APPENDIX F

PLANNING OF FACILITIES
FOR
THE MASTER PLAN

(Ref.: Section 5.3., Vol. VI)

F-1

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
												in Year 2000									
N-1																					
	C1		1730.0		(8300)		102.9		112.9	0.55	0.69	0.052	89.96	128.88	⊔ 29.5/23.5 × 3.0	0.4	1.38	97.62			
	1		15.9	1745.9	400	400	5.0	107.9	117.9	0.55	0.69	0.050	87.30	125.73	⊔ 29.5/23.5 × 3.0	0.4	1.38	97.62	⊔ 9.5/0.9 × 1.7	3.02	
				To	③																
	C2		39.6		(1700)		26.9		36.9	0.55	0.73	0.118	4.67	6.56	⊔ 5.0/2.0 × 1.5	1.0	1.07	4.84			
	2		2.0	41.6	220		3.5	30.4	40.4	0.55	0.73	0.112	4.66	6.56	⊔ 5.0/2.0 × 1.5	1.0	1.07	4.84			
	3	1	24.5	1812.0	270	670	3.4	111.3	121.3	0.55	0.69	0.049	88.79	127.59	⊔ 29.5/23.5 × 3.0	0.4	1.38	97.62	▽ 7.1 × 1.6	3.46	
				To	⑧																
	4		183.3		2360		18.9	18.9	28.9	0.55	0.75	0.139	25.48	35.32	⊔ 8.8/4.0 × 2.4	2.0	2.15	28.61			
	5		69.8	253.1	1240	3600	9.6	28.5	38.5	0.55	0.73	0.116	29.36	41.00	⊔ 9.3/4.5 × 2.4	2.0	2.19	31.50			
				To	⑥																
	C3		82.1		(2200)		21.7	21.7	31.7	0.55	0.75	0.132	10.84	15.12	⊔ 6.1/2.5 × 1.8	2.0	1.72	11.48			
	6	5	4.2	339.4	300	3900	2.5	31.0	41.0	0.55	0.73	0.112	38.01	53.10	⊔ 11.2/6.0 × 2.6	1.5	2.07	40.40			
	7		3.0	342.4	220	4120	1.8	32.8	42.8	0.55	0.72	0.107	36.64	51.56	⊔ 11.2/6.0 × 2.6	1.5	2.07	40.40			
	8	3	27.4	2181.8	370	4490	4.4	115.7	125.7	0.55	0.68	0.047	102.55	147.18	⊔ 30.4/24.0 × 3.2	0.4	1.44	111.48	▽ 6.8 × 1.5	2.94	
	9		46.8	2228.6	760	5250	9.2	124.9	134.9	0.55	0.68	0.044	98.06	142.05	⊔ 30.4/24.0 × 3.2	0.4	1.44	111.48	▽ 16.6 × 1.7	9.29	
				To	Kelang River																
N-2																					
	1		85.8		(1400) 910		21.8	21.8	31.8	0.55	0.74	0.130	11.15	15.57	⊔ 8.2/4.0 × 2.1	0.6	1.10	12.25	⊔ 3.5/1.7 × 1.0	4.40	
	2		20.0	105.8	500	1410	5.2	27.0	37.0	0.55	0.73	0.118	12.48	17.51	⊔ 4.1 × 2.2	0.6	1.64	13.07	⊔ 3.6/1.6 × 0.9	1.90	
				To	⑤																
	3		32.4		650		9.7	9.7	19.7	0.55	0.80	0.176	5.70	7.84	⊔ 5.4/2.0 × 1.7	1.0	1.14	6.16			
	4		12.8	45.2	250	900	3.5	13.2	23.2	0.55	0.78	0.160	7.23	9.99	⊔ 6.1/2.5 × 1.8	1.0	1.22	8.14			
	5	2	14.8	165.8	450	1860	5.1	32.1	42.1	0.55	0.72	0.108	17.91	25.20	⊔ 8.9/4.5 × 2.2	1.0	1.48	18.99	▽ 5.6 × 1.3	1.71	
				To	⑦																

N-1, N-2

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
N-2	⑥		24.4		680		10.3	10.3	20.3	0.55	0.80	0.174	4.25	5.84	⊔ 4.8 2.0×1.4	1.2	1.13	4.64			
	⑦	⑤	19.9	210.1	160	2020	1.8	33.9	43.9	0.55	0.72	0.106	22.27	31.18	⊔ 10.0 5.0×2.5	0.9	1.53	24.96			
				To	Kelang	River															
N-3																					
	①		14.3		(650) 340		18.9	18.9	28.9	0.65	0.75	0.164	2.35	3.26	⊔ 5.0 2.0×1.5	0.3	0.60	2.67			
				To	③																
	②		11.2		400		12.1	12.1	22.1	0.65	0.79	0.195	2.18	3.02	⊔ 4.8 2.0×1.4	0.3	0.60	2.34			
	③	1	0	25.5	40	440	1.0	19.9	29.9	0.65	0.75	0.161	4.11	5.71	⊔ 6.3 2.5×1.9	0.3	0.68	4.90			
				To	Kelang	River															
N-4																					
	①		47.2		(900) 400		11.5	11.5	21.5	0.60	0.79	0.183	8.64	11.89	⊔ 6.4 3.0×1.7	1.2	1.34	9.29	⊔ 1.8 0.9×0.6	2.28	
	②		24.4	71.6	610	1010	7.8	19.3	29.3	0.60	0.75	0.150	10.74	14.95	⊔ 7.0 3.0×2.0	1.0	1.32	11.40	⊔ 5.6 0.8×1.3	7.48	
	③		48.8	120.4	770	1780	9.9	29.2	39.2	0.60	0.73	0.125	15.05	21.07	⊔ 8.6 4.0×2.3	0.8	1.33	16.71	⊔ 6.9 3.7×1.4	7.42	
				To	⑤																
	④		38.6		(1300) 800		21.3	21.3	31.3	0.60	0.75	0.145	5.60	7.81	⊔ 5.6 2.0×1.8	0.8	1.05	6.16			
	⑤	③	3.0	162.0	80	1860	1.0	30.2	40.2	0.60	0.73	0.123	19.93	27.95	⊔ 9.5 4.5×2.5	0.8	1.41	21.41			
				To	Kelang	River															

F-2

N-2, N-3, N-4

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition: Existing Drain Size (m)	Existing Condition: Existing Drain Capacity (m^3/s)	Remarks
N-5																					
	①		2.07	(8.46) 10.53	155	(565) 720	1.8	(8.7) 10.5	(18.7) 20.5	0.71	0.80	0.223	2.35	3.24	⊔1.4×1.4	1.5	1.52	2.67	⊔ 3.0 / 0.8×1.1	8.14	R_1=1.13 (8.46) Q=0.94
	②		8.11	(3.96) 22.60	400	1120	4.5	15.0	25.0	0.72	0.77	0.200	4.52	6.26	⊔2.0×2.0	1.0	1.57	5.65	∨2.2×1.0	1.93	R_1=7.43 (3.16) R_2=0.46 Q=0.22 (S=0.80)
	③		7.18	(9.56) 39.34	400	1520	4.2	19.2	29.2	0.72	0.75	0.180	7.08	9.85	⊔2.3×2.3	0.9	1.64	7.79	∨3.8×1.4	3.57	R_2=7.09 (3.10) Q=0.09 (C=5.44) (R_1=1.02)
	④		0.74	(1.20) 41.28	75	1595	0.8	20.0	30.0	0.71	0.75	0.175	7.22	10.05	⊔2.4×2.4	0.9	1.68	8.72			R_2=0.35 (C=0.85) Q=0.74
	⑤		0.77	(9.46) 51.51	170	1765	1.7	21.7	31.7	0.73	0.75	0.175	9.02	12.57	⊔2.6×2.6	0.8	1.68	10.18			R_2=1.61 (C=7.53) Q=0.77 (0.32)
	⑥		4.17	(2.25) 57.93	165	1930	1.7	23.4	33.4	0.72	0.74	0.166	9.62	13.43	⊔2.7×2.7	0.8	1.72	11.26	⊔ 6.0 / 3.3×1.9	17.22	R_2=2.31 C=0.84 (2.05) Q=0.22 (0.20) S=0.80
	⑦		3.20	(8.37) 69.50	60	1990	0.6	24.0	34.0	0.71	0.74	0.162	11.26	15.72	⊔2.8×2.8	0.9	1.86	13.16			C=3.20 (0.29) (R_2=8.08)

F-3

N-5

Name of Catchment	Line No.	Inflow No.	Area in Year 2000		Length		Time of Flow in the Drain		Time of Concentration	Runoff Coefficient	Storage Coefficient	Design Runoff		Runoff Major Storm	Proposed Drain				Existing Condition: Existing Drain		Remarks
			Each (ha)	Total (ha)	Each (m)	Total (m)	Each (min)	Total (min)	(min)			Per ha (m^3/s)	Total Runoff (m^3/s)	(m^3/s)	Size (m)	Slope (‰)	Velocity (m/s)	Capacity (m^3/s)	Size (m)	Capacity (m^3/s)	
N-6																					
	①		0.26	(9.30) 9.56	120	(755) 875	1.6	12.4	22.4	0.75	0.78	0.221	2.11	2.92	⊎1.5×1.5	1.0	1.30	2.62	∀2.9×0.9	1.42	C=0.26 (1.17) (R1=4.17 Q=0.54)
	②		0.66	10.22	160	1035	2.0	14.4	24.4	0.76	0.77	0.213	2.18	3.02	⊎1.5×1.5	1.2	1.42	2.88	∀2.0×1.1	1.15	C=0.66
	③		5.13	(1.20) 16.55	625	1660	7.7	22.1	32.1	0.80	0.74	0.188	3.12	4.35	⊎1.7×1.7	1.1	1.42	3.67	⊎1.6/0.4×1.0	1.07	R2=0.29 (R1=0.30) C=4.84 (0.90)
	④		3.72	20.27	340	2000	4.0	26.1	36.1	0.82	0.73	0.179	3.63	5.08	⊎1.8×1.8	1.1	1.46	4.27	∀1.3×1.2	0.70	C=3.72
		⑩																			
	⑤		2.92	(2.82) 5.74	270	590	4.1	9.4	19.4	0.76	0.80	0.244	1.40	1.93	⊎1.3×1.3	1.0	1.18	1.79			R1=1.92 (2.54) C=1.00 (0.08) (Q=0.20)
	⑥		0.95	6.69	175	765	2.6	12.0	22.0	0.72	0.79	0.217	1.45	2.00	⊎1.3×1.3	1.0	1.18	1.79			S=0.95
	⑦		0.88	(6.36) 13.93	205	970	2.9	14.9	24.9	0.64	0.77	0.178	2.48	3.44	⊎1.6×1.6	0.8	1.21	2.79			Q=0.88 (0.57) (R1=2.25 R2=2.81 S=0.13)
	⑧		6.06	(3.94) 23.93	230	1200	2.7	17.6	27.6	0.55	0.76	0.144	3.45	4.79	⊎1.7×1.7	1.1	1.48	3.84			S=6.06 (Q=3.94)
	⑨		1.79	25.72	320	1520	3.7	21.3	31.3	0.57	0.75	0.138	3.55	4.95	⊎1.8×1.8	1.1	1.54	4.48			C=1.40 S=0.39
	⑩	④⑨	0.45	(4.18) 50.62	125	2125	1.1	27.2	37.2	0.69	0.73	0.148	7.49	10.48	□2.1×2.1	1.9	1.89	8.33			C=0.07 (3.82) Q=0.38 (0.09) (S=0.27)
	⑪		1.07	51.69	35	2160	0.3	27.5	37.5	0.69	0.73	0.147	7.60	10.64	□2.1×2.1	1.9	1.89	8.33	φ1.2	1.47	C=0.46 Q=0.61
	⑫		0.89	(1.29) 53.87	295	2455	2.7	30.2	40.2	0.69	0.73	0.142	7.65	10.73	□2.1×2.1	1.9	1.89	8.33	φ1.2	1.47	C=0.33 (1.12) Q=0.56 (0.17)
	⑬		2.86	(15.57) 72.30	85	2540	0.7	30.9	40.9	0.74	0.73	0.150	10.85	15.22	□2.4×2.4	1.9	2.07	11.92	φ1.2	1.47	C=2.86 (15.01) (Q=0.56)

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
N-7																					
	①		1.70	(2.52) 4.22	125	(380) 505	2.0	(6.8) 8.8	(16.8) 18.8	0.79	0.81	0.260	1.10	1.51	⊔1.2×1.2	1.0	1.12	1.45			R_1=0.32 (0.76) C=1.38 (1.71) (O=0.65)
	②		0.09	(3.38) 7.69	25	530	0.3	9.1	19.1	0.83	0.81	0.272	2.09	2.88	⊔1.4×1.4	1.2	1.36	2.39			R_1=0.09 (0.72) (C=2.66)
	③		0.05	(4.61) 12.35	20	550	0.2	9.3	19.3	0.71	0.81	0.232	2.87	3.95	⊔1.6×1.6	1.1	1.42	3.27	1.5 ⊔1.2×0.8	0.56	R_1=0.05 (2.26) (O=2.35)
	④		2.73	(4.32) 19.40	180	730	2.2	11.5	21.5	0.69	0.79	0.210	4.07	5.62	⊔1.9×1.9	0.9	1.44	4.68			I=2.73 (2.35) (C=0.74 S=1.23)
	⑤		2.67	(3.49) 25.56	220	950	2.6	14.1	24.1	0.70	0.77	0.197	5.04	6.98	⊔2.1×2.1	0.8	1.45	5.76	2.5 ⊔2.2×0.9	2.08	I=2.67 (C=2.72 S=0.77)
		⑨																			
	⑥		1.25		265		4.5	4.5	14.5	0.90	0.87	0.350	0.44	0.60	⊔0.8×0.8	1.6	1.08	0.62			C=1.25
	⑦		6.44	7.69	360	625	5.9	10.4	20.4	0.90	0.80	0.283	2.18	3.01	⊔1.7×1.7	0.6	1.09	2.84			C=6.44
	⑧		3.15	(5.70) 16.54	240	865	3.4	13.8	23.8	0.85	0.78	0.244	4.04	5.57	⊔2.1×2.1	0.6	1.26	4.99			I=3.15 (C=5.70)
	⑨	⑤ ⑧	—	(6.10) 48.20	20	970	0.2	14.3	24.3	0.75	0.77	0.211	10.17	14.08	⊔2.9×2.9	0.6	1.56	11.79			I=6.10

F-5

N-7

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition: Existing Drain Size (m)	Existing Condition: Existing Drain Capacity (m^3/s)	Remarks
N-8																					
	①		78.4		(1700) 1200		32.0	32.0	42.0	0.60	0.72	0.118	9.25	13.02	⊔ 7.9 3.5×2.2	0.4	0.90	9.77	⊔ 4.9 0.8×0.9	1.05	
				To	③																
	②		59.1		(1800) 1400		31.1	31.1	41.1	0.60	0.73	0.121	7.15	10.07	⊔ 6.8 3.0×1.9	0.6	1.00	8.05	⊔ 3.8 1.1×0.9	1.14	
	③	①	4.3	141.8	100	1500	1.6	33.6	43.6	0.60	0.72	0.116	16.35	23.05	⊔ 100 5.0×2.5	0.4	1.02	16.64			
				To	⑥																
	④		32.2		(1200) 870		15.4	15.4	25.4	0.60	0.77	0.165	5.31	7.37	⊔ 2.8×1.7	0.6	1.33	5.57			
				To	⑥																
	⑤		32.2		1200		18.2	18.2	28.2	0.60	0.76	0.155	4.99	6.94	⊔ 2.9×1.8	0.4	1.12	5.17			
	⑥		48.8	255.0	300	1800	4.1	37.7	47.7	0.60	0.72	0.110	28.05	39.32	⊔ 13.0 8.0×2.5	0.5	1.23	28.37	⊔ 4.4 1.9×1.0	1.07	
				To	Kelang		River														
N-9																					
	①		57.6		(600) 380		10.8	10.8	20.8	0.50	0.79	0.154	8.87	12.26	⊔ 8.1 4.5×1.8	0.5	0.95	9.42			
	②		37.5	95.1	1140	1520	18.5	29.3	39.3	0.50	0.73	0.104	9.89	13.85	⊔ 8.3 4.5×1.9	0.6	1.07	11.36	⊔ 4.5 0.3×1.5	2.25	
				To	⑤																
	③		74.6		(1000) 500		14.0	14.0	24.0	0.50	0.77	0.141	10.52	14.59	⊔ 7.2 3.0×2.1	0.8	1.21	11.18			
	④		42.7	117.3	670	1170	10.7	24.7	34.7	0.50	0.74	0.113	13.25	18.51	⊔ 9.1 4.5×2.3	0.5	1.07	14.55	⊔ 2.5 1.7×0.5	0.34	
	⑤	②	68.3	280.7	1240	2760	19.7	49.0	59.0	0.50	0.71	0.078	21.89	31.15	⊔ 12.8 8.0×2.4	0.4	1.07	23.48	⊔ 4.0 1.5×1.1	1.47	
				To	⑦																
	⑥		44.4		(1200) 880		17.9	17.9	27.9	0.50	0.76	0.130	5.77	8.01	⊔ 5.4 2.0×1.7	1.0	1.14	6.16			
	⑦	⑤	12.7	337.8	200	2960	3.1	52.1	62.1	0.50	0.70	0.075	25.34	35.74	⊔ 14.0 9.0×2.5	0.4	1.12	28.35	⊔ 3.5 2.2×1.2	1.75	
	⑧		28.5	366.3	500	3460	7.7	59.8	69.8	0.50	0.70	0.069	25.27	35.82	⊔ 14.0 9.0×2.5	0.4	1.12	28.35	⊔ 6.6 1.1×1.7	3.77	$3663^{ha} = 342.7 + 394 \times \frac{0.30}{0.50}$
				To	Kelang		River														

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
S-1																					
	①		77.5		(1500) 800		31.1	31.1	41.1	0.40	0.73	0.081	6.28	8.81	⊔ 7.0 / 3.0 × 2.0	0.4	0.84	7.26	∨ 2.8 × 1.1	1.29	
	②		34.5	112.0	640	1440	12.8	43.9	53.9	0.40	0.71	0.067	7.50	10.53	⊔ 7.5 / 3.5 × 2.0	0.4	0.86	8.20	⊔ 5.0 / 1.0 × 1.5	2.48	
	③		16.6	128.6	180	1620	3.5	47.4	57.4	0.40	0.71	0.064	8.23	11.62	⊔ 8.0 / 4.0 × 2.0	0.4	0.88	9.19	⊔ 5.8 / 1.1 × 1.3	2.36	
				To	Kelang		River														
S-2																					
	①		108.9		(1100) 780		13.3	13.3	23.3	0.40	0.78	0.116	12.63	17.48	⊔ 7.8 / 4.0 × 1.9	1.1	1.42	13.87	⊔ 2.9 / 2.2 × 0.6	0.79	
	②		18.6	127.5	530		6.4	19.7	29.7	0.40	0.75	0.099	12.62	17.63	⊔ 7.8 / 4.0 × 1.9	1.1	1.42	13.87	∨ 2.9 × 1.2	1.72	
				To	④																
	③		30.5		(600) 380		8.2	8.2	18.2	0.40	0.82	0.135	4.12	5.67	⊔ 4.2 / 1.0 × 1.6	1.6	1.25	4.39			
	④	②	19.5	177.5	100	1410	1.1	20.8	30.8	0.40	0.75	0.098	17.40	24.12	⊔ 9.0 / 5.0 × 2.0	1.1	1.51	18.48	⊔ 12.5 / 3.1 × 1.6	13.23	
				To	Kelang		River														
S-3																					
	①		11.8		350		3.7	3.7	13.7	0.75	0.88	0.301	3.55	4.85	⊔ 1.6 × 1.6	1.4	1.60	3.69	⊔ 1.5 / 1.2 × 1.2	1.78	
				To	Kelang		River														
S-4																					
	①		53.9		(900) 700		6.3	6.3	16.3	0.55	0.84	0.198	10.67	14.66	⊔ 2.7 × 2.0	1.9	2.44	11.52	⊔ 1.6 / 0.6 × 3.0	1.69	
				To	Kelang		River														

