

**Table VI-9 (1/5) Construction Cost of Proposed Detention Facilities in Sg. Ayer Salak Basin
(Tg. Minyak(1) D.P.)**

Type of Pond : Excavation/Non-community/Dry condition

Effective Storage Capacity : 63,600m³

Unit : per pond

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Direct Cost								
a. Earth Work								
Common excavation	m3	59,964	0.6	1.4	35,978	83,950	119,928	by mech.equip
Foundation excavation	m3	3,156	7.3	3.5	22,960	10,967	33,927	50%.hand,50%.mech.
b. Slope Protection								
Turfing	m2	5,000	4.0	0.0	20,000	0	20,000	slope
Turfing	m2	21,600	4.0	0.0	86,400	0	86,400	bottom
c. Concrete Work								
R.C. Structures(inlet/outlet)	m3	30	200.0	50.0	6,000	1,500	7,500	
Concrete Drain (450mm)	m	250	19.2	4.8	4,800	1,200	6,000	
Storm Outfall(w/ effluent pipe)	place	3	8,000.0	2,000.0	24,000	6,000	30,000	pipe length : 100m/place
d. Metal Work								
Screen (d 25mm)	ton	0.40	600.0	1,800.0	240	720	960	
Sluice Gate (1m * 1m)	ton	0.05	1,750.0	5,250.0	88	263	350	
e. Road Work								
Asphalt pavement (t=180mm)	m2	2,010	4.8	1.2	9,648	2,412	12,060	
f. Chain Link Fencing (h=1.8m)	m	670	36.0	9.0	24,120	6,030	30,150	
g. Others (5% of the above)	L.S.				11,712	5,652	17,364	
2. Indirect Cost (20% of 1.)	L.S.				49,189	23,739	72,928	
3. Land Acquisition	m2	27,000	6.2	0.0	167,400	0	167,400	
4. Total (1.+2.+3.)					462,535	142,432	604,967	

**Table VI-9 (2/5) Construction Cost of Proposed Detention Facilities in Sg. Ayer Salak Basin
(Upper Ayer Salak D.P.)**

Type of Pond : Natural/Non-community/Dry condition

Effective Storage Capacity : 20,000 m3

Unit : per pond

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Direct Cost								
a. Earth Work								
Common excavation	m3	180	0.6	1.4	108	252	360	by mech.equip
Foundation excavation	m3	70	7.3	3.5	509	243	753	50%:hand,50%:mech.
Embankment	m3	3,448	3.0	9.0	10,344	31,032	41,377	
b. Slope Protection								
Turfing	m2	1,207	4.0	0.0	4,829	0	4,829	Embankment Slope
c. Concrete Work								
R.C. Structures(side overflow weir)	m3	516	200.0	50.0	103,200	25,800	129,000	
Concrete Drain (450mm)	m	300	19.2	4.8	5,760	1,440	7,200	
d. Metal Work								
Screen (d 25mm)	ton	0.40	600.0	1,800.0	240	720	960	
Sluice Gate (1m * 1m)	ton	0.05	1,750.0	5,250.0	88	263	350	
e. Road Work								
Asphalt pavement (t=180mm)	m2	1,350	4.8	1.2	6,480	1,620	8,100	
f. Others (5% of the above)	L.S.				6,578	3,069	9,646	
2. Indirect Cost (20% of 1.)	L.S.				27,627	12,888	40,515	
3. Land Acquisition	m2	51,000	6.2	0.0	316,200	0	316,200	
4. Total (1.+2.+3.)					481,963	77,326	559,290	

**Table VI-9 (3/5) Construction Cost of Proposed Detention Facilities in Sg. Ayer Salak Basin
(Tg. Minyak(2) D.P.)**

Type of Pond : Excavation/Community/Wet condition

Effective Storage Capacity : 70,400m³

Unit : per pond

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Direct Cost								
a. Earth Work								
Common excavation	m3	46,134	0.6	1.4	27,680	64,588	92,268	by mech.equip
Foundation excavation	m3	2,428	7.3	3.5	17,664	8,438	26,102	50%.hand,50%.mech.
Embankment	m3	2,928	3.0	9.0	8,784	26,352	35,136	
b. Slope Protection								
Revetment(st.pitch, t=250mm)	m2	1,320	58.5	6.5	77,220	8,580	85,800	slope below HWL
Turfing	m2	720	4.0	0.0	2,880	0	2,880	slope above HWL
Turfing	m2	14,500	4.0	0.0	58,000	0	58,000	higher stage
c. Concrete Work								
R.C. Structures(inlet/outlet & spillway)	m3	250	200.0	50.0	50,000	12,500	62,500	
d. Metal Work								
Screen (d 25mm)	ton	0.40	600.0	1,800.0	240	720	960	
Sluice Gate (1m * 1m)	ton	0.05	1,750.0	5,250.0	88	263	350	
e. Road Work								
Asphalt pavement (t=180mm)	m2	1,620	4.8	1.2	7,776	1,944	9,720	
f. Chain Link Fencing (h=1.8m)	m	540	36.0	9.0	19,440	4,860	24,300	
g. Others (5% of the above)	L.S.				13,489	6,412	19,901	
2. Indirect Cost (20% of 1.)	L.S.				56,652	26,931	83,583	
3. Land Acquisition	m2	23,800	6.2	0.0	147,560	0	147,560	
4. Total (1.+2.+3.)					487,473	161,587	649,060	

