TABLES

Table IV-1 Conceptual Features of Detention Facilituies

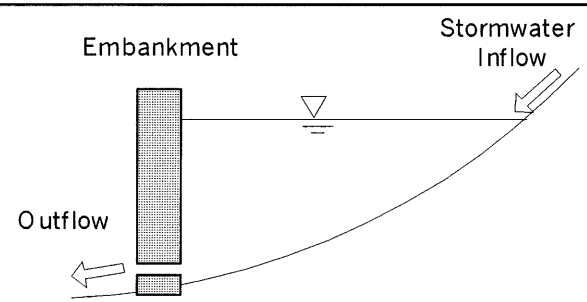
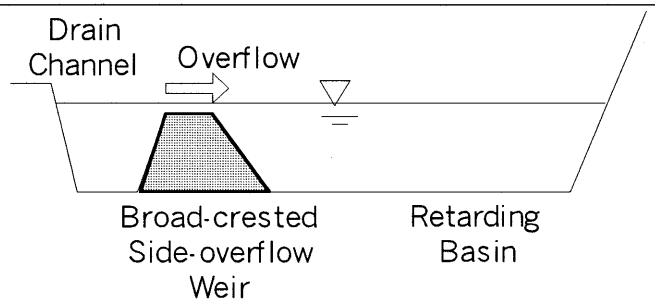
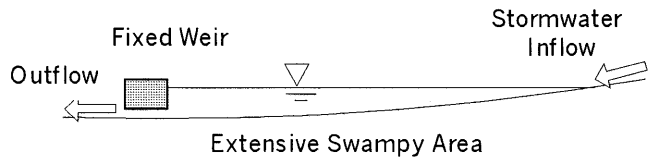
Type of Pond	Conceptual Layout	Applicable Topography	Applicable Sewer System	Possible Multiple Use
Embankment and excavation		Hilly area/narrow valley	Combined sewer in catchment and contaminated inflow in dry-weather → Dry type	Ponding area for recreational use
			Separate sewer in catchment and clean inflow in dry-weather → Wet type	Pond for recreational use or amenity space
Retarding basin with broad-crested side-overflow weir		Swampy area/wide valley plain	Both types of sewer	Retarding basin for recreational use
Wetland		Wide swampy area	Separate sewer in catchment and clean inflow in dry-weather	Amenity space and ecological reserve

Table IV-2(1) Present Conditions of Trunk Drains

Trunk Drain	Channel No.	Drainage Area (ha)		Existing Channel (Approximate Features)						
		Upstream-end	Downstream-end	Length (m)	Type	Shape	Width (m)	Depth (m)	Gradient (%)	Flow Capacity (m^3/s)
Sg. Air Mendidih Drainage Basin										
Air Mendidih	AM-1	359.23	362.54	190	Earth	Natural	15-30	0.5-2	0.138	Tidal Effect
	AM-2	333.87	359.23	600	Earth	Natural	15-30	0.5-2	0.138	Tidal Effect
	AM-3	322.93	333.87	160	Earth	Natural	5-12	0.5-1.4	0.138	<5
	AM-4	272.59	322.93	130	Earth	Natural	5-12	0.5-1.4	0.138	<5
	AM-5	252.84	272.59	230	Earth	Natural	5-12	0.5-1.4	0.138	<5
Line N	N-1	113.75	125.12	430	Earth	Natural	2.8-4.5	0.7-0.8	0.273	<5
	N-2	104.17	113.75	460	R.C	Rectangular	2-3	1.3-1.5	0.505	10
	N-3	84.87	86.47	200	R.C	Rectangular	2-3	1.3-1.5	1.487	10
	N-4	36.86	59.43	650	Earth	Trapezoidal	10-17	3-3.9	0.810	30-40
	N-5	6.96	12.32	220	Earth	Trapezoidal	10-17	3-3.9	0.070	30
Line P	P-1	115.29	127.72	400	Earth	Trapezoidal	3.3-5.2	0.8-1	0.304	1
	P-2	68.95	115.29	710	Earth	Trapezoidal	3-4	0.8-1.2	0.304	3
	P-3	54.49	68.95	210	Earth	Trapezoidal	3-4	0.8-1.2	0.304	3
	P-4	54.49	54.49	90	Earth	Trapezoidal	4.5-6.1	0.9-1.1	0.304	5
Line O	O-1	-	17.70	630	Earth	Trapezoidal	4.5-6.1	0.9-1.1	0.116	2
Line G Drainage Basin										
Line G	G-1	268.02	272.82	160	Earth	Natural	1.5	0.7	0.962	3
	G-2	255.48	255.48	240	R.C	Rectangular	1.2	1.4-1.6	0.190	2
	G-3	232.70	239.75	400	R.C	Rectangular	3	1.8	0.467	16
	G-4	184.14	232.70	400	Earth	Natural	4-8	0.5-1.2	0.198	Swampy Area
	G-5	168.09	184.14	400	Earth	Natural	2-4	0.6-1.5	0.198	Swampy Area
	G-6	150.38	150.38	60	C.P	Circle	ϕ1.7×2	-	0.658	13
	G-7	69.71	75.89	320	Earth	Natural	2-4	0.6-1.5	0.253	3
	G-8	37.06	69.71	670	Earth	Natural	2-4	0.6-1.5	0.943	1
Taman Keladi	TK-1	69.62	69.62	180	R.C	Rectangular	3.5	0.5	0.308	3