S-1, S-2, S-3, S-4

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition: Existing Drain Size (m)	Existing Condition: Existing Drain Capacity (m^3/s)	Remarks
S-5	①		16.0		480		7.9	7.9	17.9	0.55	0.82	0.187	2.99	4.11	⊔ 4.1/1.5×1.3	1.2	1.04	3.25	⊔ 1.0/0.5×0.8	0.51	
	②		29.0	45.0	455	935	6.3	14.2	24.2	0.55	0.77	0.154	6.93	9.65	⊔ 8.8×1.8	0.4	1.22	7.33	⊔ 4.3/1.8×1.0	2.60	
	③		52.4	97.4	800	1735	10.9	25.1	35.1	0.55	0.74	0.123	11.98	16.80	⊔ 5.8×2.0	0.3	1.24	12.74	⊔ 2.7/1.2×1.2	1.11	
				To	⑤																
	④		49.7		1800		26.1	26.1	36.1	0.55	0.73	0.120	5.96	8.33	⊔ 3.4×1.8	0.4	1.18	6.33	⊔ 4.0/1.5×1.2	0.83	
	⑤	③	9.0	156.1	800	2600	11.0	37.1	47.1	0.55	0.72	0.101	15.74	22.23	⊔ 9.7/5.5×2.1	0.7	1.25	17.46			
				To	⑤-②																
S-6	①		59.5		850		15.8	15.8	25.8	0.45	0.77	0.123	7.32	10.15	⊔ 7.6/4.0×1.8	0.5	0.93	8.47	⊔ 2.9×0.8	0.51	
	②	⑤-⑤	37.2	252.8	400	3000	5.3	42.4	52.4	0.55	0.71	0.093	23.48	33.27	⊔ 12.1/7.5×2.3	0.6	1.27	25.16			To Retention Pond
	③		0	252.8	50	3050	0.7	43.2	53.1	0.55	0.71	0.092	23.20	33.00	⊔ 12.1/7.5×2.3	0.6	1.27	25.16			
				To	Kelang		River														
S-7	①		27.0		800		17.1	17.1	27.1	0.55	0.76	0.145	3.87	5.43	⊔ 5.4/2.0×1.7	0.5	0.80	4.32	∨ 2.7×0.4	0.15	
	②		67.3	94.3	600	1400	10.3	27.4	37.4	0.55	0.73	0.118	11.11	15.52	⊔ 9.3/5.5×1.9	0.5	1.01	12.45	⊔ 2.9/0.2×0.9	0.63	
	③		16.5	110.8	200	1600	3.3	30.7	40.7	0.55	0.73	0.112	12.40	17.41	⊔ 9.5/5.5×2.0	0.5	1.03	13.53			
				To	Kelang		River														
S-8	①		255.6		(2200) 1200		35.9	35.9	45.9	0.65	0.72	0.121	30.93	43.68	⊔ 15.6/10.0×2.8	0.3	1.04	32.81	∨ 5.2×1.2	1.48	
	②		61.9	317.5	1200	2400	19.8	55.7	65.7	0.65	0.70	0.093	29.53	42.06	⊔ 15.6/10.0×2.8	0.3	1.04	32.81	⊔ 5.1/1.0×2.1	2.21	
	③		11.8	329.3	500	2900	8.4	64.1	74.1	0.65	0.70	0.086	28.32	40.17	⊔ 15.6/10.0×2.8	0.3	1.04	32.81	∨ 5.1×1.2	1.19	
				To	⑤																
	④		54.1		(1300) 1000		23.2	23.2	33.2	0.65	0.74	0.150	8.11	11.35	⊔ 7.2/3.0×2.1	0.5	0.96	8.87			
	⑤	③	4.0	387.4	200	3100	3.2	67.3	77.3	0.65	0.70	0.083	32.15	45.87	⊔ 15.8/10.0×2.9	0.3	1.06	34.89	∨ 4.1×0.8	0.40	
				To	⑧																
	⑥		36.5		(930) 630		14.5	14.5	24.5	0.65	0.77	0.182	6.64	9.20	⊔ 3.7×2.0	0.3	1.09	7.13			

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Per ha (m^3/s)	Design Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (%)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
S-8	⑦		106.4	142.9	1870	2500	27.6	42.1	52.1	0.65	0.71	0.111	15.86	22.31	⊔6.0×2.8	0.2	1.15	17.07			
	⑧ ⑤		8.9	539.2	300	3400	4.5	71.9	81.9	0.65	0.69	0.079	42.60	60.39	⊔180×2.9	0.3	1.10	44.82	▽5.8×0.9	0.71	
	⑨		0	539.2	267	3667	4.2	76.1	86.1	0.65	0.69	0.076	40.98	58.25	⊔180×2.9	0.3	1.10	44.82	▽7.5×1.4	1.88	
				To	Kelang	River															
S-9																					
	①		23.2		1100		13.4	13.4	23.4	0.65	0.78	0.188	4.36	6.04	⊔2.3×1.70	0.8	1.42	4.82	⊔2.2×1.0×0.8	0.89	
				To	③																
	②		29.8		1000		12.7	12.7	22.7	0.65	0.78	0.191	5.69	7.86	⊔2.5×2.0	0.6	1.33	5.90	⊔5.7×1.6×1.1	3.02	
	③ ①		34.8	87.8	290	1290	3.5	16.9	26.9	0.65	0.76	0.172	15.10	20.95	⊔8.5×4.5×2.0	1.0	1.41	15.99	▽4.7×2.0	1.83	
				To	⑤																
	④		32.7		(740) 540		12.7	12.7	22.7	0.65	0.78	0.191	6.25	8.62	⊔6.7×3.5×1.6	0.7	1.02	7.26	⊔5.5×1.5×0.8	1.51	
	⑤ ③		0	120.5	100	1390	1.2	18.1	28.1	0.65	0.76	0.168	20.24	28.17	□7.2×2.1	0.6	1.42	21.47			
				To	Kelang	River															
S-10																					
	①		48.4		(1400) 1210		18.5	18.5	28.5	0.70	0.75	0.178	8.62	11.95	⊔4.0×2.0	0.4	1.29	9.07	⊔5.8×1.8×1.4	1.54	
				To	③																
	②		26.5		(1300) 1100		17.2	17.2	27.2	0.70	0.76	0.184	4.88	6.77	⊔2.5×1.9	0.6	1.31	5.47	⊔2.0×0.8×0.6	0.24	
	③ ①		30.1	105.0	400	1610	4.4	22.4	32.9	0.70	0.74	0.163	17.12	23.84	⊔5.4×2.5	0.4	1.53	18.23	⊔6.9×2.6×1.6	2.47	
				To	⑤																
	④		39.6		(1100) 880		12.6	12.6	22.6	0.70	0.78	0.206	8.16	11.26	⊔3.3×2.0	0.6	1.48	8.61			
	⑤ ③		0	144.6	90	1700	1.0	23.9	33.9	0.70	0.74	0.160	23.14	32.33	⊔10.5×5.6×2.5	0.9	1.55	27.03			
				To	Kelang	River															

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
A-1																					
	C		431.7		(6000)		89.1		99.1	0.40	0.69	0.042	18.13	25.85	⊔ 10.5 / 5.5 × 2.5	0.5	1.16	20.23			
	1		9.0	440.7	400		6.0	95.1	105.1	0.40	0.69	0.040	17.63	25.24	⊔ 10.5 / 5.5 × 2.5	0.5	1.16	20.23	⊔ 3.3 / 0.8 × 0.7	0.58	
				To	3																
	2		231.7		(2250) / 1500		30.4	30.4	40.4	0.40	0.73	0.082	19.00	26.58	⊔ 11.5 / 7.5 × 2.0	0.7	1.28	21.43			
	3	1	5.2	677.6	490	1990	6.9	102.0	112.0	0.40	0.69	0.038	25.75	36.94	⊔ 13.0 / 8.0 × 2.5	0.5	1.23	28.37	⊔ 3.2 / 1.8 × 1.3	1.95	
				To	5																
	4		84.4		(1700) / 1300		26.2	26.2	36.2	0.40	0.73	0.087	7.34	10.28	⊔ 6.8 / 3.0 × 1.9	0.8	1.15	9.26			
	5	3	0.9	762.9	240	2230	3.3	105.3	115.3	0.40	0.69	0.037	28.23	40.66	⊔ 14.0 / 9.0 × 2.5	0.5	1.25	31.64	⊔ 4.7 / 1.6 × 1.2	2.20	
	6		260.7	1023.6	1270	3500	17.0	122.3	132.3	0.40	0.68	0.033	33.78	48.20	⊔ 15.5 / 10.5 × 2.5	0.5	1.27	36.43	⊔ 2.8 / 1.7 × 1.0	1.14	
				To	8																
	7		110.9		(2650) 2040		45.6	45.6	55.6	0.40	0.71	0.065	7.21	10.23	⊔ 6.8 / 3.0 × 1.9	0.6	1.00	8.05	⊔ 8.0 / 3.5 × 1.2	4.40	
	8		43.7	1178.2	1340	4840	36.0	158.3	168.3	0.40	0.68	0.027	31.81	45.51	⊔ 25.4 / 20.0 × 2.7	0.1	0.64	34.88	⊔ 3.6 / 0.9 × 0.7	0.38	
				To	11																
	9		55.0		(1750) 1340		37.2	37.2	47.2	0.40	0.72	0.073	4.02	5.69	⊔ 5.4 / 2.0 × 1.7	0.5	0.80	4.32	⊔ 3.4 / 1.0 × 1.8	2.97	
				To	11																
	10		389.8		(11000) 870		244.8	244.8	254.8	0.40	0.68	0.019	7.41	10.52	⊔ 7.7 / 3.5 × 2.1	0.3	0.76	7.74			
	11	8 4	0	1623.0	20	4860	0.5	245.3	255.3	0.40	0.68	0.019	30.84	43.71	⊔ 25.4 / 20.0 × 2.7	0.1	0.64	34.88			
				To	Aur	River															
A-2																					
	1		63.0		(1400) 1000		15.6	15.6	25.6	0.55	0.77	0.151	9.51	13.18	⊔ 3.5 × 2.1	0.6	1.53	9.92	∨ 5.7 × 1.2	2.45	
				To	4																
	2		41.2		(1450) 1200		21.6	21.6	31.6	0.55	0.75	0.132	5.44	7.60	⊔ 3.0 × 1.9	0.4	1.15	5.75	∨ 5.7 × 1.4	1.69	
				To	4																
	3		16.1		(700) 430		10.1	10.1	20.1	0.55	0.80	0.174	2.80	3.87	⊔ 1.9 × 1.5	0.7	1.19	2.95			

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
A-2	④	①②	13.3	133.6	600	1800	6.3	27.9	37.9	0.55	0.73	0.117	15.63	21.83	⊔ 5.0×2.3	0.5	1.62	16.46	∨ 5.0×1.4	0.58	
				To	Aur	River															
A-3																					
	①		9.7		300		8.0	8.0	18.0	0.70	0.82	0.237	2.30	3.17	⊔ 4.5/1.5×1.5	0.4	0.64	2.46			
				To	③																
	②		25.3		(950) 700		21.8	21.8	31.8	0.70	0.74	0.166	4.20	5.84	⊔ 5.9/2.5×1.7	0.4	0.75	4.62	∨ 3.8×1.1	0.85	
	③	1	8.3	43.3	820	1520	12.0	33.8	43.8	0.70	0.72	0.135	5.85	8.19	⊔ 3.3×1.8	0.4	1.17	6.09	⊔ 8.5/2.8×0.8	1.92	
				To	⑦																
	④		12.2		1000		17.4	17.4	27.4	0.70	0.76	0.183	2.23	3.11	⊔ 1.8×1.5	0.5	0.99	2.33	∨ 3.1×1.0	0.58	
				To	⑥																
	⑤		24.0		(750) 570		10.3	10.3	20.3	0.70	0.80	0.221	5.30	7.31	⊔ 3.2×1.6	0.5	1.24	5.58			
	⑥	④	27.4	63.6	560	1560	7.1	24.5	34.5	0.70	0.74	0.159	10.11	14.09	⊔ 4.3×2.1	0.4	1.34	10.65	⊔ 4.0/1.5×0.8	0.91	
	⑦	③	0	106.9	250	1810	4.0	37.8	47.8	0.70	0.72	0.128	13.68	19.20	⊔ 9.1/4.5×2.3	0.5	1.07	14.55	⊔ 5.9/1.9×0.6	0.83	
				To	Aur	River															
A-5																					
	①		16.8		750		10.1	10.1	20.1	0.85	0.80	0.269	4.52	6.24	⊔ 2.5×1.7	0.6	1.27	4.74			
	②		20.1	36.9	800	1550	10.8	20.9	30.9	0.85	0.75	0.207	7.64	10.64	⊔ 3.5×2.1	0.4	1.25	8.07			
	③		19.2	56.1	230	1780	3.1	24.0	34.0	0.85	0.74	0.194	10.88	15.21	⊔ 7.7/3.5×2.1	0.9	1.32	13.45			
	④		16.3	72.4	50	1830	0.6	24.6	34.6	0.85	0.74	0.192	13.91	19.45	⊔ 8.2/4.0×2.1	1.0	1.42	15.81	⊔ 7.0/3.8×1.8	10.98	Port Area (28.5ha) is directly drained to the sea.
				To	Aur	River															

in Year 2000

A-2, A-3, A-5

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
A-4																					
	①		1.26	(1.50) 2.76	190	(200) 390	3.4	(5.3) 8.7	(15.3) 18.7	0.90	0.81	0.297	0.82	1.13	⊔1.1×1.1	0.9	1.00	1.09			(C=1.50) C=1.26
	②		2.51	(1.95) 7.22	235	625	3.6	12.3	22.3	0.90	0.78	0.266	1.92	2.65	⊔1.5×1.5	0.8	1.16	2.35			(C=1.95) C=2.51
	③		0.08	(7.49) 14.79	50	675	0.7	13.0	23.0	0.90	0.78	0.262	3.87	5.35	⊔2.0×2.0	0.6	1.22	4.38	0.6 ⊔0.4×0.5	0.09	(C=7.49) R1=0.08
	④		3.44	(3.61) 21.84	255	930	3.4	16.4	26.4	0.82	0.76	0.219	4.78	6.63	⊔2.2×2.2	0.6	1.30	5.65	2.7 ⊔1.6×0.7	1.14	R1=2.30 (1.75) S=1.14 (1.86)
	⑤		0.75	(5.00) 27.59	35	965	0.4	16.8	26.8	0.81	0.76	0.215	5.93	8.23	⊔2.4×2.4	0.6	1.36	7.12			R1=0.75 (5.00)
		⑨																			
	⑥		2.41	(4.29) 6.70	365	(285) 650	7.5	(7.0) 14.5	(17.0) 24.5	0.84	0.77	0.235	1.57	2.17	⊔1.6×1.6	0.4	0.86	1.97			C=2.41 (3.05) (R2=1.24)
	⑦		0.13	(2.61) 9.44	60	710	1.0	15.5	25.5	0.85	0.77	0.234	2.21	3.06	⊔1.7×1.7	0.5	1.00	2.59			C=0.13 ha (2.61)
	⑧		2.68	12.12	305	1015	4.8	20.3	30.3	0.86	0.75	0.211	2.56	3.56	⊔1.7×1.7	0.6	1.09	2.84			R=0.62 C=2.06
	⑨	⑤	0.65	40.36	80	1095	1.0	21.3	31.3	0.82	0.75	0.198	7.99	11.13	⊔2.7×2.7	0.5	1.36	8.90	▽1.2×0.5	0.58	R1=0.65
	⑩		—	(12.14) 52.50	20	1115	0.2	21.5	31.5	0.77	0.75	0.186	9.77	13.62	⊔2.9×2.9	0.5	1.42	10.77			(I=5.50 C=1.03 Q=2.50 R1=3.11)

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
0-1																					
	①		279.2		(6250) 3340		156.9	156.9	166.9	0.45	0.68	0.030	8.38	12.22	⊎ 8.8 4.0×2.4	0.2	0.68	9.05			
				To	③																
	②		299.7		(4750) 2840		111.0	111.0	121.0	0.45	0.69	0.040	11.99	17.30	⊎ 11.0 6.0×2.5	0.2	0.74	13.74			
	③	①	63.8	642.7	2000	5340	44.0	200.9	210.9	0.45	0.68	0.025	16.07	23.03	⊎ 12.7 7.5×2.6	0.2	0.78	17.96			
				To	⑦																
	④		121.7		(2200) 2000		35.9	35.9	45.9	0.45	0.72	0.084	10.22	14.40	⊎ 4.9×2.5	0.2	1.05	11.25			
				To	⑥																
	⑤		151.2		(2950) 2540		74.9	74.9	84.9	0.45	0.69	0.053	8.01	11.42	⊎ 8.8 4.0×2.4	0.2	0.68	9.05			
	⑥	④	42.4	315.3	1000	3540	15.0	89.9	99.9	0.45	0.69	0.047	14.82	21.11	⊎ 5.5×3.0	0.2	1.16	16.48			
	⑦	③	1.1	959.1	80	5420	1.6	202.5	212.5	0.45	0.68	0.025	23.98	34.14	⊎ 13.9 7.5×3.2	0.2	0.87	26.01			$959.1^{ha} \fallingdotseq 366.9+870.1\times\frac{0.30}{0.45}$
				To Pulok		River															
0-2																					
	①		109.3		(2300) 2100		59.3	59.3	69.3	0.50	0.70	0.069	7.54	10.74	⊎ 8.6 4.0×2.3	0.2	0.67	8.42			
				To	③																
	②		77.1		(2000) 1800		46.2	46.2	56.2	0.50	0.71	0.081	6.25	8.83	⊎ 7.2 3.0×2.1	0.3	0.74	6.84			
	③	①	41.5	227.9	530	2630	10.2	69.5	79.5	0.50	0.70	0.063	14.36	20.35	⊎ 11.0 6.0×2.5	0.3	0.91	16.89			
				To	⑤																
	④		31.2		(900) 700		19.0	19.0	29.0	0.50	0.75	0.126	3.93	5.46	⊎ 3.0×2.0	0.2	0.82	4.27			
	⑤	③	1.6	260.7	150	2780	2.8	72.3	82.3	0.50	0.69	0.060	15.64	22.38	⊎ 11.2 6.0×2.6	0.3	0.93	18.15			
				To Pulok		River															

F-13

0-1, 0-2

F-14

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
0-3																					
	C1		377.3		3900		87.5	87.5	97.5	0.35	0.69	0.037	13.96	20.01	⊔ 11.4 / 6.0 × 2.7	0.2	0.77	15.77			
	1		211.0	588.3	2380	6280	52.0	139.5	149.5	0.35	0.68	0.026	15.30	21.94	⊔ 11.6 / 6.0 × 2.8	0.2	0.79	16.96			
	2		168.0	756.3	1250	7530	26.3	165.8	175.8	0.35	0.68	0.023	17.39	24.64	⊔ 12.2 / 6.0 × 3.1	0.2	0.83	20.36			
	3		177.9	934.2	1300	8830	27.0	192.8	202.8	0.35	0.68	0.020	18.68	26.93	⊔ 12.7 / 6.5 × 3.1	0.2	0.84	21.77			
	4		90.2	1024.4	1000	9830	20.9	213.7	223.7	0.35	0.68	0.018	18.44	27.12	⊔ 12.7 / 6.5 × 3.1	0.2	0.84	21.77			
				To	⑦																
	5		18.8		(900) 700		20.8	20.8	30.8	0.35	0.75	0.085	1.60	2.24	⊔ 1.6 × 1.6	0.3	0.74	1.71			
				To	⑦																
	6		29.4		700		13.9	13.9	23.9	0.35	0.77	0.099	2.91	4.03	⊔ 2.0 × 2.0	0.3	0.86	3.10			
	7	4 5	0.3	1072.9	80	9910	1.6	215.3	225.3	0.35	0.68	0.018	19.31	28.23	⊔ 12.7 / 6.5 × 3.1	0.2	0.84	21.77			$1072.9^{ha} = 2086 + 1008.3 \times \frac{0.30}{0.35}$
				To	Pulok	River															
0-4																					
	C1		479.1		3500		58.6	58.6	68.6	0.35	0.70	0.049	23.48	33.19	⊏ 12.4 / 6.0 × 3.2	0.3	1.03	26.34			
				To	③																
	1		87.0		2100		35.0	35.0	45.0	0.35	0.72	0.066	5.74	8.10	⊔ 2.8 × 2.5	0.3	1.05	6.30			
				To	③																
	2		23.7		800		16.9	16.9	26.9	0.35	0.76	0.093	2.20	3.04	⊔ 2.2 × 1.5	0.3	0.83	2.38			
	3	C1 1	0	589.8	180	3680	2.9	61.5	71.5	0.35	0.70	0.047	27.72	39.71	⊔ 13.0 / 6.0 × 3.5	0.3	1.08	31.13			$589.8^{ha} = 77.8 + 597.4 \times \frac{0.30}{0.35}$
				To	Besar	River															

