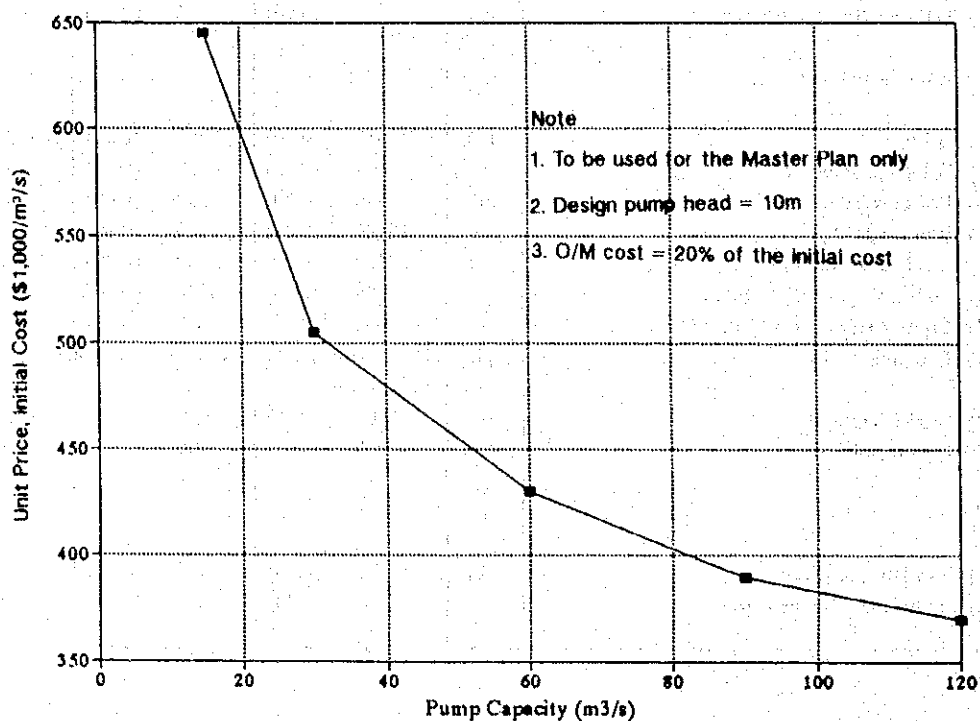


Table D3.2(2) UNIT PRICES FOR COST ESTIMATION (2/2)

Item	Unit	Unit Price (US\$)		Total
		F.C	L.C	
<b>B Compensation Cost</b>				
<b>1 Land Acquisition</b>				
(1) Yen So/Hoang Liet areas,inside Red River dike	m2	-	(-) 25 (1.0)	25
(2) Yen So/Hoang Liet areas,outside Red River dike	m2	-	(-) 19 (1.0)	19
(3) Along rivers/drainage channels	m2	-	(-) 190 (1.0)	190
<b>2 House Evacuation</b>	house	-	(-) 1300 (1.0)	1300
<b>3 Fishery Compensation</b>	m2	-	(-) 0.5 (1.0)	0.5



**TABLE D3.3(1) RUNOFF COEFFICIENT AT EACH RIVER BASIN (1/2)**  
**(LAND USE OF TO LICH RIVER BASIN IN 2010)**

No. of River Basin	Type of Land Use								Overall Runoff Coefficient
	High Density Urban Area		General Urban Area		Park & Green		Paddy Field etc.		
	Ai (ha)	AiCi	Ai (ha)	AiCi	Ai (ha)	AiCi	Ai (ha)	AiCi	
T1	67	53.6	39	25.35	24	2.4	0	0	0.63
T2	48	38.4	325	211.25	50	5	0	0	0.60
T3	36	28.8	217	141.05	50	5	0	0	0.58
T4	0	0	97	63.05	25	2.5	0	0	0.54
T5	75	60	214	139.1	20	2	0	0	0.65
T6	21	16.8	198	128.7	10	1	0	0	0.64
T7	11	8.8	87	56.55	8	0.8	0	0	0.62
T8	3	2.4	168	109.2	53	5.3	0	0	0.52
T9	0	0	21	13.65	26	2.6	31	1.55	0.23
L1	31	24.8	162	105.3	6	0.6	0	0	0.66
L2	10	8	151	98.15	14	1.4	0	0	0.61
L3	0	0	88	57.2	2	0.2	0	0	0.64
L4	0	0	78	50.7	19	1.9	0	0	0.54
L5	0	0	59	38.35	16	1.6	0	0	0.53
L6	0	0	184	119.6	97	9.7	0	0	0.46
K1	270	216	52	33.8	12	1.2	0	0	0.75
K2	15	12	56	36.4	51	5.1	0	0	0.44
K3	25	20	91	59.15	30	3	0	0	0.56
K4	0	0	75	48.75	51	5.1	0	0	0.43
K5	0	0	216	140.4	51	5.1	10	0.5	0.53
K6	0	0	154	100.1	217	21.7	100	5	0.27
S1	87	69.6	72	46.8	30	3	0	0	0.63
S2	0	0	176	114.4	18	1.8	0	0	0.60
S3	21	16.8	85	55.25	38	3.8	0	0	0.53
S4	2	1.6	126	81.9	10	1	0	0	0.61
H1	9	7.2	160	104	66	6.6	211	10.55	0.29
H2	0	0	126	81.9	30	3	45	2.25	0.43
Y1	0	0	15	9.75	23	2.3	0	0	0.32

**TABLE D3.3(2) RUNOFF COEFFICIENT AT EACH RIVER BASIN (2/2)**  
**(LAND USE OF NHUE RIVER BASIN IN 2010)**

No. of River Basin	Type of Land Use								Overall Runoff Coefficient
	High Density Urban Area		General Urban Area		Park & Green		Paddy Field etc.		
	Ai (ha)	AiCi	Ai (ha)	AiCi	Ai (ha)	AiCi	Ai (ha)	AiCi	
C1	0	0	76	49.4	40	4	22	1.1	0.39
C2	0	0	192	124.8	32	3.2	8	0.4	0.55
C3	0	0	49	31.85	229	22.9	21	1.05	0.19
C4	0	0	111	72.15	150	15	44	2.2	0.29
C5	0	0	160	104	20	2	26	1.3	0.52
C6	23	18.4	191	124.15	60	6	0	0	0.54
C7	0	0	17	11.05	45	4.5	13	0.65	0.22
C8	0	0	77	50.05	18	1.8	0	0	0.55
C9	0	0	167	108.55	23	2.3	45	2.25	0.48
C10	11	8.8	80	52	0	0	0	0	0.67
D1	26	20.8	332	215.8	54	5.4	30	1.5	0.55
D2	13	10.4	199	129.35	53	5.3	54	2.7	0.46
D3	0	0	11	7.15	26	2.6	75	3.75	0.12
D4	0	0	29	18.85	29	2.9	110	5.5	0.16
D5	15	12	58	37.7	0	0	224	11.2	0.21
M1	4	3.2	232	150.8	48	4.8	0	0	0.56
M2	0	0	142	92.3	32	3.2	55	2.75	0.43
M3	0	0	168	109.2	35	3.5	36	1.8	0.48
M4	0	0	51	33.15	58	5.8	344	17.2	0.12
M5	29	23.2	143	92.95	34	3.4	0	0	0.58
B1	0	0	101	65.65	15	1.5	85	4.25	0.36
B2	7	5.6	197	128.05	39	3.9	118	5.9	0.40
B3	14	11.2	225	146.25	42	4.2	89	4.45	0.45

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (1/11)

Line No.	Area Each Line (ha)	Accumu. (ha)	Length Each Line (m)		Con-Time (min)	P=1 years (m <sup>3</sup> /s)	Peak Flow P=2 years (m <sup>3</sup> /s)	P=5 years (m <sup>3</sup> /s)	Pipe Diameter (m)	Box Culvert		Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
			Ext.	Int.						Width (m)	Height (m)			
Roughness Coefficient 0.013														
Mean Velocity 0.8 m/sec														
Max. Waste water flow m <sup>3</sup> /sec/ha														
KS1	5.3	5.3	200	1,104	29.99	0.89	0.99	1.13	1.0			0.0025	1.51	1.19
KS2	4.6	4.6	250	1,087	29.65	0.77	0.86	0.98	1.0			0.0020	1.36	1.07
HK45	6.2	11.5	137	726	22.13	2.22	2.47	2.81		0.90	1.60	0.0038	2.07	2.98
To HK32														
KS3	3.0	3.0	300	585	19.19	0.61	0.66	0.77	0.80			0.0037	1.60	0.80
HK64	4.0	4.0	284	666	20.87	0.79	0.88	1.00		0.70	1.00	0.0037	1.63	1.14
HK32	1.5	20.0	141	1,656	41.50	2.81	3.15	3.60	1.00			0.0025	1.69	2.43
KS4												0.0025	1.53	1.20
To HK21														
KS5	5.1	5.1	300	780	23.24	0.95	1.06	1.20	1.20			0.0025	1.72	1.95
KS6	1.8	6.8	100	1,046	28.79	1.16	1.29	1.47	1.20			0.0025	1.72	1.95
HK3,28,27	8.0	8.0	720	1,480	37.83	1.18	1.33	1.51		0.90	1.30	0.0004	0.64	0.75
KS7	1.7	1.7	200	362	14.53	0.39	0.43	0.48	0.80			0.0020	1.18	0.59
KS8	0.0	10.2	300	1,708	42.57	1.41	1.59	1.81		1.30	1.00	0.0020	1.48	1.93
HK70	3.2	11.2	257	2,009	48.85	1.43	1.61	1.85		0.90	1.50	0.0007	0.84	1.14
KS9	2.7	12.9	280	2,213	53.10	1.56	1.76	2.02		1.35	1.50	0.0020	1.50	2.02
HK77	9.1	20.3	450	3,233	74.34	2.00	2.26	2.61		1.50	1.50	0.0003	0.71	1.60
HK71a	8.0	18.2	600	4,513	101.01	1.45	1.65	1.92		1.50	1.50	0.0001	0.28	0.64
HK54d	4.0	13.1	340	5,193	115.18	0.96	1.09	1.27		1.95	1.70	0.0001	0.45	1.49
To HK21														
HK11	35.3	35.3	533	3,879	87.81	3.11	3.53	4.09		0.90	1.60	0.0010	1.06	1.53
HK21	10.0	78.3	158	11,733	251.44	3.22	3.72	4.36		1.90	1.80	0.0022	2.12	6.63
HK80h	13.6	52.9	350	13,239	282.81	1.98	2.30	2.71		1.95	1.70	0.0011	1.50	4.96
HK67b	0	52.8	340	13,579	289.90	1.95	2.25	2.66		1.70	1.60	0.0003	0.73	1.98
To HB10b														
HK53	26.3	26.3	820	9,319	75.14	2.55	2.89	3.33		1.10	1.60	0.0008	0.96	1.49
HK67a	13.4	39.7	200	4,658	104.03	3.12	3.55	4.11		1.70	1.60	0.0062	3.36	9.13
To HB10a														
HK19	34.5	34.5	360	3,638	82.78	3.16	3.59	4.15		0.80	1.60	0.0007	0.87	1.11
HB10a	59.0	133.2	460	13,770	293.88	4.86	5.63	6.64		1.70	1.60	0.0019	1.87	5.09
To Kim N'gau river														
HB24'	18.9	18.9	260	2,056	49.82	2.39	2.69	3.08		1.00	0.80	0.0014	1.07	0.85
HB10b	7.9	79.6	1030	17,336	368.17	2.44	2.84	3.36		1.70	1.60	0.0008	1.20	6.55
To Kim N'gau river														
KS10	2.0	2.0	220	410	15.54	0.44	0.49	0.56	0.80			0.0020	1.18	0.59
KS11	3.5	18.4	260	2,770	64.71	1.98	2.23	2.57		1.35	1.20	0.0020	1.60	2.59
KS12	3.9	22.3	420	2,822	80.37	2.08	2.36	2.72		1.40	1.20	0.0020	1.62	2.72
KS13	2.0	12.2	310	2,096	50.67	1.52	1.71	1.96	1.20			0.0020	1.54	1.74
KS14	1.1	44.6	390	6,104	134.16	2.93	3.34	3.89		1.80	1.25	0.0020	1.77	3.88
KS15	0.6	45.2	210	6,361	139.53	2.88	3.29	3.84		1.75	1.25	0.0020	1.76	3.84
KS16	4.7	89.0	310	12,937	276.53	3.41	3.94	4.64		1.80	1.40	0.0020	1.85	4.66
KS17	2.6	91.6	540	13,698	292.38	3.36	3.89	4.59		1.80	1.40	0.0020	1.85	4.56
KS18	1.9	93.6	550	14,412	307.25	3.30	3.82	4.52		1.80	1.40	0.0020	1.85	4.66
To KC1														
KS20	6.0	6.0	400	967	27.14	1.05	1.17	1.33	0.40			0.0029	0.89	0.11
KS21	5.0	11.0	550	1,945	47.51	1.43	1.61	1.84	1.00			0.0030	1.67	1.31
KC2	3.7	14.7	300	2,559	60.52	1.65	1.87	2.15	1.20			0.0020	1.54	1.74
To KC3										1.35	1.10	0.0020	1.55	2.30
HB14'	1.0	1.0	130	1,179	31.56	0.16	0.18	0.20	0.60			0.0005	0.46	0.13
To HB10b									0.60			0.0005	0.49	0.14
HB14'	4.8	4.8	620	1,071	29.52	0.80	0.90	1.02	0.80			0.0005	0.60	0.30
To HB10b									1.20			0.0005	0.77	0.87

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (2/11)

Line No.	Area Each Line (ha)	Accumu. (ha)	Length Each Line (m)	Con-Time (min)		P=1 years (m <sup>3</sup> /s)	Peak Flow P=2 years (m <sup>3</sup> /s)	P=5 years (m <sup>3</sup> /s)	Pipe Diameter (m)	Box Cover		Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
				Ext. (m)	Int. (m)					Width (m)	Height (m)			
Max. Waste water flow 0.8 m <sup>3</sup> /sec Roughness Coefficient 0.013 Mean Velocity 0.8 m/sec														
H823	1.0	1.0	180	272	12.66	0.23	0.26	0.29	0.60			0.0007	0.57	0.16
H833	4.0	4.0	250	859	24.90	0.90	1.00	1.14	0.80			0.0000	0.11	0.05
K519	5.5	5.5	778	23.20	1.03	1.15	1.30	1.30	1.20			0.0020	1.54	1.74
KC1	3.4	102.4	320	15.796	3.37	3.91	4.62	4.62		1.80	1.40	0.0020	1.85	4.66
KC3	2.5	119.5	140	18.704	3.46	4.02	4.77	4.77		1.85	1.40	0.0020	1.86	4.82
KC4	9.0	128.6	100	19.571	4.14.73	2.68	3.12	3.71		1.90	1.40	0.0020	1.88	4.99
To Thanh Nhan Lake(K3)														
K522	4.8	4.8	601	19.53	0.97	1.07	1.21	1.21	1.20			0.0020	1.54	1.74
K525	4.4	4.4	400	1.375	35.65	1.40	1.56	1.79	1.20			0.0020	1.54	1.74
To Kim Ngau River (K.C)														
H466	5.4	5.4	480	988	27.59	0.78	0.87	0.99		1.16	0.72	0.0015	1.09	0.91
S53	0.8	6.2	200	1.256	33.17	0.82	0.92	1.05	1.20			0.0020	1.54	1.74
S54	6.3	12.5	590	2.382	56.62	1.22	1.38	1.59	1.20			0.0020	1.54	1.74
To S55														
S51	6.3	6.3	340	934	26.45	0.93	1.04	1.18	1.10			0.0020	1.45	1.38
S52	13.2	19.4	570	2.822	61.61	1.81	2.04	2.35		1.40	1.10	0.0020	1.57	2.42
S55	5.0	39.8	1520	7.873	171.02	1.84	2.10	2.46		1.45	1.10	0.0020	1.59	2.53
To Set River(S.B)														
H480-ab	0.8	0.8	120	1.96	11.08	0.17	0.18	0.21		0.80	0.80	0.0004	0.52	0.33
H485	1.5	2.3	350	6.69	20.94	0.37	0.41	0.47		1.80	1.00	0.0006	0.81	1.14
H485'	0.7	3.0	200	929	26.35	0.44	0.49	0.56		2.40	1.15	0.0004	0.86	2.37
To S55														
H480c	8.5	8.5	270	1.078	29.45	1.20	1.34	1.53		0.58	0.61	0.0028	1.14	0.40
H480e	13.8	13.8	320	1.631	40.98	1.64	2.10	2.10	0.80			0.0030	1.45	0.73
H479	7.2	29.5	370	3.691	83.89	2.25	2.55	2.95		1.50	1.05	0.0010	1.07	1.46
S56	13.2	42.7	320	6.061	133.28	2.36	2.70	3.14	1.20			0.0019	1.89	5.56
H479'	8.8	51.5	300	7.109	155.11	2.55	2.93	3.41		1.50	1.40	0.0009	1.14	4.78
To Bay Mau lake														
H443	0.7	0.7	740	8.10	23.88	0.12	0.13	0.15	0.60			0.001	0.56	0.16
H443'	0.5	1.2	750	1.601	40.35	0.15	0.16	0.19	0.80			0.001	0.77	0.39
To Bay Mau lake														
H815	33.6	33.6	650	3.842	87.04	2.50	2.84	3.28	1.00			0.002	1.25	0.98
S57	34.7	68.3	1070	7.862	170.78	3.16	3.62	4.23	1.20			0.003	1.78	3.14
H815'									1.00			0.003	1.67	1.31
To S52														
H42	17.4	17.4	510	2.163	52.06	1.80	2.03	2.33		2.37	1.84	0.003	2.91	32.69
S52	4.0	89.7	530	10.897	234.03	3.28	3.78	4.44		1.80	1.40	0.002	1.85	4.66
To S.B(Set River)														
H89	2.9	2.9	40	3.16	13.57	0.57	0.63	0.71	0.60			0.004	1.45	0.41
S51	10.9	13.8	720	1.965	47.93	1.50	1.69	1.94	1.20			0.003	1.89	2.13
To S.B(Set River)														
B20	4.4	4.4	350	7.68	23.00	0.70	0.78	0.86	0.60			0.001	0.59	0.17
B27	14.8	19.2	340	2.366	56.29	1.89	2.13	2.45		0.85	0.85	0.002	1.09	0.67
W1.1	6.95	11.4	300	1.659	41.56	1.34	1.50	1.72	1.20			0.003	1.78	2.01
W1.2									1.20			0.003	1.89	2.13
To Truc Bach														
B21	12.1	7.9	590	1.740	43.24	0.91	1.02	1.17		1.40	0.70	0.002	1.37	1.24
B21'	3.7	3.7	45	3.97	15.26	0.70	0.77	0.87	0.80			0.006	2.08	1.04
To Truc Bach														
B51	3.0	3.0	130	4.15	15.65	0.56	0.62	0.70	0.80			0.004	1.61	0.81
To Truc Bach														
B53	1.5	1.5	180	3.23	13.72	0.29	0.32	0.37	0.80			0.016	3.37	1.69

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (3/11)

Line No.	Area Each Line (ha)	Accum. (ha)	Length Each Line (m)	Est. (m)	Com-Time (min)	Peak Flow (m <sup>3</sup> /s)			Pipe Diameter (m)	Box Covert Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
						P=1 years	P=2 years	P=5 years						
Max. Winds water flow m <sup>3</sup> /sec/ha      Mean Velocity 0.8 m/sec      Roughness Coefficient 0.013														
B9	14.2	14.2	135	1,484	37.92	1.76	1.97	2.26	0.80	0.80	0.012	0.012	2.92	1.47
TS1														1.45
B28-a'	10.8	30.9	730	3,132	72.25	2.60	2.95	3.40	0.80	1.48	1.25	0.012	2.88	1.13
TS2														2.40
B28-a	7.6	38.5	700	4,478	100.29	2.60	2.96	3.43		1.49	1.25	0.002	1.60	1.07
TS3										1.50	1.30	0.002	1.60	2.40
To B28-c														
HK26	5.8	5.8	350	901	25.77	0.88	0.98	1.11	0.60	0.90	1.10	0.002	0.38	0.19
823	7.1	7.1	450	1,121	30.35	0.99	1.10	1.25	0.60	0.60	0.002	0.002	0.89	0.25
B28-b'	5.3	18.2	700	3,175	73.14	1.52	1.72	1.98		1.55	1.67	0.001	0.94	2.03
To B28-b														
88	13.1	13.1	450	1,697	42.95	1.53	1.72	1.97	0.60	0.60	0.002	0.002	0.98	0.28
TS5														1.74
817	10.3	10.3	450	1,430	36.79	1.30	1.46	1.66	0.80	1.20	0.002	0.002	1.54	0.59
TS6														1.07
B28-b	32.4	74.0	750	9,802	211.21	2.92	3.36	3.94	1.00	1.55	1.67	0.001	1.19	2.57
B28-c	26.4	138.9	520	17,045	362.10	3.62	4.21	4.99	1.00	2.00	1.80	0.001	1.19	4.30
TS4														1.07
To T1 (Thuy Khue Channel)														
HK68	9.1	9.1	530	1,395	36.05	1.20	1.34	1.53	1.00	1.00	1.20	0.001	1.17	1.41
To B31														0.26
823'	9.4	9.4	520	1,408	36.34	1.22	1.37	1.57	0.60	1.02	0.96	0.002	0.91	0.26
831	4.9	23.4	400	3,619	82.40	1.86	2.11	2.44		1.40	1.12	0.001	1.12	1.75
TS7														1.71
To B31'	6.2	6.2	650	1,239	32.81	0.86	0.96	1.09		1.40	1.12	0.001	1.09	1.71
831'	13.1	13.1	550	1,797	44.43	1.54	1.73	1.98	0.80	1.02	0.96	0.001	0.83	0.42
TS8														1.74
B31'	2.4	38.9	250	5,870	129.29	2.27	2.59	3.02	1.20	1.02	0.96	0.000	0.55	0.54
TS9										2.00	1.25	0.001	1.29	3.22
To D13'	7.0	7.0	220	887	25.49	1.10	1.23	1.39	0.60	0.60	0.001	0.001	0.69	0.19
81									1.00	1.10	1.05	0.002	1.37	1.07
D13'	14.1	66.2	580	9,777	210.69	2.70	3.11	3.65		2.80	1.05	0.001	1.07	1.18
TS11										3.12	1.65	0.003	3.05	14.88
D13	26.0	92.2	400	12,387	285.07	3.16	3.65	4.30						0.58
To TS.C (Nam Yen Lang Channel)														
D2	7.1	7.1	200	875	25.22	1.12	1.25	1.42	0.80	0.80	0.002	0.002	1.15	0.58
TS12									1.00	1.00	1.37	0.002	1.37	1.07
To TS.C (Nam Yen Lang Channel)														
D1	2.9	2.9	246	517	17.77	0.52	0.58	0.65	0.60	1.8	1.2	0.001	0.64	0.18
TS13	5.2	8.1	134	1,093	29.77	1.17	1.31	1.49		1.8	1.2	0.001	1.24	2.68
TS14	2.9	11.0	230	1,569	39.69	1.37	1.53	1.75		1.8	1.2	0.001	1.23	2.66
TS15	13.0	13.0	230	1,460	37.42	1.67	1.87	2.14	1			0.002	1.37	1.07
TS16	1.75	1.8	250	416	0.34	0.34	0.37	0.42	0.8			0.002	1.18	0.59
TS17	11.6	11.6	170	1,269	33.43	1.58	1.77	2.02				0.002	1.37	1.07
TS18	11.1	11.1	250	1,305	34.18	1.50	1.68	1.92	1			0.002	1.37	1.07
TS19	3.1	3.1	200	495	17.30	0.64	0.72	0.81	0.8	1.4	1.1	0.002	1.18	0.59
TS20	15.1	15.1	250	1,688	42.16	1.82	2.05	2.35		1.3	1.1	0.002	1.57	2.42
TS20	11.4	11.4	170	1,253	33.10	1.57	1.76	2.00				0.002	1.53	2.19
To TS.C (Nam Yen Lang Channel)														

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (4/11)

Line No.	Max. Waste water flow m <sup>3</sup> /sec/ha		Mean Velocity 0.8 m/sec		Roughness Coefficient 0.013		Area Each Line (ha)	Accumu. (ha)	Length Each Line (m)	Ext. (m)	Con-Time (min)	Peak Flow (m <sup>3</sup> /s)			Pipe Diameter (m)	Box Culvert Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
	P=1 years	P=2 years	P=5 years	P=1 years	P=2 years	P=5 years														
D17	2	2	400	19.29	0.35	0.39	0.45	0.80										0.003	1.36	0.68
TS28	2	4	320	29.50	0.58	0.65	0.74	1.00										0.002	1.37	1.07
TS29	5.9	5.9	200	22.84	0.97	1.08	1.23	1.00										0.002	1.37	1.07
TC3	6.2	6.2	500	28.33	0.92	1.02	1.17	1.00										0.002	1.37	1.74
TC4	9.8	9.8	500	34.71	1.31	1.47	1.62	1.20										0.002	1.54	1.74
TS22	8.5	8.5	200	28.04	1.28	1.42	1.57	1.00										0.002	1.54	1.74
TS23	6.5	6.5	200	23.97	1.04	1.16	1.32	1.00										0.002	1.37	1.07
TS24	7.7	7.7	200	26.47	1.19	1.33	1.51	1.20										0.002	1.54	1.74
TS25	8.5	8.5	200	28.04	1.28	1.42	1.57	1.20										0.002	1.54	1.74
TS26	16.8	16.8	200	44.39	1.97	2.21	2.53	1.20										0.002	1.54	1.74
TS27	3.3	3.3	200	17.60	0.60	0.66	0.75	1.00										0.002	1.37	1.07
To TS.5 (Nam Yen Lang Channel)																				
D39	24.0	24.0	750	70.09	2.13	2.40	2.77	1.50										0.001	1.37	2.42
TC4	31.6	31.6	280	32.84	2.67	3.03	3.49											0.002	1.73	3.49
To TS.A (Nam Yen Lang Channel)																				
D29	2.7	2.7	1130	1.388	0.36	0.40	0.46	0.80										0.001	0.89	0.45
TS29	6.6	6.6	807	23.81	1.07	1.19	1.35	1.00										0.002	1.37	1.07
TS30	8.1	8.1	180	9.50	1.24	1.38	1.57	1.20										0.002	1.54	1.74
TS31	5.9	5.9	170	7.33	22.27	0.99	1.10	1.25										0.002	1.37	1.07
TS32	14.4	14.4	170	1.536	38.99	1.81	2.03	2.32										0.002	1.58	2.47
TS33	10.4	10.4	230	12.19	1.45	1.62	1.85	1.20										0.002	1.54	1.74
TS34	13.3	13.3	260	1.526	1.68	1.89	2.16	1.20										0.002	1.54	2.22
TS35	14.6	14.6	200	1.589	40.11	1.82	2.04	2.33										0.002	1.58	2.47
To TS.A (Nam Yen Lang Channel)																				
D14	0.8	0.8	226	3.04	0.17	0.19	0.21	0.80										0.004	1.66	0.84
L32	3.8	3.8	450	8.13	23.94	0.63	0.70	0.79	1.00									0.002	1.37	1.07
LC4	4.8	4.8	280	1.807	44.64	1.12	1.26	1.44	1.20									0.002	1.54	1.74
D10	2.9	2.9	122	3.95	0.57	0.63	0.71	0.80										0.004	1.67	0.84
LC3	4.0	4.0	400	1.131	30.56	0.99	1.11	1.26	1.20									0.002	1.54	1.74
LC1	6.0	6.0	400	9.70	27.21	2.41	2.69	3.05	1.5									0.002	1.70	3.32
LC2	2.4	2.4	200	1.374	35.63	2.42	2.71	3.09	1.5									0.002	1.75	3.67
L53	3.8	3.8	300	6.58	20.70	0.66	0.73	0.83	1.00									0.002	1.37	1.07
L54	3.6	3.6	180	5.22	17.88	0.67	0.74	0.84	1.00									0.002	1.37	1.07
To L3 (Van Chong Lake)																				
D15	7.3	7.3	198	8.95	25.65	1.16	1.30	1.47	0.80									0.001	0.99	0.50
L51	2.3	2.3	292	5.07	17.57	0.42	0.47	0.53	1.00									0.002	1.37	1.07
To L1 (Gann Lake)																				
D46	15.9	15.9	180	1.687	42.15	1.94	2.18	2.50	0.80									0.001	0.83	0.42
D7a	13.2	13.2	600	1.854	45.63	1.55	1.74	1.99	0.60									0.002	0.89	0.25
L59	0.0	0.0	83	5.161	114.51	2.47	2.81	3.27	1.00									0.002	0.97	0.27
L55	2.6	2.6	350	5.92	19.34	0.46	0.51	0.58	1.00									0.002	1.37	1.07
L57	3.3	3.3	200	5.14	17.70	0.61	0.68	0.77	1.00									0.002	1.37	1.07
L58	3.3	3.3	150	1.526	39.01	1.17	1.31	1.50	1.20									0.002	1.54	1.74
To L1A																				
D7b	2.8	2.8	400	6.64	20.84	0.48	0.54	0.61	0.60									0.002	0.97	0.27
D21	1.4	1.4	308	1.101	29.93	0.61	0.68	0.77	0.80									0.002	1.18	0.59
L56	17.3	17.3	450	2.094	50.62	1.91	2.15	2.46	0.80									0.002	1.18	0.59
L510	13.9	13.9	300	1.616	40.66	1.73	1.94	2.22	1.20									0.002	1.58	2.47
L511	8.4	8.4	200	2.769	27.69	1.28	1.42	1.62	1.20									0.002	1.53	2.19
L512	2.6	2.6	500	5.424	120.00	3.27	3.72	4.33	1.00									0.002	1.54	1.74
L5	3.7	3.7	270	6.22	19.85	0.66	0.73	0.83	1.00									0.002	1.37	1.07
L513	10.4	10.4	300	1.288	33.83	1.44	1.61	1.83	1.00									0.002	1.50	1.96
L514	13.5	13.5	400	1.683	42.05	1.66	1.86	2.13	1.20									0.002	1.58	2.47