**Table VI-9 (4/5) Construction Cost of Proposed Detention Facilities in Sg. Ayer Salak Basin
(Middle AB1 D.P.)**

Type of Pond : Wetland/Community/Wet condition

Effective Storage Capacity : 29,300 m3

Unit : per pond

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Direct Cost								
a. Earth Work								
Common excavation	m3	38	0.6	1.4	23	53	76	by mech.equip
Foundation excavation	m3	14	7.3	3.5	103	49	152	50%:hand,50%:mech.
Embankment	m3	2,160	3.0	9.0	6,480	19,440	25,920	
b. Slope Protection								
Turfing	m2	805	4.0	0.0	3,220	0	3,220	Embankment Slope
c. Concrete Work								
Fixed Weir w/ orifice	m3	108	200.0	50.0	21,600	5,400	27,000	
d. Metal Work								
Screen (d 25mm)	ton	0.40	600.0	1,800.0	240	720	960	
Sluice Gate (1m * 1m)	ton	0.05	1,750.0	5,250.0	88	263	350	
e. Road Work								
Asphalt pavement (t=180mm)	m2	720	4.8	1.2	3,456	864	4,320	
f. Others (5% of the above)	L.S.				1,760	1,339	3,100	
2. Indirect Cost (20% of 1.)	L.S.				7,394	5,626	13,020	
3. Land Acquisition	m2	74,000	6.2		458,800	0	458,800	
4. Total (1.+2.+3.)					503,164	33,754	536,917	

**Table VI-9 (5/5) Construction Cost of Proposed Detention Facilities in Sg. Ayer Salak Basin
(Middle AB11 D.P.)**

Type of Pond : Natural/Community/Dry condition

Effective Storage Capacity : 54,200 m3

Unit : per pond

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Direct Cost								
a. Earth Work								
Common excavation	m3	76	0.6	1.4	45	106	151	by mech.equip
Foundation excavation	m3	28	7.3	3.5	206	99	305	50%.hand,50%.mech.
b. Concrete Work								
Fixed Weir w/ orifice	m3	216	200.0	50.0	43,200	10,800	54,000	
Concret Wall	m3	121	200.0	50.0	24,200	6,050	30,250	
Concrete Drain (450mm)	m	400	19.2	4.8	7,680	1,920	9,600	
Storm Outfall (w/ effluent pipe)	place	3	8,000.0	2,000.0	24,000	6,000	30,000	pipe length : 100m/place
c. Metal Work								
Screen (d 25mm)	ton	0.40	600.0	1,800.0	240	720	960	
Sluice Gate (1m * 1m)	ton	0.05	1,750.0	5,250.0	88	263	350	
d. Others (5% of the above)	L.S.				4,983	1,298	6,281	
2. Indirect Cost (20% of 1.)	L.S.				20,928	5,451	26,379	
3. Land Acquisition	m2	116,000	6.2	0.0	719,200	0	719,200	
4. Total (1.+2.+3.)					844,770	32,706	877,476	

Table VI-10 Unit Construction Cost of Storage Facility in Public Open Space

On-site Detention Pond Area: 4,000 m²

Unit : per 4000 m² of pond area

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Direct Cost								
a. Earth Work								
Common excavation	m3	1,080	0.6	1.4	648	1,512	2,160	by mech.equip
Foundation excavation	m3	120	7.3	3.5	876	414	1,290	50%:hand,50%:mech.
b. Concrete Work								
R.C. wall	m3	29	200.0	50.0	5,837	1,459	7,296	
R.C. outlet	m3	4	200.0	50.0	745	186	932	
Roadside Drain (300mm)	m	250	10.0	2.5	2,500	625	3,125	
c. Screen/Grating	ton	0.05	600.0	1,800.0	30	90	120	
d. Bottom Surface Protection								
Turfing	m2	4,000	4.0	0.0	16,000	0	16,000	bottom of storage place
e. Others (5% of the above)	L.S.				1,332	214	1,546	
2. Indirect Cost (20% of 1.)	L.S.				5,594	900	6,494	
3. Total (1.+2.)					33,562	5,401	38,963	

Table VI-11 Unit Construction Cost of Storage Tank in House Lot

CA: 100m²

Unit : per 100m² of house lot

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Direct Cost								
a. Installation of FRP Storage Tank	no	1	600.0	200.0	600	200	800	
b. PVC Pipe Plumbing								
Half round rainwater gutter(150mm)	m	30	26.3	8.7	789	261	1,050	
Rainwater downpipe (100mm)	m	10	18.0	6.0	180	60	240	
c. Others (5% of the above)	L.S.				78	26	105	
2. Indirect Cost (20% of 1.)	L.S.				329	109	439	
3. Total (1.+2.)					1,977	656	2,633	