Table IV-2(2) Present Conditions of Trunk Drains

Trunk Drain	Channel No.	Drainage Area (ha)		Existing Channel (Approximate Features)						
		Upstream-end	Downstream-end	Length (m)	Type	Shape	Width (m)	Depth (m)	Gradient (%)	Flow Capacity (m^3/s)
Prt. Pokok Mangga Drainage Basin (including Prt. Besar Limbongan Drainage Basin)										
Prt. Pokok Mangga	PM-1	168.67	202.95	850	Earth	Trapezoidal	4.5-8.0	1.0-1.4	0.0333	2
	PM-2	139.59	168.67	350	Earth	Trapezoidal	4.5-8.0	1.0-1.4	0.0333	1
	PM-3	60.57	95.35	960	Earth	Trapezoidal	5.0-6.5	0.7-1.7	0.0333	nil
	PM-4	0	45.14	1,110	Lined	Trapezoidal	3.0-6.5	1.1-1.7	0.0116	nil
Prt. Malim	M-1	0	88.17	1,480	Earth	Trapezoidal	5.0-6.0	0.6-1.0	0.0473	2
	M-2	0	15.43	750	Earth	Trapezoidal	5.5-6.5	0.5-1.0	0.0667	2
Prt. Besar Limbongan	BL-1	189.52	267.95	920	Lined	Trapezoidal	4.8	1.6	0.100	11
Lorong Pandan	LP-1	164.37	189.52	800	R.C	Rectangular	1.2	1.0	0.0963	1
	LP-2	88.17	164.37	1,070	R.C	Rectangular	1.2	1.0	0.0963	1
Sg. Ayer Salak Drainage Basin										
Sg. Ayer Salak	AS-1	1704.46	1720.29	590	Earth	Trapezoidal	26-29	3.0-4.2	0.0451	170
	AS-2	1642.69	1704.46	200	Earth	Trapezoidal	26-29	3.0-4.2	0.0451	210
	AS-3	948.66	1057.01	1,320	Earth	Trapezoidal	23-29	3.0-4.2	0.0451	150
	AS-4	801.15	948.66	1,350	Earth	Trapezoidal	19-25	2.5-3.6	0.0451	100
	AS-5	664.34	801.15	930	Earth	Trapezoidal	19-20	2.5-2.8	0.171	30
	AS-6	450.90	664.34	640	Earth	Trapezoidal	5-10	1.3-2.3	0.171	5
	AS-7	342.28	450.90	940	Earth	Trapezoidal	5-10	1.3-2.3	0.463	10
	AS-8	71.71	179.27	1,420	Earth	Natural	2-4	0.8-1.5	0.640	1
Tributary (1)	T1-1	30.89	61.77	760	Earth	Natural	3.2	1.4	0.0364	1
Tributary (2)	T2-1	24.58	40.96	820	Earth	Rectangular	1.85	1.5	0.536	4
Tributary (3)	T3-1	39.30	137.55	1,290	Earth	Natural	1.8	1.4	0.524	3
Tributary (4)	T4-1	20.56	61.67	740	Earth	Natural	3-5	0.8-1.5	0.808	6
Tributary (5)	T5-1	134.63	163.01	490	Earth	Natural	1.7	0.6	1.22	1
Prt. AB1	A1-1	573.54	585.68	480	Earth	Trapezoidal	8-10	1.1-2.0	0.102	12
	A1-2	261.99	353.12	1,860	Earth	Trapezoidal	5.5-8.5	0.5-1.6	0.102	3
	A1-3	128.95	261.99	1,570	Earth	Natural	1.5-2.5	0.8-1.2	0.102	1
Prt. AB11	A2-1	164.40	220.42	2,010	Earth	Trapezoidal	5-6	0.9-1.6	0.0801	2
	A2-2	98.13	164.40	940	Earth	Natural	2-3	0.7-1.1	0.209	1

