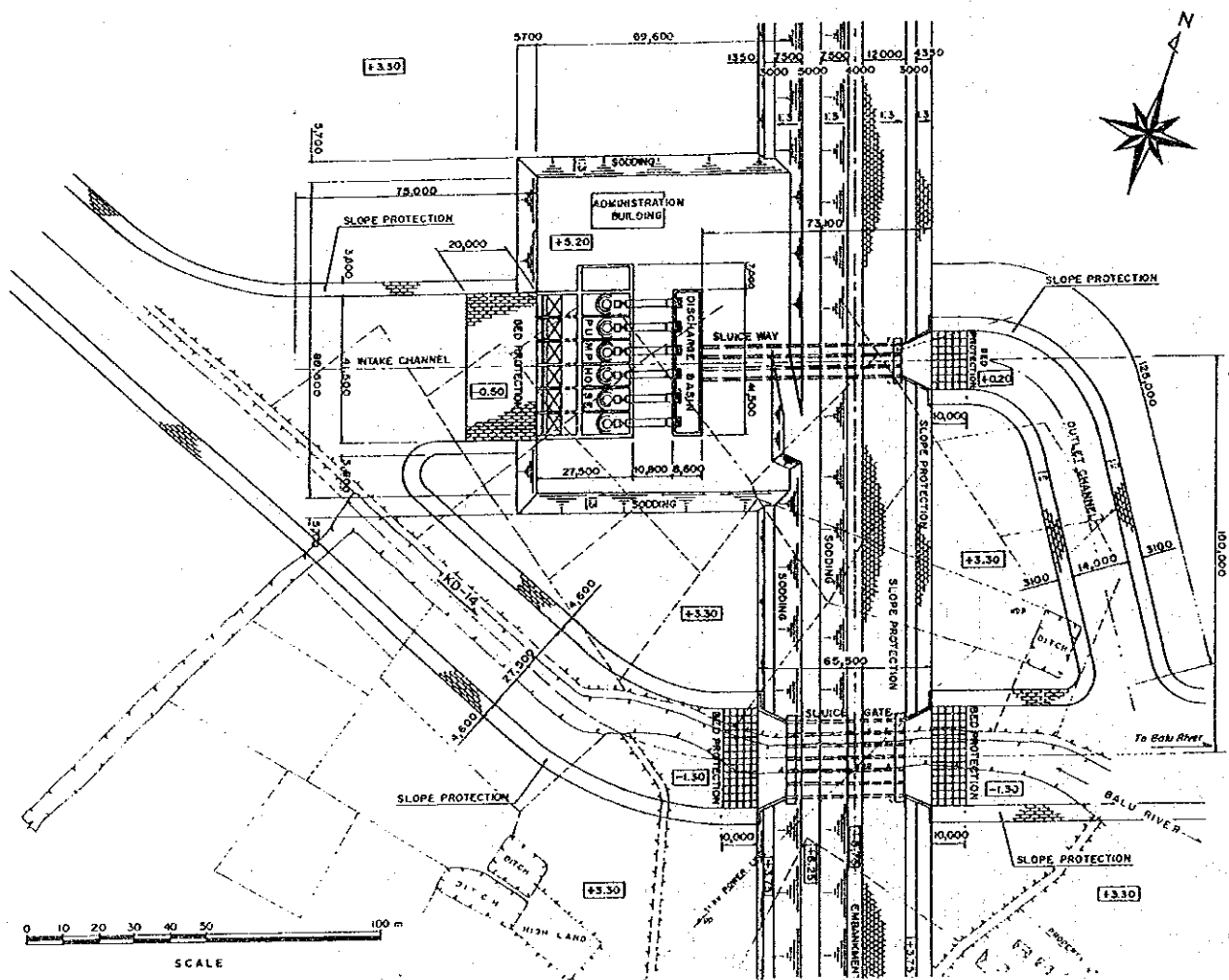


Perspective of Pumping Station



P.7B Pumping Station (Q=47.2 m³/s)

FIG. 6.1.12 (1)

LAYOUT OF PROPOSED P7B PUMPING STATION

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

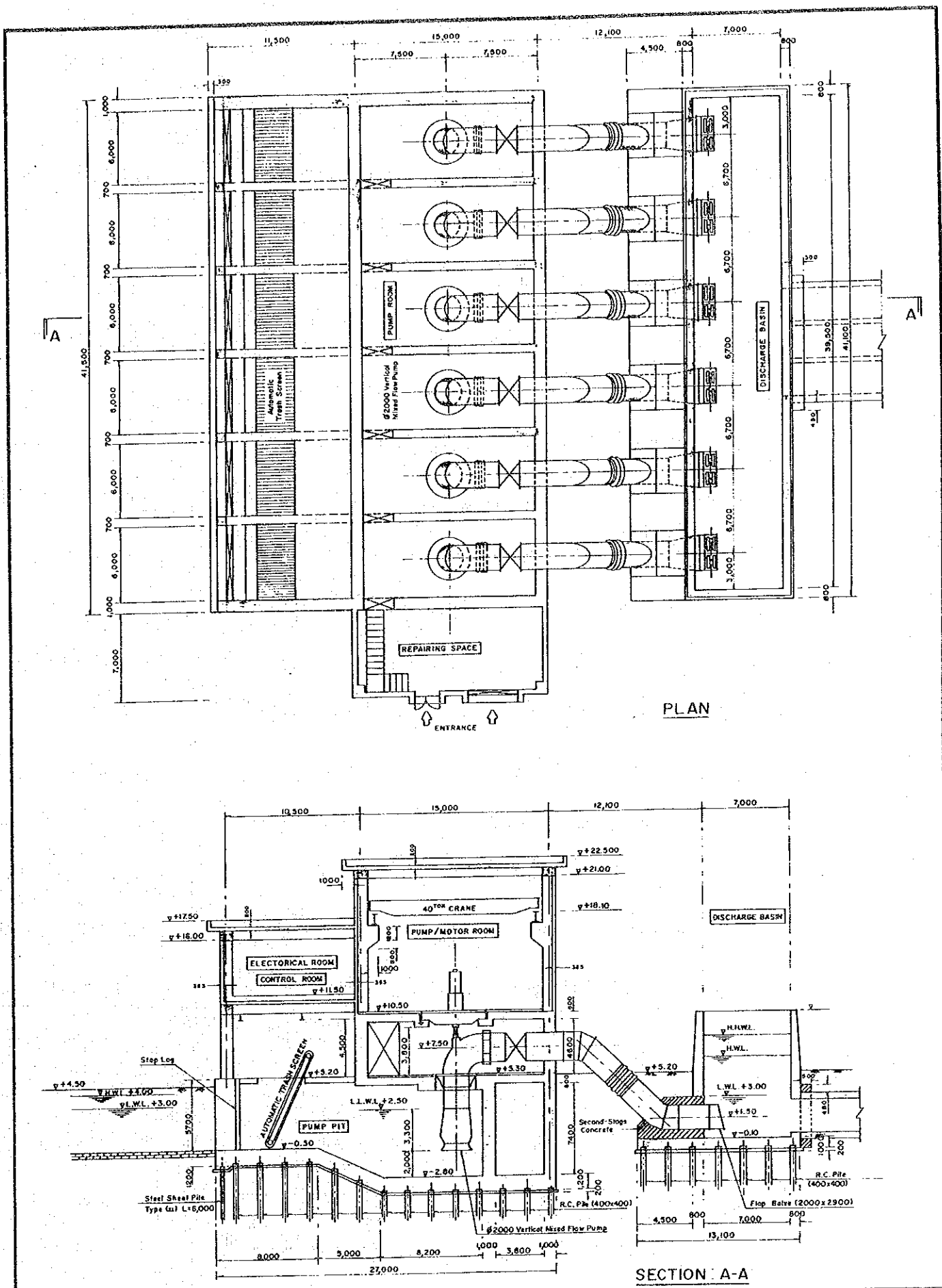
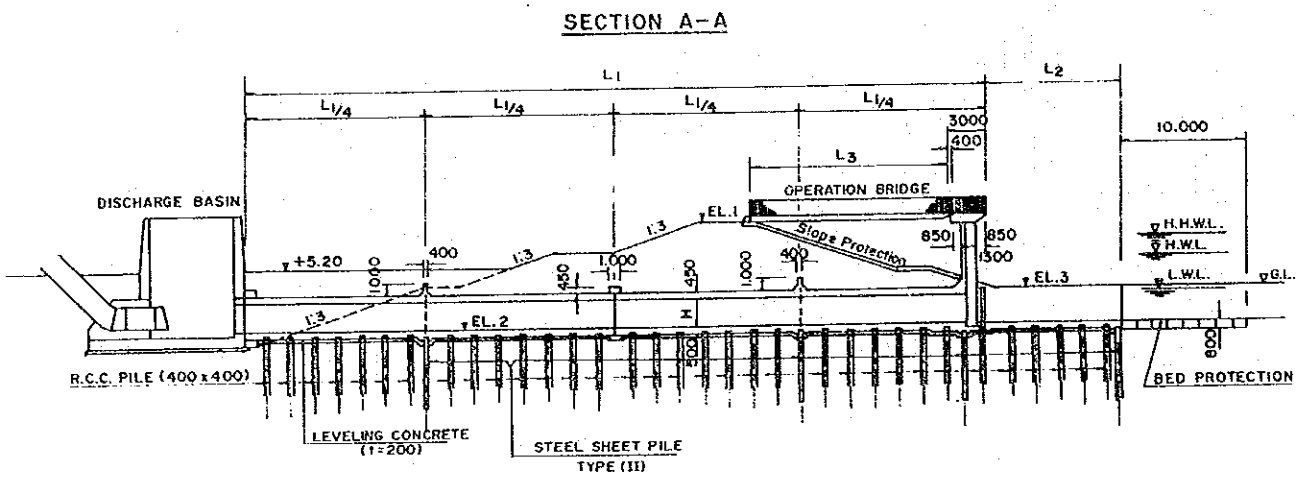
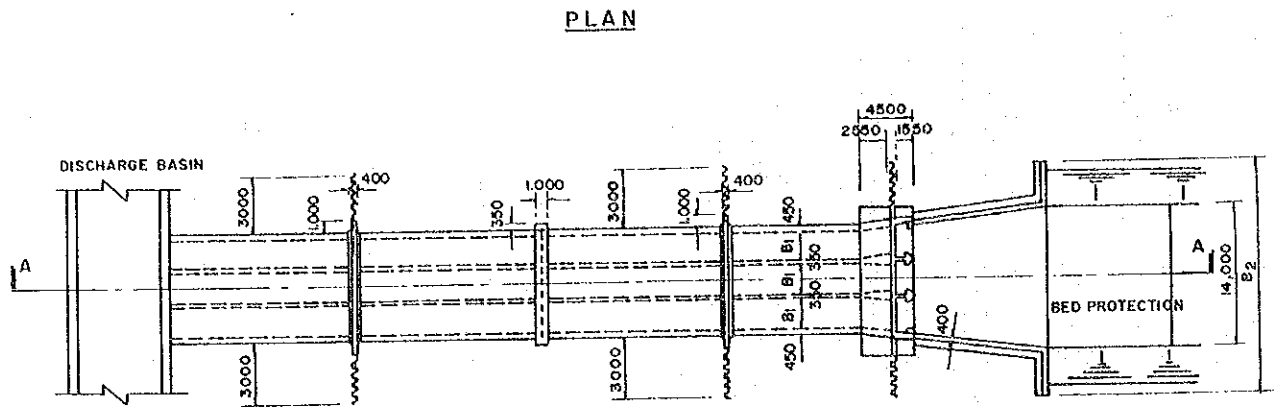


FIG. 6.1.12 (2)

TYPICAL DESIGN OF PROPOSED 50 M³/S CLASS PUMPING STATION (P6, P7A, P7B AND P11)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

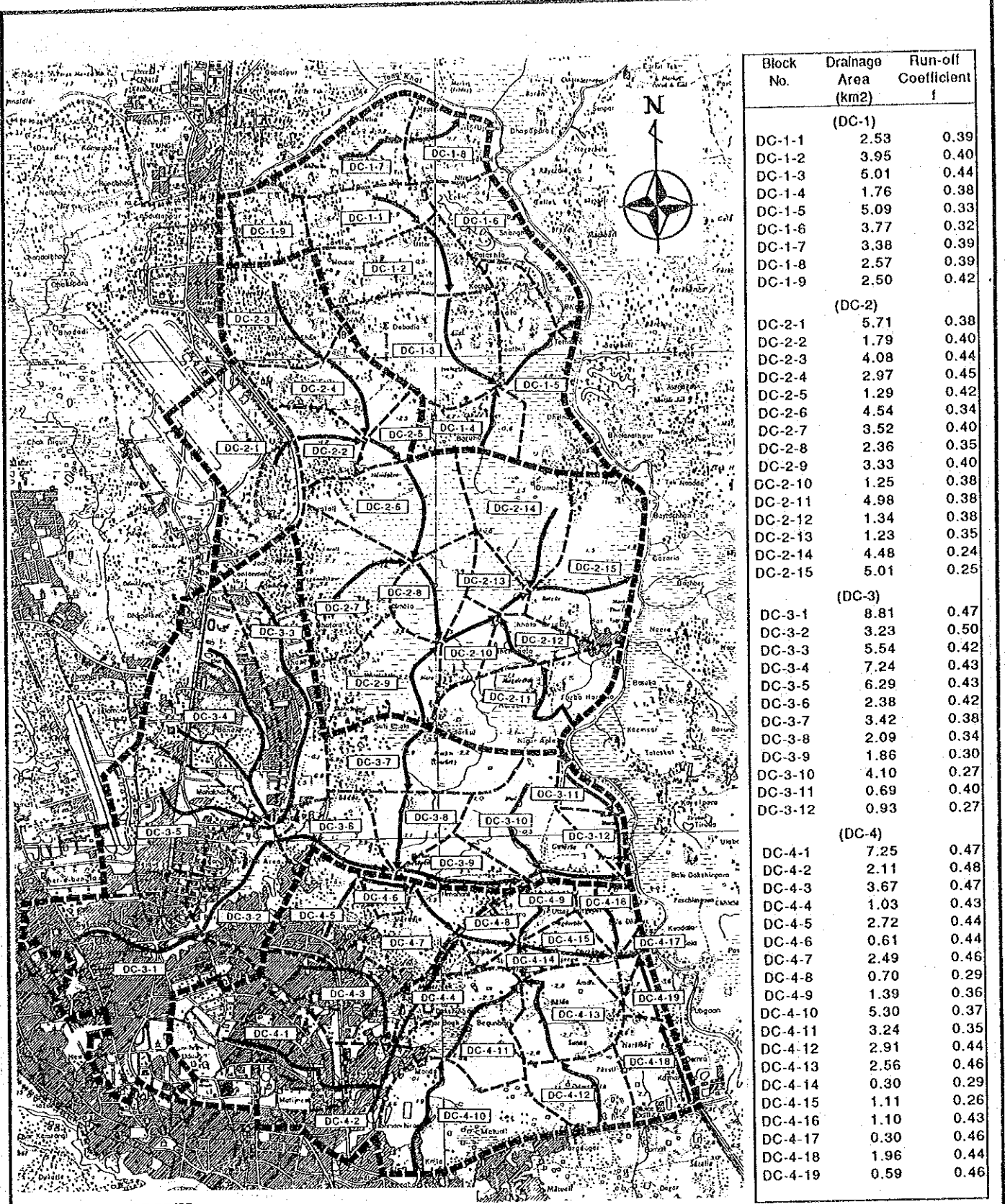


Main Feature of Sluice Way

Pump No.	Culvert				Outlet		O.Bridge	Elevation		
	B1 (mm)	H1 (mm)	L1 (mm)	n (Nos.)	B2 (mm)	L2 (mm)	L3 (mm)	EL.1	EL.2	EL.3
P.5	2,300	2,300	62,000	2	19,000	14,700	14,850	+9.35	+0.20	+1.70
P.6	2,700	2,700	61,200	3	20,000	14,000	14,800	+9.10	+0.20	+2.20
P.7A	2,700	2,700	60,000	3	21,600	13,400	14,500	+8.80	+0.20	+3.00
P.7B	2,500	2,500	60,000	3	22,200	13,100	14,650	+8.75	+0.20	+3.30
P.11	2,500	2,000	48,400	4	23,200	13,000	9,500	+8.00	+0.20	+3.80

FIG. 6.1.12 (3) TYPICAL DESIGN OF PROPOSED SLUICE WAY FOR 25 M³/S ~ 50 M³/S CLASS PUMPING STATION (P5, P6, P7A, P7B AND P11)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



Block No.	Drainage Area (km ²)	Run-off Coefficient f
(DC-1)		
DC-1-1	2.53	0.39
DC-1-2	3.95	0.40
DC-1-3	5.01	0.44
DC-1-4	1.76	0.38
DC-1-5	5.09	0.33
DC-1-6	3.77	0.32
DC-1-7	3.38	0.39
DC-1-8	2.57	0.39
DC-1-9	2.50	0.42
(DC-2)		
DC-2-1	5.71	0.38
DC-2-2	1.79	0.40
DC-2-3	4.08	0.44
DC-2-4	2.97	0.45
DC-2-5	1.29	0.42
DC-2-6	4.54	0.34
DC-2-7	3.52	0.40
DC-2-8	2.36	0.35
DC-2-9	3.33	0.40
DC-2-10	1.25	0.38
DC-2-11	4.98	0.38
DC-2-12	1.34	0.38
DC-2-13	1.23	0.35
DC-2-14	4.48	0.24
DC-2-15	5.01	0.25
(DC-3)		
DC-3-1	8.81	0.47
DC-3-2	3.23	0.50
DC-3-3	5.54	0.42
DC-3-4	7.24	0.43
DC-3-5	6.29	0.43
DC-3-6	2.38	0.42
DC-3-7	3.42	0.38
DC-3-8	2.09	0.34
DC-3-9	1.86	0.30
DC-3-10	4.10	0.27
DC-3-11	0.69	0.40
DC-3-12	0.93	0.27
(DC-4)		
DC-4-1	7.25	0.47
DC-4-2	2.11	0.48
DC-4-3	3.67	0.47
DC-4-4	1.03	0.43
DC-4-5	2.72	0.44
DC-4-6	0.61	0.44
DC-4-7	2.49	0.46
DC-4-8	0.70	0.29
DC-4-9	1.39	0.36
DC-4-10	5.30	0.37
DC-4-11	3.24	0.35
DC-4-12	2.91	0.44
DC-4-13	2.56	0.46
DC-4-14	0.30	0.29
DC-4-15	1.11	0.26
DC-4-16	1.10	0.43
DC-4-17	0.30	0.46
DC-4-18	1.96	0.44
DC-4-19	0.59	0.46

FIG. 6.1.13

SUB-DRAINAGE ZONE AND THEIR RUN-OFF COEFFICIENT : GREATER DHAKA EAST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



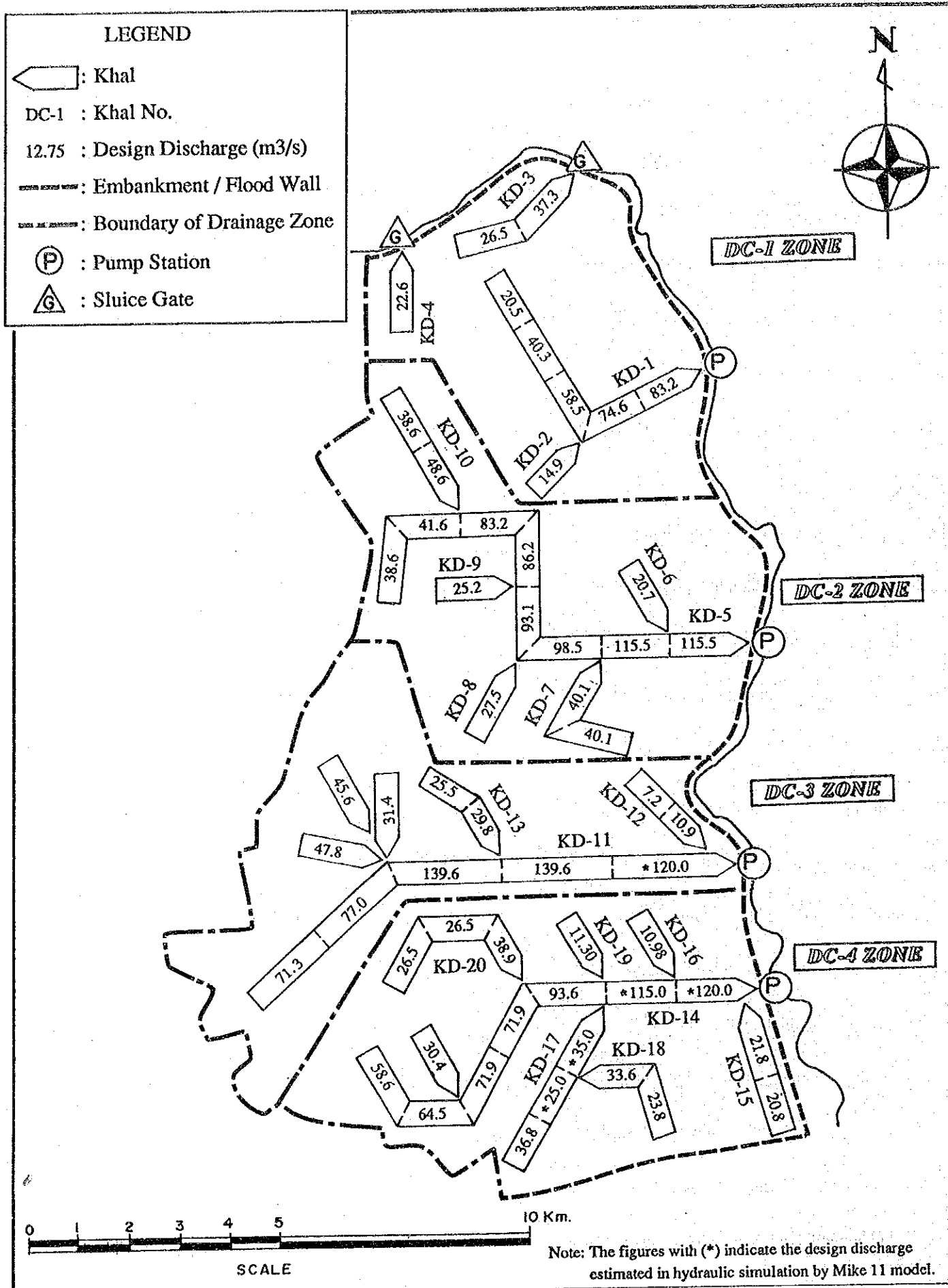
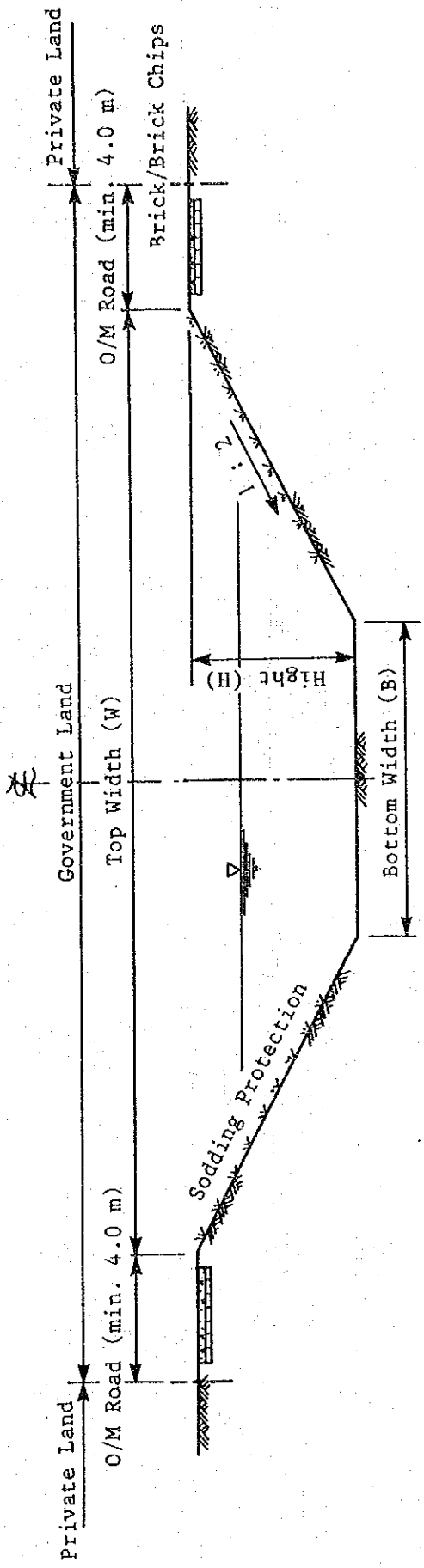


