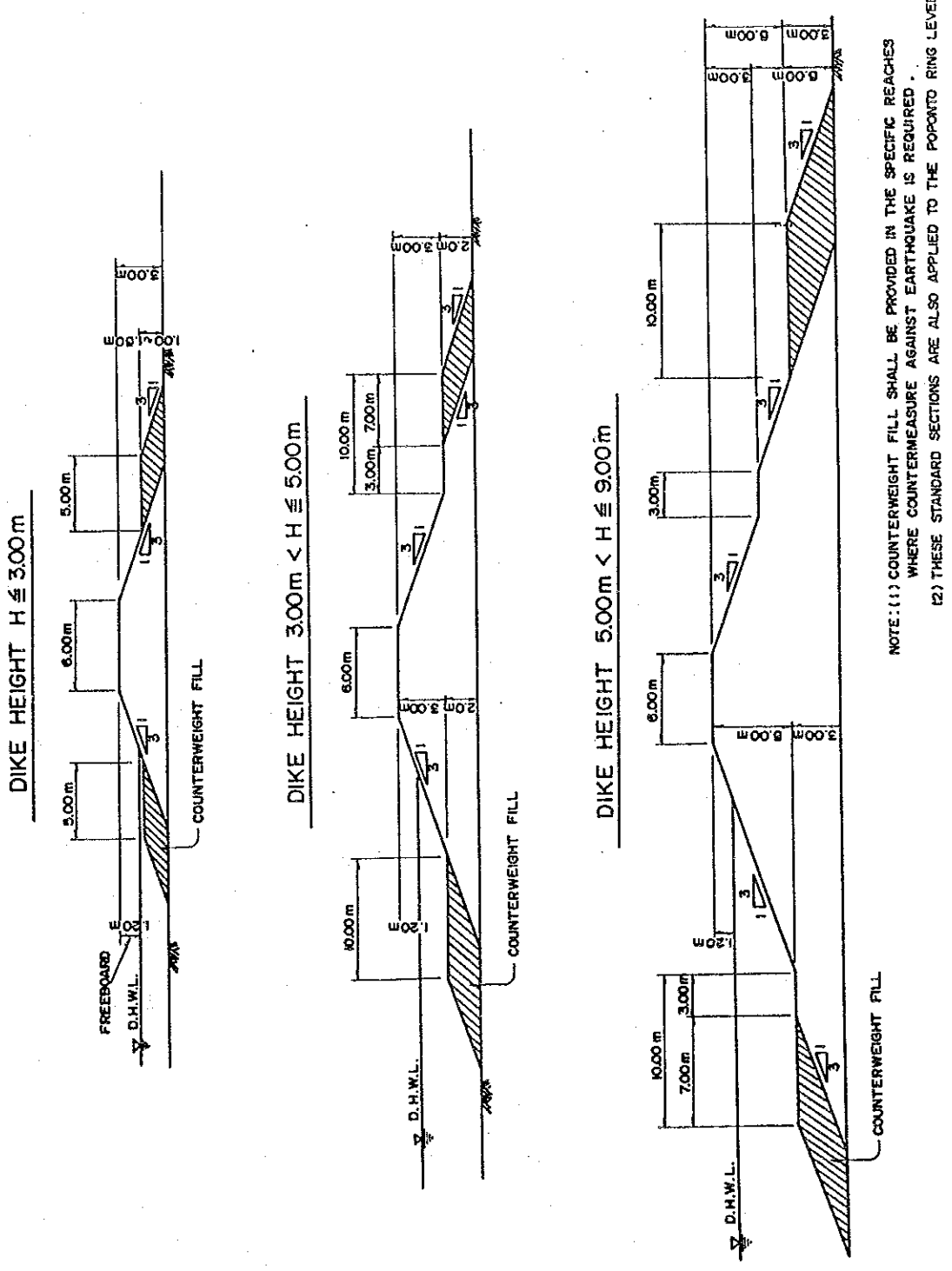


Fig. 2.14 STANDARD DIKE SECTION FOR UPPER AGNO RIVER

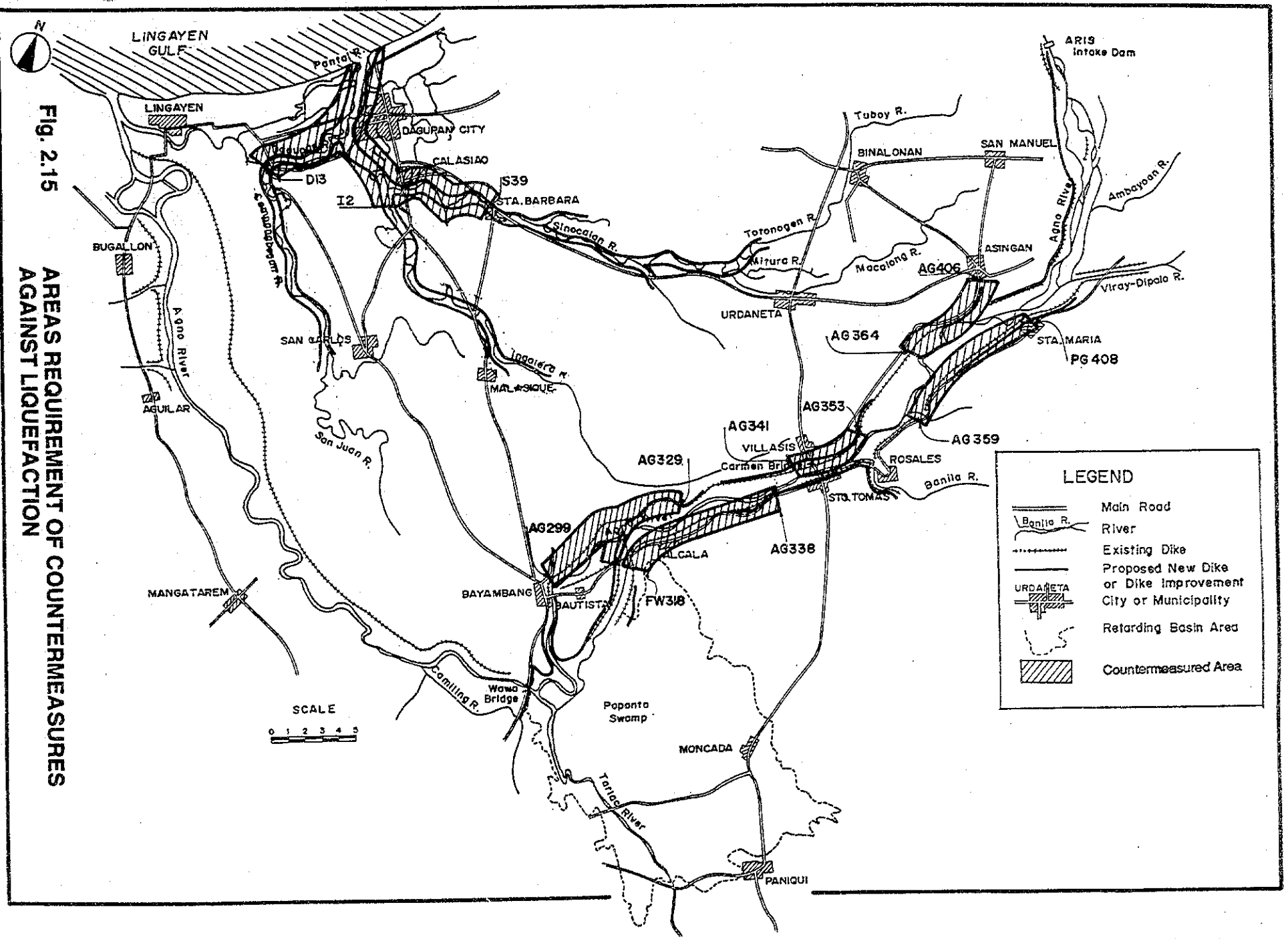
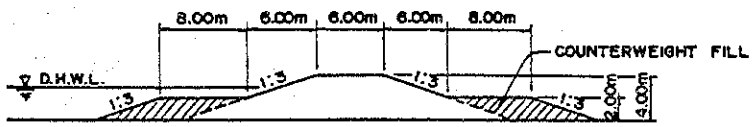


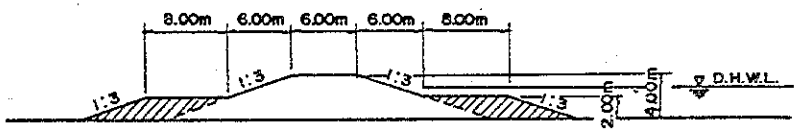
Fig. 2.15 AREAS REQUIREMENT OF COUNTERMEASURES AGAINST LIQUEFACTION

Fig. 2.16

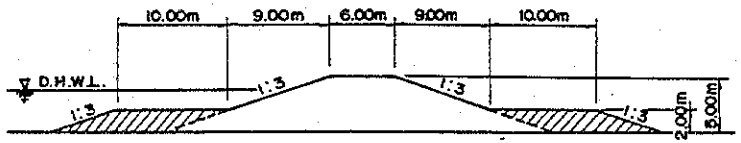
STANDARD DESIGN OF COUNTERWEIGHT FILL AGAINST LIQUEFACTION (UPPER AGNO)



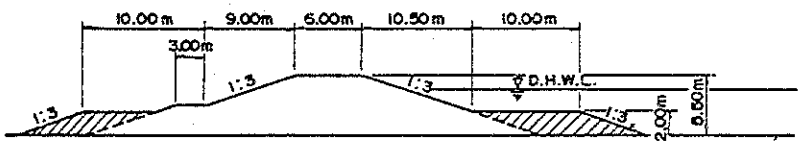
STATION NO. FW318 – AG 321 (RIGHT DIKE)



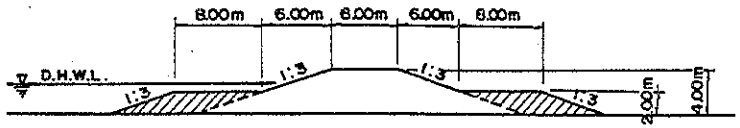
STATION NO. FW318 – AG 325 (LEFT DIKE)



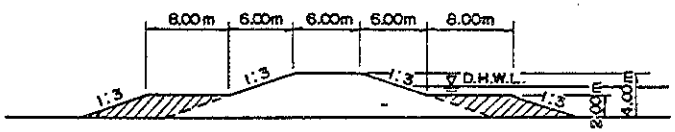
STATION NO. AG 321 – AG 329 (RIGHT DIKE)



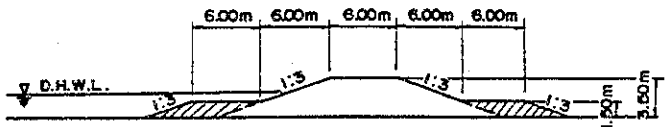
STATION NO. AG 325 – AG 331 (LEFT DIKE)



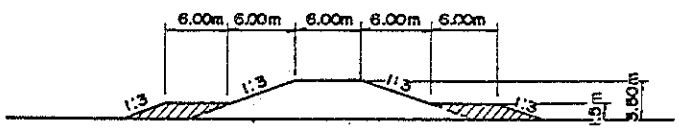
STATION NO. AG 341 – AG 353 (RIGHT DIKE)



STATION NO. AG 331 – AG 338 (LEFT DIKE)



STATION NO. AG 364 – AG 408 (RIGHT DIKE)



STATION NO. AG 360 – AG 416 (LEFT DIKE)