Table IV-3(1) Existing Major Secondary Drains

Drain No.	Location of Junction (Chainage)	Type	Shape and Dimension
Sg. Air Mendidih Drainage Basin			
Sg. Air Mendidih			
1	318 m	Earth	Natural (w: 2.5 m, d: 1.0 m)
2	946 m	R.C	Rectangular (w: 1.6 m, d: 0.7 m), Groove (w: 0.60m, d: 0.55 m)
3	949 m	R.C	Rectangular (w: 3.0 m, d: 0.8 m)
Line N			
4	1,524 m	Earth	Natural (w: 1.9 m, d: 0.9 m)
5	1,526 m	C.P	Culvert (ϕ 0.9 m)
6	3,047 m	Lined	Trapezoidal (t.w: 2.20 m, b.w: 1.55 m, d: 1.50 m)
Line P			
7	355 m	Earth	Natural (w: 1.00 m, d: 1.55 m)
Line G Drainage Basin			
Line G			
1	117 m	Earth	Natural (w: 3.5 m, d: 1.3 m)
2	165 m	R.C	Rectangular (w: 1.0 m, d: 1.3 m)
3	170 m	Earth	Natural (w: 2.7 m, d: 2.0 m)
4	566 m	R.C	Rectangular (w: 1.1 m, d: 1.1 m)
5	590 m	R.C	Rectangular (w: 3.2 m, d: 1.6 m)
6	1,615 m	Lined	Trapezoidal (t.w: 2.60 m, b.w: 1.50 m, d: 0.70 m)
7	1,635 m	Lined	Trapezoidal (t.w: 1.65 m, b.w: 0.80 m, d: 0.40 m)
8	1,670 m	Lined	Trapezoidal (t.w: 2.60 m, b.w: 1.45 m, d: 0.70 m)
9	1,670 m	Lined	Trapezoidal (t.w: 1.65 m, b.w: 0.80 m, d: 0.50 m)
Prt. Pokok Mangga Drainage Basin			
Prt. Pokok Mangga			
1	45 m	R.C	Rectangular (w: 0.83 m, d: 1.46 m)
2	918 m	Earth	Natural (w: 1.3 m, d: 0.5 m)
3	1,173 m	Earth	Natural (w: 1.7 m, d: 0.9 m)
4	1,214 m	Earth	Natural (w: 3.0 m, d: 0.7 m)
5	1,330 m	Earth	Natural (w: 1.4 m, d: 0.7 m)
6	1,748 m	Earth	Natural (w: 2.0 m, d: 0.9 m)
7	2,218 m	R.C	Rectangular (w: 2.1 m, d: 1.6 m)
8	2,559 m	Earth	Natural (w: 2.0 m, d: 1.4 m)
9	2,715 m	R.C	Rectangular (w: 1.26 m, d: 0.76 m), Groove (sc ϕ 0.35m)
10	2,930 m	R.C	Rectangular (w: 1.3 m, d: 0.9 m)
11	3,160 m	R.C	Rectangular (w: 1.0 m, d: 1.3 m)
12	3,280 m	R.C	Rectangular (w: 1.5 m, d: 1.2 m)

Note; 1) Secondary drain number is to be referred to the figures of "Location of Major Secondary Drains". 2) R.C: Reinforced Concrete, C.P: Culvert Pipe, w: width, d: depth, ϕ: diameter, t.w: top width, b.w: bottom width, sc: semicircle.