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (5/11)

Line No.	Area Each Line (ha)	Accum. (ha)	Length Each Line (m)	Ext. (m)	Con-Time		Peak flow P=1 years (m <sup>3</sup> /s)	Peak flow P=2 years (m <sup>3</sup> /s)	Peak flow P=5 years (m <sup>3</sup> /s)	Pipe Diameter (m)	Box Over- Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
					(min)	(m)									
D6	0.9	0.9	866	956	26.92	0.15	0.15	0.15	0.19	0.60			0.001	0.69	0.19
LC6	0.6	1.6	213	1,223	32.49	0.22	0.25	0.29	0.29	0.80			0.001	0.83	0.42
To L6(Trung Tu Lake)	5.2	6.8	400	2,065	50.03	0.75	0.85	0.85	0.97	1.20			0.001	1.09	1.23
LS17	4.3	4.3	150	562	18.71	0.73	0.81	0.81	0.92	1.00		1.15	0.002	1.37	1.07
LS18	8.7	8.7	350	1,174	31.46	1.15	1.29	1.29	1.47	1.20		1.20	0.002	1.54	1.74
LS19	4.3	4.3	160	572	18.92	0.73	0.81	0.81	0.91	1.00		1.15	0.002	1.37	1.07
LS20	1.9	1.9	200	384	14.99	0.41	0.46	0.46	0.46	0.80		1.15	0.002	1.18	0.59
LS21	7.2	7.2	200	887	25.48	1.12	1.24	1.24	1.41	1.20		1.15	0.002	1.54	1.74
LS22	8.6	8.6	100	920	26.17	1.32	1.47	1.47	1.67	1.20		1.15	0.002	1.54	1.74
LS23	13.0	13.0	500	1,736	43.17	1.45	1.63	1.63	1.87	1.20		1.15	0.002	1.54	2.10
LS24	4.3	4.3	150	559	18.66	0.73	0.81	0.81	0.91	1.20		1.15	0.002	1.54	1.74
LS25	16.1	16.1	200	1,730	43.03	1.80	2.02	2.02	2.32	1.30		1.20	0.002	1.58	2.47
LS26	4.4	4.4	130	548	18.42	0.75	0.83	0.83	0.94	1.00		1.15	0.002	1.37	1.07
LS27	4.9	4.9	100	566	18.78	0.82	0.91	0.91	1.03	1.00		1.15	0.002	1.37	1.07
LS28	2.2	2.2	200	405	15.43	0.39	0.43	0.43	0.49	0.80		1.15	0.002	1.18	0.59
LS29	4.8	4.8	250	702	21.62	0.75	0.84	0.84	0.95	1.00		1.15	0.002	1.37	1.07
LS30	23.7	23.7	220	2,467	58.39	2.21	2.49	2.49	2.86	1.55	1.20	1.20	0.002	1.67	3.11
LS31	16.1	16.1	400	1,930	47.20	1.71	1.92	1.92	2.20	1.30	1.20	1.15	0.002	1.56	2.33
LS32	10.9	10.9	340	5,663	124.97	2.84	3.24	3.24	3.77	1.85	1.20	1.15	0.002	1.78	4.12
LS33	14.1	14.1	200	1,557	39.02	1.65	1.87	1.87	2.13	1.30	1.20	1.15	0.002	1.56	2.33
LS34	7.5	7.5	400	1,114	30.20	1.02	1.14	1.14	1.29	1.20	1.20	1.15	0.002	1.54	1.74
LS35	5.6	5.6	400	927	26.32	0.80	0.90	0.90	1.02	1.00		1.25	0.002	1.37	1.07
LS36	4.3	4.3	400	4,341	97.45	2.10	2.38	2.38	2.76	1.50	1.50	1.25	0.002	1.68	3.15
D3a	0.9	0.9	591	674	21.04	0.14	0.16	0.16	0.18	0.60			0.002	0.97	0.27
D3b	1.6	1.6	334	482	17.05	0.27	0.30	0.30	0.34	0.80			0.002	0.97	0.59
D3c	4.4	4.4	237	1,814	44.79	0.75	0.84	0.84	0.97	1.00			0.002	1.52	1.20
To L2.A	2.3	2.3	240	457	16.52	0.40	0.45	0.45	0.51	0.60			0.002	1.02	0.29
D3d	1.9	1.9	400	584	19.16	0.32	0.36	0.36	0.41	1.00			0.002	1.37	1.07
D3e	5.6	5.6	500	1,032	28.50	0.78	0.87	0.87	0.99	1.00			0.002	1.37	1.07
D3f	2.9	2.9	250	526	17.95	0.50	0.55	0.55	0.62	1.00			0.002	1.37	1.07
LS37	10.2	10.2	150	1,119	30.31	1.22	1.36	1.36	1.55	1.20	1.20	1.15	0.002	1.52	2.10
LS38	10.8	10.8	230	1,246	32.96	1.24	1.38	1.38	1.58	1.20	1.20	1.15	0.002	1.52	2.10
LS39	15.8	15.8	230	1,729	43.01	1.56	1.76	1.76	2.01	1.20	1.20	1.15	0.002	1.52	2.10
LS40	5.0	5.0	400	873	23.18	0.65	0.73	0.73	0.82	1.00			0.002	1.37	1.07
LS41	1.7	1.7	400	562	16.70	0.25	0.28	0.28	0.32	0.80			0.002	1.18	0.59
LS42	2.0	2.0	400	588	19.24	0.29	0.32	0.32	0.37	0.80			0.002	1.18	0.59
To L.C(Upper Lu River)	3.0	3.0	250	505	17.52	0.39	0.43	0.43	0.49	1.00			0.002	1.37	1.07
LS44	12.2	12.2	170	1,207	32.15	1.21	1.35	1.35	1.54	1.25	1.25	1.15	0.002	1.54	2.21
LS45	15.6	15.6	300	1,623	40.82	1.35	1.52	1.52	1.74	1.35	1.35	1.15	0.002	1.58	2.45
To L14	17.4	17.4	650	2,126	51.30	1.32	1.49	1.49	1.71	1.35	1.35	1.15	0.002	1.56	2.45
LS47	13.6	13.6	450	1,606	40.46	1.19	1.33	1.33	1.52	1.25	1.25	1.15	0.002	1.54	2.21
LS48	41.4	41.4	600	2,974	68.97	2.63	2.97	2.97	3.42	1.85	1.85	1.40	0.002	1.86	4.82
LC7	9.0	9.0	300	1,068	29.26	0.94	1.05	1.05	1.19	1.20			0.002	1.54	1.74
To L6A	7.9	7.9	420	1,092	29.74	0.94	1.05	1.05	1.19	1.20			0.002	1.54	1.74
LS50	12.6	12.6	420	1,504	38.33	1.32	1.48	1.48	1.69	1.20	1.20	1.15	0.002	1.52	2.10
LS51	15.2	15.2	350	1,642	41.21	1.52	1.70	1.70	1.94	1.35	1.35	1.15	0.002	1.58	2.45
LS52	18.5	18.5	300	1,868	45.92	1.73	1.94	1.94	2.23	1.40	1.40	1.25	0.002	1.64	2.88
To L8	1.4	1.4	531	664	20.83	0.24	0.27	0.27	0.31	0.80		1.00	0.001	0.83	0.42
D8	2.8	2.8	212	1,009	28.02	0.43	0.48	0.48	0.54	0.50	0.50	1.00	0.002	1.04	0.52
D23	5.9	5.9	330	891	25.55	0.94	1.05	1.05	1.19	1.00			0.002	1.37	1.07
LS16	2.3	2.3	240	457	16.52	0.40	0.45	0.45	0.51	0.60			0.002	1.02	0.29
To L6(Trung Tu Lake)	2.3	2.3	240	457	16.52	0.40	0.45	0.45	0.51	0.60			0.002	1.02	0.29



TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (6/11)

Line No.	Area Each Line (ha)	Accumul. (ha)	Length Each Line (m)		Con-Time (min)	Peak Flow (m <sup>3</sup> /s)			Pipe Diameter (m)	Box Culvert Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
			Ext.	Int.		P=1 years	P=2 years	P=5 years						
D25 & D44	8.5	8.5	1,696	2,502	59.12	0.67	0.76	0.87	1.00			0.002	1.18	0.93
To To Lich river	5.0	5.0	1,680	2,159	51.96	0.50	0.56	0.64	1.00			0.001	0.97	0.76
HS14	8.0	8.0	600	1,277	33.61	1.00	1.12	1.28	1.20			0.002	1.54	1.74
To Lu-Set Floodway	4.0	4.0	1,330	1,709	42.61	0.32	0.36	0.41	1.00			0.001	0.97	0.76
To H3(Linh Dam Lake)	7.5	7.5	450	1,159	31.15	0.98	1.09	1.25	1.20			0.002	1.54	1.74
SS9	12.3	12.3	400	1,572	39.74	1.42	1.59	1.82	1.20			0.002	1.54	1.98
SS10	15.0	15.0	400	1,825	45.02	1.61	1.81	2.07	1.30			0.002	1.56	2.33
SS11	14.1	14.1	360	1,698	42.37	1.56	1.76	2.01	1.25			0.002	1.54	2.21
SC3	3.7	3.7	702	1,055	28.99	0.26	0.40	0.46	0.80			0.001	0.77	0.39
HS26	8.7	8.7	850	1,587	40.06	0.71	0.80	0.91	1.20			0.002	1.54	1.74
SC18	9.3	9.3	180	1,059	29.06	1.26	1.40	1.60	1.20			0.002	1.54	1.74
SC16	25.9	25.9	150	2,606	61.29	2.04	2.30	2.64	1.60		1.25	0.002	1.71	3.42
SC17	3.7	3.7	350	702	21.61	0.51	0.57	0.64	1.00			0.002	1.37	1.07
SC19	16.4	16.4	300	1,862	45.79	1.75	1.96	2.25	0.80			0.002	1.26	0.63
HS40	16.8	16.8	270	1,866	45.88	1.78	2.00	2.30	0.80			0.002	1.52	2.08
SS12	9.3	9.3	150	1,029	28.43	1.27	1.42	1.61	1.20			0.002	1.54	1.74
To S.B.(Set river)	36.6	36.6	280	1,029	28.43	5.11	5.70	6.49	2.20			0.002	2.03	6.94
SS20	18.9	18.9	340	2,134	51.45	1.90	2.14	2.46	1.40			0.002	1.82	2.72
SS21	8.5	8.5	290	1,054	28.97	1.17	1.31	1.49	1.20			0.002	1.54	1.74
SS22	9.6	9.6	100	1,012	28.08	1.35	1.50	1.71	1.20			0.002	1.50	1.98
SS23	8.4	8.4	500	1,298	34.04	1.07	1.20	1.36	1.20			0.002	1.54	1.74
SS24	18.8	18.8	250	2,036	49.42	0.92	1.04	1.19	1.10			0.002	1.45	1.38
HL1	34.7	34.7	150	3,443	78.74	1.88	2.13	2.47	1.50			0.002	1.60	2.64
To Linh Dam Lake	7.1	7.1	520	1,190	31.79	0.66	0.73	0.84	1.00			0.002	1.37	1.07
To Linh Dam Channel	40.0	40.0	200	4,000	90.33	1.34	1.52	1.76	1.20			0.002	1.54	1.74
HL4	54.8	54.8	650	5,856	129.00	2.12	2.42	2.82	1.50			0.002	1.65	2.96
HL5	9.9	9.9	400	1,341	34.93	1.14	1.28	1.46	1.20			0.002	1.54	1.74
To T.B.(Lower Kim Ngau River)	1.9	1.9	260	441	16.18	0.31	0.34	0.39	0.70			0.002	1.08	0.41
KS23	2.2	2.2	260	469	16.77	0.28	0.31	0.35	0.70			0.002	1.08	0.41
To K3.A	23.05	23.05	600	2,790	65.12	1.45	1.64	1.89	1.30			0.002	1.48	1.93
KS24	18.7	18.7	500	2,278	54.46	1.32	1.48	1.70	1.20			0.002	1.54	1.74
To K3.B	6.7	6.7	300	937	26.51	0.84	0.94	1.07	1.00			0.002	1.37	1.07
KS30	4.3	4.3	230	637	20.28	0.61	0.67	0.76	1.00			0.002	1.27	0.81
KS51	6.7	6.7	380	1,017	28.78	0.82	0.91	1.04	1.00			0.002	1.37	1.07
KS32	15.0	15.0	200	1,625	40.85	1.50	1.69	1.93	1.30			0.002	1.48	1.93
KS33	2.5	2.5	350	588	19.24	0.36	0.40	0.45	0.80			0.002	1.18	0.59
To K5.A														

Max. Waste water flow m<sup>3</sup>/sec/ha 0.8 m/sec  
Roughness Coefficient 0.013

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (7/11)

Line No.	Area Each Line (ha)	Accumul. (ha)	Length Each Line (m)		Con-time (min)	P=1 years (m <sup>3</sup> /s)	Peak flow P=2 years (m <sup>3</sup> /s)	P=5 years (m <sup>3</sup> /s)	Pipe Diameter (m)	Box Convent Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
			Ext.	Int.										
H839	3.5	16.29	113	448	16.29	0.57	0.63	0.72	0.60			0.002	0.97	0.27
	1.8	59	59	21.14	21.14	0.78	0.87	0.98	0.80			0.002	1.18	0.59
	8.4	13.7	271	1749	43.43	1.41	1.58	1.81	1.00			0.002	1.37	1.07
H838	12.7	26.4	408	3359	76.98	1.90	2.15	2.48	1.50			0.002	1.79	3.16
	2.4	120	353	14.35	14.35	0.33	0.36	0.41	0.40	0.50		0.002	0.80	0.16
	6.6	9.1	324	1305	34.18	0.83	0.93	1.06	0.60			0.002	0.97	0.27
KS25	15.5	53.40	314	2227	53.40	1.10	1.24	1.42	0.80			0.002	1.18	0.59
	15.6	480	480	1962	47.88	1.43	1.60	1.84	1.00			0.002	1.37	1.07
	23.1	38.7	450.0	2640	61.99	3.02	3.41	3.92	1.25	1.00	1.25	0.002	1.46	1.83
To K.B(Upper Kim Ngau River)	41.7	100	4063	91.64	2.05	2.33	2.69	1.63	1.50	1.15		0.002	1.63	2.81
	11.5	460	1549	39.28	5.57	6.25	7.14	2.05	2.50	1.45		0.002	2.05	7.42
	12.3	300	1472	37.66	1.05	1.17	1.34	1.45	1.10			0.002	1.45	1.38
To K.A(Upper Kim Ngau River)	8.3	450	1242	32.87	0.76	0.85	0.97	1.37	1.00			0.002	1.37	1.07
	1.8	300	471	16.81	0.22	0.25	0.28	0.27	0.60			0.002	0.97	0.27
	4.5	250	678	21.11	0.63	0.70	0.79	0.81	0.90			0.002	1.27	0.81
KS40	20.5	600	2548	60.07	1.33	1.50	1.72	1.74	1.20			0.002	1.74	1.74
	12.4	450	1628	40.92	1.24	1.39	1.59	1.54	1.20			0.002	1.54	1.74
	26.5	400	2919	67.81	1.96	2.21	2.55	1.59	1.40	1.15		0.002	1.59	2.57
KS44	32.8	300	3416	78.17	2.21	2.50	2.89	1.65	1.50	1.20		0.002	1.65	2.98
	7.8	300	1038	28.62	0.94	1.05	1.19	1.37	1.00			0.002	1.37	1.07
	11.0	520	1560	39.51	1.27	1.42	1.62	0.73	0.80			0.001	0.73	0.37
To K6.F	14.0	470	1800	44.50	1.51	1.70	1.95	1.09	1.20			0.001	1.09	1.23
	28.8	240	3923	88.73	2.01	2.28	2.64	2.02	1.50	1.70		0.002	2.02	5.14
	3.0	70	260	12.42	0.38	0.42	0.48	0.97	1.00			0.001	0.97	0.76
To T2.B(Ngoc Ha Channel)	3.0	70	355	14.40	0.59	0.66	0.74	0.82	1.67	1.29		0.002	1.77	3.82
	1.0	200	295	13.15	0.20	0.23	0.25	0.61	0.80			0.002	1.22	0.61
	5.1	220	966	27.13	0.78	0.87	0.99	1.74	1.20			0.002	1.74	1.74
To T5.C(Nam Yen Lang Channel)	1.7	80	242	12.03	0.35	0.39	0.44	0.97	1.70	1.30		0.001	1.10	2.44
	2.5	350	588	19.24	0.44	0.48	0.55	0.76	1.00			0.001	0.97	0.76
	5.3	350	854	24.78	0.63	0.92	1.05	0.83	0.80			0.001	0.83	0.42
To T2.C(Dat Yen Channel)	10.0	500	3035	70.24	1.70	1.93	2.22	1.09	1.20	1.20		0.001	1.09	1.23
	13.3	1100	2359	56.14	1.25	1.41	1.61	2.29	1.60			0.001	1.19	2.29
	5.1	530	1011	28.07	0.75	0.83	0.95	0.64	0.80			0.001	0.64	0.32
TS40	2.6	240	4508	100.91	1.86	2.12	2.45	1.09	1.60	1.20		0.001	1.09	1.23
	6.5	200	818	24.03	1.03	1.15	1.30	0.63	1.00			0.001	0.63	0.31
	4.7	150	600	19.49	0.82	0.91	1.03	0.97	1.00			0.002	0.97	0.76
To T17(Giding Vo Lake)	4.7	150	600	19.49	0.82	0.91	1.03	0.63	1.00			0.002	0.63	0.31
	4.7	150	600	19.49	0.82	0.91	1.03	0.97	1.00			0.002	0.97	0.76
	4.7	150	600	19.49	0.82	0.91	1.03	1.69	1.00			0.002	1.69	3.24

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (8/11)

Line No.	Area Each Line (ha)	Accum. (ha)	Length Each Line (m)	Etc. (m)	Con-time (min)	Peak Flow (m <sup>3</sup> /s)			Pipe Diameter (m)	Box Convent Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
						P=1 years (m <sup>3</sup> /s)	P=2 years (m <sup>3</sup> /s)	P=5 years (m <sup>3</sup> /s)						
TS44	6.1	27.37	400	978	27.37	0.91	1.01	1.15	1.10			0.002	1.45	1.38
TS45	3.0	3.0	400	680	21.17	0.49	0.55	0.62	0.90			0.002	1.27	0.81
TS46	8.6	8.6	350	1,169	31.36	1.20	1.34	1.53	1.20			0.002	1.54	1.74
TS47	5.1	5.1	350	832	24.34	0.80	0.89	1.01	1.00			0.002	1.37	1.07
TS48	8.9	8.9	350	1,191	31.81	1.22	1.37	1.56	1.20			0.002	1.54	1.74
TS49	6.7	6.7	200	839	24.48	1.06	1.18	1.34	1.20			0.002	1.54	1.74
To T6.B	5.0	5.0	300	778	23.21	0.81	0.90	1.02	1.00			0.002	1.37	1.07
TS50	10.7	10.7	400	1,417	36.51	1.38	1.54	1.76	1.20			0.002	1.54	1.74
TS51	3.0	3.0	220	502	17.45	0.54	0.60	0.68	0.90			0.002	1.27	0.81
TS52	8.9	8.9	220	1,066	29.20	1.29	1.44	1.63	1.20			0.002	1.54	1.74
TS53	8.6	8.6	220	1,040	28.67	1.26	1.41	1.60	1.20			0.002	1.54	1.74
TS54	9.1	9.1	420	1,285	33.76	1.22	1.37	1.56	1.20			0.002	1.54	1.74
TS55	7.1	7.1	300	972	27.25	1.06	1.18	1.34	1.20			0.002	1.54	1.74
TS56	6.3	6.3	300	901	25.77	0.97	1.08	1.23	1.20			0.002	1.54	1.74
TS57	10.5	10.5	350	1,343	34.97	1.38	1.54	1.76	1.20			0.002	1.54	1.74
TS58	6.3	6.3	250	3,031	70.15	2.02	2.28	2.63	1.50	1.10		0.002	1.60	2.64
To T6.A	8.9	8.9	200	1,046	28.78	1.21	1.36	1.54	1.20			0.002	1.54	1.74
TS60	9.6	9.6	600	2,462	58.28	1.70	1.92	2.21	1.20	1.45		0.002	1.53	2.22
TC1	3.9	3.9	150	521	17.84	0.66	0.73	0.83	1.00			0.002	1.37	1.07
To T2.C	6.8	6.8	300	941	26.61	0.96	1.07	1.21	1.20			0.002	1.54	1.74
TS61	12.7	12.7	350	1,554	38.38	1.47	1.65	1.88	1.20	1.30		0.002	1.48	1.93
To T2.B	20.0	20.0	320	2,222	53.30	1.94	2.19	2.51	1.45	1.10		0.002	1.59	2.53
TS62	29.1	29.1	350	3,117	71.93	2.34	2.65	3.06	1.60	1.20		0.002	1.69	3.24
TS63	11.2	11.2	404	4,671	104.31	2.53	2.88	3.34	1.65	1.20		0.002	1.70	3.37
TS64	39.6	39.6	100	3,857	87.36	2.80	3.18	3.67	1.80	1.20		0.002	1.74	3.76
To T6.A	26.0	26.0	350	2,820	65.75	2.22	2.50	2.88	1.50	1.20		0.002	1.65	2.98
TS65	8.6	8.6	120	936	26.50	1.10	1.22	1.39	1.20			0.002	1.54	1.74
TS70	11.9	11.9	200	1,320	34.70	1.33	1.48	1.69	1.20			0.002	1.54	1.74
TS71	4.9	4.9	200	669	20.93	0.70	0.78	0.88	1.00			0.002	1.37	1.07
TS72	34.7	34.7	650	3,943	89.14	2.18	2.47	2.86	1.50	1.20		0.002	1.65	2.98
TS73	13.9	13.9	500	1,818	44.88	1.34	1.51	1.73	1.20			0.002	1.54	1.74
TS74	3.2	3.2	170	473	16.85	0.59	0.65	0.74	0.90			0.002	1.27	0.81
TS75	2.9	2.9	170	448	16.33	0.55	0.60	0.68	0.90			0.002	1.27	0.81
To T4.A	5.9	5.9	180	736	22.33	0.87	0.97	1.10	1.20			0.002	1.54	1.74
TS77	1.9	1.9	280	456	16.49	0.31	0.34	0.39	0.70			0.002	1.08	0.41
TS78	2.9	2.9	350	626	20.93	0.45	0.50	0.57	0.80			0.002	1.18	0.59
TS79	20.3	20.3	120	2,049	49.68	1.99	2.24	2.57	1.50	1.10		0.002	1.60	2.64
To T.E	10.3	10.3	300	1,282	33.71	1.26	1.41	1.60	1.20			0.002	1.54	1.74
TS80	64.8	64.8	460	6,613	144.77	3.11	3.56	4.15	2.00	2.00		0.002	1.79	4.29
To T3.A	27.3	27.3	500	3,096	71.50	2.13	2.41	2.78	1.50	1.20		0.002	1.65	2.98
TS82	11.5	11.5	300	1,389	35.94	1.21	1.35	1.55	1.20			0.002	1.54	1.74
TS83	28.2	28.2	150	2,824	65.84	2.08	2.35	2.70	1.50	1.20		0.002	1.65	2.98
To T.D	14.1	14.1	300	1,635	41.06	1.38	1.54	1.77	1.20			0.002	1.54	1.74
TS84	15.2	15.2	350	1,794	44.38	1.43	1.60	1.83	1.30	1.00		0.002	1.48	1.93
To T.C	3.7	3.7	450	804	23.75	0.48	0.54	0.61	0.90			0.002	1.27	0.81
TS86	3.7	3.7	450	804	23.75	0.48	0.54	0.61	0.90			0.002	1.27	0.81
TS87	3.7	3.7	450	804	23.75	0.48	0.54	0.61	0.90			0.002	1.27	0.81
TS88	3.7	3.7	450	804	23.75	0.48	0.54	0.61	0.90			0.002	1.27	0.81
To T8.A														

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (9/11)