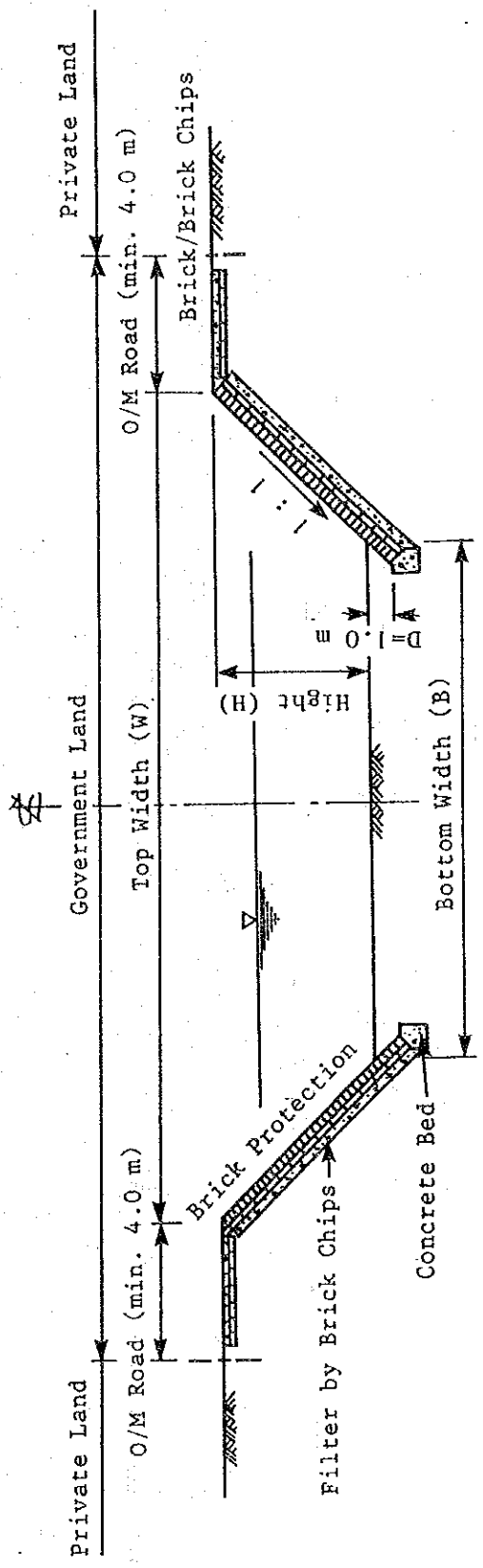
FIG. 6.1.14 DESIGN DISCHARGE FOR KHAL IMPROVEMENTS : GREATER DHAKA EAST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





TYPE (1) : TRAPEZOIDAL SHAPE WITH 1 : 2 SLOPE PROTECTION BY SODDING



TYPE (2) : TRAPEZOIDAL SHAPE WITH 1 : 1 SLOPE PROTECTED BY BRICK

FIG. 6.1.15 TYPICAL SECTION OF PROPOSED KHAL IMPROVEMENT

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



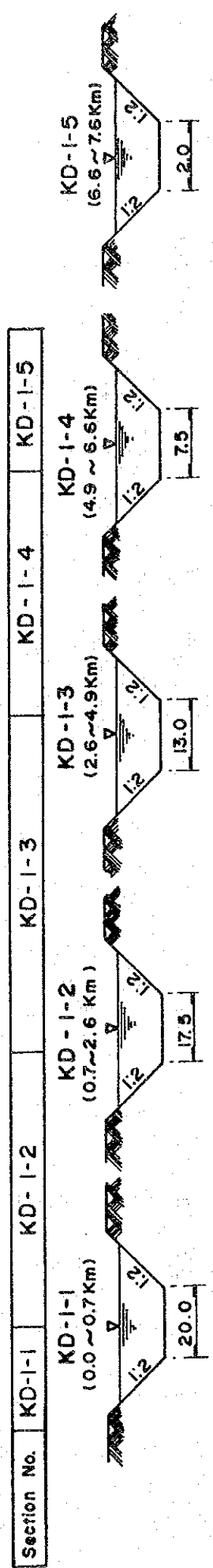
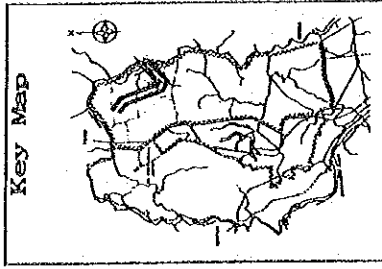
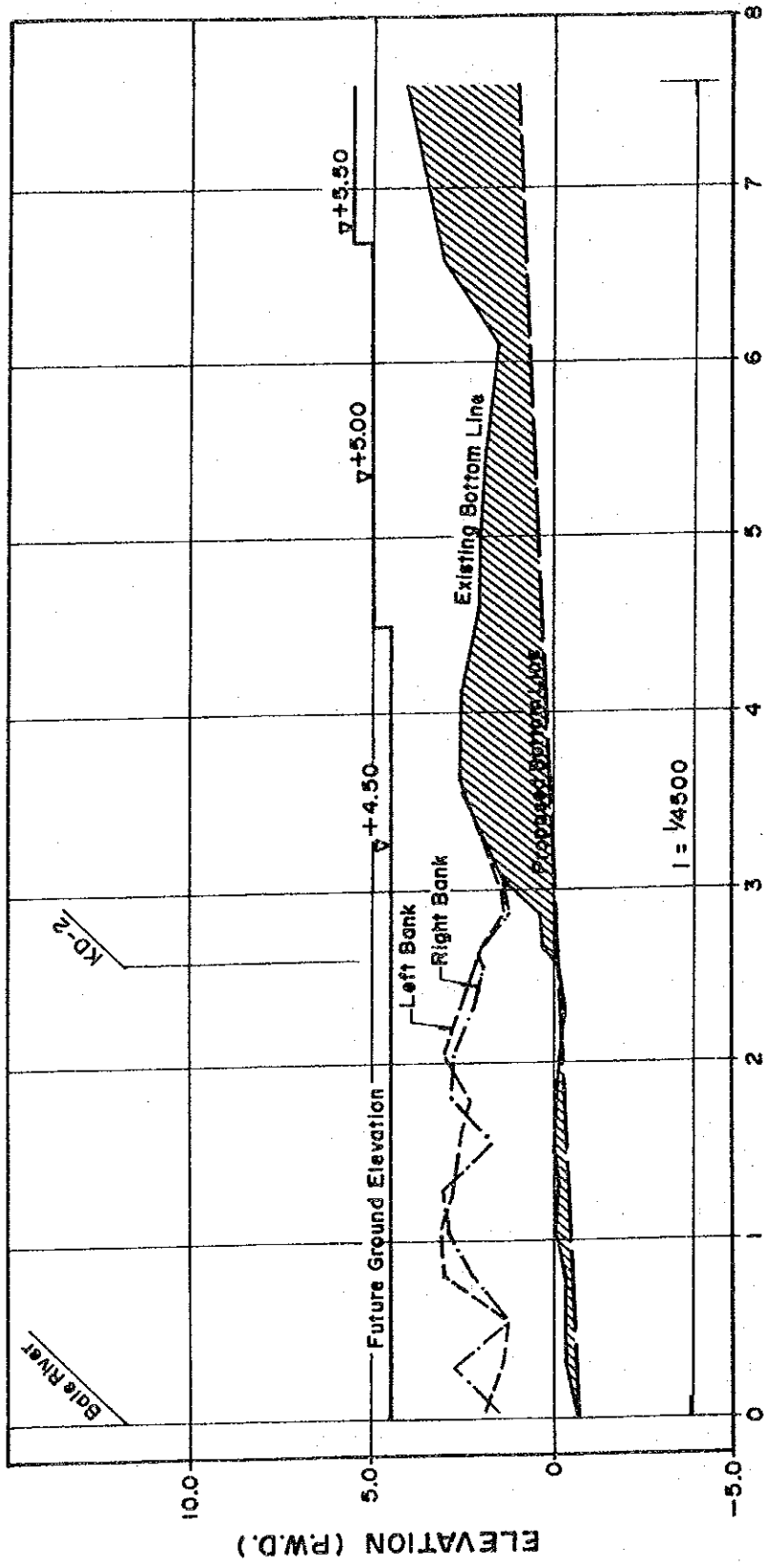
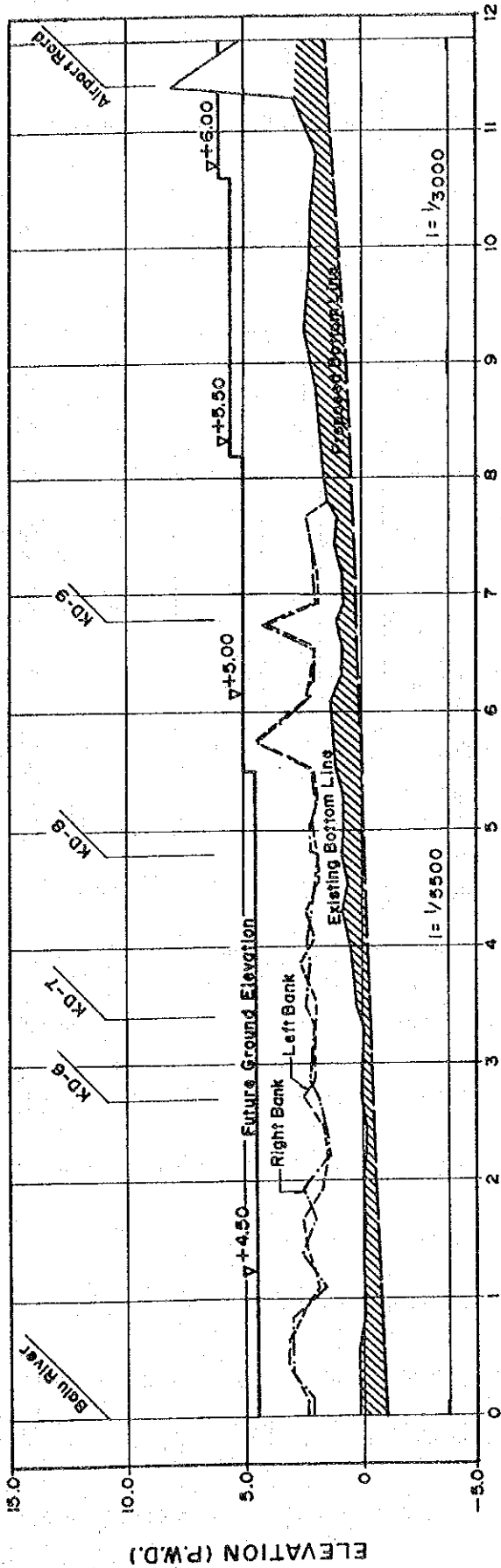


FIG. 6.1.16(1) PROPOSED LONGITUDINAL AND CROSS SECTIONS (KD-1)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





DISTANCE (Km)

Section No.	KD-5-1	KD-5-2	KD-5-3	KD-5-4	KD-5-5	KD-5-6	KD-5-7	KD-5-8
	KD-5-1 (0.0 ~ 2.7 Km)	KD-5-2 (2.7 ~ 3.4 Km)	KD-5-3 (3.4 ~ 4.8 Km)	KD-5-4 (4.8 ~ 6.8 Km)	KD-5-5 (6.8 ~ 9.0 Km)	KD-5-6 (9.0 ~ 10.0 Km)	KD-5-7 (10.0 ~ 11.4 Km)	KD-5-8 (11.4 ~ 11.8 Km)
	27.5	27.5	23.0	21.5	6.5	6.5	6.0	

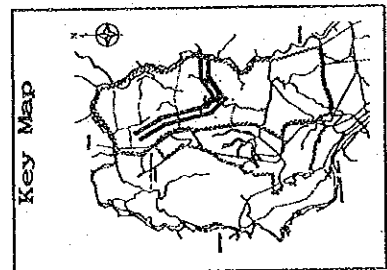
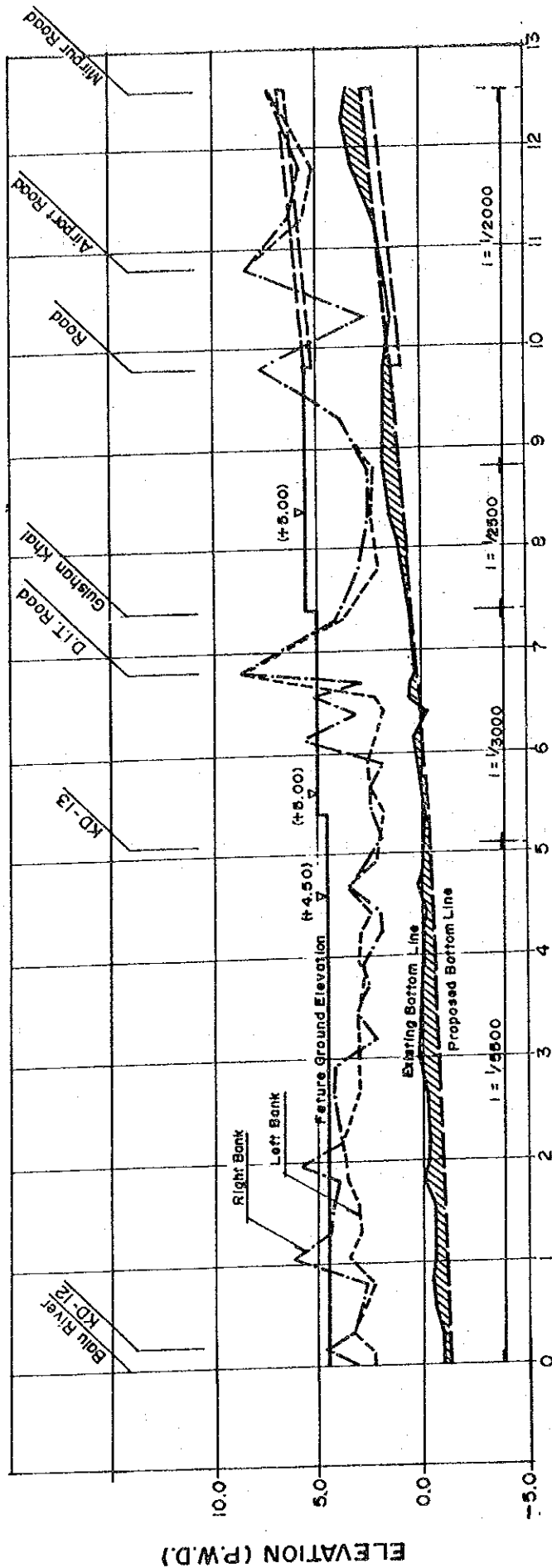


FIG. 6.1.16(2) PROPOSED LONGITUDINAL AND CROSS SECTIONS (KD-5)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO 8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





DISTANCE (Km.)

Section No.	KD-11-1	KD-11-2	KD-11-3	(A.D.B. Project Area)
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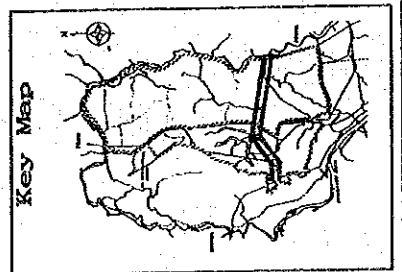
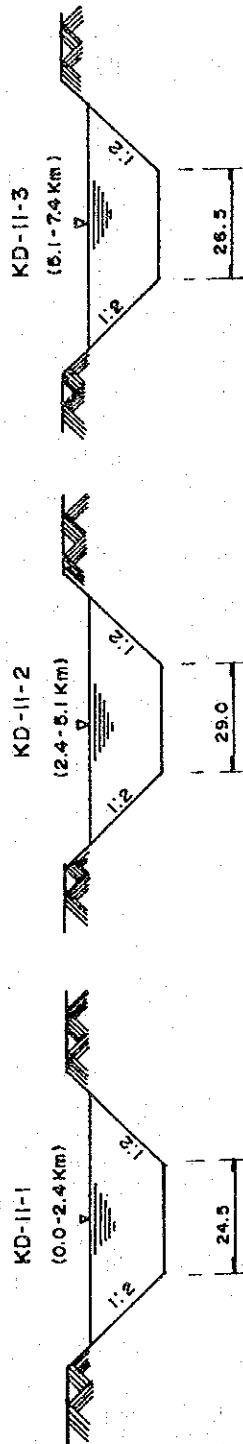
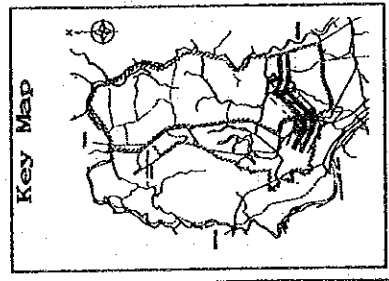
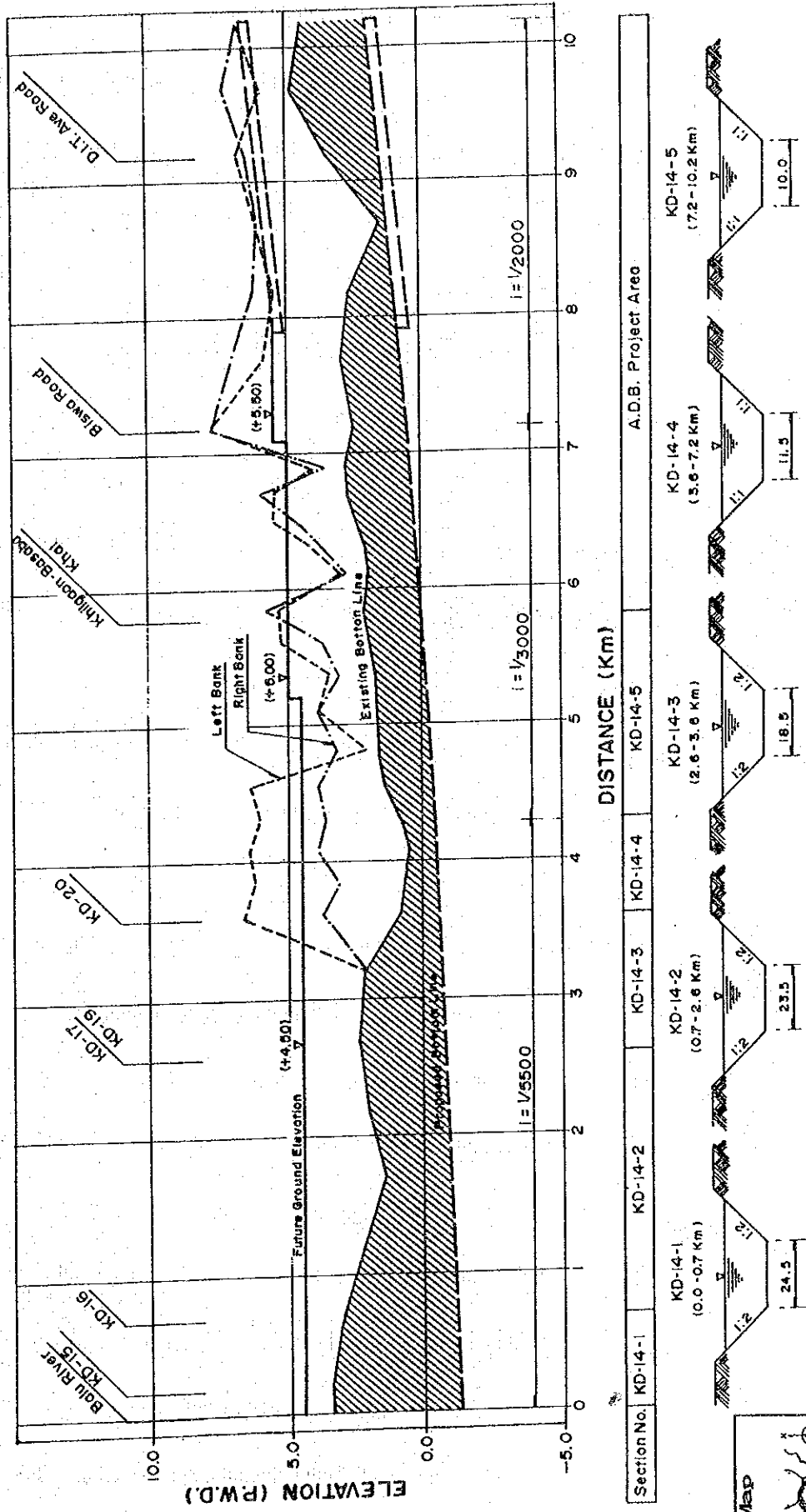


FIG. 6.1.16(3)

PROPOSED LONGITUDINAL AND CROSS SECTIONS (KD-11)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





Section No.	KD-14-1	KD-14-2	KD-14-3	KD-14-4	KD-14-5	A.D.B. Project Area	
	KD-14-1 (0.0 - 0.7 Km)	KD-14-2 (0.7 - 2.6 Km)	KD-14-3 (2.6 - 3.6 Km)	KD-14-4 (3.6 - 7.2 Km)	KD-14-5 (7.2 - 10.2 Km)		
	24.5	23.5	18.5	11.5	10.0		

FIG. 6.1.16(4) PROPOSED LONGITUDINAL AND CROSS SECTIONS (KD-14)
 GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF
 BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



