

Table H.1-7 FIRR Cash Flow of Cost and Benefit  
(5 years Delay in Benefit Accrual) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,459	0	1,459	0	1.0000	1,459	0
2	1994	1,575	0	1,575	0	1.0000	1,575	0
3	1995	7,129	0	7,129	0	1.0000	7,129	0
4	1996	36,931	0	36,931	0	1.0000	36,931	0
5	1997	31,010	0	31,010	0	1.0000	31,010	0
6	1998	25,130	720	25,850	0	1.0000	25,850	0
7	1999	0	720	720	0	1.0000	720	0
8	2000	0	720	720	0	1.0000	720	0
9	2001	0	720	720	0	1.0000	720	0
10	2002	0	720	720	0	1.0000	720	0
11	2003	0	720	720	4,698	1.0000	720	4,698
12	2004	0	720	720	9,791	1.0000	720	9,791
13	2005	0	720	720	15,303	1.0000	720	15,303
14	2006	0	720	720	21,263	1.0000	720	21,263
15	2007	0	720	720	21,263	1.0000	720	21,263
16	2008	0	720	720	21,263	1.0000	720	21,263
17	2009	0	720	720	21,263	1.0000	720	21,263
18	2010	0	720	720	21,263	1.0000	720	21,263
19	2011	0	720	720	21,263	1.0000	720	21,263
20	2012	0	720	720	21,263	1.0000	720	21,263
21	2013	0	720	720	21,263	1.0000	720	21,263
22	2014	0	720	720	21,263	1.0000	720	21,263
23	2015	0	720	720	21,263	1.0000	720	21,263
24	2016	0	720	720	21,263	1.0000	720	21,263
25	2017	0	720	720	21,263	1.0000	720	21,263
26	2018	0	720	720	21,263	1.0000	720	21,263
27	2019	0	720	720	21,263	1.0000	720	21,263
28	2020	0	720	720	21,263	1.0000	720	21,263
29	2021	0	720	720	21,263	1.0000	720	21,263
30	2022	0	720	720	21,263	1.0000	720	21,263
31	2023	0	720	720	21,263	1.0000	720	21,263
32	2024	0	720	720	21,263	1.0000	720	21,263
33	2025	0	720	720	21,263	1.0000	720	21,263
34	2026	0	720	720	21,263	1.0000	720	21,263
35	2027	0	720	720	21,263	1.0000	720	21,263
36	2028	0	720	720	21,263	1.0000	720	21,263
37	2029	0	720	720	21,263	1.0000	720	21,263
38	2030	0	720	720	21,263	1.0000	720	21,263
39	2031	0	720	720	21,263	1.0000	720	21,263
40	2032	0	720	720	21,263	1.0000	720	21,263
41	2033	0	720	720	21,263	1.0000	720	21,263
42	2034	0	720	720	21,263	1.0000	720	21,263
43	2035	0	720	720	21,263	1.0000	720	21,263
44	2036	0	720	720	21,263	1.0000	720	21,263
45	2037	0	720	720	21,263	1.0000	720	21,263
46	2038	0	720	720	21,263	1.0000	720	21,263
47	2039	0	720	720	21,263	1.0000	720	21,263
48	2040	0	720	720	21,263	1.0000	720	21,263
49	2041	0	720	720	21,263	1.0000	720	21,263
50	2042	0	720	720	21,263	1.0000	720	21,263
Total (Lp)		103,234	32,400	135,634	816,523		135,634	816,523
(US \$)		51,617	16,200	67,817	408,262		67,817	408,262