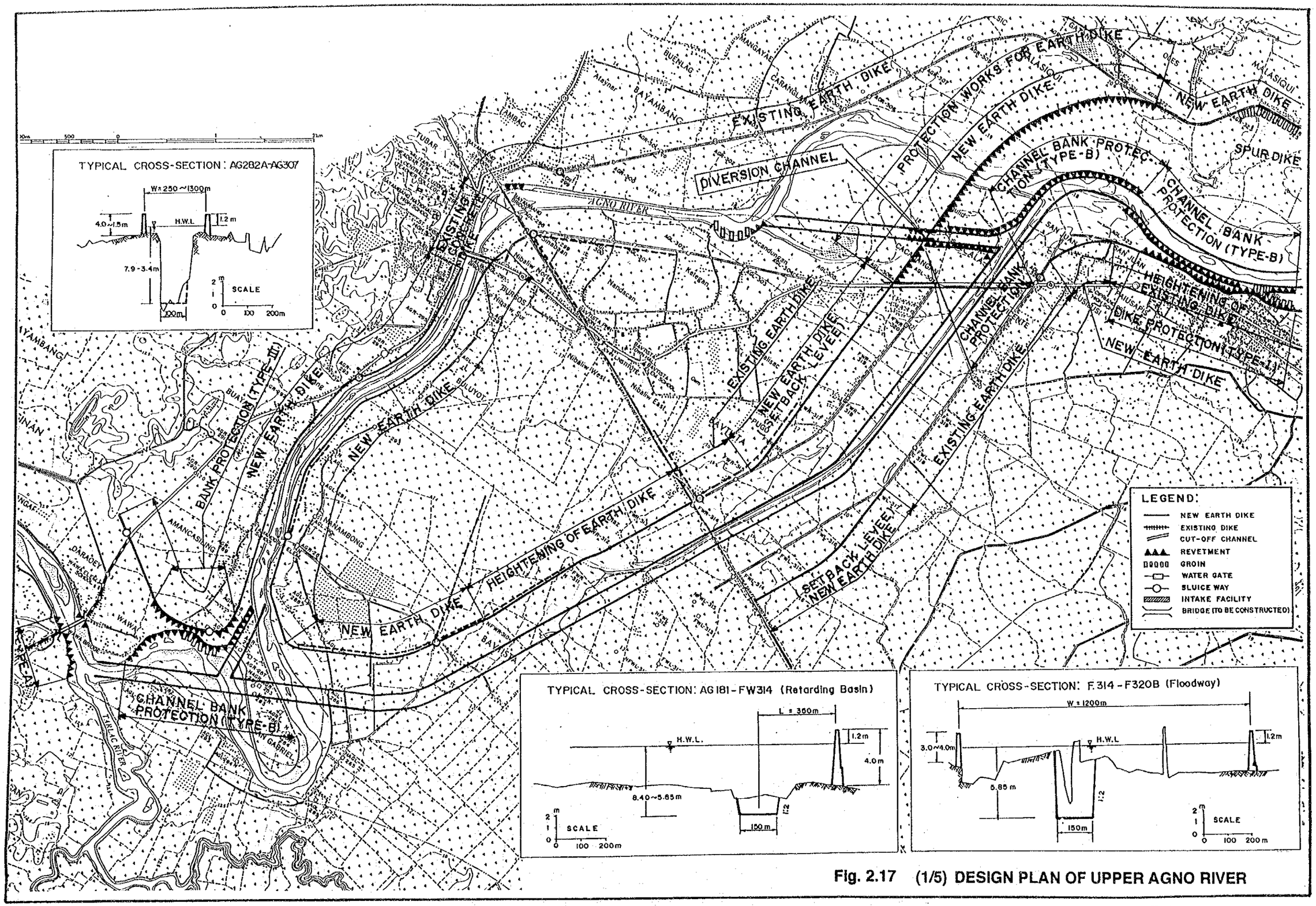


Fig. 2.17 (1/5) DESIGN PLAN OF UPPER AGNO RIVER

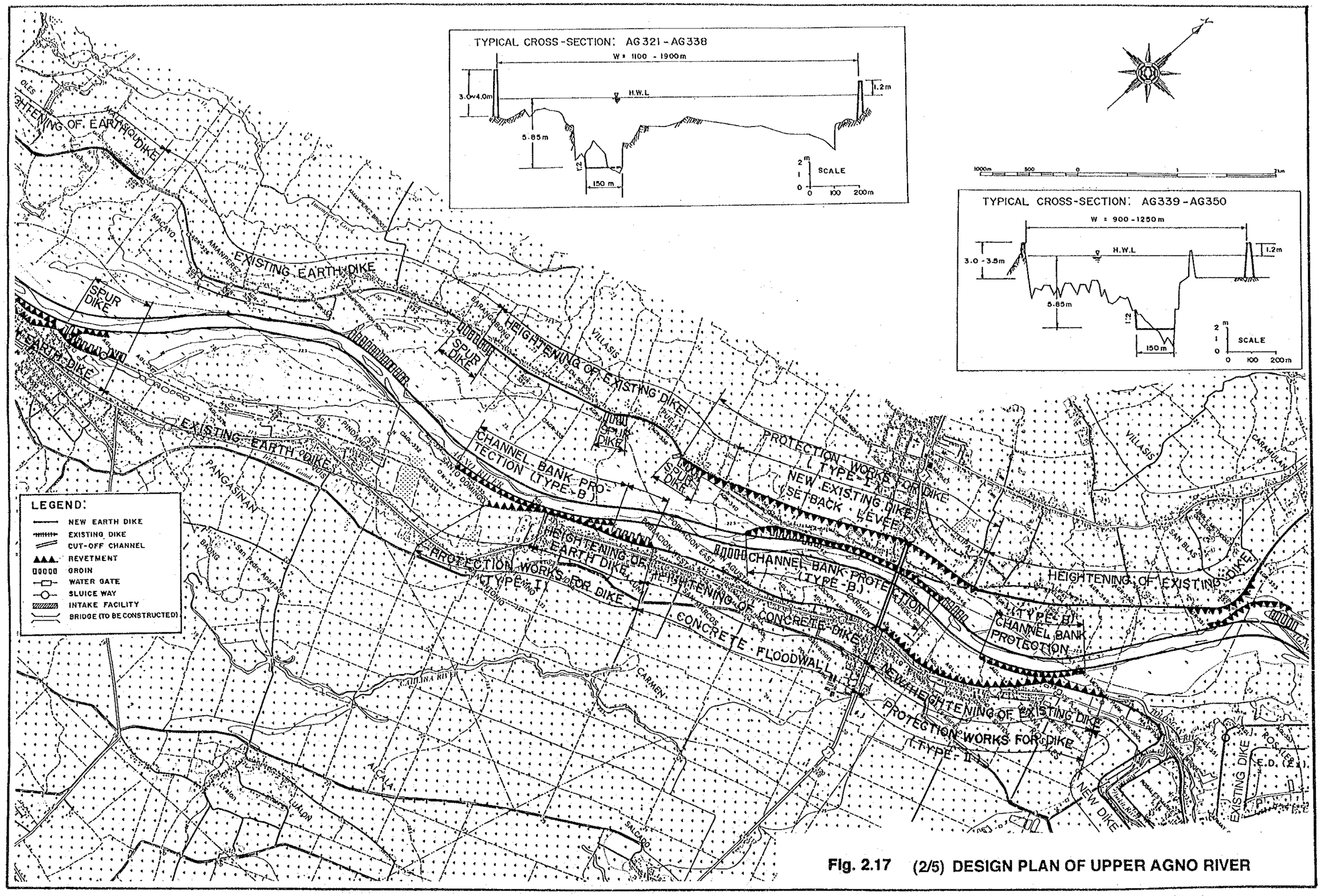


Fig. 2.17 (2/5) DESIGN PLAN OF UPPER AGNO RIVER

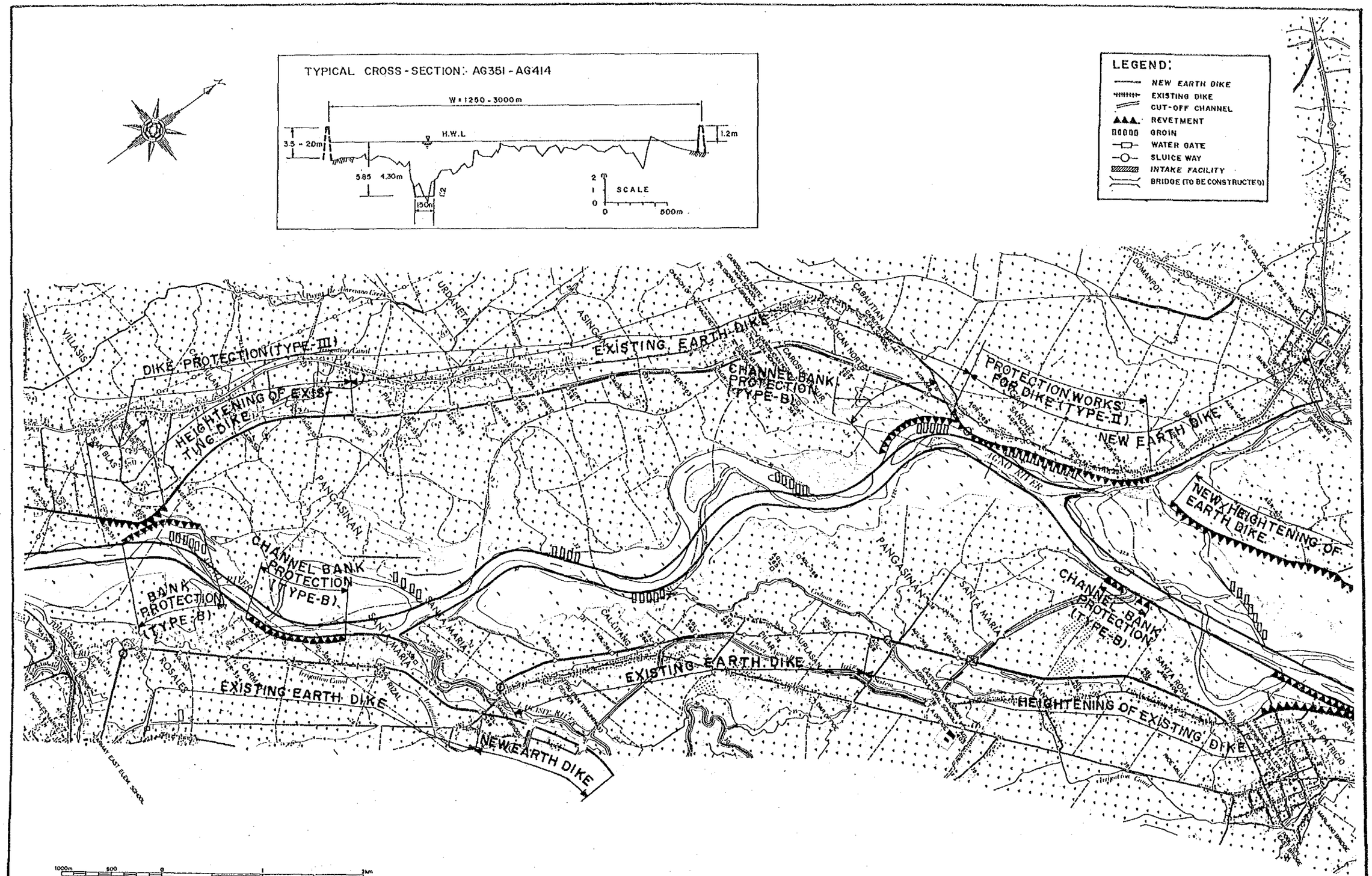


Fig. 2.17 (3/5) DESIGN PLAN OF UPPER AGNO RIVER

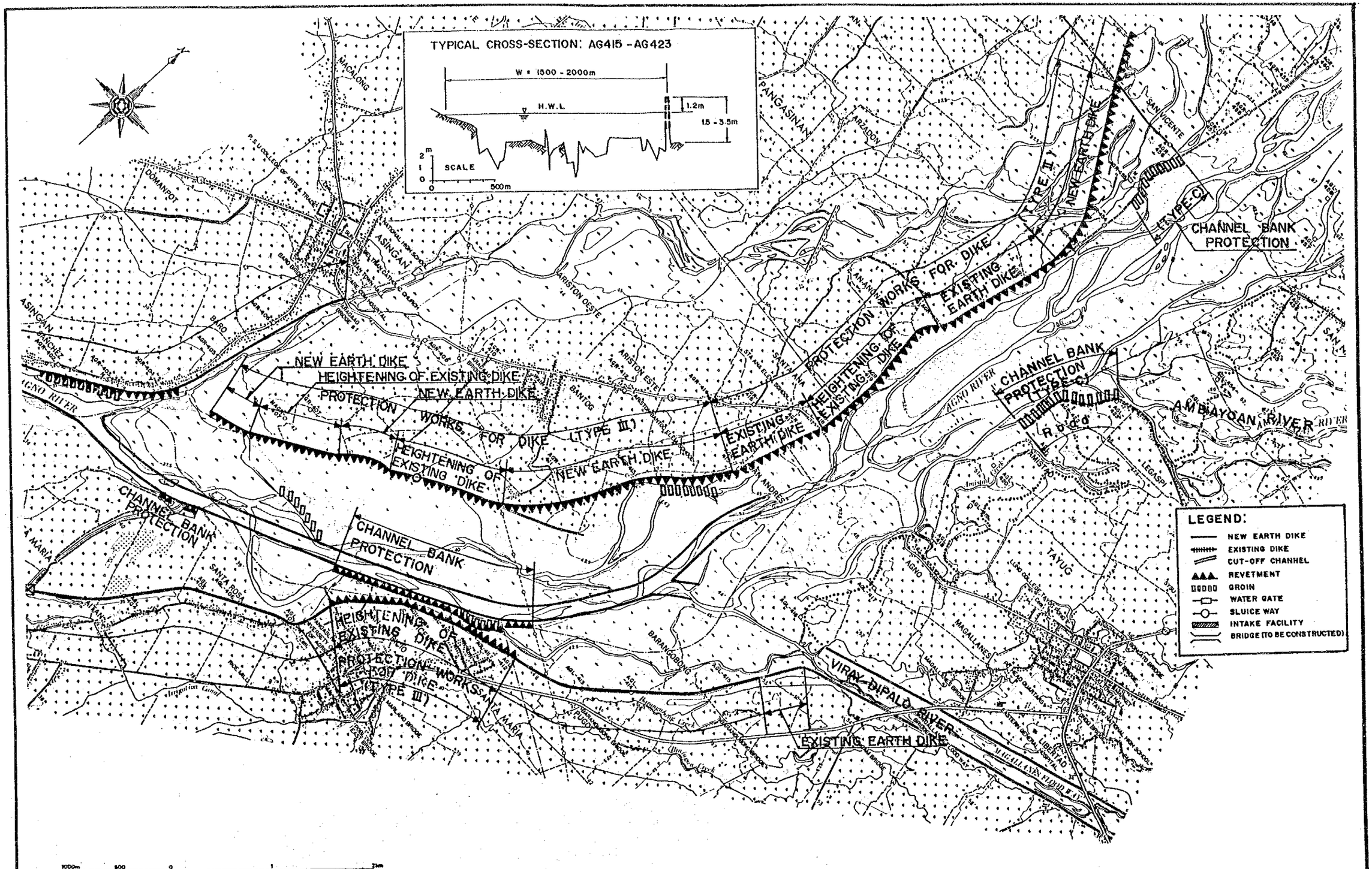


Fig. 2.17 (4/5) DESIGN PLAN OF UPPER AGNO RIVER

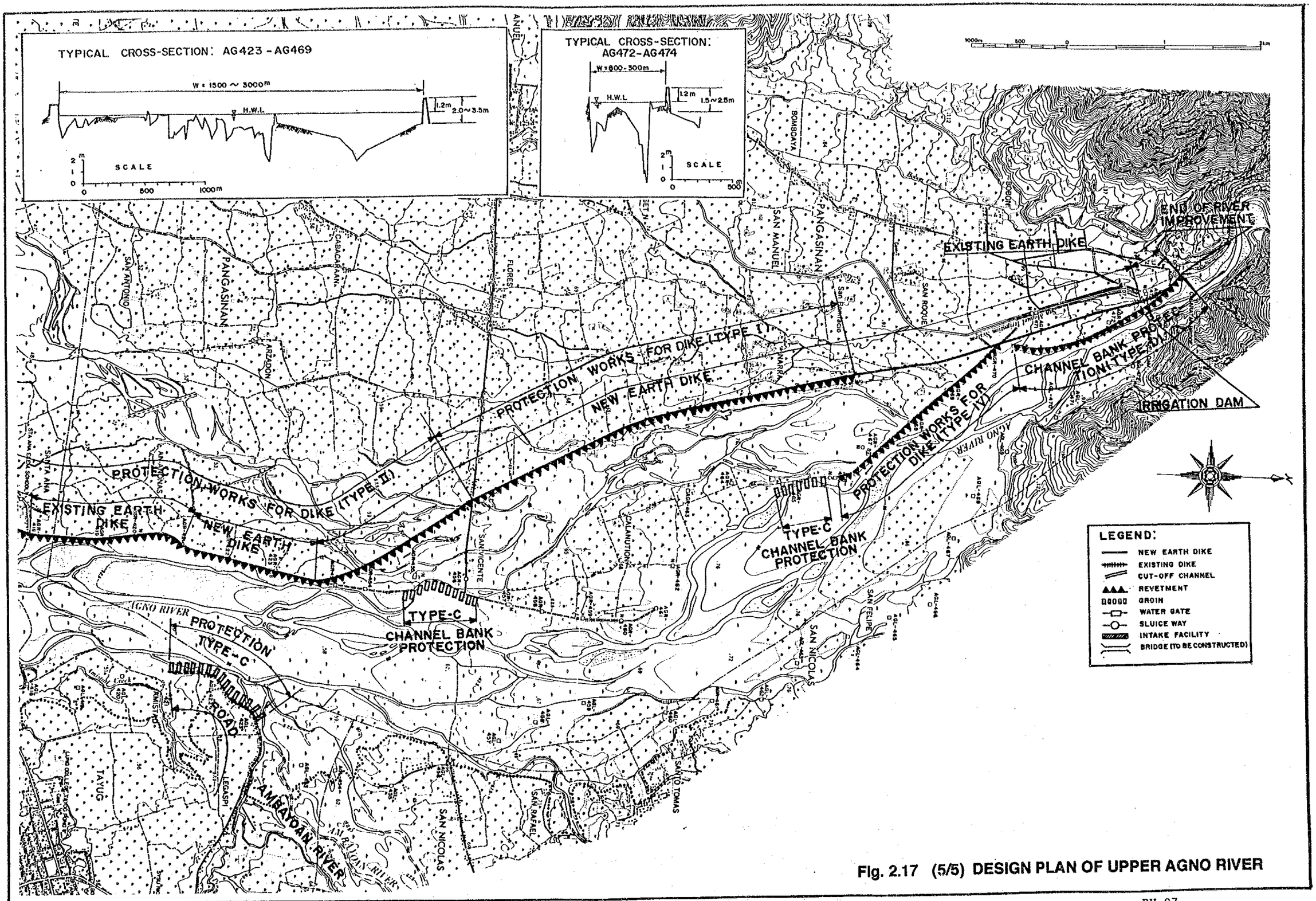
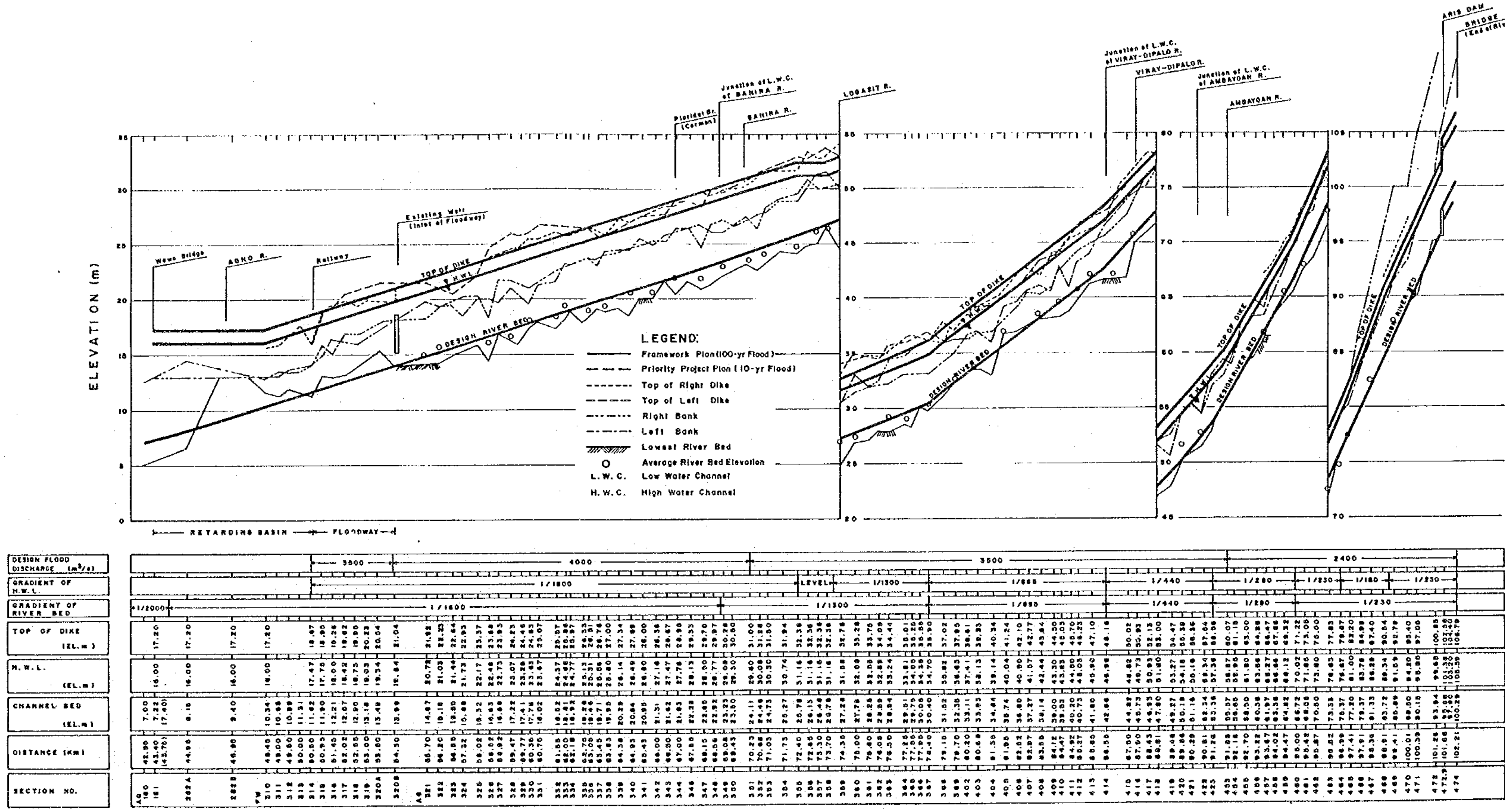
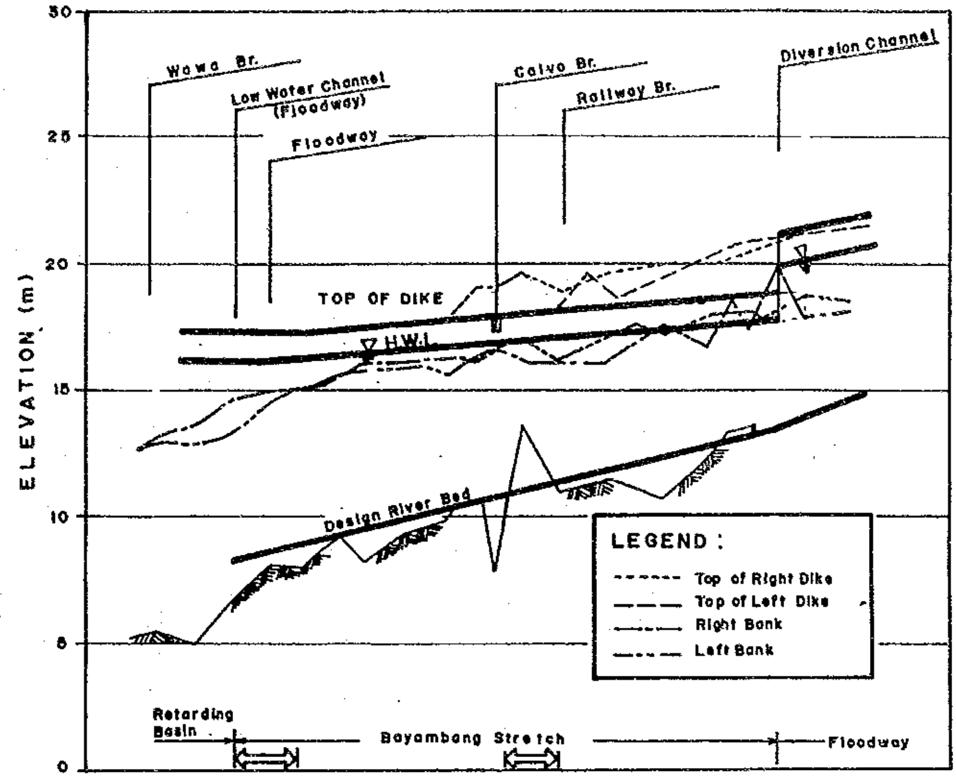


Fig. 2.17 (5/5) DESIGN PLAN OF UPPER AGNO RIVER



NOTE: NO LOW-WATER CHANNEL IMPROVEMENT IN STRETCH FROM AG416-AG474 FOR PRIORITY PROJECT.