Table IV-3(2) Existing Major Secondary Drains

Drain No.	Location of Junction (Chainage)	Type	Shape and Dimension
Sg. Ayer Salak Drainage Basin			
Sg. Ayer Salak			
1	1,495 m	Earth	Natural (w: 1.8 m, d: 1.4 m)
2	1,800 m	Earth	Natural (w: 1.4 m, d: 1.0 m)
3	2,045 m	Earth	Natural (w: 1.6 m, d: 0.9 m)
4	2,225 m	Earth	Natural (w: 1.6 m, d: 0.9 m)
5	2,310 m	Earth	Natural (w: 1.6 m, d: 0.9 m)
6	2,425 m	Earth	Natural (w: 1.6 m, d: 1.4 m)
7	2,580 m	R.C	Rectangular (w: 1.2 m, d: 0.45 m), Groove (w: 0.55m, d: 0.60 m)
8	3,003 m	Earth	Natural (w: 1.3 m, d: 1.1 m)
9	3,316 m	C.P	Culvert (ϕ 1.0 m)
10	4,040 m	R.C	Rectangular (w: 0.85 m, d: 1.30 m)
11	4,430 m	R.C	Rectangular (w: 2.3 m, d: 1.4 m)
12	4,615 m	Earth	Natural (w: 1.5 m, d: 1.3 m)
13	4,675 m	Earth	Natural (w: 1.7 m, d: 0.9 m)
14	4,805 m	R.C	Trapezoidal (t.w: 1.6 m, b.w: 1.1 m, d: 1.8 m)
15	4,990 m	Earth	Natural (w: 0.9 m, d: 1.3 m)
16	5,050 m	Earth	Natural (w: 1.5 m, d: 0.7 m)
17	5,160 m	C.P	Culvert (ϕ 1.2 m)
18	5,250 m	Earth	Natural (w: 0.9 m, d: 2.0 m)
19	5,503 m	Earth	Natural (w: 1.5 m, d: 1.5 m)
20	5,543 m	R.C	Rectangular (w: 1.2 m, d: 1.2 m)
21	5,653 m	Earth	Natural (w: 2.0 m, d: 1.0 m)
22	5,698 m	Earth	Natural (w: 1.6 m, d: 0.7 m)
23	5,733 m	Earth	Natural (w: 1.7 m, d: 0.6 m)
24	5,793 m	Earth	Natural (w: 2.0 m, d: 1.0 m)
25	5,876 m	Earth	Natural (w: 1.2 m, d: 1.0 m)
26	5,956 m	Earth	Natural (w: 1.6 m, d: 0.7 m)
27	5,996 m	Earth	Natural (w: 1.4 m, d: 0.9 m)
28	6,131 m	Earth	Natural (w: 1.4 m, d: 1.1 m)
29	6,241 m	Earth	Natural (w: 2.4 m, d: 0.9 m)
30	6,306 m	Earth	Natural (w: 2.5 m, d: 1.0 m)
31	6,401 m	Earth	Natural (w: 1.1 m, d: 1.2 m)
32	6,650 m	Earth	Natural (w: 1.2 m, d: 1.2 m)
33	6,700 m	Earth	Natural (w: 1.6 m, d: 1.0 m)
34	6,825 m	Earth	Natural (w: 1.4 m, d: 0.9 m)
35	6,875 m	Earth	Natural (w: 1.4 m, d: 0.8 m)
36	6,950 m	Earth	Natural (w: 3.3 m, d: 1.5 m)
37	7,100 m	Earth	Natural (w: 1.0 m, d: 0.8 m)
38	7,475 m	Earth	Natural (w: 3.0 m, d: 1.0 m)
Prt. AB1			
39	1,723 m	Earth	Natural (w: 3.0 m, d: 1.0 m)
40	2,250 m	Earth	Natural (w: 2.5 m, d: 1.0 m)

Note; 1) Secondary drain number is to be referred to the figures of "Location of Major Secondary Drains". 2) R.C: Reinforced Concrete, C.P: Culvert Pipe, w: width, d: depth, ϕ: diameter, t.w: top width, b.w: bottom width, sc: semicircle.

Table IV-4 Preliminary Comparison with Alternative Drainage Networks in Prt. Pokok Mangga

Alternative	(1) Original Drainage Divide	(2) New Trunk Drain	(3) New Diversion to Sg. Malim
Drainage Area Prt. Pokok Mangga Prt. Besar Limbongan Newly Divided Basin	 202.95 ha 267.95 ha -	 132.30 ha 70.79 ha 267.81 ha (New Drain)	 107.51 ha (Lower) 151.10 ha 212.29 ha (Upper)
Channel Length of Major Drain Prt. Pokok Mangga Prt. Besar Limbongan Newly Divided Basin	 3,270 m 2,790 m -	 3,270 m 2,790 m 2,550 m(New Drain)	 1,200 m (Lower) 2,790 m 2,070 m (Upper)
Additional New Work Item Excluding Channel Improvement	-	- Construction of new trunk drain	- Construction of new diversion drain - Installation of gate structure and pump station at outfall to Sg. Malim
Advantage	- There are no additional work components.	- New drain will reduce stormwater loads for existing trunk drains. - Land acquisition in the middle and lower reaches may be relatively easy because of agricultural use in present land use. - Land to be acquired is smallest along Besar Limbongan.	- New drain will reduce stormwater loads for existing trunk drains. - Channel with short distance may be preferable for easy maintenance. - Land to be acquired is smallest along Pokok Mangga.
Disadvantage	- Land acquisition may be a difficult issue to conduct channel improvement in the entire stretch.. - Long channel with mild slope may cause a maintenance problem due to stagnant water and thick growth of plants.	- Land acquisition may be a difficult issue to conduct channel improvement in the lower reaches of new trunk drain.	- Land acquisition may be a difficult issue to conduct channel improvement in the upper-most reaches of Pokok Mangga due to urbanized residential areas. - Gate structure and pump station are required for smooth discharge to Sg. Malim.