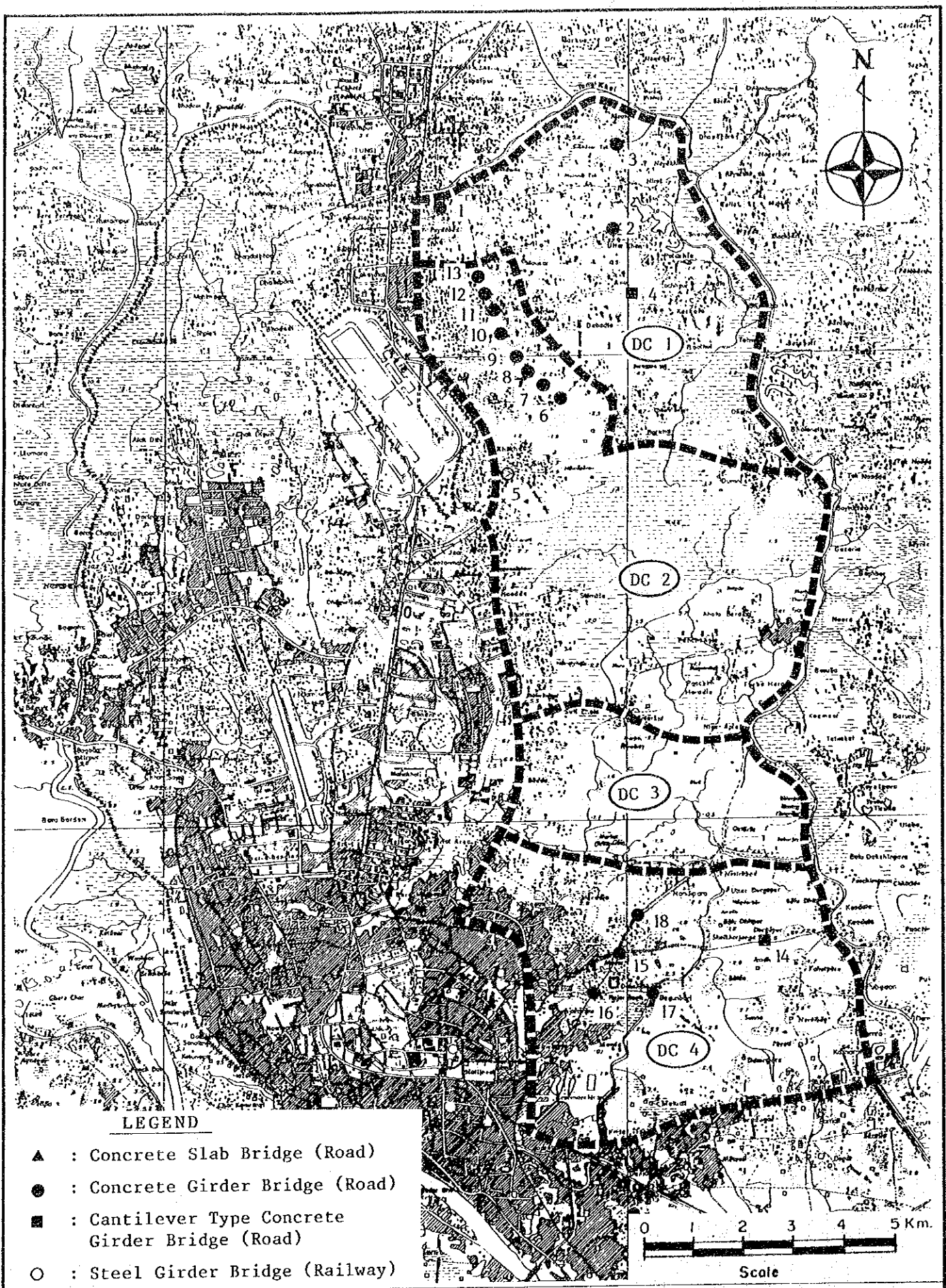


FIG. 6.1.17

LOCATION OF PROPOSED BRIDGES : GREATER DHAKA EAST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

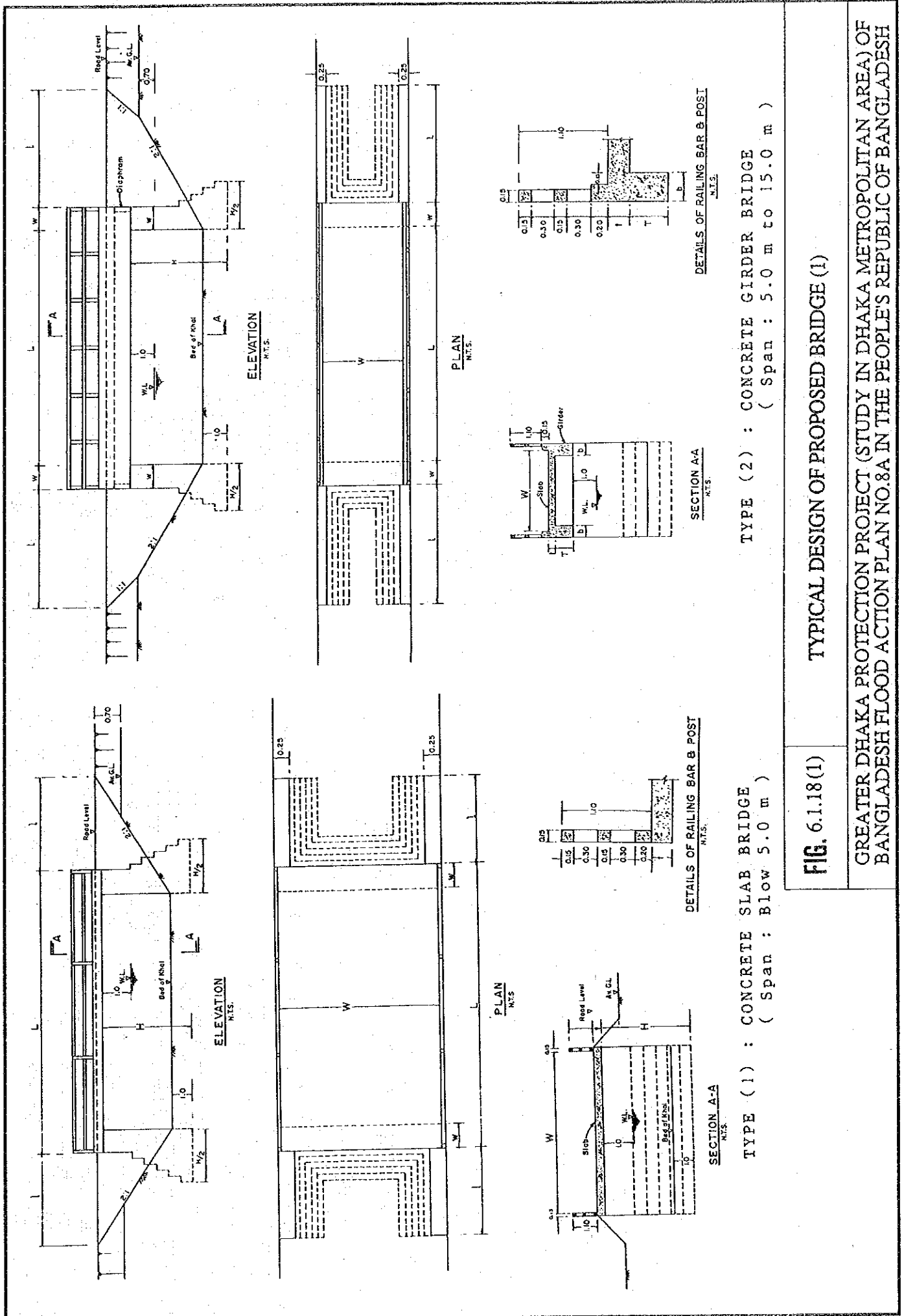
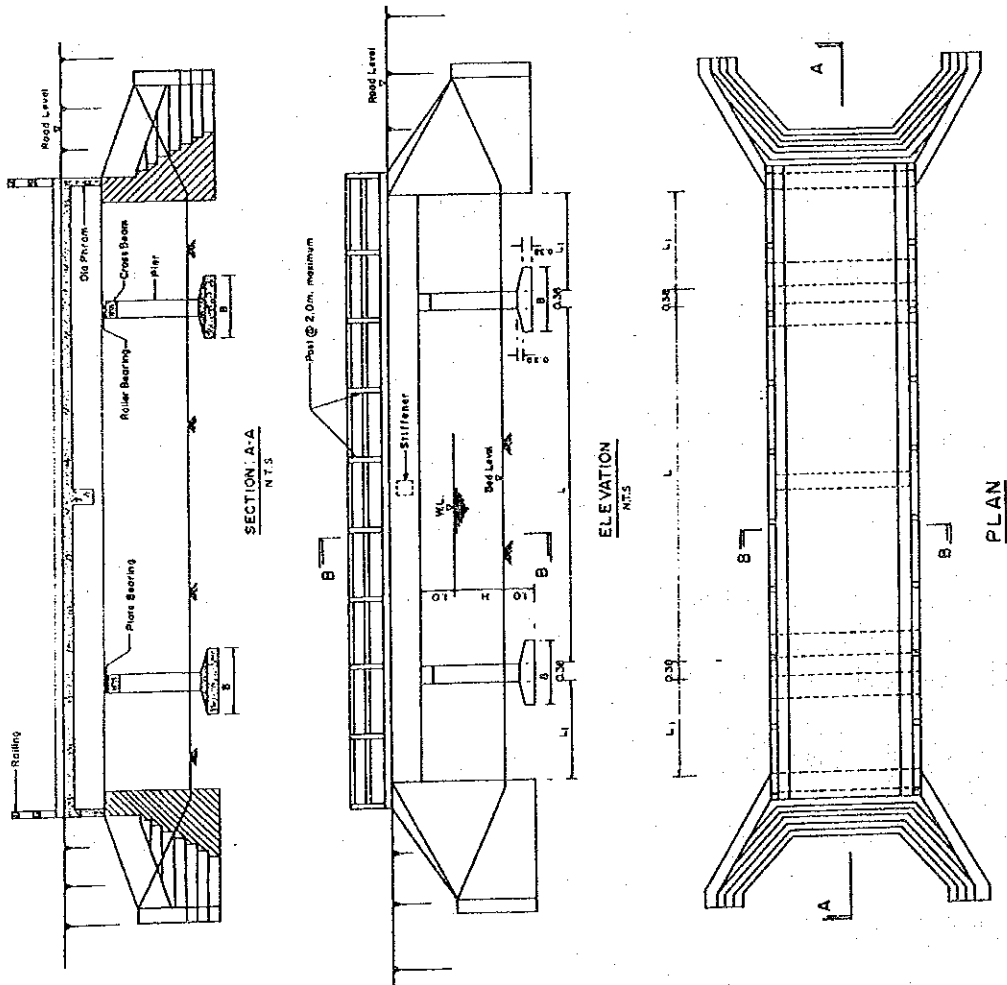


FIG. 6.1.18(1)

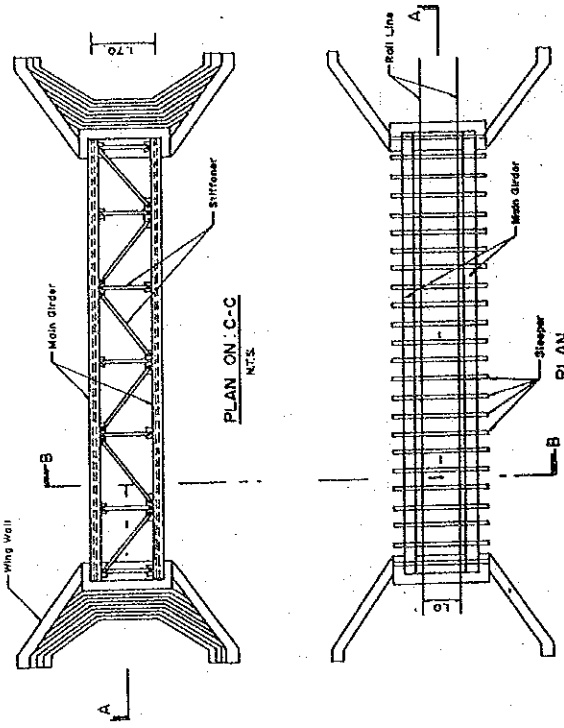
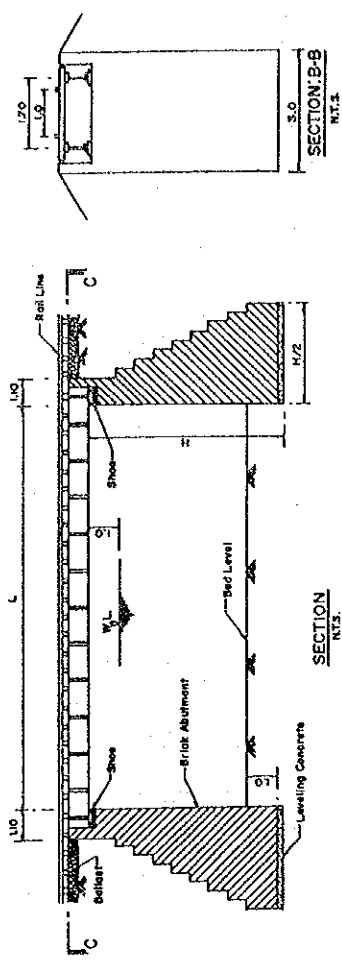
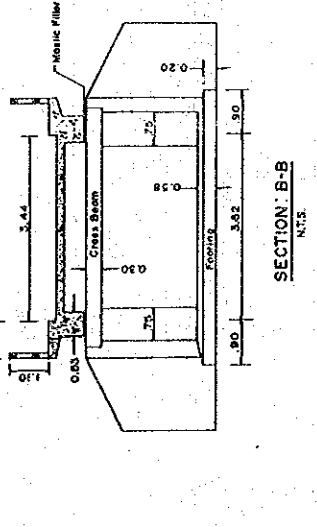
TYPICAL DESIGN OF PROPOSED BRIDGE (1)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





TYPE (3) :
CANTILEVER TYPE
CONCRETE GIRDER BRIDGE
(Span : 15.0 m to 30 m)



TYPE (4) : STEEL GIRDER RAILWAY BRIDGE

FIG. 6.1.18 (2)

TYPICAL DESIGN OF PROPOSED BRIDGE (2)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



TABLE 6.2.1(1) HYDRAULIC REQUIREMENTS OF PROPOSED PUMPING STATION : DND

Proposed Pumping Station	Drainage Zone		Discharge Capacity (m ³ /s)	Design Water Level (m, PWD)						Static Head (m)		Remarks
	No.	Area (km ²)		Outer		Inner		Design	Max.			
				H.H.W.L	H.W.L	H.W.L	L.W.L					
P 10	NA-1	25.10	14.50	---	5.75	3.00	1.80	1.00	4.75	---	Existing Pumping Station	
P 11	NA-2	31.69	50.20	7.10	5.65	3.00	4.00	3.00	2.65	4.10		

Note : 1. H.H.W.L. and H.W.L. of outer design water level means that of 100-year and 2-year frequency flood respectively

TABLE 6.2.1(2) HYDRAULIC REQUIREMENTS OF PROPOSED RETARDING POND : DND

Proposed Retarding Pond	Drainage Zone	Pond Area (ha)	Storage Capacity (x 10 ⁶ m ³)	Design Water Level (m, PWD)		Remarks
				H.W.L	L.W.L	
RP 10-1	NA-1	196	1.96	4.00	3.00	
RP 10-2	NA-1	45	0.45	4.00	3.00	
RP 10-3	NA-1	60	0.60	4.00	3.00	
RP 11-1	NA-2	90	0.90	4.00	3.00	
RP 11-2	NA-2	225	2.25	4.00	3.00	
RP 11-3	NA-2	66	0.66	4.00	3.00	

TABLE 6.2.2(1) PROPOSED KHAL IMPROVEMENT WORKS : DND

DND Project Area (NA)

Zone	Khal No.	Khal Length (km)	Required Hydraulic Section Wb x Wu x H (m x m x m)			Open Channel		Covered Channel		Bridge (Places)	Aqueduct (Places)	Dredging (1000m3)	Maintenance Flood (km)	Land Acquisition (ha)
						Brick Protection (km)	Sodding (km)	Box Culvert (km)	Brick Pipe (km)					
NA-1	KN-1-1	2.10	5.5	13.5	4.0	2.10	-	-	-	-	22.27	2.10	0.61	
	KN-1-2	0.70	14.5	30.5	4.0	-	0.70	-	-	1	34.44	0.70	1.72	
	KN-1-3	1.00	13.0	29.0	4.0	-	1.00	-	-	1	43.02	1.00	2.54	
	KN-1-4	0.60	10.0	26.0	4.0	-	0.60	-	-	-	11.90	0.60	0.82	
	KN-1-5	1.80	10.0	26.0	4.0	-	1.80	-	-	1	76.88	1.80	4.83	
	KN-1-6	1.40	8.5	24.0	3.9	-	1.40	-	-	1	49.86	1.40	3.98	
	KN-1-7	1.20	3.5	17.0	3.4	-	1.20	-	-	-	29.51	1.20	2.67	
	KN-1-8	0.60	2.5	8.8	3.1	0.60	-	-	-	-	5.91	0.60	0.22	
	KN-2-1	1.60	2.0	17.5	3.9	-	1.60	-	-	3	34.36	1.60	3.70	
	KN-2-2	1.60	2.5	9.4	3.5	1.60	-	-	-	2	21.32	1.60	2.37	
	KN-3	1.70	2.0	17.4	3.9	-	1.70	-	-	1	16.78	1.70	2.92	
	KN-13	1.20	2.0	17.6	3.9	-	1.20	-	-	1	39.35	1.20	3.49	
	KN-14-1	1.50	6.5	22.0	3.9	-	1.50	-	-	-	48.18	1.50	4.92	
	KN-14-2	1.50	3.0	18.0	3.8	-	1.50	-	-	-	36.30	1.50	4.45	
	KN-14-3	1.60	2.0	8.2	3.1	1.60	-	-	-	1	27.68	1.60	3.18	
	KN-15	1.60	2.0	14.8	3.2	-	1.60	-	-	1	11.69	1.60	4.32	
KN-16	2.20	4.0	11.4	3.7	2.20	-	-	-	-	43.04	2.20	4.68		
Sub-Total	23.90					8.10	15.80	0.00	0.00	13	1	552.49	23.90	51.42
NA-2	KN-4-1	1.80	33.5	41.8	4.2	1.80	-	-	-	3	-	229.56	1.80	4.37
	KN-4-2	1.30	10.5	27.2	4.2	-	1.30	-	-	-	-	118.68	1.30	4.93
	KN-4-3	1.20	10.5	27.2	4.2	-	1.20	-	-	2	-	61.65	1.20	2.61
	KN-4-4	1.50	5.5	21.7	4.0	-	1.50	-	-	2	-	73.93	1.50	4.16
	KN-4-5	1.80	4.0	11.2	3.6	1.80	-	-	-	4	-	24.91	1.80	1.27
	KN-4-6	0.80	3.5	10.0	3.3	0.80	-	-	-	1	-	20.80	0.80	0.67
	KN-5-1	1.80	22.5	38.7	4.1	-	1.80	-	-	-	-	256.96	1.80	6.03
	KN-5-2	1.00	9.5	17.5	4.0	1.00	-	-	-	-	-	67.23	1.00	2.40
	KN-6	0.90	2.0	17.9	4.0	-	0.90	-	-	-	-	18.44	0.90	1.36
	KN-7-1	2.40	12.0	28.7	4.2	-	2.40	-	-	1	1	196.23	2.40	7.92
	KN-7-2	0.80	12.0	28.7	4.2	-	0.80	-	-	-	-	42.41	0.80	2.52
	KN-7-3	1.20	7.0	15.1	4.1	1.20	-	-	-	-	-	24.82	1.20	1.36
	KN-7-4	1.40	4.5	11.9	3.7	1.40	-	-	-	6	-	34.30	1.40	1.18
	KN-7-5	0.80	2.0	8.8	3.4	0.80	-	-	-	1	-	8.70	0.80	0.58
	KN-8	1.00	2.0	18.4	4.1	-	1.00	-	-	-	-	20.54	1.00	1.65
	KN-9	1.30	2.0	18.3	4.1	-	1.30	-	-	1	-	31.32	1.30	2.20
	KN-10	1.80	2.0	16.3	3.6	-	1.80	-	-	2	-	20.00	1.80	2.43
KN-11	1.40	2.0	18.2	4.1	-	1.40	-	-	-	-	30.19	1.40	3.14	
KN-12	1.60	2.0	9.3	3.6	1.60	-	-	-	1	-	8.96	1.60	0.76	
KN-17	1.50	2.0	15.8	3.5	-	1.50	-	-	1	-	47.32	1.50	4.18	
Sub-Total	27.30					10.40	16.90	0.00	0.00	25	1	1336.95	27.30	55.72
Total	51.20					18.50	32.70	0.00	0.00	38	2	1889.44	51.20	107.14

TABLE 6.2.2(2) PROPOSED KHAL IMPROVEMENT RELATED WORKS
(BRIDGE AND AQUEDUCT) : DND

Zone	Khal No.	Bridge No.	Existing		Required		Proposed			Remarks
			Type	Size (m x m)	Size (m x m)	Type	Size (m x m)	Width		
NA-1	KN-1-1	1	Girder bridge	12.50 x 5.00	6.65 x 5.00	-	-	-	Road bridge	
	"	2	" "	8.40 x 5.00	6.50 x 5.00	-	-	-	" "	
	KN-1-2	3	Box culvert	4.70 x 4.70	15.80 x 5.00	Girder bridge	15.8 x 5.00	40.00	Highway bridge	
	KN-1-3	4	Girder bridge	11.00 x 3.00	14.75 x 5.00	" "	14.7 x 5.00	3.66	Road bridge	
	KN-1-5	5	Box culvert	4.50 x 4.50	12.60 x 5.00	" "	12.6 x 5.00	40.00	Highway bridge	
	KN-1-6	6	Slab bridge	4.85 x 2.30	11.32 x 4.90	" "	11.5 x 4.90	3.66	Road bridge	
	KN-1-7	7	Deck-Rly.	11.00 x 4.88	6.26 x 4.88	-	-	-	Railway bridge	
	"	8	Girder bridge	8.00 x 4.75	6.47 x 4.75	-	-	-	Road bridge	
	NA-2-1	9	Aqueduct	4.00 x 0.61	6.68 x 0.61	Rect. Aqueduct	7.00 x 0.61	"	Rect. Aqueduct	
	"	10	Pipe	0.91 x 2.00	6.68 x 4.95	Girder bridge	6.70 x 4.95	"	Road bridge	
	"	11	Slab	1.09 x 1.57	6.77 x 4.90	" "	6.80 x 4.90	"	" "	
	"	12	Pipe	0.91 x 1.00	6.77 x 4.90	" "	6.80 x 4.90	"	" "	
	"	13	Slab	91.00 x 1.35	3.71 x 4.87	Slab bridge	3.80 x 4.87	"	" "	
	KN-2-2	14	Pipe	0.91 x 1.00	3.94 x 4.65	" "	4.00 x 4.65	"	" "	
	KN-3	15	-	-	6.73 x 4.90	Girder bridge	6.80 x 4.90	"	" "	
	KN-13	16	-	-	6.69 x 5.00	" "	6.70 x 5.00	"	" "	
	KN-14-3	17	-	-	2.96 x 4.70	Slab bridge	3.00 x 4.70	7.00	" "	
	KN-15	18	-	-	4.92 x 4.80	" "	5.00 x 4.80	3.66	" "	
NA-2	KN-4-1	19	Deck Rly.	18.3 x 7.00	26.18 x 5.20	Deck Girder	26.10 x 5.20	1.70	Railway bridge	
	"	20	Pipe	0.45 x 2.00	29.18 x 5.20	Cantilever	26.10 x 5.20	3.66	Road bridge	
	"	21	"	0.91 x 1.00	26.18 x 5.20	Deck Girder	26.10 x 5.20	1.70	Railway bridge	
	KN-4-3	22	"	0.91 x 1.00	13.19 x 5.17	Girder bridge	13.20 x 5.20	3.66	Road bridge	
	"	23	"	0.61 x 1.00	13.19 x 5.17	" "	13.20 x 5.20	"	" "	
	KN-4-4	24	Girder bridge	5.50 x 3.70	9.37 x 5.10	" "	9.40 x 5.10	"	" "	
	"	25	Arch bridge	4.50 x 4.85	9.50 x 5.04	" "	9.50 x 5.00	"	" "	
	KN-4-5	26	Pipe	0.91 x 1.00	4.95 x 4.85	Slab bridge	5.00 x 4.90	"	" "	
	"	27	"	"	5.02 x 4.80	girder bridge	5.10 x 4.80	"	" "	
	"	28	"	"	5.09 x 4.75	" "	5.10 x 4.80	"	" "	
	"	29	"	"	5.15 x 4.70	" "	5.20 x 4.70	"	" "	
	KN-4-6	30	Box culvert	0.70 x 0.80	4.40 x 4.59	Deck Girder	4.40 x 4.60	1.70	Railway bridge	
	KN-5-2	31	Girder bridge	13.00 x 5.00	13.30 x 5.00	-	-	-	Road bridge	
	KN-6	32	" "	10.80 x 5.10	6.85 x 5.10	-	-	-	" "	
	"	33	" "	7.00 x 5.20	6.85 x 5.20	-	-	-	" "	
	"	34	" "	10.70 x 5.15	6.85 x 5.15	-	-	-	" "	
	KN-7-1	35	Aqueduct	3.60 x 1.80	14.24 x 1.37	Rect. aqueduct	15.00 x 1.37	0.91	Rect. Aqueduct	
	"	36	Slab bridge	2.40 x 2.50	14.24 x 5.17	Girder bridge	14.30 x 5.17	3.66	Road bridge	
	KN-7-4	37	Pipe	0.91 x 2.00	5.26 x 5.07	" "	5.30 x 5.07	"	" "	
	"	38	Slab bridge	0.95 x 1.65	5.28 x 5.05	" "	5.30 x 5.05	"	" "	
	"	39	Pipe	0.61 x 1.00	5.35 x 5.00	" "	5.35 x 5.00	"	" "	
	"	40	-	-	5.42 x 4.95	" "	5.45 x 4.95	"	" "	
	"	41	Pipe	0.91 x 1.00	5.49 x 4.90	" "	5.50 x 4.90	"	" "	
	"	42	Slab bridge	2.30 x 2.00	5.56 x 4.85	" "	5.56 x 4.85	"	" "	
	KN-7-5	43	Pipe	0.45 x 1.00	3.47 x 4.72	Deck Girder	3.50 x 4.72	1.70	Railway bridge	
	KN-9	44	Slab bridge	3.00 x 1.90	7.05 x 5.10	Girder	7.00 x 5.10	3.66	Road bridge	
	"	45	Girder bridge	10.40 x 5.00	7.05 x 5.10	-	-	-	" "	
	KN-10	46	Pipe	0.45 x 1.00	6.26 x 4.65	Girder bridge	6.30 x 4.60	3.66	" "	
	"	47	"	0.45 x 2.00	6.26 x 4.65	" "	6.30 x 4.65	"	" "	
KN-12	48	Slab bridge	1.70 x 2.25	3.59 x 5.00	Slab bridge	3.60 x 5.00	"	" "		
KN-17	49	-	-	6.14 x 4.50	Girder bridge	6.20 x 4.50	"	" "		