Fig. 2.18 LONGITUDINAL PROFILE OF UPPER AGNO RIVER

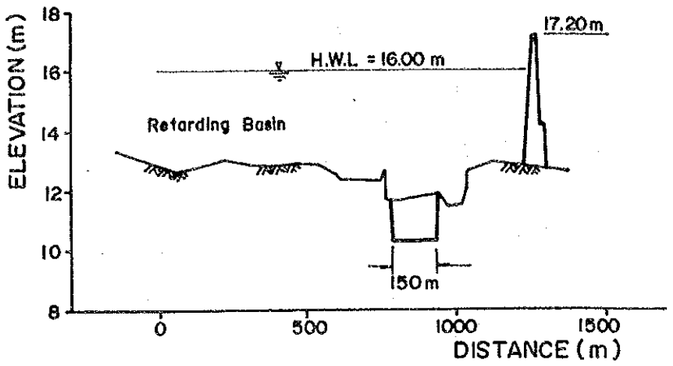


DESIGN FLOOD DISCHARGE (m^3/s)				800 (Sec. 282A – 307)																						
GRADIENT OF H.W.L.			LEVEL	1/6000 (to Sec. 307)																						
GRADIENT OF RIVER BED				1/1850 (Sec. 282A – 307)																						
TOP OF DIKE (EL. m.)				17.20	17.20	17.20	17.20	17.23	17.29	17.37	17.42	17.56	17.63	17.73	17.78	17.88	17.98	18.07	18.14	18.23	18.32	18.47	18.55	18.60	18.70	21.34	21.92
H.W.L. (EL. m.)				16.00	16.00	16.00	16.15	16.23	16.29	16.37	16.42	16.56	16.63	16.73	16.78	16.88	16.98	17.07	17.14	17.23	17.32	17.47	17.55	17.60	17.70	20.14	20.72
CHANNEL BED (EL. m.)		7.00			8.15	8.58	8.89	9.12	9.31	9.57	9.92	10.18	10.43	10.75	10.92	11.23	11.56	11.84	12.08	12.38	12.66	13.14	13.40	13.56	13.91	14.29	14.87
DISTANCE (Km.)		42.95	43.40	44.25	44.95	45.75	46.32	46.75	47.10	47.58	48.23	48.70	49.17	49.72	50.07	50.65	51.25	51.77	52.22	52.77	53.29	54.19	54.67	54.95	55.60		
SECTION NO.	AG	180	181	281	282A	288	289	290	291	292	293	294	295	296	297	298	299	300	301	302	303	304	305	306	307	3208 +500m	321

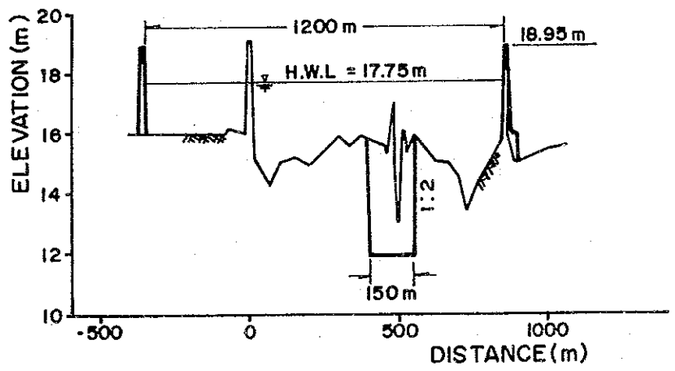
NOTE : ⇔ : Low Water Channel Improved

Fig. 2.19 LONGITUDINAL PROFILE OF BAYAMBANG STRETCH OF THE AGNO RIVER

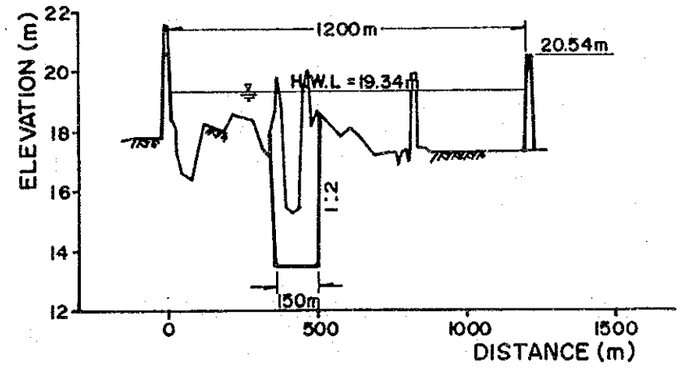
STATION : FW310 (Floodway)



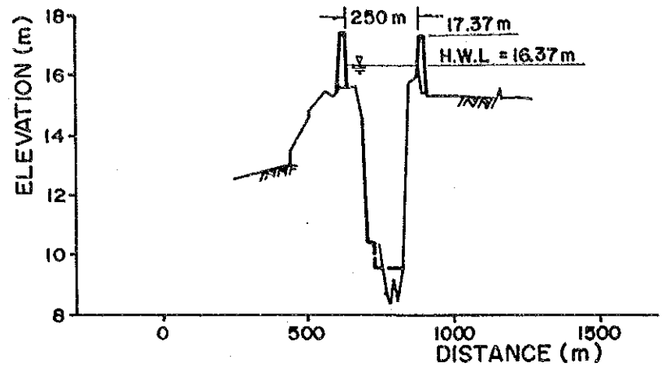
STATION : FW315 (Floodway)



STATION : FW320A (Floodway)



STATION : AG292 (Bayambang Stretch)

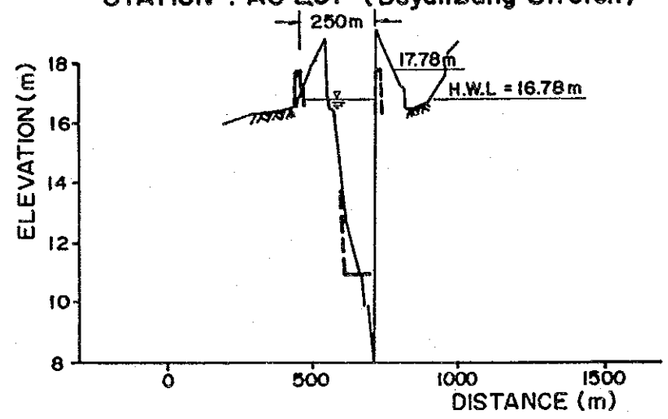


LEGEND

— PRIORITY PROJECT PLAN

— EXISTING

STATION : AG297 (Bayambang Stretch)



STATION : AG306 (Bayambang Stretch)

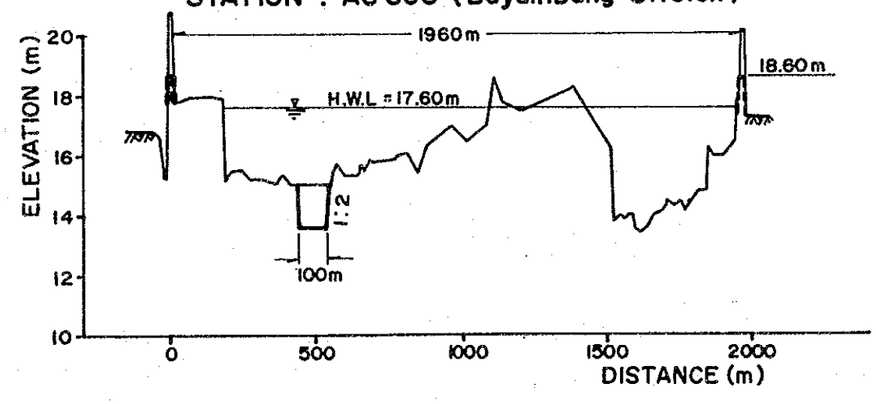
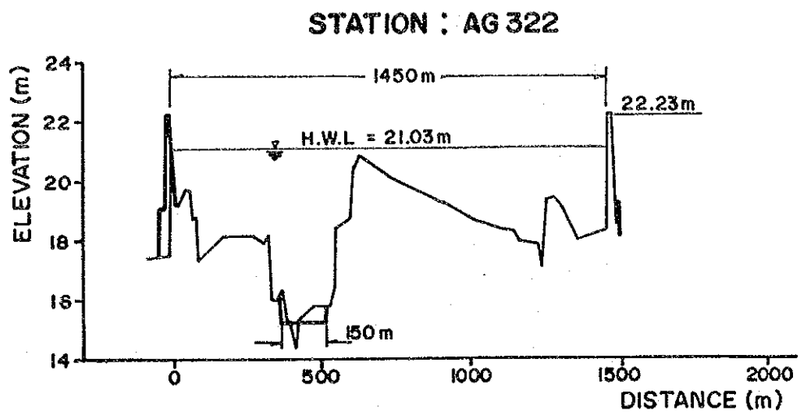
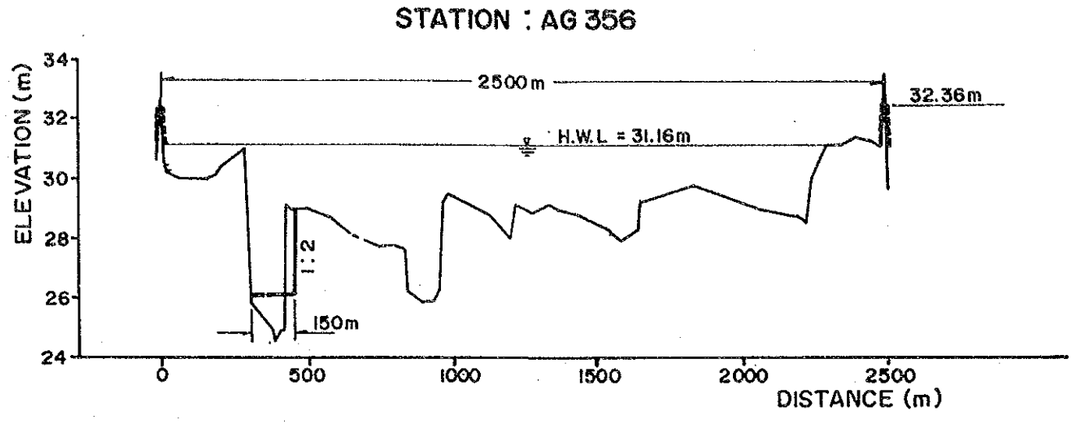
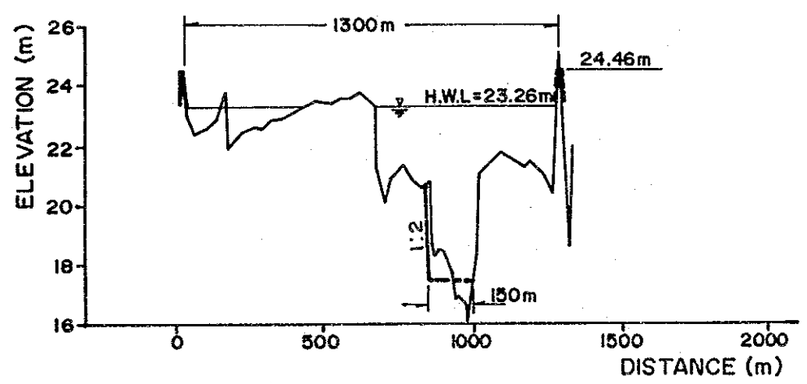
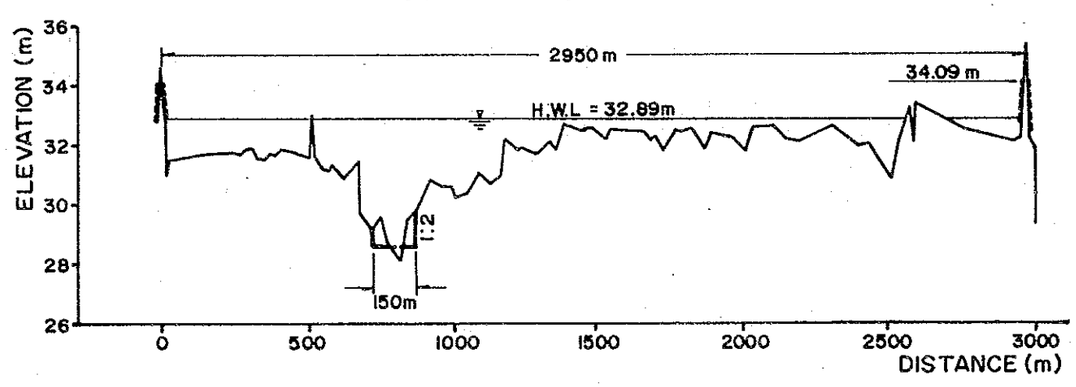


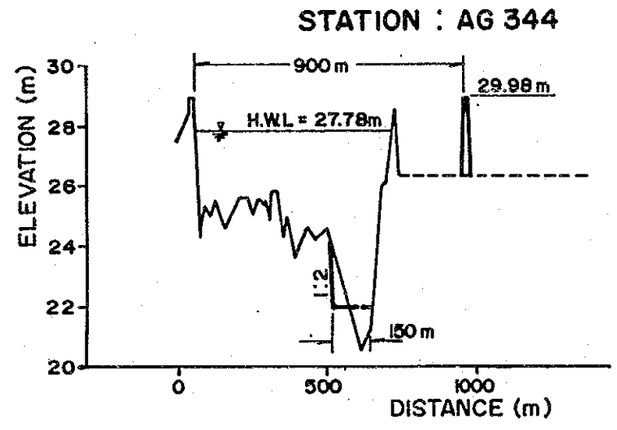
Fig. 2.20 (1/3) TYPICAL CROSS-SECTION OF UPPER AGNO RIVER











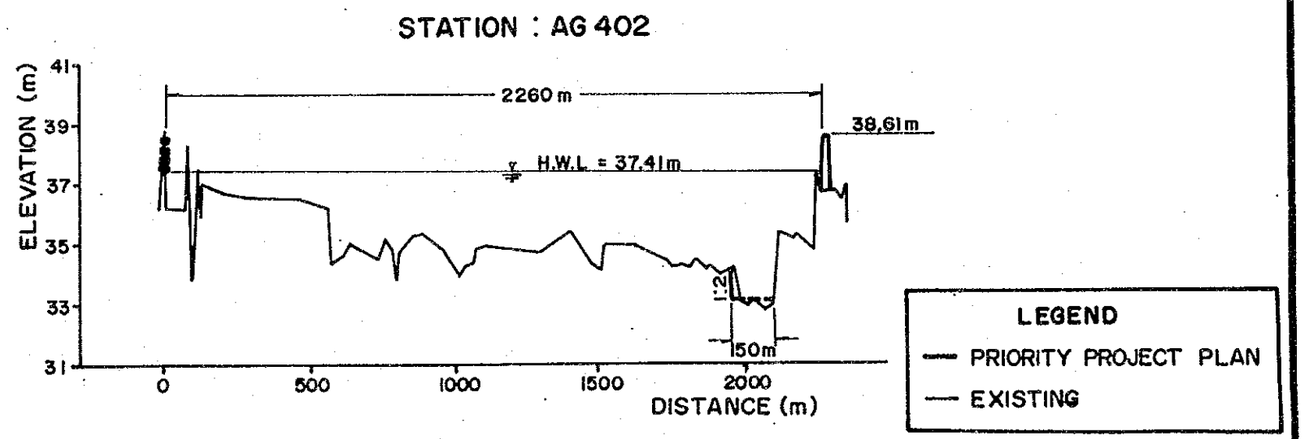
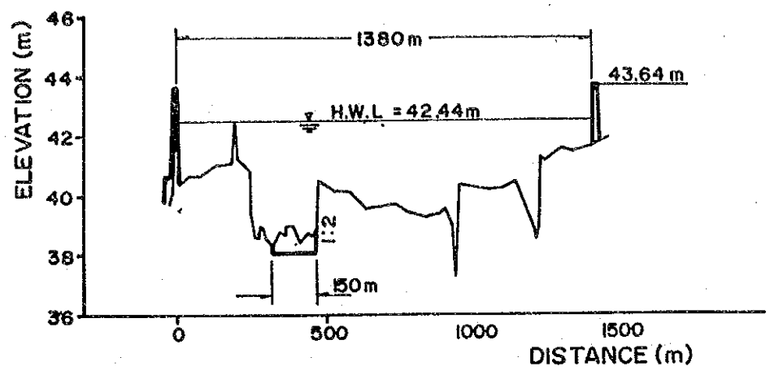
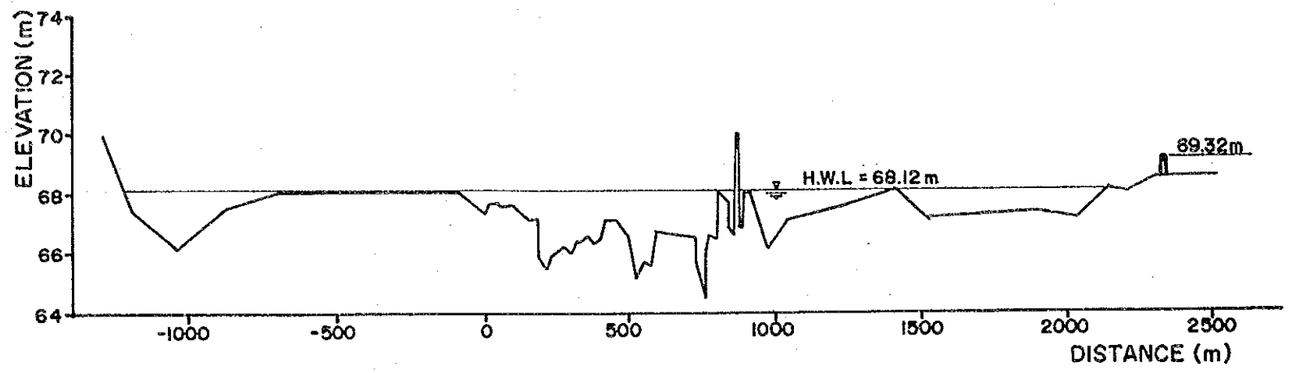