Table VI-12 Construction Cost of Taman Asean P/S

Design Discharge : 20 m3/s

Unit : per station

Description of Work	Unit	Quantity	Unit Price(RM)		Amount(RM)			Remarks
			L.C.	F.C.	L.C.	F.C.	Total	
1. Inlet Channel Improvement (280m)					509,768	182,180		
a. Earth Work								
Common excavation	m3	5,107	0.6	1.4	3,064	7,150	10,214	by mech.equip
Foundation excavation	m3	269	7.3	3.5	1,956	934	2,890	50%:hand,50%:mech.
b. Concrete Work								
R.C. Structures (sluice)	m3	192	200.0	50.0	38,400	9,600	48,000	
Concrete Channel	m3	2,128	200.0	50.0	425,600	106,400	532,000	
c. Metal Work (sluice)								
Screen (d 25mm)	ton	3.46	600.0	1,800.0	2,074	6,221	8,294	
Sluice Gate (12m*3m)	ton	24.00	600.0	1,800.0	14,400	43,200	57,600	12m(w)x3m(h)
d. Others (5% of a. to c.)	L.S.				24,275	8,675	32,950	
2. Pumping Station					5,023,591	19,350,238	24,373,829	
2.1. Civil Works					197,591	50,238	247,829	
a. Earth Work(incl. regulation pond)								
Common excavation	m3	5,760	0.6	1.4	3,456	8,064	11,520	by mech.equip
Foundation excavation	m3	1,440	7.3	3.5	10,476	5,004	15,480	50%:hand,50%:mech.
b. Concrete Work								
R.C. Structures	m3	60	200.0	50.0	12,000	3,000	15,000	
c. Wet Masonry								
Regulation Pond	m2	1,081	58.5	6.5	63,250	7,028	70,278	
d. Road Work								
Asphalt pavement (t=180mm)	m2	18,000	4.8	1.2	86,400	21,600	108,000	
e. Chain Link Fencing (h=1.8m)	m	350	36.0	9.0	12,600	3,150	15,750	
f. Others (5% of a. to e.)	L.S.				9,409	2,392	11,801	
2.2 Mechanical & Electrical Works					4,826,000	19,300,000	24,126,000	
a. Intake Equipement	L.S.				292,000	1,168,000	1,460,000	
b. Pumping Equipement	L.S.				2,163,000	8,651,000	10,814,000	
c. Power supply equipement	L.S.				2,141,000	8,562,000	10,703,000	
d. Others (5% of a. to c.)	L.S.				230,000	919,000	1,149,000	
3. Indirect Cost (20% of 1.+ 2.)	L.S.				1,106,672	3,906,484	5,013,156	
4. Land Acquisition & House Evacuation					700,000	0	700,000	
a. Land Acquisition	m2	7,000	100		700,000	0	700,000	
b. House Evacuation	unit	0	100,000		0	0	0	
5. Total (1.+2.+3.+4.)					7,340,031	23,438,902	30,778,933	

Table VI-13 (1/2) Required Facilities and Construction Costs by Alternatives

Air Mendidih (Sungai Petani)

Drainage Channel Improvement				Construction Cost of Alternatives (1000RM)			
Segment	Type	Status	Channel Length(m)	Alt.1	Alt.2	Alt.3	Alt.4
AM-1	E.T.	New	190	593	547	513	422
AM-2	E.T.	New	600	1,800	1,656	1,476	1,296
AM-3	E.T.	New	160	461	432	374	336
AM-4	E.T.	New	130	359	320	281	250
AM-5	E.T.	New	230	635	538	483	442
N-1	E.T.	New	430	722	722	671	619
N-2(1)	RC.R	New	260	555	555	437	374
N-2(2)	RC.R	New	200	336	336	288	276
N-3	RC.R	New	200	228	228	168	168
O-1	RC.R	New	630	983	983	907	718
P-1	RC.R	New	400	744	552	552	456
P-2	RC.R	New	710	1,193	809	809	809
P-3	RC.R	New	210	328	176	176	176
P-4	RC.R	New	90	130	59	59	59
Sub-total			4,440	9,066	7,915	7,195	6,402
Detention Facilities				Construction Cost of Alternatives (1000RM)			
Location	Type	Status	Pond Area (m2)	Alt.1	Alt.2	Alt.3	Alt.4
Polis Hutan	D.P.	New	25,400	-	717	717	717
Upper Line P	D.P.	New	10,200	-	329	329	329
Sek.Men.Sains	S.P.O.S.	New	54,000	-	-	318	318
IKM	S.P.O.S.	New	11,000	-	-	107	107
Line N	S.P.O.S.	New	6,400	-	-	111	111
Storage Tank	S.T.I.H.	New		-	-	-	22,071
Sub-total			107,000	0	1,047	1,583	23,654
Total				9,066	8,962	8,778	30,056

Note : Segments and locations of facilities refer to the Sector IV of Urban Drainage Improvement Plan

- ET = Earth Channel
- RC.R = Reinforced Concrete Channel (Rectangular Shape)
- D.P. = Detention Pond
- S.P.O.S. = Storage Facility in Public Open Space(On-site Detention Pond)
- S.I.I.H. = Storage Tank in Individual House Lot

Line G (Sungai Petani)