B/C = 6.02  
 B-C = 680,889  
 FIRR = 0.00 %

Table H.1-8 FIRR Cash Flow of Cost and Benefit  
(2 years Delay in Benefit Accrual) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,459	0	1,459	0	1.0000	1,459	0
2	1994	1,575	0	1,575	0	0.8907	1,403	0
3	1995	7,129	0	7,129	0	0.7933	5,656	0
4	1996	36,931	0	36,931	0	0.7066	26,095	0
5	1997	31,010	0	31,010	0	0.6293	19,516	0
6	1998	25,130	720	25,850	0	0.5605	14,490	0
7	1999	0	720	720	0	0.4993	359	0
8	2000	0	720	720	4,698	0.4447	320	2,089
9	2001	0	720	720	9,791	0.3961	285	3,878
10	2002	0	720	720	15,303	0.3528	254	5,399
11	2003	0	720	720	21,263	0.3142	226	6,681
12	2004	0	720	720	21,263	0.2799	202	5,951
13	2005	0	720	720	21,263	0.2493	179	5,300
14	2006	0	720	720	21,263	0.2220	160	4,721
15	2007	0	720	720	21,263	0.1978	142	4,205
16	2008	0	720	720	21,263	0.1761	127	3,745
17	2009	0	720	720	21,263	0.1569	113	3,336
18	2010	0	720	720	21,263	0.1397	101	2,971
19	2011	0	720	720	21,263	0.1245	90	2,646
20	2012	0	720	720	21,263	0.1108	80	2,357
21	2013	0	720	720	21,263	0.0987	71	2,099
22	2014	0	720	720	21,263	0.0879	63	1,870
23	2015	0	720	720	21,263	0.0783	56	1,665
24	2016	0	720	720	21,263	0.0698	50	1,483
25	2017	0	720	720	21,263	0.0621	45	1,321
26	2018	0	720	720	21,263	0.0553	40	1,177
27	2019	0	720	720	21,263	0.0493	35	1,048
28	2020	0	720	720	21,263	0.0439	32	934
29	2021	0	720	720	21,263	0.0391	28	831
30	2022	0	720	720	21,263	0.0348	25	741
31	2023	0	720	720	21,263	0.0310	22	660
32	2024	0	720	720	21,263	0.0276	20	588
33	2025	0	720	720	21,263	0.0246	18	523
34	2026	0	720	720	21,263	0.0219	16	466
35	2027	0	720	720	21,263	0.0195	14	415
36	2028	0	720	720	21,263	0.0174	13	370
37	2029	0	720	720	21,263	0.0155	11	329
38	2030	0	720	720	21,263	0.0138	10	293
39	2031	0	720	720	21,263	0.0123	9	261
40	2032	0	720	720	21,263	0.0109	8	233
41	2033	0	720	720	21,263	0.0097	7	207
42	2034	0	720	720	21,263	0.0087	6	185
43	2035	0	720	720	21,263	0.0077	6	164
44	2036	0	720	720	21,263	0.0069	5	146
45	2037	0	720	720	21,263	0.0061	4	130
46	2038	0	720	720	21,263	0.0055	4	116
47	2039	0	720	720	21,263	0.0049	4	103
48	2040	0	720	720	21,263	0.0043	3	92
49	2041	0	720	720	21,263	0.0039	3	82
50	2042	0	720	720	21,263	0.0034	2	73
Total (Lp)		103,234	32,400	135,634	880,312		71,887	71,887
(US \$)		51,617	16,200	67,817	440,156		35,943	35,943