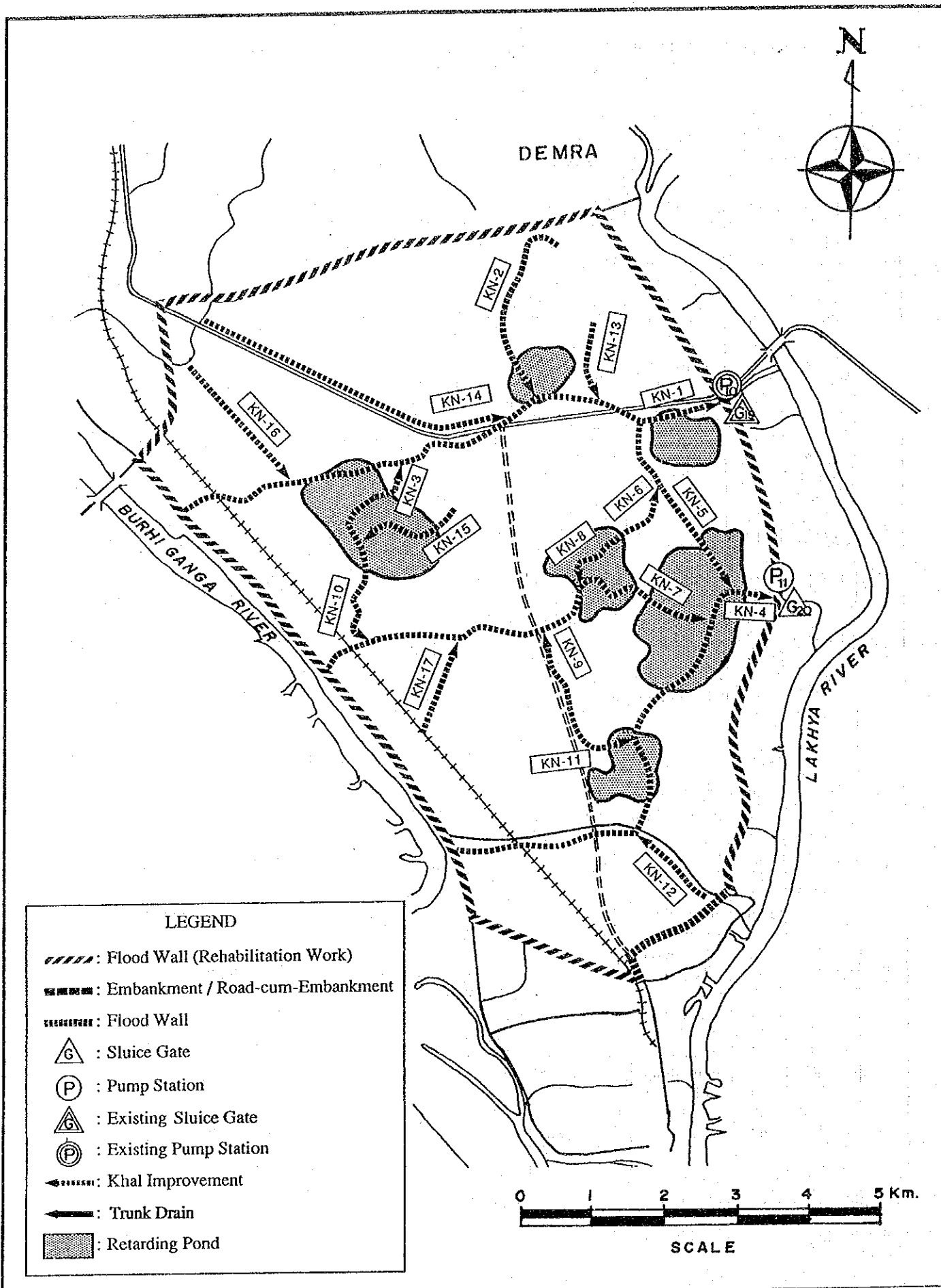


FIG. 6.2.1

PROPOSED FACILITIES : DND

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

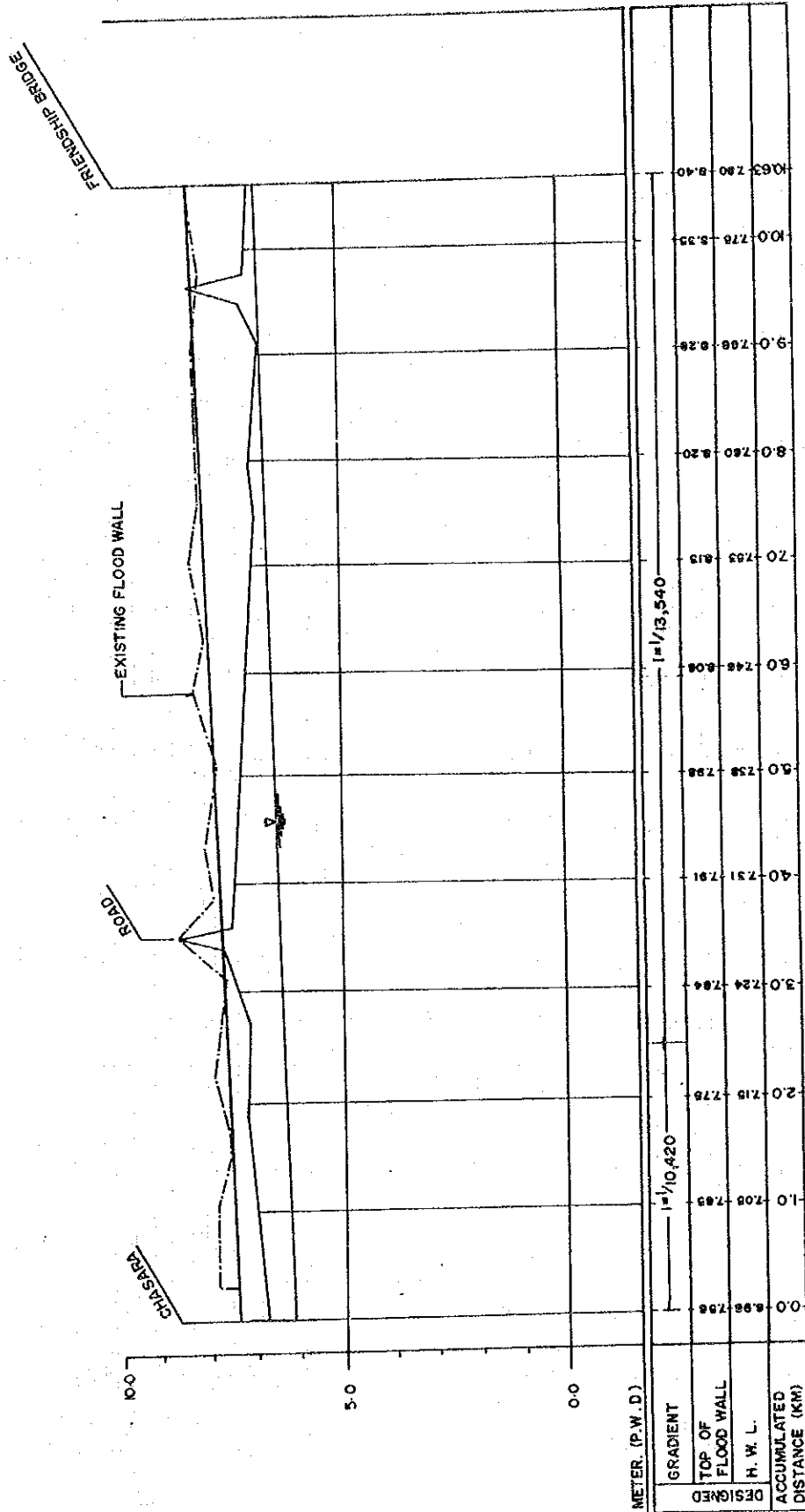


FIG. 6.2.2 (1) LONGITUDINAL SECTION OF FLOOD WALL : DND (DW)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



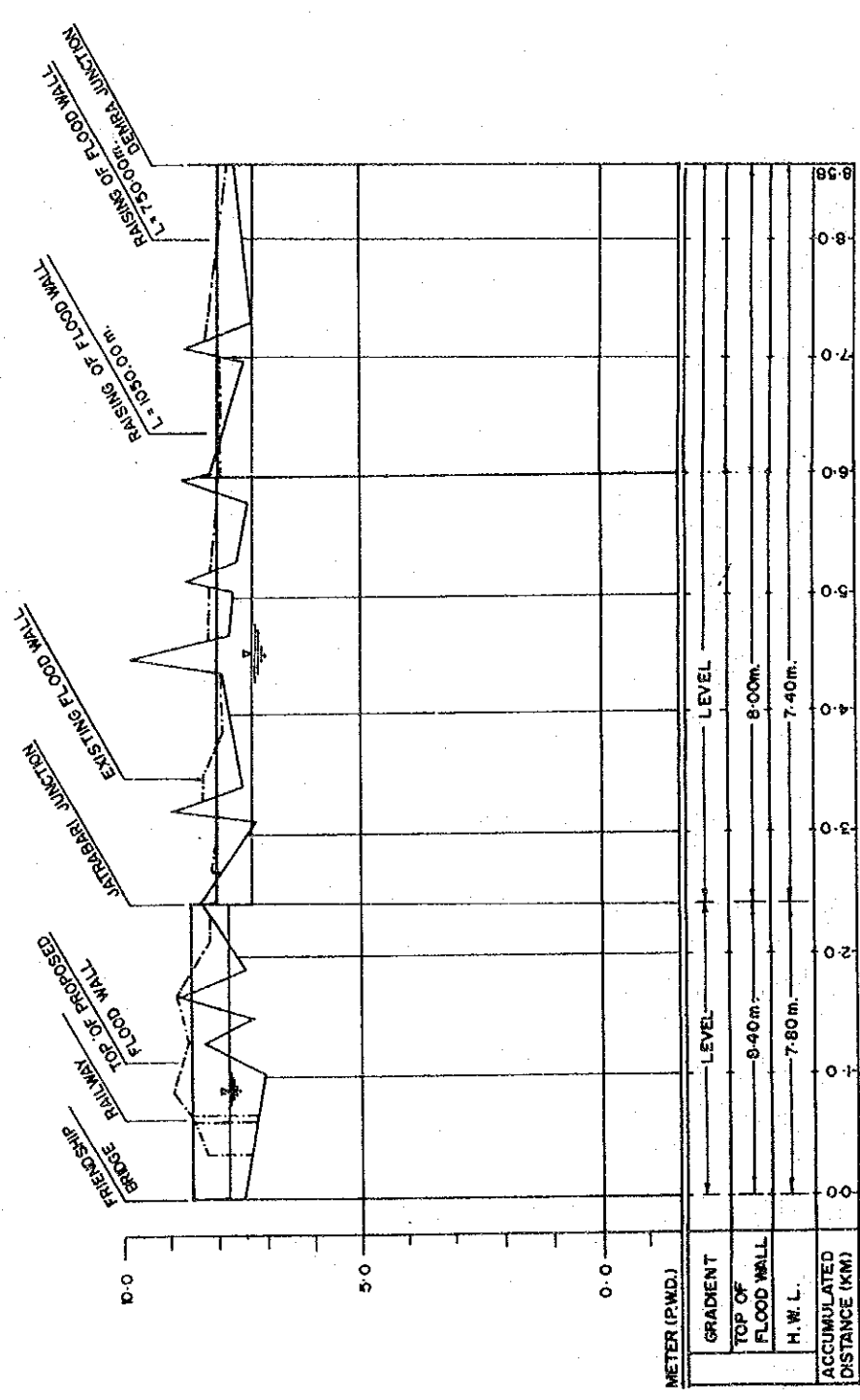


FIG. 6.2.2 (2)

LONGITUDINAL SECTION OF FLOOD WALL : DND (DN)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



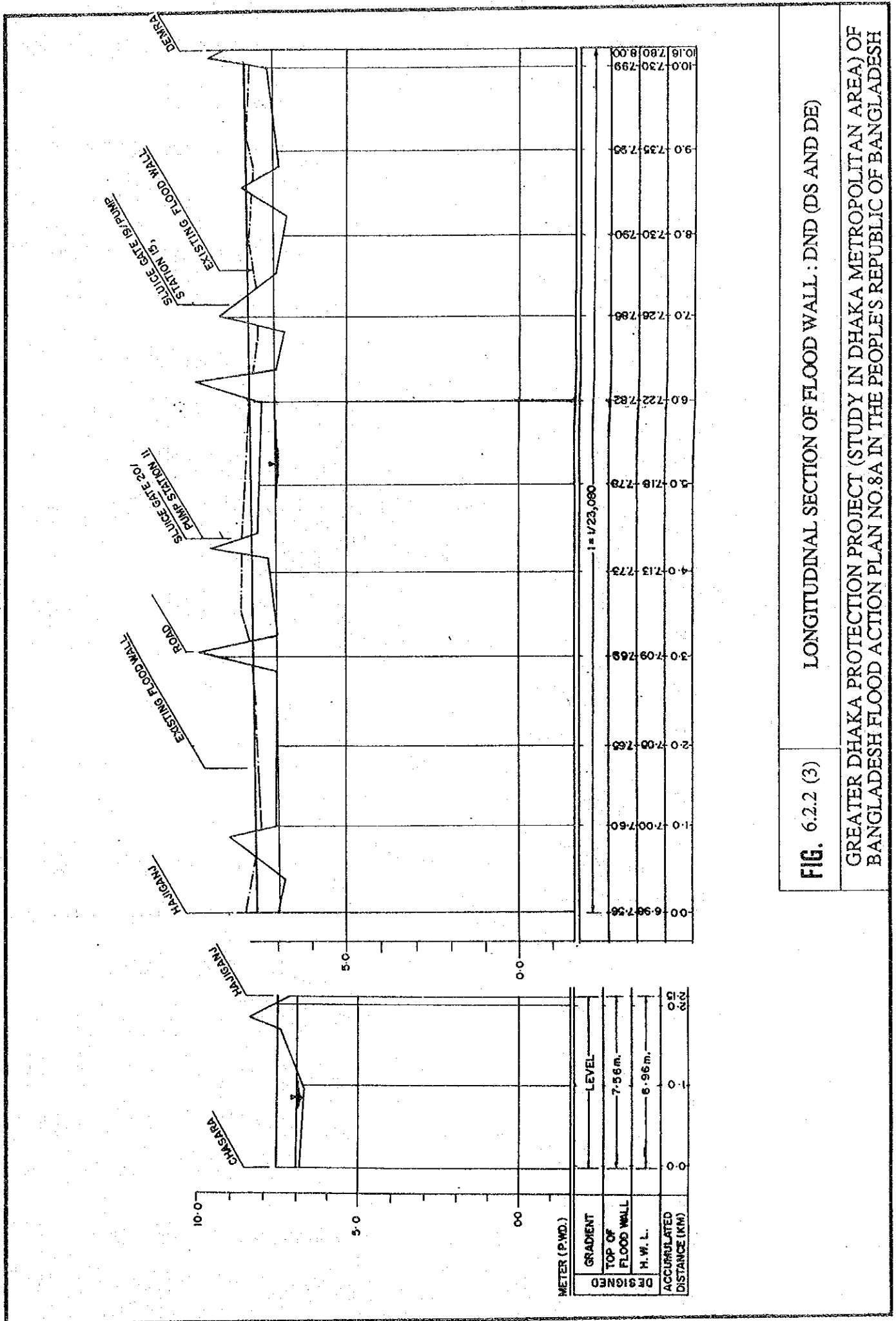
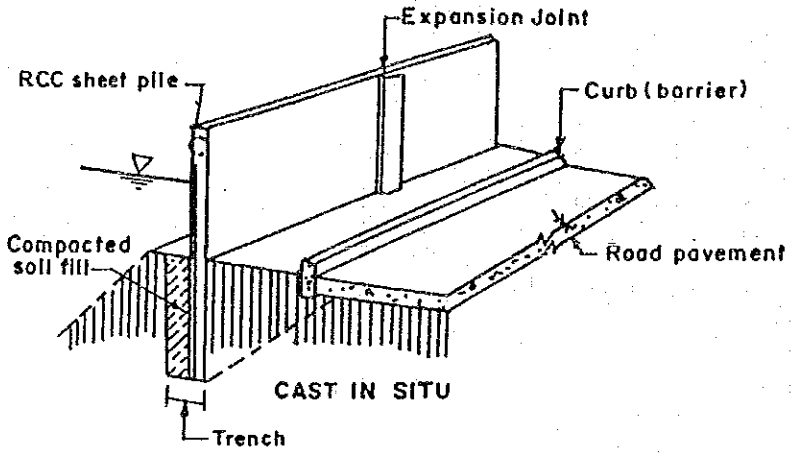
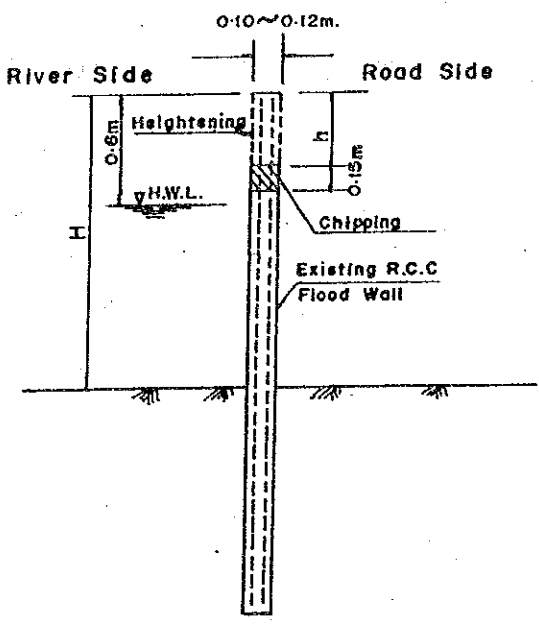
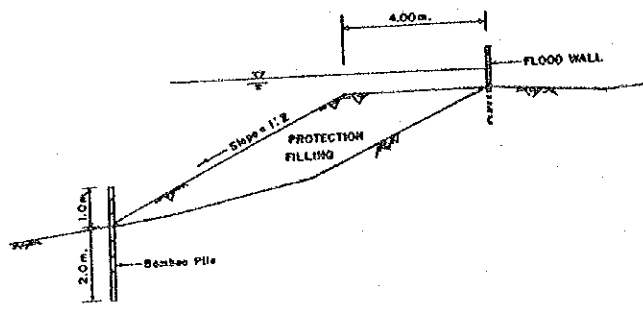


FIG. 6.2.2 (3) LONGITUDINAL SECTION OF FLOOD WALL : DND (DS AND DE)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





TYPICAL SECTION OF FLOOD WALL

TYPICAL SECTION OF FLOOD WALL

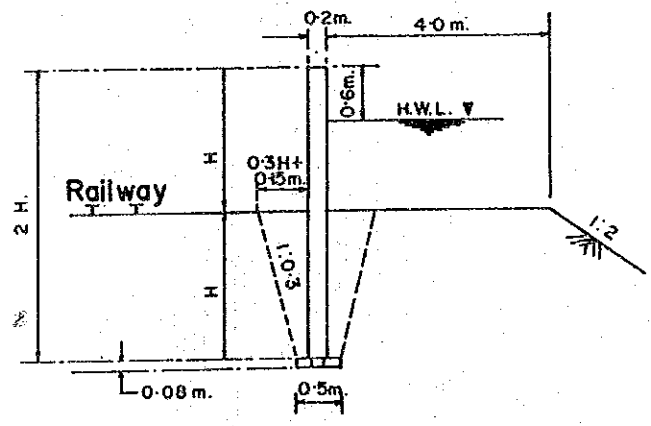
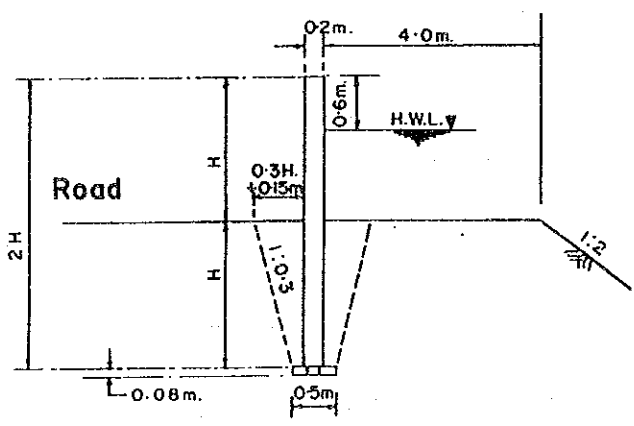