Line No.	Area Each Line (ha)	Accumu. (ha)	Length Each Line (m)		Com-Time (min)	Peak Flow (m <sup>3</sup> /s)			Pipe Diameter (m)	Box Culvert		Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
			Ext.	Int.		p=1 years	p=2 years	p=5 years		Width (m)	Height (m)			
CS1	32.3	32.3	3714	650	84.37	1.52	1.72	1.99	1.30	1.30	1.70	0.002	1.53	2.19
CS2	17.1	17.1	1920	300	46.99	1.16	1.30	1.49	1.20	1.40	1.15	0.002	1.54	1.74
CS3	57.3	57.3	6347	900	139.23	1.90	2.18	2.54				0.002	1.59	2.57
To C.E														
CS4	42.2	42.2	4605	600	102.93	1.73	1.97	2.29				0.002	1.55	2.30
To C2.A														
CS5	58.5	58.5	6256	700	137.33	1.96	2.24	2.61	1.20	1.40	1.20	0.002	1.62	2.72
CS6	19.4	19.4	2496	650	59.00	1.15	1.30	1.50	1.20	1.40	1.20	0.002	1.54	1.74
To C.D														
CS7	5.4	5.4	811	300	23.89	0.52	0.58	0.66	0.90	0.90	1.20	0.002	1.27	0.81
To C3.A														
CS8	37.2	37.2	3933	400	88.93	2.38	2.71	3.13	1.20	1.60	1.20	0.002	1.69	3.24
CS9	20.0	20.0	2345	450	55.86	0.91	1.03	1.18	1.20	1.60	1.20	0.002	1.54	1.74
To C4.B														
CS10	13.2	13.2	1754	500	43.54	1.32	1.49	1.70	1.20	1.60	1.20	0.002	1.54	1.74
CS11	37.2	37.2	4083	550	92.06	2.33	2.64	3.06				0.002	1.69	3.24
CS12	9.7	9.7	1473	550	37.69	0.56	0.62	0.71	0.90	0.90	1.20	0.002	1.27	0.81
CS13	9.7	9.7	1173	250	31.44	0.61	0.69	0.78	0.90	0.90	1.20	0.002	1.27	0.81
CS14	15.2	15.2	2089	650	50.53	0.48	0.54	0.62	0.90	0.90	1.20	0.002	1.27	0.81
To C4.A														
CS15	15.2	15.2	2189	750	52.61	1.29	1.45	1.66	1.20	1.60	1.20	0.002	1.54	1.74
CS27	5.2	5.2	794	300	23.54	0.70	0.78	0.89	1.00	1.00	1.20	0.002	1.37	1.07
To C.C														
CS16	19.2	19.2	1876	150	48.17	1.72	1.93	2.22	1.20	1.40	1.10	0.002	1.57	2.42
CS17	9.6	9.6	1663	750	41.65	0.93	1.05	1.20	1.20	1.20	1.10	0.002	1.54	1.74
CS18	9.6	9.6	1263	350	33.32	1.05	1.18	1.35	1.20	1.20	1.10	0.002	1.54	1.74
To C5.B														
CS19	26.4	26.4	3058	550	70.71	1.86	2.11	2.43				0.002	1.59	2.57
To C5.A														
CS20	6.3	6.3	952	350	26.83	0.80	0.90	1.02	1.00	1.00	1.00	0.002	1.37	1.07
CS21	40.3	40.3	4024	200	90.83	2.50	2.83	3.28				0.002	1.70	3.37
CS22	11.3	11.3	1377	300	35.68	1.25	1.39	1.59	1.20	1.65	1.20	0.002	1.54	1.74
CS23	8.9	8.9	1249	400	33.01	1.02	1.14	1.30	1.20	1.50	1.15	0.002	1.54	1.74
CS24	27.7	27.7	3053	420	70.61	2.03	2.30	2.65				0.002	1.63	2.81
To C5.B														
CS25	19.9	19.9	2695	800	63.14	1.57	1.77	2.04	0.70	1.35	1.05	0.002	1.53	2.16
CS26	2.0	2.0	510	320	17.63	0.31	0.34	0.38	0.70	0.70	1.05	0.002	1.08	0.41
To C5.A														
CS28	10.5	10.5	1398	400	36.11	1.10	1.24	1.41	1.20	1.40	1.15	0.002	1.54	1.74
CS29	2.4	2.4	578	350	19.04	0.34	0.38	0.43	0.80	0.80	1.05	0.002	1.18	0.59
To C7.A														
CS30	20.4	20.4	2283	350	54.57	1.75	1.98	2.27	1.00	1.30	1.15	0.002	1.56	2.33
CS31	24.8	24.8	2556	200	60.25	0.82	0.92	1.06	1.00	1.30	1.15	0.002	1.37	1.07
To C.B														
CS32	22.3	22.3	2565	450	60.44	1.84	2.07	2.38				0.002	1.57	2.42
To C8.A														
CS33	23.4	23.4	2621	400	61.61	1.87	2.11	2.43				0.002	1.59	2.57
To Co Nhus R/R														
CS34	43.7	43.7	4853	700	108.11	2.14	2.43	2.83	1.55	1.55	1.15	0.002	1.64	2.93
CS35	21.3	21.3	2674	650	62.70	1.50	1.69	1.95	1.30	1.30	1.05	0.002	1.51	2.06
CS36	21.3	21.3	2574	550	60.61	1.53	1.73	1.98	1.30	1.30	1.05	0.002	1.51	2.06
CS37	10.0	10.0	1260	330	33.67	1.01	1.13	1.29	1.20	1.20	1.05	0.002	1.34	1.74
CS38	10.0	10.0	1450	500	37.21	1.33	1.49	1.71	1.20	1.20	1.05	0.002	1.54	1.74
To Nhus River														
DS1	52.4	52.4	5331	350	118.07	2.76	3.15	3.66	1.80	1.80	1.20	0.002	1.74	3.76
DS2	14.1	14.1	1713	370	42.88	1.43	1.61	1.84	1.30	1.30	1.05	0.002	1.51	2.06
DS3	8.7	8.7	30.89	320	1.147	1.05	1.17	1.34	1.20	1.20	1.05	0.002	1.54	1.74

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (10/11)

Line No.	Area Each Line (ha)	Accum. (ha)	Length Each Line (m)	Ext.	Cor-Time (min)	Peak Flow (m <sup>3</sup> /s)			Pipe Diameter (m)	Box Culvert Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
						P-1 years (m <sup>3</sup> /s)	P-2 years (m <sup>3</sup> /s)	P-5 years (m <sup>3</sup> /s)						
Max. Waste water flow m <sup>3</sup> /sec/ha														
Mean Velocity 0.8 m/sec														
Roughness Coefficient 0.013														
D54	25.6	25.6	560	2,967	69.23	1.93	2.18	2.52	1.20	1.40	1.15	0.002	1.54	2.57
D55	8.4	8.4	280	1,076	29.46	1.04	1.16	1.32				0.002	1.54	1.74
To D.D	10.0	10.0	300	1,245	32.94	1.16	1.30	1.48	1.20			0.002	1.54	1.74
D56	11.7	11.7	700	1,812	44.74	1.16	1.30	1.48	1.20			0.002	1.54	1.74
D57	15.5	15.5	900	2,373	56.43	1.33	1.50	1.73	1.20			0.002	1.54	1.74
D58	13.4	13.4	300	1,573	39.77	1.41	1.59	1.81		1.20	1.05	0.002	1.47	1.86
To D.C	26.9	26.9	470	3,028	70.08	2.02	2.28	2.63	1.00	1.50	1.10	0.002	1.60	2.64
D510	4.6	4.6	200	639	20.32	0.68	0.75	0.85				0.002	1.37	1.07
To D1.A	52.0	52.0	650	5,585	123.36	2.22	2.53	2.94	1.60	1.60	1.15	0.002	1.66	3.05
D512	25.8	25.8	700	3,151	72.65	1.58	1.79	2.06	1.30	1.30	1.05	0.002	1.51	2.06
D513	28.6	28.6	550	3,267	75.06	1.72	1.94	2.24	1.40	1.40	1.05	0.002	1.54	2.27
D514	9.1	9.1	650	3,855	38.55	0.82	0.92	1.05	1.00			0.002	1.37	1.07
D515	18.6	18.6	600	2,367	56.31	1.34	1.51	1.73	1.20			0.002	1.54	1.74
To D2.B	5.7	5.7	270	812	23.91	0.65	0.73	0.82	1.60			0.002	1.37	1.07
D516	15.6	15.6	450	1,932	47.25	1.25	1.40	1.61	1.20			0.002	1.54	1.74
To D2.C	6.4	6.4	400	1,008	28.00	0.18	0.20	0.22	0.60			0.002	0.97	0.27
D517	3.6	3.6	550	892	25.58	0.10	0.12	0.13	0.50			0.002	0.86	0.17
To D2.A	3.0	3.0	350	637	20.28	0.10	0.11	0.12	0.50			0.002	0.86	0.17
D518	8.17	8.17	500	8,257	179.02	0.93	1.06	1.24	1.20			0.002	1.54	1.74
D519	23.9	23.9	650	2,916	67.74	0.70	0.79	0.91	1.00			0.002	1.37	1.07
D520	26.5	26.5	300	2,818	65.70	0.79	0.89	1.03	1.00			0.002	1.37	1.07
To Nharu River	44.9	44.9	650	4,919	109.47	2.18	2.48	2.88	1.50	1.50	1.20	0.002	1.65	2.98
M51	37.5	37.5	550	4,113	92.68	2.04	2.32	2.68	1.50			0.002	1.63	2.81
M52	13.2	13.2	400	1,654	41.46	1.06	1.19	1.37	1.20			0.002	1.54	1.74
To M3.A	4.0	4.0	300	680	21.17	0.45	0.50	0.57	0.80			0.002	1.18	0.59
M53	4.9	4.9	300	766	22.95	0.53	0.59	0.67	0.90			0.002	1.27	0.81
M54	5.2	5.2	300	796	23.57	0.56	0.62	0.71	0.90			0.002	1.27	0.81
To M2.A	23.6	23.6	500	2,742	64.13	1.47	1.65	1.90	1.30	1.30	1.00	0.002	1.48	1.93
M55	27.1	27.1	500	3,075	71.05	1.58	1.78	2.05	1.30	1.30	1.05	0.002	1.51	2.06
M56	26.4	26.4	400	2,905	67.52	2.06	2.33	2.69	1.55	1.55	1.10	0.002	1.62	2.75
To M4.A	17.4	17.4	400	2,053	49.77	1.64	1.85	2.12	1.35	1.35	1.05	0.002	1.53	2.16
To M.D	50.5	50.5	200	4,998	111.13	2.83	3.22	3.74	1.80	1.80	1.20	0.002	1.74	3.76
M57	25.0	25.0	200	2,575	60.65	0.45	0.51	0.58	0.80			0.002	1.18	0.59
To M1.A	7.9	7.9	400	1,148	30.92	0.74	0.83	0.95	1.00			0.002	1.37	1.07
M58	24.0	24.0	600	2,860	67.00	1.45	1.64	1.89	1.25	1.25	1.05	0.002	1.49	1.96
To M1.B	7.8	7.8	300	1,039	28.64	0.21	0.24	0.27	0.60			0.002	0.97	0.27
M59	15.8	15.8	400	1,901	46.60	1.61	1.81	2.07	1.35	1.35	1.05	0.002	1.53	2.16
M60	10.8	10.8	270	984	27.49	1.46	1.63	1.85	1.40	1.40	1.10	0.002	1.49	1.96
To M4.B	18.7	18.7	350	2,127	51.30	1.80	2.02	2.32	0.80			0.002	1.57	2.42
M61	16.0	16.0	180	1,700	42.42	0.36	0.40	0.46	0.80			0.002	1.18	0.59

TABLE D3.4 FLOW RATE OF PROPOSED DRAINAGE SYSTEM (11/11)

Line No.	Area Each Line (ha)	Accumu. (ha)	Length (m)		Con-Time (min)	P=1 years (m <sup>3</sup> /s)	P=2 years (m <sup>3</sup> /s)	P=5 years (m <sup>3</sup> /s)	Pipe Diameter (m)	Box Cover Width (m)	Height (m)	Hydraulic Gradient	Velocity (m/s)	Flow Capacity (m <sup>3</sup> /s)
			Each Line	Ext.										
MS20	22.8	22.8	900	3,064	70.83	0.37	0.42	0.48	0.80	1.30	1.10	0.002	1.18	0.59
MS21	16.5	16.5	550	2,118	51.11	1.59	1.79	2.05	0.80	1.40	1.10	0.002	1.53	2.19
MS22	41.5	58.0	200	5,845	128.77	3.03	3.46	4.03	0.80			0.002	1.57	2.42
MS23	3.6	3.6	1200	1,542	39.13	0.40	0.52	0.52	0.80			0.002	1.18	0.59
BS1	17.1	17.1	800	2,421	57.44	1.19	1.34	1.54	1.20			0.002	1.54	1.74
BS2	17.1	17.1	800	2,421	57.44	1.27	1.43	1.64	1.20			0.002	1.54	1.74
BS3	17.9	52.0	770	6,630	149.29	1.89	2.17	2.53	1.20	1.45	1.10	0.002	1.59	2.53
BS4	17.9	69.8	100	6,447	182.98	2.19	2.52	2.94	1.20	1.60	1.15	0.002	1.66	3.05
BS5	19.1	19.1	650	2,466	58.37	1.32	1.49	1.71	1.20			0.002	1.54	1.74
BS6	11.5	11.5	400	1,489	38.03	1.01	1.14	1.30	1.20			0.002	1.54	1.74
BS7	17.2	17.2	700	2,329	55.53	1.22	1.37	1.58	1.20			0.002	1.54	1.74
BS8	0.0	47.7	100	6,384	140.00	1.82	2.08	2.43	1.20	1.45	1.10	0.002	1.59	2.53
To White River														
BS9	18.1	18.1	350	2,066	50.05	1.21	1.37	1.57	1.20			0.002	1.54	1.74
BS10	26.4	26.4	600	3,110	71.78	1.42	1.61	1.85	1.20	1.30	1.00	0.002	1.48	1.93
BS11	18.7	45.1	250	4,949	110.11	1.82	2.07	2.40	1.20	1.45	1.10	0.002	1.59	2.53
To BS2,B														
BS12	8.2	8.2	600	1,379	35.73	0.67	0.75	0.85	1.00			0.002	1.37	1.07
BS13	36.0	36.0	550	3,970	89.71	1.67	1.89	2.19	1.00	1.45	1.00	0.002	1.53	2.22
BS14	28.4	28.4	700	3,398	77.79	1.45	1.64	1.89	1.00	1.30	1.00	0.002	1.48	1.93
BS15	15.2	79.6	120	8,776	189.83	2.16	2.48	2.90	1.00	1.55	1.15	0.002	1.64	2.93
To BS2,C														
BS16	23.9	23.9	450	2,719	63.64	1.56	1.76	2.03	1.00	1.40	1.00	0.002	1.51	2.12
BS17	30.3	30.3	700	3,579	81.55	1.68	1.91	2.21	1.00	1.45	1.00	0.002	1.53	2.22
BS18	3.8	58.0	80	6,702	146.63	2.14	2.45	2.86	1.00	1.55	1.15	0.002	1.64	2.93
To BS3,A														
BS19	20.3	20.3	380	2,309	55.09	1.16	1.31	1.50	1.20			0.002	1.54	1.74
BS20	16.7	16.7	750	2,337	55.68	0.95	1.07	1.23	1.20			0.002	1.54	1.74
BS21	0.0	37.0	70	4,715	105.23	1.38	1.57	1.83	1.20	1.30	1.00	0.002	1.48	1.93
To B,C														
BS22	10.8	10.8	700	1,724	42.91	0.79	0.89	1.02	1.00			0.002	1.37	1.07
To B,A														
BS23	4.0	4.0	150	530	18.04	0.40	0.45	0.51	0.80			0.002	1.18	0.59
To Thant Lim Channel														

TABLE D3.5 COST OF CONSTRUCTION COST OF SEWER FOR STORMWATER (1/3)

ITEM	UNIT COST (US\$)	To Lich River Basin													
		West Lake		To Lick		Upper Lu		Lower Lu		Kim Nguu					
		QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)				
1. Separate Sewer															
1.1 Tertiary (d:250-400 mm)	70	16,074	1,125,180	65,220	4,565,400	22,320	1,562,400	21,360	1,495,200	69,732	4,881,240				
1.2 Secondary Sewer ( d :500-1000 mm)	120	6,698	803,700	27,175	3,261,000	9,300	1,116,000	8,900	1,068,000	29,055	3,486,600				
1.3 Trunk Sewer (d:1000-1200 mm)	250	2,679	669,750	10,870	2,717,500	3,720	930,000	3,560	890,000	11,622	2,905,500				
1.4 Box Culvert (>1200 -1200 mm)	600	1,340	803,700	5,435	3,261,000	1,860	1,116,000	1,780	1,068,000	5,811	3,486,600				
Sub-total			3,402,330		13,804,900		4,724,400		4,521,200		14,759,940				
2. Combined Sewer															
2.1 Tertiary (d:200-400 mm)	70				0		0				0				
2.2 Secondary Sewer ( d :500-1000 mm)	120	1,444	173,335	18,063	2,167,560	4,418	530,138			6,647	797,653				
2.3 Trunk Sewer (d:1000-1200 mm)	250	222	55,556	2,408	602,100	1,004	251,013			3,324	830,889				
2.4 Box Culvert (1200-1200 mm)	600	111	66,667	1,204	722,520	502	301,215			1,662	997,067				
Sub-total			295,558		3,492,180		1,082,366				2,625,609				
Direct Cost (1+2)			3,697,888		17,297,080		5,806,766		4,521,200		17,385,549				
3. Street Drain (U-drain for main road)	150	26,790	4,018,500	78,200	11,730,000	19,700	2,955,000	35,600	5,340,000	116,220	17,433,000				
Sub-total			4,018,500		11,730,000		2,955,000		5,340,000		17,433,000				
Total Cost			7,716,388		29,027,080		8,761,766		9,861,200		34,818,549				

TABLE D3.5 CONSTRUCTION COST OF SEWER FOR STORMWATER (2/3)

ITEM	UNIT COST (US\$)	Set		Hoan Liet		Yen So	
		QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)
1. Separate Sewer							
1.1 Tertiary (d:250-400 mm)	70	28,764	2,013,480	38,820	2,717,400	2,280	159,600
1.2 Secondary Sewer (d :500-1000 mm)	120	11,985	1,438,200	16,175	1,941,000	950	114,000
1.3 Trunk Sewer (d:1000-1200 mm)	250	4,794	1,198,500	6,470	1,617,500	380	95,000
1.4 Box Culvert (>1200 *1200 mm)	600	2,397	1,438,200	3,235	1,941,000	190	114,000
Sub-total			6,088,380		8,216,900		482,600
2. Combined Sewer							
2.1 Tertiary (d:200-400 mm)	70		0		0		0
2.2 Secondary Sewer ( d :500-1000 mm)	120	3,814	457,645		0		0
2.3 Trunk Sewer (d:1000-1200 mm)	250	867	216,688		0		0
2.4 Box Culvert (1200*1200 mm)	600	433	260,026		0		0
Sub-total			934,359		0		0
Direct Cost (1+2)			7,022,739		8,216,900		482,600
3. Street Drain (U-drain for main road)	150	47,940	7,191,000	64,700	9,705,000	3,800	570,000
Sub-total			7,191,000		9,705,000		570,000
Total Cost			14,213,739		17,921,900		1,052,600



TABLE D3.5 CONSTRUCTION COST OF SWE FOR STORMWATER (3/3)

ITEM	UNIT COST (US\$)	Nhue River Basin											
		Co Nhue		My Dinh		Me Tin		Ba Xa					
		QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)	QUANTITY (m)	AMOUNT (US\$)				
1. Separate Sewer	70	118,200	8,274,000	39,900	2,793,000	52,020	3,641,400	26,160	1,831,200				
1.1 Tertiary (d:250-400 mm)													
1.2 Secondary Sewer ( d :500-1000 mm)	120	49,250	5,910,000	16,625	1,995,000	21,675	2,601,000	10,900	1,308,000				
1.3 Trunk Sewer (d:1000-1200 mm)	250	19,700	4,925,000	6,650	1,662,500	8,670	2,167,500	4,360	1,090,000				
1.4 Box Culvert (> 1200 * 1200 mm)	600	9,850	5,910,000	3,325	1,995,000	4,335	2,601,000	2,180	1,308,000				
Sub-total			25,019,000		8,445,500		11,010,900		5,537,200				
2. Combined Sewer	70		0		0		0		0				
2.1 Tertiary (d:200-400 mm)													
2.2 Secondary Sewer ( d :500-1000 mm)	120		0		0		0		0				
2.3 Trunk Sewer (d:1000-1200 mm)	250		0		0		0		0				
2.4 Box Culvert (1200*1200 mm)	600		0		0		0		0				
Sub-total			0		0		0		0				
Direct Cost (1+2)			25,019,000		8,445,500		11,010,900		5,537,200				
3. Street Drain (U-drain for main road)	150	197,000	29,550,000	66,500	9,975,000	86,700	13,005,000	43,600	6,540,000				
Sub-total			29,550,000		9,975,000		13,005,000		6,540,000				
Total Cost			54,569,000		18,420,500		24,015,900		12,077,200				

Table D3.6(1) DISCHARGE OF EACH CHANNEL STRETCH.  
TO LICH RIVER BASIN (1/3)

Channel Code *1	Channel Length (m)	Catchment Area (km <sup>2</sup> )	Alternative 1		Alternative 2	
			Discharge (m <sup>3</sup> /s)	Specific Discharge (m <sup>3</sup> /s/km <sup>2</sup> )	Discharge (m <sup>3</sup> /s)	Specific Discharge (m <sup>3</sup> /s/km <sup>2</sup> )
<b>(TO LICH RIVER BASIN)</b>						
T.A	300	32.43	101	3.1	93	2.9
T.B	6,100	24.33	93	3.8	85	3.5
T.C	4,900	19.20	78	4.1	70	3.6
T.D	4,200	10.00	47	4.7	44	4.4
T.E	2,400	1.30	12	9.2	12	9.2
T1.A	1,800	1.30	12	9.2	12	9.2
T2.A	1,500	4.36	17	3.9	17	3.9
T2.B	1,100	0.99	4	3.9	4	3.9
T2.C	600	0.99	4	3.9	4	3.9
T3.A	1,600	2.32	11	4.7	9	3.9
T4.A	1,200	1.22	8	6.6	8	6.6
T5.A	700	6.86	27	3.9	22	3.2
T5.B	1,200	3.30	10	3.0	8	2.4
T5.C	1,100	1.94	6	3.0	5	2.4
T6.A	1,500	2.50	7	2.8	5	2.0
T6.B	900	1.32	4	2.8	3	2.0
T6.A	900	1.25	7	5.6	7	5.6
<b>(LOWER LU RIVER BASIN)</b>						
L.A	1,000	4.33	14	3.2	14	3.2
L.B	2,200	0.75	5	6.7	5	6.7
L6.A	900	3.58	10	2.8	10	2.8
<b>(HOANG LIET DRAINAGE BASIN)</b>						
H.A	2,200	8.10	12	1.5	12	1.5
<b>(SET AND UPPER LU RIVER BASIN)</b>						
S.A	2,200	11.53	59	5.1	49	4.2
S.B	2,200	4.16	20	4.8	15	3.6
S4.A	1,300	1.44	7	4.9	7	4.9
L.C	2,200	5.87	33	5.6	29	4.9
L.D	900	2.15	8	3.7	6	2.8
L1.A	1,400	2.15	8	3.7	6	2.8
L2.A	1,000	1.75	12	6.9	12	6.9
<b>(KIM NGUU RIVER BASIN)</b>						
K.A	1,200	10.31	53	5.1	51	4.9
K.B	1,500	6.28	36	5.7	34	5.4
K.C	700	3.47	19	5.5	19	5.5
K2.A	800	1.22	11	9.0	11	9.0
K3.A	400	1.59	7	4.4	4	2.5
K4.A	800	0.83	9	10.8	9	10.8
K5.A	1,000	2.77	10	3.6	10	3.6
K5.B	1,200	1.60	6	3.6	6	3.6
K6.A	700	6.99	5	0.7	5	0.7
K6.B	1,800	3.52	3	0.7	3	0.7
K6.C	800	1.48	2	0.7	2	0.7
K6.D	700	0.97	2	0.7	2	0.7
K6.E	1,200	1.58	2	0.7	2	0.7
K6.F	1,300	1.47	2	0.7	2	0.7
<b>(DIVERSIONS)</b>						
T	1,000	-	45	-	45	-
Y	3,400	-	45	-	45	-
I	1,200	-	*2	-	*2	-
O	1,600	-	*2	-	*2	-
L	1,000	(Not applicable)	-	-	-	-
D	400	(Not applicable)	-	-	-	-

\*1 : Refer to Fig.D3.6

\*2 : Same as the pump capacity

T : Thanh Liet Channel

Y : Yen So Channel

I : Inlet Channel

O : Outlet Channel

L : Linh Dam Channel

D : Dinh Cong Channel

Table D3.6(2) DISCHARGE OF EACH CHANNEL STRETCH,  
TO LICH RIVER BASIN (2/3)

Channel Code *1	Channel Length (m)	Catchment Area (km <sup>2</sup> )	Alternative 3		Alternative 4	
			Discharge (m <sup>3</sup> /s)	Specific Discharge (m <sup>3</sup> /s/km <sup>2</sup> )	Discharge (m <sup>3</sup> /s)	Specific Discharge (m <sup>3</sup> /s/km <sup>2</sup> )
<b>(TO LICH RIVER BASIN)</b>						
T.A	300	26.81	87	3.2	87	3.2
T.B	6,100	24.33	85	3.5	85	3.5
T.C	4,900	19.20	70	3.6	70	3.6
T.D	4,200	10.00	44	4.4	44	4.4
T.E	2,400	1.30	12	9.2	12	9.2
T1.A	1,800	1.30	12	9.2	12	9.2
T2.A	1,500	4.36	17	3.9	17	3.9
T2.B	1,100	0.99	4	3.9	4	3.9
T2.C	600	0.99	4	3.9	4	3.9
T3.A	1,600	2.32	9	3.9	9	3.9
T4.A	1,200	1.22	8	6.6	8	6.6
T5.A	700	6.86	22	3.2	22	3.2
T5.B	1,200	3.30	8	2.4	8	2.4
T5.C	1,100	1.94	5	2.4	5	2.4
T6.A	1,500	2.50	5	2.0	5	2.0
T6.B	900	1.32	3	2.0	3	2.0
T8.A	900	1.25	7	5.6	7	5.6
<b>(LOWER LU RIVER BASIN)</b>						
L.A	1,000	4.33	14	3.2	14	3.2
L.B	2,200	0.75	5	6.7	5	6.7
L6.A	900	3.58	10	2.8	10	2.8
<b>(HOANG LIET DRAINAGE BASIN)</b>						
H.A	1,400	2.48	5	2.0	5	2.0
<b>(SET AND UPPER LU RIVER BASIN)</b>						
S.A	2,200	11.53	49	4.2	49	4.2
S.B	2,200	4.16	15	3.6	15	3.6
S4.A	1,300	1.44	7	4.9	7	4.9
L.C	2,200	5.87	29	4.9	29	4.9
L.D	900	2.15	6	2.8	6	2.8
L1.A	1,400	2.15	6	2.8	6	2.8
L2.A	1,000	1.75	12	6.9	12	6.9
<b>(KIM NGUU RIVER BASIN)</b>						
K.A	1,200	10.31	51	4.9	51	4.9
K.B	1,500	6.28	34	5.4	34	5.4
K.C	700	3.47	19	5.5	19	5.5
K2.A	800	1.22	11	9.0	11	9.0
K3.A	400	1.59	4	2.5	4	2.5
K4.A	800	0.83	9	10.8	9	10.8
K5.A	1,000	2.77	10	3.6	10	3.6
K5.B	1,200	1.60	6	3.6	6	3.6
K6.A	700	6.99	5	0.7	5	0.7
K6.B	1,800	3.52	3	0.7	3	0.7
K6.C	800	1.48	2	0.7	2	0.7
K6.D	700	0.97	2	0.7	2	0.7
K6.E	1,200	1.58	2	0.7	2	0.7
K6.F	1,300	1.47	2	0.7	2	0.7
<b>(DIVERSIONS)</b>						
T	1,000	-	45	-	45	-
Y	3,400	-	45	-	45	-
I	1,200	-	*2	-	*2	-
O	1,600	-	*2	-	*2	-
L	1,000	5.62	5	0.9	2	0.4
D	400	(Not applicable)				

\*1 : Refer to Fig.D3.6

\*2 : Same as the pump capacity

T : Thanh Liet Channel

Y : Yen So Channel

I : Inlet Channel

O : Outlet Channel

L : Linh Dam Channel

D : Dinh Cong Channel

Table D3.6(3) DISCHARGE OF EACH CHANNEL STRETCH,  
TO LICH RIVER BASIN (3/3)