Drainage Channel Improvement				Construction Cost of Alternatives (1000RM)			
Segment	Type	Status	Channel Length(m)	Alt.1	Alt.2	Alt.3	Alt.4
G-1	RC.R	New	160	461	413	269	134
G-2	RC.R	New	240	648	518	374	202
G-3	RC.R	New	400	1,080	864	576	576
G-4	RC.R	New	400	1,032	792	-	-
G-5	RC.R	New	600	1,260	1,008	-	-
	RC.R	New	300			432	432
G-6	RC.R	New	70	118	101	101	101
G-7	RC.R	New	320	499	499	499	499
G-8	RC.R	New	670	884	884	884	884
D-1	RC.R	New	280	-	-	-	218
TK-1	RC.R	New	180	259	173	173	173
Sub-total			3,020	6,241	5,252	3,308	3,220
Detention Facilities				Construction Cost of Alternatives (1000RM)			
Location	Type	Status	Pond Area (m2)	Alt.1	Alt.2	Alt.3	Alt.4
Taman Keladi	D.P.	Rehabilitation	25,680	-	390	390	390
Taman Sri Wang	D.P.	Rehabilitation	6,870	-	145	145	145
Upper Line G	D.P.	New	18,200	-	-	468	468
Middle Line G	D.P.	New	42,500	-	-	998	998
Sub-total			93,250	0	535	2,001	2,001
Total				6,241	5,788	5,310	5,221

Note : Segments and locations of facilities refer to the Sector IV of Urban Drainage Improvement Plan

- RC.R = Reinforced Concrete Channel (Rectangular Shape)
- D.P. = Detention Pond

Table VI-13 (2/2) Required Facilities and Construction Costs by Alternatives

Pokok Mangga (Melaka)

Drainage Channel Improvement				Construction Cost of Alternatives (1000RM)						
Segment	Type	Status	Channel Length(m)	Alt.1	Alt.2	Alt.3	Alt.4	Alt.5	Alt.6	Alt.7
PM-1	RC.R	New	850	3,825	3,213	3,213	2,009	1,836	1,836	1,326
PM-2	RC.R	New	350	1,323	1,113	1,113	504	483	483	336
PM-3	RC.R	New	960	3,283	2,650	2,650	1,325	1,244	1,244	864
PM-4	RC.R	New	1,100	1,848	1,716	1,716	990	990	990	3,168
FW-1	RC.R	New	300				1,015	839	839	
	RC.R	New	800				1,680	1,344	1,344	
FW-2	RC.R	New	900				1,372	1,188	1,188	
FW-3	RC.R	New	550				726	574	574	
BL-1	RC.R	New	920	2,098	1,766	1,766	1,049	905	905	1,766
LP-1	RC.R	New	800	1,152	1,104	1,104	912	797	797	1,104
LP-2	RC.R	New	1,070	1,348	1,220	1,220	1,066	796	796	1,220
M-1	RC.R	New	1,480	2,486	2,220	2,220	1,456	1,066	1,066	3,374
M-2	RC.R	New	750	810	720	720	540	540	540	657
Taman Asean P/S	Unit Pump	New		-	-	-	-	-	-	30,800
Sub-total			10,830	18,173	15,722	15,722	14,644	12,602	12,602	44,616
Detention Facilities				Construction Cost of Alternatives (1000RM)						
Location	Type	Status	Pond Area (m2)	Alt.1	Alt.2	Alt.3	Alt.4	Alt.5	Alt.6	Alt.7
P-1	S.P.O.S.	New	14,250	-	139	-	-	139	-	-
P-2	S.P.O.S.	New	22,600	-	220	-	-	220	-	-
P-3	S.P.O.S.	New	7,700	-	75	-	-	75	-	-
P-4	S.P.O.S.	New	17,400	-	169	-	-	169	-	-
P-5	S.P.O.S.	New	8,000	-	78	-	-	78	-	-
P-6	S.P.O.S.	New	15,000	-	146	-	-	146	-	-
P-7	S.P.O.S.	New	17,200	-	168	-	-	168	-	-
L-1	S.P.O.S.	New	44,100	-	430	-	-	430	-	-
L-2	S.P.O.S.	New	14,200	-	138	-	-	138	-	-
L-3	S.P.O.S.	New	25,200	-	245	-	-	245	-	-
L-4	S.P.O.S.	New	39,100	-	381	-	-	381	-	-
L-5	S.P.O.S.	New	11,300	-	110	-	-	110	-	-
Storage Tank	S.T.I.H.	New		-	-	48,772	-	-	48,772	-
Sub-total			236,050	0	2,299	48,772	0	2,299	48,772	0
Total				18,173	18,021	64,494	14,644	14,901	61,374	44,616

Note : Segments and locations of facilities refer to the Sector IV of Urban Drainage Improvement Plan

RC.R = Reinforced Concrete Channel (Rectangular Shape)

S.P.O.S. = Storage Facility in Public Open Space(On-site Detention Pond)

S.I.I.H. = Storage Tank in Individual House Lot

Ayer Salak (Melaka)