FIG. 6.2.3

TYPICAL SECTIONS OF FLOOD WALL REHABILITATION WORKS

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

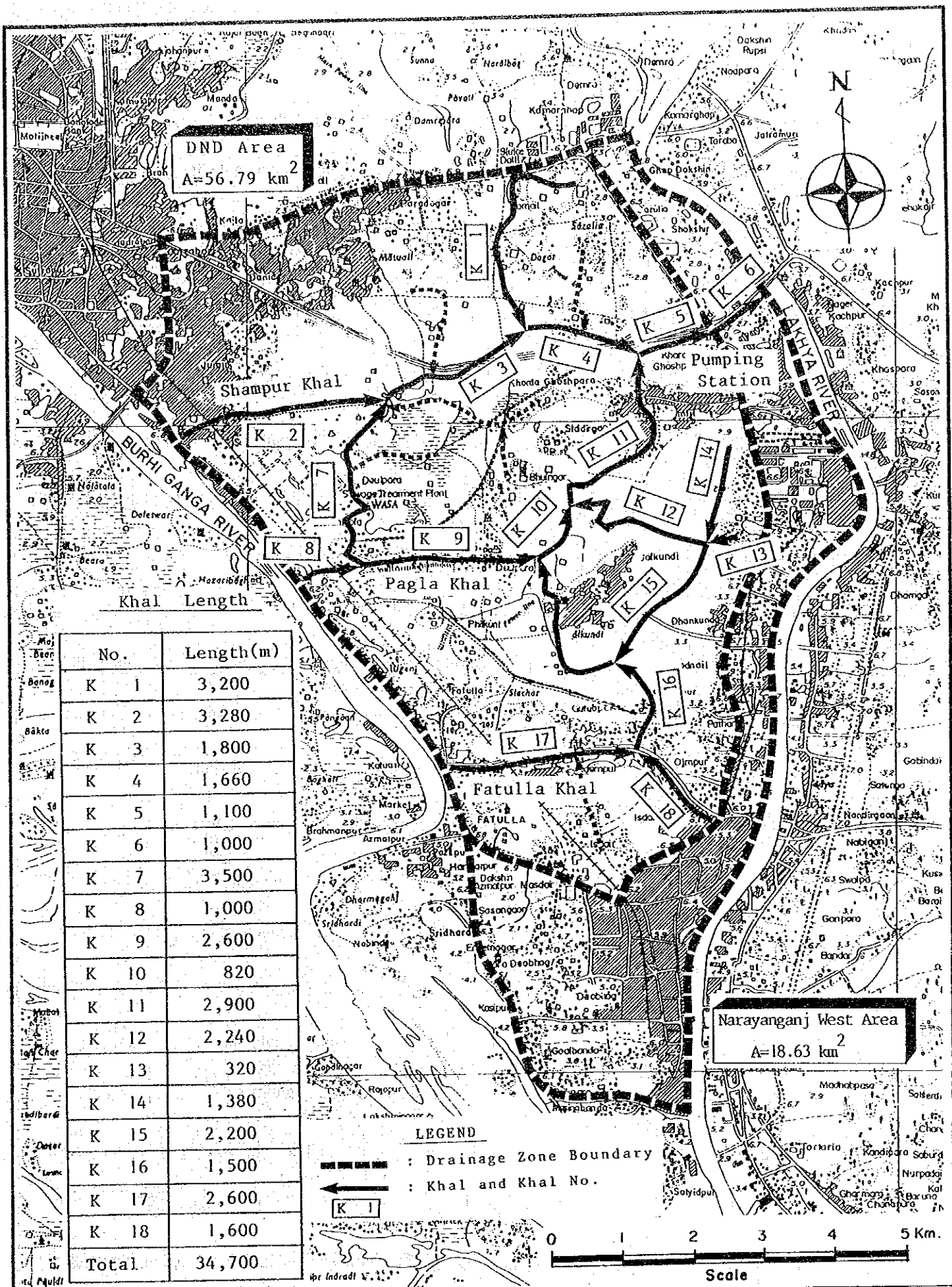


FIG. 6.2.4

EXISTING MAJOR KHALS : DND

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

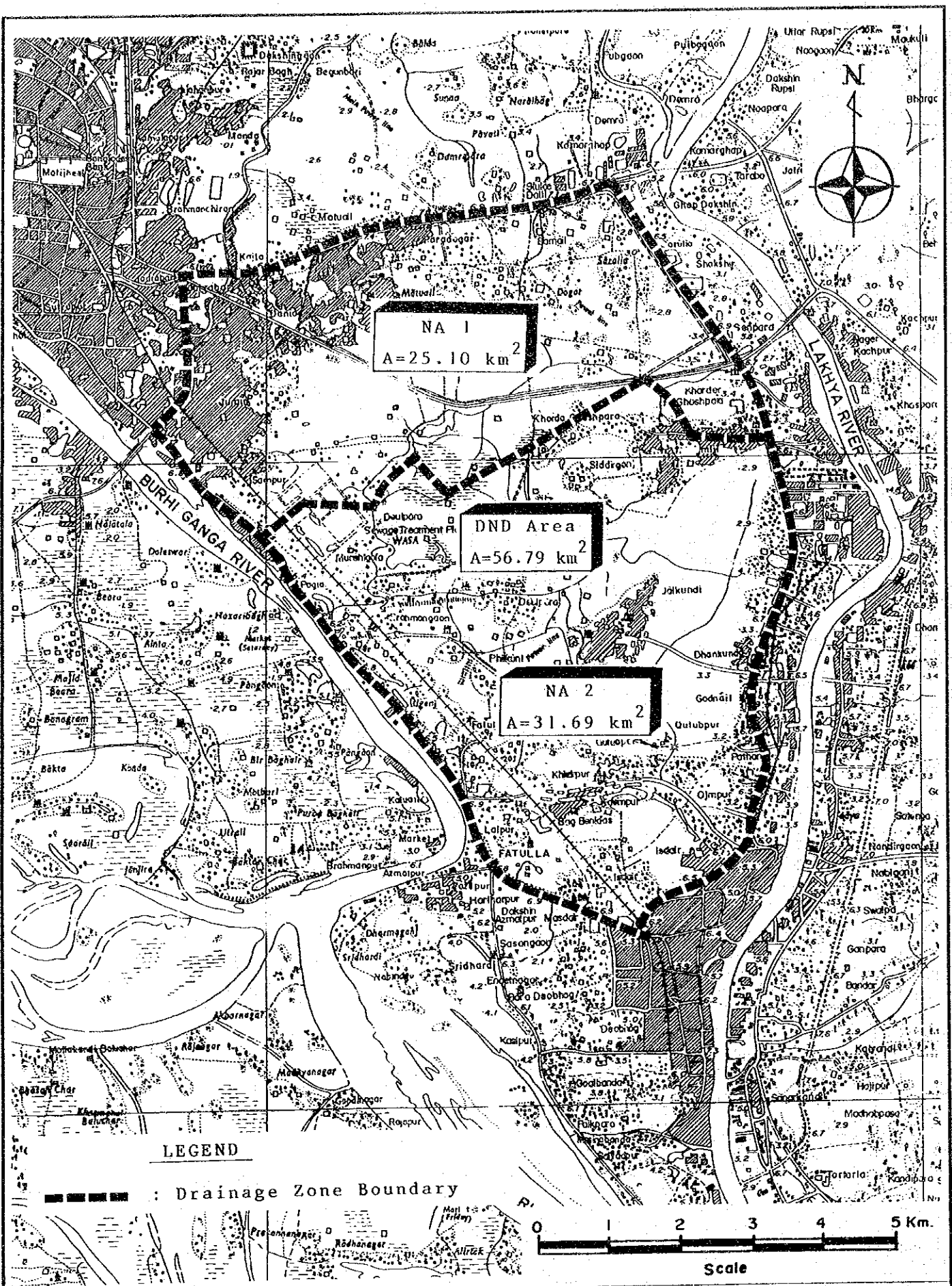


FIG. 6.2.5

DRAINAGE ZONE : DND

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

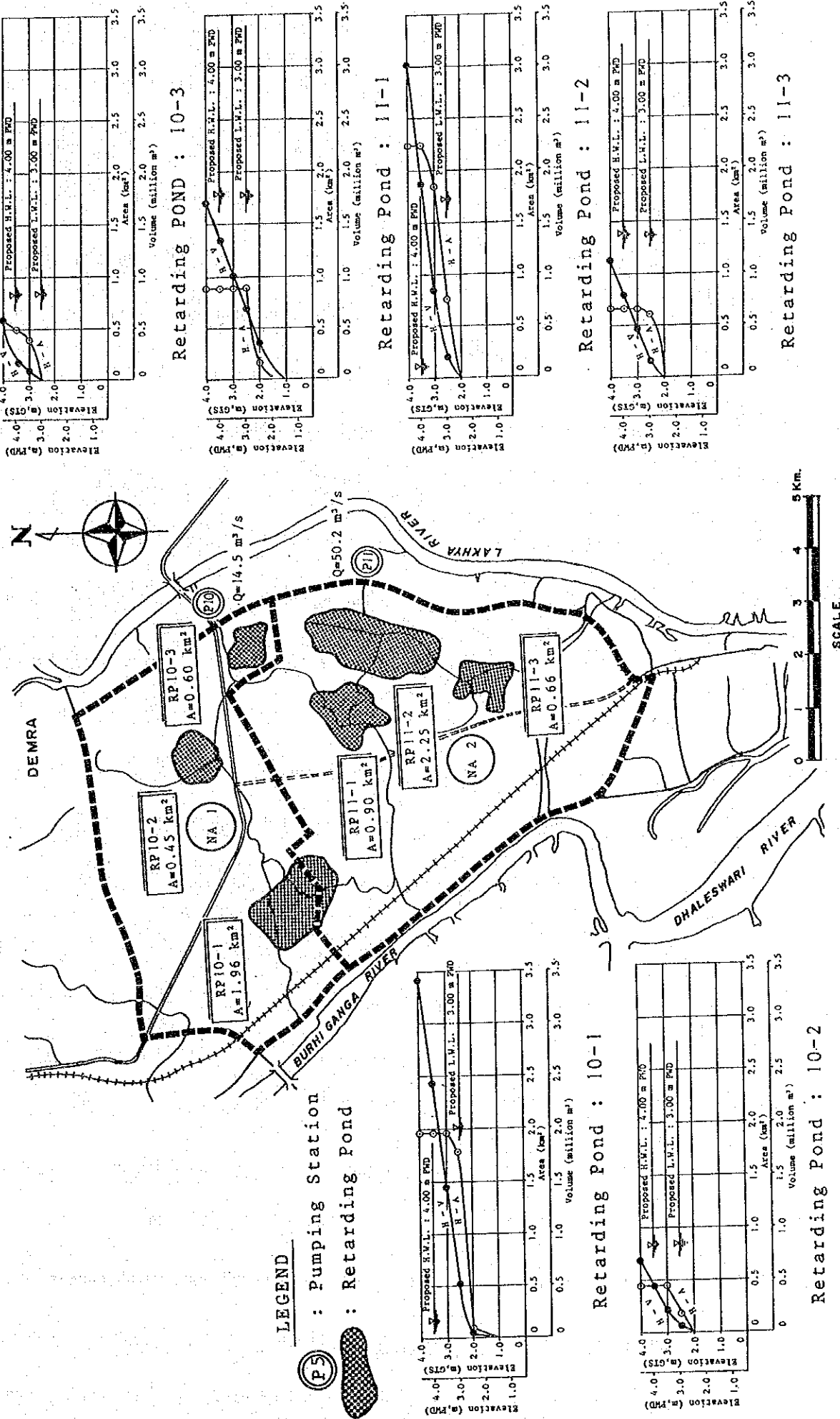


FIG. 6.2.6 PROPOSED REQUIREMENTS OF PUMP STATION AND RETARDING POND : DND
 GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF
 BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



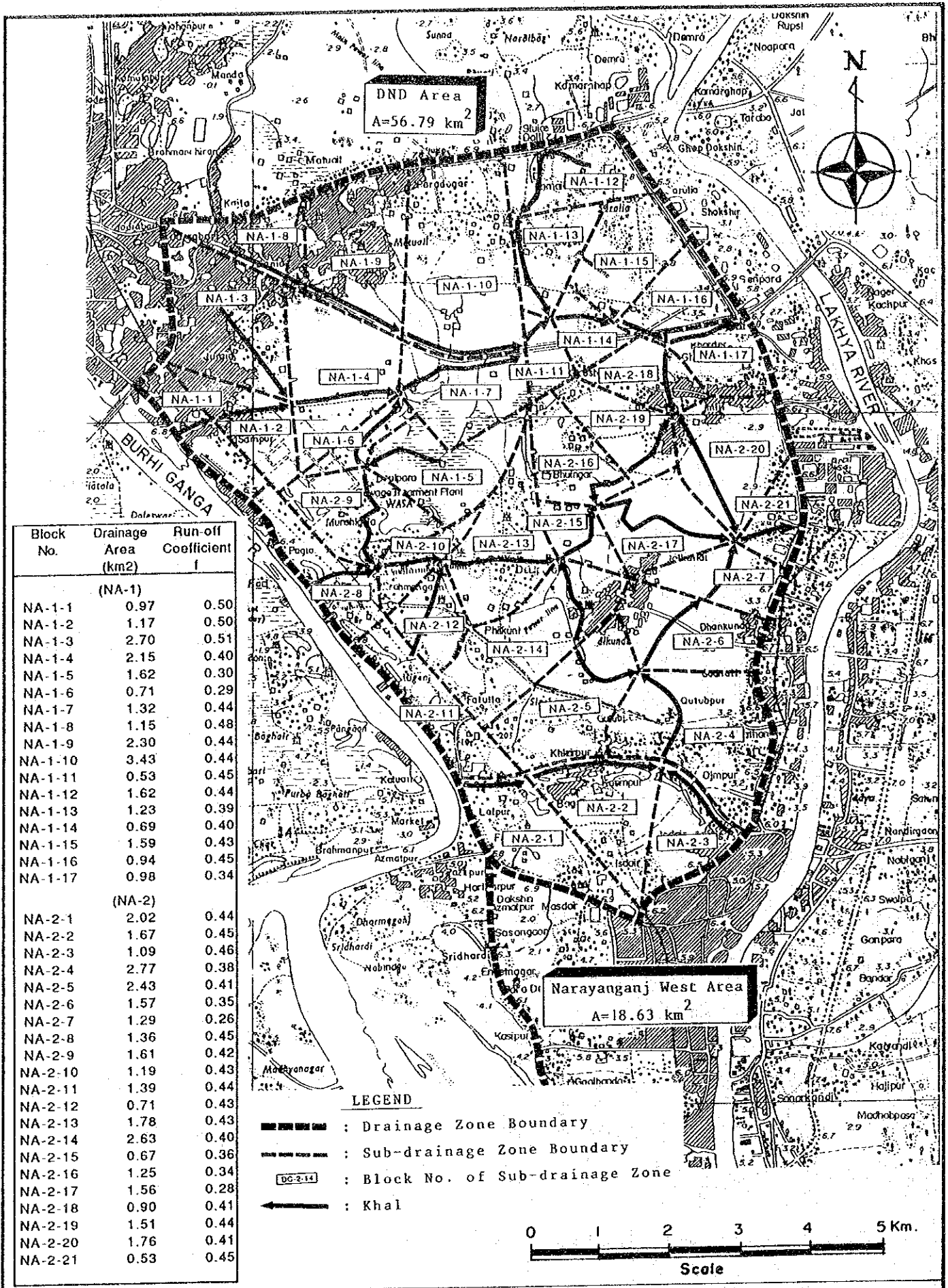
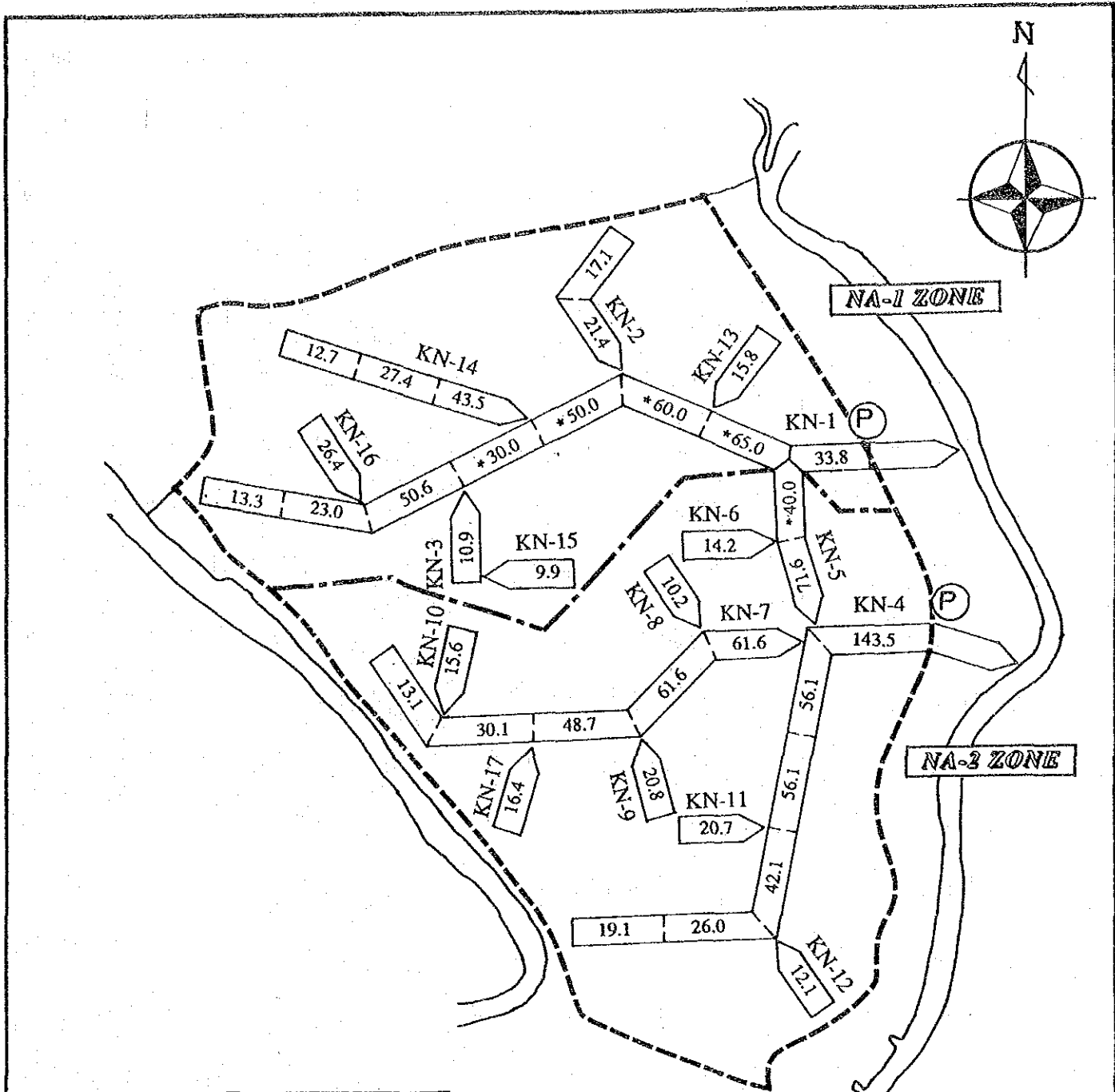


FIG. 6.2.7

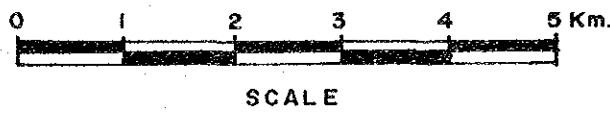
SUB-DRAINAGE ZONE AND THEIR RUN-OFF COEFFICIENT : DND

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



LEGEND

- : Khal
- DC-1 : Khal No.
- 12.75 : Design Discharge (m³/s)
- : Embankment / Flood Wall
- : Boundary of Drainage Zone
- : Pump Station
- : Sluice Gate



Note: The figures with (*) indicate the design discharge estimated in hydraulic simulation by Mike 11 model.

