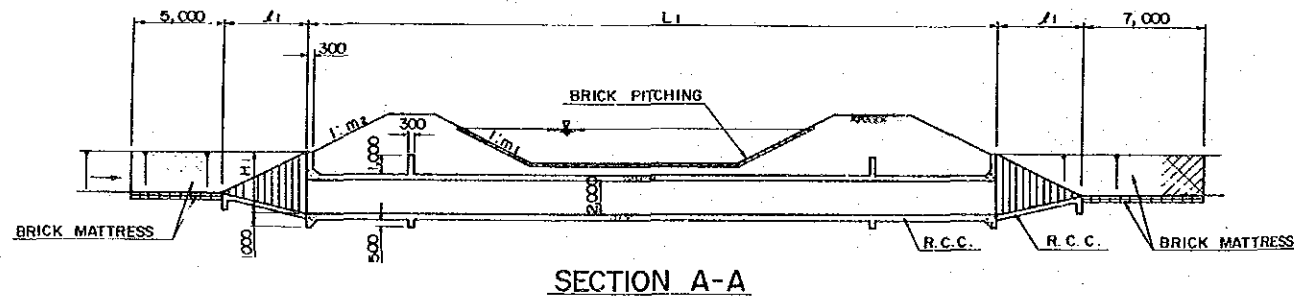
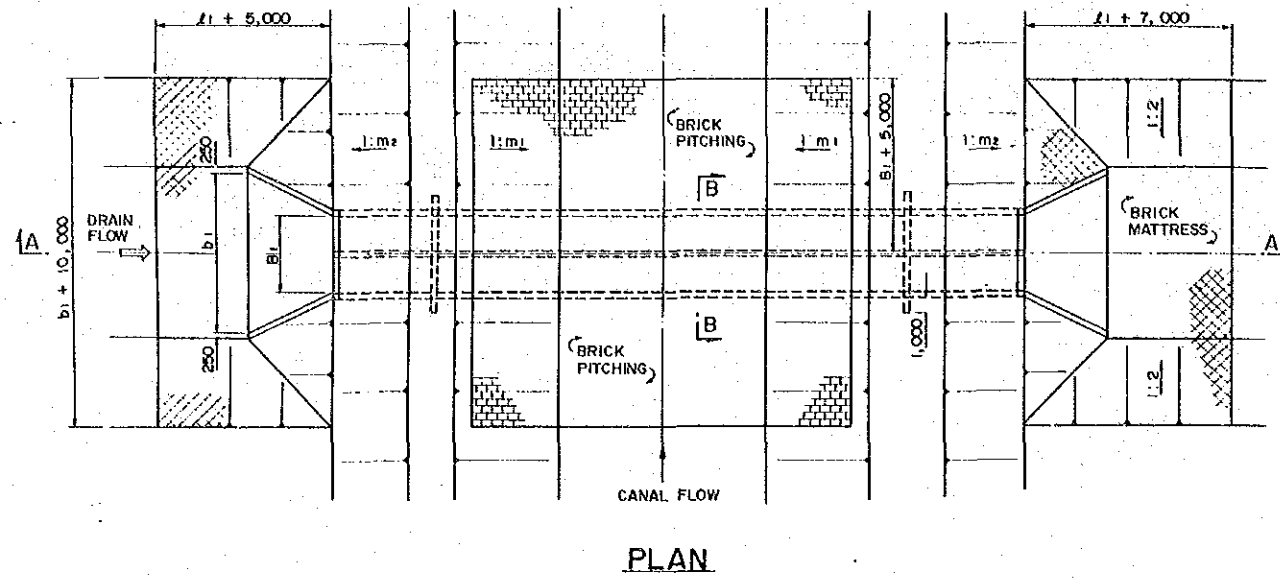
Q (m <sup>3</sup> /sec)		(Unit : mm)				
Q	TYPE	L	B	H	I	W
1.00	A-1	7000	2500	1500	300	2500
~1.50	A-2	4500	*	*	*	*
	A-3	3000	*	*	*	*
0.75	B-1	7000	2000	1400	250	2000
~1.00	B-2	4500	*	*	*	*
	B-3	3000	*	*	*	*
0.50	C-1	7000	1500	1200	250	1600
~0.75	C-2	4500	*	*	*	*
	C-3	3000	*	*	*	*

**DIMENSION TABLE FOR PIPE CULVERT TYPE**

Q (m <sup>3</sup> /sec)		(Unit : mm)				
Q	TYPE	L	D	B	H	I
0.40	A-1	7600	1000	5500	2200	1000
~0.50	A-2	5100	*	*	*	*
	A-3	3600	*	*	*	*
0.30	B-1	7600	800	4500	2000	900
~0.40	B-2	5100	*	*	*	*
	B-3	3600	*	*	*	*
Less than 0.30	C-1	7600	600	3500	1800	850
	C-2	5100	*	*	*	*
	C-3	3600	*	*	*	*

THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 ROAD CULVERTS  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 29 SHEET OF

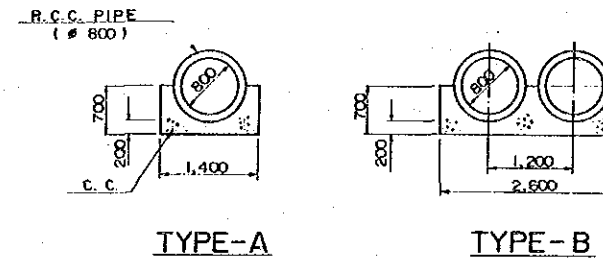
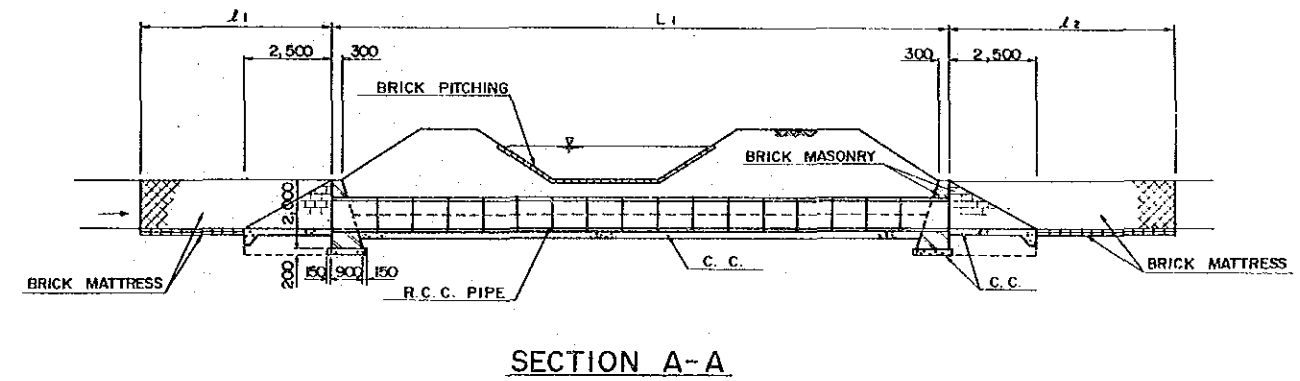
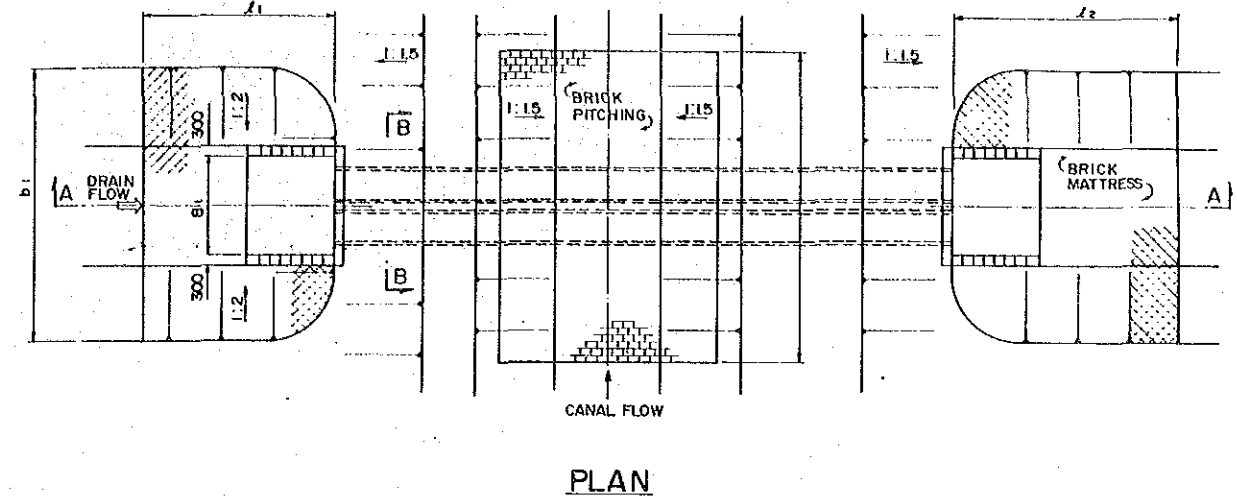
**BOX CULVERT TYPE**



DIMENSION TABLE FOR BOX CULVERT TYPE (Unit: mm)