0-3, 0-4

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
0-5																					
	C1		311.7		(4800)		89.1	89.1	99.1	0.50	0.69	0.052	16.20	23.33	U 11.0/6.0 × 2.5	0.3	0.91	16.89			
	1		59.6	371.3	620	5420	11.2	100.3	110.3	0.50	0.69	0.048	17.82	25.61	U 11.2/6.0 × 2.6	0.3	0.93	18.15			
				To	④																
	2		104.4		(1900) 1500		31.0	31.0	41.0	0.50	0.73	0.101	10.54	14.85	U 4.6 × 2.5	0.2	1.03	10.56			
				To	④																
	3		25.6		(900) 700		17.2	17.2	27.2	0.50	0.76	0.131	3.35	4.67	U 2.1 × 2.1	0.3	0.89	3.53			
	4	1 2	303.9	805.2	2060	7480	39.1	139.4	149.4	0.50	0.68	0.037	29.79	42.93	U 16.2/10.0 × 3.1	0.2	0.90	32.12			
	5		289.1	1094.3	2560	10.040	47.7	187.1	197.1	0.50	0.68	0.029	31.73	46.19	U 16.4/10.0 × 3.2	0.2	0.91	33.76			
	6		217.3	1311.6	3660	13700	70.2	257.3	267.3	0.50	0.68	0.022	28.86	42.38	U 16.4/10.0 × 3.2	0.2	0.91	33.76			
	7		42.4	1354.0	300	14000	5.7	263.0	273.0	0.50	0.67	0.022	29.79	42.30	U 16.4/10.0 × 3.2	0.2	0.91	33.76			$1354.0^{ha} = 303.3 + 1751.1 \times \frac{0.30}{0.50}$

in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
0-6																					
	C1		1398.3		7600		138.6	138.6	148.6	0.40	0.68	0.030	41.95	59.90	∪ 21.0 / 15.0 × 3.0	0.2	0.93	44.44			
	1		9.1	1407.4	400	8000	7.4	146.0	156.0	0.40	0.68	0.029	40.81	57.92	∪ 21.0 / 15.0 × 3.0	0.2	0.93	44.44			
				TO	③																
	C2		294.8		2900		52.7	52.7	62.7	0.40	0.70	0.059	17.39	24.79	∪ 11.4 / 6.0 × 2.7	0.3	0.94	19.26			
	2		30.9	325.7	400	3300	7.2	59.9	69.9	0.40	0.70	0.055	17.91	25.46	∪ 11.4 / 6.0 × 2.7	0.3	0.94	19.26			
	3	1	80.3	1813.4	700	4000	12.6	158.6	168.6	0.40	0.68	0.027	48.96	69.94	∪ 24.0 / 18.0 × 3.0	0.2	0.95	53.10			
	4		168.5	1981.9	1370	5370	24.9	183.5	193.5	0.40	0.68	0.024	47.57	68.00	∪ 24.0 / 18.0 × 3.0	0.2	0.95	53.10			
	5		153.0	2134.9	1300	6670	24.1	207.6	217.6	0.40	0.68	0.021	44.83	66.18	∪ 24.0 / 18.0 × 3.0	0.2	0.95	53.10			
	6		151.7	2286.6	1450	8120	27.2	234.8	244.8	0.40	0.68	0.019	43.45	63.91	∪ 24.0 / 18.0 × 3.0	0.2	0.95	53.10			
	7		148.2	2434.8	2250	10370	43.7	278.5	288.5	0.40	0.67	0.016	38.96	57.91	∪ 24.0 / 18.0 × 3.0	0.2	0.95	53.10			
				TO	⑨																
	C3		3480.2		11700		180.7	180.7	190.7	0.40	0.68	0.024	83.52	120.91	∪ 27.6 / 20.0 × 3.8	0.2	1.10	88.11			
	8		26.4	3506.6	1400	13100	22.2	202.9	212.9	0.40	0.68	0.022	77.15	110.78	∪ 27.6 / 20.0 × 3.8	0.2	1.10	88.11			
	9	7	6.8	5948.2	700	13800	10.6	289.1	299.1	0.40	0.67	0.016	95.17	136.95	∪ 29.8 / 22.0 × 3.9	0.2	1.13	101.18			
				TO	⑫																
	C4		905.1		6700		134.9	134.9	144.9	0.40	0.68	0.030	27.15	39.59	∪ 17.4 / 12.0 × 2.7	0.2	0.85	29.81			
	10		199.3	1104.4	1220	7920	23.8	158.7	168.7	0.40	0.68	0.027	29.82	42.58	∪ 17.6 / 12.0 × 2.8	0.2	0.87	31.83			
	11		51.3	1155.7	500	8420	9.9	168.6	178.6	0.40	0.68	0.025	28.89	42.45	∪ 17.6 / 12.0 × 2.8	0.2	0.87	31.83			
	12	9	4.0	7107.9	350	14150	5.1	294.2	304.2	0.40	0.67	0.016	113.73	161.17	∪ 33.2 / 25.0 × 4.1	0.2	1.17	123.86			
				TO	⑲																
	C5		52.1		1300		33.4	33.4	43.4	0.40	0.72	0.077	4.01	5.66	∪ 5.8 / 2.0 × 1.9	0.3	0.66	4.19			
	13		51.4	103.5	630	1930	16.8	50.2	60.2	0.40	0.71	0.062	6.42	9.07	∪ 7.8 / 3.0 × 2.4	0.2	0.65	7.24			
	14		148.9	252.4	2920	4850	74.1	124.3	134.3	0.40	0.68	0.032	8.08	11.74	∪ 8.8 / 4.0 × 2.4	0.2	0.68	9.05			
	15		236.6	489.0	3000	7850	70.2	194.5	204.5	0.40	0.68	0.023	11.25	16.00	∪ 10.2 / 5.0 × 2.6	0.2	0.73	12.54			
	16		290.6	779.6	2660	10510	59.5	254.0	264.0	0.40	0.68	0.018	14.03	20.38	∪ 11.2 / 6.0 × 2.6	0.2	0.76	14.83			
				TO	⑱																

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Per ha (m^3/s)	Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
0-6	(17)				(7200) 980		27.8	27.8	37.8	0.40	0.73	0.085	2.86	4.01	U 2.3×2.0	0.2	0.74	2.98			
	(18)	(16)	73.3	886.4	760	11270	16.7	270.7	280.7	0.40	0.67	0.017	15.07	21.61	U 6.0×2.7	0.2	0.77	15.77			
		(19) (12)	4.8	7992.3	370	14520	5.4	299.6	309.6	0.40	0.67	0.015	119.99	178.51	U 28.0×4.1	0.2	1.18	129.28			
				To	Rapar	Besar	River														

F-18

Alternative A (N-6) in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition: Existing Drain Size (m)	Existing Condition: Existing Drain Capacity (m^3/s)	Remarks
	①		3.90	(67.70) 71.60	225	(1285) 1510	3.1	(16.2) 19.3	(26.2) 29.3	0.60	0.75	0.150	10.64		7.2 ∪ 3.0 × 2.1	0.8	1.21	11.18			
	②		20.00	91.60	400	1910	5.4	24.7	34.7	0.60	0.74	0.136	12.42		7.9 ∪ 3.5 × 2.2	0.8	1.27	13.78			
	③		31.50	123.10	370	2280	4.8	29.5	39.5	0.60	0.73	0.124	15.27		8.6 ∪ 4.0 × 2.3	0.8	1.33	16.71			
	④		38.90	162.00	80	2360	1.0	30.5	40.5	0.60	0.73	0.123	19.86		9.8 ∪ 5.0 × 2.4	0.8	1.41	21.81			
		G1																			
	⑤		2.28	(14.27) 16.55	250	(1410) 1660	3.0	(19.1) 22.1	32.1	0.80	0.74	0.188	3.12		∪ 1.7 × 1.7	1.0	1.42	3.67			
	⑥		3.72	20.27	340	2000	4.0	26.1	36.1	0.82	0.73	0.179	3.63		∪ 1.8 × 1.8	1.0	1.46	4.27			
		⑨																			
	⑦		6.06	(17.87) 23.93	230	(970) 1200	2.7	17.6	27.6	0.55	0.76	0.144	3.45		∪ 1.7 × 1.7	1.1	1.48	3.84			
	⑧		1.79	25.72	320	1520	3.7	21.3	31.3	0.57	0.75	0.138	3.55		∪ 1.8 × 1.8	1.1	1.54	4.48			
	⑨	⑥	0.45	(4.18) 50.62	125	2125	1.1	27.2	37.2	0.69	0.73	0.148	7.49		□ 2.1 × 2.1	1.9	1.89	8.33			
	⑩		1.07	51.69	35	2160	0.3	27.5	37.5	0.69	0.73	0.147	7.60		□ 2.1 × 2.1	1.9	1.89	8.33			
	⑪		0.89	(1.29) 53.87	295	2455	2.7	30.2	40.2	0.69	0.73	0.142	7.65		□ 2.1 × 2.1	1.9	1.89	8.33			
	⑫		2.86	(15.57) 72.30	85	2540	0.7	30.9	40.9	0.74	0.73	0.150	10.85		□ 2.4 × 2.4	1.9	2.07	11.92			
		G2																			
	⑬		1.70	(2.52) 4.22	125	(380) 505	2.0	(6.8) 8.8	(16.8) 18.8	0.79	0.81	0.260	1.09		∪ 1.2 × 1.2	1.0	1.12	1.45			
	⑭		0.09	(3.38) 7.69	25	530	0.3	9.1	19.1	0.83	0.81	0.272	2.09		∪ 1.4 × 1.4	1.2	1.36	2.39			
	⑮		0.05	(4.61) 12.35	20	550	0.2	9.3	19.3	0.71	0.81	0.232	2.88		∪ 1.6 × 1.6	1.1	1.42	3.27			
	⑯		2.73	(4.32) 19.40	180	730	2.2	11.5	21.5	0.69	0.79	0.210	4.08		∪ 1.9 × 1.9	0.9	1.44	4.68			
	⑰		2.67	(3.49) 25.56	220	950	2.6	14.1	24.1	0.70	0.77	0.197	5.04		∪ 2.1 × 2.1	0.8	1.45	5.76			
	⑱		—	(22.64) 48.20	20	970	0.2	14.3	24.3	0.75	0.77	0.211	10.16		∪ 2.9 × 2.9	0.6	1.56	11.79			
		G3																			

N-6 (A)

F-19

Alternative B (N-6) in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
N-6	①		8.34	(32.14) 40.48	270	(1400) 1670	2.9	(18.4) 21.3	(28.4) 31.3	0.75	0.75	0.181	7.34		⊔ 2.4 × 2.4	0.8	1.59	8.22			
(B)	②		—	40.48	580	2250	6.5	27.8	37.8	0.75	0.73	0.159	6.44		⊡ 2.4 × 2.4	0.8	1.59	8.22			
	③		3.90	(67.70) 112.08	225	2475	2.9	30.7	40.7	0.65	0.73	0.132	14.72		⊔ 8.3 / 3.5 × 2.4	0.8	1.33	16.26			
	④		20.00	132.08	400	2875	5.0	35.7	45.7	0.65	0.72	0.122	16.10		⊔ 8.5 / 3.5 × 2.5	0.8	1.36	17.60			
	⑤		31.50	163.58	370	3245	4.5	40.2	50.2	0.65	0.71	0.113	18.39		⊔ 9.0 / 4.0 × 2.5	0.8	1.39	19.55			
	⑥		38.90	202.48	80	3325	0.9	41.1	51.1	0.65	0.71	0.112	22.72		⊔ 9.9 / 4.5 × 2.7	0.8	1.47	24.75			
		G1																			
	⑦		7.03	(4.18) 11.21	155	(410) 565	1.5	(5.0) 6.5	(15.0) 16.5	0.75	0.84	0.269	3.01		⊡ 1.5 × 1.5	1.9	1.79	3.62			
	⑧		2.18	13.39	295	860	2.8	9.3	19.3	0.75	0.81	0.245	3.28		⊡ 1.5 × 1.5	1.9	1.79	3.62			
	⑨		18.43	31.82	80	940	0.6	9.9	19.9	0.75	0.80	0.239	7.59		⊡ 2.1 × 2.1	1.9	2.24	8.88			
		G2																			
	⑩		1.70	(2.52) 4.22	125	(380) 505	2.0	(6.8) 8.8	(16.8) 18.8	0.79	0.81	0.260	1.09		⊔ 1.2 × 1.2	1.0	1.12	1.45			
	⑪		0.09	(3.38) 7.69	25	530	0.3	9.1	19.1	0.83	0.81	0.272	2.09		⊔ 1.4 × 1.4	1.2	1.36	2.39			
	⑫		0.05	(4.61) 12.35	20	550	0.2	9.3	19.3	0.71	0.81	0.232	2.88		⊔ 1.6 × 1.6	1.1	1.42	3.27			
	⑬		2.73	(4.32) 19.40	180	730	2.2	11.5	21.5	0.69	0.79	0.210	4.08		⊔ 1.9 × 1.9	0.9	1.44	4.68			
	⑭		2.67	(3.49) 25.56	220	950	2.6	14.1	24.1	0.70	0.77	0.197	5.04		⊔ 2.1 × 2.1	0.8	1.45	5.76			
	⑮		—	(22.64) 48.20	20	970	0.2	14.3	24.3	0.75	0.77	0.211	10.16		⊔ 2.9 × 2.9	0.6	1.56	11.79			
		G3																			

N-6 (B)

Alternative C (N-6) in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m^3/s)	Remarks
N-6	①		3.90	(67.70) 71.60	225	(1285) 1510	3.1	(16.2) 19.3	(26.2) 29.3	0.60	0.75	0.150	10.64		7.2 ⊔ 3.0 × 2.1	0.8	1.21	11.18			
(C)	②		20.00	91.60	400	1910	5.4	24.7	34.7	0.60	0.74	0.136	12.42		7.9 ⊔ 3.5 × 2.2	0.8	1.27	13.78			
	③		31.50	123.10	370	2280	4.8	29.5	39.5	0.60	0.73	0.124	15.27		8.6 ⊔ 4.0 × 2.3	0.8	1.33	16.71			
	④		38.90	162.00	80	2360	1.0	30.5	40.5	0.60	0.73	0.123	19.86		9.8 ⊔ 5.0 × 2.4	0.8	1.41	21.81			
		G1																			
	⑤		7.03	(4.18) 11.21	155	(410) 565	1.5	(5.0) 6.5	(15.0) 16.5	0.75	0.84	0.269	3.01		□ 1.5 × 1.5	1.9	1.79	3.62			
	⑥		2.18	13.39	295	860	2.8	9.3	19.3	0.75	0.81	0.245	3.28		□ 1.5 × 1.5	1.9	1.79	3.62			
	⑦		18.43	31.82	80	940	0.6	9.9	19.9	0.75	0.80	0.239	7.59		□ 2.1 × 2.1	1.9	2.24	8.88			
		G2																			
	⑧		6.06	(34.42) 40.48	505	(1420) 1925	5.5	(18.4) 23.9	(28.4) 33.9	0.75	0.74	0.172	6.96		(○2600) ⊔ 2.4 × 2.4	0.8	1.59	8.22			
	⑨		4.77	45.25	300	2225	3.2	∴1	37.1	0.75	0.73	0.161	7.30		⊔ 2.4 × 2.4	0.8	1.59	8.22			
	⑩		11.36	56.61	675	2900	7.1	34.2	44.2	0.75	0.72	0.143	8.09		⊔ 2.5 × 2.5	0.8	1.63	9.17			
		⑬																			
	⑪		6.39	(2.98) 9.37	245	(495) 740	3.5	(8.8) 12.3	(18.8) 22.3	0.75	0.78	0.222	2.07		⊔ 1.5 × 1.5	0.9	1.23	2.49			
	⑫		6.16	15.53	205	945	2.7	15.0	25.0	0.75	0.77	0.208	3.23		⊔ 1.8 × 1.8	0.8	1.31	3.82			
	⑬		—	(16.54) 88.68	20	2920	0.2	34.4	44.4	0.75	0.72	0.143	12.68		⊔ 3.1 × 3.1	0.6	1.63	14.09			
		G3																			

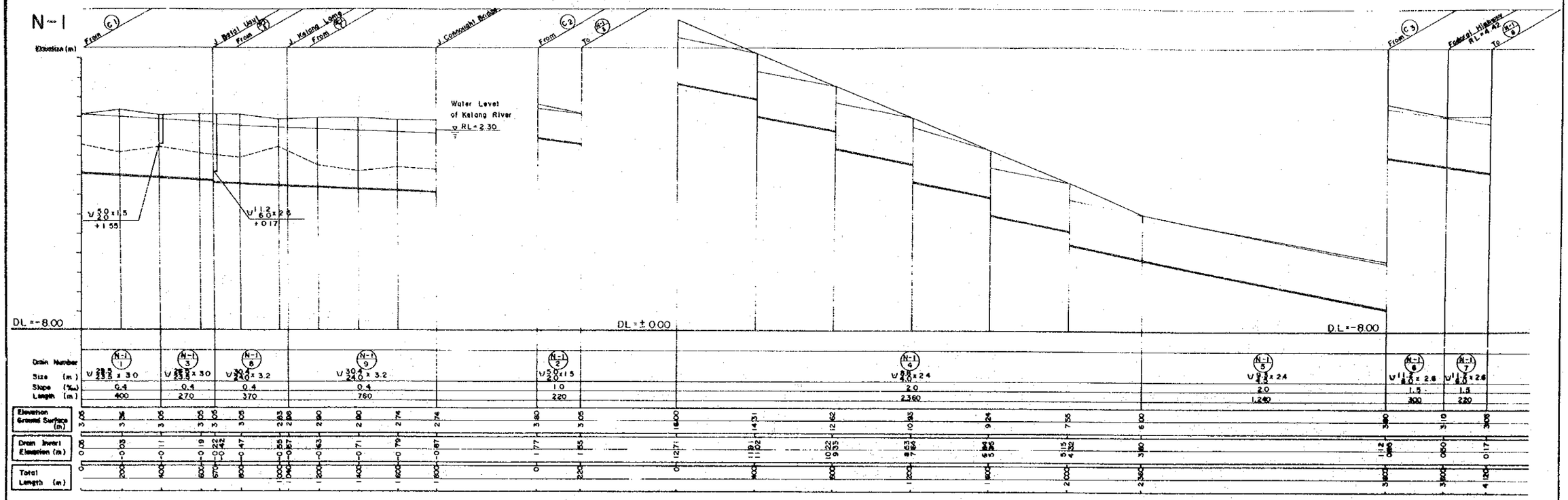
Case B (S5 ~ S7 Catchmens) in Year 2000

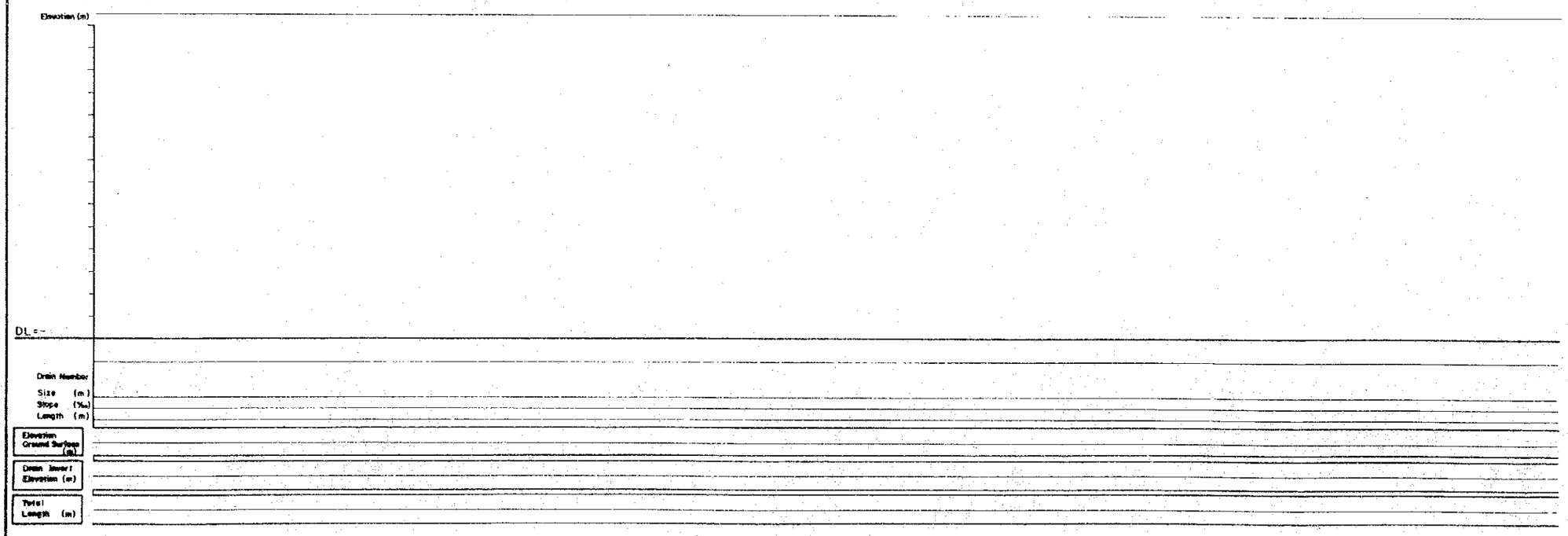
Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m³/s)	Design Runoff Total Runoff (m³/s)	Runoff Major Storm (m³/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m³/s)	Existing Condition Existing Drain Size (m)	Existing Condition Existing Drain Capacity (m³/s)	Remarks
S5~	①		68.6		(1140) 740		15.7	15.7	25.7	0.60	0.77	0.164	11.25		⊔4.4×2.5	0.3	1.24	11.98			
S7				To	③																
(B)	②		36.5		630		9.8	9.8	19.8	0.60	0.80	0.191	6.97		⊔3.8×2.0	0.3	1.10	7.32			
	③	①	49.7	154.8	1800	2540	19.9	35.6	45.6	0.60	0.72	0.113	17.49		⊔5.2×2.6	0.4	1.53	18.37			
				To	⑦																
	④		16.0		480		7.7	7.7	17.7	0.60	0.82	0.205	3.28		⊔4.3 1.5×1.4	1.2	1.08	3.76			
	⑤		29.0	45.0	455	935	6.2	13.9	23.9	0.60	0.77	0.170	7.65		⊔3.7×2.0	0.4	1.25	8.13			
	⑥		52.4	97.4	800	1735	10.6	24.5	34.5	0.60	0.74	0.136	13.25		⊔5.6×2.2	0.3	1.27	13.97			
	⑦	③	0	252.2	800	3340	9.6	45.2	55.2	0.60	0.71	0.098	24.72		⊔10.9 5.5×2.7	0.7	1.42	27.36			
				To	⑨																
	⑧		59.5		850		15.8	15.8	25.8	0.45	0.77	0.123	7.32		⊔7.6 4.0×1.8	0.5	0.93	8.47			
	⑨	⑦	37.2	348.9	400	3740	4.8	50.0	60.0	0.60	0.71	0.093	32.45		⊔12.8 7.0×2.9	0.6	1.42	35.62			
	⑩		0	348.9	50		0.6	50.6	60.6	0.60	0.71	0.092	32.26		⊔12.8 7.0×2.9	0.6	1.42	35.82			
				To	Kelang River																