Fig. 2.20 (2/3) TYPICAL CROSS-SECTION OF UPPER AGNO RIVER

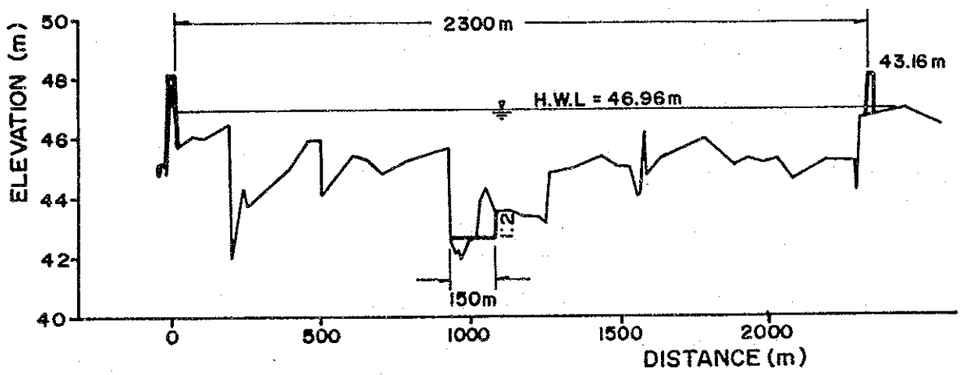
STATION : AG 408



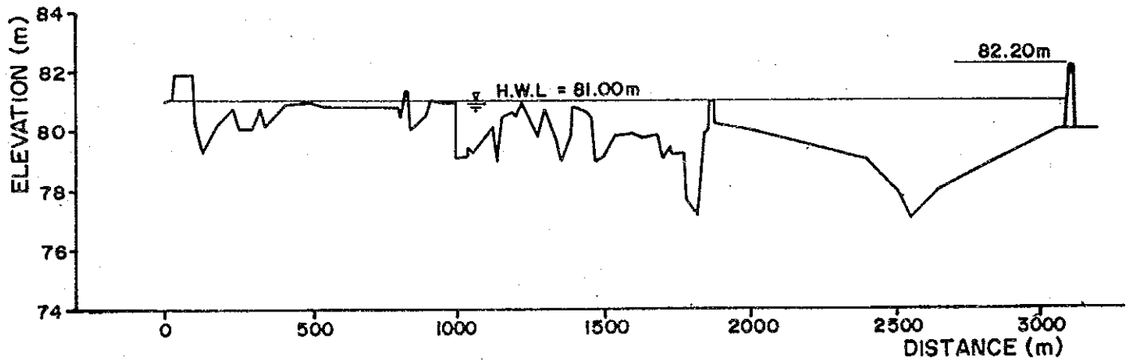
STATION : AG 459



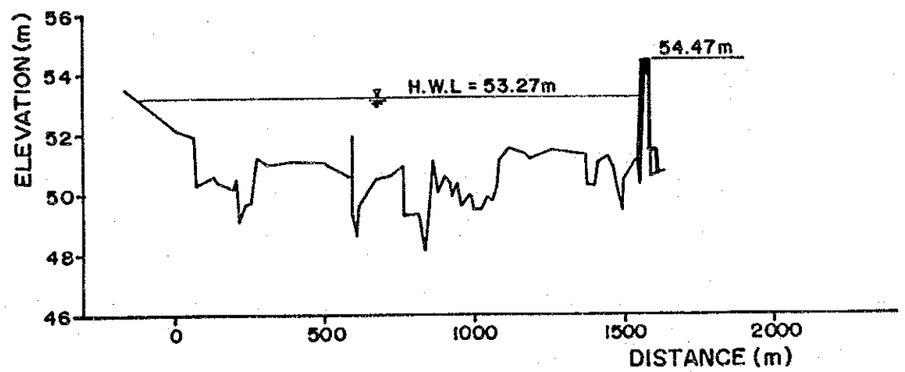
STATION : AG 414



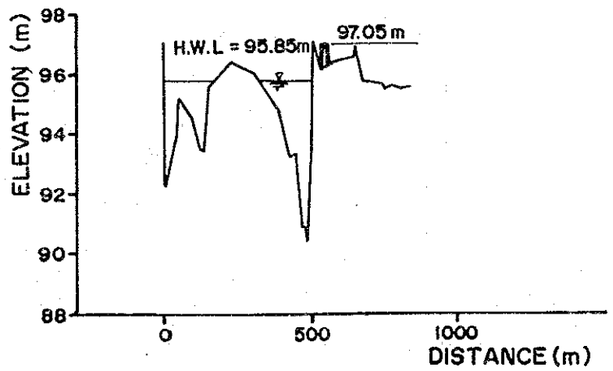
STATION : AG 465



STATION : 419



STATION : AG 471



LEGEND

- PRIORITY PROJECT PLAN
- EXISTING

Fig. 2.20 (3/3) TYPICAL CROSS-SECTION OF UPPER AGNO RIVER

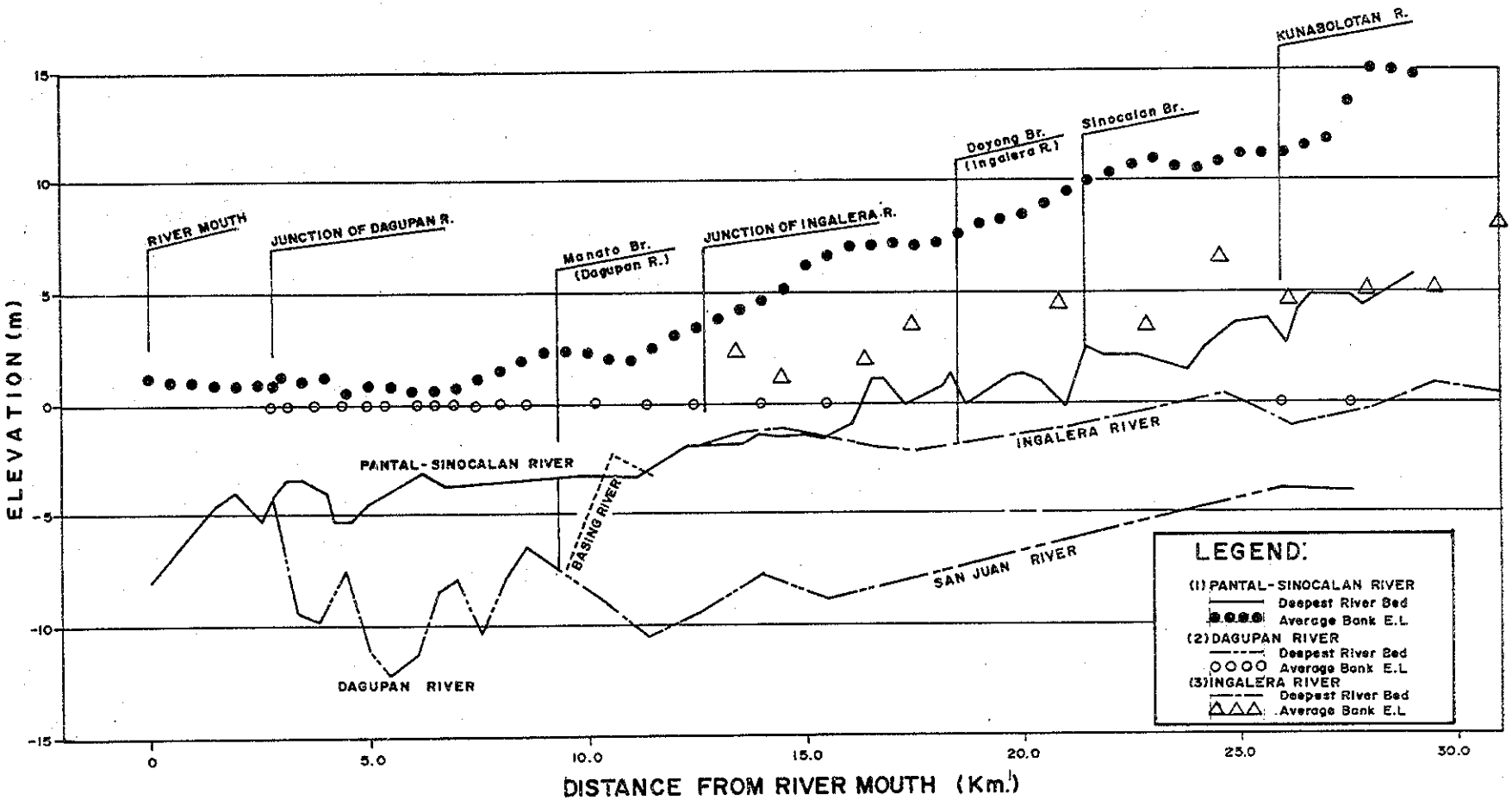
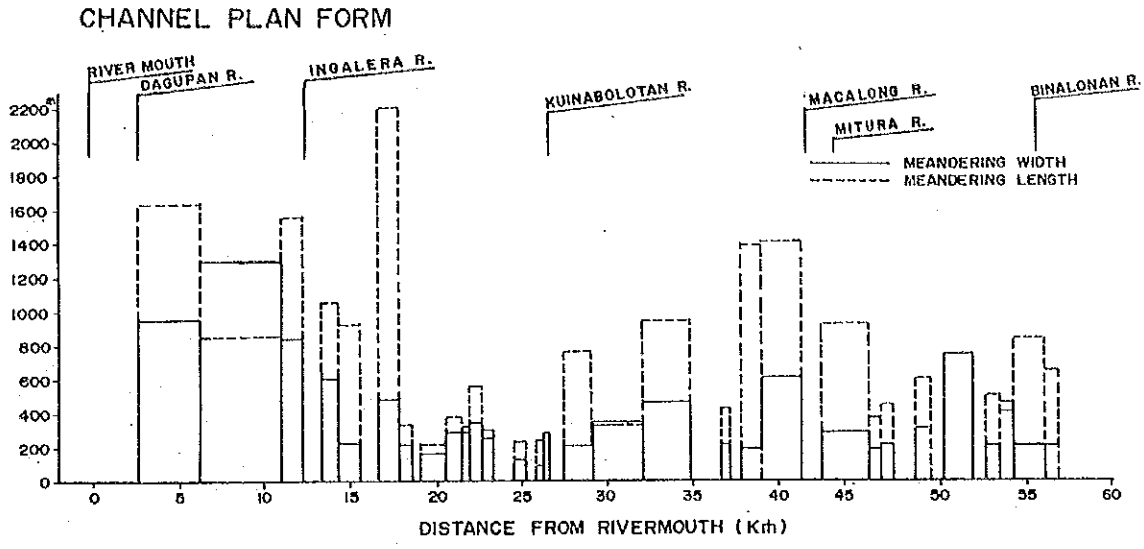
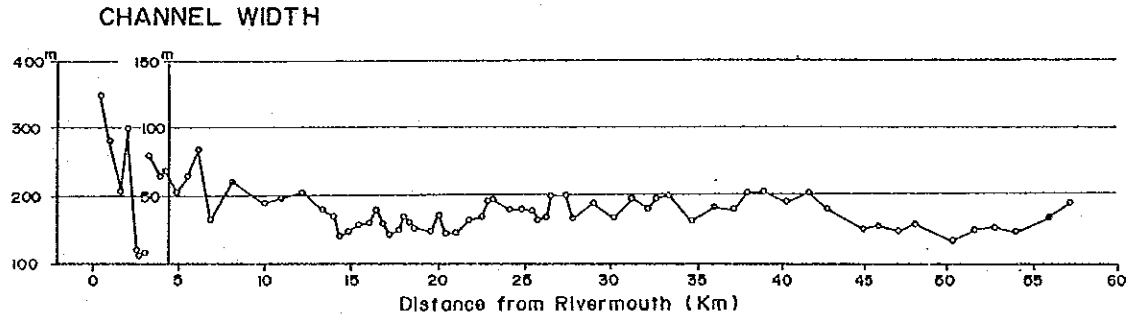
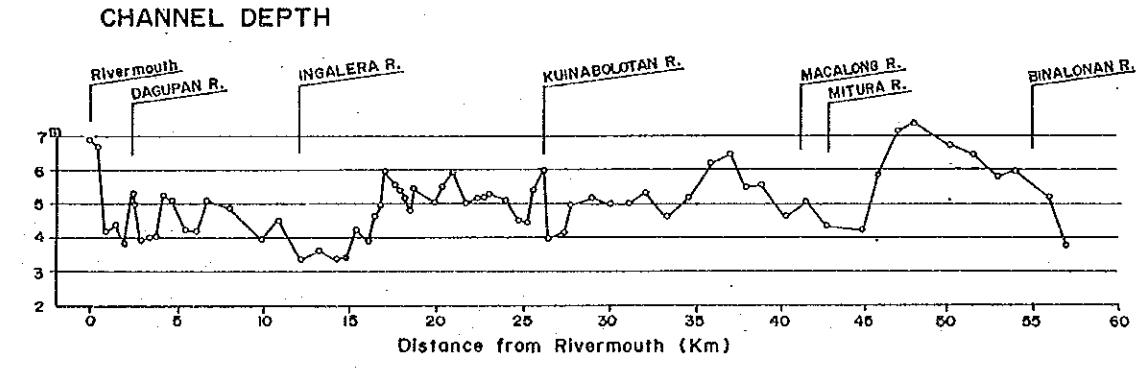


Fig. 3.1 TOPOGRAPHIC CHARACTERISTICS IN LOWER REACH OF PANTAL - SINOCALAN RIVER BASIN







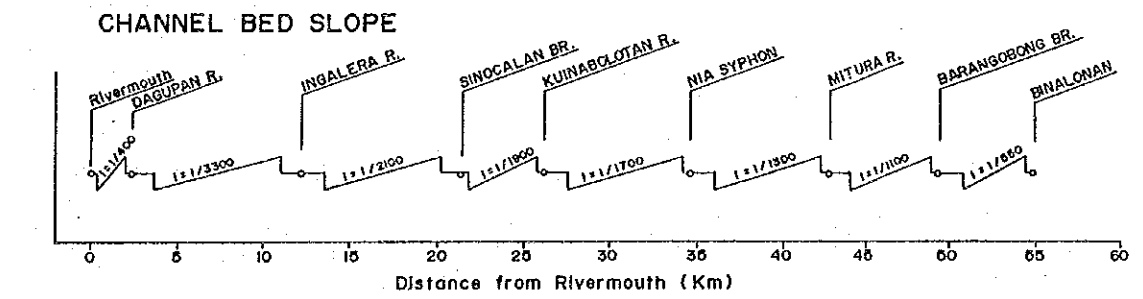
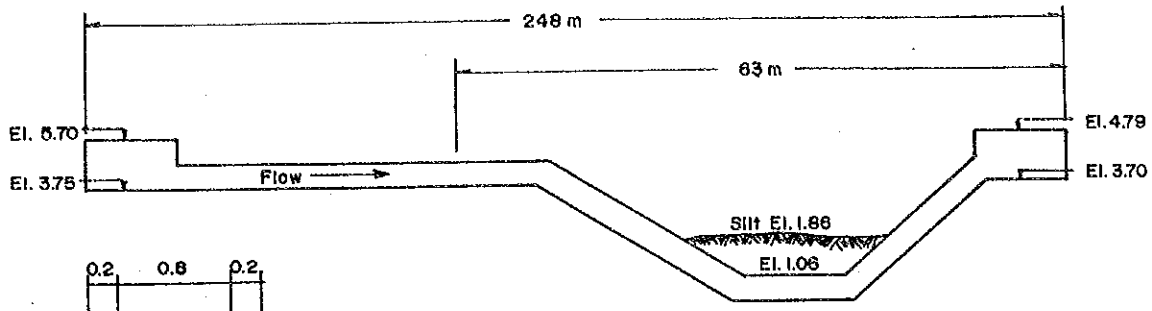
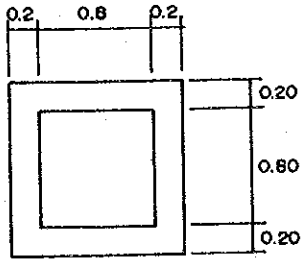


Fig. 3.2 EXISTING CHANNEL FEATURES OF PANTAL - SINOCALAN RIVER

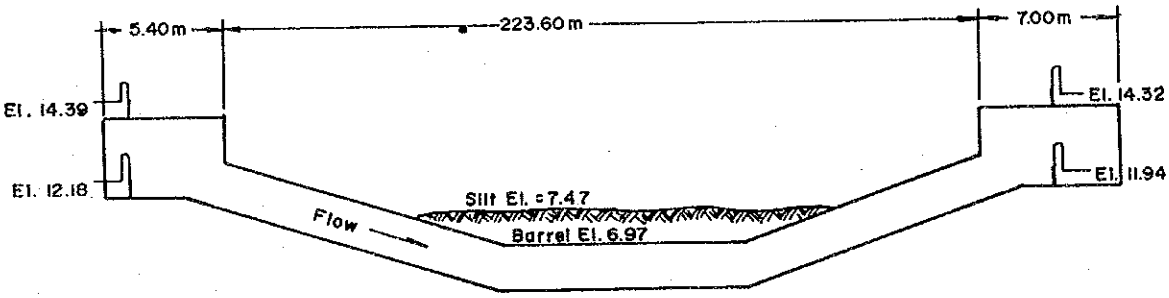


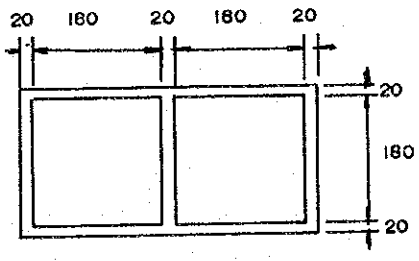


PROFILE

CROSS SECTION

LAT. A EXTRA SIPHON
(DALONGE, STA.BARBARA, PANG.)





PROFILE

CROSS SECTION

LAT. L SIPHON
(MINIEN, STA.BARBARA, PANG.)