TYPE	VENT No	B <sub>1</sub>	L <sub>1</sub>	H <sub>1</sub>	b <sub>1</sub>	l <sub>1</sub>	m <sub>1</sub>	m <sub>2</sub>	CANAL TYPE TO BE CROSSED
A-1	1	2,000	75,000	3,500	9,000	7,000	2.9	3.5	M-1
A-2	*	*	45,000	5,000	6,500	4,500	2.0	2.0	M-3
A-3	*	*	35,000	*	*	*	1.5	*	M-5, 6
A-4	*	*	25,000	*	*	*	*	*	M-9, 10
A-5	*	*	20,000	2,500	6,000	4,000	*	*	S-2, 3, 4, 8, 10
A-6	*	*	15,000	*	*	*	*	*	S-7, 8, 11, 14, 15
A-7	*	*	9,000	*	*	*	*	*	T-1, 2
B-1	2	4,250	45,000	3,000	8,750	4,500	2.0	2.0	M-3
B-2	*	*	30,000	*	*	*	1.5	2.0	M-7
B-3	*	*	20,000	2,500	6,250	4,000	*	*	S-6, 10
B-4	*	*	15,000	*	*	*	*	*	S-14

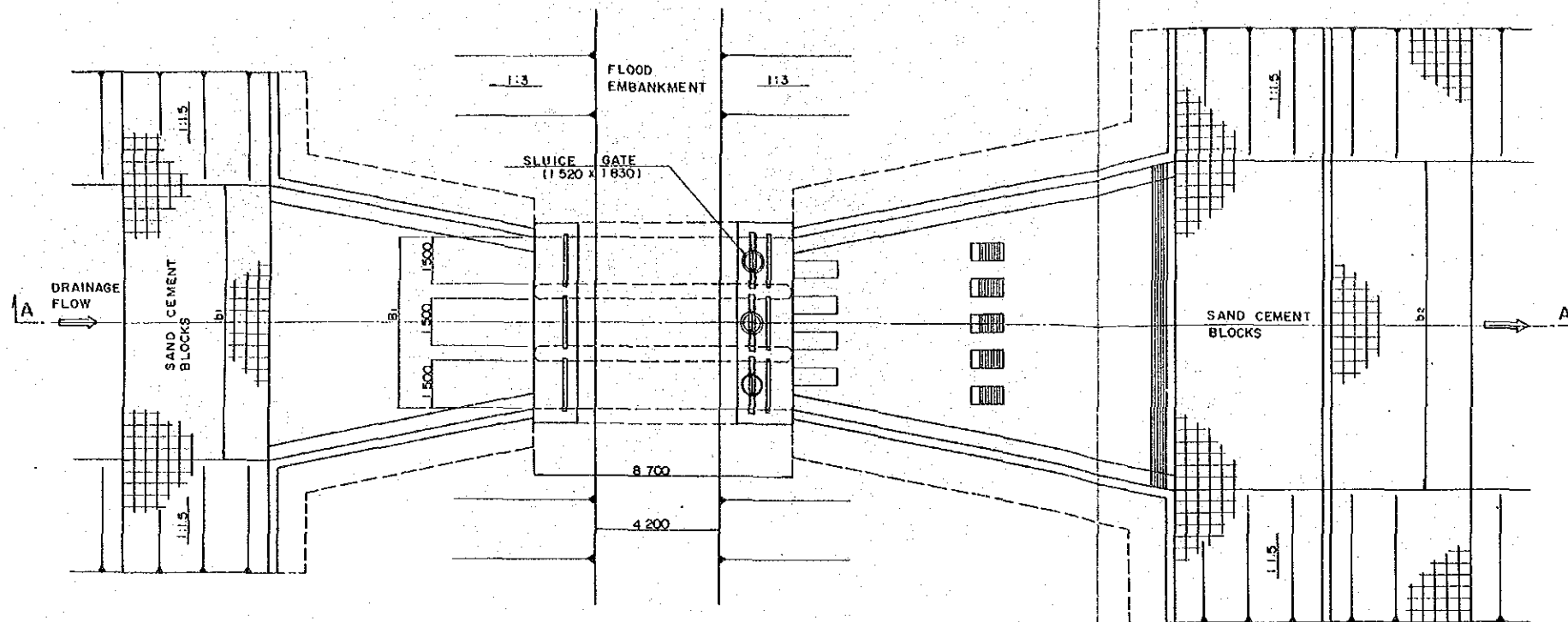
**PIPE CULVERT TYPE**



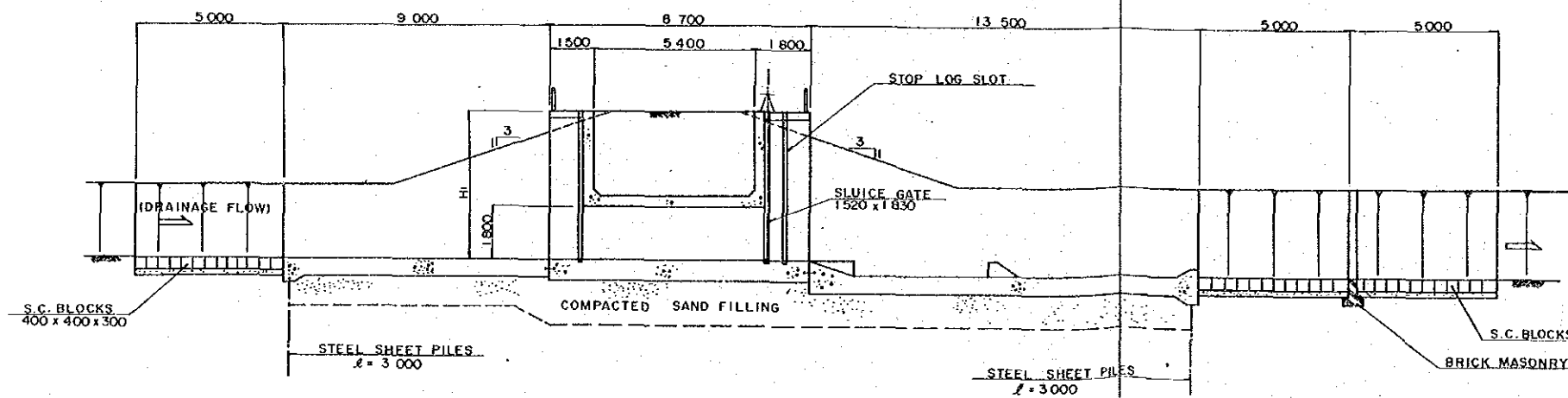