Drainage Channel Improvement				Construction Cost of Alternatives (1000RM)		
Segment	Type	Status	Channel Length(m)	Alt.1	Alt.2	Alt.3
AS-1	E.T.	New	590/400/350/0			
			400	2,736		
			350		2,352	
			0			0
AS-2	E.T.	New	200			
			0	0	0	0
AS-3	E.T.	New	1320/700/700/150			
			700	4,032		
			700		4,032	
			150			711
AS-4	E.T.	New	1350/900/900/700			
			900	5,184		
			900		5,184	
			700			3,318
AS-5	E.T.	New	930	3,236	3,236	2,678
AS-6	E.T.	New	640	1,843	1,843	1,536
AS-7	E.T.	New	940	1,918	1,918	1,579
AS-8	E.T.	New	1,420	2,045	2,045	2,045
A1-1	E.T.	New	480	1,152	1,008	835
A1-2	E.T.	New	1,860	3,348	3,348	3,013
A1-3	E.T.	New	1,570	2,543	2,543	1,941
A2-1	E.T.	New	2,010	3,497	3,136	3,015
A2-2	E.T.	New	940	1,410	1,015	902
T1-1	E.T.	New	760	958	958	958
T2-1	E.T.	New	820	590	590	590
T3-1	E.T.	New	1,290	1,548	1,548	1,548
T4-1	E.T.	New	740	577	577	577
T5-1	E.T.	New	490	559	559	500
Sub-total			15,740	37,177	35,892	25,747
Detention Facilities				Construction Cost of Alternatives (1000RM)		
Location	Type	Status	Pond Area (m2)	Alt.1	Alt.2	Alt.3
Bukit Rambai	D.P.	Rehabilitation	21,100	-	287	287
Tg. Minyak (1)	D.P.	New	24,850	-	-	605
Tg. Minyak (2)	D.P.	New	31,920	-	-	649
Upper Ayer Salak	D.P.	New	49,800	-	-	559
Middle AB1	D.P.	New	73,200	-	-	537
Middle AB11	D.P.	New	114,000	-	-	877
Sub-total			314,870	0	287	3,514
Total				37,177	36,179	29,261

Note : Segments and locations of facilities refer to the Sector IV of Urban Drainage Improvement Plan

ET = Earth Channel

D.P. = Detention Pond

Table VI-14 Components and Salient Features of Priority Project in Sg. Air Mendidih Basin (Sg. Petani)

Drainage Channel		Existing Facilities			Proposed Facilities			Remarks
Seg. No.	Type	width (m)	depth (m)	length (m)	width (m)	depth (m)	length (m)	
Main Channel								
AM-1	Earth natural cahnnel	15-30	0.5-2.0	190	Earth trapezoidal channel	23.0	2.3	190
AM-2	Earth natural cahnnel	15-30	0.5-2.0	600	Earth trapezoidal channel	21.0	2.3	600
AM-3	Earth natural cahnnel	5-12	0.5-1.4	160	Earth trapezoidal channel	20.0	2.3	160
AM-4	Earth natural cahnnel	5-12	0.5-1.4	130	Earth trapezoidal channel	18.0	2.3	130
AM-5	Earth natural cahnnel	5-12	0.5-1.4	230	Earth trapezoidal channel	17.0	2.3	230
Line N								
N-1	Earth natural cahnnel	2.8-4.5	0.7-0.8	430	Earth trapezoidal channel	11.0	2.3	430
N-2(1)	R.C. rectangular channel	2.3	1.3-1.5	260	R.C. rectangular channel	4.5	2.3	260
N-2(2)	R.C. rectangular channel	2.3	1.3-1.5	200	R.C. rectangular channel	3.5	2.3	200
N-3	R.C. rectangular channel	2.3	1.3-1.5	200	R.C. rectangular channel	1.5	2.3	200
N-4	Earth trapezoidal channel	10-17	3.0-3.9	650				
N-5	Earth trapezoidal cahnnel	10-17	3.0-3.9	220				
Line O								
O-1	Earth trapezoidal cahnnel	4.5-6.1	0.9-1.1	630	R.C. rectangular channel	3.5	2.3	630
Line P								
P-1	Earth trapezoidal cahnnel	3.3-5.2	0.8-1.0	400	R.C. rectangular channel	3.0	2.3	400
P-2	Earth trapezoidal cahnnel	3-4	0.8-1.2	710	R.C. rectangular channel	2.5	2.3	710
P-3	Earth trapezoidal cahnnel	3-4	0.8-1.2	210	R.C. rectangular channel	1.5	2.3	210
P-4	Earth trapezoidal cahnnel	4.5-6.1	0.9-1.1	90	R.C. rectangular channel	1.0	2.3	90
Total				5,310	Total			4,440
Detention Facility		Storage Capacity (m3)			Storage Capacity (m3)			Remarks
Sek. Men. Sains On-site D.P.		29,000			Polis Hutan D.P.			Wet Pond
Total		29,000			Upper Line P D.P.			Dry Pond
					Sek. Men. Sains On-site D.P.			On-site storage
					IKM On-site D.P.			On-site storage
					Line N, Channel Storage.			Channel storage
Total		29,000			Total			130,900

Table VI-15 Components and Salient Features of Priority Project in Line G Basin (Sg. Petani)