N-2 (With Upstream Retention Pond) in Year 2000

Name of Catchment	Line No.	Inflow No.	Area Each (ha)	Area Total (ha)	Length Each (m)	Length Total (m)	Time of Flow in the Drain Each (min)	Time of Flow in the Drain Total (min)	Time of Concentration (min)	Runoff Coefficient	Storage Coefficient	Design Runoff Per ha (m^3/s)	Design Runoff Total Runoff (m^3/s)	Runoff Major Storm (m^3/s)	Proposed Drain Size (m)	Proposed Drain Slope (‰)	Proposed Drain Velocity (m/s)	Proposed Drain Capacity (m^3/s)	Existing Condition: Existing Drain Size (m)	Existing Condition: Existing Drain Capacity (m^3/s)	Remarks
N-2	(H)		(29.0) 70.0		(1400) 250		23.2	23.2	33.2	0.55	0.74	0.127	887		⊔ 7.8 4.0×1.9	0.6	1.050	10.25			
(R.P.)				10.22 m^3/sec	To Retention Pond																
				3.7 m^3/sec	Outflow From Retention Pond (= tc : 32.3, A : 29 ha)																
	(1-2)		15.8	(44.8) 85.8	660	910	12.6	35.8	45.8	0.55	0.72	0.103	4.54		⊔ 5.3 1.5×1.9	0.6	0.89	4.89			
	(2)		20.0	(64.8) 105.8	500	1410	6.2	42.0	52.0	0.55	0.71	0.094	6.00		⊔ 2.8×1.9	0.6	1.37	6.42			
				To	(5)																
	(3)		32.4		(700) 650		9.7	9.7	19.7	0.55	0.80	0.176	5.70		⊔ 5.4 2.0×1.7	1.0	1.14	6.16			
	(4)		12.8	45.2	250	900	3.5	13.2	23.2	0.55	0.78	0.160	7.23		⊔ 6.1 2.5×1.8	1.0	1.22	8.14			
	(5)	(2)	14.8	(124.8) 165.8	450	1860	5.7	47.7	57.7	0.55	0.71	0.088	10.96		⊔ 6.9 2.7×2.1	1.0	1.33	11.54			
				To	(7)																
	(6)		24.4		680		10.3	10.3	20.3	0.55	0.80	0.174	4.25		⊔ 4.8 2.0×1.4	1.2	1.13	4.64			
	(7)	(5)	19.9	(169.1) 210.1	160		2.0	49.7	59.7	0.55	0.71	0.086	14.50		⊔ 8.1 3.5×2.3	0.9	1.38	15.91			
				To	Kelang River																