FIG. 6.2.8

DESIGN DISCHARGE FOR KHAL IMPROVEMENT PLAN : DND

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

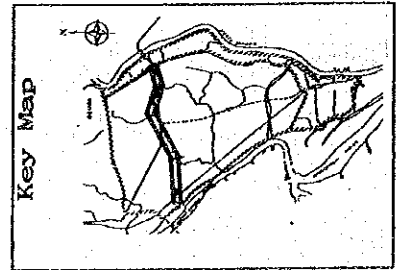
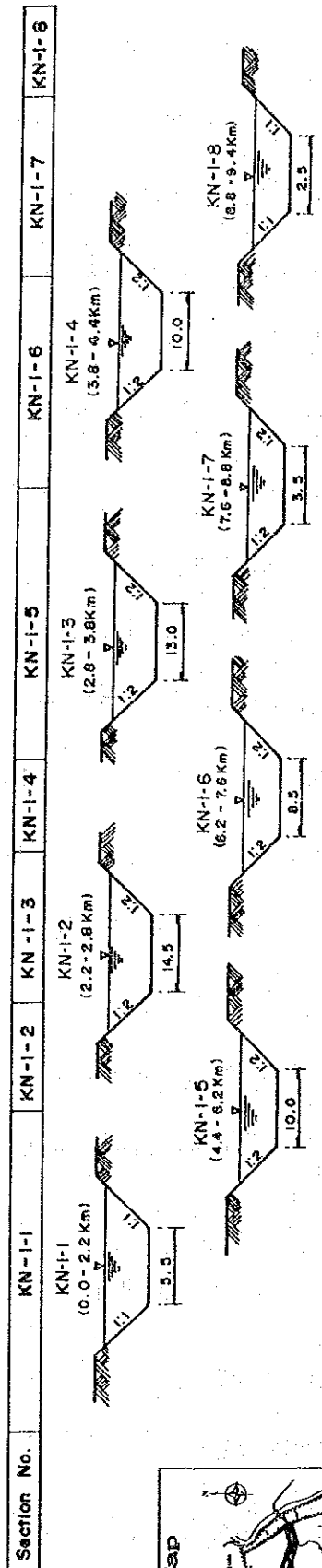
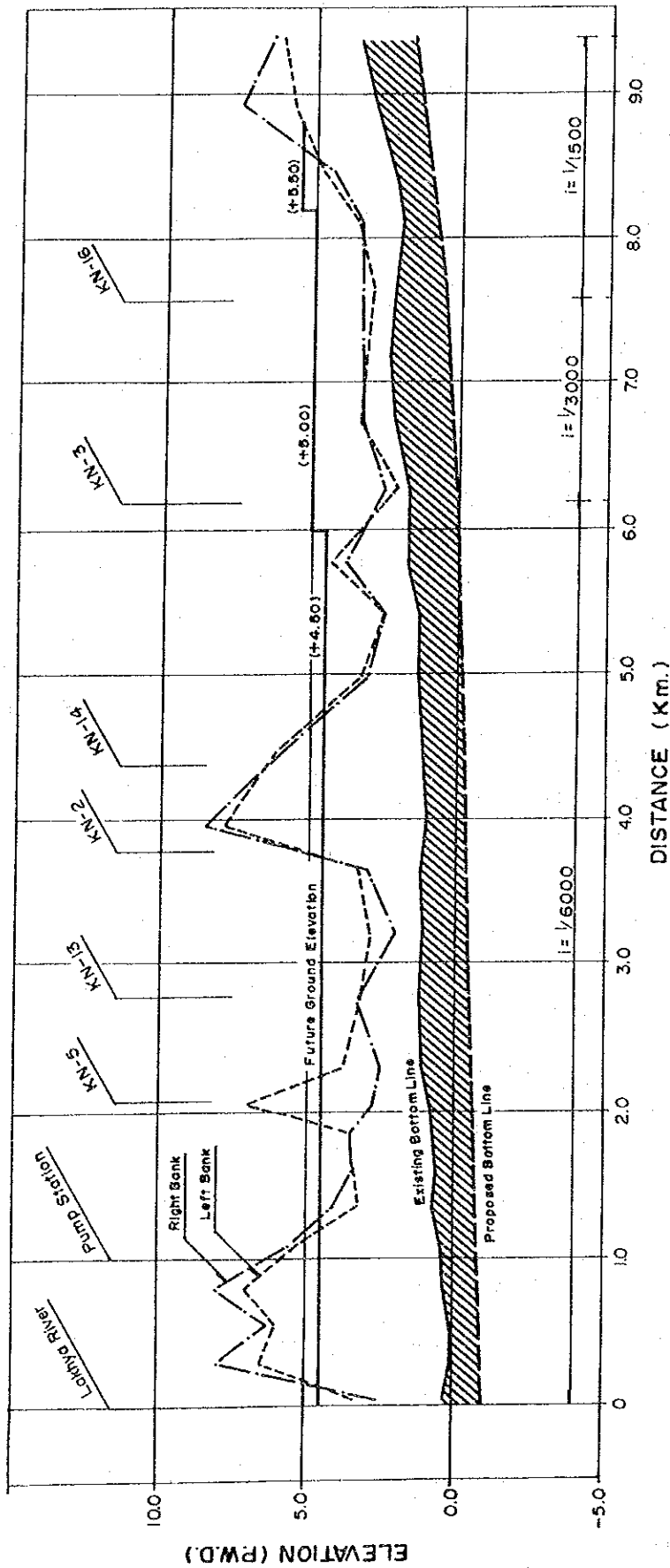
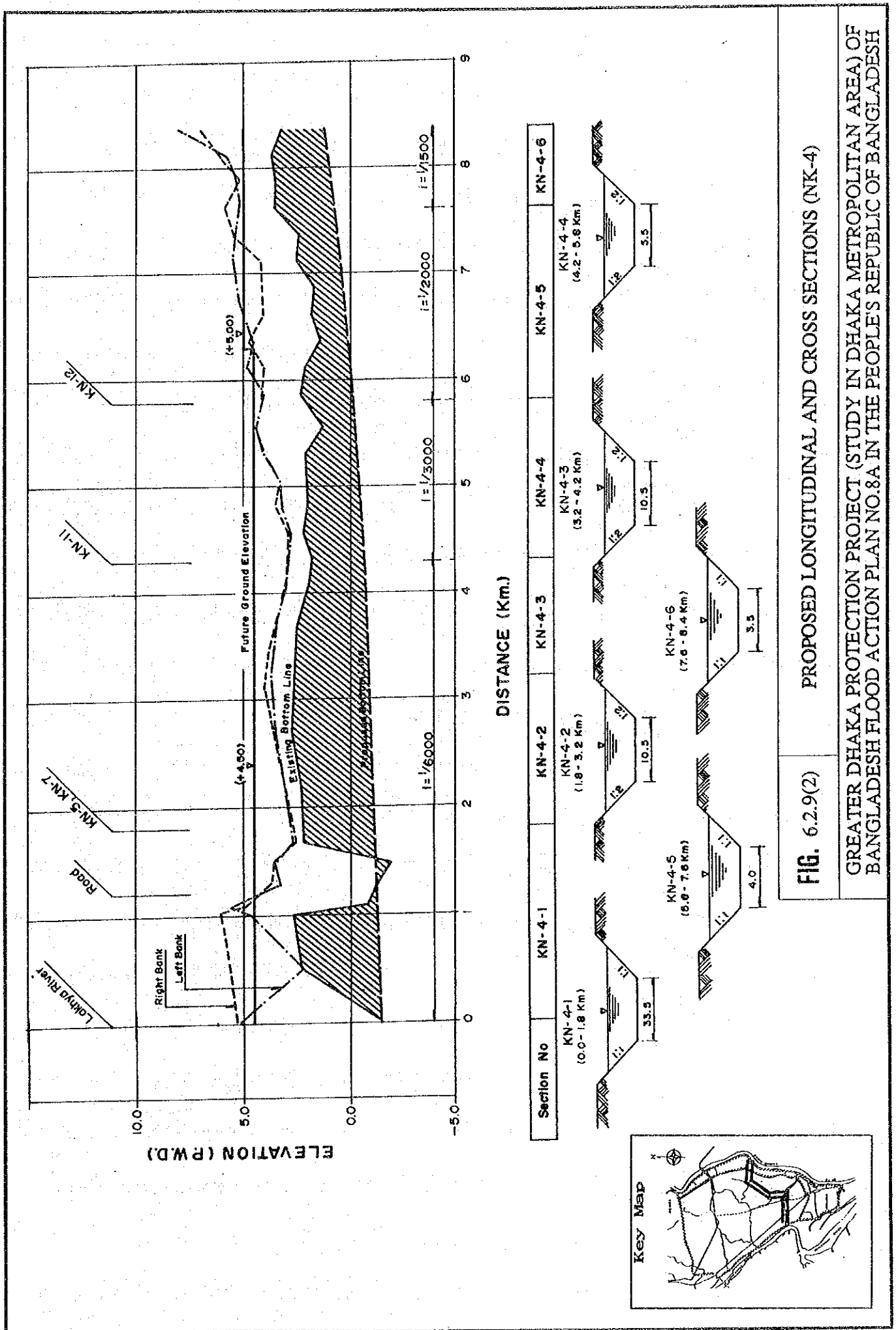


FIG. 6.2.9(1) PROPOSED LONGITUDINAL AND CROSS SECTIONS (NK-1)

GREATER DHAKA FLOOD PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





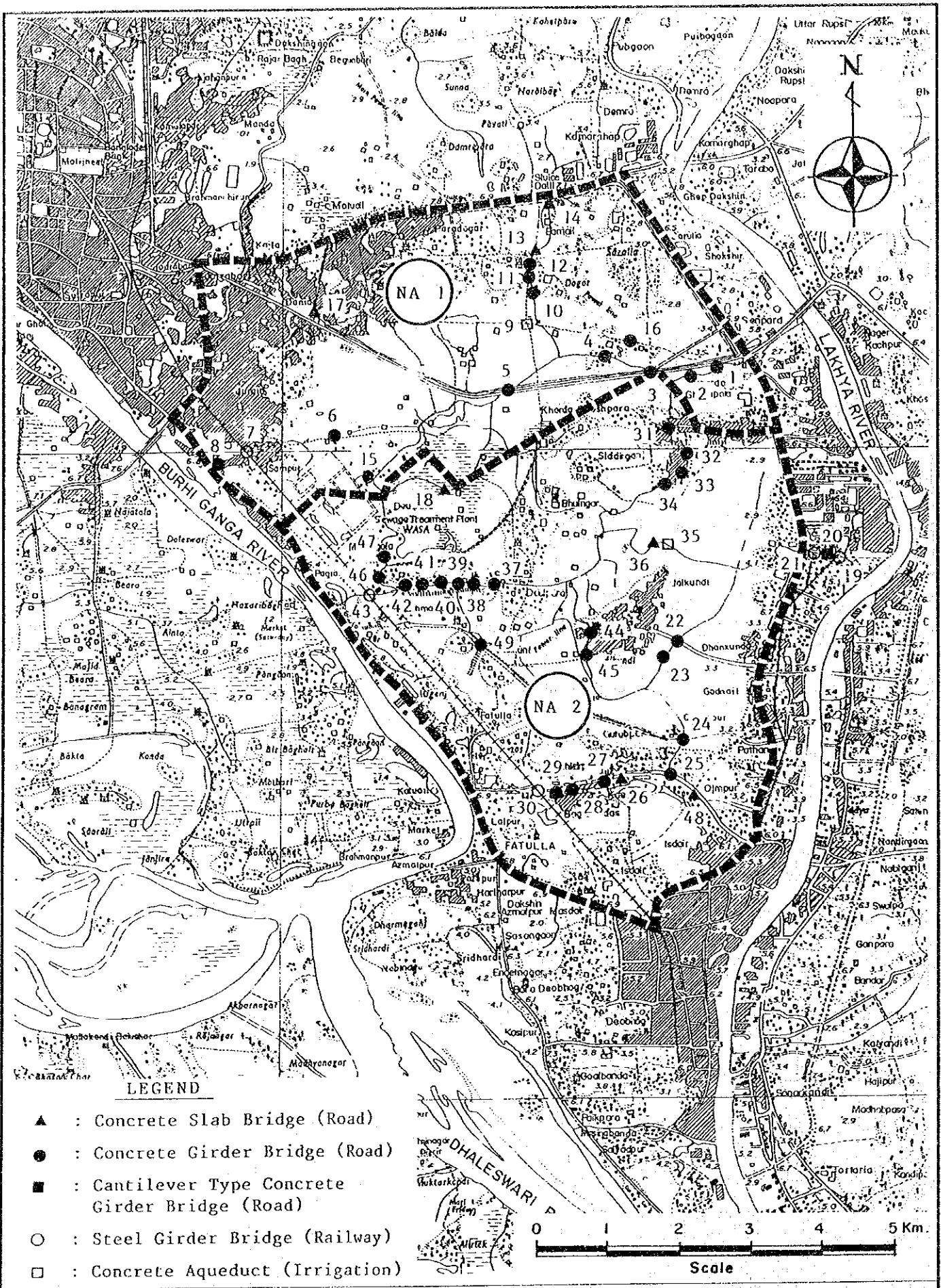


FIG. 6.2.10

LOCATION OF PROPOSED BRIDGES AND AQUEDUCT : DND

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

TABLE 6.3.1(1) HYDRAULIC REQUIREMENTS OF PROPOSED PUMPING STATION : NARAYANGANJ WEST

Proposed Pumping Station	Drainage Zone		Discharge Capacity (m ³ /s)	Design Water Level (m, PWD)				Static Head (m)		Remarks
	No.	Area (km ²)		Outer		Inner		Design	Max.	
				H.H.W.L	H.W.L	H.W.L	L.W.L			
P 12	NB-1	1.73	2.00	7.35	5.80	4.20	3.00	2.80	4.35	
P 13	NB-2	1.92	2.20	7.25	5.70	4.60	3.50	2.20	3.75	
P 14-A	NB-4	2.36	2.70	7.10	5.50	4.50	3.00	2.50	4.10	
P 14-B	NB-5	4.65	5.30	6.97	5.45	4.60	3.50	1.95	3.47	

Note: 1. H.H.W.L. and H.W.L. of outer design water level means that of 100-year and 2-year frequency flood respectively

TABLE 6.3.2(2) HYDRAULIC REQUIREMENTS OF PROPOSED RETARDING POND : NARAYANGANJ WEST

Proposed Retarding Pond	Drainage Zone	Pond Area (ha)	Storage Capacity (x 10 ⁶ m ³)	Design Water Level (m, PWD)		Remarks
				H.W.L	L.W.L	
RP 12	NB-1	21	0.21	4.20	3.00	
RP 13	NB-2	23	0.23	4.60	3.50	
RP 14-1	NB-4	28	0.28	4.50	3.00	
RP 14-2	NB-5	26	0.26	4.60	3.50	
RP 14-3	NB-5	30	0.30	4.60	3.50	

TABLE 6.3.2(1) PROPOSED KHAL AND TRUNK DRAIN IMPROVEMENT WORKS:
NARAYANGANJ WEST

Narayanganj West Zone (NB)

Zone	Khal No.	Khal Length (km)	Required Hydraulic Section W _b x W _u x H (m x m x m)			Open Channel		Covered Channel		Bridge (Places)	Aquaduc (Places)	Dredging (1000m ³)	Maintenance Flood (km)	Land Acquisition (ha)
						Brick Protection (km)	Sodding (km)	Box Culvert (km)	Brick Pipe (km)					
NB-1	KN-18	0.40	2.0	7.0	2.5	0.40	-	-	-	-	5.52	0.40	0.65	
	KN-19	1.20	2.0	14.0	3.0	-	1.20	-	-	1	29.85	1.20	2.43	
	Sub-Total	1.60				0.40	1.20	0.00	0.00	1	35.37	1.60	3.08	
NB-2	KN-20	0.90	3.0	13.0	2.5	-	0.90	-	-	-	8.46	0.90	0.90	
	KN-21	1.40	2.0	7.0	2.5	1.40	-	-	-	1	26.90	1.40	2.50	
	KN-22	0.80	4.5	10.5	3.0	0.80	-	-	-	2	9.84	0.80	1.60	
	Sub-Total	3.10				2.20	0.90	0.00	0.00	3	45.20	3.10	5.00	
NB-3	KN-23	0.60	2.5	7.5	2.5	0.60	-	-	-	1	7.80	0.60	1.02	
	KN-24	0.70	2.5	7.5	2.5	0.70	-	-	-	1	11.20	0.70	1.20	
	KN-25	0.40	2.0	7.0	2.5	0.40	-	-	-	-	0.00	0.40	0.37	
	KN-26	0.60	2.0	7.0	2.5	0.60	-	-	-	-	0.00	0.60	0.12	
	KN-27	0.30	2.0	7.0	2.5	0.30	-	-	-	-	1.80	0.30	0.31	
	S-1	0.90	3.0	-	3.0	-	-	0.90	-	-	21.69	0.90	1.50	
	S-2	0.30		2.5		-	-	-	0.30	-	5.76	0.30	0.46	
	S-3	0.20		2.2		-	-	-	0.20	-	2.44	0.20	0.29	
Sub-Total	4.00				2.60	0.00	0.90	0.50	2	50.69	4.00	5.27		
NB-4	KN-28-1	0.90	6.0	18.0	3.0	-	0.90	-	-	-	10.25	0.90	1.65	
	KN-28-2	0.50	2.0	13.3	2.8	-	0.50	-	-	-	4.33	0.50	1.04	
	KN-29	1.40	2.0	8.0	3.0	1.40	-	-	-	2	35.40	1.40	2.70	
	Sub-Total	2.80				1.40	1.40	0.00	0.00	2	49.98	2.80	5.39	
NB-5	KN-30-1	0.30	9.5	15.5	3.0	0.30	-	-	-	1	13.52	0.30	0.41	
	KN-30-2	1.50	2.5	8.5	3.0	1.50	-	-	-	-	13.67	1.50	1.26	
	KN-31-1	0.80	2.5	14.5	3.0	-	0.80	-	-	1	22.80	0.80	1.53	
	KN-31-2	1.30	2.0	8.0	3.0	1.30	-	-	-	2	33.30	1.30	3.01	
	KN-32	1.80	2.5	8.5	3.0	1.80	-	-	-	2	37.60	1.80	3.45	
	Sub-Total	5.70				4.90	0.80	0.00	0.00	6	120.89	5.70	9.66	
	Total	17.20				11.50	4.30	0.90	0.50	14	302.13	17.20	28.40	

TABLE 6.3.2(2) PROPOSED KHAL IMPROVEMENT RELATED WORKS (BRIDGE) :
NARAYANGANJ WEST

Zone	Khal No.	Bridge No.	Existing		Required	Proposed			Remarks
			Type	Size (m x m)	Size (m x m)	Type	Size (m x m)	Width	
NB-1	KN-19	50	-	-	5.60 x 4.00	Girder bridge	5.6 x 4.00	-	Road bridge
NB-2	KN-21	51	-	-	2.60 x 4.00	Slab bridge	2.7 x 4.00	-	" "
	KN-22	52	-	-	5.25 x 4.00	Girder bridge	5.3 x 4.00	-	" "
	"	53	-	-	5.25 x 4.00	Deck girder	5.3 x 4.00	1.7	Railway bridge
NB-3	KN-23	54	-	-	3.50 x 3.50	" "	3.5 x 3.50	"	" "
	KN-24	55	-	-	3.50 x 3.50	" "	3.5 x 3.50	"	" "
	KN-25	56	Deck-Rly	6.10 x 6.10	3.15 x 3.50	-	-	-	" "
	"	57	Slab bridge	2x4.6 x 5.00	3.15 x 3.50	-	-	-	Road bridge
	KN-26	58	Box culvert	4.60 x 4.90	3.15 x 3.50	-	-	-	" "
	KN-27	59	Girder bridge	6.00 x 4.70	3.15 x 3.50	-	-	-	" "
NB-4	KN-29	60	-	-	3.50 x 4.00	Slab bridge	3.50 x 4.00	3.66	Road bridge
	"	61	-	-	3.50 x 4.00	" "	3.50 x 4.00	"	" "
NB-5	KN-30-1	62	-	-	8.75 x 4.00	Girder bridge	8.80 x 4.00	"	" "
	KN-30-2	63	Girder bridge	11.80 x 5.10	3.85 x 4.00	-	-	-	" "
	KN-31-1	64	-	-	5.95 x 4.00	Slab bridge	6.00 x 4.00	3.66	Road bridge
	KN-31-2	65	-	-	3.50 x 4.00	" "	3.50 x 4.00	"	" "
	"	66	-	-	3.50 x 4.00	" "	3.50 x 4.00	"	" "
	KN-32	67	-	-	3.85 x 4.00	" "	3.90 x 4.00	"	" "
	"	68	-	-	3.85 x 4.00	" "	3.90 x 4.00	"	" "

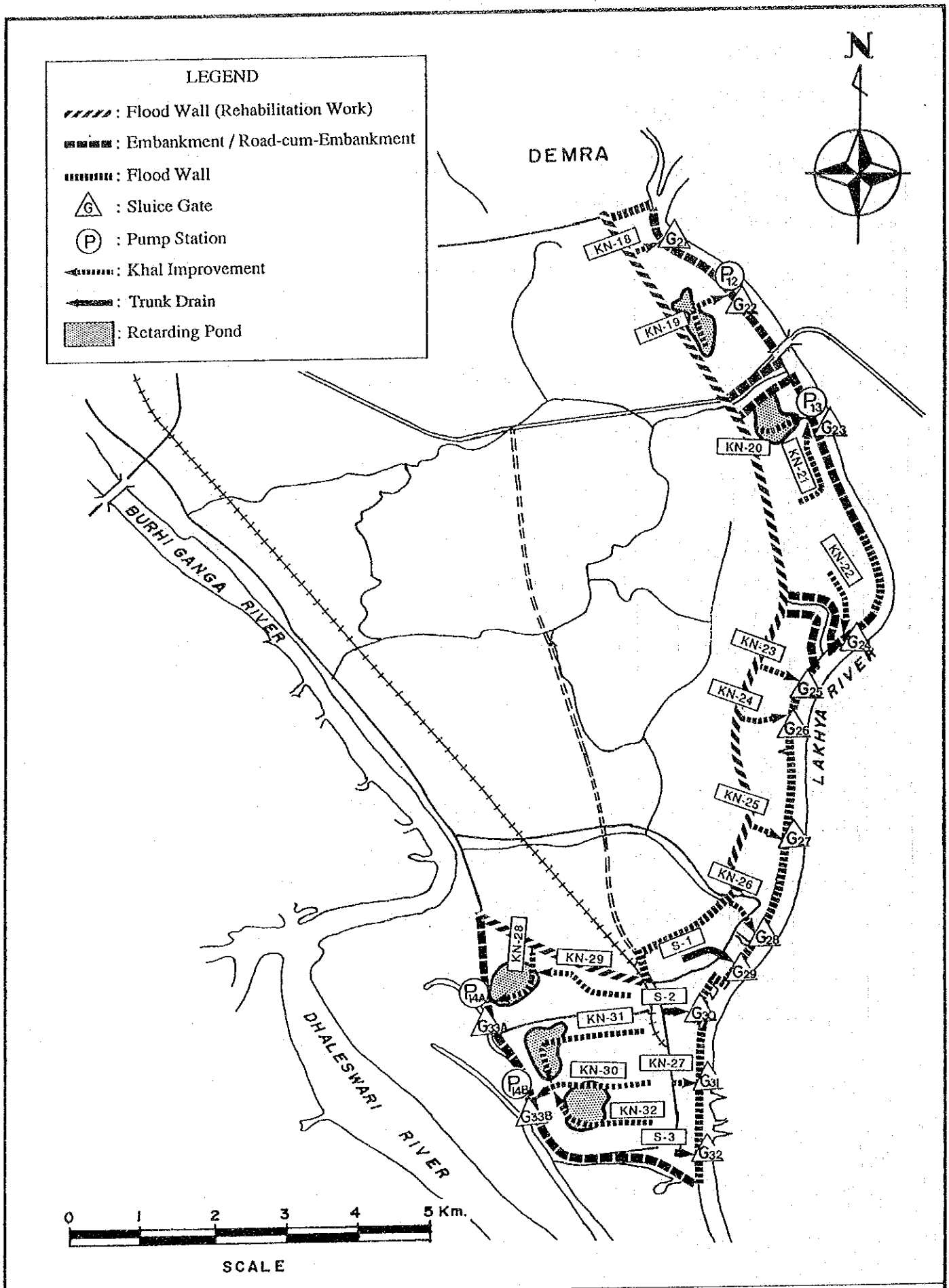


FIG. 6.3.1

PROPOSED FACILITIES : NARAYANGANJ WEST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