DIMENSION TABLE FOR PIPE CULVERT TYPE (Unit: mm)

TYPE	B <sub>1</sub>	b <sub>1</sub>	L <sub>1</sub>	l <sub>1</sub>	l <sub>2</sub>	CANAL TYPE TO BE CROSSED
A-1	1,500	7,000	20,000	5,000	7,000	S-1, 2, 3, 4
A-2	*	*	18,000	*	*	S-5, 6, 9, 10
A-3	*	*	16,000	*	*	S-7, 8, 11
A-4	*	*	13,000	*	*	S-14, 15
A-5	*	*	9,000	*	*	T-1, 2
B-1	2,800	10,000	18,000	7,000	10,000	S-5, 6, 9, 10
B-2	*	*	16,000	*	*	S-7, 11
B-3	*	*	9,000	*	*	T-1, 2

THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 DRAINAGE CULVERTS  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 30 SHEET OF



PLAN



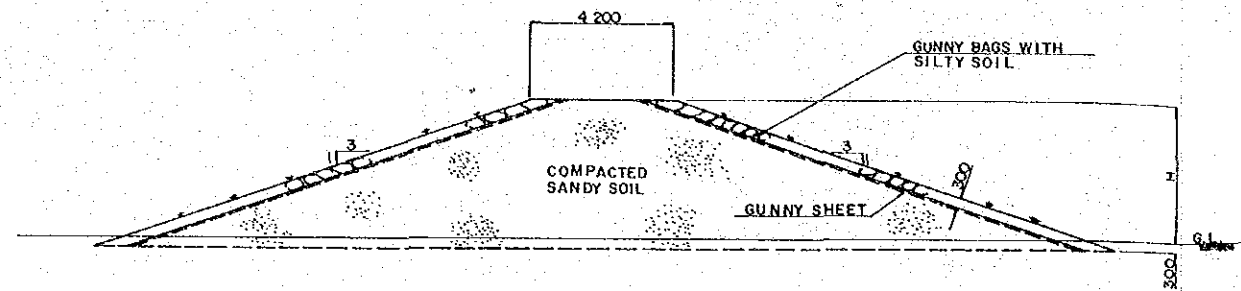
SECTION A-A

DIMENSION TABLE (Unit: mm)