Fig. 3.3 **EXISTING SIPHONE CROSSING PANTAL - SINOCALAN RIVER**

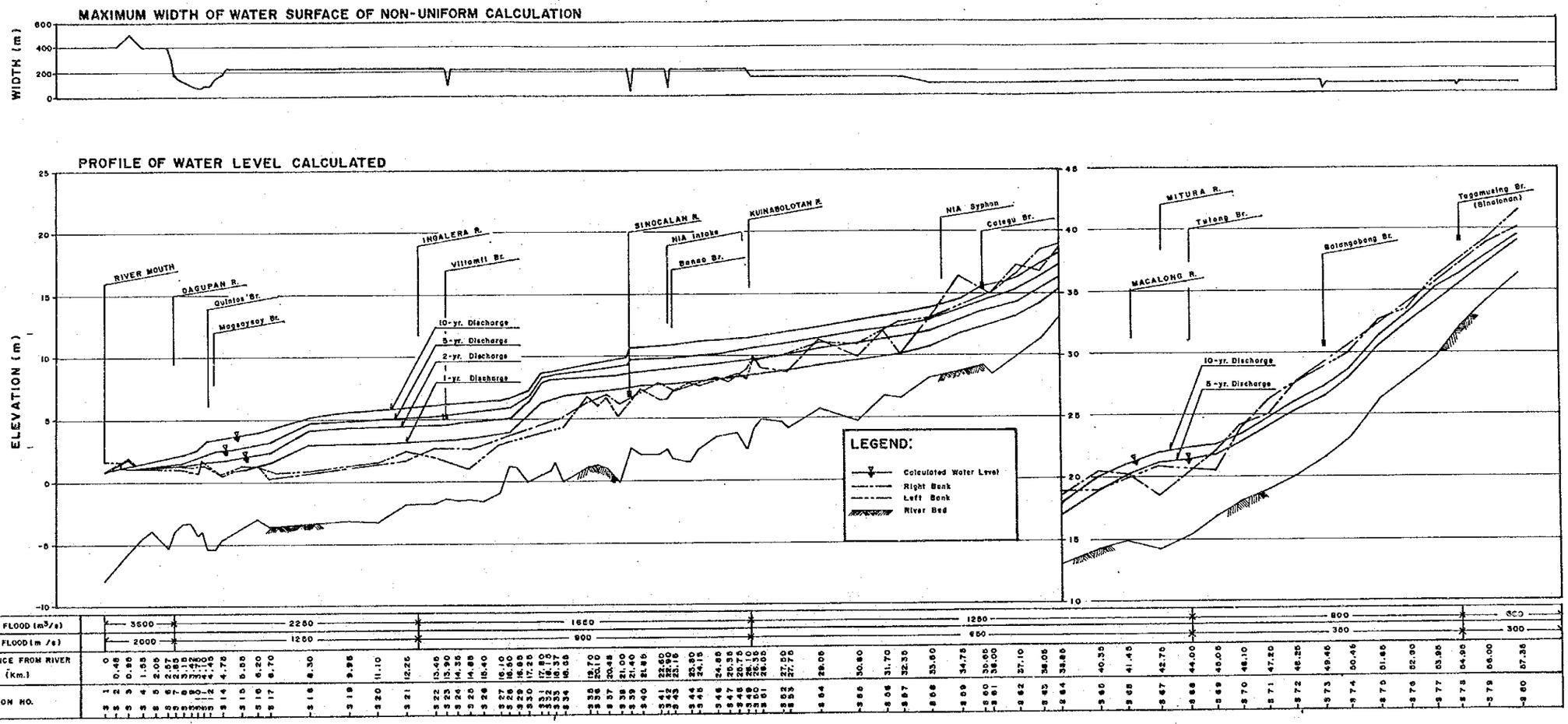


Fig. 3.4 **ESTIMATED FLOOD WATER LEVEL OF MAIN PANTAL - SINOCALAN RIVER**

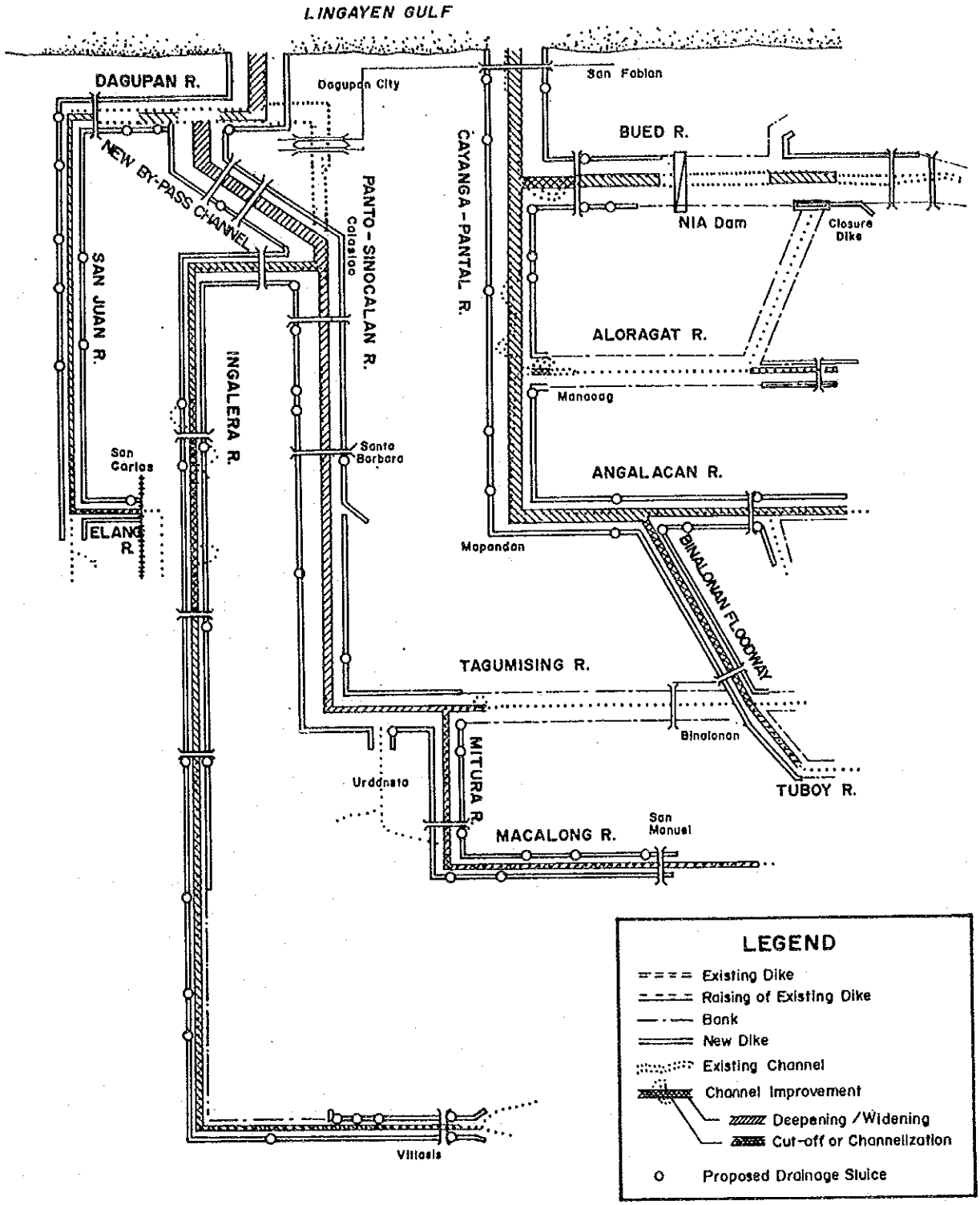


Fig. 3.5 **GENERAL LAYOUT OF ALLIED RIVER IMPROVEMENT PLAN FOR FRAMEWORK PLAN**

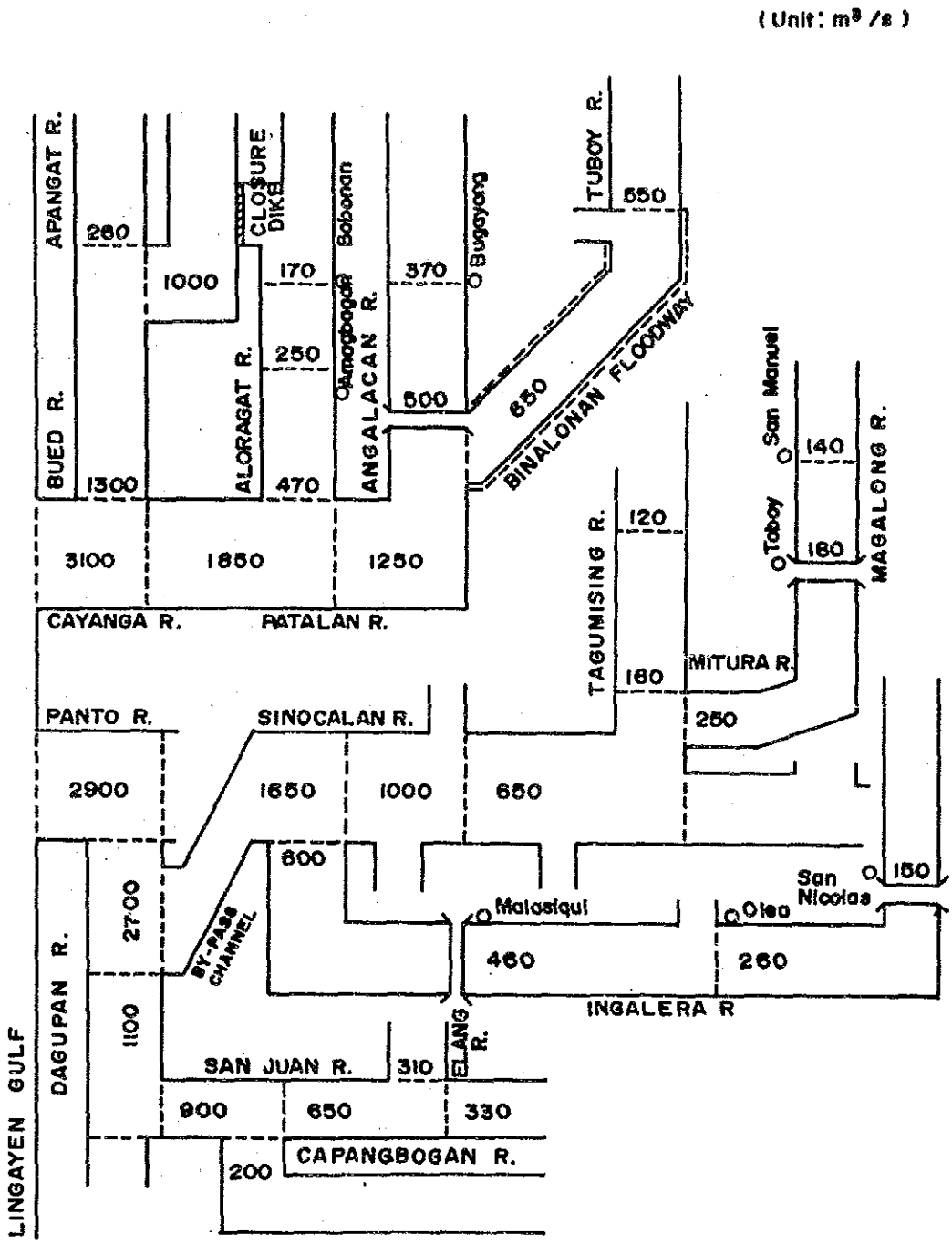
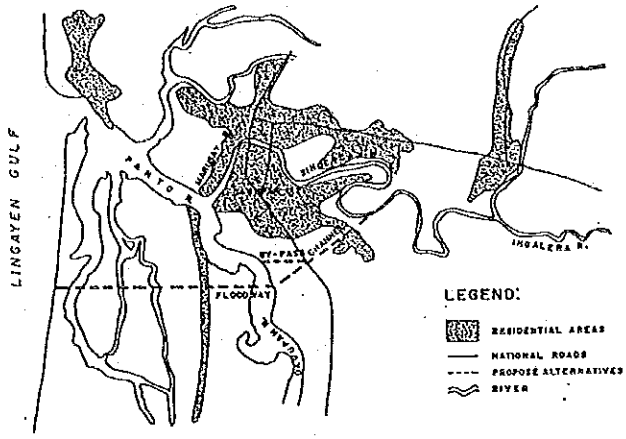


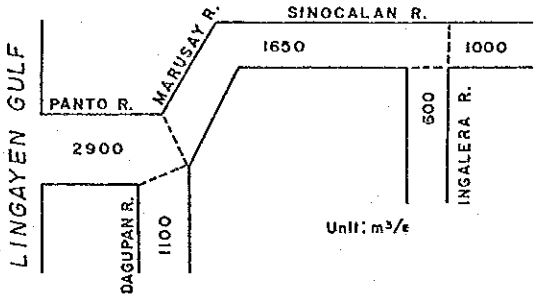
Fig. 3.6 **DESIGN FLOOD DISCHARGE DISTRIBUTION OF OF FRAMEWORK PLAN (50-YR.) OF ALLIED RIVERS**

LOCATION MAP

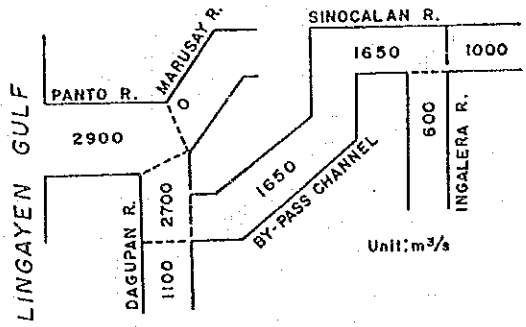


DESIGN FLOOD DISCHARGE DISTRIBUTION
(with BINALONAN FLOODWAY 50-yr FLOOD)