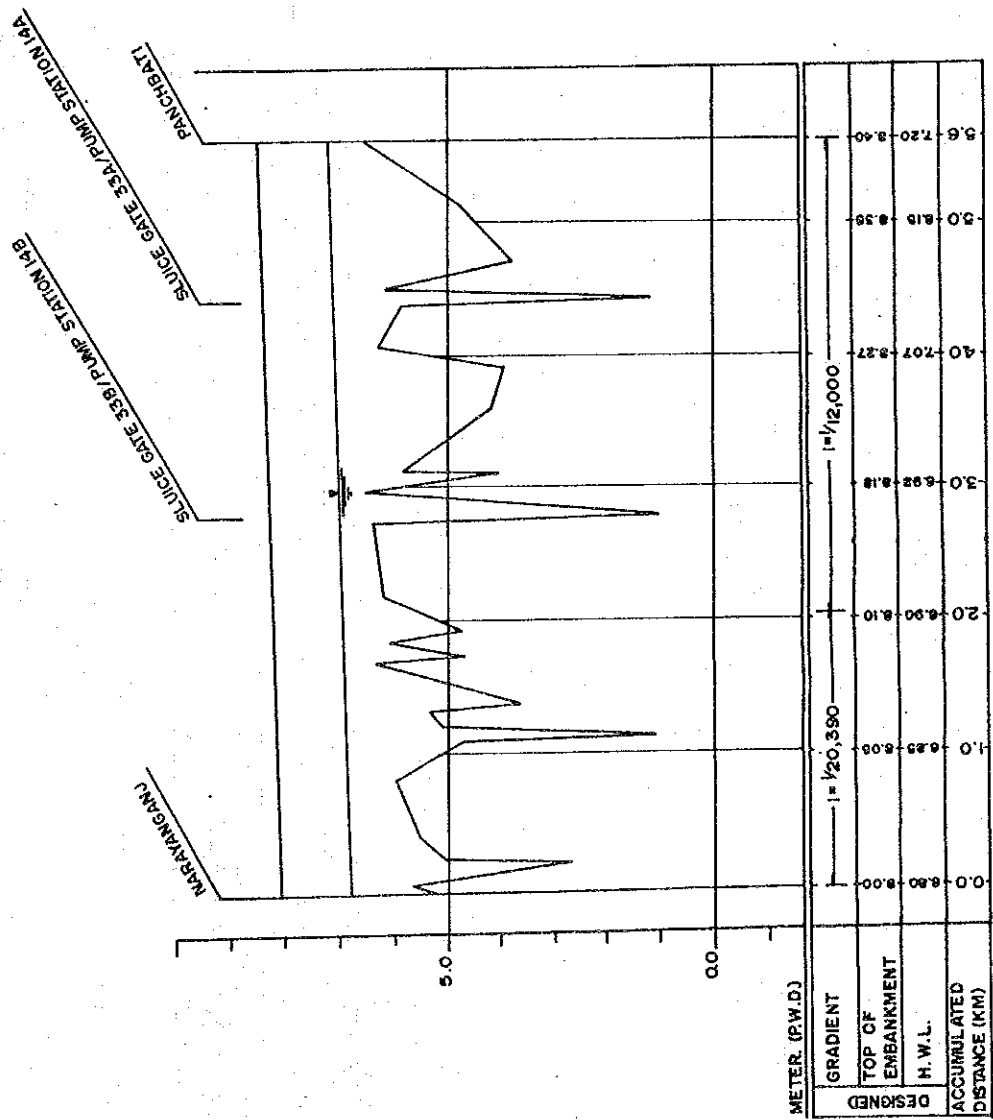


FIG. 6.3.2 (1) LONGITUDINAL SECTION OF EMBANKMENT ROAD-CUM-EMBANKMENT (NW) NARAYANGANJ WEST
 GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



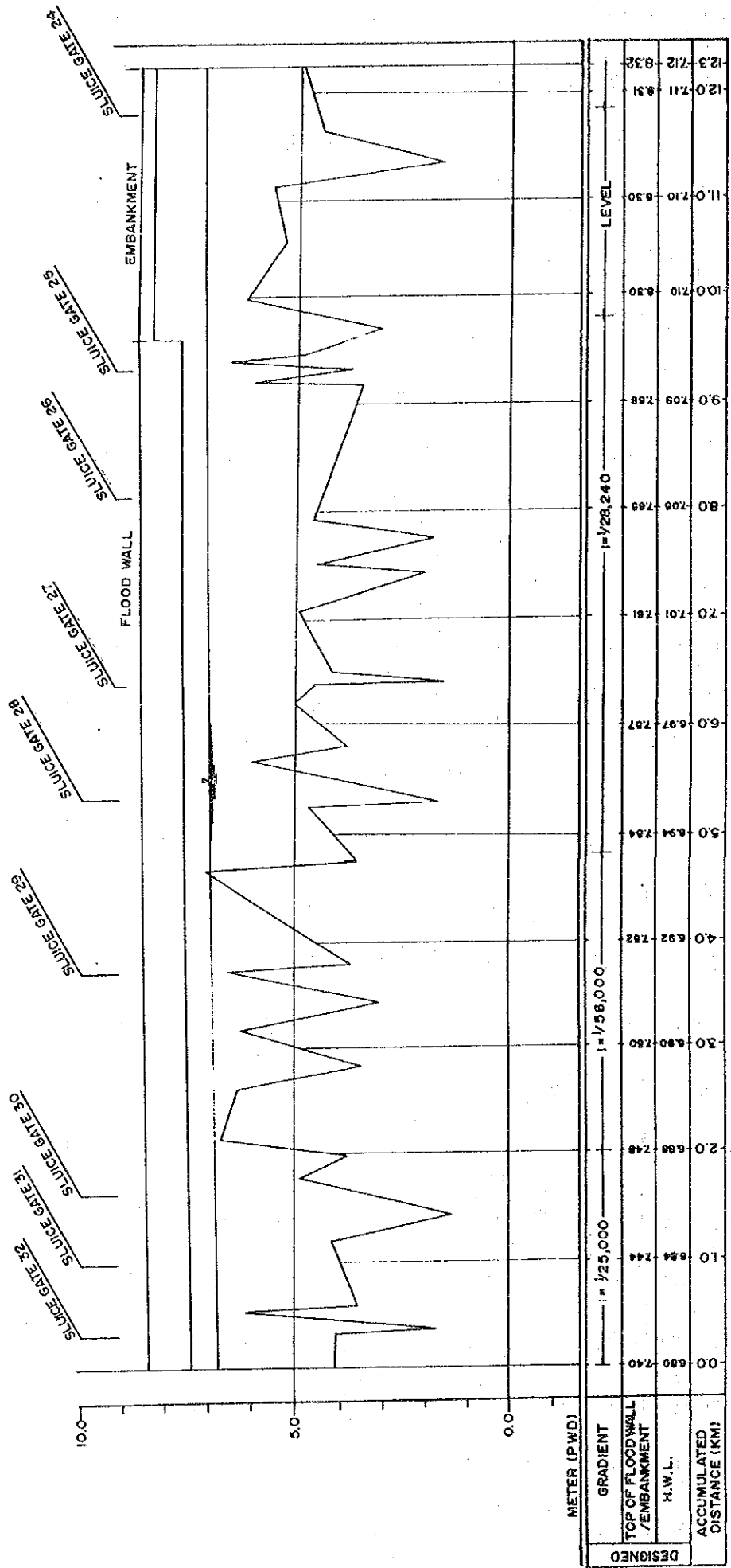


FIG. 6.3.2 (2) LONGITUDINAL SECTION OF FLOOD WALL/EMBANKMENT (NE-1): NARAYANGANJ WEST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



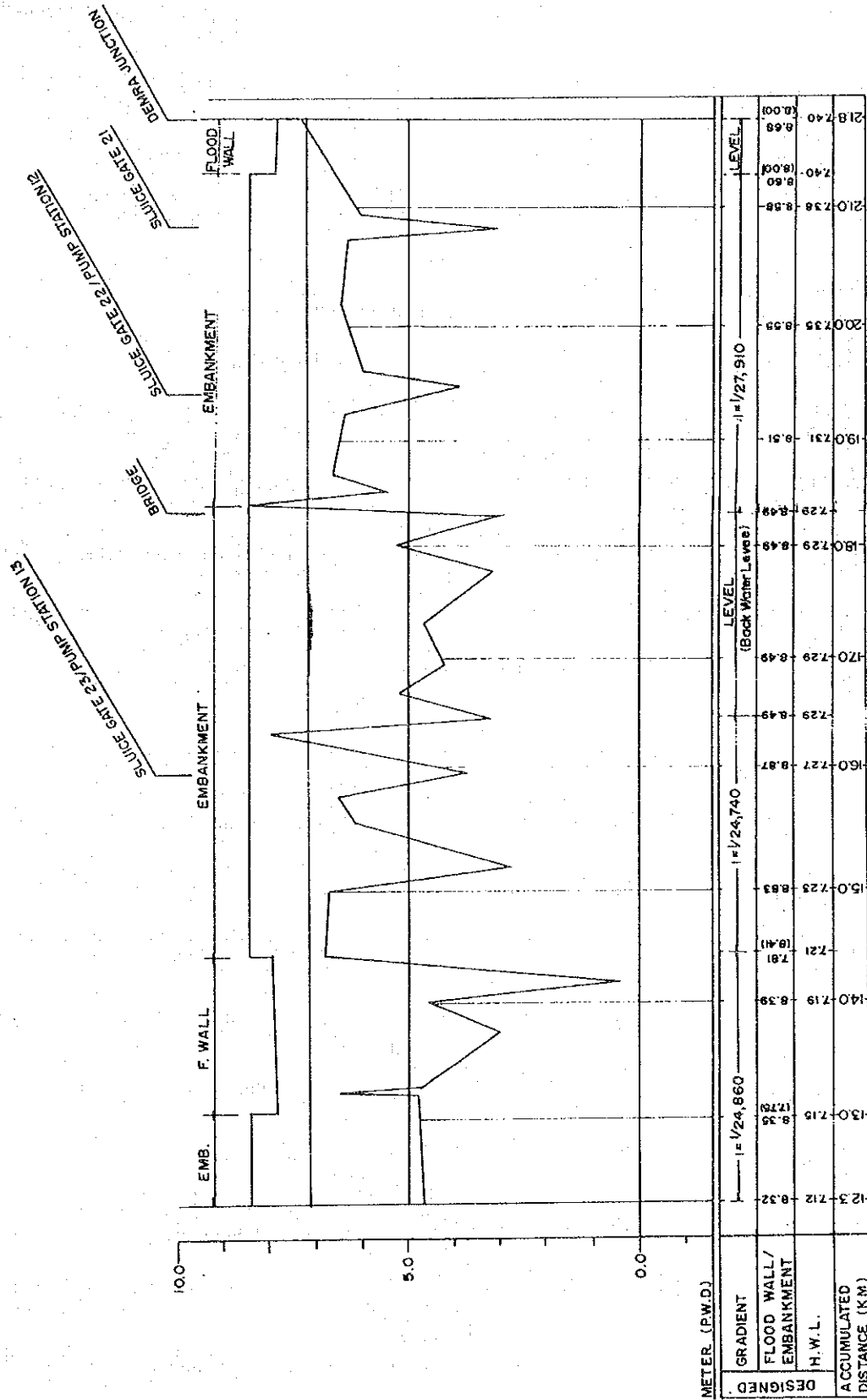
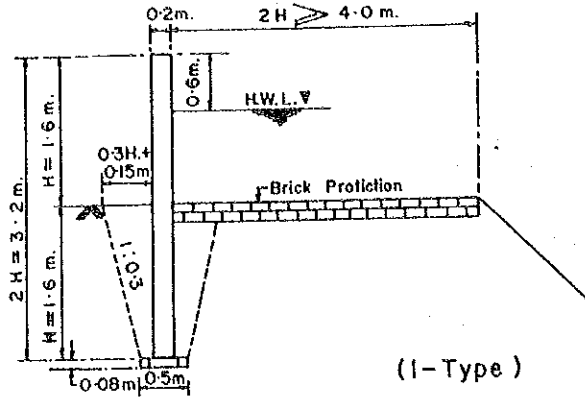


FIG. 6.3.2 (3) LONGITUDINAL SECTION OF FLOOD WALL/EMBANKMENT (NE-2):
NARAYANGANJ WEST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF
BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

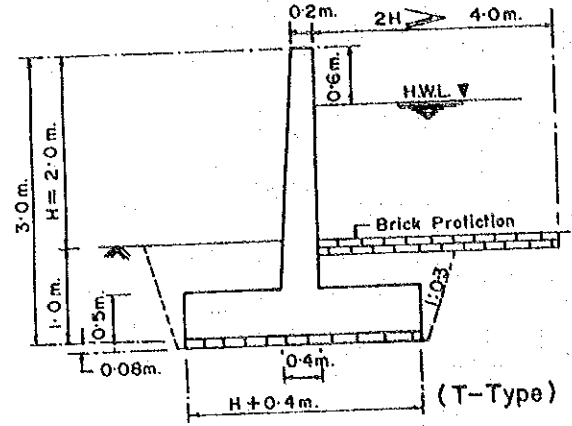


TYPICAL SECTION OF FLOOD WALL



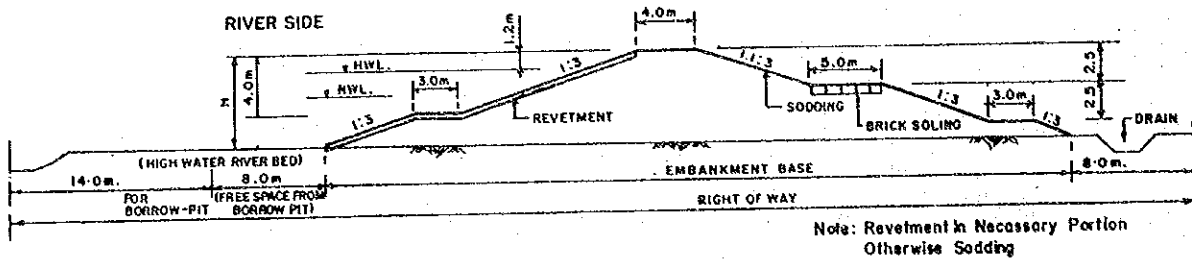
(I-Type)

TYPICAL SECTION OF FLOOD WALL



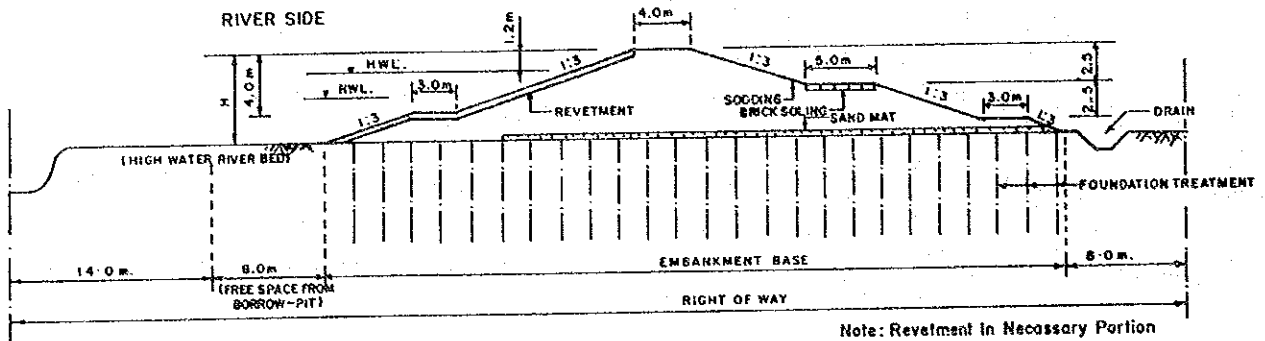
(T-Type)

TYPICAL SECTION OF EMBANKMENT



Note: Revetment in Necessary Portion
Otherwise Sodding

TYPICAL SECTION OF EMBANKMENT WITH FOUNDATION TREATMENT



Note: Revetment in Necessary Portion
Otherwise Sodding

TYPICAL SECTION OF ROAD-CUM EMBANKMENT

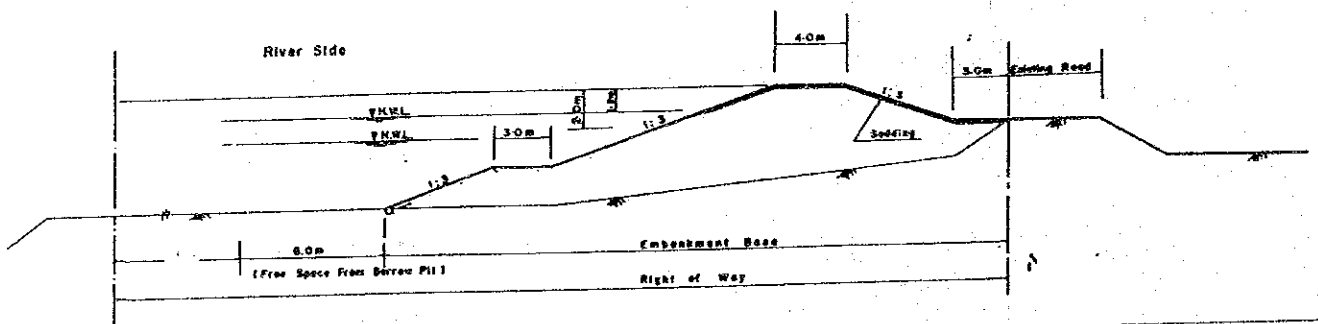


FIG. 6.3.3

TYPICAL CROSS-SECTION OF ROAD-CUM-EMBANKMENT/
EMBANKMENT AND FLOOD WALL

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF
BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

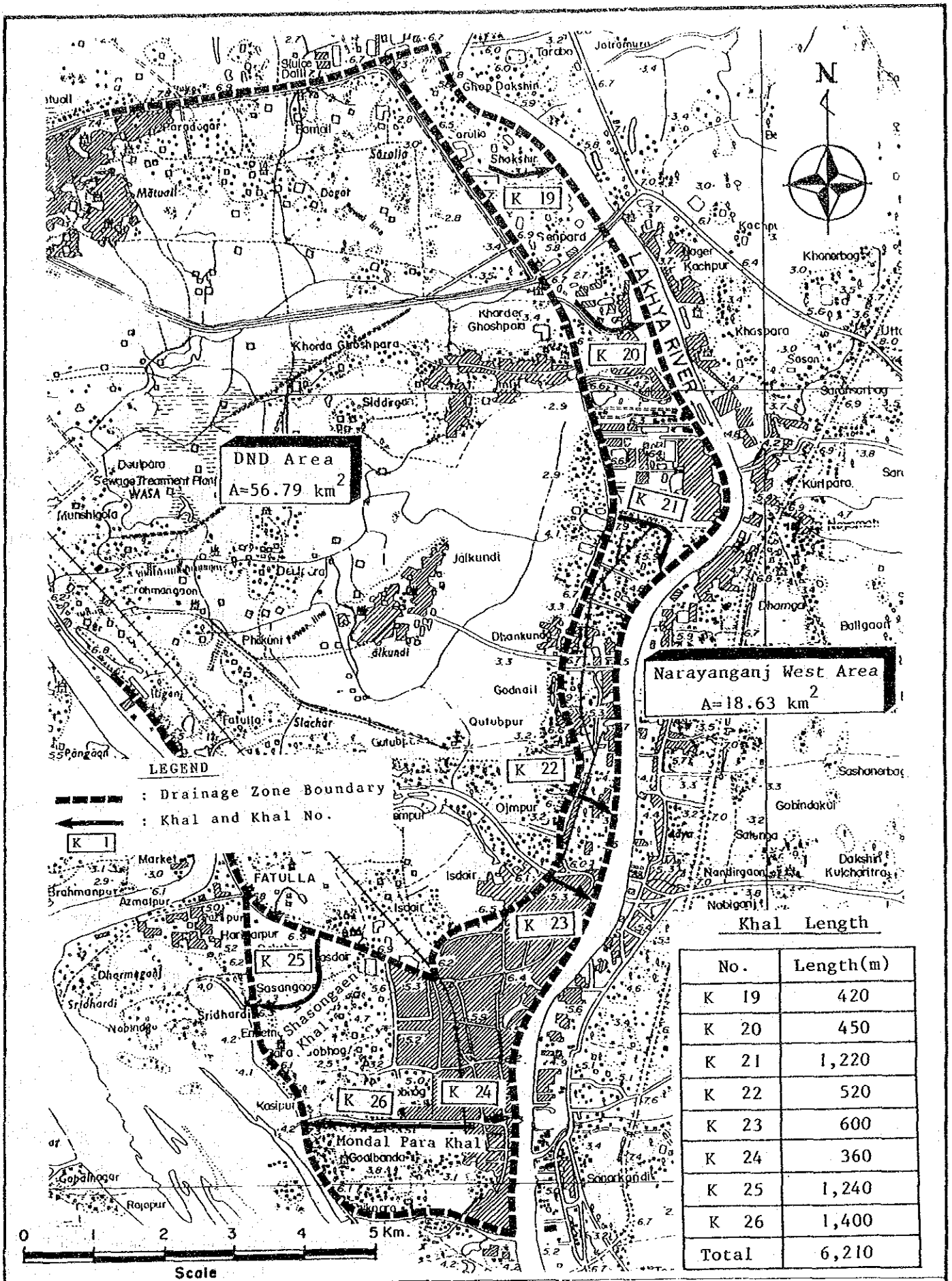


FIG. 6.3.4

EXISTING MAJOR KHALS : NARAYANGANJ WEST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

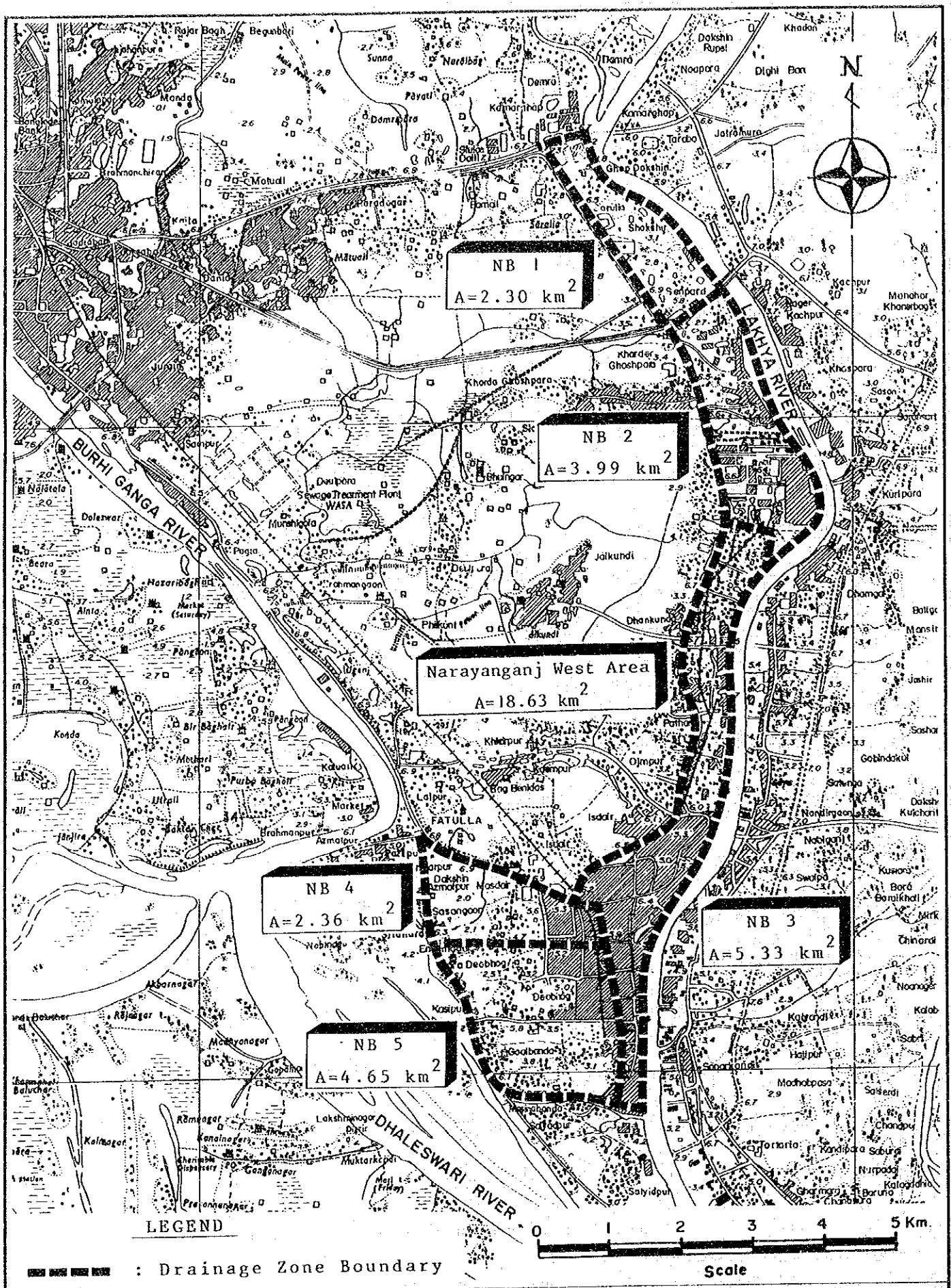
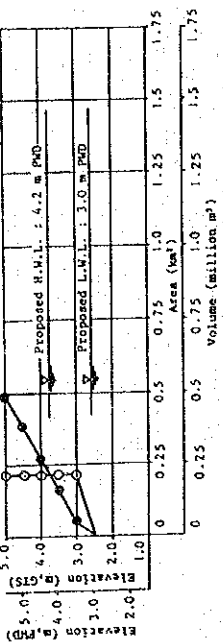