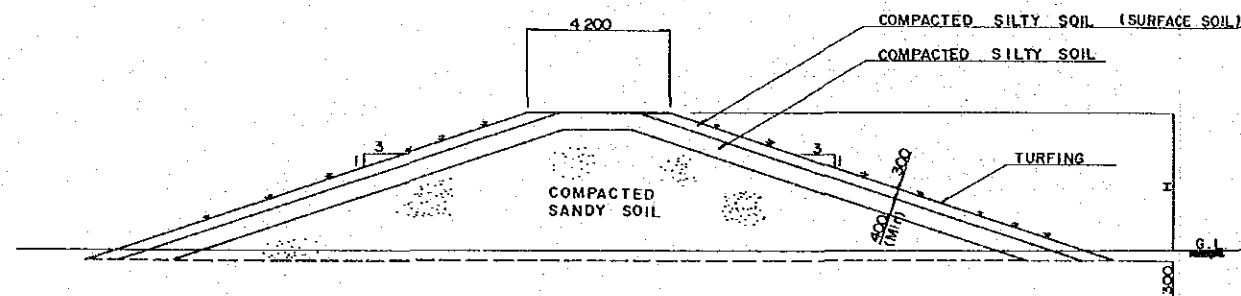
NAME	Vent No.	B <sub>1</sub>	b <sub>1</sub>	b <sub>2</sub>	H <sub>1</sub>	TYPE
Tafuk Simnabari Reg.	2	3 500	7 100	8 900	4 000	A-1
Shagon Chara Reg.	8	15 500	19 100	20 900	4 600	E
Bangmore Reg.	3	5 500	9 100	10 900	4 100	B-1
Paleswari Chara Reg.	7	13 500	17 100	18 900	4 600	D
Phuakumar Reg.	18	35 500	39 100	40 900	4 000	F
Gogadaha Reg.	4	7 500	11 100	12 900	5 400	C
Begomganj Reg.	3	5 500	9 100	10 900	6 700	B-2
Barabhko Reg.	2	3 500	7 100	8 900	4 600	A-2

THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 DRAINAGE REGULATORS  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 31 SHEET OF

TYPICAL CROSS SECTION OF  
PROPOSED FLOOD EMBANKMENT

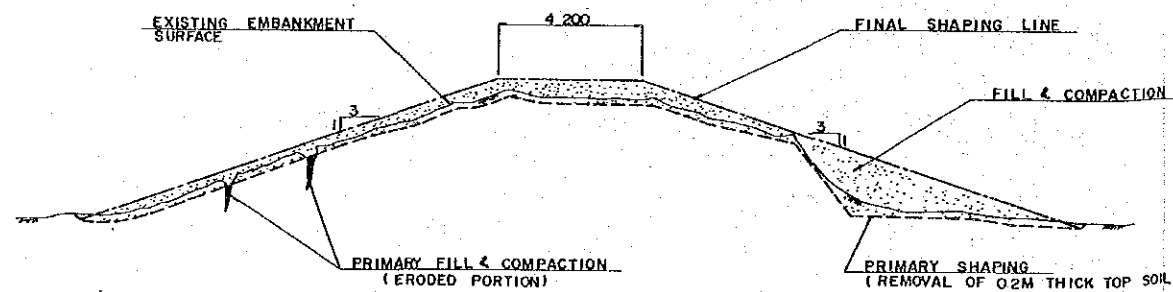


TYPE-A

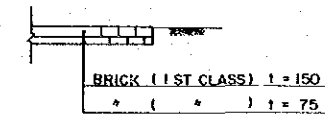
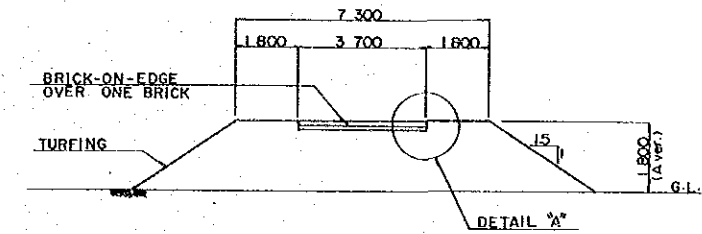