Drainage Channel		Existing Facilities			Proposed Facilities			Remarks
Seg. No.	Type	width (m)	depth (m)	length (m)	Drainage Channel Type	width (m)	depth (m)	
G-1	Earth natural cahnnel	1.5	0.7	160	R.C. rectangular channel	1.5	2.3	160
G-2	R.C. rectangular channel	1.2	1.4-1.6	240	R.C. rectangular channel	1.5	2.3	240
G-3	R.C. rectangular channel	3	1.8	400	R.C. rectangular channel	3.5	2.3	400
G-4	Earth natural cahnnel	4-8	0.5-1.2	400	-	-	-	-
G-5	Earth natural cahnnel	2-4	0.6-1.5	600	R.C. rectangular channel	3.5	2.3	300
G-6	Concrete pipe	dia.1.7x2		70	R.C. rectangular channel	3.5	2.3	70
G-7	Earth natural cahnnel	2-4	0.6-1.5	320	R.C. rectangular channel	4.0	2.3	320
G-8	Earth natural cahnnel	2-4	0.6-1.5	670	R.C. rectangular channel	3.0	2.3	670
D-1					R.C. rectangular channel	3.5	2.3	280
TK-1					R.C. rectangular channel	3.5	1.3	180
Total				2,860	Total			2,620
Detention Facility		Storage Cpaacity (m3)			Storage Cpaacity (m3)			Remarks
Taman Keladi		36,050			63,000			
Taman Sri Wang		7,300			16,800			Dry pond
Total		43,350			48,300			Dry pond
Total					152,800			Dry pond

Table VI-16 Components and Salient Features of Priority Project in Prt. Pokok Mangga Basin (Melaka)

Drainage Channel		Existing Facilities			Proposed Facilities			Remarks
Seg. No.	Type	width (m)	depth (m)	length (m)	width (m)	depth (m)	length (m)	
Prt. Pokok Mangga								
PM-1	Earth trapezoidal channel	4.5-8.0	1.0-1.4	850	8.0	2.1	850	
PM-2	Earth trapezoidal channel	4.5-8.0	1.0-1.4	350	6.0	2.1	350	
PM-3	Earth trapezoidal channel	5.0-6.5	0.7-1.7	960	5.5	2.1	960	
PM-4	Lined trapezoidal channel	3.0-6.5	1.1-1.7	1,110	3.0	2.1	1,110	
New Trunk Drain								
FW-1					13.0	2.1	1,100	New
FW-2					8.5	2.1	900	New
FW-3					7.0	2.1	550	New
Prt. Brsar Limbongan								
BL-1	Lined trapezoidal channel	4.8	1.6	920	5.0	1.9	920	
Prt. Lorong Pandan								
LP-1	R.C. rectangular channel	1.5	1.5	800	3.0	1.9	800	
LP-2	R.C. rectangular channel	1.5	1.5	1,070	2.5	1.9	1,070	
Prt. Malim								
M-1	Earth trapezoidal channel	5.0-6.0	0.6-1.0	1,480	3.5	2.1	1,480	
M-2	Earth trapezoidal channel	5.5-6.5	0.5-1.0	750	2.0	2.1	750	
Total				8,290			10,840	
Detention Facility		Storage Capacity (m3)			Storage Capacity (m3)			Remarks
					Detention Facility			
					No detention facility proposed			

Table VI-17 Components and Salient Features of Priority Project in Sg. Ayer Salak Basin (Melaka)

Drainage Channel		Existing Facilities				Proposed Facilities				Remarks	
		Seg. No.	Type	width (m)	depth (m)	length (m)	Type	width (m)	depth (m)		length (m)
Ayer Salak(main)		AS-1	Earth trapezoidal cahnnel	26-29	3.0-4.2	590	Earth trapezoidal cahnnel	-	-	-	
		AS-2	Earth trapezoidal cahnnel	26-29	3.0-4.2	200	Earth trapezoidal cahnnel	-	-	-	
		AS-3	Earth trapezoidal cahnnel	23-29	3.0-4.2	1,320	Earth trapezoidal cahnnel	29.0	3.0	150	
		AS-4	Earth trapezoidal cahnnel	19-25	2.5-3.6	1,350	Earth trapezoidal cahnnel	25.0	2.5	700	
		AS-5	Earth trapezoidal cahnnel	19-20	2.5-2.8	930	Earth trapezoidal cahnnel	25.0	2.1	930	
		AS-6	Earth trapezoidal cahnnel	5-10	1.3-2.3	640	Earth trapezoidal cahnnel	24.0	2.1	640	
		AS-7	Earth trapezoidal cahnnel	5-10	1.3-2.3	940	Earth trapezoidal cahnnel	14.0	2.1	940	
		AS-8	Earth trapezoidal cahnnel	2-4	0.8-1.5	1,420	Earth trapezoidal cahnnel	11.0	2.1	1,420	
Sg Ayer Hitam		A1-1	Earth trapeziodal cahnnel	8-10	1.1-2.0	480	Earth trapeziodal cahnnel	13.0	2.8	480	
		A1-2	Earth trapeziodal cahnnel	5.5-8.5	0.5-1.6	1,860	Earth trapeziodal cahnnel	11.0	2.8	1,860	
		A1-3	Earth natural cahnnel	6-8		1,570	Earth trapeziodal cahnnel	9.0	2.3	1,570	
Prt AB11		A2-1	Earth trapeziodal cahnnel	5-6	0.9-1.6	2,010	Earth trapeziodal cahnnel	10.0	2.3	2,010	
		A2-2	Earth natural cahnnel	2-3	0.7-1.1	940	Earth trapeziodal cahnnel	7.0	1.9	940	
Ayer Salak(tributary)		T1-1	Earth natural channel	3.2	1.4	760	Earth trapeziodal cahnnel	9.5	2.1	760	
		T2-1	Earth rectangular channel	1.85	1.5	820	Earth trapeziodal cahnnel	5.5	1.6	820	
		T3-1	Earth natural channel	1.8	1.4	1,290	Earth trapeziodal cahnnel	8.5	2.1	1,290	
		T4-1	Earth natural channel	3-5	0.8-1.5	740	Earth trapeziodal cahnnel	6.0	1.6	740	
		T5-1	Earth natural channel	1.7	0.6	490	Earth trapeziodal cahnnel	6.5	1.8	490	
Total						18,350	Total			15,740	
Detention Facility				Storage Capacity (m3)		Storage Capacity (m3)					Remarks
Bukit Rambai				15,850							Dry pond
											Dry pond
											Dry pond
											Wet Pond
											Wetland
											Dry pond
Total				15,850		Total		296,500			