N-1



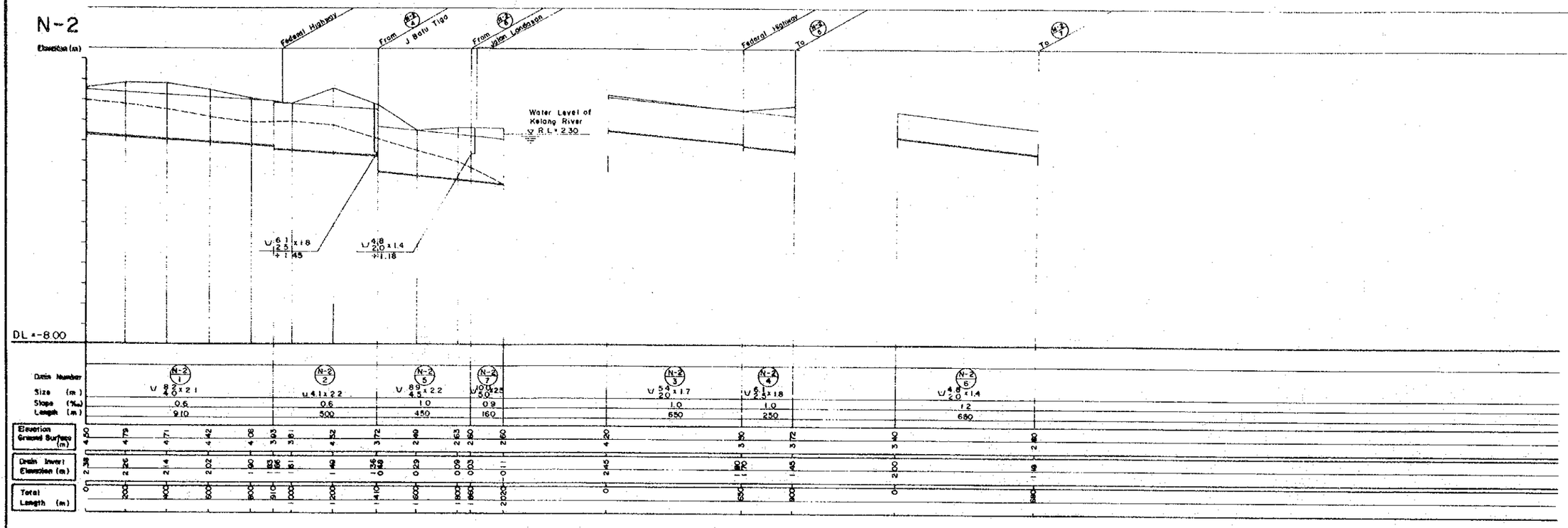


N-1

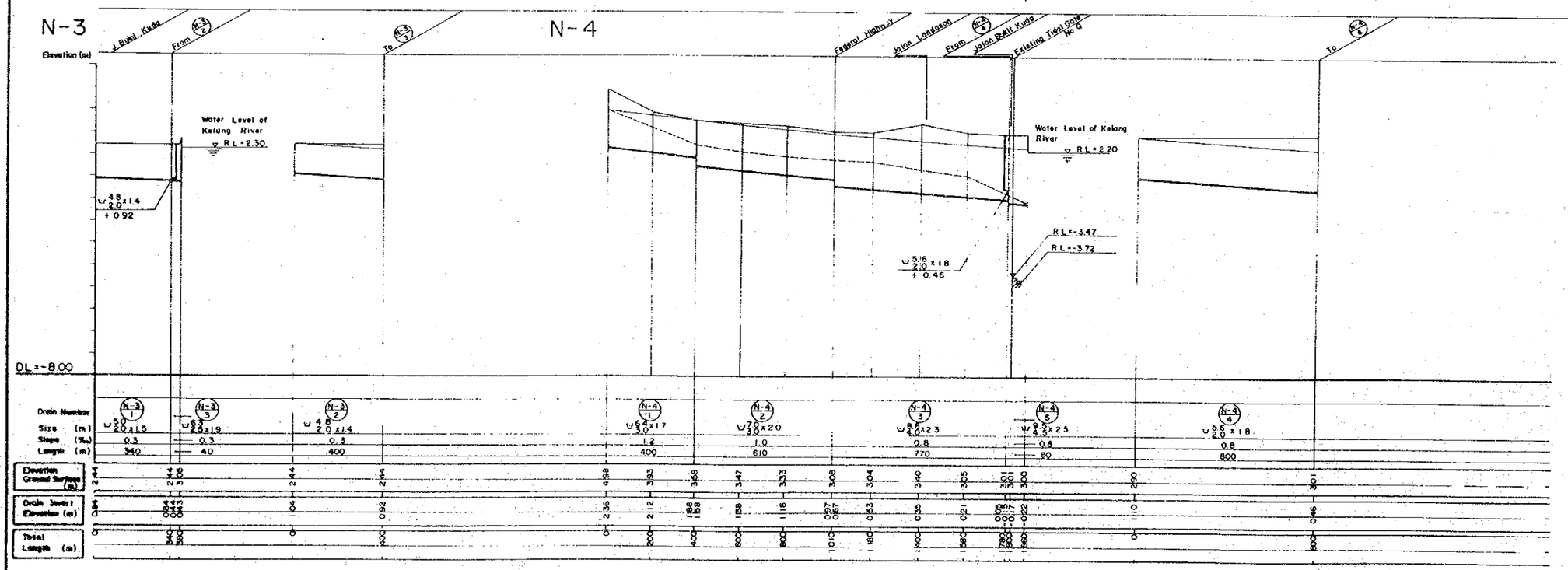
Longitudinal Section of Drains

F 1

N-2



N-3

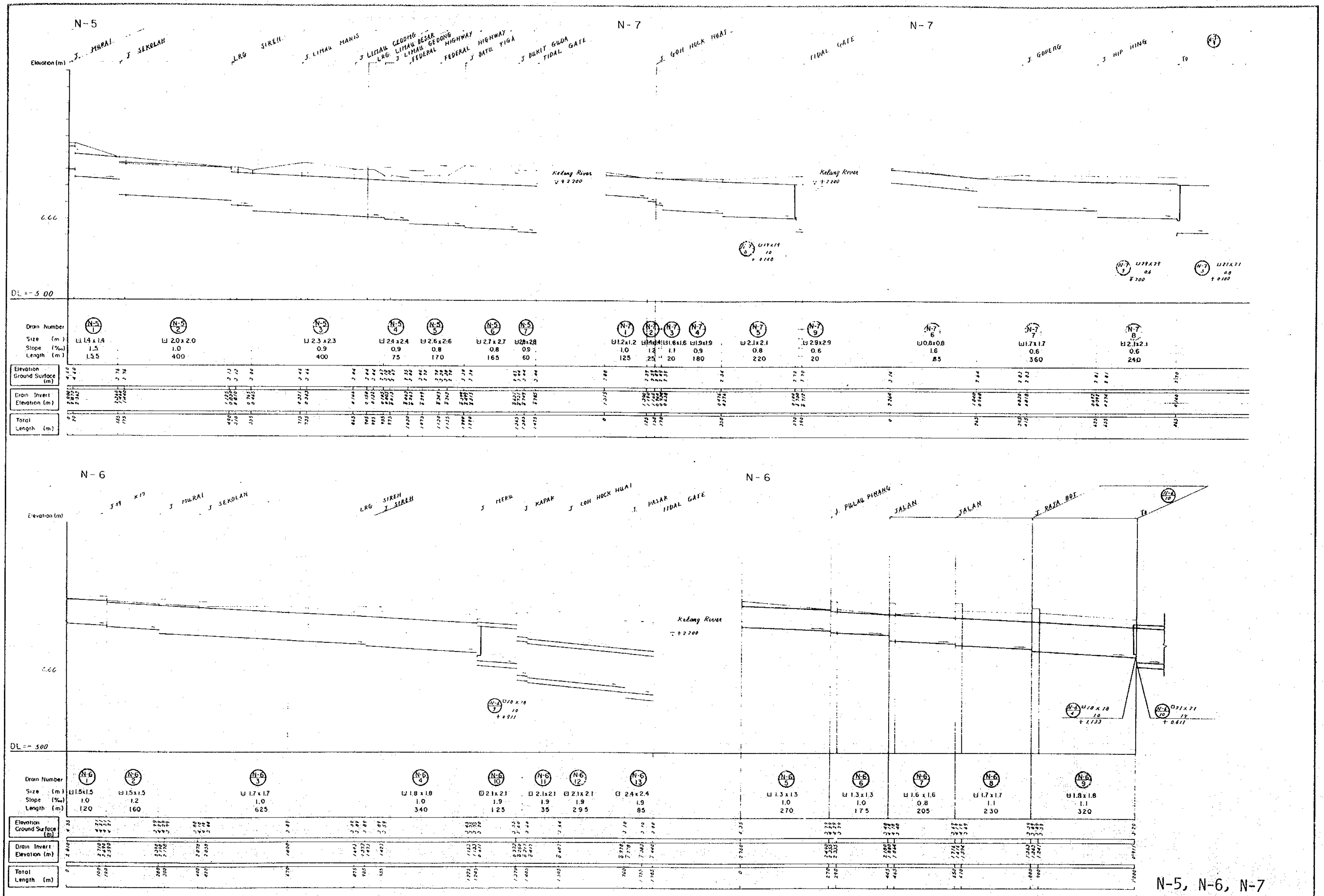


N-4

N-2, N-3, N-4

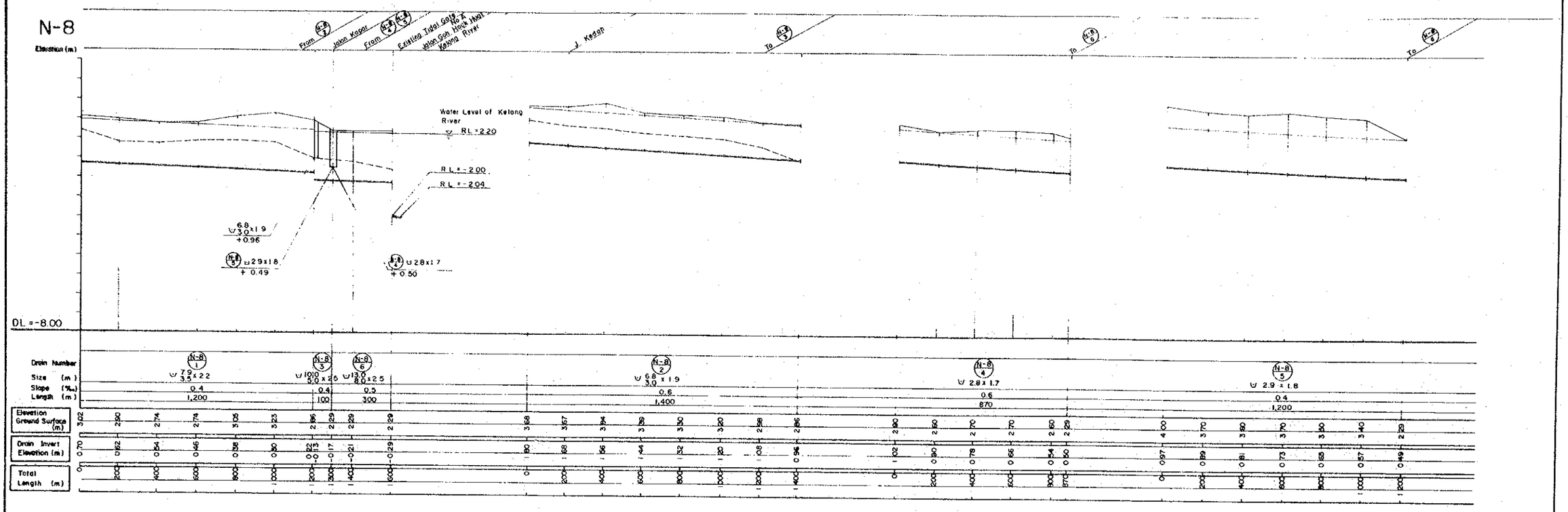
Longitudinal Section of Drains

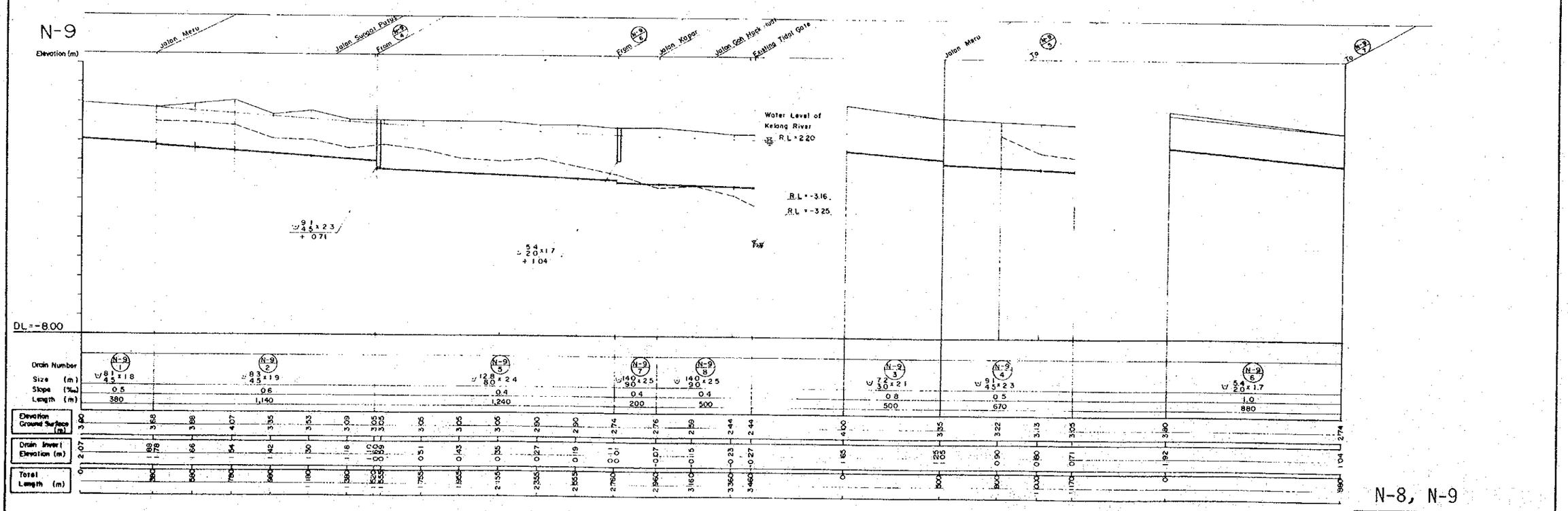
F 2



N-5, N-6, N-7

Longitudinal Section of Drains	F.3



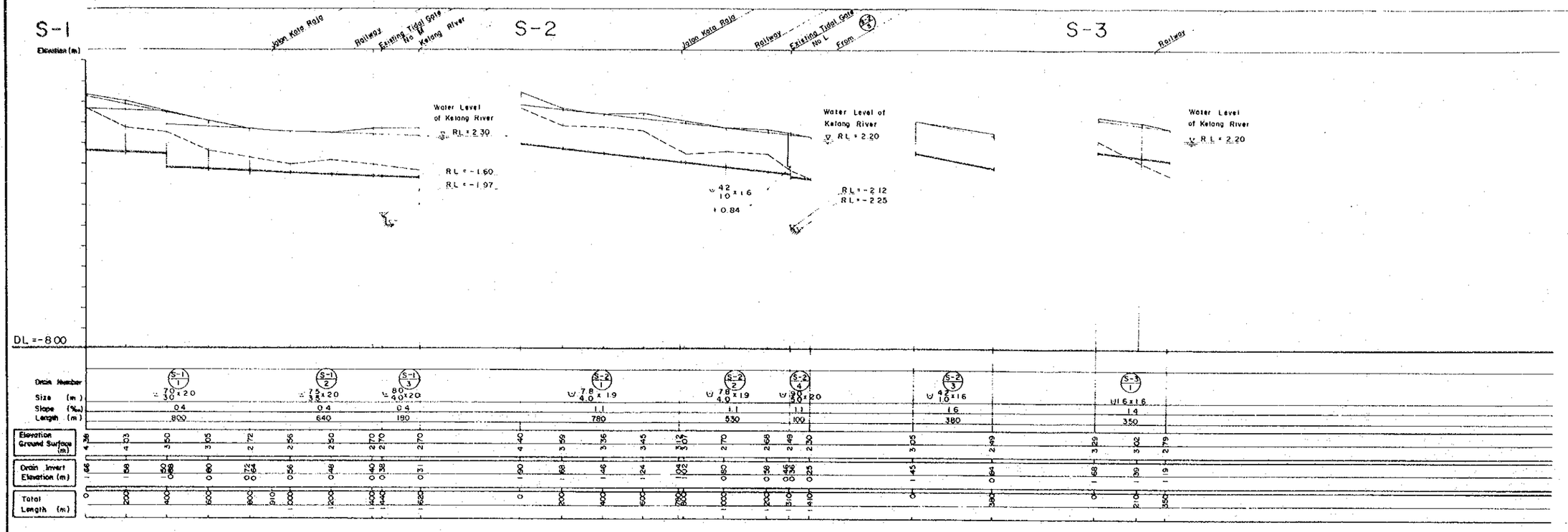


N-8, N-9

Longitudinal Section of Drains

F 4

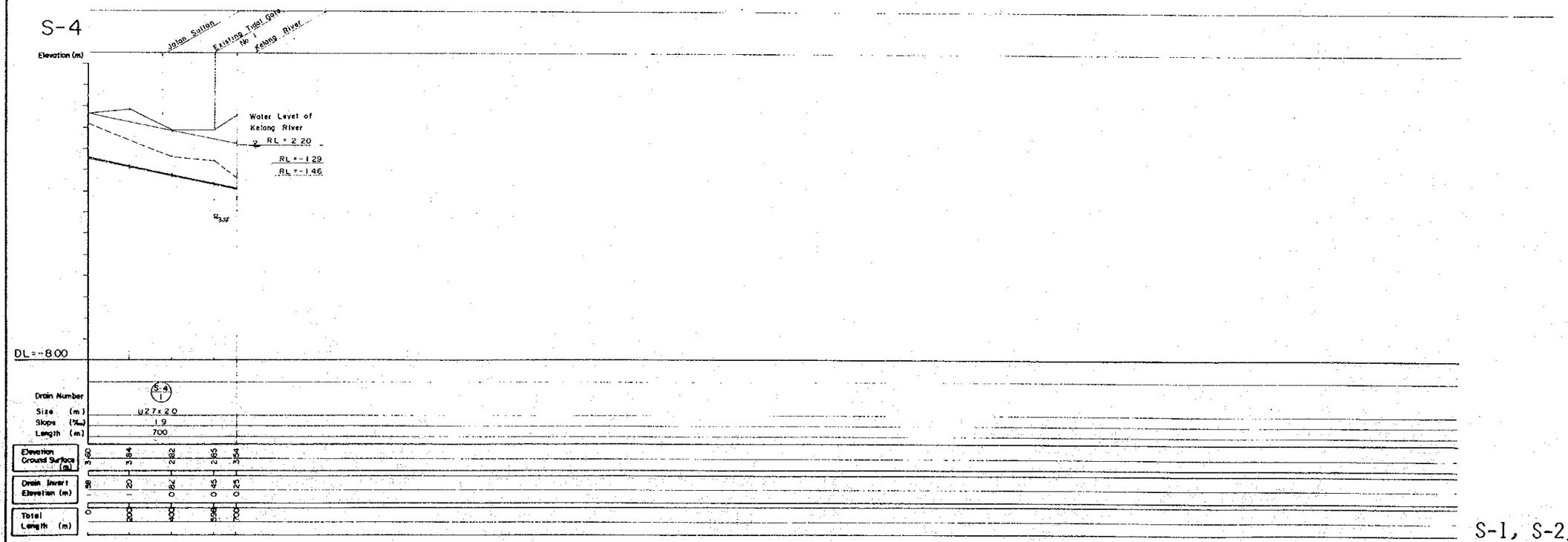
S-1



S-2

S-3

S-4

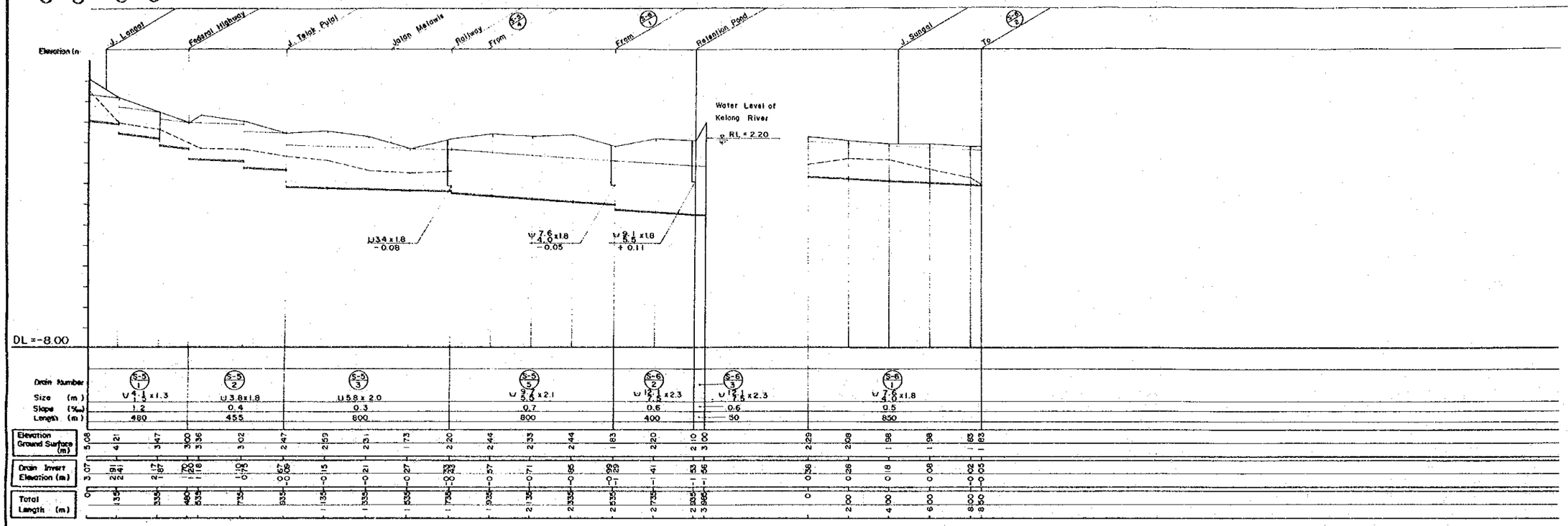


S-1, S-2, S-3, S-4

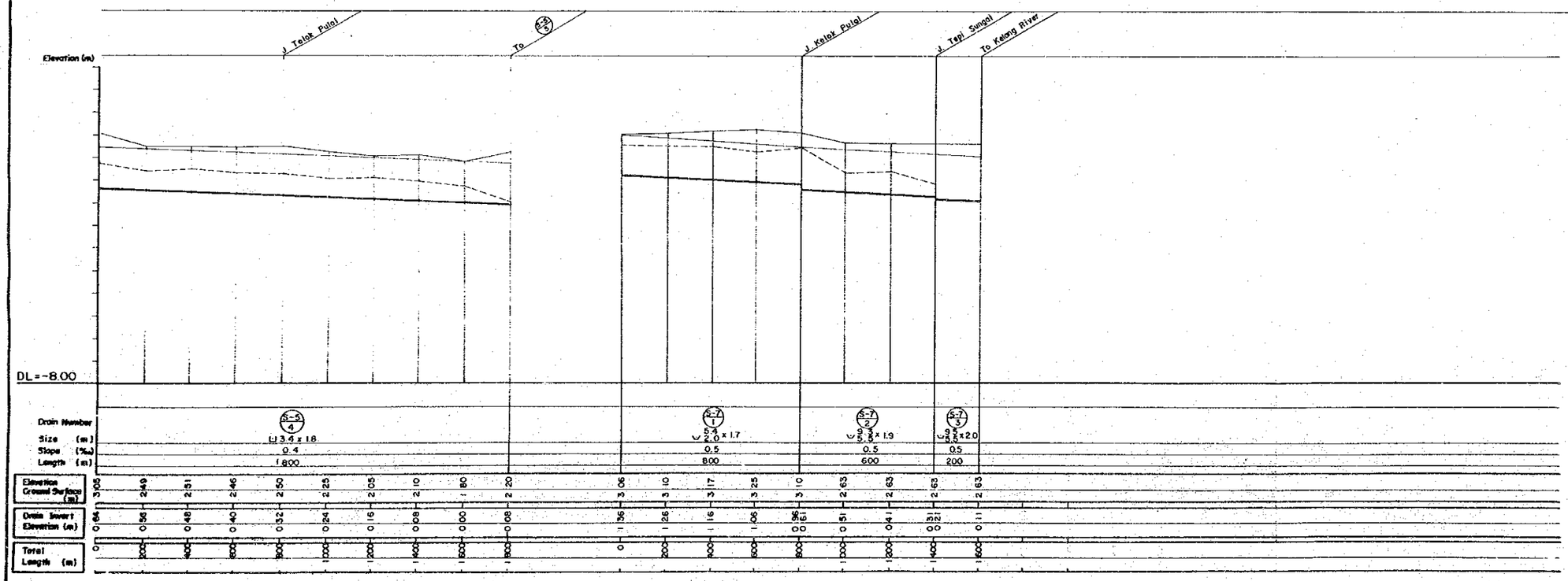
Longitudinal Section of Drains

F 5

S-5 ~ S-6



S-5 ~ S-6 S-7

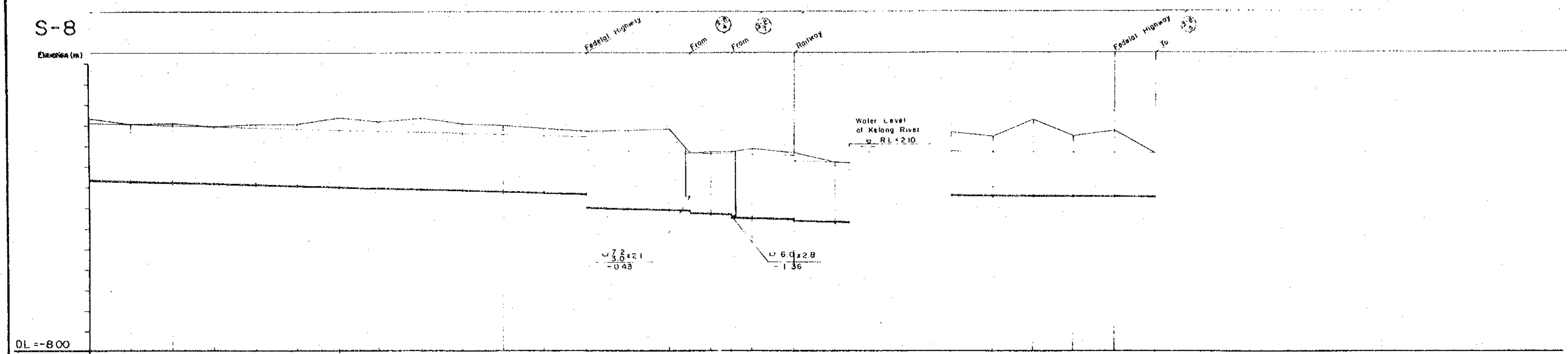


S-5, S-6, S-7

Longitudinal Section of Drains

E 6

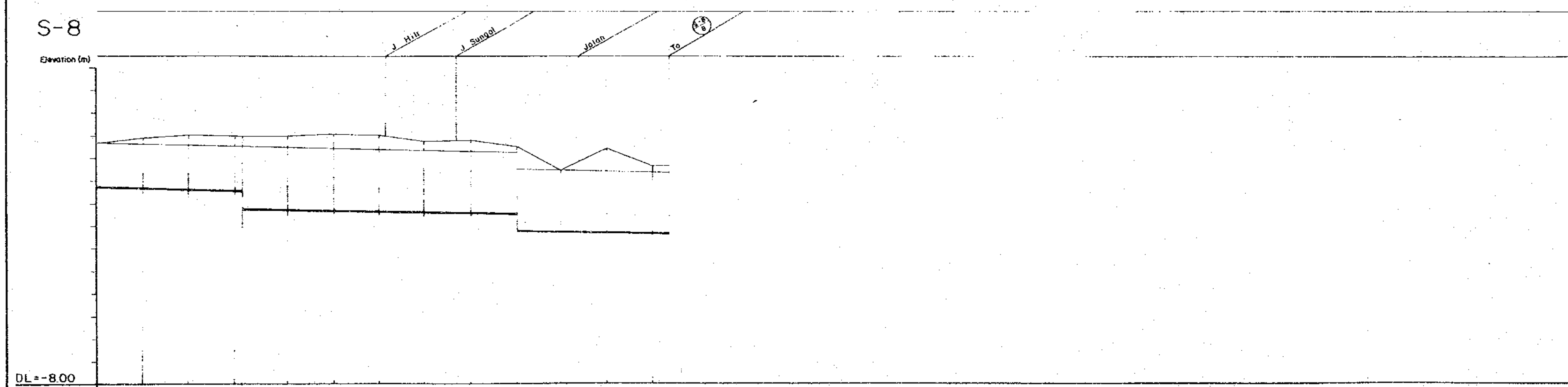
S-8



Drain Number	S-8/1	S-8/2	S-8/3	S-8/5	S-8/8	S-8/9	S-8/4
Size (m)	⊔ 15.6/10.0 x 2.8	⊔ 15.6/10.0 x 2.8	⊔ 15.6/10.0 x 2.8	⊔ 15.8/10.0 x 2.9	⊔ 18.8/13.0 x 2.9	⊔ 18.8/13.0 x 2.9	⊔ 7.2/3.0 x 2.1
Slope (‰)	0.3	0.3	0.3	0.3	0.3	0.3	0.5
Length (m)	1200	1200	500	200	300	267	1000

Total Length (m)	Elevation Ground Surface (m)	Drain Invert Elevation (m)
0	3.40	0.39
200	3.13	0.33
400	3.16	0.27
600	3.01	0.21
800	3.13	0.15
1000	3.04	0.09
1200	3.38	0.03
1400	3.21	-0.03
1600	3.38	-0.09
1800	3.04	-0.15
2000	3.01	-0.21
2200	2.90	-0.27
2400	2.74	-0.33 / -0.98
2600	2.80	-1.04
2800	2.80	-1.10
2900	1.67	-1.13 / -1.23
3000	1.70	-1.26
3100	1.73	-1.29 / -1.46
3200	1.80	-1.49
3400	1.70	-1.55 / -1.64
3600	1.20	-1.70
3667	1.20	-1.72
0	2.70	0.07
200	2.50	-0.03
400	3.30	-0.13
600	2.50	-0.23
800	2.80	-0.33
1000	1.67	-0.43

S-8



Drain Number	S-8/6	S-8/7
Size (m)	⊔ 3.7 x 2.0	⊔ 6.0 x 2.8
Slope (‰)	0.3	0.2
Length (m)	630	1870

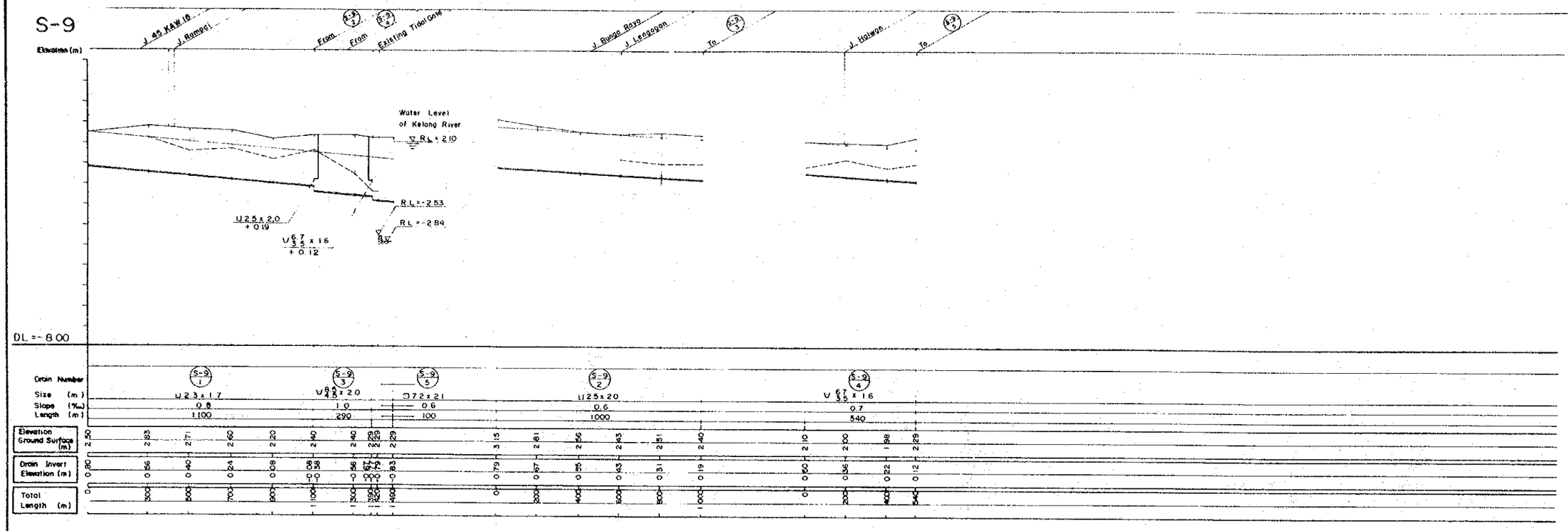
Total Length (m)	Elevation Ground Surface (m)	Drain Invert Elevation (m)
0	2.75	0.75
200	2.98	0.69
400	3.08	0.63
600	3.05	0.57
630	3.05	0.56 / -0.24
830	3.05	-0.28
1030	3.15	-0.32
1230	3.06	-0.36
1430	2.85	-0.40
1630	2.87	-0.44
1830	2.60	-0.48 / -1.23
2030	1.53	-1.27
2230	2.40	-1.31
2430	1.73	-1.35
2500	1.73	-1.36