TYPE-B

REPAIR/IMPROVEMENT OF  
EXISTING FLOOD EMBANKMENT

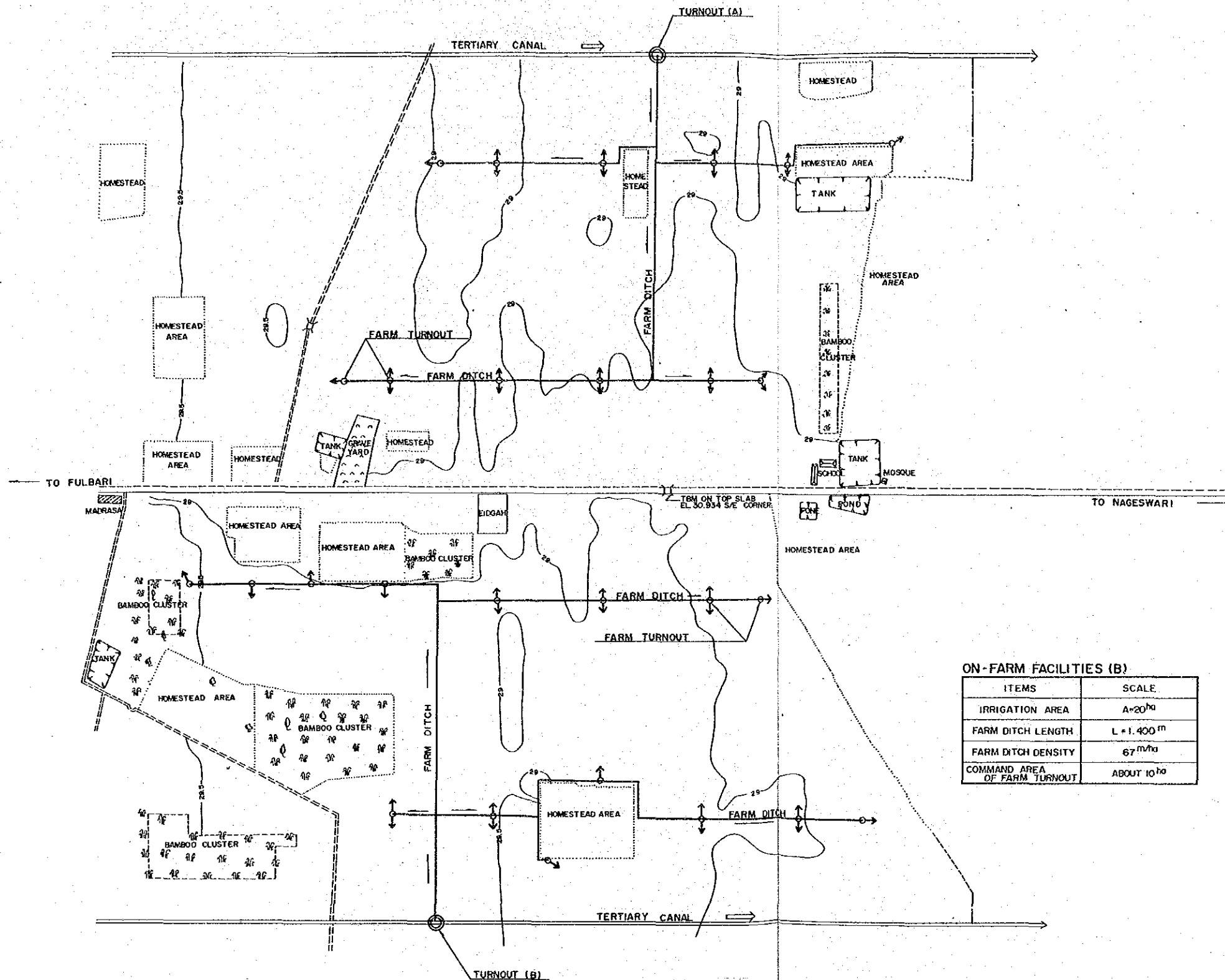


STANDARD SECTION  
OF ROAD



DETAIL "A"

THE PEOPLE'S REPUBLIC OF BANGLADESH BANGLADESH WATER DEVELOPMENT BOARD
THE KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT
FLOOD EMBANKMENTS & ROAD
JAPAN INTERNATIONAL COOPERATION AGENCY
DWG. No. 32      SHEET OF



ON-FARM FACILITIES (A)

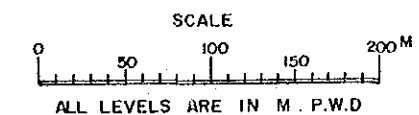
ITEMS	SCALE
IRRIGATION AREA	A = 20 <sup>ha</sup>
FARM DITCH LENGTH	L = 1.150 <sup>m</sup>
FARM DITCH DENSITY	58 m <sup>2</sup> /ha
COMMAND AREA OF FARM TURNOUT	ABOUT 10 <sup>ha</sup>