Channel Code *1	Channel Length (m)	Catchment Area (km <sup>2</sup> )	Alternative 5		Alternative 6	
			Discharge (m <sup>3</sup> /s)	Specific Discharge (m <sup>3</sup> /s/km <sup>2</sup> )	Discharge (m <sup>3</sup> /s)	Specific Discharge (m <sup>3</sup> /s/km <sup>2</sup> )
<b>(TO LICH RIVER BASIN)</b>						
T.A	300	22.48	74	3.3	74	3.3
T.B	6,100	20.00	72	3.6	72	3.6
T.C	4,900	19.20	70	3.6	70	3.6
T.D	4,200	10.00	44	4.4	44	4.4
T.E	2,400	1.30	12	9.2	12	9.2
T1.A	1,800	1.30	12	9.2	12	9.2
T2.A	1,500	4.36	17	3.9	17	3.9
T2.B	1,100	0.99	4	3.9	4	3.9
T2.C	600	0.99	4	3.9	4	3.9
T3.A	1,600	2.32	9	3.9	9	3.9
T4.A	1,200	1.22	8	6.6	8	6.6
T5.A	700	6.86	22	3.2	22	3.2
T5.B	1,200	3.30	8	2.4	8	2.4
T5.C	1,100	1.94	5	2.4	5	2.4
T6.A	1,500	2.50	5	2.0	5	2.0
T6.B	900	1.32	3	2.0	3	2.0
T8.A	900	1.25	7	5.6	7	5.6
<b>(LOWER LU RIVER BASIN)</b>						
L.A	1,000	4.33	13	3.2	11	3.2
L.B	2,200	0.75	5	6.7	5	6.7
L6.A	900	3.58	10	2.8	10	2.8
<b>(HOANG LIET DRAINAGE BASIN)</b>						
H.A	1,400	2.48	5	2.0	5	2.0
<b>(SET AND UPPER LU RIVER BASIN)</b>						
S.A	2,200	11.53	49	4.2	49	4.2
S.B	2,200	4.16	15	3.6	15	3.6
S4.A	1,300	1.44	7	4.9	7	4.9
L.C	2,200	5.87	29	4.9	29	4.9
L.D	900	2.15	6	2.8	6	2.8
L1.A	1,400	2.15	6	2.8	6	2.8
L2.A	1,000	1.75	12	6.9	12	6.9
<b>(KIM NGUU RIVER BASIN)</b>						
K.A	1,200	10.31	51	4.9	51	4.9
K.B	1,500	6.28	34	5.4	34	5.4
K.C	700	3.47	19	5.5	19	5.5
K2.A	800	1.22	11	9.0	11	9.0
K3.A	400	1.59	4	2.5	4	2.5
K4.A	800	0.83	9	10.8	9	10.8
K5.A	1,000	2.77	10	3.6	10	3.6
K5.B	1,200	1.60	6	3.6	6	3.6
K6.A	700	6.99	5	0.7	5	0.7
K6.B	1,800	3.52	3	0.7	3	0.7
K6.C	800	1.48	2	0.7	2	0.7
K6.D	700	0.97	2	0.7	2	0.7
K6.E	1,200	1.58	2	0.7	2	0.7
K6.F	1,300	1.47	2	0.7	2	0.7
<b>DIVERSIONS</b>						
T	1,000	-	45	-	45	-
Y	3,400	-	15	-	15	-
I	1,200	-	*2	-	*2	-
O	1,600	-	*3	-	*3	-
L	1,000	9.95	14	1.4	8	0.8
D	400	4.33	13	3	11	2.5
O/D	1,900	-	15	-	15	-

\*1 : Refer to Fig.D3.6

\*2 : The pump capacity minus 15 m<sup>3</sup>/s

\*3 : Same as the pump capacity

T : Thanh Liet Channel

Y : Yen So Channel

I : Inlet Channel

O : Outlet Channel

L : Linh Dam Channel

D : Dinh Cong Channel

O/D : Ordinary Drainage Channel

Table D3.7 DIMENSIONS OF RIVERS AND DRAINAGE CHANNELS,  
TO LICH RIVER BASIN

Alternative 6

Channel Code *1	Channel Length (m)	Catchment Area (km <sup>2</sup> )	Discharge Volume (m <sup>3</sup> /s)	Roughness Coefficient	Channel Bed Gradient	Side Slope Height (m)	Side Slope Gradient	Channel Bed Width (m)	Flow Area (m <sup>2</sup> )	Wetted Perimeter (m)	Hydraulic Mean Depth (m)	Flow Velocity (m)
<b>(TO LICH RIVER BASIN)</b>												
T.A	300	22.48	74	0.03	1/7000	3.5	2	20.7 (21.0)	96.8	36.3	2.67	0.77
T.B	6,100	20.00	72	0.03	1/7000	3.5	2	20.0 (21.0)	94.5	35.6	2.65	0.76
T.C	4,900	19.20	70	0.03	1/7000	3.5	2	19.4 (21.0)	92.1	35.0	2.64	0.76
T.D	4,200	10.00	44	0.03	1/15000	3.5	2	17.6 (18.0)	85.8	33.2	2.59	0.52
T.E	2,400	1.30	12									
T.E (1)	900		12	0.03	1/15000	3.5	2	1.7 (10.0)	30.4	17.4	1.75	0.40
T.E (2)	1,500		12	0.025	1/4000	2.5	0.3	5.3 (5.3)	15.0	10.5	1.43	0.80
T1.A	1,800	1.30	12	0.025	1/4000	2.5	0.3	5.3 (5.3)	15.0	10.5	1.43	0.80
T2.A	1,500	4.36	17	0.025	1/5000	2.5	0.3	9.4(9.4)	21.6	13.1	1.65	0.79
T2.B	1,100	0.99	4	0.025	1/5000	1.5	0.5	4.4(4.4)	7.3	7.5	0.96	0.55
T2.C	600	0.99	4	0.03	1/3000	1.5	2	1.9(2.0)	7.3	8.6	0.85	0.55
T3.A	1,600	2.32	9	0.03	1/3000	2.0	2	2.8(3.0)	13.5	11.7	1.16	0.67
T4.A	1,200	1.22	8	0.025	1/3000	2.0	0.3	4.4(4.4)	10.0	8.6	1.17	0.80
T5.A	700	6.86	22	0.025	1/4000	2.5	0.3	9.0(9.0)	24.4	14.2	1.70	0.90
T5.B	1,200	3.30	8	0.025	1/4000	2.5	0.3	3.7(3.7)	11.1	8.9	1.25	0.73
T5.C	1,100	1.94	5	0.025	1/4000	2.5	0.3	2.4(2.4)	7.8	7.6	1.00	0.65
T6.A	1,500	2.50	5	0.025	1/5500	2.5	0.3	2.8(2.8)	8.8	8.0	1.10	0.57
T6.B	900	1.32	3	0.025	1/5500	2.5	0.3	1.7(1.7)	6.1	6.9	0.88	0.50
T8.A	900	1.25	7	0.03	1/1500	1.5	2	2.8(3.0)	8.7	9.5	0.92	0.81
<b>(LOWER LU RIVER BASIN)</b>												
L.A	1,000	4.33	11	0.03	1/20000	2.5	2	8.2(9.0)	12.5	19.3	1.70	0.34
L.B	2,200	0.75	5	0.03	1/20000	2.5	2	2.1(5.0)	17.6	13.2	1.33	0.29
L6.A	900	3.58	10	0.03	1/2000	2.0	2	2.3(3.0)	13.1	11.2	1.11	0.80
<b>(HOANG LIET DRAINAGE BASIN)</b>												
H.A	1,400	2.48	5		1/10000	1.5	2	2.8(3)	14.3	13.3	1.07	0.35
<b>(SET AND UPPER LU RIVER BASIN)</b>												
S.A	2,200	11.53	49	0.03	1/2000	3.0	2	8.0(8.0)	42.0	21.4	1.96	1.17
S.B	2,200	4.16	15	0.03	1/3000	2.0	2	6.2(6.5)	20.3	15.1	1.34	0.74
S4.A	1,300	1.44	7	0.025	1/2500	2.0	0.3	3.6(3.6)	8.4	7.8	1.07	0.84
L.C	2,200	5.87	29	0.03	1/3000	2.5	2	10.8(11.0)	39.5	22.0	1.80	0.73
L.D	900	2.15	6	0.025	1/3000	2.5	0.3	3.0(3.0)	9.3	8.2	1.14	0.65
L1.A	1,400	2.15	6	0.025	1/3000	2.5	0.3	2.5(2.5)	8.0	7.7	1.04	0.75
L2.A	1,000	1.75	12	0.025	1/2000	2.0	0.3	5.3(5.3)	11.6	9.4	1.24	1.03
<b>(KIM NGUU RIVER BASIN)</b>												
K.A	1,200	10.31	51	0.03	1/1500	2.5	2	10.9(11.0)	40.0	22.2	1.80	1.28
K.B	1,500	6.28	34	0.03	1/1500	2.5	2	6.5(7.0)	28.7	17.7	1.63	1.19
K.C	700	3.47	19	0.025	1/1500	2.5	0.3	5.0(5.0)	14.6	10.3	1.42	1.30
K2.A	800	1.22	11	0.025	1/5000	2.0	0.3	7.3(7.3)	15.9	11.5	1.38	0.70
K3.A	400	1.59	4	0.025	1/10000	2.5	0.3	3.0(3.0)	9.3	8.2	1.13	0.43
K4.A	800	0.83	9	0.025	1/1500	1.5	0.3	6.0(6.0)	9.7	9.2	1.06	0.93
K5.A	1,000	2.77	10	0.025	1/2500	1.5	0.3	9.0(9.0)	14.3	12.2	1.17	0.70
K5.B	1,200	1.60	6	0.025	1/2500	1.5	0.3	5.7(5.7)	9.3	8.8	1.04	0.65
K6.A	700	6.99	5	0.03	1/3000	1.5	2	2.8(3)	8.5	9.6	92.00	0.57
K6.B	1,800	3.52	3	0.03	1/3000	1.0	2	4.2(4.5)	6.2	8.7	0.71	0.49
K6.C	800	1.48	2	0.03	1/3000	1.0	2	2.4(2.5)	4.4	6.9	0.64	0.45
K6.D	700	0.97	2	0.03	1/3000	1.0	2	2.4(2.5)	4.4	6.9	0.64	0.45
K6.E	1,200	1.58	2	0.03	1/3000	1.0	2	2.4(2.5)	4.4	6.9	0.64	0.45
K6.F	1,300	1.47	2	0.03	1/3000	1.0	2	2.4(2.5)	4.4	6.9	0.64	0.45
<b>DIVERSIONS</b>												
T	1,000	-	45	0.03	1/7000	-	2	8.0	-	-	-	-
Y	3,400	-	15	0.03	-	-	-	-	-	-	-	-
Y(1)	1,400	-	15	0.03	1/2300	2.5	2	4.5	-	-	-	-
Y(2)	2,000	-	15	0.03	1/4500	3.0	2	4.5	-	-	-	-
I	1,200	-	75	0.03	1/3000	2.5	2	25.5	75.8	36.5	2.08	0.99
O	1,600	-	90	0.03	1/10000	5.0	2	15.0	-	-	-	-
O/D	1,900	-	15	0.03	1/10000	3.5	2	2.0	30.8	17.5	1.77	0.49
L	1,000	9.95	8	0.03	1/10000	2.0	2	6.0	19.9	14.9	1.33	0.40
D	400	4.33	11	0.03	1/10000	2.0	2	9.0	25.8	17.8	1.44	0.43

\*1 : Refer to Fig.D3.6

T : Thanh Liet Channel  
Y : Yen So Channel  
I : Inlet Channel  
O : Outlet Channel

O/D : Ordinary Drainage Channel  
L : Linh Dan Channel  
D : Dinh Cong Channel

Table 3.8(1) WORK QUANTITIES OF RIVERS AND DRAINAGE CHANNELS,  
TO LICH RIVER BASIN (1/3)

Alternative	Channel No.	Channel Length (m)	Slope High (m)	Side Slope Gradient	Excavation Volume (m <sup>3</sup> )	Embankment Volume (m <sup>3</sup> )	Riprap (m <sup>3</sup> )	Fall Structure (Gabion Mattress) (piece)	Revetment		Bridge (piece)	Bridge Protection (piece)	Railway Bridge (m)	Box Culvert (pieces)	Intake Pump (pieces)	Drainage Facilities (piece)	House Evacuation (houses)		Land Acquisition (m <sup>2</sup> )		Total of 1st & 2nd			
									1:2 (m <sup>2</sup> )	1:0.3 (m <sup>3</sup> )							1st Stage	2nd Stage	1st Stage	2nd Stage				
To Lich River Basin																								
River																								
	T.A	300	3.5	1:2	22,200	6,000	-	-	-	-	-	-	-	-	-	1	-	-	900	-	900	900		
	T.B	6,100	3.5	1:2	427,000	109,800	-	-	1,252	2	238	10	34	-	-	6	31	-	24,400	-	24,400	24,400		
	T.C	4,900	3.5	1:2	98,000	24,500	-	-	-	-	12	-	-	-	-	5	25	-	-	-	-	-		
	T.D	4,200	3.5	1:2	71,400	14,700	-	-	-	-	12	-	-	-	-	4	21	-	-	-	-	-		
	T.E	2,400	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	TE(1)	900	3.5	1:2	1,800	2,700	-	-	-	1	250	-	-	-	-	2	18	-	-	-	-	-		
	TE(2)	3,500	2.5	1:0.3	30,000	-	3,825	1	42	-	7,650	-	-	11	218	-	30	197	-	197	7,500	7,500		
	Sub-total				650,400	157,700	3,825	1	42	1,252	7,650	3	488	34	11	218	17	125	197	0	197	32,800	32,800	
Drainage Channel																								
	T1.A	1,800	2.5	1:0.3	36,000	10,800	4,590	-	-	9,180	9,180	-	-	5	290	-	36	18	125	153	2,160	14,400	16,560	
	T2.A	1,500	2.5	1:0.3	109,500	21,000	3,825	2	39	7,650	7,650	5	815	-	-	-	30	2	60	62	240	9,000	9,240	
	T2.B	1,100	1.5	1:0.3	1,100	1,100	1,540	-	-	3,080	3,080	-	-	1	25	-	22	2	-	2	240	3,300	3,540	
	T2.C	600	1.5	1:2	600	600	-	1	18	402	-	-	-	1	128	-	1	-	-	-	1,800	1,800		
	T3.A	1,600	2.0	1:2	27,200	8,160	-	-	-	1,968	-	4	546	-	1	104	-	6	6	12	720	8,000	8,720	
	T4.A	1,200	2.0	1:0.3	25,200	15,600	2,325	1	30	4,650	-	2	-	10	489	-	24	12	18	30	1,440	1,440		
	T5.A	700	2.5	1:0.3	30,100	14,000	1,785	1	29	3,570	3	753	2	-	-	-	14	10	75	85	1,200	3,500	4,700	
	T5.B	1,200	2.5	1:0.3	13,200	15,600	3,060	-	-	6,120	-	5	-	3	256	-	24	-	29	-	-	-	-	
	T5.C	1,100	2.5	1:0.3	27,500	16,500	2,805	-	-	5,610	-	6	-	-	110	-	22	2	126	128	240	4,400	4,640	
	T6.A	1,500	2.5	1:0.3	25,500	19,500	3,825	-	-	7,650	-	14	-	4	167	-	15	-	-	-	-	-	-	
	T6.B	900	2.5	1:0.3	13,500	13,500	2,295	-	-	4,590	-	-	-	2	41	-	9	-	-	-	-	-	-	
	T6.A	900	1.5	1:2	21,600	900	-	1	40	402	-	-	-	1	89	-	9	2	2	4	240	3,600	3,840	
	Sub-total				391,000	137,260	26,050	7	182	22,683	52,100	12	2,114	29	1,699	0	272	54	451	505	6,480	48,000	54,480	
Lower Lu River Basin																								
River																								
	L.A	1,000	2.5	1:2	2,000	3,000	-	1	52	1,118	-	2	52	-	-	1	10	16	20	36	1,920	-	1,920	
	L.B	2,200	2.5	1:2	4,400	6,600	-	-	-	447	-	1	36	-	-	2	22	4	20	24	480	-	480	
	Sub-total				6,400	9,600	0	1	52	1,565	0	3	88	3	0	3	32	20	40	60	2,400	0	2,400	
Drainage Channel																								
	L6.A	900	1.5	1:2	8,100	2,430	-	1	31	1,207	-	4	175	-	-	1	18	8	17	25	960	2,700	3,660	
	Sub-total				8,100	2,430	0	1	31	1,207	0	4	175	0	0	1	18	8	17	25	960	2,700	3,660	
Hong Liei Drainage Basin																								
River: N/A																								
Drainage Channel																								
	H.A	1,400	1.5	1:2	2,800	2,800	-	-	-	-	-	-	-	-	-	1	7	-	-	-	-	-	-	
	Sub-total				2,800	2,800	0	0	0	0	0	0	0	0	0	1	7	0	0	0	0	0	0	0

Table 3.8(2) WORK QUANTITIES OF RIVERS AND DRAINAGE CHANNELS,  
TO LICH RIVER BASIN (2/3)

Alternative 6 Channel No.	Channel Length (m)	Slope (m)	Height (m)	Side Slope Gradient	Excavation Volume (m <sup>3</sup> )	Embankment Volume (m <sup>3</sup> )	Riprap (m <sup>3</sup> )	Fall Structure (Gabion Mattress) (place)	Revetment		Bridge (m <sup>2</sup> )	Bridge (place)	1:0.3 (m <sup>3</sup> )	Bridge Protection (place)	Railway Bridge (m)	Box Culvert		Intake Pump (place)	Drainage Facilities (place)	House Evacuation (houses)		Land Acquisition (m <sup>2</sup> )		Total of 1st & 2nd		
									1:2 (m <sup>2</sup> )	1:0.3 (m <sup>3</sup> )						(place)	(m <sup>2</sup> )			1st Stage	2nd Stage	1st Stage	2nd Stage			
<b>Set and Upper Lu River Basin</b>																										
<b>River</b>																										
S.A	2,200	3.0	1.2		66,000	22,000				1,610		2	356						2	22	8		8	960	960	
S.B	2,200	2.0	1.2		33,000	8,800		1	51	1,610		3	393	2			1	400		44	4		4	480	480	
Sub-total					99,000	30,800	0	1	51	3,220	0	6	749	2			0	1	400	66	12	0	12	1,440	0	1,440
<b>Drainage Channel</b>																										
S4.A	1,300	1.5	1:0.3		37,700	14,300	1,820	1	18	3,640	3,640						3	134	1	13	12	28	40	1,440	6,500	7,940
Sub-total					37,700	14,300	1,820	1	18	3,640	3,640	0	0	0			3	134	1	13	12	28	40	1,440	6,500	7,940
<b>River</b>																										
L.C	2,200	2.5	1:2		22,000	11,000		2	48	894		1	168		25					22	5		5	600	600	
L.D	900	1.5	1:0.3		31,500	7,200	1,260			2,520				2						9						
Sub-total					53,500	18,200	1,260	2	48	894	2,520	1	168	2	25					31	5	0	5	600	0	600
<b>Drainage Channel</b>																										
L1.A	1,400	2.5	1:0.3		43,400	23,800	3,570	1	15		7,140			2			5	92		28	2	202	204	240	4,200	4,440
L2.A	1,000	2.0	1:0.3		43,000	18,000	1,938	1	9		3,875						5	150		10	2	42	44	240	5,000	5,240
Sub-total					86,400	41,800	5,508	2	23	0	11,015	0	0	2			10	242	0	38	4	244	248	480	9,200	9,680
<b>Kim Nguo River Basin</b>																										
<b>River</b>																										
K.A	1,200	2.5	1:2		72,000							2	126						1	12						
K.B	1,500	2.5	1:2		22,500	12,000				894				11						15						
K.C	700																									
K.C(1)	500	2.0	1:2		7,500	3,500		1	11	179				2												
K.C(2)	200	2.0	1:0.3		3,000	1,400	388				775															
Sub-total					105,000	16,900	388	1	11	1,073	775	2	126	13			0	0	1	41	0	0	0	0	0	0
<b>Drainage Channel</b>																										
K2.A	800	2.0	1:0.3		19,200	7,200	1,550	1	12		3,100						4	316		16	16	57	73	1,920	4,000	5,920
K3.A	400	2.5	1:0.3		8,400	5,200	1,020	1	3		2,040						2	115		8	8	39	47	960	1,200	2,160
K4.A	800	1.5	1:0.3		11,200	5,600	1,120	1	47		2,240						2	66	1	8	2	20	22	240	240	
K5.A	1,000	1.5	1:0.3		37,000	9,000	1,400	1	23		2,800						2	197	1	10					5,000	5,000
K5.B	1,200	1.5	1:0.3		15,600	6,000	1,680				3,360			7						1	24					
K6.A	700	1.5	1:2		20,300	6,090		2	41	805							2	114	1	4					3,500	3,500
K6.B	1,800	1.0	1:2		16,200	4,860				716							4	107	2	9					3,600	3,600
K6.C	800	1.0	1:2		700	240				179							1	19	1	4					2,400	2,400
K6.D	700	1.0	1:2		700	700				179							1	33	1	4					2,100	2,100
K6.E	1,200	1.0	1:2		1,200	1,200				358							2	82	1	6						
K6.F	1,300	1.0	1:2		1,300	1,300				179							1	19	1	7						
Sub-total					132,700	47,390	6,770	6	126	2,415	13,540	0	0	7			21	1,068	10	99	26	116	142	3,120	21,800	24,920

Table 3.8(3) WORK QUANTITIES OF RIVERS AND DRAINAGE CHANNELS,  
TO LICH RIVER BASIN (3/3)

Alternative 6 Channel No.	Channel Length (m)	Slope Height (m)	Side Slope Gradient	Excavation Volume (m <sup>3</sup> )	Embankment Volume (m <sup>3</sup> )	Riprap (m <sup>3</sup> )	Fall Structure (Gabion Mattress)		Revetment		Bridge (place)	Railway Bridge (m)	Box Culvert (m <sup>2</sup> )		Intake Pump (place)	Drainage Facilities (place)	House Evacuation (houses)		Land Acquisition (m <sup>2</sup> )		Total of 1st & 2nd	
							(place)	(m <sup>3</sup> )	1:2 (m <sup>2</sup> )	1:0.3 (m <sup>3</sup> )			(place)	(m <sup>2</sup> )			1st Stage	2nd Stage	1st Stage	2nd Stage		1st Stage
<b>DIVERSIONS</b>																						
T	1,000	3.5	1:2	5,000	35,000	-	-	-	313	-	1	200	-	-	2	5	4	4	4,000	-	4,000	4,000
Y	3,400																					
Y(1)	2,000	3	1:2	100,000	52,080	-	-	-	3,062	-	4	615	-	-	-	-	-	-	-	-	-	-
Y(2)	1,400	2.5	1:2	70,000	36,456	-	-	-	2,144	-	1	205	-	-	-	-	-	-	-	-	-	-
I	1,200	2.5	1:2	186,300	14,400	-	-	-	24,149	-	1	190	-	-	-	-	-	-	-	-	102,000	102,000
O	1,600	5.0	1:2	268,800	166,400	-	-	-	11,557	-	1	220	-	-	-	-	-	-	-	-	176,000	176,000
OD	1,900	3.5	1:2	59,850	7,600	-	-	-	3,779	-	2	320	-	-	-	-	-	-	-	-	-	-
L	1,000	2.0	1:2	36,000	3,500	-	-	-	1,252	-	1	790	-	-	-	-	-	-	-	-	20,000	20,000
D	400	2.0	1:2	14,400	1,600	-	-	-	501	-	1	120	-	-	-	-	-	-	-	-	8,000	8,000
Sub-total				740,350	317,036	0	0	0	46,757	0	12	2,620	20	20	0	5	4	0	302,000	8,000	310,000	310,000

T : Thanh Liet Channel  
Y : Yen So Channel  
I : Inlet Channel  
O : Outlet Channel  
O/D : Ordinary Drainage Channel  
L : Linh Dam Channel  
D : Dinh Cong Channel  
\* : Included in Yen So Reservoir  
\*\* : Included in Yen So Reservoir & Inlet Channel



Table D3.9 (1) COSTS OF ALTERNATIVES FOR TO LICH RIVER BASIN (1/6)

Alternative 1	Cost Item	P = 30m <sup>3</sup> /s		P = 60 m <sup>3</sup> /s		P = 90 m <sup>3</sup> /s		P = 120 m <sup>3</sup> /s		P = 150 m <sup>3</sup> /s	
		Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)
1	Yen So Pumping Station (1) Pumping Station *1 (2) Outlet Suckaway (3) Channels (4) Bridges (5) Land Acquisition	30 m <sup>3</sup> /s 30 m <sup>3</sup> /s, H 1.4 m 20 m <sup>2</sup> 2,800 m 3 pl 51,000 m <sup>2</sup>	25.2 21.7 0.5 1.2 0.4 1.4	60 m <sup>3</sup> /s 60 m <sup>3</sup> /s, H 1.1 m 40 m <sup>2</sup> 2,800 m 3 pl 70,000 m <sup>2</sup>	42.5 37.3 1.0 1.6 0.6 2.0	90 m <sup>3</sup> /s 90 m <sup>3</sup> /s, H 0.9 m 60 m <sup>2</sup> 2,800 m 3 pl 87,000 m <sup>2</sup>	53.7 47.0 1.5 2.0 0.8 2.4	120 m <sup>3</sup> /s 120 m <sup>3</sup> /s, H 0.7 m 80 m <sup>2</sup> 2,800 m 3 pl 104,000 m <sup>2</sup>	62.9 54.7 2.3 1.0 2.9	150 m <sup>3</sup> /s 150 m <sup>3</sup> /s, H 0.6 m 100 m <sup>2</sup> 2,800 m 3 pl 123,000 m <sup>2</sup>	78.3 66.8 2.5 2.6 1.2 3.4
2	Yen So Regulating Reservoir (1) Excavation (2) Spillway (3) Investment, 12, 9,000m (4) Land Preparation (5) Fishery Compensation	12,430,000 m <sup>3</sup> 12,430,000 m <sup>3</sup> 220 m 152,000 m <sup>2</sup> 700,000m <sup>2</sup> 1,300,000m <sup>2</sup>	88.0 58.2 3.0 4.7 1.4 0.7	8,440,000 m <sup>3</sup> 8,440,000 m <sup>3</sup> 220 m 90,000 m <sup>2</sup> 700,000m <sup>2</sup> 1,300,000m <sup>2</sup>	41.0 33.1 3.0 2.8 1.4 0.7	5,510,000 m <sup>3</sup> 5,510,000 m <sup>3</sup> 220 m 45,000 m <sup>2</sup> 700,000m <sup>2</sup> 1,300,000m <sup>2</sup>	25.4 18.9 3.0 1.4 1.4 0.7	3,230,000 m <sup>3</sup> 3,230,000 m <sup>3</sup> 220 m 10,000 m <sup>2</sup> 700,000m <sup>2</sup> 1,300,000m <sup>2</sup>	15.1 9.7 3.0 0.3 1.4 0.7	1,480,000 m <sup>3</sup> 1,480,000 m <sup>3</sup> 220 m --- 700,000m <sup>2</sup> 1,300,000m <sup>2</sup>	9.5 4.4 3.0 0.0 1.4 0.7
3	Yen So Channel (1) Excavation (2) Embankment (3) Bridges (4) Land Acquisition	3,400 m 270,000 m <sup>3</sup> 80,000 m <sup>3</sup> 3 pl 170,000 m <sup>2</sup>	6.5 0.8 0.4 0.5 4.8	3,400 m 270,000 m <sup>3</sup> 80,000 m <sup>3</sup> 3 pl 170,000 m <sup>2</sup>	6.5 0.8 0.4 0.5 4.8	3,400 m 270,000 m <sup>3</sup> 80,000 m <sup>3</sup> 3 pl 170,000 m <sup>2</sup>	6.5 0.8 0.4 0.5 4.8	3,400 m 270,000 m <sup>3</sup> 80,000 m <sup>3</sup> 3 pl 170,000 m <sup>2</sup>	6.5 0.8 0.4 0.5 4.8	3,400 m 270,000 m <sup>3</sup> 80,000 m <sup>3</sup> 3 pl 170,000 m <sup>2</sup>	6.5 0.8 0.4 0.5 4.8
4	Linh Dam Channel (1) Excavation (2) Embankment (3) Bridges (4) Land Acquisition		0.0		0.0		0.0		0.0		0.0
5	Linh Dam Lake (1) Excavation (2) Fishery Compensation		0.0		0.0		0.0		0.0		0.0
6	Dinh Cong Channel (1) Excavation (2) Embankment (3) Bridges (4) Land Acquisition		0.0		0.0		0.0		0.0		0.0
7	Dinh Cong Lake (1) Excavation (2) Fishery Compensation		0.0		0.0		0.0		0.0		0.0
8	River Improvement		23.2		23.2		23.2		23.2		23.2
9	Drainage Channels		13.6		13.6		13.6		13.6		13.6
10	Lake Dredging		0.0		0.0		0.0		0.0		0.0
	Total		136.5		126.8		122.4		121.3		129.1