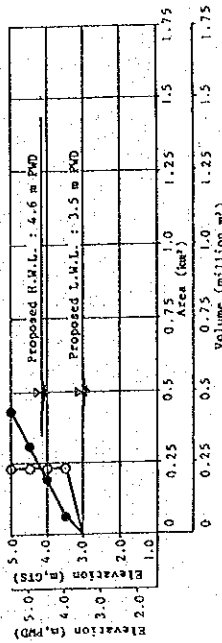
FIG. 6.3.5

DRAINAGE ZONE : NARAYANGANJ WEST

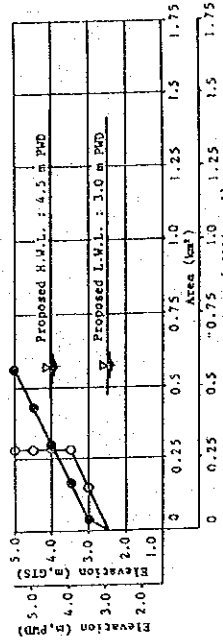
GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



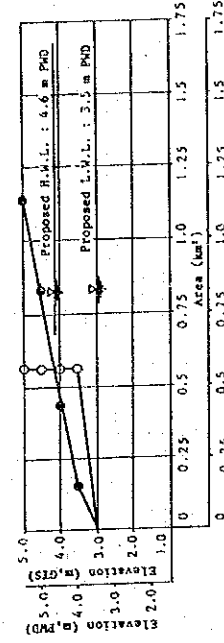
Retarding Pond : 12



Retarding Pond : 13



Retarding Pond : 14-1



Retarding-Pond : 14-2 and 14-3

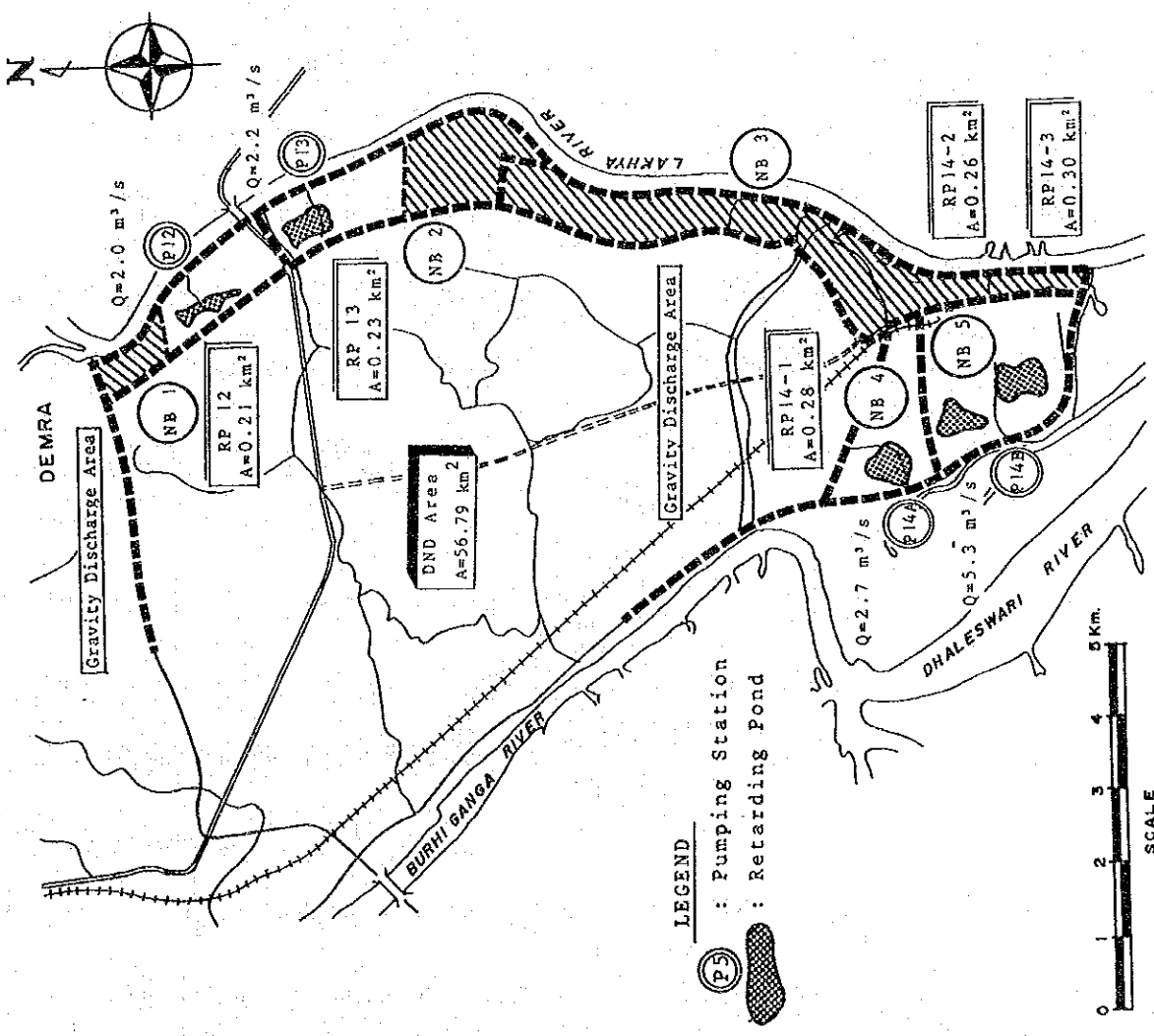


FIG. 6.3.6 PROPOSED REQUIREMENTS OF PUMP STATION AND RETARDING POND : NARAYANGANJ WEST
GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



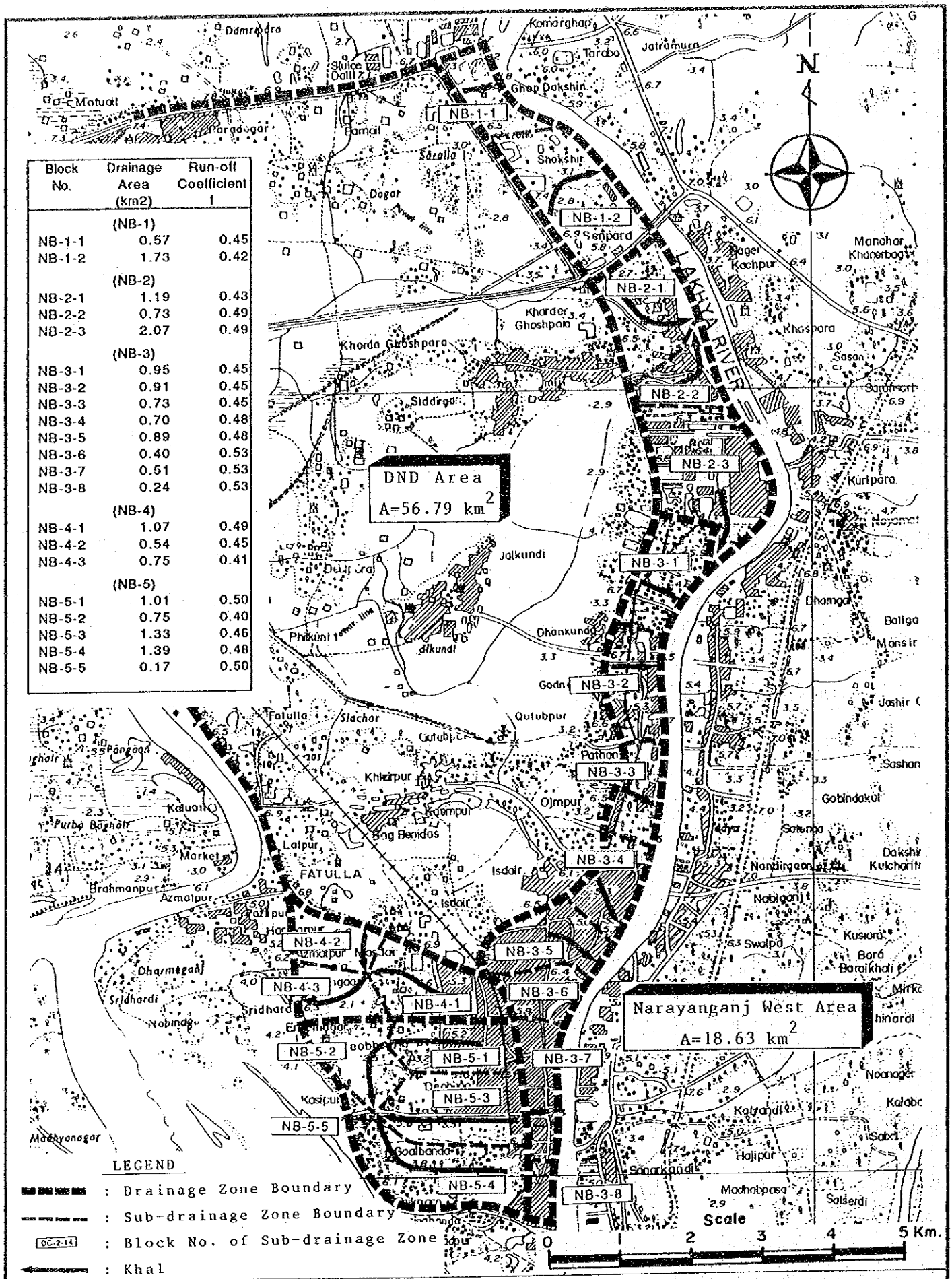


FIG. 6.3.7

SUB-DRAINAGE ZONE AND THEIR RUN-OFF COEFFICIENT
: NARAYANGANJ WEST

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF
BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

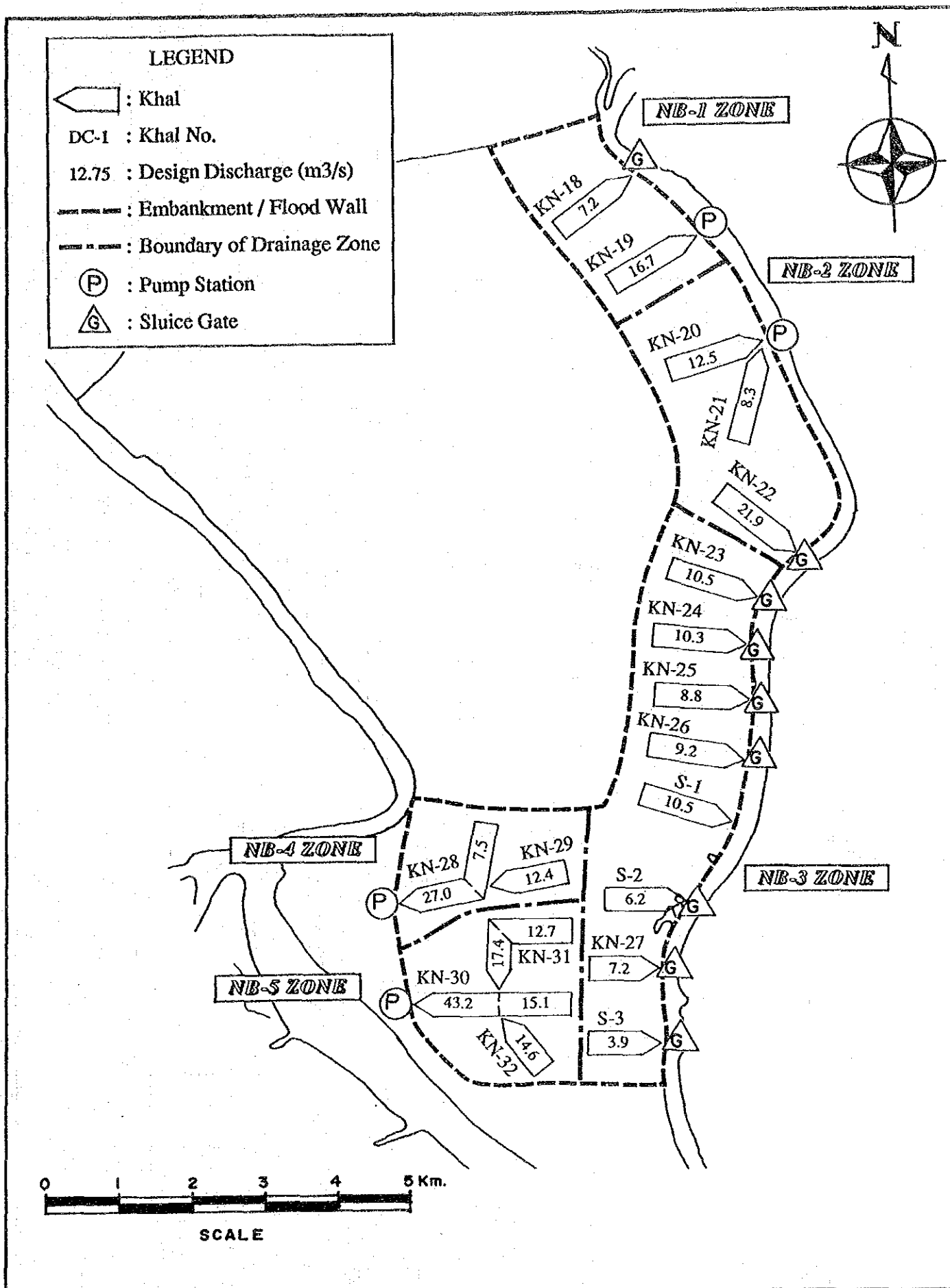
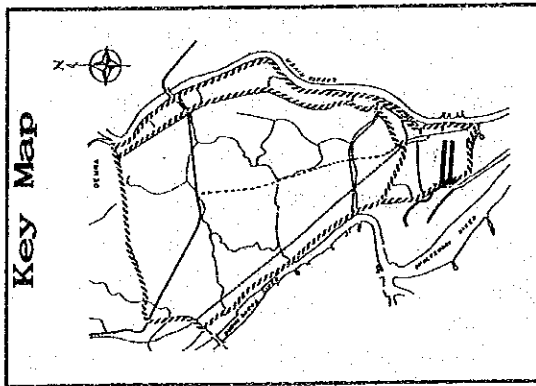
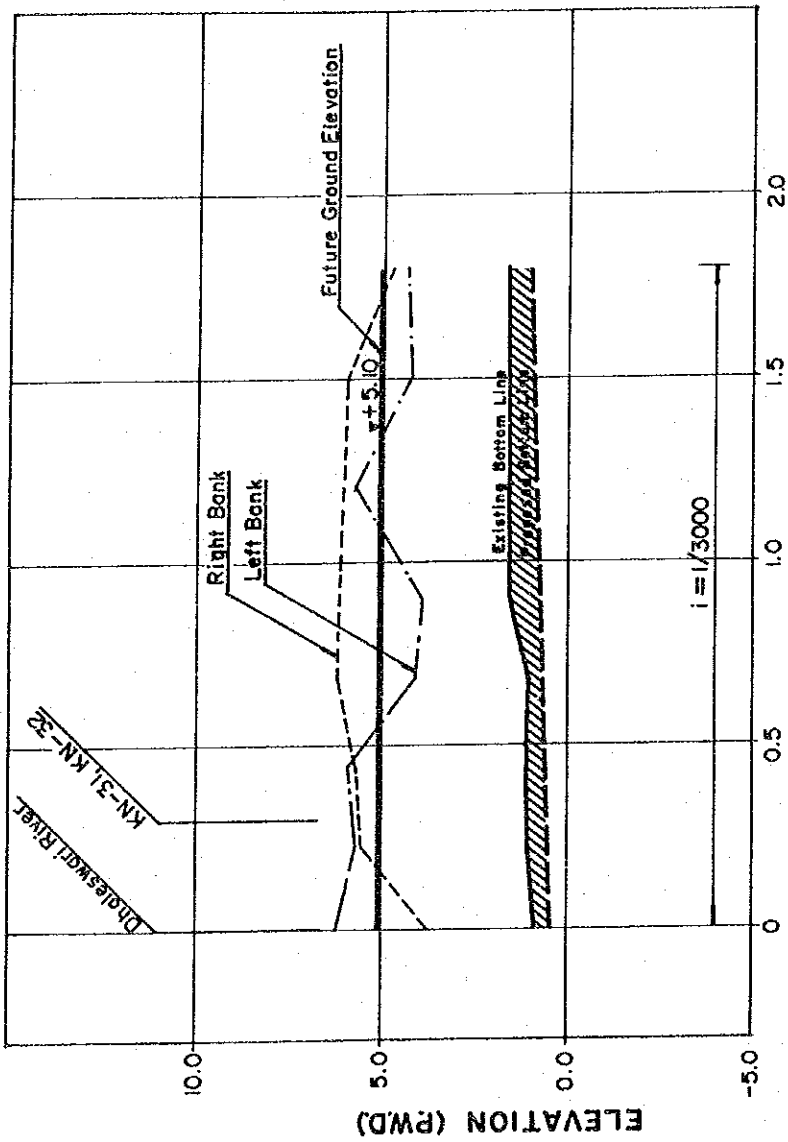


FIG. 6.3.8 DESIGN DISCHARGES FOR IMPROVEMENTS OF KHAL AND TRUNK DRAIN : NARAYANGANJ WEST-

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROLOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH



DISTANCE (Km)

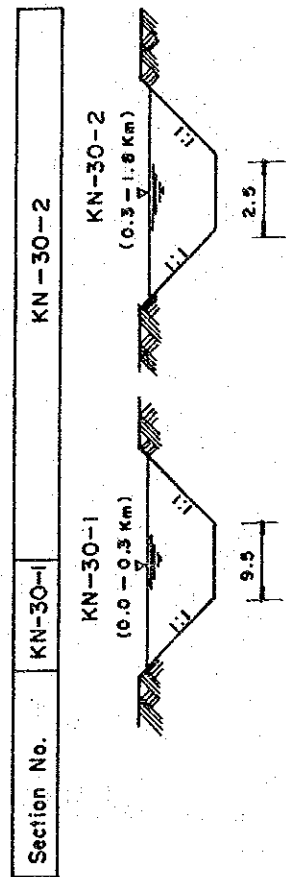
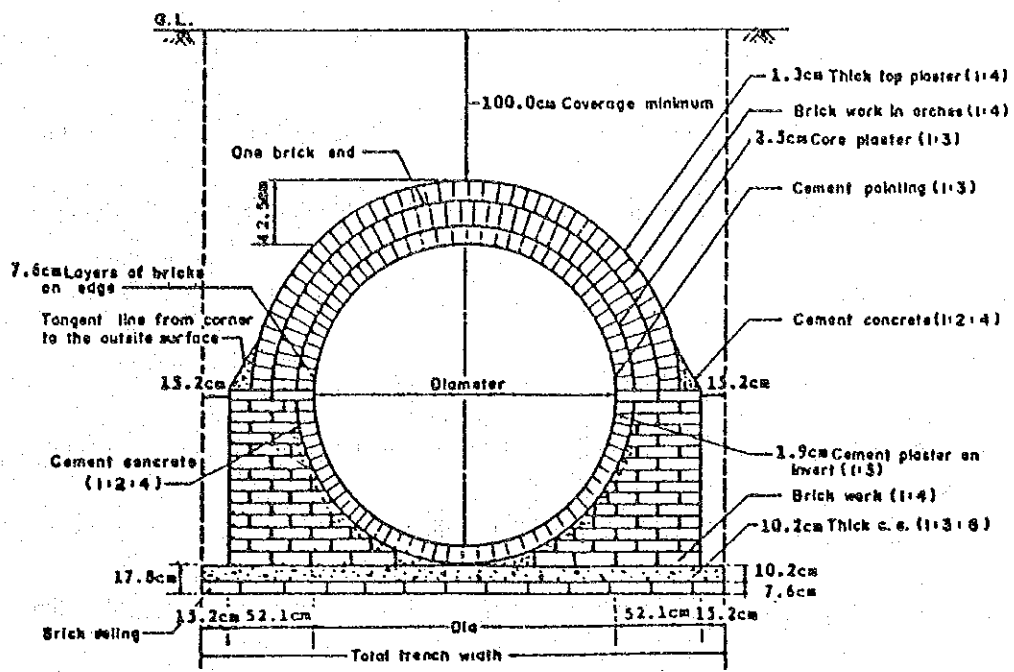


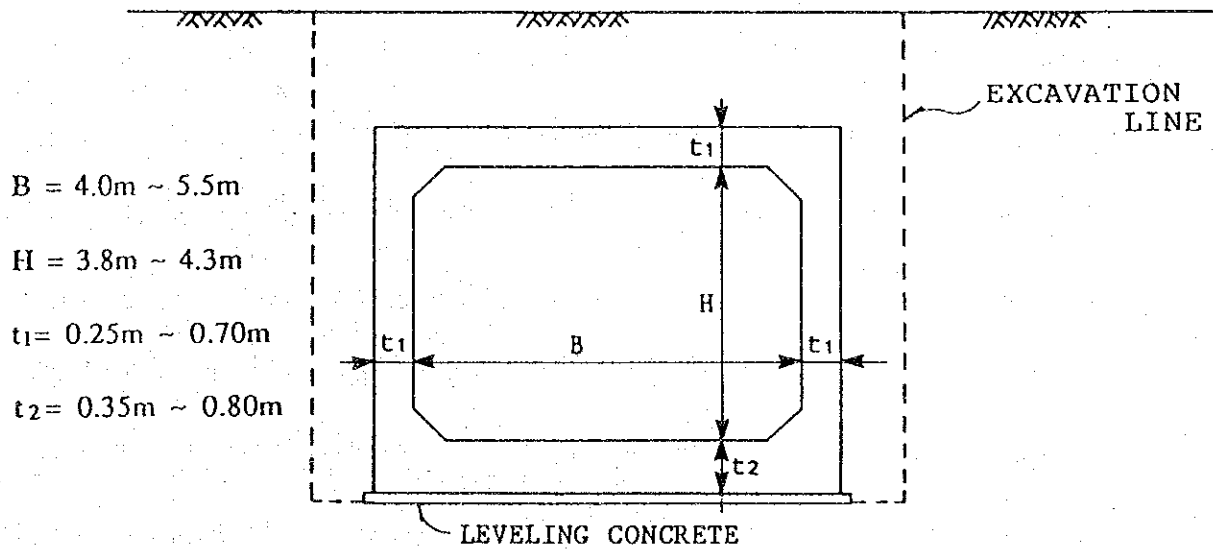
FIG. 6.3.9 PROPOSED LONGITUDINAL AND CROSS SECTIONS (KN-30)

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH





TYPE (1) : BRICK PIPE (Blow $\phi 3,000$ m/m)



TYPE (2) : SINGLE BOX CULVERT

FIG. 6.3.10 TYPICAL DESIGN OF PROPOSED TRUNK DRAIN

GREATER DHAKA PROTECTION PROJECT (STUDY IN DHAKA METROPOLITAN AREA) OF BANGLADESH FLOOD ACTION PLAN NO.8A IN THE PEOPLE'S REPUBLIC OF BANGLADESH