S-8

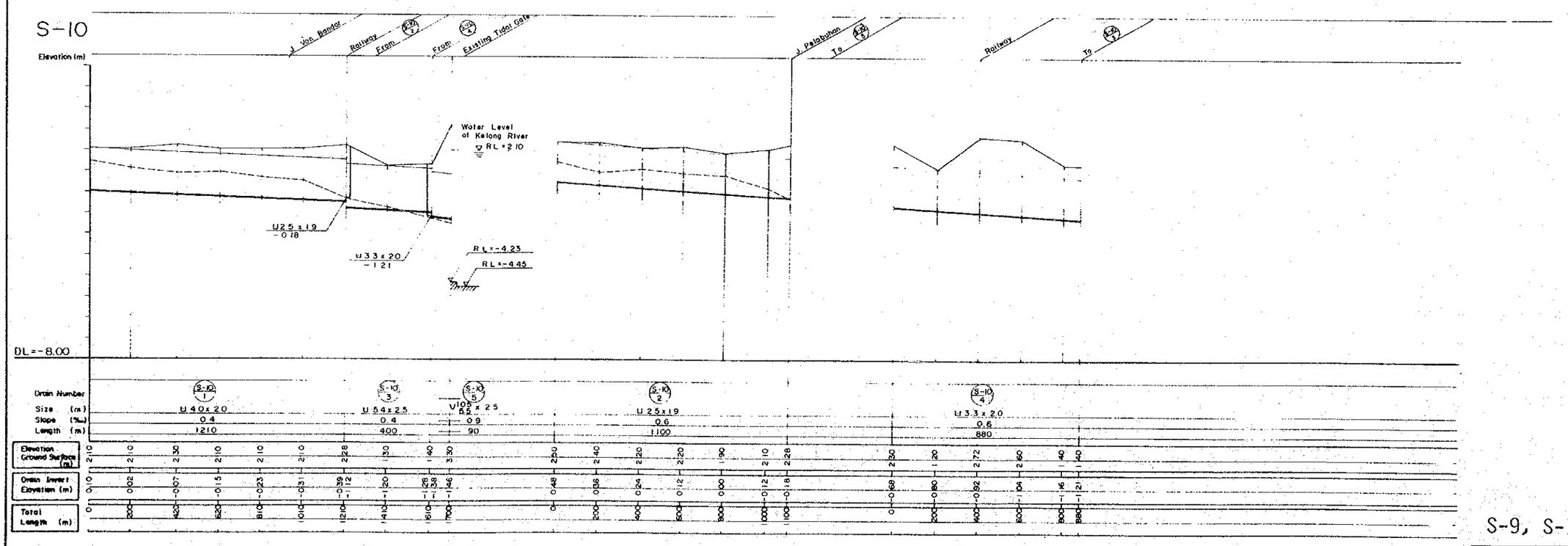
Longitudinal Section of Drains

E 7

S-9



S-10

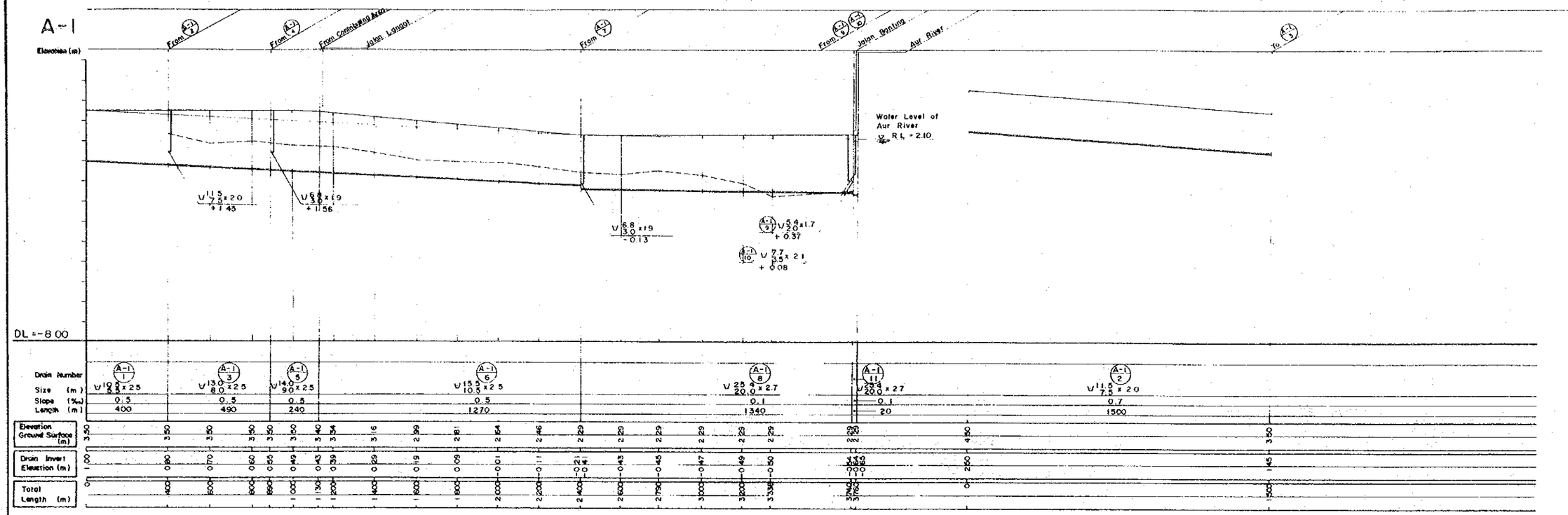


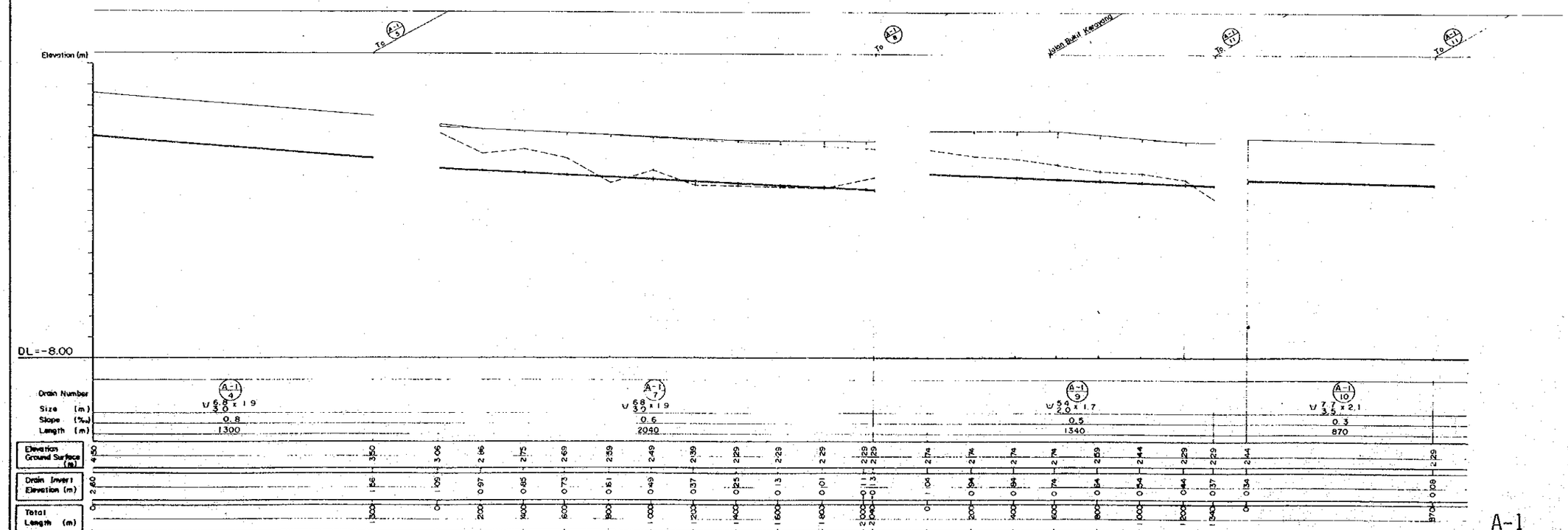
S-9, S-10

Longitudinal Section of Drains

F 8

A-1



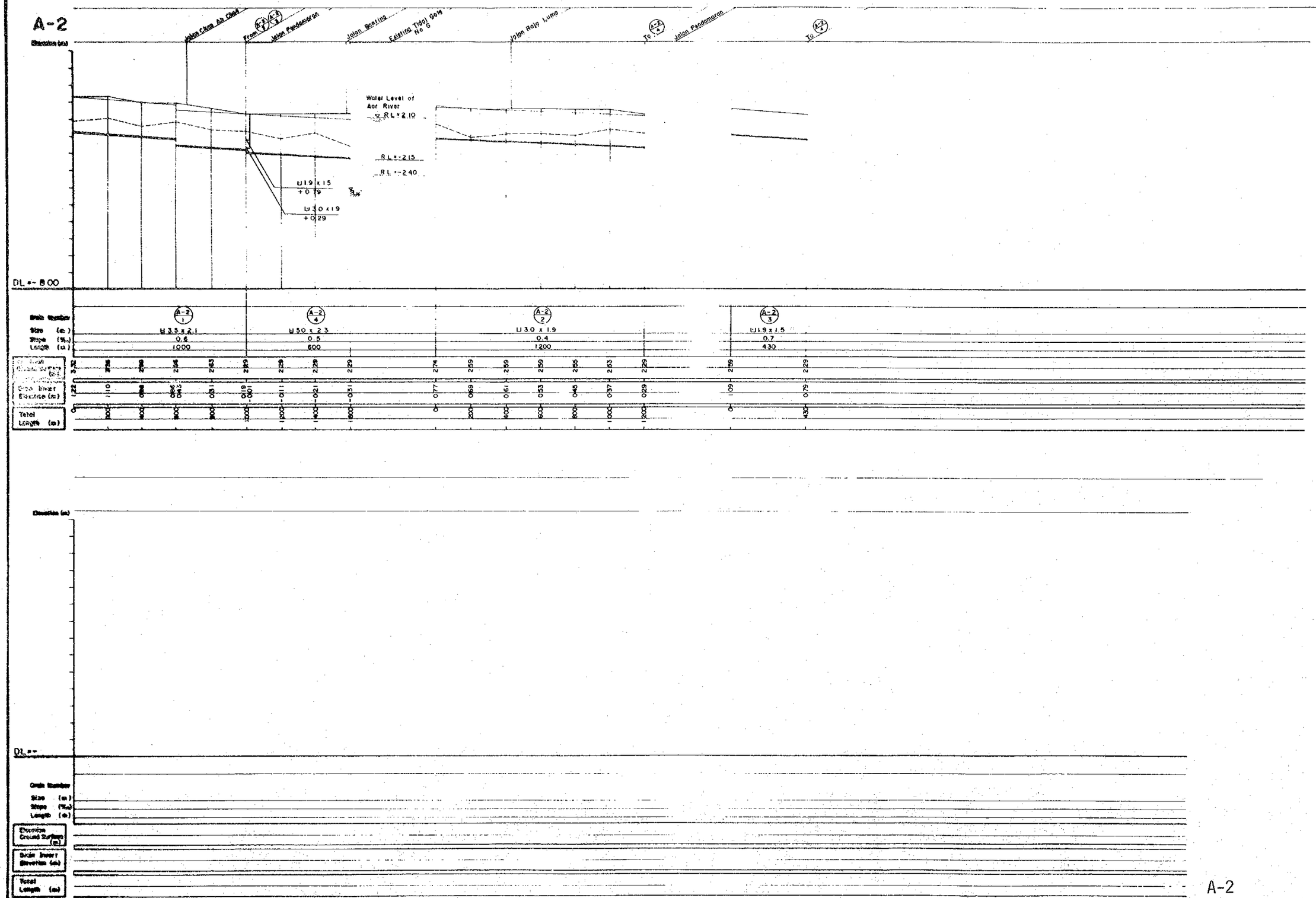


A-1

Longitudinal Section of Drains

E 9

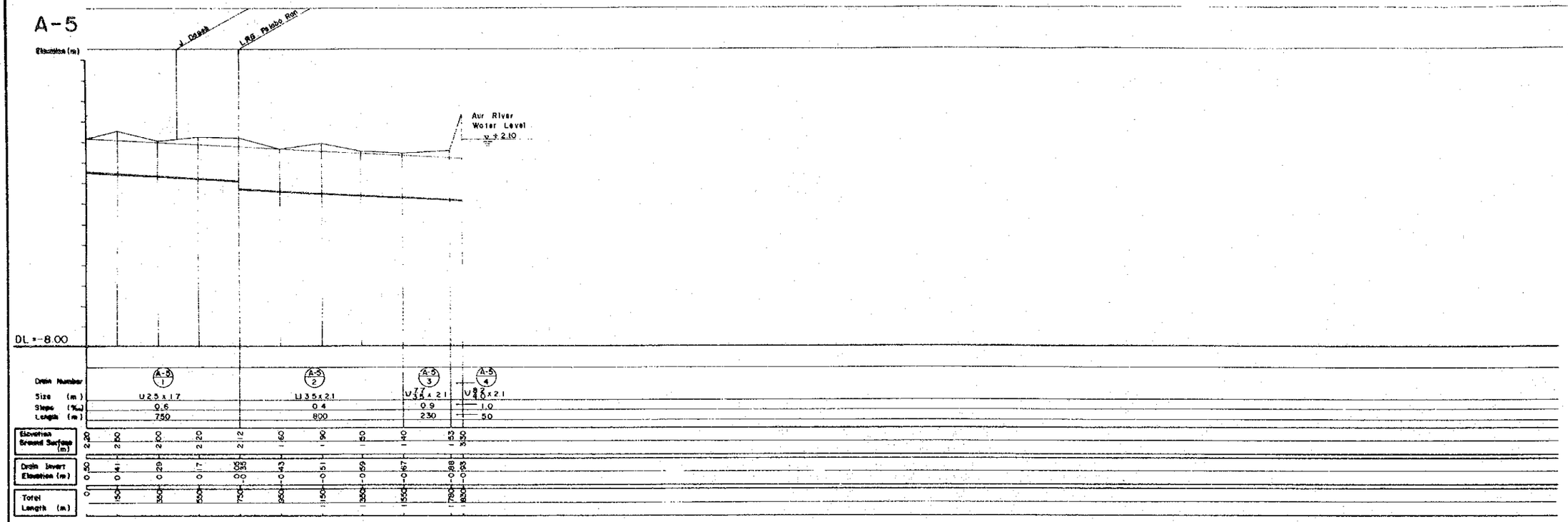
A-2



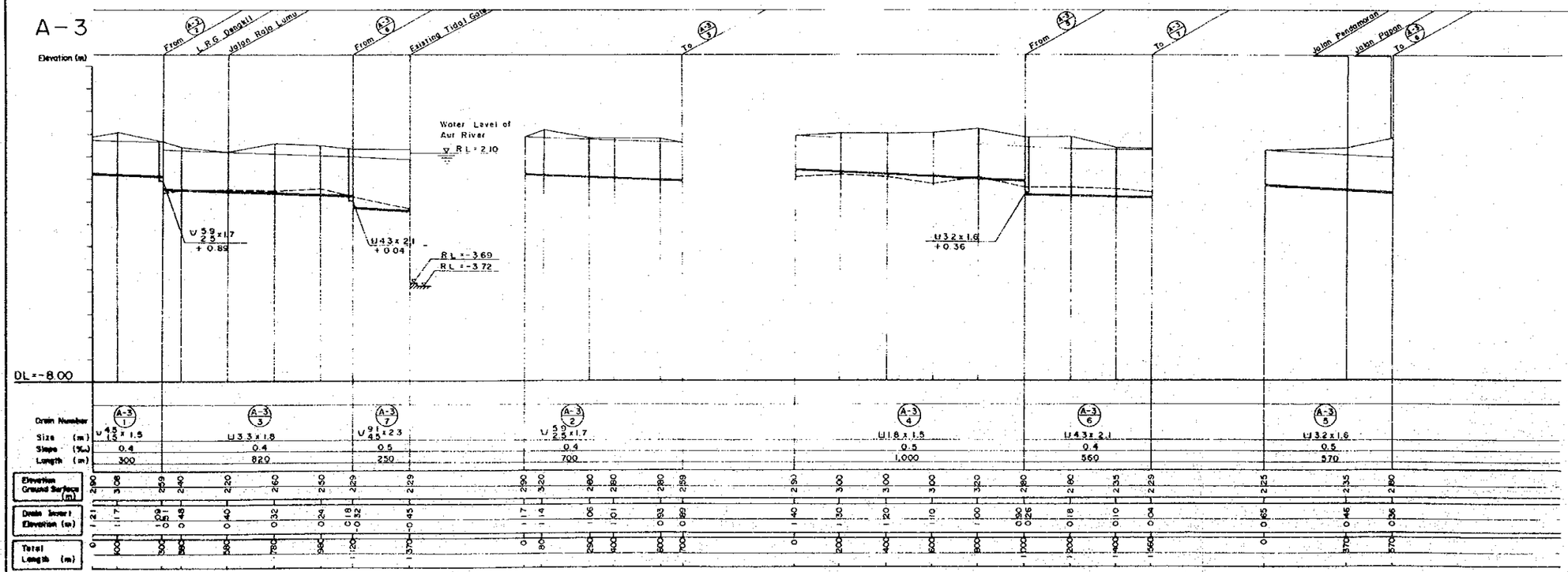
A-2

Longitudinal Section of Drains	F10

A-5



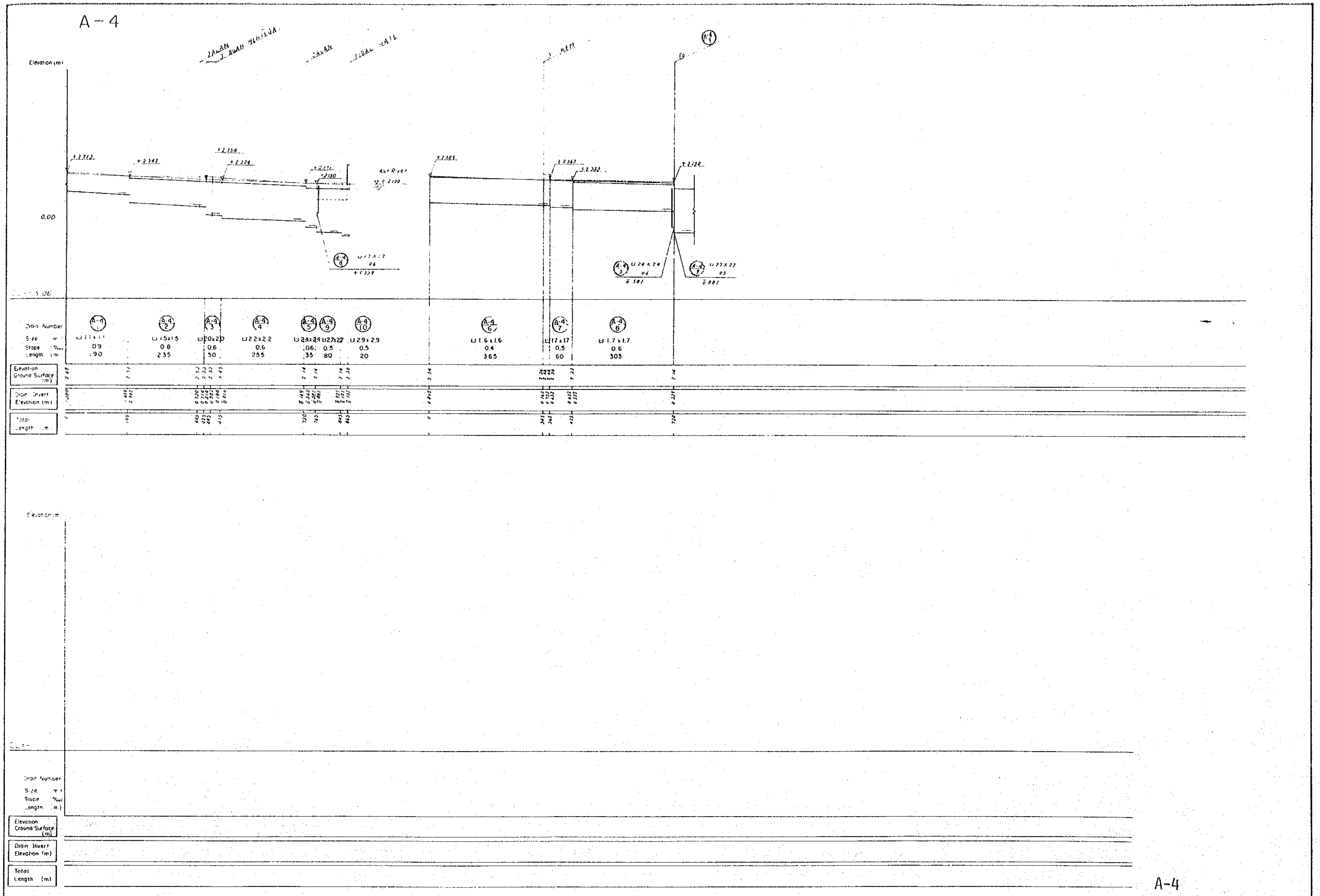
A-3



A-3, A-5

Longitudinal Section of Drains

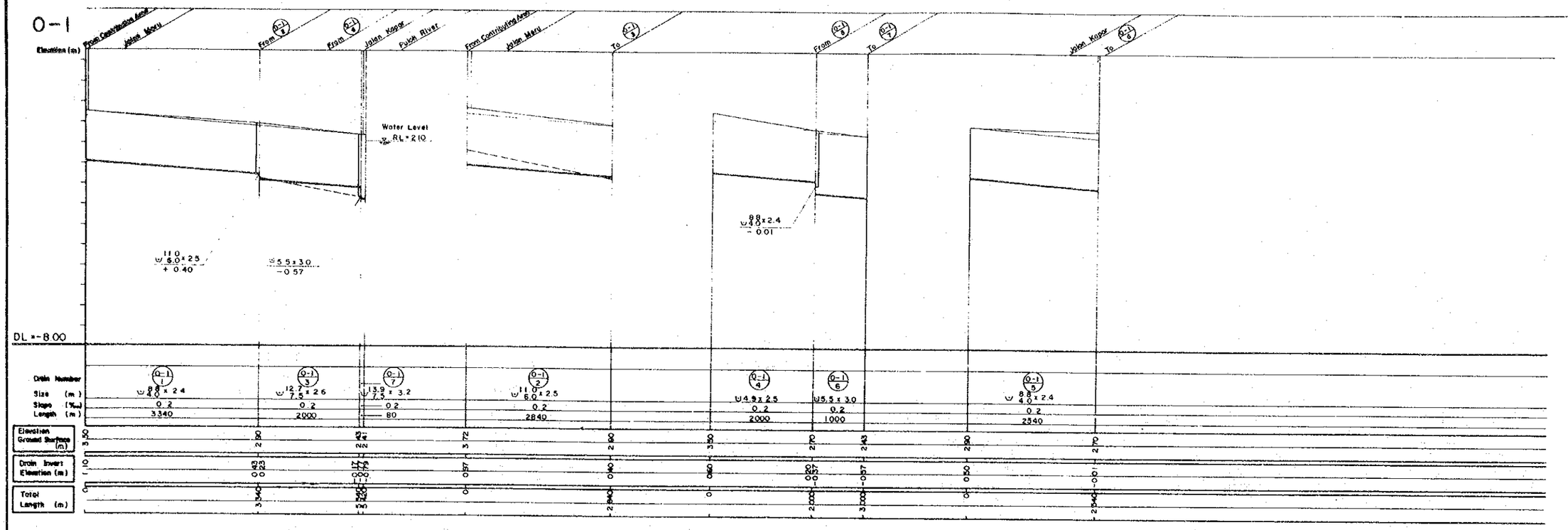
F 11



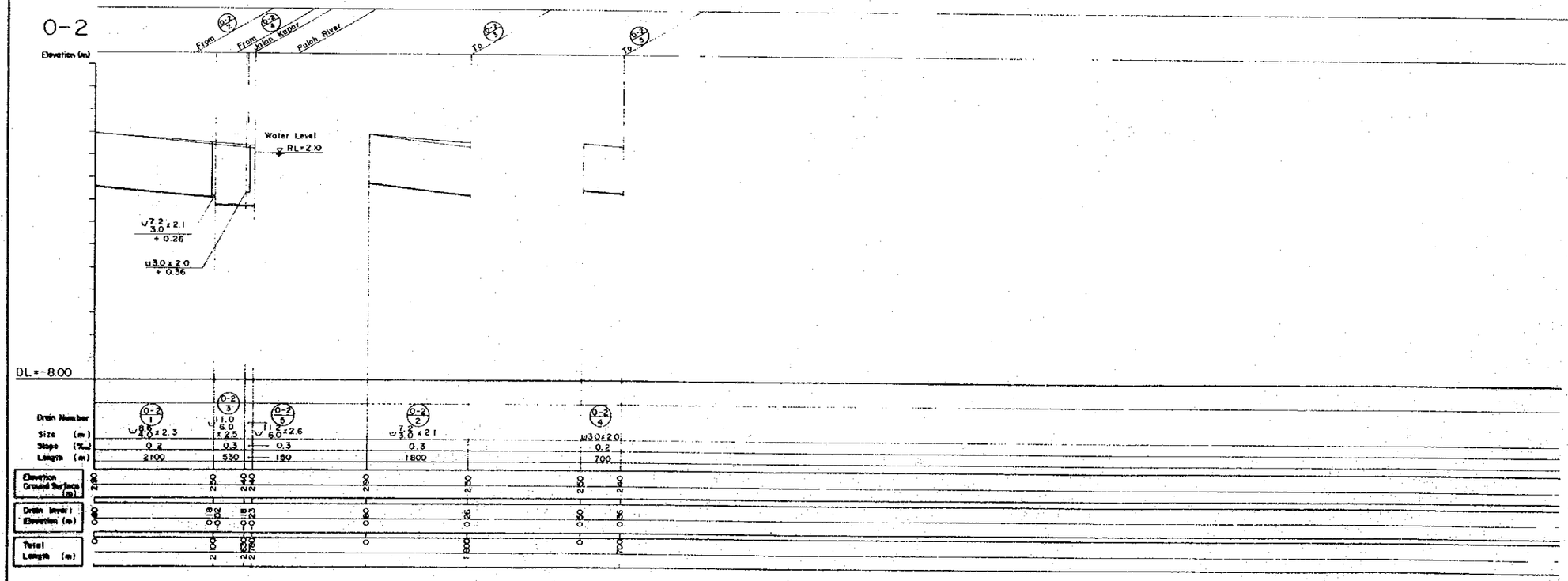
A-4

Longitudinal Section of Drains	F.12

0-1



0-2

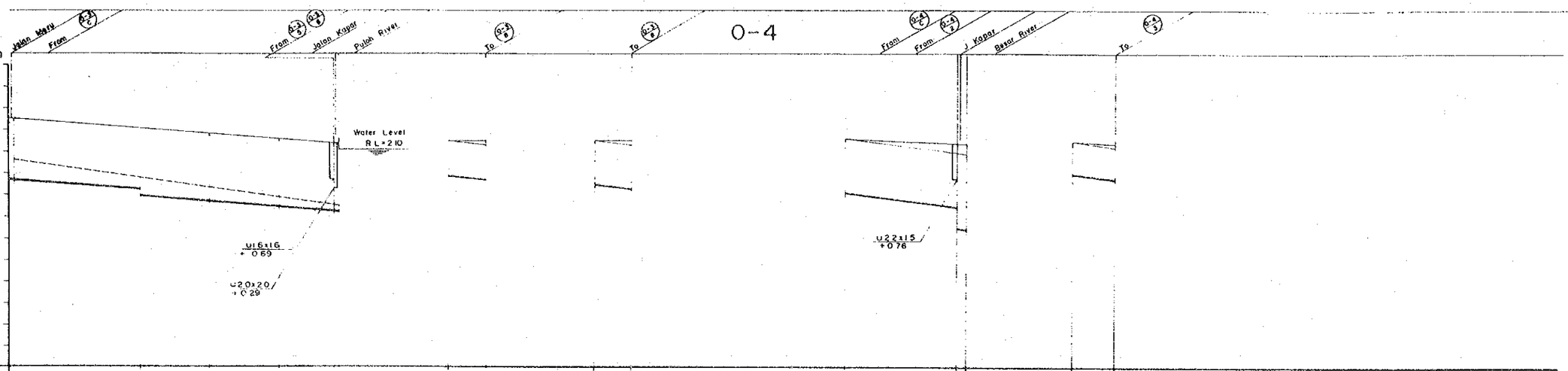


0-1, 0-2

Longitudinal Section of Drains

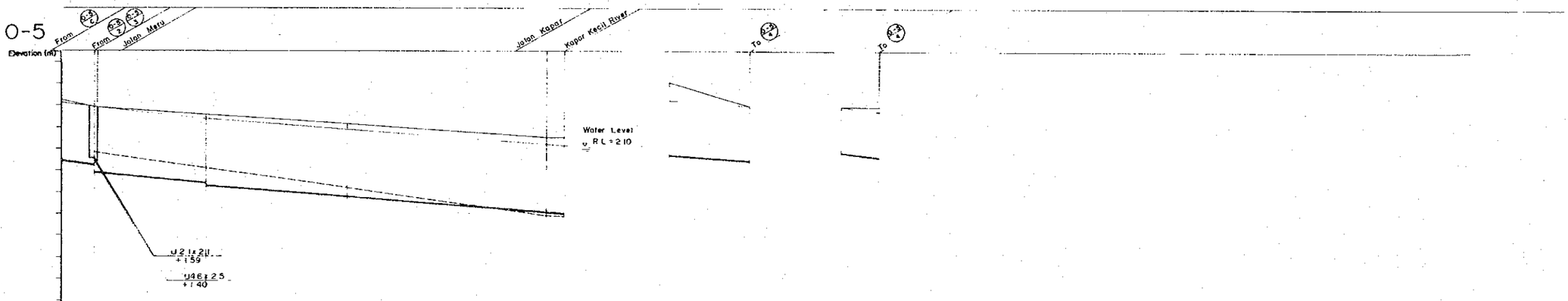
F 13

0-3



Drain Number	(0-3/1)	(0-3/2)	(0-3/3)	(0-3/4)	(0-3/7)	(0-3/5)	(0-3/6)	(0-4/1)	(0-4/3)	(0-4/2)
Size (m)	U 1.15 / 6.0 x 2.8	U 1.22 / 6.0 x 3.1	U 1.22 / 6.5 x 3.1	U 1.22 / 6.5 x 3.1	U 1.22 / 6.5 x 3.1	U16x16	U20x20	U 2.8 x 2.5	U 1.30 / 6.0 x 3.5	U22x15
Slope (‰)	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Length (m)	2380	1250	1300	1000	80	700	700	2100	180	800
Elevation Ground Surface (m)	3.50 / 3.50	3.10	2.90	2.70	2.50 / 2.50	2.50	2.50 / 2.50	2.60	2.40 / 2.40	2.50 / 2.40
Drain Invert Elevation (m)	0.78 / 0.08	0.22 / 0.08	-0.33	-0.69	-0.79 / -0.81	0.90 / 0.69	0.50 / 0.29	0.10	0.30 / 0.30	1.00	0.75
Total Length (m)	0 / 2380	2380 / 3630	3630 / 4930	4930 / 5930 / 6010	0	700	0 / 700	0	2100 / 2280	0	800