\*1 Including O/M Cost

Table D3.9 (2) COSTS OF ALTERNATIVES FOR TO LICH RIVER BASIN (2/6)

Alternative 2	Cost Item	P = 30m <sup>3</sup> /s		P = 60 m <sup>3</sup> /s		P = 90 m <sup>3</sup> /s		P = 120 m <sup>3</sup> /s		P = 150 m <sup>3</sup> /s	
		Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)
1.	Yen So Pumping Station	30 m <sup>3</sup> /s	25.2	60 m <sup>3</sup> /s	42.5	90 m <sup>3</sup> /s	53.7	120 m <sup>3</sup> /s	62.9	150 m <sup>3</sup> /s	76.3
	(1) Pumping Station *1	30 m <sup>3</sup> /s, H 14 m	21.7	60 m <sup>3</sup> /s, H 11 m	37.3	90 m <sup>3</sup> /s, H 8 m	47.0	120 m <sup>3</sup> /s, H 6 m	54.7	150 m <sup>3</sup> /s, H 5 m	66.6
	(2) Outlet Subway	20 m <sup>2</sup>	0.5	40 m <sup>2</sup>	1.0	60 m <sup>2</sup>	1.5	80 m <sup>2</sup>	2.0	100 m <sup>2</sup>	2.5
	(3) Channels	2,800 m	1.2	2,800 m	1.6	2,800 m	2.0	2,800 m	2.3	2,800 m	2.6
	(4) Bridges	3 pl	0.4	3 pl	0.6	3 pl	0.8	3 pl	1.0	3 pl	1.2
	(5) Land Acquisition	51,000 m <sup>2</sup>	1.4	70,000 m <sup>2</sup>	2.0	87,000 m <sup>2</sup>	2.4	104,000 m <sup>2</sup>	2.9	123,000 m <sup>2</sup>	3.4
2.	Yen So Regulating Reservoir	12,390,000 m <sup>3</sup>	67.4	7,860,000 m <sup>3</sup>	37.0	4,730,000 m <sup>3</sup>	21.2	2,420,000 m <sup>3</sup>	12.1	780,000 m <sup>3</sup>	7.1
	(1) Excavation	12,390,000 m <sup>3</sup>	57.9	7,860,000 m <sup>3</sup>	29.7	4,730,000 m <sup>3</sup>	15.4	2,420,000 m <sup>3</sup>	7.3	780,000 m <sup>3</sup>	2.3
	(2) Spillway	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7
	(3) Revetment, 1:2, 9,000m	152,000 m <sup>2</sup>	4.7	81,000 m <sup>2</sup>	2.5	33,000 m <sup>2</sup>	1.0	—	0.0	—	0.0
	(4) Land Preparation	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4
	(5) Fishery Compensation	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7
3.	Yen So Channel	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5
	(1) Excavation	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8
	(2) Embankment	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4
	(3) Bridges	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5
	(4) Land Acquisition	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8
4.	Linh Dam Channel		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Embankment										
	(3) Bridges										
	(4) Land Acquisition										
5.	Linh Dam Lake		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Fishery Compensation										
6.	Dinh Cong Channel		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Embankment										
	(3) Bridges										
	(4) Land Acquisition										
7.	Dinh Cong Lake		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Fishery Compensation										
8.	River Improvement		19.3		19.3		19.3		19.3		19.3
9.	Drainage Channels		9.7		9.7		9.7		9.7		9.7
10.	Lake Dredging		7.0		7.0		7.0		7.0		7.0
	Total		135.1		122.0		117.4		117.5		125.9

\*1 Including O/M Cost

Table D3.9 (3) COSTS OF ALTERNATIVES FOR TO LICH RIVER BASIN (3/6)

Alternative 3	Cost Item	P = 30m <sup>3</sup> /s		P = 60 m <sup>3</sup> /s		P = 90 m <sup>3</sup> /s		P = 120 m <sup>3</sup> /s		P = 150 m <sup>3</sup> /s	
		Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)
1	Yen So Pumping Station	30 m <sup>3</sup> /s	25.2	60 m <sup>3</sup> /s	39.4	90 m <sup>3</sup> /s	53.7	120 m <sup>3</sup> /s	62.9	150 m <sup>3</sup> /s	76.3
	(1) Pumping Station *1	30 m <sup>3</sup> /s, H 1.4 m	21.7	60 m <sup>3</sup> /s, H 1.0 m	34.2	90 m <sup>3</sup> /s, H 0.8 m	47.0	120 m <sup>3</sup> /s, H 0.8 m	54.7	150 m <sup>3</sup> /s, H 0.8 m	66.6
	(2) Outlet Sluiceway	20 m <sup>2</sup>	0.5	40 m <sup>2</sup>	1.0	60 m <sup>2</sup>	1.5	80 m <sup>2</sup>	2.0	100 m <sup>2</sup>	2.5
	(3) Channels	2,800 m	1.2	2,800 m	1.6	2,800 m	2.0	2,800 m	2.3	2,800 m	2.6
	(4) Bridges	3 pl	0.4	3 pl	0.6	3 pl	0.8	3 pl	1.0	3 pl	1.2
	(5) Land Acquisition	51,000 m <sup>2</sup>	1.4	70,000 m <sup>2</sup>	2.0	87,000 m <sup>2</sup>	2.4	104,000 m <sup>2</sup>	2.9	123,000 m <sup>2</sup>	3.4
2	Yen So Regulating Reservoir	11,920,000 m <sup>3</sup>	63.7	7,570,000 m <sup>3</sup>	35.4	4,510,000 m <sup>3</sup>	20.1	2,260,000 m <sup>3</sup>	11.8	680,000 m <sup>3</sup>	6.8
	(1) Excavation	11,920,000 m <sup>3</sup>	54.4	7,570,000 m <sup>3</sup>	28.2	4,510,000 m <sup>3</sup>	14.4	2,260,000 m <sup>3</sup>	6.8	680,000 m <sup>3</sup>	2.0
	(2) Spillway	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7
	(3) Reinforcement, 1:2, 9,000m	144,000 m <sup>2</sup>	4.5	77,000 m <sup>2</sup>	2.4	30,000 m <sup>2</sup>	0.9	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4
	(4) Land Preparation	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4
	(5) Fishery Compensation	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7
3	Yen So Channel	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5
	(1) Excavation	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8
	(2) Embankment	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4
	(3) Bridges	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5
	(4) Land Acquisition	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8
4	Linh Dam Channel	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4
	(1) Excavation	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2
	(2) Embankment	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1
	(3) Bridges	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7
	(4) Land Acquisition	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4
5	Linh Dam Lake		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Fishery Compensation										
6	Dinh Cong Channel		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Embankment										
	(3) Bridges										
	(4) Land Acquisition										
7	Dinh Cong Lake		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Fishery Compensation										
8	River Improvement		19.0		19.0		19.0		19.0		19.0
9	Drainage Channels		9.5		9.5		9.5		9.5		9.5
10	Lake Dredging		7.0		7.0		7.0		7.0		7.0
	<b>Total</b>		<b>133.3</b>		<b>119.2</b>		<b>118.2</b>		<b>118.9</b>		<b>127.5</b>

\*1 Including D/M Cost

Table D3.9 (4) COSTS OF ALTERNATIVES FOR TO LICH RIVER BASIN (4/6)

Alternative 4	Cost Item	P = 30m <sup>3</sup> /s		P = 60 m <sup>3</sup> /s		P = 90 m <sup>3</sup> /s		P = 120 m <sup>3</sup> /s		P = 150 m <sup>3</sup> /s	
		Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)
1	Yen So Pumping Station	30 m <sup>3</sup> /s	25.2	60 m <sup>3</sup> /s	39.4	90 m <sup>3</sup> /s	53.7	120 m <sup>3</sup> /s	62.9	150 m <sup>3</sup> /s	78.3
	(1) Pumping Station *1	30 m <sup>3</sup> /s, H 13 m	21.7	60 m <sup>3</sup> /s, H 10 m	34.2	90 m <sup>3</sup> /s, H 8 m	47.0	120 m <sup>3</sup> /s, H 6 m	54.7	150 m <sup>3</sup> /s, H 5 m	64.8
	(2) Outlet Sluiceway	20 m <sup>2</sup>	0.5	40 m <sup>2</sup>	1.0	60 m <sup>2</sup>	1.5	80 m <sup>2</sup>	2.0	100 m <sup>2</sup>	2.5
	(3) Channels	2,800 m	1.2	2,800 m	1.6	2,800 m	2.0	2,800 m	2.3	2,800 m	2.6
	(4) Bridges	3 pl	0.4	3 pl	0.6	3 pl	0.8	3 pl	1.0	3 pl	1.2
2	Yen So Regulating Reservoir	51,000 m <sup>2</sup>	1.4	70,000 m <sup>2</sup>	2.0	87,000 m <sup>2</sup>	2.4	104,000 m <sup>2</sup>	2.9	123,000 m <sup>2</sup>	3.4
	(1) Excavation	11,380,000 m <sup>3</sup>	59.8	7,240,000 m <sup>3</sup>	33.7	4,250,000 m <sup>3</sup>	18.9	2,080,000 m <sup>3</sup>	11.0	560,000 m <sup>3</sup>	6.5
	(2) Spoilway	11,380,000 m <sup>3</sup>	50.6	7,240,000 m <sup>3</sup>	26.7	4,250,000 m <sup>3</sup>	13.5	2,080,000 m <sup>3</sup>	6.2	560,000 m <sup>3</sup>	1.7
	(3) Revetment 1:2, 9:000h	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7
	(4) Land Preparation	136,000 m <sup>2</sup>	4.2	72,000 m <sup>2</sup>	2.2	26,000 m <sup>2</sup>	0.8	700,000 m <sup>2</sup>	1.4	700,000 m <sup>2</sup>	1.4
3	Yen So Channel	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7
	(1) Excavation	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5
	(2) Embankment	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8
	(3) Bridges	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4
	(4) Land Acquisition	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8
4	Linh Dam Channel	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4
	(1) Excavation	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2
	(2) Embankment	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1
	(3) Bridges	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7
5	Linh Dam Lake	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4
	(1) Excavation	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6
6	Dinh Cong Channel	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5
	(1) Excavation	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6
7	Dinh Cong Lake	50,000 m <sup>2</sup>	0.0	50,000 m <sup>2</sup>	0.0	50,000 m <sup>2</sup>	0.0	50,000 m <sup>2</sup>	0.0	50,000 m <sup>2</sup>	0.0
	(1) Excavation	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6
	(2) Fishery Compensation	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5
	(3) Bridges	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5
8	River Improvement	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0	19.0
	Drainage Channels	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5	9.5
10	Lake Dredging	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0
	<b>Total</b>	—	131.5	—	119.6	—	119.1	—	120.4	—	129.3

\*1 Including O/M Cost

Table D3.9 (5) COSTS OF ALTERNATIVES FOR TO LICH RIVER BASIN (5/6)

Alternative S	Cost Item	P = 30m <sup>3</sup> /s		P = 60 m <sup>3</sup> /s		P = 90 m <sup>3</sup> /s		P = 120 m <sup>3</sup> /s		P = 150 m <sup>3</sup> /s	
		Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)
1	Yen So Pumping Station	30 m <sup>3</sup> /s	25.2	60 m <sup>3</sup> /s	39.4	90 m <sup>3</sup> /s	53.7	120 m <sup>3</sup> /s	62.8	150 m <sup>3</sup> /s	76.3
	(1) Pumping Station *1	30 m <sup>3</sup> /s, H 1.4 m	21.7	60 m <sup>3</sup> /s, H 1.0 m	34.2	90 m <sup>3</sup> /s, H 0.8 m	47.0	120 m <sup>3</sup> /s, H 0.6 m	54.7	150 m <sup>3</sup> /s, H 0.5 m	66.6
	(2) Outlet Sluiceway	20 m <sup>2</sup>	0.5	40 m <sup>2</sup>	1.0	80 m <sup>2</sup>	1.5	80 m <sup>2</sup>	2.0	100 m <sup>2</sup>	2.5
	(3) Channel	2,800 m	1.2	2,800 m	1.8	2,800 m	2.0	2,800 m	2.3	2,800 m	2.8
	(4) Bridges	3 pl	0.4	3 pl	0.6	3 pl	0.8	3 pl	1.0	3 pl	1.2
	(5) Land Acquisition	51,000 m <sup>2</sup>	1.4	70,000 m <sup>2</sup>	2.0	87,000 m <sup>2</sup>	2.4	104,000 m <sup>2</sup>	2.9	123,000 m <sup>2</sup>	3.4
2	Yen So Regulating Reservoir	12,430,000 m <sup>3</sup>	87.7	7,540,000 m <sup>3</sup>	35.3	4,380,000 m <sup>3</sup>	19.4	2,120,000 m <sup>3</sup>	11.2	540,000 m <sup>3</sup>	6.4
	(1) Excavation	12,430,000 m <sup>3</sup>	56.2	7,540,000 m <sup>3</sup>	28.1	4,380,000 m <sup>3</sup>	13.9	2,120,000 m <sup>3</sup>	6.4	540,000 m <sup>3</sup>	1.6
	(2) Spoilery	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7
	(3) Revetment, 1.2, 9.000m	152,000 m <sup>2</sup>	4.7	76,000 m <sup>2</sup>	2.4	28,000 m <sup>2</sup>	0.9	700,000m <sup>2</sup>	0.0	700,000m <sup>2</sup>	0.0
	(4) Land Preparation	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4	700,000m <sup>2</sup>	1.4
	(5) Fishery Compensation	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7	1,300,000m <sup>2</sup>	0.7
3	Yen So Channel	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5
	(1) Excavation	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8
	(2) Embankment	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4
	(3) Bridges	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5
	(4) Land Acquisition	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8
4	Linh Dam Channel	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4
	(1) Excavation	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2
	(2) Embankment	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1
	(3) Bridges	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7
	(4) Land Acquisition	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4
5	Linh Dam Lake		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Fishery Compensation										
6	Dinh Cong Channel	400 m	1.1	400 m	1.1	400 m	1.1	400 m	1.1	400 m	1.1
	(1) Excavation	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1
	(2) Embankment	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1
	(3) Bridges	2 pl	0.3	2 pl	0.3	2 pl	0.3	2 pl	0.3	2 pl	0.3
	(4) Land Acquisition	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6
7	Dinh Cong Lake		0.0		0.0		0.0		0.0		0.0
	(1) Excavation										
	(2) Fishery Compensation										
8	River Improvement		17.0		17.0		17.0		17.0		17.0
9	Drainage Channels		9.5		9.5		9.5		9.5		9.5
10	Lake Dredging		7.0		7.0		7.0		7.0		7.0
	Total		136.4		118.2		116.8		117.6		128.2

\*1 Including O/M Cost

Table D3.9 (6) COSTS OF ALTERNATIVES FOR TO LICH RIVER BASIN (6/6)

Alternative #	Cost Item	P = 30m <sup>3</sup> /s		P = 60 m <sup>3</sup> /s		P = 90 m <sup>3</sup> /s		P = 120 m <sup>3</sup> /s		P = 150 m <sup>3</sup> /s	
		Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)	Quantity	Cost (\$1,000,000)
1	Yen So Pumping Station	30 m <sup>3</sup> /s	25.2	60 m <sup>3</sup> /s	39.4	90 m <sup>3</sup> /s	49.4	120 m <sup>3</sup> /s	62.9	150 m <sup>3</sup> /s	76.3
	(1) Pumping Station *1	30 m <sup>3</sup> /s, H 13 m	21.7	60 m <sup>3</sup> /s, H 10 m	34.2	90 m <sup>3</sup> /s, H 7 m	42.7	120 m <sup>3</sup> /s, H 6 m	54.7	150 m <sup>3</sup> /s, H 5 m	66.6
	(2) Outlet Sweeney	20 m <sup>2</sup>	0.5	40 m <sup>2</sup>	1.0	80 m <sup>2</sup>	1.5	80 m <sup>2</sup>	2.0	100 m <sup>2</sup>	2.5
	(3) Channels	2,800 m	1.2	2,800 m	1.6	2,800 m	2.0	2,800 m	2.3	2,800 m	2.6
	(4) Bridges	3 pl	0.4	3 pl	0.6	3 pl	0.8	3 pl	1.0	3 pl	1.2
2	(5) Land Acquisition	51,000 m <sup>2</sup>	1.4	70,000 m <sup>2</sup>	2.0	87,000 m <sup>2</sup>	2.4	104,000 m <sup>2</sup>	2.9	123,000 m <sup>2</sup>	3.4
	Yen So Regulating Reservoir	11,350,000 m <sup>3</sup>	58.6	6,830,000 m <sup>3</sup>	31.7	3,870,000 m <sup>3</sup>	17.0	1,750,000 m <sup>3</sup>	10.1	920,000 m <sup>3</sup>	5.8
	(1) Excavation	11,350,000 m <sup>3</sup>	50.8	6,830,000 m <sup>3</sup>	24.9	3,870,000 m <sup>3</sup>	11.6	1,750,000 m <sup>3</sup>	5.3	920,000 m <sup>3</sup>	1.0
	(2) Spillway	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7	200 m	2.7
	(3) Revetment 1:2, 9,000m	135,000 m <sup>2</sup>	4.2	65,000 m <sup>2</sup>	2.0	20,000 m <sup>2</sup>	0.6	—	0.0	—	0.0
3	(4) Land Preparation	700,000 m <sup>2</sup>	1.4	700,000 m <sup>2</sup>	1.4	700,000 m <sup>2</sup>	1.4	700,000 m <sup>2</sup>	1.4	700,000 m <sup>2</sup>	1.4
	(5) Fishery Compensation	1,300,000 m <sup>2</sup>	0.7	1,300,000 m <sup>2</sup>	0.7	1,300,000 m <sup>2</sup>	0.7	1,300,000 m <sup>2</sup>	0.7	1,300,000 m <sup>2</sup>	0.7
	Yen So Channel	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5	3,400 m	6.5
	(1) Excavation	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8	270,000 m <sup>3</sup>	0.8
	(2) Embankment	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4	80,000 m <sup>3</sup>	0.4
4	(3) Bridges	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5	3 pl	0.5
	(4) Land Acquisition	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8	170,000 m <sup>2</sup>	4.8
	Linh Dam Channel	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4	1,000 m	2.4
	(1) Excavation	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2	80,000 m <sup>3</sup>	0.2
	(2) Embankment	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1	10,000 m <sup>3</sup>	0.1
5	(3) Bridges	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7	2 pl	0.7
	(4) Land Acquisition	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4	50,000 m <sup>2</sup>	1.4
	Linh Dam Lake	—	2.1	—	2.1	—	2.1	—	2.1	—	2.1
	(1) Excavation	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6	540,000 m <sup>3</sup>	1.6
	(2) Fishery Compensation	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5	1,070,000 m <sup>2</sup>	0.5
6	Dinh Cong Channel	400 m	1.1	400 m	1.1	400 m	1.1	400 m	1.1	400 m	1.1
	(1) Excavation	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1	30,000 m <sup>3</sup>	0.1
	(2) Embankment	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1	4,000 m <sup>3</sup>	0.1
	(3) Bridges	2 pl	0.3	2 pl	0.3	2 pl	0.3	2 pl	0.3	2 pl	0.3
	(4) Land Acquisition	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6	20,000 m <sup>2</sup>	0.6
7	Dinh Cong Lake	—	0.5	—	0.5	—	0.5	—	0.5	—	0.5
	(1) Excavation	130,000 m <sup>3</sup>	0.4	130,000 m <sup>3</sup>	0.4	130,000 m <sup>3</sup>	0.4	130,000 m <sup>3</sup>	0.4	130,000 m <sup>3</sup>	0.4
	(2) Fishery Compensation	250,000 m <sup>2</sup>	0.1	250,000 m <sup>2</sup>	0.1	250,000 m <sup>2</sup>	0.1	250,000 m <sup>2</sup>	0.1	250,000 m <sup>2</sup>	0.1
8	River Improvement	—	17.0	—	17.0	—	17.0	—	17.0	—	17.0
9	Drainage Channels	—	9.5	—	9.5	—	9.5	—	9.5	—	9.5
10	Lake Dredging	—	7.0	—	7.0	—	7.0	—	7.0	—	7.0
Total		—	130.9	—	117.2	—	112.5	—	119.1	—	128.2

\*1 Including O/M Cost

Table D3.10 DISCHARGE OF EACH CHANNEL STRETCH,  
NHUE RIVER BASIN

Channel Number*	Channel Length (m)	Catchment Area (km <sup>2</sup> )	Discharge (m <sup>3</sup> /s)	Specific Discharge (m <sup>3</sup> /s/km <sup>2</sup> )
<b>(CO NHUE DRAINAGE BASIN)</b>				
C.A	300	19.70	55	2.8
C.B	1,400	16.38	48	2.9
C.C	1,000	11.94	32	2.7
C.D	1,700	6.80	21	3.1
C.E	1,300	4.72	14	3.0
C.F	700	1.48	4	2.7
C2.A	1,000	2.32	8	3.4
C3.A	700	0.89	3	3.4
C4.A	1,600	3.08	6	1.9
C4.B	1,800	2.18	5	1.9
C5.A	800	2.06	7	3.4
C5.B	900	1.07	4	3.4
C6.A	1,300	2.74	9	3.3
C6.B	1,500	1.58	6	3.3
C7.A	1,400	0.75	3	4.0
C8.A	1,800	2.35	5	2.1
<b>(MY DINH DRAINAGE BASIN)</b>				
D.A	1,000	13.60	26	1.9
D.B	1,300	8.95	21	2.3
D.C	1,000	4.57	11	2.4
D.D	1,500	2.22	6	2.4
D.E	900	1.64	4	2.4
D1.A	800	1.40	4	2.4
D2.A	1,400	3.26	6	1.8
D2.B	1,200	0.94	2	1.8
D2.C	800	1.49	3	1.8
D4.A	1,300	1.68	3	1.8
D5.A	1,000	2.97	4	1.3
D5.B	1,200	1.73	3	1.3
<b>(ME TRI DRAINAGE BASIN)</b>				
M.A	600	12.64	24	1.9
M.B	1,700	9.44	22	2.3
M.C	1,200	5.52	14	2.5
M.D	1,200	1.89	7	3.7
M1.A	800	1.02	4	3.9
M2.A	1,300	1.30	2	1.5
M2.B	600	1.31	2	1.5
M3.A	1,600	2.39	7	2.9
M4.A	1,500	1.93	2	1.0
M4.B	1,100	1.27	2	0.8
M5.A	1,900	2.06	8	3.9
<b>(BA XA DRAINAGE BASIN)</b>				
B.A	800	9.90	14	1.4
B.B	900	2.18	3	1.4
B.C	1,000	1.14	2	1.4
B2.A	900	3.63	6	1.7
B2.B	1,300	2.00	4	1.7
B2.C	1,200	1.14	2	1.7
B3.A	1,000	3.84	5	1.3
B3.B	1,600	3.05	4	1.3

\* Refer to Fig. D3.6

Table D3.11(1) DIMENSIONS AND WORK QUANTITIES OF DRAINAGE CHANNELS.  
NHUE RIVER BASIN (1/2)

Channel No.	Present Flow Capacity (m <sup>3</sup> /s)	Present Cross Sectional Area (m <sup>2</sup> )	Present Channel Width (m)	Channel Length (m)	Design Discharge (m <sup>3</sup> )	Water Depth (m)	Design River Bed Gradient	Required Cross Sectional Area (m <sup>2</sup> )	Side Slope Gradient	Required Channel Width (m)	Excavation Volume (m <sup>3</sup> )	Embankment Volume (m <sup>3</sup> )	Revetment (m <sup>2</sup> )	Bridge (m <sup>2</sup> )	Intake Pump (piece)	Land Acquisition (m <sup>2</sup> )
<b>Co Nhue Drainage Basin</b>																
C.A	16.3	27.5	13	300	55	3	1/5000	68.1	1:2	28.7	12200	400	-	260	0	4710
C.B	14.5	25	12	1400	48	3	1/5000	60.5	1:2	26.2	49800	1600	-	240	1	19880
C.C	10.4	20	12	1000	32	2.5	1/5000	45	1:2	23	25100	1100	-	210	1	11000
C.D	9.1	18	11	1700	21	2.5	1/5000	30.7	1:1.5	16.1	21600	1900	-	140	2	8670
C.E	5.6	12.7	10	1300	14	2	1/5000	23.1	1:1.5	14.6	13600	1500	-	130	1	5980
C.F	2.0	6	7	700	4	1.5	1/5000	8.8	1:1.5	8.1	2000	800	-	70	1	770
C2.A	4.8	11.2	9	1000	8	2	1/5000	14.6	1:1.5	10.3	3500	1100	-	0	1	1300
C3.A	2.0	6	7	700	3	1.5	1/5000	6.9	1:1.5	6.9	700	800	-	0	1	0
C4.A	5.6	12.7	10	1600	6	2	1/5000	11.6	1:1.5	8.8	0	1800	-	160	2	0
C4.B	5.6	12.7	10	1800	5	2	1/5000	10.1	1:1.5	8.1	0	2000	-	70	2	0
C5.A	5.6	12.7	10	800	7	2	1/5000	13.1	1:1.5	9.6	400	900	-	90	1	0
C5.B	5.6	12.7	10	900	4	2	1/5000	8.5	1:1.5	7.3	0	1000	-	70	1	0
C6.A	2.0	6	7	1300	9	1.5	1/5000	17.2	1:1.5	13.7	14600	1500	-	120	1	8710
C6.B	2.0	6	7	1500	6	1.5	1/5000	12.2	1:1.5	10.4	9300	1700	-	90	2	5100
C7.A	2.0	6	7	1400	3	1.5	1/5000	6.9	1:1.5	6.9	1300	1600	-	60	1	0
C9.A	1.2	4	5	1800	5	1.5	1/5000	10.5	1:1.5	9.3	11800	2000	-	80	2	7740
Sub-total											165900	21700	0	1790	20	73860
<b>My Dinh Drainage Basin</b>																
D.A	10.1	18.7	10	1000	26	2.5	1/5000	36.8	1:1.5	18.5	18100	1100	-	170	1	8300
D.B	6.7	14	9	1300	21	2.5	1/5000	30.7	1:1.5	16.1	21800	1500	-	140	1	9230
D.C	6.7	14	9	1000	11	2.5	1/5000	18.3	1:1.5	11.1	4400	1100	-	100	1	2100
D.D	4.0	9.7	8	1500	6	2	1/5000	11.6	1:1.5	8.8	2900	1700	-	80	2	1200
D.E	1.6	5	6	900	4	1.5	1/5000	8.7	1:1.5	8.1	3400	1000	-	70	1	1880
D1.A	2.0	6	7	800	4	1.5	1/5000	8.7	1:1.5	8.1	2200	900	-	70	1	880
D2.A	4.0	9.7	8	1400	6	2	1/5000	11.6	1:1.5	8.8	2700	1600	-	80	1	1120
D2.B	1.6	5	6	1200	2	1.5	1/5000	5.1	1:1.5	5.7	200	1300	-	50	1	0
D2.C	1.6	5	6	800	3	1.5	1/5000	6.9	1:1.5	6.9	1600	900	-	60	1	720
D4.A	2.0	6	7	1300	3	1.5	1/5000	6.9	1:1.5	6.9	1200	1500	-	60	1	0
D5.A	1.2	4	5	1000	4	1.5	1/5000	8.7	1:1.5	8.1	4700	1100	-	70	1	3100
D5.B	1.2	4	5	1200	3	1.5	1/5000	6.9	1:1.5	6.9	3500	1300	-	60	1	2280
Sub-total											66700	15000	0	1010	13	31020