Table VI-18 Maintenance Cost for Drainage ChannelUnit : per 10,000m²

Description	Unit	Quantity	Unit Price(RM)	Amount(RM)	
1 Direct Cost					
a. Man Power					
Foreman	man.day	1.0	80.0	80.0	
Common Labour	man.day	6.0	33.0	198.0	
Operator	man.day	2.0	55.0	110.0	
b. Equipment					
Back hoe(0.09m ³)	unit.day	1.0	850.0	850.0	
Dump Truck (4t)	unit.day	1.0	450.0	450.0	
Grass Cutter	unit.day	4.0	70.0	280.0	
c. Others (5% of the above)				98.4	
2 Indirect Cost (10% of the above)				206.6	
3 Total (1.+2.)				2,273.0	

Note : This maintenance cost is estimated on the quarterly basis.

Annual maintenance cost per 10,000m² :

9,100.0

Table VI-19 Maintenance Cost for Detention Pond

Unit : per pond.time

Description	Unit	Quantity	Unit Price(RM)	Amount(RM)	
1 Direct Cost					
a. Man Power					
Foreman	man.day	0.5	80.0	40.0	
Common Labour	man.day	2.0	33.0	66.0	
Operator	man.day	1.0	55.0	55.0	
b. Equipment					
Back hoe(0.09m ³)	unit.day	0.5	850.0	425.0	
Dump Truck (4t)	unit.day	0.5	450.0	225.0	
Grass Cutter	unit.day	1.5	70.0	105.0	
c. Others (5% of the above)				45.8	
2 Indirect Cost (10% of the above)				96.2	
3 Total (1.+2.)				1,058.0	

Note : This maintenance cost is estimated on the quarterly basis.

Annual maintenance cost per pond

4,200.0

Table VI-20 Project Cost for Priority Projects

Priority Project	Unit : thousand RM									
	Construction Cost					Annual O&M Cost				
	Channel Impvt. Sub-Total	Existing Pond Rehabilitation	New Pond Construction	Detention Facilities Storage System in Public Open Space	Sub-Total	Total	Drainage Channels	Detention Facilities	Total	
Sungai Petani										
Air Mendidih (Alt.3)	7,195	-	1,047	536	1,583	8,778	35	112	148	
Line G (Alt.4)	3,220	535	1,466	-	2,001	5,221	8	98	105	
Total	10,415	535	2,513	536	3,584	13,999	43	210	253	
Melaka										
Pokok Mangga (Alt.4)	14,644	-	-	-	-	14,644	54	-	54	
Ayer Salak (Alt.3)	25,747	287	3,227	-	3,514	29,261	202	331	532	
Total	40,391	287	3,227	-	3,514	43,905	256	331	587	
G.Total	50,806	822	5,740	536	7,098	57,904	299	541	840	

Table VI-21 (1/2) Annual Disbursement Schedule for Priority Projects

Sg.Petani (Sg. Air Mendidih) Unit : 1000 RM

Year	Total		2001		2002		2003		2004		2005		2006~
	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	
1 Construction Cost													
Drainage channel	1,949	571	0	0	0	0	650	190	650	190	650	190	
Detention facilities	819	273	0	0	0	0	273	91	273	91	273	91	
2 Land Acquisition Cost													
Land acquisition (ch.)	4,175	0	0	0	1,392	0	1,392	0	1,392	0	0	0	
Land acquisition (dp.)	272	0	0	0	136	0	136	0	0	0	0	0	
3 Administration Cost	179	0	36	0	36	0	36	0	36	0	36	0	
4 Engineering Services Cost	375	169	187	84	47	21	47	21	47	21	47	21	
Sub-Total (1. To 4.)	7,768	1,013	223	84	1,610	21	2,533	303	2,397	303	1,005	303	
5 Physical Contingency	777	101	22	8	161	2	253	30	240	30	101	30	
Sub-Total (1. To 5.)	8,545	1,114	245	93	1,771	23	2,786	333	2,636	333	1,106	333	
6 Price Contingency	1,347	51	11	1	163	1	393	12	508	16	272	20	
Total (1. To 6.)	9,892	1,165	257	94	1,934	24	3,179	345	3,144	349	1,378	353	
Annual O&M Cost (ch.)			-	-	-	-	-	-	12	-	24	-	35
Annual O&M Cost (dp.)			-	-	-	-	-	-	-	-	-	-	112