0-5



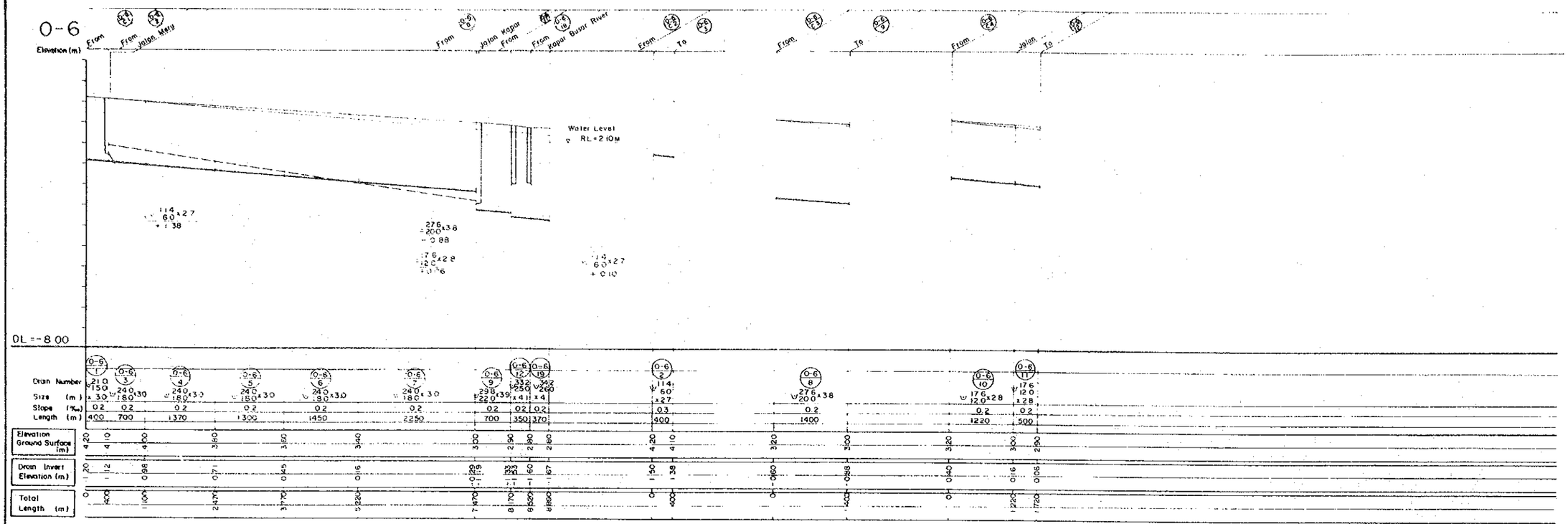
Drain Number	(0-5/1)	(0-5/4)	(0-5/5)	(0-5/6)	(0-5/7)	(0-5/2)	(0-5/3)
Size (m)	U 1.15 / 6.0 x 2.6	U 1.65 / 10.0 x 3.1	U 1.65 / 10.0 x 3.2	U 1.65 / 10.0 x 3.2	U 1.65 / 10.0 x 3.2	U 4.6 x 2.5	U 2.1 x 2.1
Slope (‰)	0.3	0.2	0.2	0.2	0.2	0.2	0.3
Length (m)	620	2060	2560	3660	300	1500	700
Elevation Ground Surface (m)	3.50	3.60	3.10	2.50	2.50	3.00	3.90	3.90	3.80
Drain Invert Elevation (m)	0.88 / -0	0.29 / 0.00	0.22	0.95	1.10	1.70	1.40	1.80	1.59
Total Length (m)	0 / 620	620 / 2680	2680 / 5240	5240 / 8900	8900 / 9200	0	1500	0	700

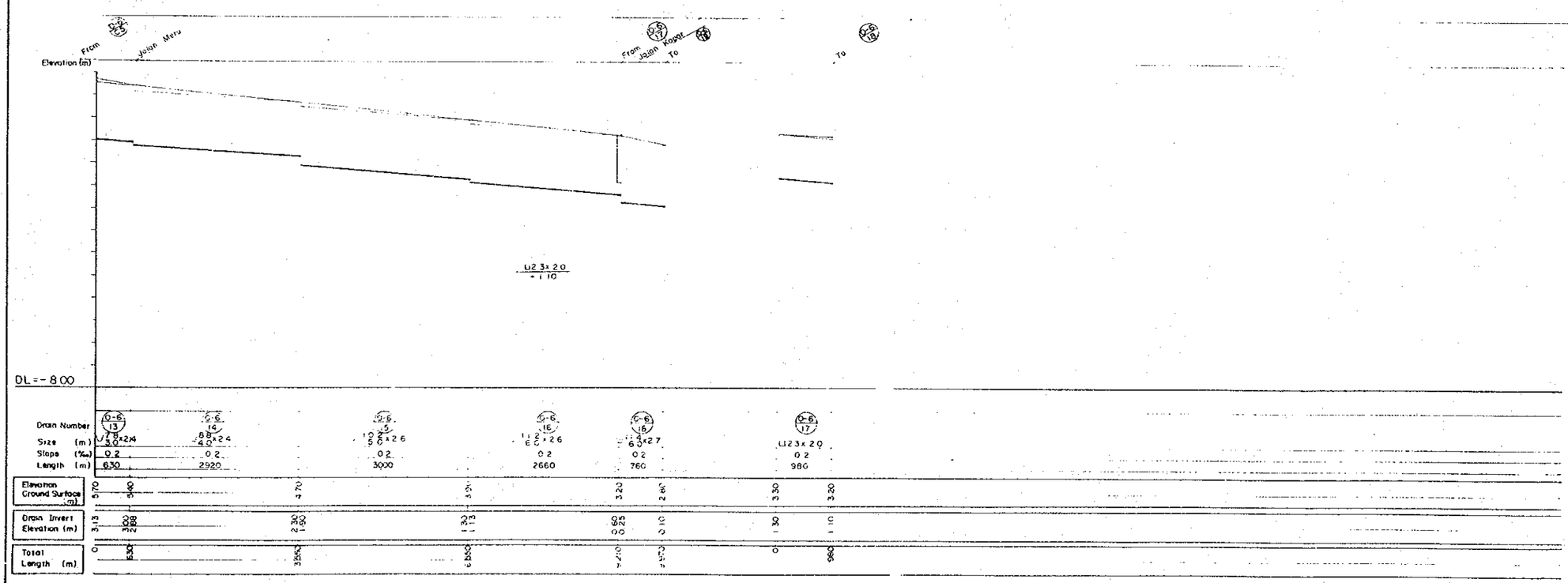
0-3, 0-4, 0-5

Longitudinal Section of Drains

F 14

0-6





0-6

Longitudinal Section of Drains	E15

APPENDIX G

IMPLEMENTATION PRIORITIES

(Ref.: Table 6.1., Vol. VI)

Table G.1. Population Density of Catchments

Catchment Code No.	Area		Served Population		Population Density		Rating Points	
	Served Area (ha)	Contributing Area (ha)	1980 (Person)	2000 (Person)	1980 (Person/ha)	2000 (Person/ha)	1980	2000
N-1	372.7	2,378.3	5,166	22,578	13.9	60.6	0	120
2	210.1	-	9,900	20,270	47.1	96.5	80	160
3	25.5	-	798	3,045	31.3	119.4	40	200
4	162.0	-	11,890	16,047	73.4	99.1	120	160
5	69.5	-	6,959	7,904	100.1	113.7	200	200
6	72.3	-	7,286	7,024	96.6	97.2	160	160
7	48.2	-	2,604	3,252	60.2	67.5	80	120
8	255.0	-	13,559	21,380	53.2	83.8	80	160
9	342.7	39.4	-	14,550	-	42.5	0	80
S-1	65.1	63.5	1,724	2,060	26.5	31.6	40	40
2	169.8	7.7	3,691	3,360	21.7	19.8	40	0
3	11.8	-	863	1,056	73.1	89.5	120	160
4	53.9	-	2,898	2,016	53.8	37.4	80	40
5	156.1	-	6,035	13,441	38.7	98.9	40	160
6	96.7	-	1,620	5,140	16.8	63.5	0	120
7	110.8	-	4,941	10,212	44.6	92.2	80	160
8	539.2	-	22,574	56,732	41.9	99.7	80	160

(to be Cont'd)

Table G.1. (Cont.)

Catchment Code No.	Area		Served Population		Population Density		Rating Points	
	Served Area (ha)	Contributing Area (ha)	1980 (Person)	2000 (Person)	1980 (Person/ha)	2000 (Person/ha)	1980	2000
S-9	120.5	-	9,250	14,326	76.8	118.9	120	200
10	144.6	-	14,084	9,702	97.4	67.1	160	120
11	295.5	-	4,096	-	13.9	-	0	-
A-1	761.7	1,591.6	19,891	65,582	26.1	86.1	40	160
2	133.6	-	8,195	8,465	61.3	63.4	120	120
3	106.9	-	10,764	12,015	100.7	112.4	200	200
4	52.5	-	7,488	5,405	142.6	103.0	200	200
5	100.9	-	2,704	2,970	26.8	29.4	40	40
6	310.4	-	2,964	4,905	9.5	15.8	0	0
O-1	366.9	870.1	-	7,602	-	20.7	0	40
2	96.7	164.0	-	696	-	7.2	0	0
3	208.6	1,008.3	-	792	-	3.8	0	0
4	77.8	597.4	-	1,428	-	18.4	0	0
5	303.3	1,751.1	-	1,062	-	3.5	0	0
6	786.7	8,151.6	23,629	23,852	30.0	30.3	40	40
Total	6,628.0	16,623.0	202,813*	370,856**	30.6	56.0		

Notes: * Excluding 2,817 persons
** Excluding inhabitants of North Port area

Table G.2. Ratio of Flooded Area

Catchment Code. No.	Flooded Area (ha)	Ratio of Flooded Area to Catchment Area (%)	Rating Points	Catchment Code No.	Flooded Area (ha)	Ratio of Flooded Area to Catchment Area (%)	Rating Points
N-1	0	0	0	S-11	0	0	0
2	13.9	7	0	A- 1	25.2	3	0
3	3.7	15	0	2	26.2	20	50
4	15.9	10	0	3	17.7	17	0
5	18.2	26	50	4	14.6	28	50
6	29.1	40	100	5	72.3	72	150
7	30.7	64	150	6	0	1	0
8	31.1	12	0	O- 1	0	0	0
9	24.3	7	0	2	0	0	0
S-1	0	0	0	3	0	0	0
2	27.2	16	0	4	0	0	0
3	2.5	21	50	5	0	0	0
4	7.5	14	0	6	0	0	0
5	145.1	93	200				
6	96.7	100	200				
7	89.2	81	200				
8	127.4	24	50				
9	30.9	26	50				
10	24.9	17	0				

Table G.3. Ratio of Estimated Stormwater Runoff to Existing Drain Capacity

Catchment Code No.	Ratio of Estimated Stormwater Runoff to Existing Drain Capacity	Rating Points	Catchment Code No.	Ratio of Estimated Stormwater Runoff to Existing Drain Capacity	Rating Points
N-1	25.0	200	S-9	4.8	40
2	6.5	80	10	7.2	80
3	-	200	11	-	200
4	2.4	40	A-1	24.7	200
5	1.0	40	2	11.3	120
6	3.8	40	3	7.9	80
7	3.8	40	4	20.3	200
8	13.2	120	5	1.3	40
9	15.9	160	6	-	200
S-1	3.8	40	O-1	1.4	40
2	8.2	80	2	-	40
3	1.9	40	3	2.3	40
4	6.3	80	4	1.0	0
5	6.6	80	5	3.1	40
6	14.5	120	6	2.4	40
7	19.5	160			
8	36.7	200			

Table G.4. Ratio of Commercial & Industrial Land

Drainage Catchment Code No.	Ratio of Commercial & Industrial Use Areas to Catchment Area * (%)	Rating Points	Drainage Catchment Code No.	Ratio of Commercial & Industrial Use Areas to Catchment Area * (%)	Rating Points
N-1	22.5	25	S-9	14.9	0
2	1.6	0	10	66.9	75
3	2.0	0	11	97.8	100
4	14.4	0	A-1	1.2	0
5	31.4	25	2	30.5	25
6	63.8	75	3	25.1	25
7	86.3	100	4	65.7	75
8	21.3	25	5	80.4	100
9	24.9	25	6	64.7	75
S-1	-	0	O-1	31.1	25
2	10.1	0	2	56.4	50
3	74.6	75	3	13.2	0
4	65.7	75	4	-	0
5	8.0	0	5	50.7	50
6	7.3	0	6	5.3	0
7	1.4	0			
8	10.3	0			

Note: * Excluding contributing area

APPENDIX H

COST ESTIMATION

(Ref.: Section 5.3.4., Vol. VI)

N-1 Catchment

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	400	R	29.5 / 23.5 x 3.0	664	3,131	
2	220	R	5.0 / 2.0 x 1.5	180	585	
3	270	R	29.5 / 23.5 x 3.0	448	2,360	
4	2,360	R	8.8 / 4.0 x 2.4	2,572	-	
5	1,240	R	9.3 / 4.5 x 2.4	1,364	-	
6	300	R	11.2 / 6.0 x 2.6	356	88	
7	170	R	11.2 / 6.0 x 2.6	201	633	
	50	B	4-2.8 x 2.6	426	-	
8	363	R	30.4 / 24.0 x 3.2	635	1,647	
	7	Br	30.4	638	-	
9	746	R	30.4 / 24.0 x 3.2	1,306	152	
	14	Br	2-30.4	1,276	-	
Sub Total	6,140 m			10,066		
b. Tidal Gate				665		
c. Retention Pond				-		
d. Bund				-		
Total				10,731		
B. Land Acquisition Cost				-	8,596	
C. Engineering Fee				1,610		
D. Contingency Cost				2,468		
GRAND TOTAL				23,405		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Box Culvert
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)		Width x Height (m)	Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	910	R	$\frac{8.2}{4.0}$ x 2.1	919	1,492	
2	450	C	4.1 x 2.2	878	-	
	50	B	2-2.05 x 2.2	140	-	
3	650	R	$\frac{5.4}{2.0}$ x 1.7	569	962	
4	200	R	$\frac{6.1}{2.5}$ x 1.8	182	226	
	50	B	2-3.05 x 1.8	153	-	
5	430	R	$\frac{8.9}{4.5}$ x 2.2	449	50	
	20	B	3-3.00 x 2.2	129	-	
6	680	R	$\frac{4.8}{2.0}$ x 1.4	541	69	
7	140	R	$\frac{10.0}{5.0}$ x 2.5	160	36	
	20	B	4-2.5 x 2.5	155	-	
Sub Total	3,600 m			4,275		
b. Tidal Gate				210		
c. Retention Pond				-		
d. Bund				-		
Total				4,485		
B. Land Acquisition Cost				-	2,835	
C. Engineering Fee				673		
D. Contingency Cost				1,032		
GRAND TOTAL				9,025		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Box Culvert
C : Railway Crossing

A. Construction Cost

a. Trunk Drain

Line No.*	Length (m)	Width x Height (m)	Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	320	R $\frac{5.0}{2.0}$ x 1.5	262	35	
	20	B 2-2.5 x 1.5	51	-	
2	400	R $\frac{4.8}{2.0}$ x 1.4	318	41	
3	40	R $\frac{6.3}{2.5}$ x 1.9	37	-	
Sub Total	780 m		668		
b. Tidal Gate			140		
c. Retention Pond			-		
d. Bund			112		
Total			920		
B. Land Acquisition Cost			-	76	
C. Engineering Fee			138		
D. Contingency Cost			212		
GRAND TOTAL			1,346		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	400	R	6.4 / 3.0 x 1.7	354	370	
2	610	R	7.0 / 3.0 x 2.0	592	-	
3	700	R	8.6 / 4.0 x 2.3	746	25	
	70	B	3-2.9 x 2.3	455	-	
4	800	R	5.6 / 2.0 x 1.8	720	101	
5	60	R	9.5 / 4.5 x 2.5	678	15	
	20	B	3-3.2 x 2.5	150	-	

Sub Total 2,660 m	3,695	
b. Tidal Gate	200	
c. Retention Pond	-	
d. Bund	117	
Total	4,012	
B. Land Acquisition Cost	-	511
C. Engineering Fee	602	
D. Contingency Cost	923	
GRAND TOTAL	6,048	