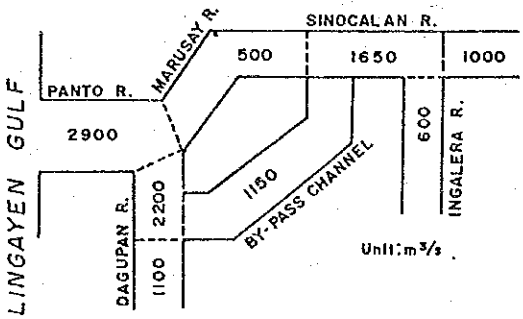
RIVER IMPROVEMENT ONLY



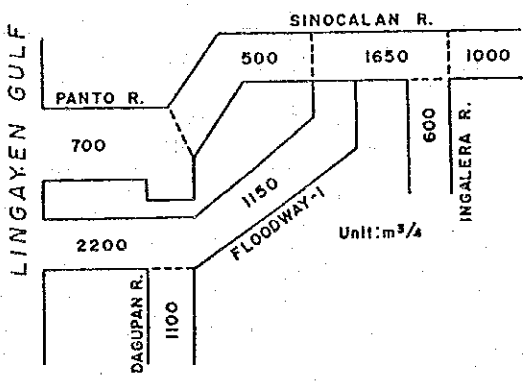
BY-PASS CHANNEL-1



BY-PASS CHANNEL-2



FLOODWAY-1



FLOODWAY-2

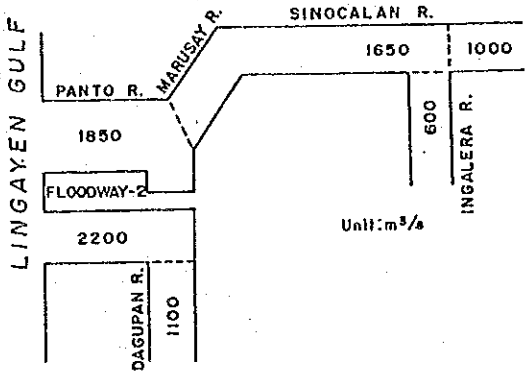


Fig. 3.7 **RIVER IMPROVEMENT ALTERNATIVESIN LOWER REACH IN PANTAL-SINOCALAN RIVER**

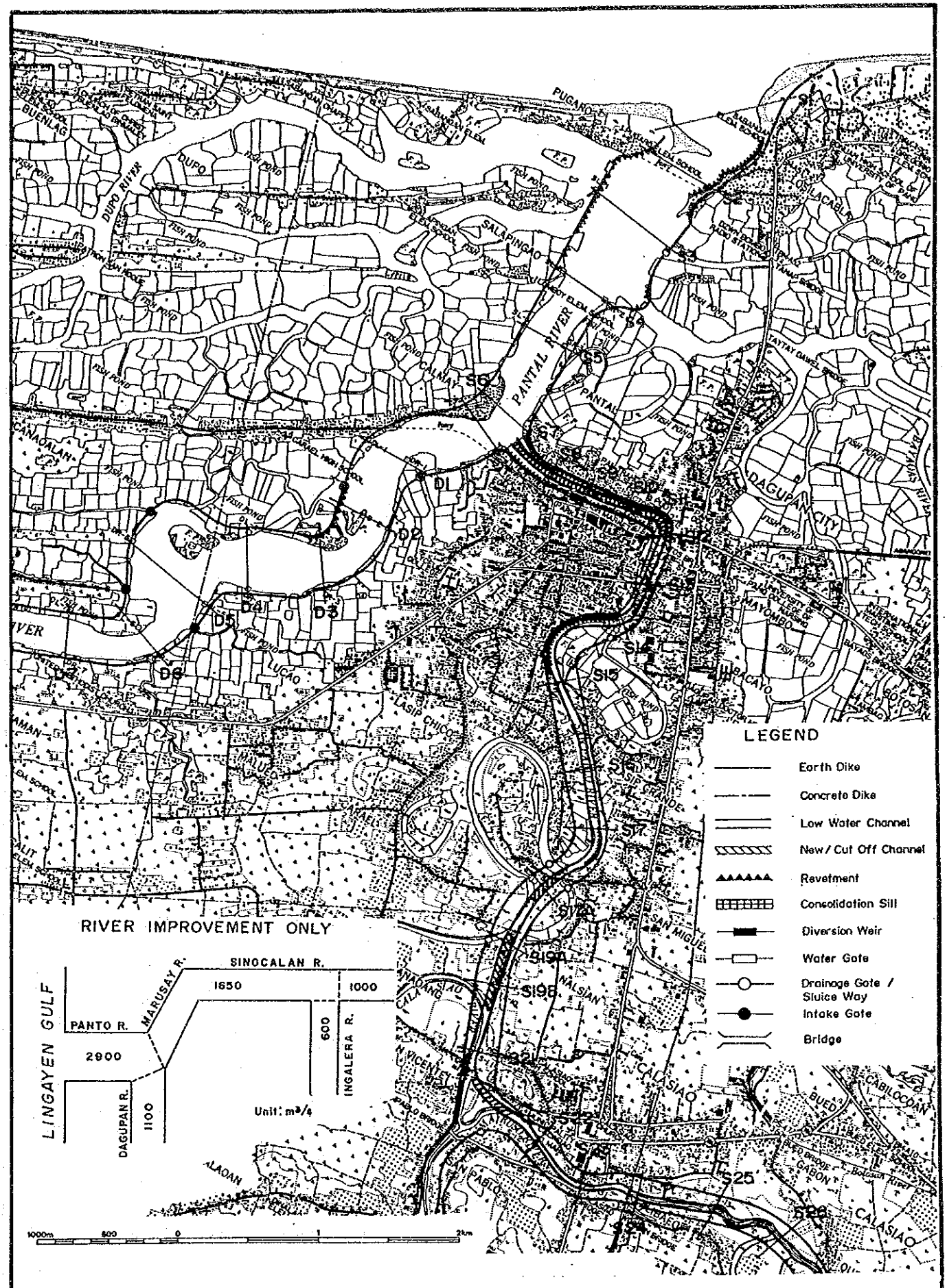


Fig. 3.8 **LAYOUT OF ALTERNATIVE-1A: SOLE RIVER IMPROVEMENT**

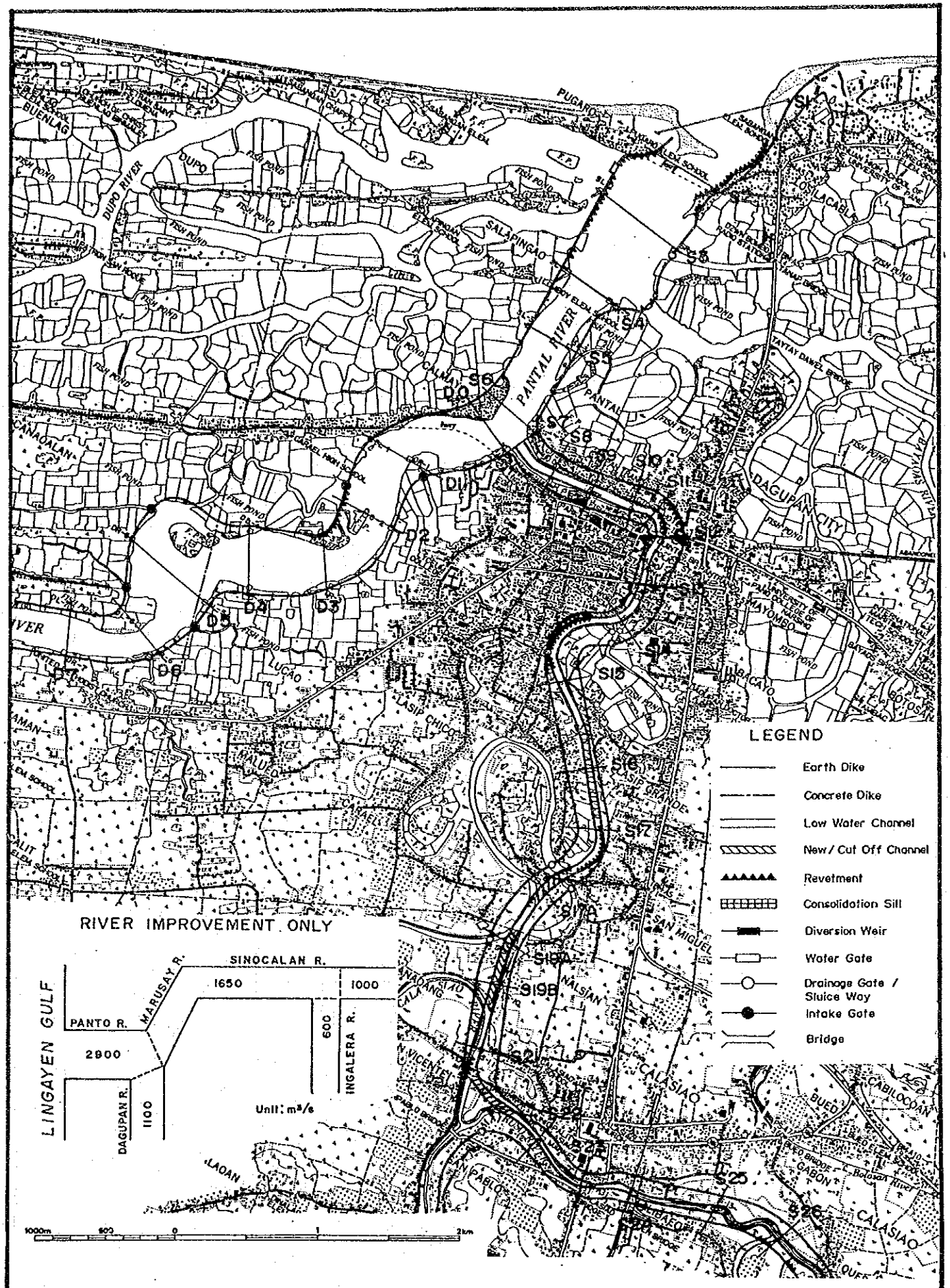


Fig. 3.9 LAYOUT OF ALTERNATIVE-1B: SOLE RIVER IMPROVEMENT

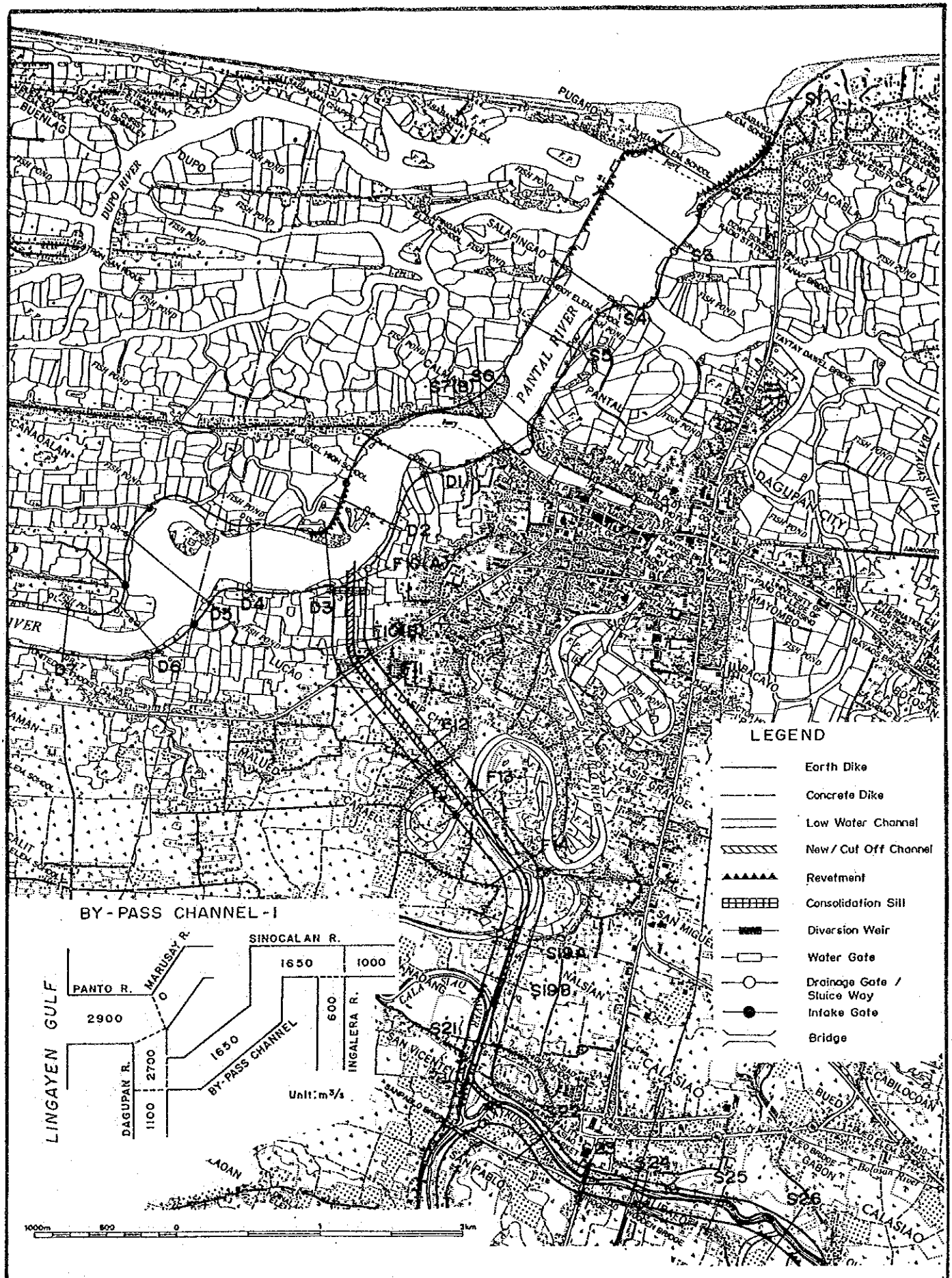


Fig. 3.10 LAYOUT OF ALTERNATIVE-2A: BY-PASS CHANNEL

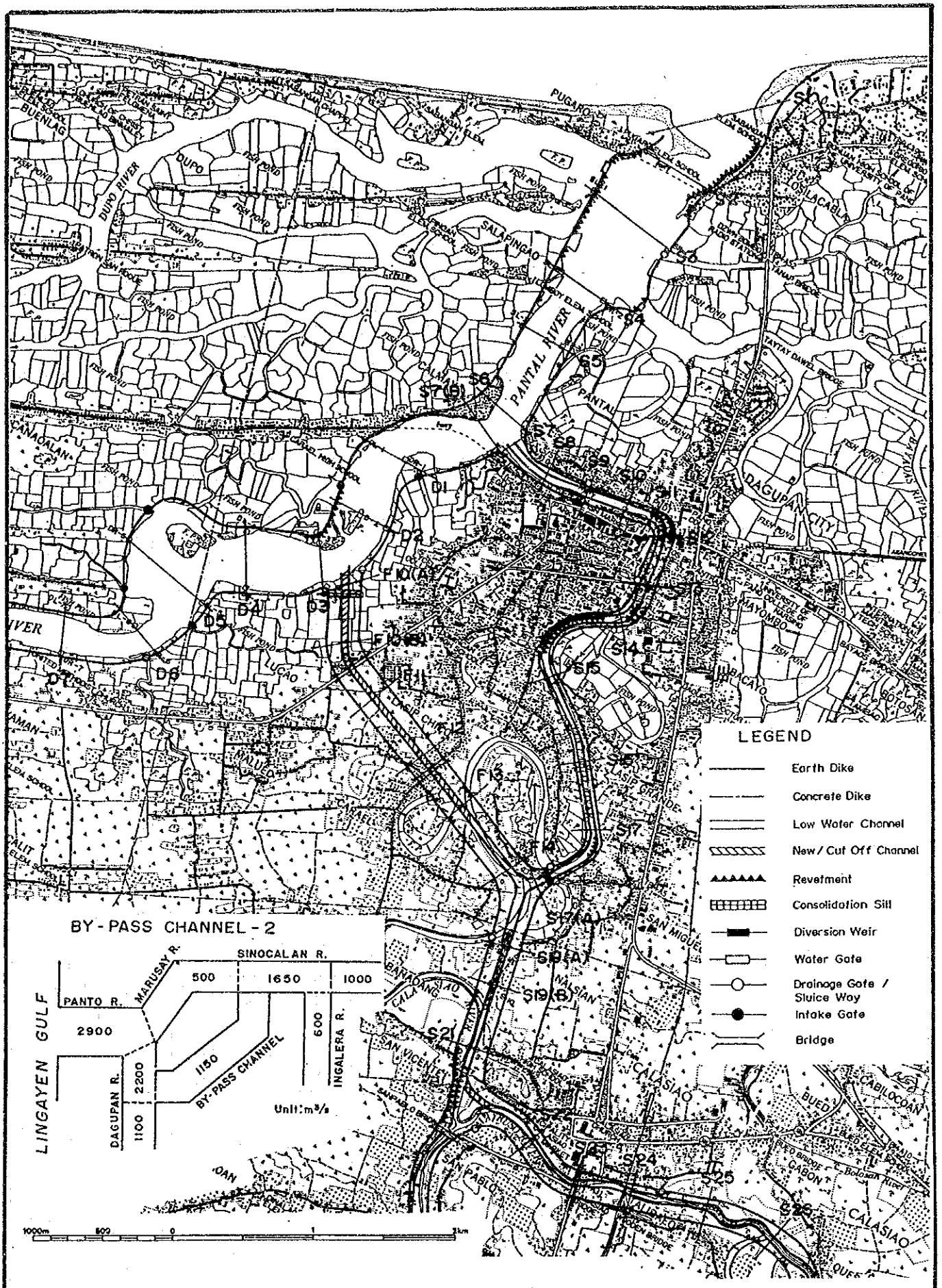


Fig. 3.11 LAYOUT OF ALTERNATIVE-2B: BY-PASS CHANNEL

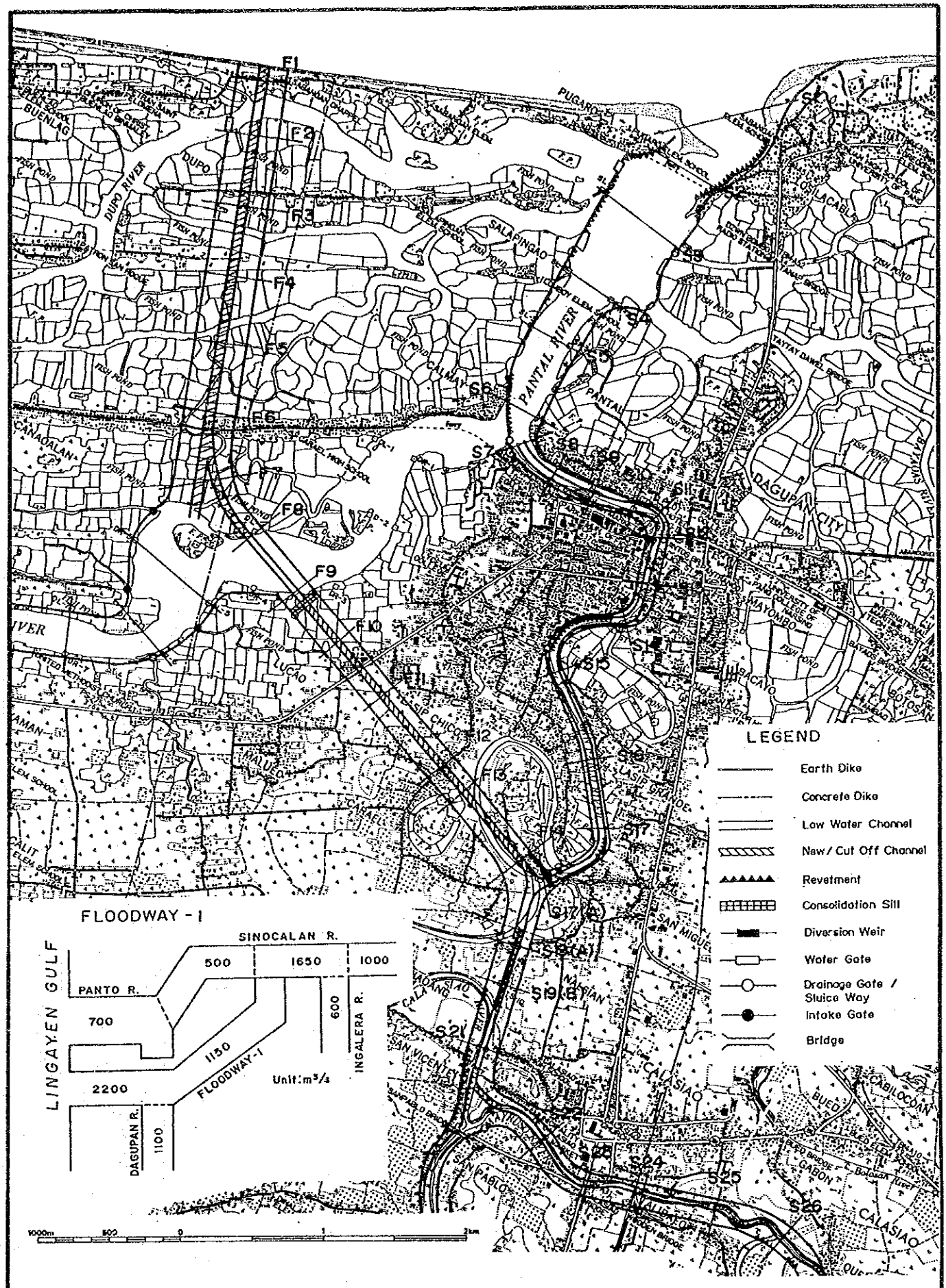


Fig. 3.12 LAYOUT OF ALTERNATIVE-3A: SINOCALAN FLOODWAY

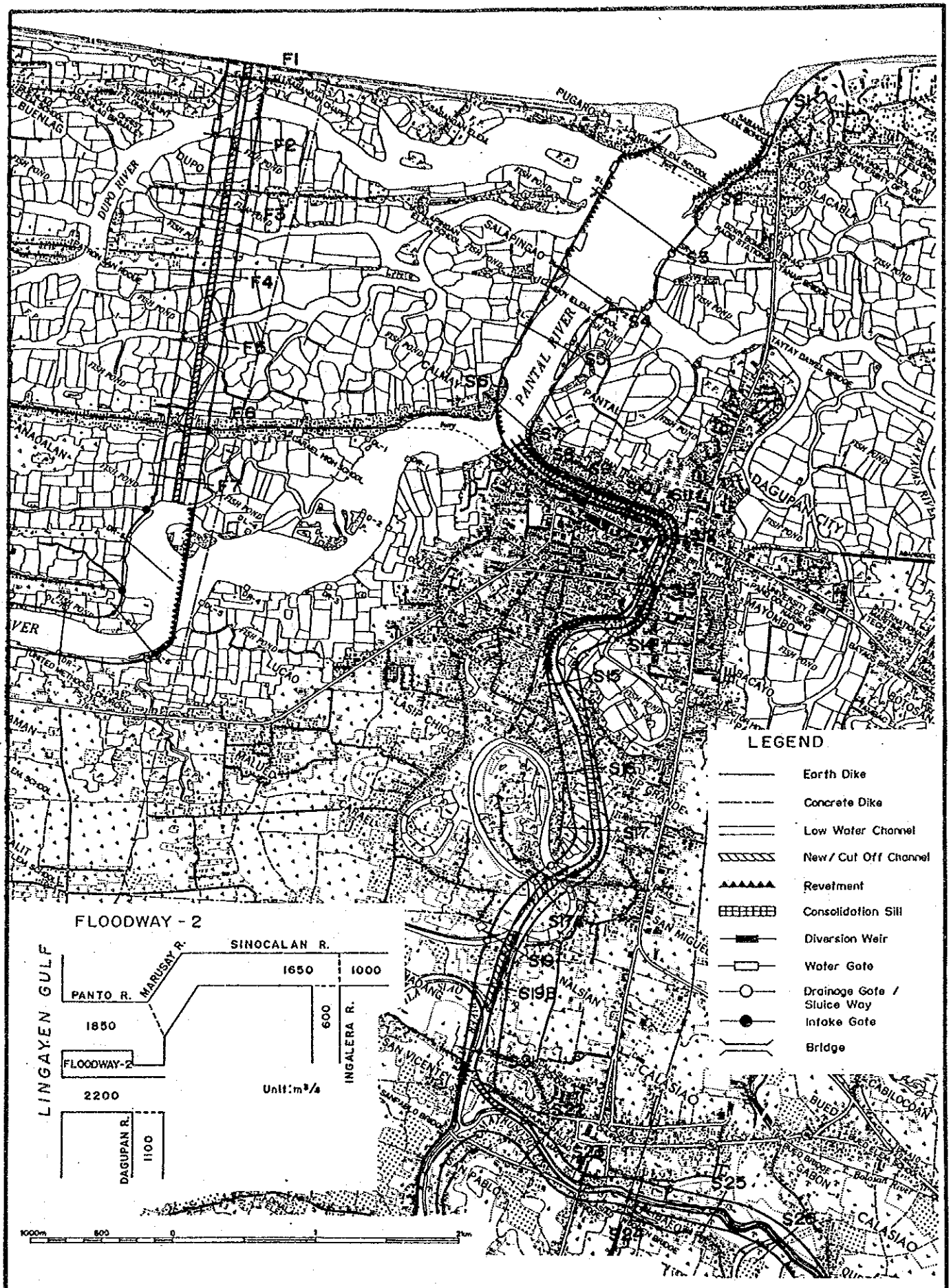
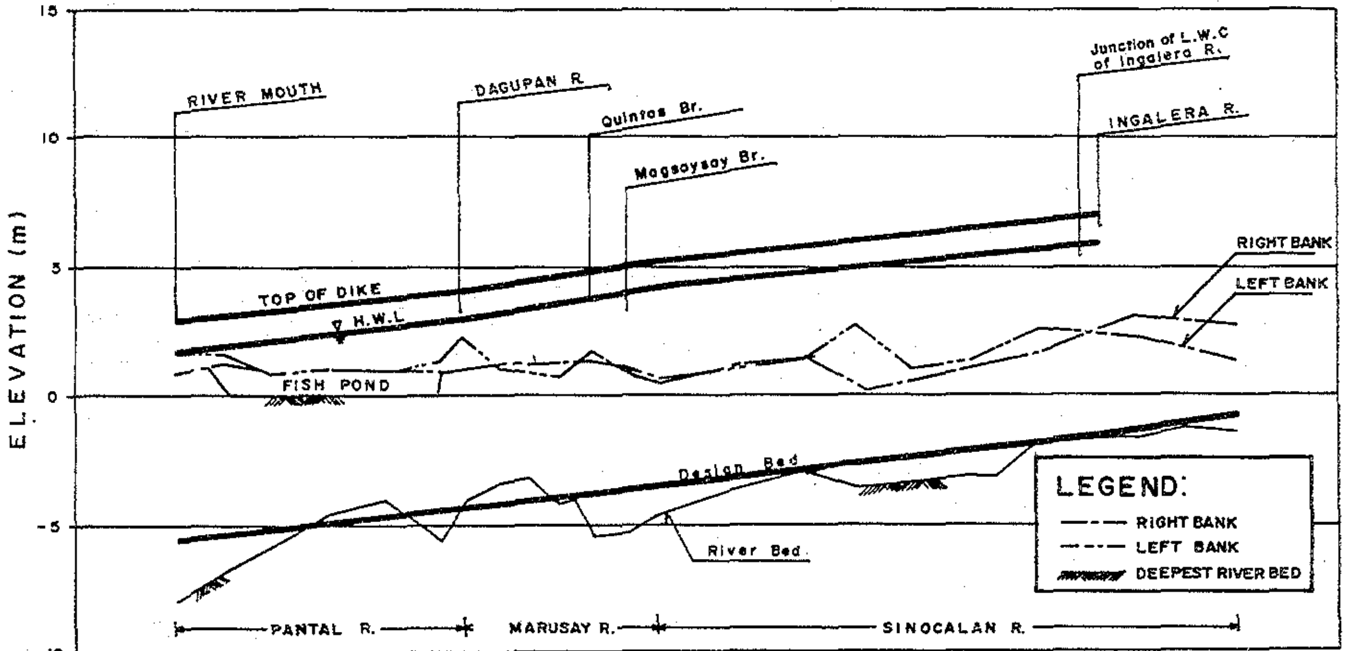


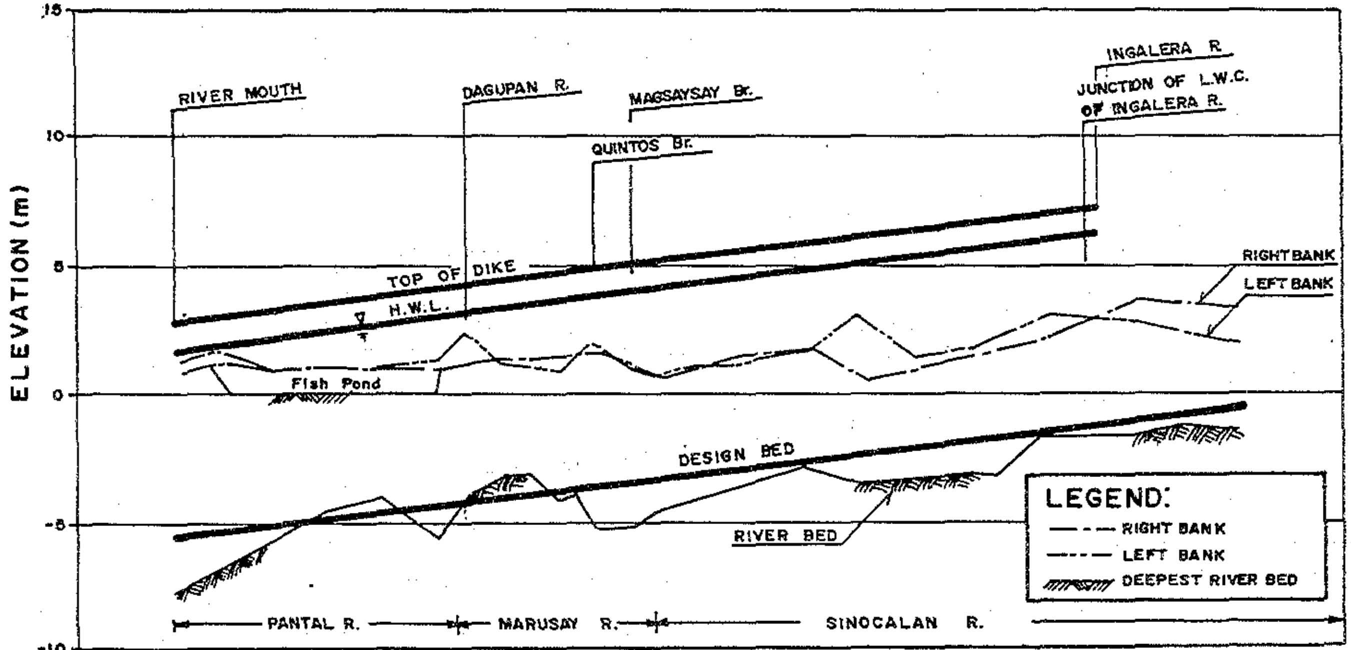
Fig. 3.13 LAYOUT OF ALTERNATIVE-4A: DAGUPAN FLOODWAY



	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12
DESIGN FLOOD DISCHARGE	2900						1650					
GRADIENT OF H.W.L	1/2425						1/1285					
GRADIENT OF RIVER BED	1/2425											
TOP OF DIKE (EL.m)	2.70	2.90	3.09	3.34	3.55	3.76	3.98	3.98	4.16	4.38	4.52	4.65
H.W.L (EL.m)	1.60	1.70	1.89	2.14	2.35	2.56	2.68	2.91	2.16	3.38	3.52	3.65
CHANNEL BED (EL.m)	-5.50	-5.30	-5.11	-4.86	-4.65	-4.44	-4.32	-4.20	-4.07	-3.95	-3.88	-3.81
DISTANCE (Km.)	0	0.48	0.95	1.55	2.05	2.57	2.85	3.15	3.47	3.75	3.93	4.10
SECTION NO.	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12

	S 13	S 14	S 15	S 16	S 17	S17A	S19A	S19B	S21		S 22	S 23	S 24
DESIGN FLOOD DISCHARGE										1000			
GRADIENT OF H.W.L		1/2425											
GRADIENT OF RIVER BED										1/1850			
TOP OF DIKE (EL.m)	4.93	5.16	5.49	5.76	5.96	6.20	6.42	6.53	6.73	6.97			
H.W.L (EL.m)	3.93	4.16	4.49	4.76	4.96	5.20	5.42	5.53	5.73	5.97			
CHANNEL BED (EL.m)	-3.66	-3.54	-3.21	-2.94	-2.74	-2.50	-2.28	-2.17	-1.97	-1.83	-1.61	-1.26	-0.99
DISTANCE (Km.)	4.45	4.75	5.55	6.20	6.70	7.27	7.82	8.08	8.68	8.90	9.50	9.85	10.46
SECTION NO.	S 13	S 14	S 15	S 16	S 17	S17A	S19A	S19B	S21		S 22	S 23	S 24