Sg.Petani (Line G) Unit : 1000 RM

Year	Total		2,001		2,002		2,003		2,004		2,005		2006~
	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	
1 Construction Cost													
Drainage channel	1,584	444	0	0	0	0	528	148	528	148	528	148	
Detention facilities	945	296	0	0	0	0	315	99	315	99	315	99	
2 Land Acquisition Cost													
Land acquisition (ch.)	786	0	0	0	262	0	262	0	262	0	0	0	
Land acquisition (dp.)	512	0	0	0	256	0	256	0	0	0	0	0	
3 Administration Cost	164	0	33	0	33	0	33	0	33	0	33	0	
4 Engineering Services Cost	342	148	171	74	43	19	43	19	43	19	43	19	
Sub-Total (1. To 4.)	4,333	889	204	74	593	19	1,436	265	1,180	265	918	265	
5 Physical Contingency	433	89	20	7	59	2	144	27	118	27	92	27	
Sub-Total (1. To 5.)	4,766	978	224	81	653	20	1,580	292	1,298	292	1,010	292	
6 Price Contingency	792	44	10	1	60	0	223	11	250	14	249	18	
Total (1. To 6.)	5,558	1,022	234	82	713	21	1,803	303	1,548	306	1,259	310	
Annual O&M Cost (ch.)			-	-	-	-	-	-	2	-	5	-	7
Annual O&M Cost (dp.)			-	-	-	-	-	-	-	-	-	-	98

Note : Physical Contingency (10% of 1. To 4.)
 Price Contingency (4.5% for LC & 1.2 % for FC)
 ch. = drainage channel
 dp. = detention facilities

Table VI-21 (2/2) Annual Disbursement Schedule for Priority Projects

Melaka (Pokok Mangga)

Unit : 1000 RM

Year	Total		2,001		2,002		2,003		2,004		2,005		2006~
	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	
1 Construction Cost													
Drainage channel	7,205	2,021	0	0	0	0	2,402	674	2,402	674	2,402	674	
2 Land Acquisition Cost													
Land acquisition (ch.)	3,573	0	0	0	1,191	0	1,191	0	1,191	0	0	0	
3 Administration Cost	461	0	92	0	92	0	92	0	92	0	92	0	
4 Engineering Services Cost	980	404	490	202	122	51	122	51	122	51	122	51	
Sub-Total (1. To 4.)	12,219	2,425	582	202	1,406	51	3,807	724	3,807	724	2,616	724	
5 Physical Contingency	1,222	243	58	20	141	5	381	72	381	72	262	72	
Sub-Total (1. To 5.)	13,441	2,668	640	222	1,546	56	4,188	797	4,188	797	2,878	797	
6 Price Contingency	2,277	121	29	3	142	1	591	29	806	39	709	49	
Total (1. To 6.)	15,718	2,788	669	225	1,689	57	4,779	826	4,994	835	3,586	846	
Annual O&M Cost (ch.)			-	-	-	-	-	-	18	18	36	36	54

Melaka (Ayer Salak)

Unit : 1000 RM

Year	Total		2,001		2,002		2,003		2,004		2,005		2006~
	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	L.C.	F.C.	
1 Construction Cost													
Drainage channel	1,880	695	0	0	0	0	627	232	627	232	627	232	
Detention facilities	954	468	0	0	0	0	318	156	318	156	318	156	
2 Land Acquisition Cost													
Land acquisition (ch.)	22,683	0	0	0	7,561	0	7,561	0	7,561	0	0	0	
Land acquisition (dp.)	1,809	0	0	0	905	0	905	0	0	0	0	0	
3 Administration Cost	200	0	40	0	40	0	40	0	40	0	40	0	
4 Engineering Services Cost	367	222	183	111	46	28	46	28	46	28	46	28	
Sub-Total (1. To 4.)	27,892	1,385	223	111	8,551	28	9,496	415	8,591	415	1,030	415	
5 Physical Contingency	2,789	139	22	11	855	3	950	42	859	42	103	42	
Sub-Total (1. To 5.)	30,681	1,524	246	122	9,407	31	10,445	457	9,450	457	1,133	457	
6 Price Contingency	4,450	69	11	1	866	1	1,475	17	1,819	22	279	28	
Total (1. To 6.)	35,131	1,593	257	124	10,272	31	11,920	474	11,270	479	1,412	485	
Annual O&M Cost (ch.)			-	-	-	-	-	-	67	67	135	135	202
Annual O&M Cost (dp.)			-	-	-	-	-	-	-	-	-	-	331

Note : Physical Contingency (10% of 1. To 4.)
 Price Contingency (4.5% for LC & 1.2 % for FC)
 ch. = drainage channel
 dp. = detention facilities