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	135	C	1.4 x 1.4	99	-	
	20	B	1.4 x 1.4	24	-	
2	360	C	2.0 x 2.0	421	-	
	40	B	2.0 x 2.0	74	-	
3	320	C	2.3 x 2.3	448	-	
	80	B	2.3 x 2.3	174	-	
4	55	C	2.4 x 2.4	81	-	
	20	B	2.4 x 2.4	45	-	
5	100	C	2.6 x 2.6	165	-	
	70	B	2.6 x 2.6	172	-	
6	145	C	2.7 x 2.7	251	-	
	20	B	2.7 x 2.7	51	-	
7	40	C	2.8 x 2.8	72	-	
	20	B	2.8 x 2.8	53	-	
Sub Total	1,425 m			2,130		
b. Tidal Gate				155		
c. Retention Pond				-	-	
d. Bund				8		
Total				2,293		
B. Land Acquisition Cost				-	-	
C. Engineering Fee				344		
D. Contingency Cost				527		
GRAND TOTAL				3,164		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)		Width x Height (m)	(m)	Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	100	C	1.5	x 1.5	80	-	
	20	B	1.5	x 1.5	26	-	
2	160	C	1.5	x 1.5	128	-	
3	555	C	1.7	x 1.7	527	-	
	70	B	1.7	x 1.7	105	-	
4	270	C	1.8	x 1.8	278	-	
	70	B	1.8	x 1.8	116	-	
5	270	C	1.3	x 1.3	176	-	
6	155	C	1.3	x 1.3	101	-	
	20	B	1.3	x 1.3	21	-	
7	185	C	1.6	x 1.6	161	-	
	20	B	1.6	x 1.6	28	-	
8	210	C	1.7	x 1.7	200	-	
	20	B	1.7	x 1.7	30	-	
9	300	C	1.8	x 1.8	309	-	
	20	B	1.8	x 1.8	33	-	
10	125	B	2.1	x 2.1	244	-	Depth of Box Culvert >1.5m
11	35	B	2.1	x 2.1	82	-	"
12	295	B	2.1	x 2.1	693	-	"
13	85	B	2.4	x 2.4	225	-	"
Sub Total	2,985 m				3,563		
b. Tidal Gate					155		
c. Retention Pond					-		
d. Bund					24		
Total					3,742		
B. Land Acquisition Cost					-	-	
C. Engineering Fee					561		
D. Contingency Cost					861		
GRAND TOTAL					5,164		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)		Width x Height (m) (m)	Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	125	C	1.2 x 1.2	75	-	
2	25	C	1.4 x 1.4	18	-	
3	20	B	1.6 x 1.6	28	-	
4	180	C	1.9 x 1.9	198	-	
5	220	C	2.1 x 2.1	275	-	
6	265	C	0.8 x 0.8	80	-	
7	340	C	1.7 x 1.7	323	-	
	20	B	1.7 x 1.7	30	-	
8	210	C	2.1 x 2.1	263	115	
	30	B	2.1 x 2.1	59	-	
9	20	C	2.9 x 2.9	37	-	
Sub Total	1,455 m			1,386		
b. Tidal Gate				155		
c. Retention Pond				-		
d. Bund				50		
Total				1,591		
B. Land Acquisition Cost				-	115	
C. Engineering Fee				239		
D. Contingency Cost				366		
GRAND TOTAL				2,311		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)	Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	1,200	R $\frac{7.9}{3.5}$ x 2.2	1,236	130	
2	1,380	R $\frac{6.8}{3.0}$ x 1.9	1,297	248	
	20	B 3-2.3 x 1.9	65	-	
3	80	R $\frac{10.0}{5.0}$ x 2.5	91	21	
	20	B 3-3.35 x 2.5	155	-	
4	870	C 2.8 x 1.7	1,131	-	
5	1,200	C 2.9 x 1.8	1,656	-	
6	293	R $\frac{13.0}{8.0}$ x 2.5	349	40	
	7	Br 13.0	273	-	
Sub Total	5,070 m		6,253		
b. Tidal Gate			260		
c. Retention Pond			-		
d. Bund			71		
Total			6,584		
B. Land Acquisition Cost			-	439	
C. Engineering Fee			988		
D. Contingency Cost			1,514		
GRAND TOTAL			9,525		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
B : Box Culvert
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)	Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	380	R $\frac{8.1}{4.5}$ x 1.8	353	76	
2	1,100	R $\frac{8.3}{4.5}$ x 1.9	1,056	-	
	40	B 3-2.8 x 1.9	203	-	
3	500	R $\frac{7.2}{3.0}$ x 2.1	498	87	
4	650	R $\frac{9.1}{4.5}$ x 2.3	696	103	
	20	B 3-3.05 x 2.3	135	-	
5	1,240	R $\frac{12.8}{8.0}$ x 2.4	1,438	283	
6	880	R $\frac{5.4}{2.0}$ x 1.7	770	106	
7	200	R $\frac{14.0}{9.0}$ x 2.5	241	67	
8	486	R $\frac{14.0}{9.0}$ x 2.5	586	322	
	14	Br 14.0	588	-	
Sub Total	5,510 m		6,564		
b. Tidal Gate			275		
c. Retention Pond			-		
d. Bund			-		
Total			6,839		
B. Land Acquisition Cost			-	1,044	
C. Engineering Fee			1,026		
D. Contingency Cost			1,573		
GRAND TOTAL			10,482		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Box Culvert
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	(800)	R	7.0 / 3.0 x 2.0	-	-	Outside of the Project Area
2	(600)	R	7.5 / 3.5 x 2.0	-	-	"
	(20)	B	3-2.5 x 2.0	-	-	"
	(20)	B	3-2.5 x 2.0	-	-	"
3	180	R	8.0 / 4.0 x 2.0	176	33	
Sub Total	180 m			176		
b. Tidal Gate				165		
c. Retention Pond				-		
d. Bund				-		
Total				341		
B. Land Acquisition Cost				-	33	
C. Engineering Fee				51		
D. Contingency Cost				78		
GRAND TOTAL				503		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	780	R	$\frac{7.8}{4.0}$ x 1.9	745	187	
2	510	R	$\frac{7.8}{4.0}$ x 1.9	487	129	
	20	B	3-2.6 x 1.9	92	-	
3	380	R	$\frac{4.2}{1.0}$ x 1.6	319	71	
4	80	R	$\frac{9.0}{5.0}$ x 2.0	80	1	
	20	B	3-3.0 x 2.0	555	-	Cross the railway line
Sub Total	1,790 m			2,278		
b. Tidal Gate				180		
c. Retention Pond				-		
d. Bund				112		
Total				2,570		
B. Land Acquisition Cost				-	388	
C. Engineering Fee				386		
D. Contingency Cost				591		
GRAND TOTAL				3,935		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)		Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	330	C	1.6	x 1.6	284	83	
	20	B	1.6	x 1.6	150	-	Cross the railway line
Sub Total	350 m				434		
b. Tidal Gate					100		
c. Retention Pond					-		
d. Bund					15		
Total					549		
B. Land Acquisition Cost					-	83	
C. Engineering Fee					82		
D. Contingency Cost					126		
GRAND TOTAL					840		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	680	C	2.7 x 2.0	952	82	
	20	B	2.7 x 2.0	44	-	
Sub Total	700 m			996		
b. Tidal Gate				120		
c. Retention Pond				-		
d. Bund				20		
Total				1,136		
B. Land Acquisition Cost				-	82	
C. Engineering Fee				170		
D. Contingency Cost				261		
GRAND TOTAL				1,649		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)		Width x Height (m)	Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	460	R	4.1 / 1.5 x 1.3	352	-	
	20	B	2-2.05 x 1.3	43	-	
2	435	C	3.8 x 1.8	718	-	
	20	B	2-1.9 x 1.8	50	-	
3	760	C	5.8 x 2.0	1,702	502	
	40	B	2-2.9 x 2.0	125	-	
4	1,780	C	3.4 x 1.8	2,706	-	
	20	B	2-1.7 x 1.8	46	-	
5	780	R	9.2 / 5.0 x 2.1	800	-	
	20	B	3-3.3 x 2.1	630	-	Cross the railway line
Sub Total	4,335 m			7,172		
b. Tidal Gate				180		
c. Retention Pond				-		
d. Bund				72		
Total				7,424		
B. Land Acquisition Cost				-	502	
C. Engineering Fee				1,080		
D. Contingency Cost				1,656		
GRAND TOTAL				10,662		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m) (m)	Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	830	R $\frac{7.6}{4.0}$ x 1.8	768	169	
	20	B 3-2.55 x 1.8	83	-	
2	400	R $\frac{12.1}{7.5}$ x 2.3	444	170	
3	50	R $\frac{12.1}{7.5}$ x 2.3	56	-	
Sub Total	1,300 m		1,351		
b. Tidal Gate			238		
c. Retention Pond			1,480	2,160	V = 118,000 m^3 A = 54,000 m^2
d. Bund			122		
Total			3,191		
B. Land Acquisition Cost			-	2,499	
C. Engineering Fee			1,107		
D. Contingency Cost			1,698		
GRAND TOTAL			8,495		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel

B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	800	R	$\frac{5.4}{2.0}$ x 1.7	704	120	
2	580	R	$\frac{9.3}{5.5}$ x 1.9	568	81	
	20	B	3-3.1 x 1.9	114	-	
3	180	R	$\frac{9.5}{5.5}$ x 2.0	180	28	
	20	B	3-3.2 x 2.0	125	-	

Sub Total 1,600 m		1,691	
b. Tidal Gate		185	
c. Retention Pond		-	
d. Bund		12	
Total		1,888	
B. Land Acquisition Cost		-	229
C. Engineering Fee		450	
D. Contingency Cost		688	
GRAND TOTAL		3,255	

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
B : Concrete Channel

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	1,200	R	15.6 / 10.0 x 2.8	1,584	2,592	
2	1,200	R	15.6 / 10.0 x 2.8	1,584	2,832	
3	493	R	15.6 / 10.0 x 2.8	651	211	
	7	Br	15.6	328	-	
4	980	R	7.2 / 3.0 x 2.1	975	90	
	20	B	2-3.6 x 2.1	94	-	
5	200	R	15.8 / 10.0 x 2.9	270	74	
6	630	C	3.7 x 2.0	1,077	-	
7	1,810	C	6.0 x 2.8	6,570	-	
	60	B	2-3.0 x 2.8	325	-	20m/No. x 3 No. = 60m
8	300	R	18.8 / 13.0 x 2.9	423	122	
9	257	R	18.8 / 13.0 x 2.9	362	67	
	10	Br	18.8	1,045	-	Cross the railway line
Sub Total	4,167 m			15,288		
b. Tidal Gate				390		
c. Retention Pond				-		
d. Bund				-		
Total				15,678		
B. Land Acquisition Cost				-	5,988	
C. Engineering Fee				2,352		
D. Contingency Cost				3,606		
GRAND TOTAL				27,624		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
C : Concrete Channel
B : Box Culvert
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m) (m)	Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	1,060	C 2.3 x 1.7	1,219	-	
	40	B 2.3 x 1.7	74	-	2-Box Culverts
2	960	C 2.5 x 2.0	1,296	-	
	40	B 2.5 x 2.0	83	-	
3	290	R $\frac{8.5}{4.5}$ x 2.0	287	191	
4	520	R $\frac{6.7}{3.5}$ x 1.6	450	-	
	20	B 3-2.25 x 1.6	61	-	
5	100	B 3-2.4 x 2.1	2,350	-	Cross the railway line
Sub Total	3,030 m		5,820		
b. Tidal Gate			185		
c. Retention Pond			960	960	V = 70,000 m^3
d. Bund			-		
Total			6,965		
B. Land Acquisition Cost			-	1,151	
C. Engineering Fee			1,045		
D. Contingency Cost			1,602		
GRAND TOTAL			10,763		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m) (m)	Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	1,190	C 4.0 x 2.0	2,142	-	
	20	B 2-2.0 x 2.0	53	-	
2	1,080	C 2.5 x 1.9	1,404	-	
	20	B 2.5 x 1.9	41	-	
3	380	C 5.4 x 2.5	1,140	-	
	20	B 2-2.7 x 2.5	452		Cross the railway line
4	860	C 3.3 x 2.0	1,376	131	
	20	B 3.3 x 2.0	265	-	Cross the railway line
5	90	R $\frac{10.5}{5.5}$ x 2.5	104	-	
Sub Total	3,680 m		6,977		
b. Tidal Gate			215		
c. Retention Pond			1,160	1,230	V = 88,000 m^3
d. Bund			-		
Total			8,352		
B. Land Acquisition Cost			-	1,361	
C. Engineering Fee			1,253		
D. Contingency Cost			1,921		
GRAND TOTAL			12,887		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	400	R	10.5 / 5.5 x 2.5	458	562	
2	1,500	R	11.5 / 7.5 x 2.0	1,545	2,727	
3	490	R	13.0 / 8.0 x 2.5	583	794	
4	1,300	R	6.8 / 3.0 x 1.9	1,222	1,240	
5	240	R	14.0 / 9.0 x 2.5	289	428	
6	1,263	R	15.5 / 10.5 x 2.5	1,553	165	
	7	Br	15.5	326	-	
7	2,040	R	6.8 / 3.0 x 1.9	1,918	-	
8	1,340	R	25.4 / 20.0 x 2.7	1,970	346	
9	1,320	R	5.4 / 2.0 x 1.7	1,155	-	
	20	B	3-1.8 x 1.7	56	-	
10	870	R	7.7 / 3.5 x 2.1	870	55	
11	13	R	25.4 / 20.0 x 2.7	19	-	
	7	Br	25.4	533	-	
Sub Total	10,810 m			12,497		
b. Tidal Gate				495		
c. Retention Pond				-		
d. Bund (for A-6 Catchment)				83		
Total				13,075		
B. Land Acquisition Cost				-	6,317	
C. Engineering Fee				1,608		
D. Contingency Cost				2,534		
GRAND TOTAL				23,534		

* Line Nos are shown in Fig. 5.8. of Vol.VI

R : Rubble Wall Channel
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)		Width x Height (m) (m)	Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	980	C	3.5 x 2.1	1,676	-	
	20	B	3.5 x 2.1	51	-	
2	1,160	C	3.0 x 2.1	1,798	-	
	40	B	3.0 x 2.1	94	-	
3	430	C	1.9 x 1.5	404	-	
4	560	C	5.0 x 2.3	1,238	-	
	40	B	2-2.5 x 2.3	124	-	
Sub Total	3,230 m			5,385		
b. Tidal Gate				155		
c. Retention Pond				-		
d. Bund				-		
Total				5,540		
B. Land Acquisition Cost				-	-	
C. Engineering Fee				831		
D. Contingency Cost				1,274		
GRAND TOTAL				7,645		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height		Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	300	R	$\frac{4.5}{1.5}$ x 1.5	245	-	
2	700	R	$\frac{5.9}{2.5}$ x 1.7	616	-	
3	780	C	3.3 x 1.8	1,162	-	
	40	B	3.3 x 1.8	92	-	
4	1,000	C	1.8 x 1.5	900	-	
5	530	C	3.2 x 1.6	721	-	
	40	B	2-1.6 x 1.6	84	-	
6	560	C	4.3 x 2.1	1,092	-	
7	250	R	$\frac{9.1}{4.5}$ x 2.3	269	-	
Sub Total	4,200 m			5,181		
b. Tidal Gate				190		
c. Retention Pond				-		
d. Bund				29		
Total				5,400		

B. Land Acquisition Cost -

C. Engineering Fee 810

D. Contingency Cost 1,242

GRAND TOTAL 7,452

* Line Nos are shown in Fig. 5.8. of Vol:VI

C : Concrete Channel
R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	190	C	1.1 x 1.1	95	-	
2	215	C	1.5 x 1.5	172	-	
	20	B	1.5 x 1.5	26	-	
3	30	C	2.0 x 2.0	35	-	
	20	B	2.0 x 2.0	37	-	
4	255	C	2.2 x 2.2	339	-	
5	35	B	2.4 x 2.4	79	-	
6	345	C	1.6 x 1.6	300	-	
	20	B	1.6 x 1.6	28	-	
7	60	C	1.7 x 1.7	57	-	
8	305	C	1.7 x 1.7	290	-	
9	80	C	2.7 x 2.7	138	-	
10	20	C	2.9 x 2.9	37	-	
Sub Total	1,595 m			1,633		
b. Tidal Gate				155		
c. Retention Pond				-		
d. Bund				-		
Total				1,788		
B. Land Acquisition Cost				-	-	
C. Engineering Fee				268		
D. Contingency Cost				411		
GRAND TOTAL				2,467		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	730	C	2. x 1.7	883	-	
	20	B	2.5 x 1.7	38	-	
2	780	C	3.5 x 2.1	1,334	-	
	20	B	3.5 x 2.1	51	-	
3	230	B	$\frac{7.7}{3.5}$ x 2.1	230	76	
4	50	R	$\frac{8.2}{4.0}$ x 2.1	51	4	
Sub Total	1,830 m			2,587		
b. Tidal Gate				170	-	
c. Retention Pond				770	1,080	V = 53,000 m^3
d. Bund				-		
Total				3,527		
B. Land Acquisition Cost				-	1,160	
C. Engineering Fee				529		
D. Contingency Cost				811		
GRAND TOTAL				6,027		

* Line Nos are shown in Fig. 5.8. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
B : Box Culvert

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	(3,320)	R	8.8 / 4.0 x 2.4	-	-	Outside of the Project Area
	20	B	3-2.95 x 2.4	137	-	
2	(2,833)	R	11.0 / 6.0 x 2.5	-	-	Outside of the Project Area
	7	Br	11.0	231	-	
3	2,000	R	12.7 / 7.5 x 2.6	2,420	882	
4	2,000	C	4.9 x 2.5	5,480	204	
5	2,520	R	8.8 / 4.0 x 2.4	2,747	816	
	20	B	3-2.95 x 2.4	137	-	
6	1,000	C	5.5 x 3.0	3,600	120	
7	73	R	13.9 / 7.5 x 3.2	101	-	
	7	Br	13.9	292	-	
Sub Total	7,647 m			15,145		
b. Tidal Gate				-		
c. Retention Pond				-		
d. Bund				-		
Total				15,145		
B. Land Acquisition Cost				-	2,022	
C. Engineering Fee				2,272		
D. Contingency Cost				3,483		
GRAND TOTAL				22,922		

* Line Nos are shown in Fig. 5.9. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
B : Box Culvert
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	(2,100)	R	8.6 / 4.0 x 2.3	-	-	Outside of the Project Area
2	(1,800)	R	7.2 / 3.0 x 2.1	-	-	"
3	530	R	11.0 / 6.0 x 2.5	612	153	
4	700	C	3.0 x 2.0	1,050	32	
5	143	R	11.2 / 6.0 x 2.6	169		
	7	Br	11.2	235	-	
Sub Total	1,380 m			2,066		
b. Tidal Gate				-		
c. Retention Pond				-		
d. Bund				-		
Total				2,066		
B. Land Acquisition Cost					185	
C. Engineering Fee				310		
D. Contingency Cost				475		
GRAND TOTAL				3,036		

* Line Nos are shown in Fig. 5.9. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line * No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	(2,373)	R	11.6 / 6.0 x 2.8	-	-	Outside of the Project Area
	7	Br	11.6	244	-	
2	(650)	R	12.2 / 6.0 x 3.1	-	-	Outside of the Project Area
	600	R	12.2 / 6.0 x 3.1	798	194	
3	1,300	R	12.7 / 6.5 x 3.1	1,742	441	
4	1,000	R	12.7 / 6.5 x 3.1	1,340	339	
5	700	C	1.6 x 1.6	602	-	
6	700	C	2.0 x 2.0	812	-	
7	73	R	12.7 / 6.5 x 3.1	98	-	
	7	Br	12.7	267	-	
Sub Total	4,387 m			5,903		
b. Tidal Gate				-		
c. Retention Pond				-		
d. Bund				-		
Total				5,903		
B. Land Acquisition Cost				-	974	
C. Engineering Fee				885		
D. Contingency Cost				1,358		
GRAND TOTAL				9,120		

* Line Nos are shown in Fig. 5.9. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	2,100	C	2.8 x 2.5	3,528	82	
2	800	C	2.2 x 1.5	824	-	
3	173	R	13.0 / 6.0 x 3.5	251	-	
	7	Br	13.0	273	-	
Sub Total	3,080 m			4,876		
b. Tidal Gate				-		
c. Retention Pond				-		
d. Bund				-		
Total				4,876		
B. Land Acquisition Cost				-	82	
C. Engineering Fee				731		
D. Contingency Cost				1,121		
GRAND TOTAL				6,810		

* Line Nos are shown in Fig. 5.9. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line No.*	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquition Cost (M$1,000)	Remarks
1	620	R	11.2 / 6.0 x 2.6	735	182	
2	1,500	C	4.6 x 2.5	3,315	140	
3	700	C	2.1 x 2.1	868	-	
4	(2,053)	R	16.2 / 10.0 x 3.1	-	-	Outside of the Project Area
	7	Br	16.2	340	-	
5	(2,560)	R	16.4 / 10.0 x 3.2	-	-	Outside of the Project Area
6	(3,660)	R	16.4 / 10.0 x 3.2	-	-	"
7	293	R	16.4 / 10.0 x 3.2	425	162	
	7	Br	16.4	344	-	
Sub Total	3,127 m			5,991		
b. Tidal Gate				-		
c. Retention Pond				-		
d. Bund				-		
Total				5,991		
B. Land Acquisition Cost				-	484	
C. Engineering Fee				899		
D. Contingency Cost				1,378		
GRAND TOTAL				8,752		

* Line Nos are shown in Fig. 5.10. of Vol.VI

C : Concrete Channel
R : Rubble Wall Channel
Br: Bridge

A. Construction Cost

a. Trunk Drain

Line* No.	Length (m)	Width x Height (m)		Construction Cost (M$1,000)	Land Acquisition Cost (M$1,000)	Remarks
1	400	R	21.0 / 15.0 x 3.0	594	235	
2	400	R	11.4 / 6.0 x 2.7	486	120	
3	693	R	24.0 / 18.0 x 3.0	1,074	470	
	7	Br	24.0	504	-	
4	1,370	R	24.0 / 18.0 x 3.0	2,124	929	
5	1,300	R	24.0 / 18.0 x 3.0	2,015	881	
6	1,450	R	24.0 / 18.0 x 3.0	2,248	896	
7	2,250	R	24.0 / 18.0 x 3.0	3,488	1,391	
8	1,400	R	27.6 / 20.0 x 3.8	2,660	1,016	
9	693	R	29.8 / 22.0 x 3.9	1,379	-	
	7	Br	29.8	626	-	
10	220	R	17.6 / 12.0 x 2.8	1,659	717	
11	493	R	17.6 / 12.0 x 2.8	670	290	
	7	Br	17.6	370	-	
12	350	R	33.2 / 25.0 x 4.1	754	-	
13	630	R	7.8 / 3.0 x 2.4	677	185	
14	300	R	8.8 / 4.0 x 2.4	327	67	
	(2,600)	R	8.8 / 4.0 x 2.4	-	-	Outside of the Project Area
	20		3-2.95 x 2.4	137	-	
15	(3,000)	R	10.2 / 5.0 x 2.6	-	-	Outside of the Project Area
16	(2,660)	R	11.2 / 6.0 x 2.6	-	-	"
17	980	C	2.3 x 2.0	1,235	-	
18	753	R	11.4 / 6.0 x 2.7	913	226	
	7	Br	11.4	239	-	
19	370	R	34.2 / 26.0 x 4.1	808	-	
Sub Total	15,100 m			24,987		
b. Tidal Gate				-		
c. Retention Pond				-		
d. Bund				-		
Total				24,987		
B. Land Acquisition Cost				-	7,423	
C. Engineering Fee				3,748		
D. Contingency Cost				5,747		
GRAND TOTAL				41,905		

* Line Nos are shown in Fig. 5.10. of Vol.VI