Table D3.11(2) DIMENSIONS AND WORK QUANTITIES OF DRAINAGE CHANNELS.  
NHUE RIVER BASIN (2/2)

Channel No.	Present Flow Capacity (m <sup>3</sup> /s)	Present Cross Sectional Area (m <sup>2</sup> )	Present Channel Width (m)	Channel Length (m)	Design Discharge (m <sup>3</sup> )	Slope Height (m)	Design River Channel Bed Gradient	Required Cross Sectional Area (m <sup>2</sup> )	Required Side Slope Gradient	Required Channel Width (m)	Excavation Volume (m <sup>3</sup> )	Embankment Volume (m <sup>3</sup> )	Revetment (m <sup>2</sup> )	Bridge (m <sup>2</sup> )	Intake Pump (piece)	Land Acquisition (m <sup>2</sup> )
<b>Me Tri Drainage Basin</b>																
M.A	9.8	18	9	600	24	3	1/5000	34.4	1:2	17.5	9900	700	-	160	1	5100
M.B	4.4	10	7	1700	22	2.5	1/5000	31.9	1:1.5	16.6	37900	1900	-	150	2	16320
M.C	3.3	8.2	7	1200	14	2	1/5000	23.1	1:1.5	14.6	17900	1300	-	130	1	9120
M.D	1.6	5	6	1200	7	1.5	1/5000	13.8	1:1.5	11.5	10600	1300	-	100	1	6600
M1.A	1.2	4	5	800	4	1.5	1/5000	8.7	1:1.5	8.1	3800	900	-	70	1	2480
M2.A	1.2	4	5	1300	2	1.5	1/5000	5.1	1:1.5	5.7	1500	1500	-	50	1	910
M2.B	1.2	4	5	600	2	1.5	1/5000	5.1	1:1.5	5.7	700	700	-	50	1	420
M3.A	1.2	4	5	1600	7	1.5	1/5000	13.8	1:1.5	11.5	15700	1800	-	100	2	10400
M4.A	4.0	9.7	8	1500	2	2	1/5000	5.1	1:1.5	5.7	0	1700	-	50	2	0
M4.B	1.2	4	5	1100	1	1.5	1/5000	3	1:1	3.5	0	1200	-	30	1	0
M5.A	1.2	4	5	1900	8	1.5	1/5000	15.5	1:1.5	12.6	21900	2100	-	110	2	14440
Sub-total											119300	15100	0	1000	15	65790
<b>Ba Xa Drainage Basin</b>																
B.A	4.8	11.2	9	800	14	2	1/5000	5.1	1:1.5	5.7	0	900	-	50	1	0
B.B	2.0	6	7	900	3	1.5	1/5000	6.9	1:1.5	6.9	900	1000	-	60	1	0
B.C	1.6	5	6	1000	2	1.5	1/5000	5.1	1:1.5	5.7	100	1100	-	50	1	0
B2.A	1.6	5	6	900	6	1.5	1/5000	12.2	1:1.5	10.4	6500	1000	-	90	1	3960
B2.B	1.6	5	6	1300	4	1.5	1/5000	8.7	1:1.5	8.1	4900	1500	-	70	1	2730
B2.C	1.6	5	6	1200	2	1.5	1/5000	5.1	1:1.5	5.7	200	1300	-	50	1	0
B3.A	4.0	9.7	8	1000	5	2	1/5000	10.4	1:1.5	9.2	800	1100	-	80	1	1200
B3.B	3.3	8.2	7	1600	4	2	1/5000	8.7	1:1.5	8.1	900	1800	-	70	2	1760
Sub-total											14300	9700	0	520	9	9650

Table D3.12 RECLAMATION COST FOR NHUE RIVER BASIN

Name of Drainage Basin	Item	Area where Reclamation Works are Required against Nhue River High Water Level (EL.5.7 m to 6.0 m)					Area to be Urbanized by 2010	Total
		Presently Urbanized Area		Area to be Urbanized				
		Office/Public Facilities	Urban Residential Area	Suburban Residential Area	Industrial Area			
Co Nhue (A=19.7km <sup>2</sup> )	Area (ha)	3	13	22	0	1,116	1,154	
	Cost (\$1000)	1,883	1,840	1,221	0	61,380	66,324	
My Dinh (A=13.6km <sup>2</sup> )	Area (ha)	33	37	43	15	555	683	
	Cost (\$1000)	20,708	5,236	2,387	3,563	30,525	62,419	
Me Tri (A=14.7km <sup>2</sup> )	Area (ha)	36	133	51	99	450	769	
	Cost (\$1000)	22,590	18,820	2,831	23,513	24,750	92,504	
Ba Xa (A=9.9km <sup>2</sup> )	Area (ha)	36	61	59	21	365	542	
	Cost (\$1000)	22,590	8,632	3,275	4,988	20,075	59,560	
Total (A=57.9km <sup>2</sup> )	Area (ha)	108	244	175	135	2,486	3,148	
	Cost (\$1000)	67,771	34,528	9,714	32,064	136,730	280,807	
Unit cost per Hectare		\$5.5/m <sup>3</sup> x0.5m x10,000m <sup>2</sup> +\$600,000 = \$627,500	\$5.5/m <sup>3</sup> x0.5m x10,000m <sup>2</sup> +\$114,000 = \$141,500	\$5.5/m <sup>3</sup> x0.5m x10,000m <sup>2</sup> +\$28,000 = \$55,500	\$5.5/m <sup>3</sup> x0.5m x10,000m <sup>2</sup> +\$210,000 = \$237,500	\$5.5/m <sup>3</sup> x1.0m x10,000m <sup>2</sup> = \$55,000		

Table D3.13 CHARACTERISTICS AND COST OF EACH ALTERNATIVE FOR INTRODUCTION OF FLUSHING WATER

Alternative Characteristics	1	2	3
Existing irrigation channel is used as the route together with re-construction of the pumping station. A control gate is required in the To Lich river basin.		Completely new route. Sand bar at the intake point is unstable. A control gate is also required in the To Lich river.	Yen So pumping station and regulating reservoir can be used commonly for this purpose. Longer pipeline is necessitated.
Cost Breakdown	Pumping Station ; \$700,000/m <sup>3</sup> /s x 3.5m <sup>3</sup> /s =\$2,450,000 Settling basin ; \$3/m <sup>3</sup> x 302,000m <sup>3</sup> =\$906,000 Control gate ; \$25,000/m <sup>2</sup> x 30m <sup>2</sup> =\$750,000 Open channel ; \$10/m x 7,300m =\$73,000 Pipeline with Valves ; \$1,000/m x 6,000m =\$6,000,000 \$10,179,000	Pumping station: =\$2,450,000 Settling basin: =\$906,000 Control gate: =\$750,000 Open channel ; \$100/m x 3,800m =\$380,000 Pipeline with valves =\$6,000,000 \$10,486,000	Pipeline with valves ; \$1000/m x 12,500 m = \$12,500,000
Total	\$10,179,000	\$10,486,000	\$12,500,000
Assessment	1	3	2

Table D3.14 (1) PROJECT COST FOR DRAINAGE MASTER PLAN (1/8)

Description	Cost (\$1,000)
<b>I. TO LICH RIVER BASIN (77.5 km<sup>2</sup>)</b>	
<b><u>1st Stage Construction Project</u></b>	
<b>A. Construction Cost</b>	<b>113,391</b>
1. Site Preparatory Works	723
2. Main Civil Works	85,071
(1) General Installations	8,066
(2) Yen So Pumping Station	13,506
(a) Pumping Station, Civil Work	5,360
(b) Inlet Structure	1,435
(c) Inlet Channel, 1,200 m	1,914
(d) Ordinary Drainage Channel, 1,900 m	834
(e) Outlet Sluiceway, Civil Work	1,158
(f) Outlet Channel, 1,600 m	2,805
(3) Yen So Regulating Reservoir	19,151
(a) Regulating Reservoir, 203 ha	14,923
(b) Yen So Channel, 3,400 m	2,522
(c) Spoil Bank	1,706
(4) Linh Dam Channel, 1,000 m	2,204
(5) Floodgates and Control Gates, Civil Work	4,489
(6) River Improvement	14,427
(a) Lower Kim Nguu, To Lich and Lower Lu Rivers, and Thanh Liet Channel, 22,100 m	8,899
(b) Set and Upper Lu Rivers, and Lu-Set Floodway, 7,500 m	4,299
(c) Upper Kim Nguu River, 3,400 m	1,229
(7) Hygdromechanical Equipment	22,828
(a) Pumping Station, Mechanical/Electrical Work	19,520
(b) Outlet Sluiceway Gates	315

Note : 1994 price, excluding price contingencies

Table D3.14 (2) PROJECT COST FOR DRAINAGE MASTER PLAN (2/8)

Description	Cost (\$1,000)
(c) Floodgates and Control Gates, Metal Work	2,993
(8) Installation of Flood Forecasting System	400
3. Drainage Channel Improvement, Reconstruction of Bridges/Culverts	4,548
(1) To Lich and Lower Lu River Basins, and Hoang Liet Drainage Basin, 16,400 m	2,979
(2) Set and Upper Lu River Basins, 3,700 m	397
(3) Kim Nguu River Basin, 10,700 m	1,172
4. Lake Improvement	3,367
(1) Lake Dredging, 4 lakes	3,052
(2) Lake Conservation, Aeration in 2 pilot lakes	315
5. Sewer Rehabilitation and Construction	10,032
(1) West Lake Basin	336
(2) To Lich River Basin	1,660
(3) Set River Basin	1,284
(4) Upper Lu River Basin	2,649
(5) Kim Nguu River Basin	4,103
6. Supply of Dredging Equipment	9,650
 B. Administration Cost	 3,402
 C. Land Acquisition and Compensation Cost	 15,181
1. Land Acquisition	14,030
2. House Evacuation	501
3. Fishery Compensation	650
 D. Physical Contingency	 11,573

Note : 1994 price, excluding price contingencies

Table D3.14 (3) PROJECT COST FOR DRAINAGE MASTER PLAN (3/8)

Description	Cost (\$1,000)
E. Engineering Service Cost	16,925
(Sub-total of 1st Stage Construction Project)	160,472
<u>2nd Stage Construction Project</u>	
A. Construction Cost	101,609
1. Main Civil Works	27,878
(1) General Installations	1,512
(2) Yen So Pumping Station	5,519
(a) Pumping Station, Civil Work	4,384
(b) Outlet Sluiceway, Civil Work	1,135
(3) Linh Dam and Dinh Cong Lakes	4,561
(a) Linh Dam Lake, 107 ha	3,348
(b) Dinh Cong Channel, 400m	429
(c) Dinh Cong Lake, 25 ha	784
(4) Hydromechanical Equipment	16,286
(a) Pumping Station, Mechanical/Electrical Work	15,971
(b) Outlet Sluiceway Gates	315
2. Drainage Channel Improvement	17,723
(1) To Lich and Lower Lu River Basins and Hoang Liet Drainage Basin, 16,400 m	11,684
(2) Set and Upper Lu River Basins, 3,700 m	2,924
(3) Kim Nguu River Basin, 10,700 m	3,115
3. Lake Improvement	7,584
(1) Lake Dredging, 14 lakes	6,240
(2) Lake Conservation, 11 lakes	1,344
4. Sewer Rehabilitation and Construction	48,424
(1) West Lake Basin	2,412

Note : 1994 price, excluding price contingencies

Table D3.14 (4) PROJECT COST FOR DRAINAGE MASTER PLAN (4/8)

Description	Cost (\$1,000)
(2) To Lich River Basin	15,262
(3) Lower Lu River Basin	2,891
(4) Hoang Liet Drainage Basin	5,167
(5) Set River Basin	6,273
(6) Upper Lu River Basin	3,311
(7) Kim Nguu River Basin	12,803
(8) Yen So Drainage Basin	305
<b>B. Administration Cost</b>	<b>3,048</b>
<b>C. Land Acquisition and Compensation Cost</b>	<b>20,049</b>
1. Land Acquisition	18,050
2. House Evacuation	1,339
3. Fishery Compensation	660
<b>D. Physical Contingency</b>	<b>11,656</b>
<b>E. Engineering Service Cost</b>	<b>20,577</b>
(Sub-total of 2nd Stage Construction Project)	156,939
<b>Total of I. TO LICH RIVER BASIN</b>	<b>317,411</b>
<b>II. NHVE RIVER BASIN (57.9 km<sup>2</sup>)</b>	
<u>Co Nhue Drainage Basin Project (19.7 km<sup>2</sup>)</u>	
<b>A. Construction Cost</b>	<b>54,787</b>
1. Drainage Improvement	25,801

Note : 1994 price, excluding price contingencies

Table D3.14 (5) PROJECT COST FOR DRAINAGE MASTER PLAN (5/8)

Description	Cost (\$1,000)
(1) General Installations	3,365
(2) Pumping Station, 12 m <sup>3</sup> /S	9,405
(3) Regulating Reservoir, 76 ha	9,808
(4) Drainage Channels, 19,200 m	3,223
2. Nhue River Left Levee, 6,000 m	565
3. Sewer Construction	25,019
4. River/Lake Conservation Works	3,402
B. Administration Cost	1,644
C. Land Acquisition and Compensation Cost	14,478
1. Land Acquisition	14,033
2. House Evacuation	65
3. Fishery Compensation	380
D. Physical Contingency	7,091
E. Engineering Service Cost	8,218
(Sub-total of Co Nhue Drainage Basin Project)	86,218
<u>My Dinh Drainage Basin Project (13.6 km<sup>2</sup>)</u>	
A. Construction Cost	26,659
1. Drainage Improvement	15,516
(1) General Installations	2,024
(2) Pumping Station, 8m <sup>3</sup> /S	6,648
(3) Regulating Reservoir, 40 ha	5,124

Note : 1994 price, excluding price contingencies



Table D3.14 (6) PROJECT COST FOR DRAINAGE MASTER PLAN (6/8)

Description	Cost (\$1,000)
(4) Drainage Channels, 13,400 m	1,720
2. Nhue River Left Levee, 3,700 m	348
3. Sewer Construction	8,446
4. River/Lake Conservation Works	2,349
B. Administration Cost	800
C. Land Acquisition and Compensation Cost	6,133
1. Land Acquisition	5,894
2. House Evacuation	39
3. Fishery Compensation	200
D. Physical Contingency	3,359
E. Engineering Service Cost	3,999
(Sub-total of My Dinh Drainage Basin Project)	40,950
 <b><u>Me Tri Drainage Basin Project (14.7 km<sup>2</sup>)</u></b>	
A. Construction Cost	30,801
1. Drainage Improvement	16,799
(1) General Installations	2,191
(2) Pumping Station, 9m <sup>3</sup> /S	7,317
(3) Regulating Reservoir, 40 ha	5,222
(4) Drainage Channels, 13,500 m	2,069
2. Nhue River Left Levee, 4,800 m	452
3. Sewer Construction	11,011

Note : 1994 price, excluding price contingencies

Table D3.14 (7) PROJECT COST FOR DRAINAGE MASTER PLAN (7/8)

Description	Cost (\$1,000)
4. River/Lake Conservation Works	2,539
B. Administration Cost	924
C. Land Acquisition and Compensation Cost	12,791
1. Land Acquisition	12,500
2. House Evacuation	91
3. Fishery Compensation	200
D. Physical Contingency	4,452
E. Engineering Service Cost	4,620
(Sub-total of Me Tri Drainage Basin Project)	53,588
<u>Ba Xa Drainage Basin Project (9.9 km<sup>2</sup>)</u>	
A. Construction Cost	18,510
1. Drainage Improvement	10,877
(1) General Installations	1,419
(2) Pumping Station, 6m <sup>3</sup> /S	5,174
(3) Regulating Reservoir, 27 ha	3,390
(4) Drainage Channels, 8,700 m	894
2. Nhue River Left Levee, 4,100 m	386
3. Sewer Construction	5,537
4. River/Lake Conservation Works	1,710
B. Administration Cost	555

Note : 1994 price, excluding price contingencies

Table D3.14 (8) PROJECT COST FOR DRAINAGE MASTER PLAN (8/8)

Description	Cost (\$1,000)
C. Land Acquisition and Compensation Cost	1,995
1. Land Acquisition	1,834
2. House Evacuation	26
3. Fishery Compensation	135
D. Physical Contingency	2,106
E. Engineering Service Cost	2,776
(Sub-total of Ba Xa Drainage Basin Project)	25,942
Total of II. NHUE RIVER BASIN	206,698
III. GRAND TOTAL	524,109

Note : 1994 price, excluding price contingencies

Table D3.15 O/M/R COST FOR DRAINAGE MASTER PLAN

Item	Initial Cost (\$1,000)	Annual O/M Cost		Replacement Cost	
		Rate for Initial Cost	Amount (\$1,000)	Amount (\$1,000)	Economic Life
<b>A. TO LICH RIVER BASIN</b>	214,997		1,437	214,997	
1. 1st Stage Project	113,388		859	113,388	
(1) Civil Works	80,911	0.3%	243	80,911	50-year
(2) Pumps & Equipment	29,170	2.0%	583	29,170	25-year
(3) Gates	3,307	1.0%	33	3,307	25-year
2. 2nd Stage Project	101,609		578	101,609	
(1) Civil Works	85,323	0.3%	256	85,323	50-year
(2) Pumps	15,971	2.0%	319	15,971	25-year
(3) Gates	315	1.0%	3	315	25-year
<b>B. NHUE RIVER BASIN</b>	130,757		729	130,757	
1. Co Nhue Basin	54,787		273	54,787	
(1) Civil Works	48,127	0.3%	144	48,127	50-year
(2) Pumps	6,210	2.0%	124	6,210	25-year
(3) Gates	450	1.0%	5	450	25-year
2. My Dinh Basin	26,659		159	26,659	
(1) Civil Works	21,883	0.3%	66	21,883	50-year
(2) Pumps	4,536	2.0%	91	4,536	25-year
(3) Gates	240	1.0%	2	240	25-year
3. Me Tri Basin	30,801		180	30,801	
(1) Civil Works	25,549	0.3%	77	25,549	50-year
(2) Pumps	4,982	2.0%	100	4,982	25-year
(3) Gates	270	1.0%	3	270	25-year
4. Ba Xa Basin	18,510		117	18,510	
(1) Civil Works	14,752	0.3%	44	14,752	50-year
(2) Pumps	3,618	2.0%	72	3,618	25-year
(3) Gates	140	1.0%	1	140	25-year
<b>Total</b>	<b>345,754</b>	<b>-</b>	<b>2,166</b>	<b>345,754</b>	<b>-</b>

Table D3.16 (1) DISBURSEMENT SCHEDULE FOR DRAINAGE MASTER PLAN (1/6)

Unit : US\$1,000

Item	Total	Year														
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007		
I. TO LICH RIVER BASIN																
<u>1st Stage Project</u>																
A. Construction Cost	113,387	72	18,095	30,729	39,026	22,577	2,888									
1. Site Preparatory Works	722	72	578	72												
2. Main Civil Works	85,068		8,507	28,622	31,524	15,153	1,262									
3. Drainage Channel Imp.	4,548			455	1,819	1,819	455									
4. Lake Improvement	3,367			337	1,430	1,432	168									
5. Sewer Reh. & Const.	10,032			1,003	4,013	4,013	1,003									
6. Supply of Equipment	9,650		9,010	240	240	160										
B. Administration Cost	3,402	340	510	851	851	510	340									
C. Land Acquisition and Compensation Cost	15,181	2,396	6,666	4,925	1,194											
D. Physical Contingency	11,573	246	2,216	3,201	3,602	2,025	283									
E. Engineering Service Cost	16,925	5,096	2,378	3,055	2,562	2,456	1,378									
Total	160,467	8,150	29,866	42,762	47,235	27,568	4,889									

Table D3.16 (2) DISBURSEMENT SCHEDULE FOR DRAINAGE MASTER PLAN (2/6)

Unit : US\$1,000

Item	Total	Year												
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
<b>I. TO LICH RIVER BASIN</b>														
<b>2nd Stage Project</b>														
A. Construction Cost	101,608							10,009	37,934	38,160	15,505			
1. Main Civil Works	27,878							3,395	16,573	7,910	3,545			
2. Drainage Channel Imp.	17,723							1,772	5,317	7,089	2,275			
3. Lake Improvement	7,584							4,842	1,517	3,792	9,685			
4. Sewer Reh. & Const.	48,423								14,527	19,369				
B. Administration Cost	3,048							610	914	914	305			
C. Land Acquisition and Compensation Cost	20,050							8,020	8,020					
D. Physical Contingency	11,656							1,742	4,381	3,652	1,478			
E. Engineering Service Cost	20,577							2,058	6,173	4,115	2,058			
<b>Total</b>	156,939							22,439	57,422	46,841	19,346			

Table D3.16 (3) DISBURSEMENT SCHEDULE FOR DRAINAGE MASTER PLAN (3/6)

Unit : US\$1,000

Item	Total	Year												
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>II. NHUE RIVER BASIN</b>														
Co Nhue Basin														
A. Construction Cost	54,787			15,246	16,607	17,171	5,763							
1. Drainage Improvement	25,801			7,740	7,740	7,740	2,581							
2. Nhue River Left Levee	565					565								
3. Sewer Construction	25,019			7,506	7,506	7,505	2,502							
4. River/Lake Conservation	3,402			1,361	1,361	1,361	680							
B. Administration Cost	1,644	247	247	329	329	328	164							
C. Land Acquisition and Compensation Cost	14,478	4,343	4,343	2,896	2,896									
D. Physical Contingency	7,092	459	459	1,847	1,983	1,750	593							
E. Engineering Service Cost	8,218	1,644	822	1,644	1,643	1,643	822							
<b>Total</b>	<b>86,218</b>	<b>6,693</b>	<b>5,871</b>	<b>21,962</b>	<b>23,458</b>	<b>20,892</b>	<b>7,342</b>							

Table D3.16 (4) DISBURSEMENT SCHEDULE FOR DRAINAGE MASTER PLAN (4/6)

Unit: US\$1,000

Item	Total	Year													
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	
II. NHUE RIVER BASIN															
My Dinh Basin															
A. Construction Cost	26,659														
1. Drainage Improvement	15,516														
2. Nhue River Left Levee	348														
3. Sewer Construction	8,446														
4. River/Lake Conservation	2,349														
B. Administration Cost	800				160	120	160	120	120	120					
C. Land Acquisition and Compensation Cost	6,133				1,840	1,840	1,227	1,226							
D. Physical Contingency	3,360				200	196	738	804	740	682					
E. Engineering Service Cost	3,999				800	400	800	800	799	400					
Total	40,951				3,000	2,556	8,916	9,645	8,937	7,897					



Table D3.16 (5) DISBURSEMENT SCHEDULE FOR DRAINAGE MASTER PLAN (5/6)

Unit : US\$1,000

Item	Total	Year												
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>II. NHUE RIVER BASIN</b>														
<b>Mc Tri Basin</b>														
A. Construction Cost	30,801													
1. Drainage Improvement	16,799													
2. Nhue River Left Levee	452													
3. Sewer Construction	11,011													
4. River/Lake Conservation	2,539													
B. Administration Cost	924				185	139	185	139	138	138				
C. Land Acquisition and Compensation Cost	12,791				3,837	3,838	2,558	2,558						
D. Physical Contingency	4,451				402	398	969	1,041	856	785				
E. Engineering Service Cost	4,620				924	462	924	924	924	462				
<b>Total</b>	<b>53,587</b>				<b>5,348</b>	<b>4,837</b>	<b>11,587</b>	<b>12,377</b>	<b>10,338</b>	<b>9,100</b>				

Table D3.16 (6) DISBURSEMENT SCHEDULE FOR DRAINAGE MASTER PLAN (6/6)

Unit : US\$1,000

Item	Total	Year												
		2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
<b>II. NHUE RIVER BASIN</b>														
<b>Ba Xa Basin</b>														
A. Construction Cost	18,510										4,103	4,618	5,173	4,616
1. Drainage Improvement	10,877										2,719	2,720	2,719	2,719
2. Nhue River Left Levee	386												386	
3. Sewer Constiuction	5,537										1,384	1,385	1,384	1,384
4. River/Lake Conservation	1,710											513	684	513
B. Administration Cost	555							111	83	83	111	84	83	83
C. Land Acquisition and Compensation Cost	1,995							599	598	399	399	399		
D. Physical Comingency	2,106							71	68	461	510	526	470	
E. Engineering Service Cost	2,776							555	278	555	555	555	278	
<b>Total</b>	25,942							1,336	1,027	5,629	6,166	6,337	5,447	

Table D3.17 DIRECT DAMAGE PER HECTARE WITH INUNDATION DEPTH BY LAND USE

Land Use	Item	Unit Price (\$/ha)	Inundation Depth (m)											
			Shallower than 0.2		0.2 to 0.5		0.5 to 1.0		1.0 to 2.0		Deeper than 2.0			
			Damage Rate	Damage (\$/ha)	Damage Rate	Damage (\$/ha)	Damage Rate	Damage (\$/ha)	Damage Rate	Damage (\$/ha)	Damage Rate	Damage (\$/ha)		
Office/Public Facilities	Building	900,000	0.030	27,000	0.053	47,700	0.072	64,800	0.109	98,100	0.152	136,800		
	House	461,100	0.030	13,800	0.053	24,400	0.072	33,200	0.109	50,300	0.152	70,100		
	Household Goods	317,900	0.000	0	0.086	27,300	0.191	60,700	0.331	105,200	0.499	158,600		
	Total	779,000	-	13,800	-	51,700	-	93,900	-	155,500	-	228,700		
Urban Residential Area	House	168,200	0.030	5,000	0.053	8,900	0.072	12,100	0.109	18,300	0.152	25,600		
	Household Goods	115,900	0.000	0	0.086	10,000	0.191	22,100	0.331	38,400	0.499	57,800		
Suburban Residential Area	House	284,100	-	5,000	-	18,900	-	34,200	-	56,700	-	83,400		
	Household Goods	40,100	0.030	1,200	0.053	2,100	0.072	2,900	0.109	4,400	0.152	6,100		
Industrial Area	House	23,900	0.000	0	0.086	2,100	0.191	4,600	0.331	7,900	0.499	11,900		
	Total	64,000	-	1,200	-	4,200	-	7,500	-	12,300	-	18,000		
Fishpond /Lake Area	Building	315,000	0.030	9,500	0.053	16,700	0.072	22,700	0.109	34,300	0.152	47,900		
	Area	1,350	0.300	410	0.500	680	0.75	1,010	1.000	1,350	1.000	1,350		
Agricultural Land	Area	660	0.360	240	0.360	240	0.5	330	0.640	420	0.640	420		
	Green Area /Un-used Land	0	-	0	-	0	-	0	-	0	-	0		

Table D3.18(1) AREA WITH ELEVATION BY LAND USE (1/4)