Table IV-5 Proposed Platform Level for Future Development

Chainage (m)	Design Bank Level (m)	Platform Level (m)
Sg. Air Mendidih		
0 – 200	1.000 – 1.576	1.6
200 – 410	1.576 – 1.866	1.9
410 – 644	1.866 – 2.189	2.2
644 – 900	2.189 – 2.542	2.6
900 – 1150	2.542 – 2.887	2.9
1150 – 1364	2.887 – 3.182	3.2
1364 – 1500	3.182 – 3.553	3.6
1500 – 1700	3.553 – 4.099	4.1
1700 – 1800	4.099 – 4.372	4.4
1800 – 2000	4.372 – 4.918	5.0
2000 – 2100	4.918 – 5.423	5.5
2100 – 2200	5.423 – 5.928	6.0
2200 – 2300	5.928 – 7.445	7.5
2300 – 2400	7.445 – 8.962	9.0
Line O		
0 – 200	5.852 – 6.084	6.1
200 – 400	6.084 – 6.316	6.4
400 – 600	6.316 – 6.548	6.6
Line P		
0 – 202	3.182 – 3.796	3.8
202 – 402	3.796 – 4.404	4.4
402 – 604	4.404 – 5.018	5.1
604 – 811	5.018 – 5.647	5.7
811 – 992	5.647 – 6.198	6.2
Line G		
120 – 300	1.900 – 2.946	3.0
300 – 400	2.946 – 3.526	3.6
400 – 600	3.526 – 4.404	4.4
600 – 800	4.404 – 5.280	5.3
800 – 1000	5.280 – 5.750	5.8
1000 – 1200	5.750 – 6.220	6.3
1200 – 1400	6.220 – 6.690	6.7
1400 – 1600	6.690 – 7.160	7.2
1600 – 1886	7.160 – 7.832	7.9
1886 – 2086	7.832 – 8.532	8.6
2086 – 2286	8.532 – 9.230	9.3
2286 – 2486	9.230 – 10.300	10.3
2486 – 2686	10.300 – 11.378	11.4
2686 – 2886	11.378 – 12.450	12.5

Chainage (m)	Design Bank Level (m)	Platform Level (m)
Prt. Pokok Mangga		
0 – 600	2.100 – 2.300	2.3
600 – 1200	2.300 – 2.500	2.5
1200 – 1800	2.500 – 2.700	2.7
1800 – 2400	2.700 – 2.899	2.9
2400 – 3000	2.899 – 3.099	3.1
3000 – 3270	3.099 – 3.190	3.2
Sg. Ayer Salak		
0 – 4200	1.640	1.7
4200 – 4600	1.640 – 2.324	2.4
4600 – 5000	2.324 – 3.008	3.0
5000 – 5400	3.008 – 3.692	3.7
5400 – 5793	3.692 – 4.364	4.4
5793 – 6193	4.364 – 5.048	5.1
6193 – 6393	5.048 – 5.390	5.4
6393 – 6593	5.930 – 6.316	6.4
6593 – 6793	6.316 – 7.242	7.3
6793 – 6993	7.242 – 8.168	8.2
6993 – 7193	8.168 – 9.094	9.1
7193 – 7393	9.094 – 10.020	10.1
7393 – 7593	10.020 – 11.300	11.3
7593 – 7793	11.300 – 12.580	12.6
7793 – 7993	12.580 – 13.860	13.9
7993 – 8193	13.860 – 15.140	15.2
8193 – 8393	15.140 – 16.420	16.5
8393 – 8593	16.420 – 17.700	17.7
8593 – 8793	17.700 – 18.980	19.0
8793 – 8993	18.980 – 20.260	20.3
Prt. AB1		
0 – 1225	2.800	2.8
1225 – 1800	2.800 – 3.387	3.4
1800 – 2204	3.387 – 3.798	3.8
Prt. AB11		
0 – 700	2.800	2.8
700 – 1172	2.800 – 3.178	3.2
1172 – 1572	3.178 – 3.498	3.5
1572 – 2022	3.498 – 4.116	4.2
2022 – 2447	4.116 – 5.004	5.0
2447 – 2847	5.004 – 5.840	5.9