LEGEND

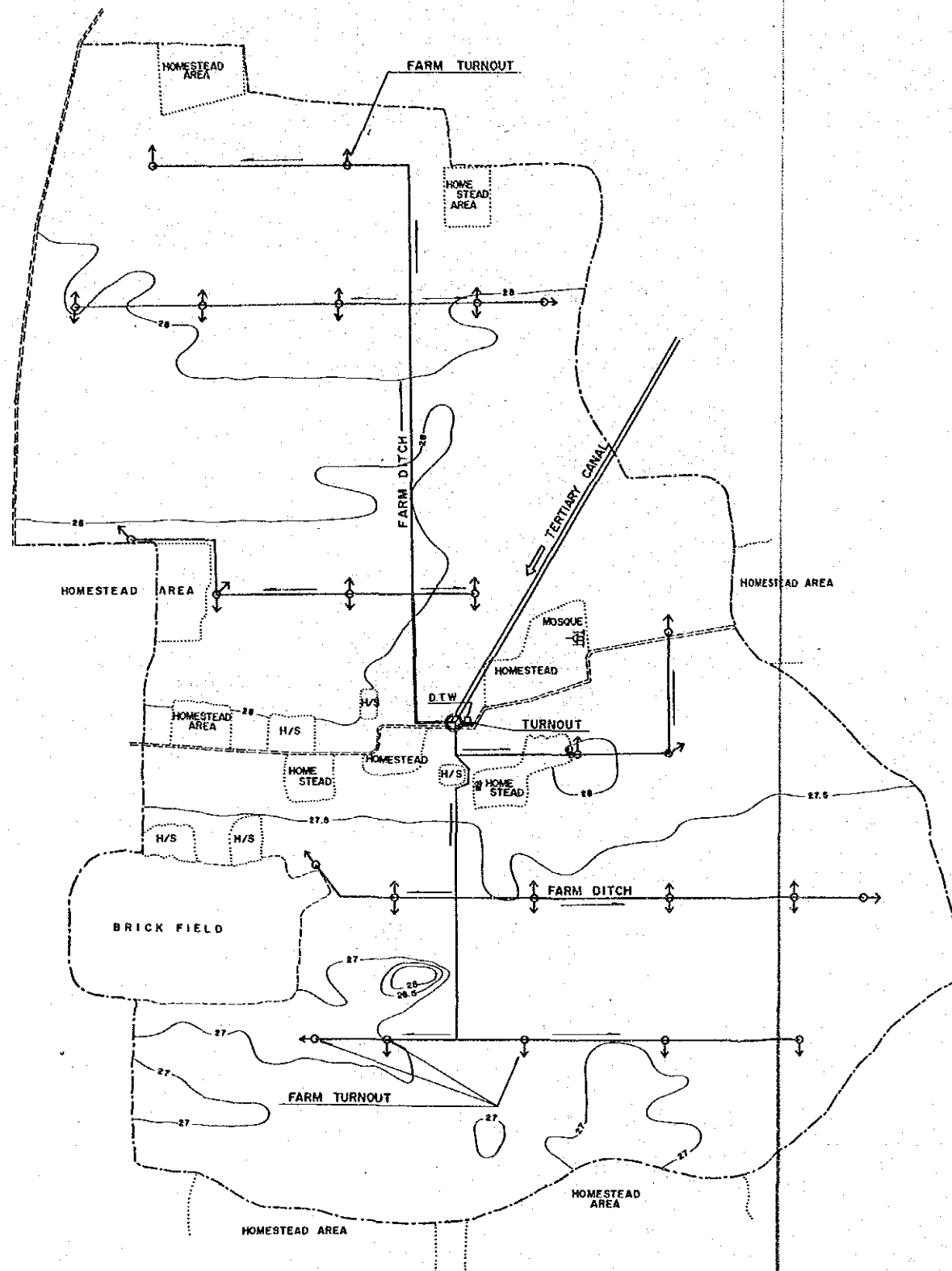
- ROAD: UQAZILA ROAD UNMETALLED
- HOMESTEAD
- TANK, POND
- TREES, BAMBOO CLUSTER
- MOSQUE
- GRAVEYARD
- CONTOUR LINES

ON-FARM FACILITIES (B)

ITEMS	SCALE
IRRIGATION AREA	A = 20 <sup>ha</sup>
FARM DITCH LENGTH	L = 1.400 <sup>m</sup>
FARM DITCH DENSITY	67 m <sup>2</sup> /ha
COMMAND AREA OF FARM TURNOUT	ABOUT 10 <sup>ha</sup>



THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD  
 THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT  
 PLAN OF ON-FARM DEVELOPMENT (I)  
 JAPAN INTERNATIONAL COOPERATION AGENCY  
 DWG. No. 33 SHEET 1 OF 2

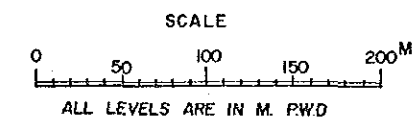


**ON-FARM FACILITIES**

ITEMS	SCALE
IRRIGATION AREA	A = 34 ha
FARM DITCH LENGTH	L = 2.350 <sup>m</sup>
FARM DITCH DENSITY	69 <sup>m</sup> /ha
COMMAND AREA OF FARM TURNOUT	ABOUT 1.0 ha

**LEGEND**

UNMETALLED ROAD	---
IRRIG. DRAIN (MASONRY)	—
D.T.W. HOUSE	□
HOMESTEAD, (H/S)	⬡
MOSQUE	⚡
TREES, BAMBOOS	⊕ 10
CONTOUR LINES	28 27.5