Fig. 3.14 LONGITUDINAL PROFILE OF ALTERNATIVE-1A



DESIGN FLOOD DISCHARGE (m^3/s): 2 900 (S 1 – S 6/S 7); 1650 (S 6/S 7 – S 21/S 22); 1000 (S 21/S 22 – S 24)

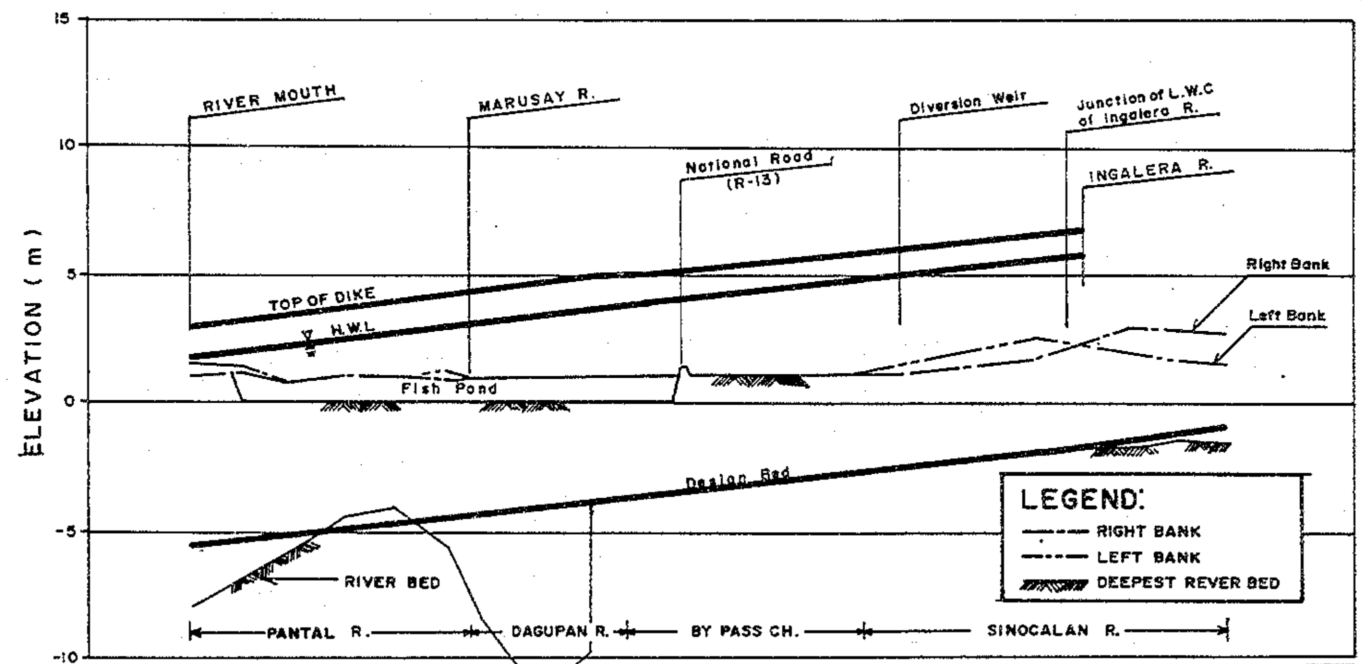
GRADIENT OF H.W.L.: 1/2425 (S 1 – S 6/S 7); 1/480 (S 6/S 7 – S 13/S 14); 1/2425 (S 13/S 14 – S 21/S 22); (S 21/S 22 – S 24)

GRADIENT OF RIVER BED: 1/2425 (S 1 – S 21); 1/1850 (S 21 – S 24)

SECTION NO.	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12	S 13
DISTANCE (Km.)	0	0.48	0.95	1.55	2.05	2.57	2.85	3.15	3.47	3.75	3.93	4.10	4.45
CHANNEL BED (EL. m.)	5.50	5.30	5.11	4.86	4.65	4.44	4.32	4.20	4.07	3.95	3.88	3.81	3.66
H.W.L. (EL. m.)	1.50	1.70	1.89	2.14	2.35	2.56	2.68	2.88	3.10	3.29	3.41	3.52	3.76
TOP OF DIKE (EL. m.)	2.70	2.90	3.09	3.34	3.55	3.76	3.88	3.98	4.10	4.29	4.41	4.52	4.76

SECTION NO.	S 14	S 15	S 16	S 17	S 17 (A)	S19A	S19B	S 21		S 22	S 23	S 24
DISTANCE (Km.)	4.75	5.55	6.20	6.70	7.27	7.82	8.08	8.55	8.90 / 9.15	9.50	9.95	10.45
CHANNEL BED (EL. m.)	3.54	3.21	2.94	2.74	2.50	2.28	2.17	1.97	1.83	1.51	1.26	0.99
H.W.L. (EL. m.)	3.98	4.29	4.56	4.76	5.00	5.22	5.33	5.53	5.77			
TOP OF DIKE (EL. m.)	4.96	5.29	5.56	5.76	6.00	6.22	6.33	6.53	6.77			

Fig. 3.15 LONGITUDINAL PROFILE OF ALTERNATIVE-1B



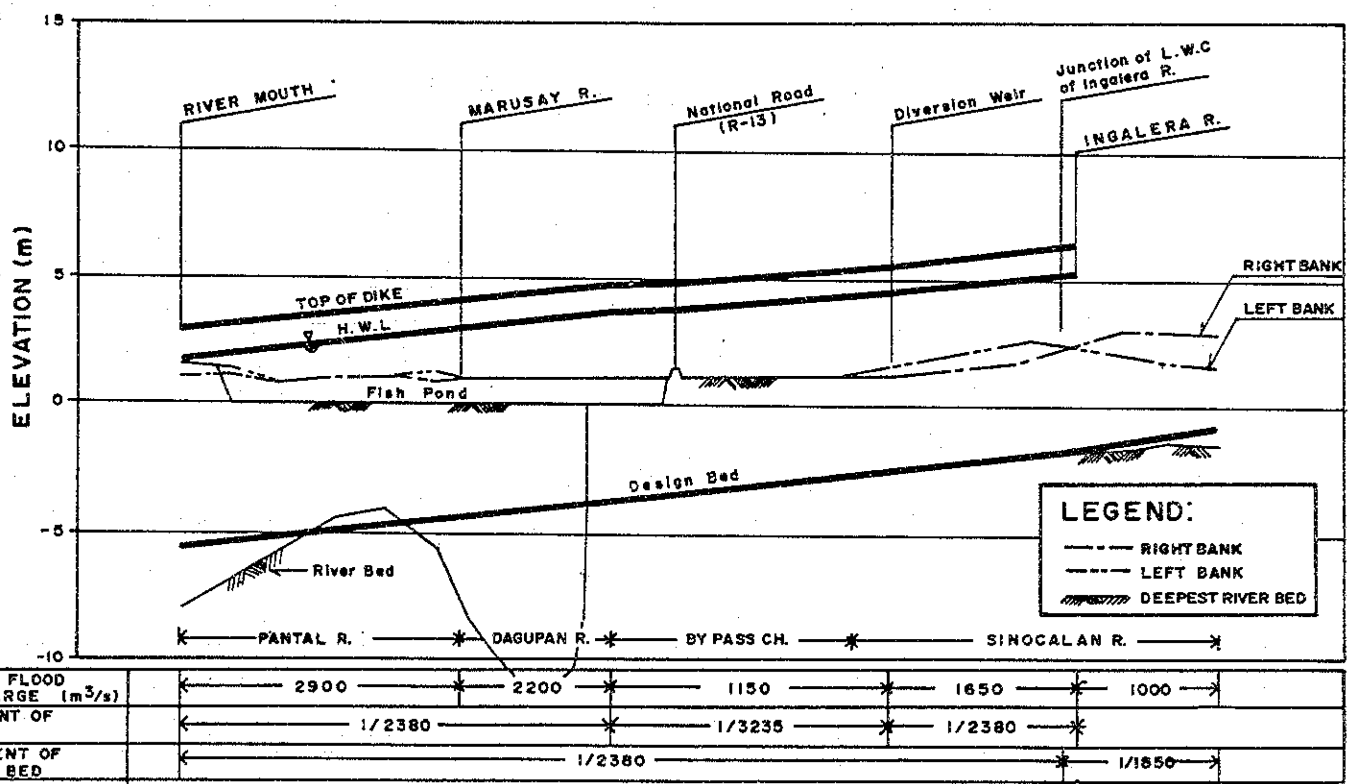
	S1–S7 (B)	S7 (B)–F10 (A)	F10 (A)–7.05	7.05–8.73	8.73–S24
DESIGN FLOOD DISCHARGE	2900	2200	1650	1650	1000

	S1–F10 (A)	F10 (A)–8.73
GRADIENT OF H.W.L	1/2040	1/2380

	S1–8.73	8.73–S24
GRADIENT OF RIVER BED	1/2380	1/1850

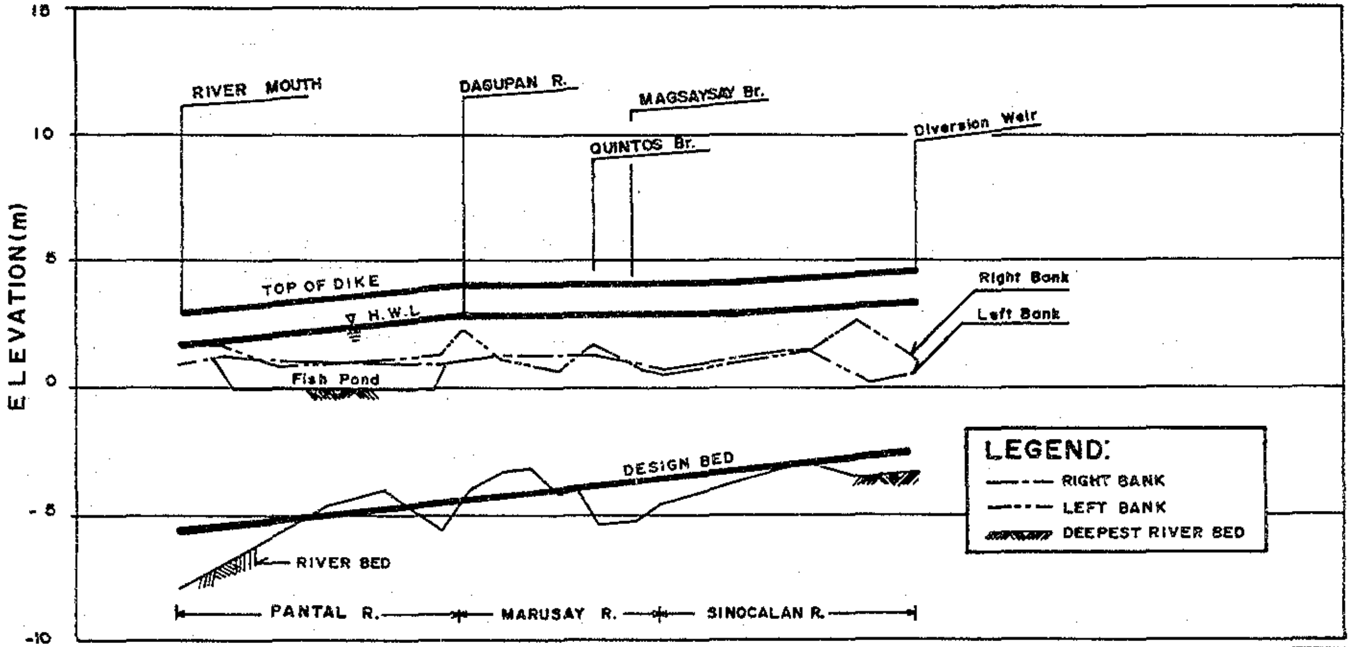
SECTION NO.	DISTANCE (Km)	CHANNEL BED (EL.m.)	H.W.L (EL.m.)	TOP OF DIKE (EL.m.)
S1	0	-5.50	1.70	2.90
S2	0.48	-5.30	1.94	3.14
S3	0.95	-5.10	2.17	3.37
S4	1.55	-4.95	2.46	3.66
S5	2.05	-4.64	2.70	3.90
S6	2.57	-4.42	2.96	4.16
S7 (B)	2.82	-4.32	3.08	4.28
D1	3.47	-4.04	3.40	4.60
D2	4.00	-3.82	3.66	4.86
F10 (A)	4.30	-3.69	3.81	4.86
F10 (B)	4.80	-3.48	4.02	5.02
F11	5.30	-3.27	4.23	5.23
F12	5.80	-3.08	4.44	5.44
F13	6.30	-2.85	4.65	5.65
F14	6.80	-2.64	4.86	5.86
	7.05	-2.54	4.96	5.96
F19A	7.65	-2.29	5.21	6.21
F19B	7.91	-2.18	5.32	6.32
S21	8.58	-1.98	5.52	6.52
	8.73	-1.83	5.77	6.77
S22	9.33	-1.51		
S23	9.78	-1.26		
S24	10.28	-0.99		

Fig. 3.16 LONGITUDINAL PROFILE OF ALTERNATIVE-2A



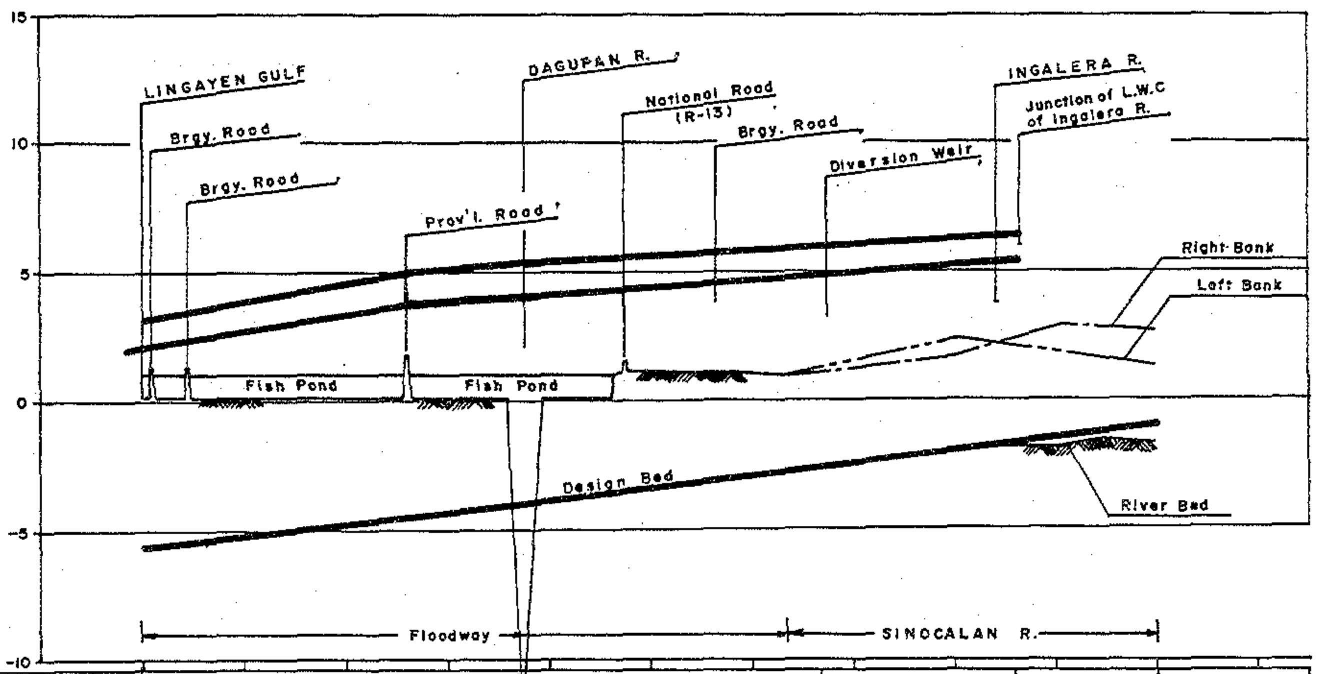
SECTION NO.	DISTANCE (Km.)	CHANNEL BED (EL.m.)	H.W.L (EL.m.)	TOP OF DIKE (EL.m.)
S 1	0	-5.60	1.70	2.90
S 2	0.48	-5.30	1.90	3.10
S 3	0.95	-6.10	2.10	3.30
S 4	1.55	-4.85	2.35	3.55
S 5	2.05	-4.64	2.56	3.76
S 6	2.57	-4.42	2.78	3.98
S 7(B)	2.82	-4.32	2.88	4.08
D 1	3.47	-4.04	3.16	4.36
D 2	4.00	-3.82	3.38	4.58
F 10 (A)	4.30	-3.69	3.51	4.71
F 10 (B)	4.80	-3.48	3.68	4.71
F 11	5.30	-3.27	3.82	4.82
F 12	5.80	-3.06	3.97	4.97
F 13	6.30	-2.85	4.13	5.13
F 14	6.80	-2.64	4.28	5.28
	7.05	-2.54	4.38	5.36
F 19A	7.65	-2.29	4.61	5.61
F 19B	7.91	-2.18	4.72	5.72
F 21	8.38	-1.98	4.92	5.92
	8.73 / 8.98	-1.83	6.17	6.17
S 22	9.35	-1.51		
S 23	9.78	-1.26		
S 24	10.28	-0.99		

Fig. 3.17 (1/2) LONGITUDINAL PROFILE OF ALTERNATIVE-2B



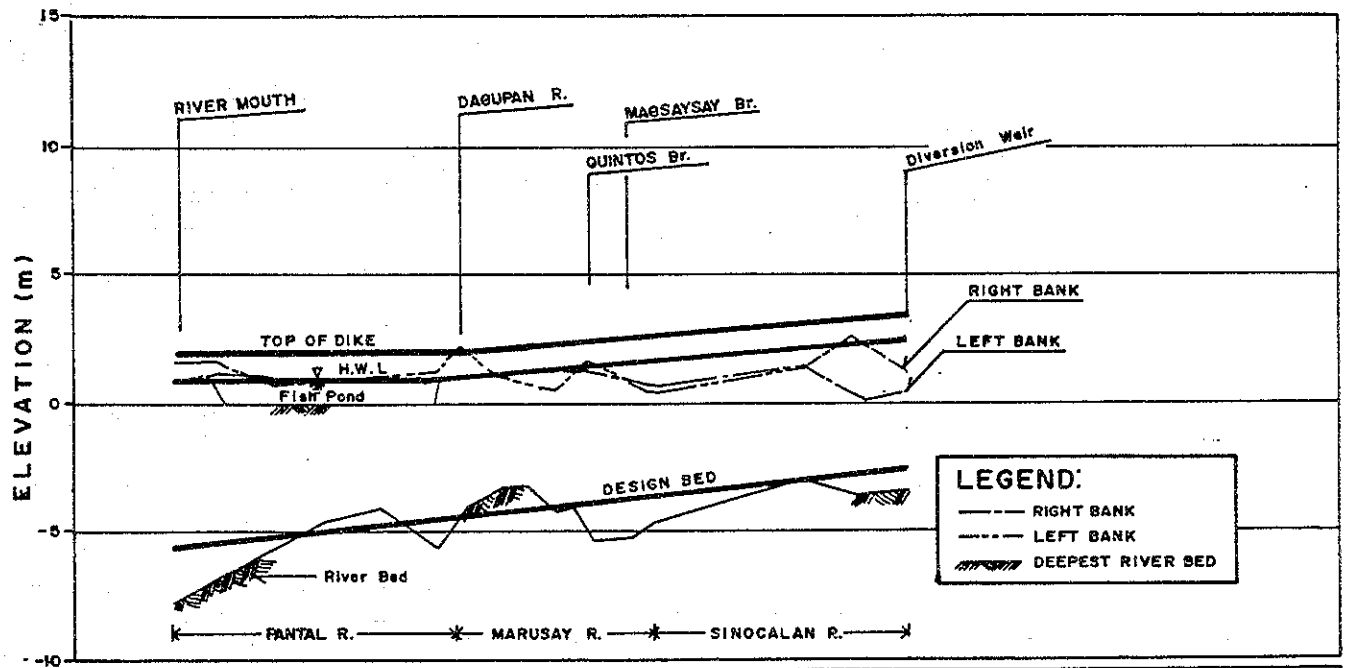
SECTION NO.	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12	S 13	S 14	S 15	S 16	S 17	S 17 (A)
DESIGN FLOOD DISCHARGE (m^3/s)	2900					500												
GRADIENT OF H.W.L	2380					LEVEL									6350			
GRADIENT OF RIVER BED	1/2380																	
TOP OF DIKE (EL.m.)	2.90	3.10	3.30	3.55	3.76	3.98	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.08	4.18
H.W.L (EL.m.)	1.70	1.90	2.10	2.35	2.56	2.78	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.88	2.98	3.06	3.16
CHANNEL BED (EL.m.)	5.50	5.30	5.10	4.85	4.64	4.42	4.30	4.18	4.04	3.95	3.88	3.81	3.66	3.54	3.21	2.94	2.74	2.50
DISTANCE (Km.)	0	0.48	0.95	1.55	2.05	2.57	2.85	3.15	3.47	3.75	3.93	4.10	4.48	4.75	5.55	6.20	6.70	7.27