RIVER BASIN	SUB RIVER BASIN	ELEVATION	AREA (km2)									
			Office/ Public	Anclant	Urban	Village	Industry	Fish Pond	Agri- culture	Green Area	Total	
TO LICH (20.0 km2)	T1 EL. (m) 7.4-10.1	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		higher than 7 m	0.55	0.17	0.33	0.00	0.00	0.00	0.00	0.00	0.25	1.30
		Total	0.55	0.17	0.33	0.00	0.00	0.00	0.00	0.00	0.25	1.30
	T2 EL. (m) 5.9-7.6	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.00	0.00	0.04	0.00	0.00	0.00	0.09	0.00	0.13	0.13
		6 - 7 m	0.15	0.00	1.73	0.00	0.02	0.16	0.02	0.11	2.19	2.19
		higher than 7 m	0.30	0.00	1.34	0.00	0.13	0.00	0.15	0.12	2.04	2.04
		Total	0.45	0.00	3.11	0.00	0.15	0.16	0.26	0.23	4.36	4.36
	T3 EL. (m) 5.8-6.6	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.02	0.00	0.13	0.00	0.00	0.13	0.72	0.00	1.00	1.00
		6 - 7 m	0.27	0.00	1.65	0.11	0.02	0.00	0.07	0.00	2.12	2.12
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	0.29	0.00	1.78	0.11	0.02	0.13	0.79	0.00	3.12	3.12
	T4 EL. (m) 5.8-7.5	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14
		6 - 7 m	0.36	0.00	0.28	0.00	0.00	0.03	0.02	0.00	0.69	0.69
		higher than 7 m	0.02	0.00	0.37	0.00	0.00	0.00	0.00	0.00	0.39	0.39
		Total	0.52	0.00	0.65	0.00	0.00	0.03	0.02	0.00	1.22	1.22
	T5 EL. (m) 5.8-8.8	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.14	0.00	0.87	0.00	0.02	0.44	0.04	0.04	1.55	1.55
		6 - 7 m	0.12	0.00	0.74	0.00	0.04	0.00	0.00	0.05	0.95	0.95
		higher than 7 m	0.59	0.10	0.05	0.00	0.00	0.00	0.00	0.06	0.80	0.80
		Total	0.85	0.10	1.66	0.00	0.06	0.44	0.04	0.15	3.30	3.30
	T6 EL. (m) 5.9-7.3	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.25	0.00	0.95	0.00	0.00	0.19	0.00	0.03	1.42	1.42
		6 - 7 m	0.05	0.00	0.87	0.00	0.00	0.02	0.02	0.00	0.96	0.96
		higher than 7 m	0.00	0.00	0.08	0.00	0.04	0.00	0.00	0.00	0.12	0.12
		Total	0.30	0.00	1.90	0.00	0.04	0.21	0.02	0.03	2.50	2.50
	T7 EL. (m) 5.8-6.5	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.04	0.00	0.77	0.00	0.00	0.00	0.00	0.00	0.81	0.81
		6 - 7 m	0.03	0.00	0.20	0.00	0.02	0.00	0.00	0.00	0.25	0.25
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	0.07	0.00	0.97	0.00	0.02	0.00	0.00	0.00	1.06	1.06
	T8 EL. (m) 4.0-7.0	lower than 5m	0.00	0.00	0.00	0.03	0.00	0.00	0.11	0.00	0.14	0.14
5 - 6 m		0.03	0.00	0.15	0.51	0.00	0.00	0.40	0.00	1.09	1.09	
6 - 7 m		0.00	0.00	0.48	0.06	0.45	0.11	0.01	0.00	1.11	1.11	
higher than 7 m		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total		0.03	0.00	0.63	0.60	0.45	0.11	0.52	0.00	2.34	2.34	
T9 EL. (m) 4.0-6.0	lower than 5m	0.00	0.00	0.00	0.03	0.00	0.00	0.17	0.00	0.20	0.20	
	5 - 6 m	0.00	0.00	0.00	0.41	0.00	0.10	0.09	0.00	0.60	0.60	
	6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Total	0.00	0.00	0.00	0.44	0.00	0.10	0.26	0.00	0.80	0.80	
LU (10.2 km2)	L1 EL. (m) 5.9-8.0	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		5 - 6 m	0.01	0.00	0.62	0.00	0.00	0.15	0.00	0.03	0.81	
		6 - 7 m	0.07	0.00	1.14	0.00	0.01	0.01	0.00	0.04	1.27	
		higher than 7 m	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.07	
		Total	0.13	0.00	1.78	0.00	0.01	0.16	0.00	0.07	2.15	

Table D3.18(2) AREA WITH ELEVATION BY LAND USE (2/4)

RIVER BASIN	SUB RIVER BASIN	ELEVATION	AREA (km2)									
			Office/ Public	Ancient	Urban	Village	Industry	Fish Pond	Agri- culture	Green Area	Total	
	L2 EL. (m) 5.7-6.4	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.19	0.00	0.95	0.00	0.02	0.05	0.00	0.00	1.21	
		6 - 7 m	0.04	0.00	0.48	0.00	0.02	0.00	0.00	0.00	0.54	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Total	0.23	0.00	1.43	0.00	0.04	0.05	0.00	0.00	1.75	
	L3 EL. (m) 5.7-6.3	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		5 - 6 m	0.05	0.00	0.76	0.00	0.00	0.02	0.00	0.00	0.83	
		6 - 7 m	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.09	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Total	0.05	0.00	0.85	0.00	0.00	0.02	0.00	0.00	0.92	
	L4 EL. (m) 5.7-6.5	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		5 - 6 m	0.07	0.00	0.32	0.00	0.12	0.09	0.04	0.04	0.64	
		6 - 7 m	0.27	0.00	0.09	0.00	0.01	0.00	0.00	0.00	0.37	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Total	0.34	0.00	0.41	0.00	0.13	0.09	0.04	0.04	1.05	
	L5 EL. (m) 4.9-6.0	lower than 5m	0.01	0.00	0.00	0.10	0.01	0.00	0.03	0.00	0.15	
		5 - 6 m	0.05	0.00	0.26	0.10	0.11	0.00	0.08	0.00	0.60	
		6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Total	0.06	0.00	0.26	0.20	0.12	0.00	0.11	0.00	0.75	
	L6 EL. (m) 4.0-6.6	lower than 5m	0.00	0.00	0.02	0.02	0.00	0.68	0.51	0.00	1.23	
		5 - 6 m	0.04	0.00	0.13	0.27	0.05	0.00	1.18	0.00	1.67	
		6 - 7 m	0.00	0.00	0.16	0.14	0.00	0.10	0.28	0.00	0.68	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total		0.04	0.00	0.31	0.43	0.05	0.78	1.97	0.00	3.58		
HOANG LIET (8.1 km2)	H1 EL. (m) 4.0-5.9	lower than 5m	0.01	0.00	0.05	0.22	0.21	1.38	1.59	0.00	3.46	
		5 - 6 m	0.11	0.00	0.06	0.35	0.19	0.03	1.42	0.00	2.16	
		6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Total	0.12	0.00	0.11	0.57	0.40	1.41	3.01	0.00	5.62	
	H2 EL. (m) 4.0-5.4	lower than 5m	0.18	0.00	0.11	0.09	0.24	1.01	0.54	0.00	2.17	
		5 - 6 m	0.04	0.00	0.02	0.13	0.10	0.00	0.02	0.00	0.31	
		6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		Total	0.22	0.00	0.13	0.22	0.34	1.01	0.56	0.00	2.48	
SBT (7.1 km2)	S1 EL. (m) 5.9-7.7	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		5 - 6 m	0.00	0.00	0.00	0.00	0.00	0.28	0.00	0.27	0.55	
		6 - 7 m	0.25	0.00	0.83	0.00	0.13	0.00	0.00	0.03	1.24	
		higher than 7 m	0.04	0.00	0.33	0.00	0.01	0.00	0.00	0.00	0.38	
		Total	0.29	0.00	1.16	0.00	0.14	0.28	0.00	0.30	2.17	
	S2 EL. (m) 5.3-6.7	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
		5 - 6 m	0.10	0.00	0.50	0.00	0.04	0.05	0.00	0.00	0.69	
		6 - 7 m	0.37	0.00	0.90	0.00	0.00	0.00	0.00	0.03	1.30	
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
Total	0.47	0.00	1.40	0.00	0.04	0.05	0.00	0.03	1.99			
S3 EL. (m) 4.6-5.8	lower than 5m	0.06	0.00	0.34	0.00	0.00	0.21	0.06	0.00	0.67		
	5 - 6 m	0.00	0.00	0.72	0.00	0.07	0.02	0.02	0.00	0.83		
	6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		
	Total	0.06	0.00	1.06	0.00	0.07	0.23	0.08	0.00	1.50		

Table D3.18(3) AREA WITH ELEVATION BY LAND USE (3/4)

RIVER BASIN	SUB RIVER BASIN	ELEVATION	AREA (km <sup>2</sup> )								
			Office/ Public	Anciant	Urban	Village	Industr	Fish Pond	Agri- culture	Green Area	Total
	S4 EL. (m) 4.0-6.7	lower than 5m	0.05	0.00	0.05	0.00	0.05	0.31	0.32	0.00	0.78
		5 - 6 m	0.00	0.00	0.41	0.00	0.06	0.06	0.00	0.00	0.53
		6 - 7 m	0.00	0.00	0.13	0.00	0.00	0.00	0.00	0.00	0.13
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	0.05	0.00	0.59	0.00	0.11	0.37	0.32	0.00	1.44
KIM NGUU (17.3 km <sup>2</sup> )	K1 EL. (m) 6.4-9.5	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		6 - 7 m	0.02	0.00	0.21	0.00	0.00	0.01	0.00	0.00	0.24
		higher than 7 m	0.48	0.55	1.90	0.00	0.15	0.15	0.00	0.00	3.23
		Total	0.50	0.55	2.11	0.00	0.15	0.16	0.00	0.00	3.47
	K2 EL. (m) 5.4-8.0	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.00	0.00	0.55	0.00	0.42	0.00	0.00	0.00	0.97
		6 - 7 m	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.09
		higher than 7 m	0.00	0.00	0.13	0.00	0.03	0.00	0.00	0.00	0.16
		Total	0.00	0.00	0.77	0.00	0.45	0.00	0.00	0.00	1.22
	K3 EL. (m) 5.6-6.5	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		5 - 6 m	0.00	0.00	1.00	0.00	0.08	0.13	0.03	0.05	1.29
		6 - 7 m	0.06	0.00	0.24	0.00	0.00	0.00	0.00	0.00	0.30
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	0.06	0.00	1.24	0.00	0.08	0.13	0.03	0.05	1.59
	K4 EL. (m) 4.6-6.8	lower than 5m	0.00	0.00	0.18	0.02	0.00	0.39	0.11	0.00	0.70
		5 - 6 m	0.00	0.00	0.41	0.00	0.10	0.00	0.00	0.00	0.51
		6 - 7 m	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.05
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	0.00	0.00	0.64	0.02	0.10	0.39	0.11	0.00	1.26
	K5 EL. (m) 4.7-5.7	lower than 5m	0.00	0.00	0.39	0.18	0.22	0.53	0.19	0.00	1.51
		5 - 6 m	0.00	0.00	0.14	0.60	0.49	0.00	0.03	0.00	1.26
		6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Total		0.00	0.00	0.53	0.78	0.71	0.53	0.22	0.00	2.77	
K6 EL. (m) 4.6-6.2	lower than 5m	0.01	0.00	0.00	0.53	0.06	1.84	0.84	0.00	3.28	
	5 - 6 m	0.01	0.00	0.01	2.56	0.06	0.44	0.22	0.00	3.30	
	6 - 7 m	0.00	0.00	0.00	0.13	0.05	0.00	0.23	0.00	0.41	
	higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
	Total	0.02	0.00	0.01	3.22	0.17	2.28	1.29	0.00	6.99	
YEN SO (5.5 km <sup>2</sup> )	EL. (m) 4.0-5.5	lower than 5m	0.00	0.00	0.00	0.03	0.00	5.12	0.12	0.00	5.27
		5 - 6 m	0.00	0.00	0.00	0.23	0.00	0.00	0.00	0.00	0.23
		6 - 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
		Total	0.00	0.00	0.00	0.26	0.00	5.12	0.12	0.00	5.50

Table D3.18(4) AREA WITH ELEVATION BY LAND USE (4/4)

RIVER BASIN	ELEVATION	AREA (km2)								
		Office/ Public	Anciant	Urban	Village	Industr	Fish Pond	Agri- culture	Green Area	Total
C EL. (m) 5.2-9.5	lower than 5m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	5 - 6 m	0.03	0.00	0.13	0.22	0.00	0.00	4.08	0.00	4.46
	6 - 7 m	0.30	0.00	0.12	2.10	0.19	0.17	5.48	0.00	8.36
	higher than 7 m	0.31	0.00	0.15	3.04	0.30	0.08	3.00	0.00	6.88
	Total	0.64	0.00	0.40	5.36	0.49	0.25	12.56	0.00	19.70
D EL. (m) 4.7-6.5	lower than 5m	0.00	0.00	0.02	0.04	0.15	0.27	2.36	0.00	2.84
	5 - 6 m	0.33	0.00	0.65	0.39	0.00	0.61	5.27	0.00	7.25
	6 - 7 m	0.55	0.00	0.07	1.43	0.13	0.16	1.17	0.00	3.51
	higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.88	0.00	0.74	1.86	0.28	1.04	8.80	0.00	13.60
M EL. (m) 4.7-7.0	lower than 5m	0.00	0.00	0.00	0.02	0.00	0.49	2.50	0.00	3.01
	5 - 6 m	0.36	0.00	1.33	0.49	0.99	0.14	5.69	0.00	9.00
	6 - 7 m	0.09	0.00	0.69	0.61	0.22	0.05	1.03	0.00	2.69
	higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.45	0.00	2.02	1.12	1.21	0.68	9.22	0.00	14.70
B EL. (m) 4.5-6.5	lower than 5m	0.02	0.00	0.14	0.03	0.07	0.16	3.57	0.00	3.99
	5 - 6 m	0.34	0.00	0.47	0.56	0.14	0.23	3.22	0.00	4.96
	6 - 7 m	0.35	0.00	0.04	0.20	0.01	0.19	0.16	0.00	0.95
	higher than 7 m	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	Total	0.71	0.00	0.65	0.79	0.22	0.58	6.95	0.00	9.90
G. Total		8.38	0.82	29.63	15.98	6.05	16.79	47.3	1.16	126.11

Table 3D.19(1) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (1/32)

TI

GL = EL - 7.4 m to 10.1 m

Land Use	Inundation Water Level (Maximum Water Depth)		El.7.6 m (0.2 m)		El.7.9 m (0.5 m)		El.8.4 m (1.0 m)		El.9.4 m (2.0 m)		El.10.1 m (2.7 m)			
	Area (ha)	Unit Damage (\$/ha)	Shallower than 0.2	0.2-0.5		Shallower than 0.2	0.2-0.5		Shallower than 0.2	0.2-0.5		Shallower than 0.2	0.2-0.5	
				4	6		4	6		4	6		4	6
Office/Public Facilities			4		4		4		4		4		4	
	Area (ha)	(\$/ha)	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700
	Unit Damage (\$/ha)		108	286	108	286	108	286	108	286	108	286	108	286
Ancient Area			1		1		1		1		1		1	
	Area (ha)	(\$/ha)	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700
	Unit Damage (\$/ha)		14	103	14	103	14	103	14	103	14	103	14	103
	Direct Damage (\$1000\$)		3	4	3	4	3	4	3	4	3	4	3	4
Urban Residential Area			15		15		15		15		15		15	
	Area (ha)	(\$/ha)	5000	18900	5000	18900	5000	18900	5000	18900	5000	18900	5000	18900
	Unit Damage (\$/ha)		0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (\$1000\$)		0	0	0	0	0	0	0	0	0	0	0	0
Suburban Residential Area			0		0		0		0		0		0	
	Area (ha)	(\$/ha)	1200	4200	1200	4200	1200	4200	1200	4200	1200	4200	1200	4200
	Unit Damage (\$/ha)		0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (\$1000\$)		0	0	0	0	0	0	0	0	0	0	0	0
Industrial Area			0		0		0		0		0		0	
	Area (ha)	(\$/ha)	9500	16700	9500	16700	9500	16700	9500	16700	9500	16700	9500	16700
	Unit Damage (\$/ha)		0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (\$1000\$)		0	0	0	0	0	0	0	0	0	0	0	0
Fishpond /Lake Area			0		0		0		0		0		0	
	Area (ha)	(\$/ha)	410	680	410	680	410	680	410	680	410	680	410	680
	Unit Damage (\$/ha)		0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (\$1000\$)		0	0	0	0	0	0	0	0	0	0	0	0
Agricultural Land			0		0		0		0		0		0	
	Area (ha)	(\$/ha)	240	240	240	240	240	240	240	240	240	240	240	240
	Unit Damage (\$/ha)		0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (\$1000\$)		0	0	0	0	0	0	0	0	0	0	0	0
Green Area /Un-used Land			2		2		2		2		2		2	
	Area (ha)	(\$/ha)	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (\$/ha)		0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (\$1000\$)		0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (\$1000\$)			137	465	137	465	137	465	137	465	137	465	137	465
Total			137	602	137	602	137	602	137	602	137	602	137	602



Table 3D.19(2) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (2/32)

GL = EL. 5.9 m to 7.6 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)		El.6.1 m (0.2 m)		El.6.4 m (0.5 m)		El.6.9 m (1.0 m)		El.7.9 m (2.0 m)		1.0 - 2.0	
	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)
Office/Public Facilities	1	27000	3	47700	3	47700	4	64800	6	27000	10	64800
Ancient Area	27	81	81	143	81	143	191	389	389	477	477	1361
	0	0	0	0	0	0	0	0	0	0	0	0
Urban Residential Area	13800	13800	13800	51700	13800	51700	51700	93900	93900	51700	51700	93900
	20	33	33	40	33	40	52	73	73	43	43	108
Suburban Residential Area	5000	5000	5000	18900	5000	18900	18900	34200	34200	18900	18900	34200
	100	165	165	756	165	756	983	2497	2497	813	813	3694
Industrial Area	0	0	0	0	0	0	0	0	0	0	0	0
	1200	1200	1200	4200	1200	4200	4200	7500	7500	4200	4200	7500
Fishpond /Lake Area	0	0	0	0	0	0	0	0	0	0	0	0
	9500	9500	9500	16700	9500	16700	16700	22700	22700	16700	16700	22700
Agricultural Land	1	17	3	5	3	5	5	6	6	67	67	204
	410	680	410	680	410	680	680	1010	1010	680	680	1010
Green Area /Un-used Land	0	0	1	2	2	3	3	6	6	0	0	2
	9	9	9	1	9	1	1	10	10	0	0	1
Direct Damage Total (x1000\$)	240	240	240	240	240	240	240	330	330	240	240	330
	2	2	2	2	2	2	3	4	4	4	4	9
Sub-total	130	920	247	1167	247	1167	1194	2917	2917	1357	1357	5261
	130	1167	1167	4359	1167	4359	4359	16944	16944	1167	1167	16944

Table 3D.19(3) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (3/32)

T3

GL = EL 5.8 m to 6.6 m

Land Use	Inundation Water Level (Maximum Water Depth)		El.6.0 m (0.2 m)		El.6.3 m (0.5 m)		El.6.8 m (1.0 m)		El.7.8 m (2.0 m)		1.0 - 2.0	
	Inundation Depth (m)		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2		0.5 - 1.0	
	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)
Office/Public Facilities	2	27000	8	47700	6	47700	14	64800	14	27000	0	47700
	0	54	216	286	0	286	0	666	0	907	0	1373
Ancient Area	0	13800	13800	51700	0	51700	0	93900	0	13800	0	51700
	0	0	0	0	0	0	0	0	0	0	0	0
Urban Residential Area	13	54	54	43	43	81	97	34200	5000	18900	0	178
	65	5000	270	813	270	813	6	3317	0	5000	0	18900
Suburban Residential Area	0	1200	1200	4200	0	4200	0	7500	1200	4200	0	4200
	0	0	5	8	0	8	25	45	0	0	0	148
Industrial Area	0	9500	1	16700	0	16700	1	22700	0	9500	0	16700
	0	0	10	17	0	17	23	23	0	0	0	0
Fishpond /Lake Area	13	410	0	13	13	680	1010	1010	410	680	0	680
	5	72	0	9	0	9	13	13	0	0	0	0
Agricultural Land	72	240	3	73	73	240	330	330	240	240	0	240
	17	0	1	18	18	25	25	25	0	0	0	0
Green Area /Un-used Land	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	142	501	1134	1635	1134	2241	4331	6572	0	0	0	11733
	142	1635	1635	1635	1635	1635	1635	1635	1635	1635	1635	1635

Table 3D.19(4) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (4/32)

T4

GL = EL 5.8 m to 7.5 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	El.6.0 m (0.2 m) Shallower than 0.2		El.6.3 m (0.5 m) Shallower than 0.2		El.6.8 m (1.0 m) Shallower than 0.2		El.7.8 m (2.0 m) Shallower than 0.2		1.0 - 2.0						
		Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	0.2 - 0.5	0.5 - 1.0					
Office/Public Facilities		14	27000	7	47700	7	27000	7	27000	0	47700	1	47700	7	64800	98100
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	378	189	311	189	189	189	189	189	0	48	0	48	454	4120	
Ancient Area		0	13800	0	51700	0	13800	0	13800	0	51700	0	51700	0	93900	155500
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban Residential Area		0	5000	5	18900	6	5000	8	18900	8	18900	8	18900	15	27	22
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	0	0	25	57	30	0	151	274	0	284	0	284	923	1247	
Suburban Residential Area		0	1200	0	4200	0	1200	0	4200	0	4200	0	4200	0	7500	12300
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial Area		0	9500	0	16700	0	9500	0	16700	0	16700	0	16700	0	22700	34300
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Fishpond /Lake Area		0	410	0	680	1	410	1	680	1	680	1	680	1	1010	1350
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Agricultural Land		0	240	0	240	0	240	0	240	0	240	0	240	0	330	420
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Area /Un-used Land		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Area (ha)															
	Unit Damage (/ha)															
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)		378	214	868	220	677	1829	2725	1082	331	1378	5474	7183			
	Sub-total															
	Total	378	1082	2725	7183											

Table 3D.19(S) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (5/32)

Land Use	GL = EL 5.8 m to 8.8 m											
	EI 6.0 m (0.2 m)			EI 6.3 m (0.5 m)			EI 6.8 m (1.0 m)			EI 7.8 m (2.0 m)		
	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	1.0-2.0
Office/Public Facilities	Area (ha)	14	2	15	3	17	7	9	12	23		
	Unit Damage (/ha)	27000	27000	47700	47700	64800	27000	47700	64800	98100		
	Direct Damage (x1000\$)	378	54	716	81	1102	189	429	778	2236		
Ancient Area	Area (ha)	0	0	0	0	0	0	0	0	0		
	Unit Damage (/ha)	13800	13800	51700	51700	93900	13800	51700	93900	155500		
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0		
Urban Residential Area	Area (ha)	87	13	95	15	108	0	1	16	142		
	Unit Damage (/ha)	5000	5000	18900	5000	34200	5000	18900	34200	56700		
	Direct Damage (x1000\$)	435	65	1796	75	3694	0	19	547	8051		
Suburban Residential Area	Area (ha)	0	0	0	0	0	0	0	0	0		
	Unit Damage (/ha)	1200	1200	4200	1200	7500	1200	4200	7500	12300		
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0		
Industrial Area	Area (ha)	2	1	2	1	3	0	0	1	5		
	Unit Damage (/ha)	9500	9500	16700	9500	22700	9500	16700	22700	34300		
	Direct Damage (x1000\$)	19	10	33	10	68	0	0	23	172		
Fishpond /Lake Area	Area (ha)	44	0	44	0	44	0	0	0	44		
	Unit Damage (/ha)	410	410	680	410	1010	410	680	1010	1350		
	Direct Damage (x1000\$)	18	0	30	0	44	0	0	0	59		
Agricultural Land	Area (ha)	4	0	4	0	4	0	0	0	4		
	Unit Damage (/ha)	240	240	240	240	330	240	240	330	420		
	Direct Damage (x1000\$)	1	0	1	0	1	0	0	0	2		
Green Area /Un-used Land	Area (ha)	4	1	4	1	5	1	1	2	7		
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0		
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0		
Direct Damage Total (x1000\$)	Sub-total	851	129	2575	166	687	4909	203	552	10540		
	Total	851	2704	5761	12830							

Table 3D.19(6) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (6/32)

T6

GL = EL. 5.9 m to 7.3 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL.6.1 m (0.2 m)			EL.6.4 m (0.5 m)			EL.6.9 m (1.0 m)			EL.7.9 m (2.0 m)		
		Shallower than 0.2			Shallower than 0.2			Shallower than 0.2			Shallower than 0.2		
		Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)
Office/Public Facilities	Area (ha)	25	1	26	1	1	27	1	1	27	1	1	27
	Unit Damage (/ha)	27000	27000	47700	27000	47700	27000	47700	64800	27000	47700	64800	98100
	Direct Damage (x1000\$)	675	27	1240	27	48	1750	27	48	1750	27	48	2845
Ancient Area	Area (ha)	13800	0	0	13800	0	0	13800	0	0	13800	0	0
	Unit Damage (/ha)	13800	13800	51700	13800	51700	93900	13800	51700	93900	13800	51700	155500
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Urban Residential Area	Area (ha)	103	17	113	18	27	130	18	27	130	18	27	175
	Unit Damage (/ha)	5000	5000	18900	5000	18900	34200	5000	18900	34200	5000	18900	56700
	Direct Damage (x1000\$)	515	85	2136	90	510	4446	90	510	4446	90	510	9923
Suburban Residential Area	Area (ha)	1200	0	0	1200	0	0	1200	0	0	1200	0	0
	Unit Damage (/ha)	1200	1200	4200	1200	4200	7500	1200	4200	7500	1200	4200	12300
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Industrial Area	Area (ha)	9500	0	0	9500	0	0	9500	0	0	9500	0	0
	Unit Damage (/ha)	9500	9500	16700	9500	16700	22700	9500	16700	22700	9500	16700	34300
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Fishpond /Lake Area	Area (ha)	19	0	19	0	19	19	0	19	19	0	19	19
	Unit Damage (/ha)	410	410	680	410	680	1010	410	680	1010	410	680	1350
	Direct Damage (x1000\$)	8	0	13	0	1	19	0	1	19	0	1	26
Agricultural Land	Area (ha)	240	0	240	0	240	330	0	240	330	0	240	420
	Unit Damage (/ha)	240	240	240	240	240	330	240	240	240	240	330	420
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	1
Green Area /Un-used Land	Area (ha)	3	0	3	0	3	3	0	3	3	0	3	3
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Sub-total	1198	112	3389	117	559	6215	0	0	0	0	0	12794
	Total	1198	3501	6891									13432

Table 3D.19(7) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (7/32)

GL = EL 5.8 m to 6.5 m

Land Use	Inundation Water Level (Maximum Water Depth)		El.6.0 m (0.2 m) Shallower than 0.2		El.6.3 m (0.5 m) Shallower than 0.2		El.6.8 m (1.0 m) Shallower than 0.2		El.7.8 m (2.0 m) Shallower than 0.2		1.0 - 2.0	
	Area (ha)	Unit Damage (/ha)	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.5-1.0	1.0-2.0
Office/Public Facilities												
	4	27000	47700	27000	47700	27000	47700	27000	47700	64800	64800	98100
		108	27	191	27	191	48	324	0	0	0	589
Ancient Area												
	0	13800	51700	13800	51700	13800	51700	13800	51700	93900	93900	155500
		0	0	0	0	0	0	0	0	0	0	0
	77	81	8	86	0	0	0	0	0	0	0	94
Urban Residential Area												
	5000	18900	18900	5000	18900	5000	18900	5000	18900	34200	34200	56700
	385	1531	35	1531	0	1531	2941	0	0	0	0	5330
Suburban Residential Area												
	1200	4200	4200	1200	4200	1200	4200	1200	4200	7500	7500	12300
	0	0	0	0	0	0	0	0	0	0	0	0
Industrial Area												
	9500	16700	16700	9500	16700	9500	16700	9500	16700	22700	22700	34300
	0	10	17	23	0	23	0	0	0	0	0	69
Fishpond /Lake Area												
	410	680	680	410	680	410	680	410	680	1010	1010	1330
	0	0	0	0	0	0	0	0	0	0	0	0
Agricultural Land												
	240	240	240	240	240	240	240	240	240	330	330	420
	0	0	0	0	0	0	0	0	0	0	0	0
Green Area /Un-used Land												
	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	493	1722	72	1793	216	3288	0	3503	0	5987	0	5987