THE PEOPLE'S REPUBLIC OF BANGLADESH  
 BANGLADESH WATER DEVELOPMENT BOARD

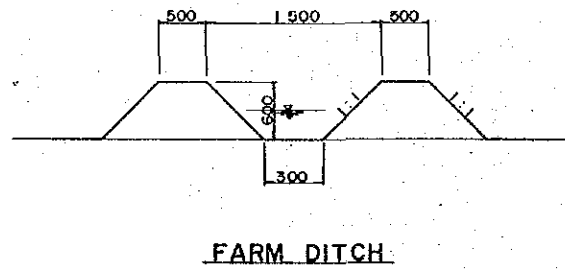
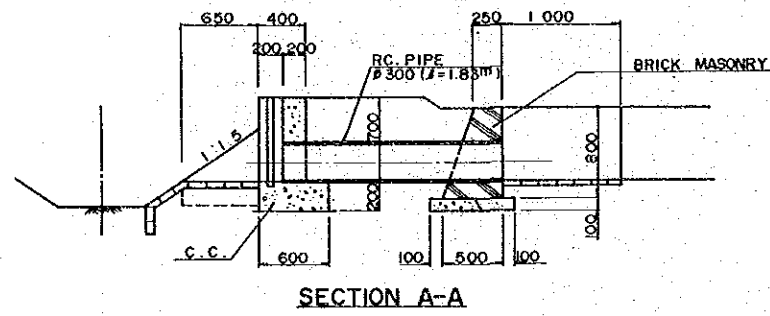
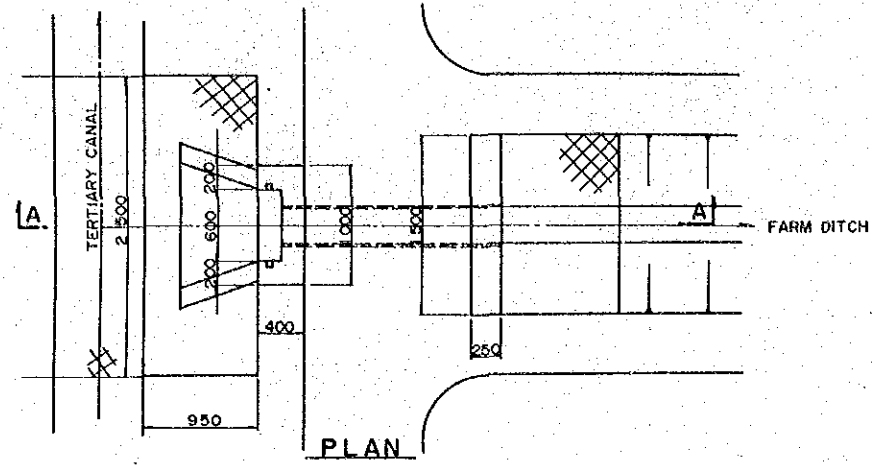
THE KURIGRAM  
 IRRIGATION AND FLOOD CONTROL PROJECT

PLAN OF ON-FARM DEVELOPMENT (2)

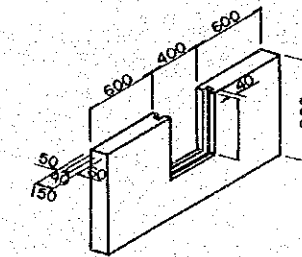
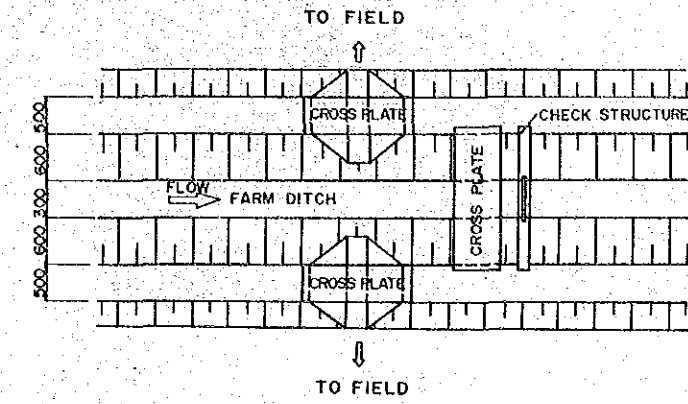
JAPAN INTERNATIONAL COOPERATION AGENCY

DWG.No. 34 SHEET 2 OF 2

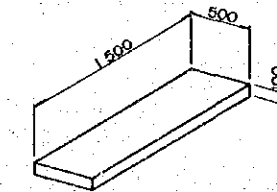
**TURNOUT**



**FARM TURNOUT**



DIMENSION OF CHECK STRUCTURE



DIMENSION OF CROSS PLATE

DIMENSION ; mm

THE PEOPLE'S REPUBLIC OF BANGLADESH BANGLADESH WATER DEVELOPMENT BOARD	
THE KURIGRAM IRRIGATION AND FLOOD CONTROL PROJECT	
ON-FARM FACILITIES	
JAPAN INTERNATIONAL COOPERATION AGENCY	
DWG. No: 35	SHEET OF



JICA