Fig. 3.17 (2/2) LONGITUDINAL PROFILE OF ALTERNATIVE-2B



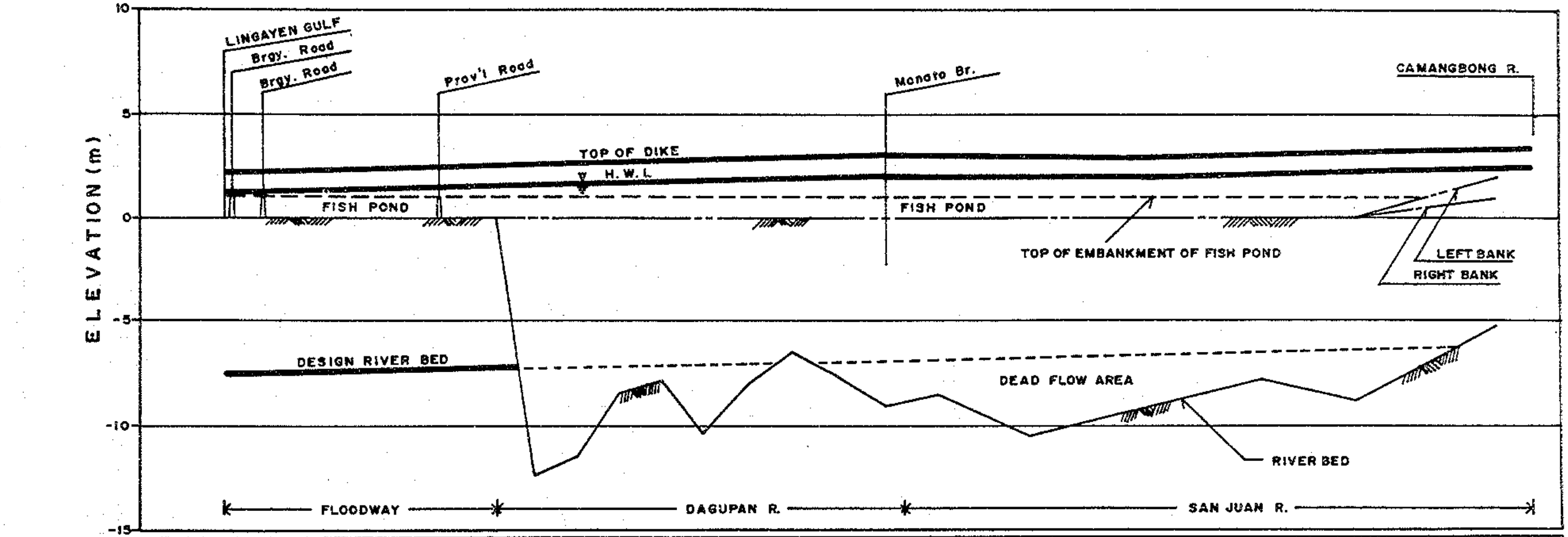
DESIGN FLOOD DISCHARGE	2200								1150						1650				1000			
GRADIENT OF H.W.L.	1/1550						1/3800															
GRADIENT OF RIVER BED	1/2300																		1/1850			
TOP OF DIKE (EL.m)	3.20	3.52	3.85	4.17	4.49	4.81	5.14	5.27	5.33	5.33	5.47	5.60	5.73	5.86	5.93	6.09	6.15	6.28	6.42			
H.W.L. (EL.m)	2.00	2.32	2.65	2.97	3.29	3.61	3.94	4.07	4.20	4.33	4.47	4.60	4.73	4.86	4.93	5.09	5.15	5.28	5.42			
CHANNEL BED (EL.m)	-5.50	-5.28	-5.07	-4.85	-4.63	-4.41	-4.20	-3.98	-3.76	-3.54	-3.33	-3.11	-2.89	-2.67	-2.57	-2.30	-2.19	-1.97	-1.83	-1.61	-1.26	-0.99
DISTANCE (Km.)	0.00	0.50	1.00	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00	5.50	6.00	6.50	6.75	7.35	7.61	8.08	8.43 (8.63)	9.03	9.48	9.98
SECTION NO.	F-1	F-2	F-3	F-4	F-5	F-6	F-7	F-8	F-9	F-10	F-11	F-12	F-13	F-14		F19A	F19B	S21		S22	S23	S24

Fig. 3.18 (1/2) LONGITUDINAL PROFILE OF ALTERNATIVE-3A



DESIGN FLOOD DISCHARGE (m^3/s)	700						500												
GRADIENT OF H.W.L.	1/2000						1/3100												
GRADIENT OF RIVER BED	1/2425																		
TOP OF DIKE (EL. m.)	1.85	1.87	1.90	1.93	1.95	1.98	1.99	2.09	2.19	2.28	2.36	2.39	2.51	2.60	2.86	3.07	3.23	3.42	
H.W.L. (EL. m.)	0.85	0.87	0.90	0.93	0.95	0.98	0.98	1.09	1.19	1.28	1.34	1.39	1.51	1.60	1.86	2.07	2.23	2.42	
CHANNEL BED (EL. m.)	5.50	5.30	5.11	4.86	4.65	4.44	4.32	4.20	4.07	3.95	3.88	3.81	3.68	3.54	3.21	2.94	2.74	2.60	
DISTANCE (Km.)	0	0.48	0.95	1.56	2.05	2.57	2.85	3.15	3.47	3.75	3.93	4.10	4.48	4.75	5.55	6.20	6.70	7.27	
SECTION NO.	S 1	S 2	S 3	S 4	S 5	S 6	S 7	S 8	S 9	S 10	S 11	S 12	S 13	S 14	S 15	S 16	S 17	S 17 (A)	

Fig. 3.18 (2/2) LONGITUDINAL PROFILE OF ALTERNATIVE-3A



SECTION NO.	F1	F2	F3	F4	F5	F6	F7	D5	D6	D7	D8	D9	D10	D11	D12 (A)	D12 (B)	D13	D14 (A)	D14 (B)	D14 (C)	D14 (D)	D16
DESIGN FLOOD DISCHARGE	1200							1100									900					
GRADIENT OF H.W.L	1/10000							1/10000														
GRADIENT OF RIVER BED	1/10000							EXISTING														
TOP OF DIKE (EL.m.)	2.20	2.25	2.30	2.35	2.40	2.45	2.50	2.57	2.63	2.67	2.72	2.77	2.83	2.88	2.93	2.99	2.99	2.99	2.99	3.12	3.28	3.42
H.W.L (EL.m.)	1.20	1.25	1.30	1.35	1.40	1.45	1.50	1.57	1.63	1.67	1.72	1.77	1.83	1.88	1.93	1.99	1.99	1.99	1.99	2.12	2.28	2.42
CHANNEL BED (EL.m.)	7.50	7.45	7.40	7.35	7.30	7.25	7.20	(-7.13)	(-7.07)	(-7.03)	(-6.98)	(-6.93)	(-6.87)	(-6.82)	(-6.77)	(-6.71)	(-6.66)	(-6.54)	(-6.43)	(-6.28)	(-6.16)	
DISTANCE (Km.)	0.00	0.50	1.00	1.50	2.00	2.50	3.00	3.70	4.25	4.70	5.20	5.70	6.25	6.75	7.30	7.90	8.50	9.60	10.70	12.15	13.60	15.20

Fig. 3.19 LONGITUDINAL PROFILE OF ALTERNATIVE-4A

(Unit: m³/s)

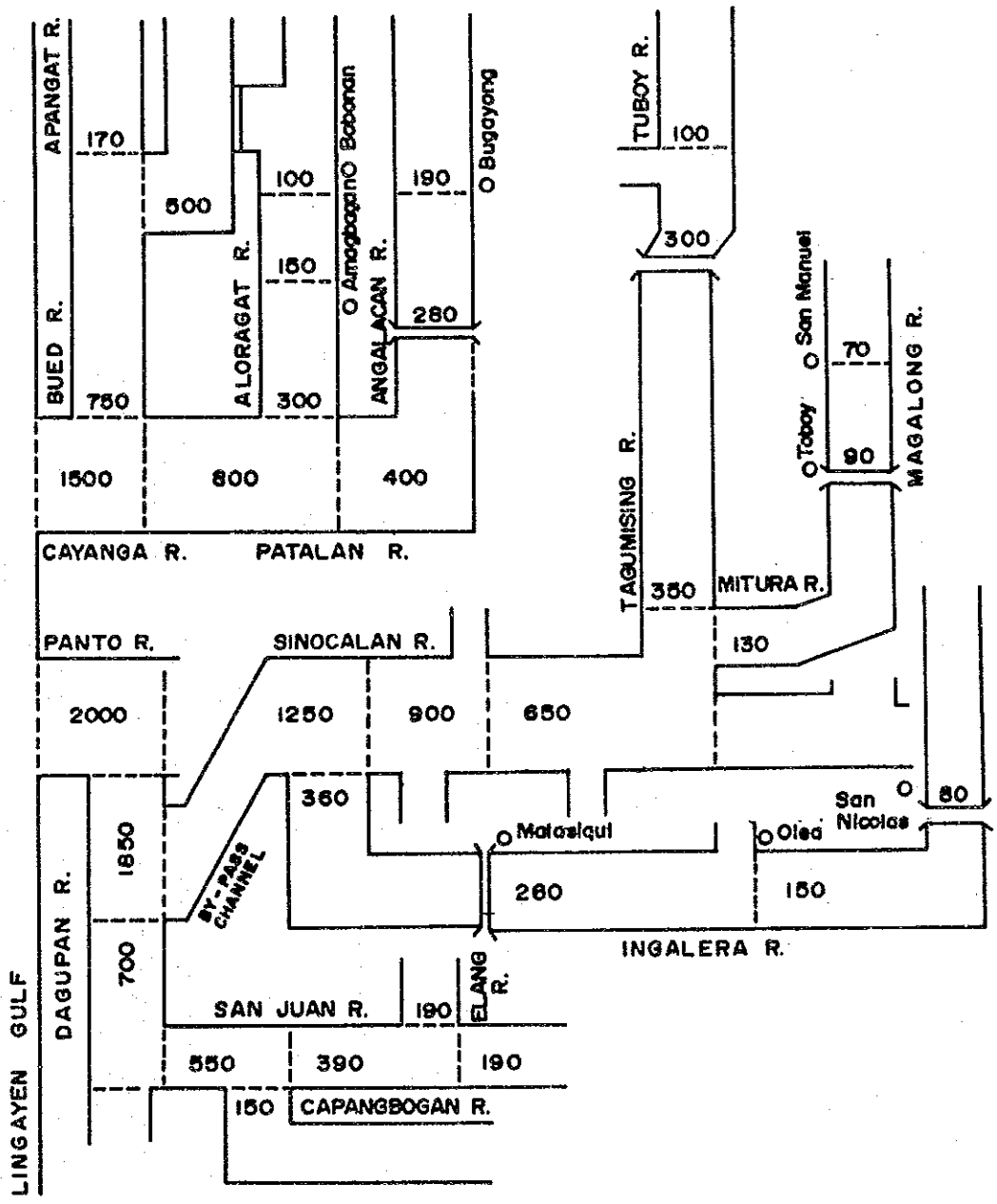


Fig. 3.20 **DESIGN FLOOD DISCHARGE DISTRIBUTION OF PRIORITY PROJECTS OF ALLIED RIVERS**

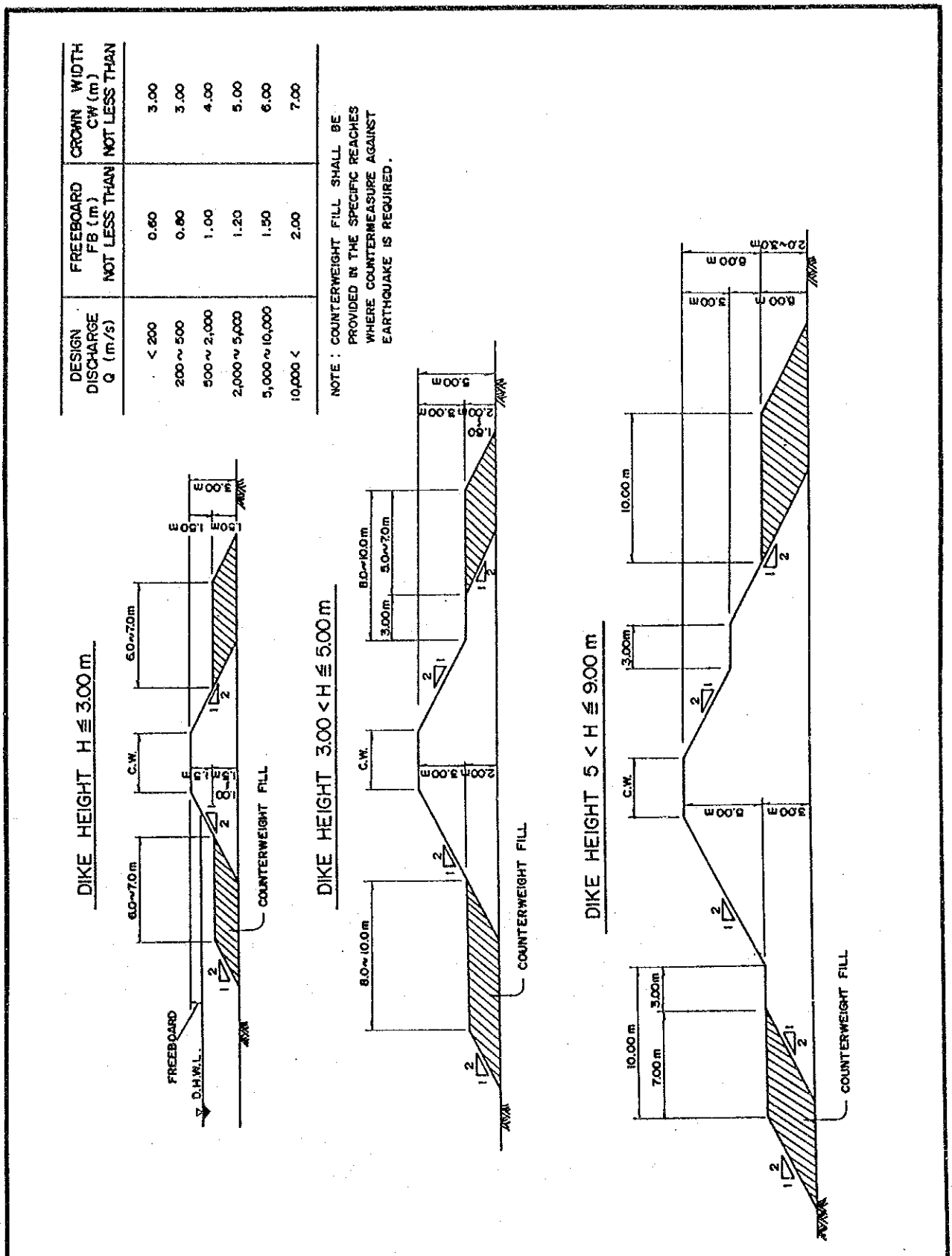


Fig. 3.21 **STANDARD DIKE SECTION OF PANTAL-SINOCALAN RIVER**

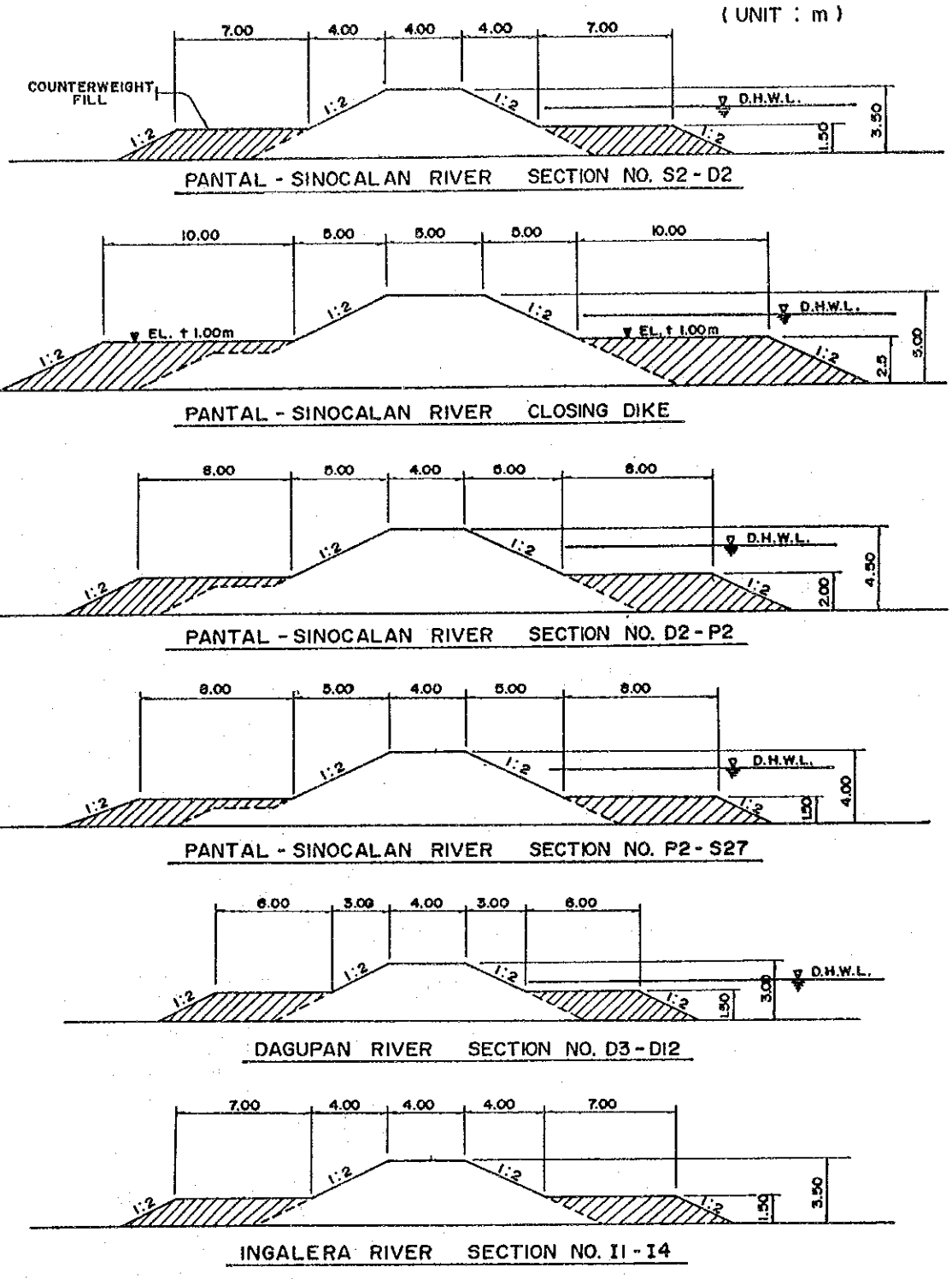


Fig. 3.22 **STANDARD DESIGN OF COUNTERWEIGHT FILL AGAINST LIGUEFACTION IN PANTAL-SINOCALAN RIVER**