Table 3D.19(8) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (8/32)

T8

GL = EL. 4.0 m to 7.0 m

Land Use	Inundation Water Level (Maximum Water Depth)		EL.4.5 m (0.5 m)		EL.5.0 m (1.0 m)		EL.6.0 m (2.0 m)		1.0 - 2.0	
	Inundation Depth (m)		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2		0.5 - 1.0	
	Area (ha)	Unit Damage (/ha)	0.2-0.5	0.5-1.0	0.2-0.5	0.5-1.0	0.2-0.5	0.5-1.0	0.2-0.5	0.5-1.0
Office/Public Facilities	Area (ha)		0	0	0	0	0	0	1	2
	Unit Damage (/ha)		27000	47700	27000	47700	27000	47700	27000	47700
	Direct Damage (x1000\$)		0	0	0	0	0	0	27	48
Ancient Area	Area (ha)		0	0	0	0	0	0	0	0
	Unit Damage (/ha)		13800	51700	13800	51700	13800	51700	13800	51700
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0
Urban Residential Area	Area (ha)		0	0	0	0	0	0	3	4
	Unit Damage (/ha)		5000	18900	5000	18900	5000	18900	5000	18900
	Direct Damage (x1000\$)		0	0	0	0	0	0	15	76
Suburban Residential Area	Area (ha)		1	1	1	1	1	1	11	15
	Unit Damage (/ha)		1200	4200	1200	4200	1200	4200	1200	4200
	Direct Damage (x1000\$)		1	4	1	4	1	4	13	63
Industrial Area	Area (ha)		0	0	0	0	0	0	0	0
	Unit Damage (/ha)		9500	16700	9500	16700	9500	16700	9500	16700
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0
Fishpond /Lake Area	Area (ha)		410	410	410	410	410	410	410	410
	Unit Damage (/ha)		0	680	0	680	0	680	0	680
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0
Agricultural Land	Area (ha)		2	3	2	3	2	3	9	12
	Unit Damage (/ha)		240	240	240	240	240	240	240	240
	Direct Damage (x1000\$)		0	1	0	1	0	1	2	3
Green Area /Un-used Land	Area (ha)		0	0	0	0	0	0	0	0
	Unit Damage (/ha)		0	0	0	0	0	0	0	0
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Sub-total		2	1	2	5	2	5	9	189
	Total		2	6	2	16	2	16	9	597
885										

Table 3D.19(9) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (9/32)

GL = EL - 4.0 m to 6.0 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL4.2 m (0.2 m)			EL4.5 m (0.5 m)			EL5.0 m (1.0 m)			EL6.0 m (2.0 m)		
		Shallower than 0.2			Shallower than 0.2			Shallower than 0.2			Shallower than 0.2		
		Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)
Office/Public Facilities	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	
	Unit Damage (/ha)	27000	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700	
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	
Ancient Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	
	Unit Damage (/ha)	13800	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700	
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	
Urban Residential Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	
	Unit Damage (/ha)	5000	5000	18900	5000	18900	5000	18900	5000	18900	5000	18900	
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	
Suburban Residential Area	Area (ha)	1	0	1	1	1	1	1	1	1	1	1	
	Unit Damage (/ha)	1200	1200	4200	1200	4200	1200	4200	1200	4200	1200	4200	
	Direct Damage (x1000\$)	1	0	4	1	4	1	4	1	4	1	4	
Industrial Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	
	Unit Damage (/ha)	9500	9500	16700	9500	16700	9500	16700	9500	16700	9500	16700	
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	
Fishpond /Lake Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	
	Unit Damage (/ha)	410	410	680	410	680	410	680	410	680	410	680	
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	
Agricultural Land	Area (ha)	2	3	5	3	5	3	5	3	5	3	5	
	Unit Damage (/ha)	240	240	240	240	240	240	240	240	240	240	240	
	Direct Damage (x1000\$)	0	1	1	1	1	1	1	1	1	1	1	
Green Area /Un-used Land	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0	0	0	
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	
Direct Damage Total (x1000\$)	Sub-total	2	1	5	2	5	2	5	2	5	11	57	
	Total	2	6	6	2	6	2	6	2	6	17	164	
												44	276



Table 3D.19(10) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (10/32)

GL = EL - 5.9 m to 7.0 m

Land Use	Inundation Water Level (Maximum Water Depth)		EL.6.1 m (0.2 m)		EL.6.4 m (0.5 m)		EL.6.9 m (1.0 m)		EL.7.9 m (2.0 m)		1.0 - 2.0	
	Inundation Depth (m)		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2	
	Area (ha)	Unit Damage (x1000\$)	1	2	1	2	1	2	1	2	1	2
Office/Public Facilities			2	2	2	2	2	2	2	2	2	2
	Area (ha)		27000	27000	27000	27000	27000	27000	27000	27000	27000	27000
	Unit Damage (/ha)		47700	47700	47700	47700	47700	47700	47700	47700	47700	47700
	Direct Damage (x1000\$)		54	27	95	54	95	54	95	48	194	687
Ancient Area	Area (ha)		0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)		13800	13800	51700	13800	51700	93900	13800	51700	93900	155500
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0	0	0
Urban Residential Area	Area (ha)		75	23	86	24	33	109	0	1	11	166
	Unit Damage (/ha)		5000	5000	18900	5000	18900	34200	5000	18900	34200	56700
	Direct Damage (x1000\$)		375	115	1625	120	624	3728	0	19	376	9412
Suburban Residential Area	Area (ha)		0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)		1200	1200	4200	1200	4200	7500	1200	4200	7500	12300
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0	0	0
Industrial Area	Area (ha)		0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)		9500	9500	16700	9500	16700	22700	9500	16700	22700	34300
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0	0	0
Fishpond /Lake Area	Area (ha)		10	0	15	0	15	0	0	0	0	16
	Unit Damage (/ha)		410	410	680	410	680	1010	410	680	1010	1330
	Direct Damage (x1000\$)		4	0	10	0	15	0	0	0	0	22
Agricultural Land	Area (ha)		0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)		240	240	240	240	240	330	240	240	330	420
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0	0	0
Green Area /Un-used Land	Area (ha)		3	2	4	1	2	6	0	0	0	9
	Unit Damage (/ha)		0	0	0	0	0	0	0	0	0	0
	Direct Damage (x1000\$)		0	0	0	0	0	0	0	0	0	0
Direct Damage	Sub-total		433	142	1731	174	736	3937	27	67	571	10155
Total (x1000\$)	Total		433	1873	4848	10819						

Table 3D.19(11) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (11/32)

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	GL = EL 5.7 m to 6.4 m											
		EL 5.9 m (0.2 m)		EL 6.2 m (0.5 m)		EL 6.7 m (1.0 m)		EL 7.7 m (2.0 m)		1.0 - 2.0			
		Shallower than 0.2	Shallower than 0.2	0.2-0.5	0.2-0.5	Shallower than 0.2	Shallower than 0.2	0.2-0.5	0.2-0.5	Shallower than 0.2	Shallower than 0.2		
Office/Public Facilities	Area (ha)	11	2	19	2	21	2	21	0	0	0	0	23
	Unit Damage (/ha)	27000	27000	47700	27000	64800	47700	64800	47700	27000	47700	64800	98100
	Direct Damage (x1000\$)	297	54	906	0	1361	95	1361	0	0	0	0	2256
Ancient Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	13800	13800	51700	13800	93900	51700	93900	51700	13800	51700	93900	155500
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Urban Residential Area	Area (ha)	58	24	95	24	119	24	119	0	0	0	0	143
	Unit Damage (/ha)	5000	5000	18900	5000	34200	18900	34200	5000	18900	18900	34200	56700
	Direct Damage (x1000\$)	290	120	1796	120	4070	454	4070	0	0	0	0	8108
Suburban Residential Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	1200	1200	4200	1200	7500	4200	7500	1200	4200	4200	7500	12300
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Industrial Area	Area (ha)	1	1	2	1	3	1	3	0	0	0	0	4
	Unit Damage (/ha)	9500	9500	16700	9500	22700	16700	22700	9500	16700	16700	22700	34300
	Direct Damage (x1000\$)	10	10	33	10	68	17	68	0	0	0	0	137
Fishpond /Lake Area	Area (ha)	3	0	5	0	5	0	5	0	0	0	0	5
	Unit Damage (/ha)	410	410	680	410	1010	680	1010	410	680	680	1010	1350
	Direct Damage (x1000\$)	1	0	3	0	5	0	5	0	0	0	0	7
Agricultural Land	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	240	240	240	240	330	240	330	240	240	240	330	420
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Green Area /Un-used Land	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Sub-total	598	184	2739	184	5504	566	5504	0	0	0	0	10508
	Total	598	184	2922	184	6069	566	6069	0	0	0	0	10508

Table 3D.19(12) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (12/32)

GL = EL - 5.7 m to 6.3 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL 5.9 m (0.2 m)		EL 6.2 m (0.5 m)		EL 6.7 m (1.0 m)		EL 7.7 m (2.0 m)		1.0 - 2.0	
		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2		Shallower than 0.2			
		0.2-0.5	0.5-1.0	0.2-0.5	0.5-1.0	0.2-0.5	0.5-1.0	0.2-0.5	0.5-1.0		
Office/Public Facilities	Area (ha)	3	0	0	0	0	0	5	0	0	3
	Unit Damage (/ha)	27000	27000	47700	27000	47700	27000	64800	47700	64800	98100
	Direct Damage (x1000\$)	81	0	0	0	239	0	324	0	0	491
Ancient Area	Area (ha)	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	13800	13800	51700	13800	51700	13800	93900	51700	93900	155500
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0
Urban	Area (ha)	48	6	76	0	3	0	82	0	0	85
	Unit Damage (/ha)	5000	5000	18900	5000	18900	5000	34200	18900	34200	56700
	Direct Damage (x1000\$)	240	30	1436	0	57	0	2804	0	0	4820
Suburban Residential Area	Area (ha)	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	1200	1200	4200	1200	4200	1200	7500	4200	7500	12300
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0
Industrial Area	Area (ha)	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	9500	9500	16700	9500	16700	9500	22700	16700	22700	34300
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0
Fishpond /Lake Area	Area (ha)	3	0	0	0	0	0	2	0	0	2
	Unit Damage (/ha)	410	410	680	410	680	410	1010	680	1010	1350
	Direct Damage (x1000\$)	0	0	1	0	0	0	2	0	0	3
Agricultural Land	Area (ha)	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	240	240	240	240	240	240	330	240	330	420
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0
Green Area /Us-used Land	Area (ha)	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0	0
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Sub-total	321	30	1676	0	57	0	3130	0	0	5313
	Total	321	1706	3187	0	0	0	0	0	0	5313

Table 3D.19(13) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (13/32)

L4

GL = EL - 5.7 m to 6.5 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL 5.9 m (0.2 m)			EL 6.2 m (0.5 m)			EL 6.7 m (1.0 m)			EL 7.7 m (2.0 m)		
		Area (ha)	Unit Damage (\$/ha)	Direct Damage (\$1000\$)	Area (ha)	Unit Damage (\$/ha)	Direct Damage (\$1000\$)	Area (ha)	Unit Damage (\$/ha)	Direct Damage (\$1000\$)	Area (ha)	Unit Damage (\$/ha)	Direct Damage (\$1000\$)
		Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2	Shallower than 0.2
Office/Public Facilities	Area (ha)	4	27000	11	7	16	18	34	0	0	0	0	
	Unit Damage (\$/ha)			27000	47700	47700	64800	96100	27000	47700	47700	64800	
Ancient Area	Area (ha)	0	108	297	334	763	1166	3335	0	0	0	0	
	Unit Damage (\$/ha)			13800	51700	13800	93900	155500	13800	51700	93900	155500	
Urban Residential Area	Area (ha)	20	5000	3	32	6	35	41	0	0	0	0	
	Unit Damage (\$/ha)			5000	18900	18900	34200	56700	5000	18900	34200	56700	
Suburban Residential Area	Area (ha)	100	1200	15	605	113	1197	2325	0	0	0	0	
	Unit Damage (\$/ha)			1200	4200	4200	7500	12300	1200	4200	4200	7500	
Industrial Area	Area (ha)	7	9500	1	12	1	13	14	0	0	0	0	
	Unit Damage (\$/ha)			9500	16700	16700	22700	34300	9500	16700	22700	34300	
Fishpond /Lake Area	Area (ha)	16	67	10	200	17	295	480	0	0	0	0	
	Unit Damage (\$/ha)			410	680	680	1010	1350	410	680	680	1010	
Agricultural Land	Area (ha)	2	240	0	4	0	4	4	0	0	0	0	
	Unit Damage (\$/ha)			240	240	240	330	420	240	240	330	420	
Green Area /Un-used Land	Area (ha)	0	0	0	1	0	1	2	0	0	0	0	
	Unit Damage (\$/ha)			0	4	0	4	0	0	0	0	0	
Direct Damage	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	
	Unit Damage (\$/ha)			0	0	0	0	0	0	0	0	0	
Total (\$1000\$)	Sub-total	282	322	1146	2669	893	2669	6154	0	0	0	0	
	Total	282	1468	3562	6154	0	0	0	0	0	0	0	

Table 3D.19(14) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (14/32)

GL = EL 4.9 m to 6.0 m

Land Use	EL5.1 m (0.2 m)		EL5.4 m (0.5 m)		EL5.9 m (1.0 m)		EL6.9 m (2.0 m)						
	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)		Inundation Water Level (Maximum Water Depth) Inundation Depth (m)		Inundation Water Level (Maximum Water Depth) Inundation Depth (m)		Inundation Water Level (Maximum Water Depth) Inundation Depth (m)						
	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Area (ha)	Unit Damage (/ha)	Shallower than 0.2	0.2-0.5	0.5-1.0	1.0-2.0			
Office/Public Facilities	2	27000	2	27000	2	27000	3	47700	64800	0	47700	64800	98100
								95	194	0	0	0	392
	0	0	0	0	0	0	0	0	0	0	0	0	0
Ancient Area	13800	13800	13800	13800	13800	13800	93900	51700	93900	13800	51700	93900	155500
	0	0	0	0	0	0	0	0	0	0	0	0	0
	2	5000	6	5000	5	5000	11	7	7	0	0	3	23
Urban Residential Area	10	5000	30	5000	25	5000	376	18900	34200	5000	18900	34200	56700
	11	1200	2	1200	2	1200	14	4200	7500	1200	4200	7500	12300
	13	1200	2	1200	2	1200	105	13	105	0	0	8	234
	2	9500	2	9500	3	9500	5	3	3	0	0	1	10
Industrial Area	19	9500	19	9500	19	9500	114	16700	22700	9500	16700	22700	34300
	0	410	0	410	0	410	0	0	0	0	0	0	0
	410	410	410	410	410	410	680	680	1010	410	680	1010	1350
	0	0	0	0	0	0	0	0	0	0	0	0	0
Fishpond /Lake Area	4	240	2	240	2	240	6	2	2	0	0	1	10
	240	240	240	240	240	240	330	240	330	240	240	330	420
	1	0	0	0	1	0	2	0	2	0	0	0	4
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
	0	0	0	0	0	0	0	0	0	0	0	0	0
	97	291	79	291	74	243	791	243	791	0	0	198	2277
Direct Damage Total (x1000\$)	97	370	370	1108	1108	2475	2475	2475	2475	2475	2475	2475	2475

Table 3D.19(15) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (15/32)

L6

GL = EL 4.0 m to 6.6 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL 4.5 m (0.5 m)				EL 5.0 m (1.0 m)				EL 6.0 m (2.0 m)							
		Shallower than 0.2		0.2-0.5		Shallower than 0.2		0.2-0.5		Shallower than 0.2		0.2-0.5		0.5-1.0		1.0-2.0	
		Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)	Area (ha)	Unit Damage (x1000\$)
Office/Public Facilities	Inundation Water Level	0	27000	0	47700	0	47700	0	64800	0	64800	0	64800	0	64800	0	98100
	Area (ha)	0	27000	0	47700	0	47700	0	64800	0	64800	0	64800	0	64800	0	98100
	Unit Damage (x1000\$)	0	27000	0	47700	0	47700	0	64800	0	64800	0	64800	0	64800	0	98100
Ancient Area	Inundation Water Level	0	13800	0	51700	0	51700	0	93900	0	93900	0	93900	0	93900	0	155500
	Area (ha)	0	13800	0	51700	0	51700	0	93900	0	93900	0	93900	0	93900	0	155500
	Unit Damage (x1000\$)	0	13800	0	51700	0	51700	0	93900	0	93900	0	93900	0	93900	0	155500
Urban Residential Area	Inundation Water Level	1	5000	5	18900	1	18900	1	34200	1	34200	1	34200	1	34200	2	56700
	Area (ha)	1	5000	5	18900	1	18900	1	34200	1	34200	1	34200	1	34200	2	56700
	Unit Damage (x1000\$)	5	18900	19	51700	19	51700	34	93900	34	93900	76	205	76	205	113	113
Suburban Residential Area	Inundation Water Level	1	1200	0	4200	0	4200	0	7500	0	7500	0	7500	0	7500	0	12300
	Area (ha)	1	1200	0	4200	0	4200	0	7500	0	7500	0	7500	0	7500	0	12300
	Unit Damage (x1000\$)	1	1200	4	4200	4	4200	8	7500	8	7500	15	205	15	205	25	25
Industrial Area	Inundation Water Level	0	9500	0	16700	0	16700	0	22700	0	22700	0	22700	0	22700	0	34300
	Area (ha)	0	9500	0	16700	0	16700	0	22700	0	22700	0	22700	0	22700	0	34300
	Unit Damage (x1000\$)	0	9500	0	16700	0	16700	0	22700	0	22700	0	22700	0	22700	0	34300
Fishpond /Lake Area	Inundation Water Level	12	410	13	680	15	680	19	1010	33	1010	33	1010	0	1010	0	1350
	Area (ha)	12	410	13	680	15	680	19	1010	33	1010	33	1010	0	1010	0	1350
	Unit Damage (x1000\$)	410	680	680	1010	680	1010	1010	1350	680	1010	680	1010	0	1010	0	1350
Agricultural Land	Inundation Water Level	5	10	5	240	6	240	10	330	14	330	26	330	0	330	0	420
	Area (ha)	5	10	5	240	6	240	10	330	14	330	26	330	0	330	0	420
	Unit Damage (x1000\$)	240	330	240	330	240	330	240	330	240	330	240	330	0	330	0	420
Green Area /Un-used Land	Inundation Water Level	2	0	2	0	2	0	3	0	4	0	7	0	9	0	19	21
	Area (ha)	2	0	2	0	2	0	3	0	4	0	7	0	9	0	19	21
	Unit Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Inundation Water Level	14	14	8	41	9	39	84	132	84	132	199	249	519	1033	249	1033
	Area (ha)	14	14	8	41	9	39	84	132	84	132	199	249	519	1033	249	1033
	Unit Damage (x1000\$)	41	132	48	48	48	132	132	132	132	132	199	249	519	1033	249	1033

Table 3D.19(16) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (16/32)

GL = EL - 4.0 m to 5.9 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL 4.2 m (0.2 m)				EL 4.5 m (0.5 m)				EL 5.0 m (1.0 m)				EL 6.0 m (2.0 m)			
		Shallower than 0.2				Shallower than 0.2				Shallower than 0.2				Shallower than 0.2			
		0.2-0.5	0.5-1.0	1.0-1.5	1.5-2.0	0.2-0.5	0.5-1.0	1.0-1.5	1.5-2.0	0.2-0.5	0.5-1.0	1.0-1.5	1.5-2.0	0.2-0.5	0.5-1.0	1.0-1.5	1.5-2.0
Office/Public Facilities	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ancient Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban Residential Area	Area (ha)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
	Unit Damage (/ha)	5000	18900	5000	18900	5000	18900	5000	18900	5000	18900	5000	18900	5000	18900	5000	18900
	Direct Damage (x1000\$)	5	19	5	19	5	19	5	19	5	19	5	19	5	19	5	19
Suburban Residential Area	Area (ha)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Unit Damage (/ha)	1200	4200	1200	4200	1200	4200	1200	4200	1200	4200	1200	4200	1200	4200	1200	4200
	Direct Damage (x1000\$)	5	29	5	29	5	29	5	29	5	29	5	29	5	29	5	29
Industrial Area	Area (ha)	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
	Unit Damage (/ha)	9500	16700	9500	16700	9500	16700	9500	16700	9500	16700	9500	16700	9500	16700	9500	16700
	Direct Damage (x1000\$)	38	100	38	100	38	100	38	100	38	100	38	100	38	100	38	100
Fishpond /Lake Area	Area (ha)	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23	23
	Unit Damage (/ha)	410	680	410	680	410	680	410	680	410	680	410	680	410	680	410	680
	Direct Damage (x1000\$)	9	5	9	5	9	5	9	5	9	5	9	5	9	5	9	5
Agricultural Land	Area (ha)	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
	Unit Damage (/ha)	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240	240
	Direct Damage (x1000\$)	3	4	3	4	3	4	3	4	3	4	3	4	3	4	3	4
Green Area /Un-used Land	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Sub-total	60	189	57	189	67	210	67	210	67	210	67	210	67	210	67	210
	Total	60	246	733	246	733	246	733	246	733	246	733	246	733	246	733	246

Table 3D.19(17) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (17/32)

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	GL = EL 4.0 m to 5.4 m												
		EL4.2 m (0.2 m)			EL4.5 m (0.5 m)			EL5.0 m (1.0 m)			EL6.0 m (2.0 m)			
		Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	1.0-2.0
Office/Public Facilities	Area (ha)	3	3	3	5	4	4	5	8	0	0	4	4	17
	Unit Damage (/ha)	27000	27000	27000	47700	27000	27000	47700	64800	47700	27000	64800	47700	98100
Ancient Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	13800	13800	13800	51700	13800	13800	51700	93900	51700	13800	93900	51700	155500
Urban Residential Area	Area (ha)	2	2	2	3	2	2	3	5	0	0	2	2	10
	Unit Damage (/ha)	5000	5000	5000	18900	5000	5000	18900	34200	18900	5000	34200	18900	50700
Suburban Residential Area	Area (ha)	2	2	2	2	2	2	2	4	0	0	2	2	8
	Unit Damage (/ha)	1200	1200	1200	4200	1200	1200	4200	7500	4200	1200	7500	4200	12300
Industrial Area	Area (ha)	9	4	4	7	5	5	7	11	0	0	10	10	23
	Unit Damage (/ha)	9500	9500	9500	16700	9500	9500	16700	22700	16700	9500	22700	16700	34300
Fishpond /Lake Area	Area (ha)	19	19	19	30	20	20	32	49	0	0	0	0	101
	Unit Damage (/ha)	410	410	410	680	410	410	680	1010	410	410	1010	680	1350
Agricultural Land	Area (ha)	11	10	10	17	11	11	17	27	0	0	2	2	55
	Unit Damage (/ha)	240	240	240	240	240	240	240	330	240	240	330	240	420
Green Area /Un-used Land	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Sub-total	189	142	142	445	179	179	446	1028	0	0	570	0	3281
	Total	189	189	189	587	1653	1653	587	1653	1653	1653	587	1653	3852



Table 3D.19(18) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (18/32)

GL = EL-5.9 m to 7.7 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL.6.1 m (0.2 m)			EL.6.4 m (0.5 m)			EL.6.9 m (1.0 m)			EL.7.9 m (2.0 m)				
		Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5	Shallower than 0.2	0.2-0.5		
														Area (ha)	Unit Damage (/ha)
Office/Public Facilities	Area (ha)	2	5	5	8	10	23	5	8	10	23	5	8	10	23
	Unit Damage (/ha)	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700	27000	47700
	Direct Damage (x1000\$)	54	135	135	382	648	648	95	95	324	324	2256	2256	0	0
Ancient Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700	13800	51700
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Urban Residential Area	Area (ha)	9	15	8	25	23	14	14	14	27	27	64	64	64	64
	Unit Damage (/ha)	5000	18900	5000	18900	34200	5000	5000	18900	34200	5000	5000	18900	34200	5000
	Direct Damage (x1000\$)	45	75	151	473	787	787	265	265	923	923	3629	3629	0	0
Suburban Residential Area	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	1200	4200	1200	4200	7500	1200	1200	4200	7500	1200	1200	4200	7500	1200
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Industrial Area	Area (ha)	1	2	3	4	5	2	2	4	5	2	2	4	5	2
	Unit Damage (/ha)	9500	16700	9500	16700	22700	9500	9500	16700	22700	9500	9500	16700	22700	9500
	Direct Damage (x1000\$)	10	19	50	67	114	114	45	45	114	114	45	45	114	114
Fishpond /Lake Area	Area (ha)	28	0	28	0	28	0	28	0	28	0	28	0	28	0
	Unit Damage (/ha)	410	410	680	680	1010	410	410	680	680	1010	410	410	680	680
	Direct Damage (x1000\$)	11	0	19	0	28	28	0	0	28	28	0	0	28	28
Agricultural Land	Area (ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	240	240	240	240	330	240	240	240	330	240	240	240	330	240
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Green Area /Un-used Land	Area (ha)	27	1	28	1	29	0	0	0	0	0	0	0	0	0
	Unit Damage (/ha)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Direct Damage (x1000\$)	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Direct Damage Total (x1000\$)	Sub-total	120	229	459	921	1576	1576	360	360	1293	1293	6355	6355	6355	6355
	Total	120	688	688	2741	2741	2741	7987	7987	7987	7987	7987	7987	7987	7987

Table 3D.19(19) INUNDATION WATER LEVEL VS. DIRECT DAMAGE (19/32)

GL = EL 5.3 m to 6.7 m

Land Use	Inundation Water Level (Maximum Water Depth) Inundation Depth (m)	EL 5.5 m (0.2 m)			EL 5.8 m (0.5 m)			EL 6.3 m (1.0 m)			EL 7.3 m (2.0 m)		
		Shallower than 0.2			Shallower than 0.2			Shallower than 0.2			Shallower than 0.2		
		Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)	Area (ha)	Unit Damage (/ha)	Direct Damage (x1000\$)
Office/Public Facilities		2	27000	47700	3	27000	47700	11	27000	47700	7	27000	47700
	Area (ha)												
Ancient Area		54	191	297	81	297	382	0	0	0	0	0	0
	Area (ha)												
Urban Residential Area		13800	13800	51700	13800	13800	51700	13800	13800	51700	93900	13800	51700
	Area (ha)												
Suburban Residential Area		13	5000	18900	15	5000	18900	26	5000	18900	35	5000	18900
	Area (ha)												
Industrial Area		65	1200	4200	75	1200	4200	130	1200	4200	529	1200	4200
	Area (ha)												
Fishpond /Lake Area		1	9500	16700	1	9500	16700	0	9500	16700	3	9500	16700
	Area (ha)												
Agricultural Land		2	410	680	1	410	680	2	410	680	1	410	680
	Area (ha)												
Green Area /Un-used Land		0	240	240	0	240	240	0	240	240	0	240	240
	Area (ha)												
Direct Damage Total (x1000\$)		129	129	604	166	604	928	427	928	1722	769	1722	3077
	Total												