B/C = 1.00  
 B-C = 0  
 FIRR = 12.27 %

Table H.1-9 FIRR Cash Flow of Cost and Benefit  
(2 years Delay in Benefit Accrual)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,459	0	1,459	0	1.0000	1,459	0
2	1994	1,575	0	1,575	0	0.8929	1,406	0
3	1995	7,129	0	7,129	0	0.7972	5,683	0
4	1996	36,931	0	36,931	0	0.7118	26,287	0
5	1997	31,010	0	31,010	0	0.6355	19,707	0
6	1998	25,130	720	25,850	0	0.5674	14,668	0
7	1999	0	720	720	0	0.5066	365	0
8	2000	0	720	720	4,698	0.4523	326	2,125
9	2001	0	720	720	9,791	0.4039	291	3,954
10	2002	0	720	720	15,303	0.3606	260	5,518
11	2003	0	720	720	21,263	0.3220	232	6,846
12	2004	0	720	720	21,263	0.2875	207	6,113
13	2005	0	720	720	21,263	0.2567	185	5,458
14	2006	0	720	720	21,263	0.2292	165	4,873
15	2007	0	720	720	21,263	0.2046	147	4,351
16	2008	0	720	720	21,263	0.1827	132	3,885
17	2009	0	720	720	21,263	0.1631	117	3,468
18	2010	0	720	720	21,263	0.1456	105	3,097
19	2011	0	720	720	21,263	0.1300	94	2,765
20	2012	0	720	720	21,263	0.1161	84	2,469
21	2013	0	720	720	21,263	0.1037	75	2,204
22	2014	0	720	720	21,263	0.0926	67	1,968
23	2015	0	720	720	21,263	0.0826	60	1,757
24	2016	0	720	720	21,263	0.0738	53	1,569
25	2017	0	720	720	21,263	0.0659	47	1,401
26	2018	0	720	720	21,263	0.0588	42	1,251
27	2019	0	720	720	21,263	0.0525	38	1,117
28	2020	0	720	720	21,263	0.0469	34	997
29	2021	0	720	720	21,263	0.0419	30	890
30	2022	0	720	720	21,263	0.0374	27	795
31	2023	0	720	720	21,263	0.0334	24	710
32	2024	0	720	720	21,263	0.0298	21	634
33	2025	0	720	720	21,263	0.0266	19	566
34	2026	0	720	720	21,263	0.0238	17	505
35	2027	0	720	720	21,263	0.0212	15	451
36	2028	0	720	720	21,263	0.0189	14	403
37	2029	0	720	720	21,263	0.0169	12	360
38	2030	0	720	720	21,263	0.0151	11	321
39	2031	0	720	720	21,263	0.0135	10	287
40	2032	0	720	720	21,263	0.0120	9	256
41	2033	0	720	720	21,263	0.0107	8	229
42	2034	0	720	720	21,263	0.0096	7	204
43	2035	0	720	720	21,263	0.0086	6	182
44	2036	0	720	720	21,263	0.0076	6	163
45	2037	0	720	720	21,263	0.0068	5	145
46	2038	0	720	720	21,263	0.0061	4	130
47	2039	0	720	720	21,263	0.0054	4	116
48	2040	0	720	720	21,263	0.0049	4	103
49	2041	0	720	720	21,263	0.0043	3	92
50	2042	0	720	720	21,263	0.0039	3	82
Total (Lp)		103,234	32,400	135,634	880,312		72,592	74,808
(US \$)		51,617	16,200	67,817	440,156		36,296	37,404

B/C = 1.03  
 B-C = 2,216  
 FIRR = 12.00 %

Table H.1-10 FIRR Cash Flow of Cost and Benefit

(2 years Delay in Benefit Accrual)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,459	0	1,459	0	1.0000	1,459	0
2	1994	1,575	0	1,575	0	1.0000	1,575	0
3	1995	7,129	0	7,129	0	1.0000	7,129	0
4	1996	36,931	0	36,931	0	1.0000	36,931	0
5	1997	31,010	0	31,010	0	1.0000	31,010	0
6	1998	25,130	720	25,850	0	1.0000	25,850	0
7	1999	0	720	720	0	1.0000	720	0
8	2000	0	720	720	4,698	1.0000	720	4,698
9	2001	0	720	720	9,791	1.0000	720	9,791
10	2002	0	720	720	15,303	1.0000	720	15,303
11	2003	0	720	720	21,263	1.0000	720	21,263
12	2004	0	720	720	21,263	1.0000	720	21,263
13	2005	0	720	720	21,263	1.0000	720	21,263
14	2006	0	720	720	21,263	1.0000	720	21,263
15	2007	0	720	720	21,263	1.0000	720	21,263
16	2008	0	720	720	21,263	1.0000	720	21,263
17	2009	0	720	720	21,263	1.0000	720	21,263
18	2010	0	720	720	21,263	1.0000	720	21,263
19	2011	0	720	720	21,263	1.0000	720	21,263
20	2012	0	720	720	21,263	1.0000	720	21,263
21	2013	0	720	720	21,263	1.0000	720	21,263
22	2014	0	720	720	21,263	1.0000	720	21,263
23	2015	0	720	720	21,263	1.0000	720	21,263
24	2016	0	720	720	21,263	1.0000	720	21,263
25	2017	0	720	720	21,263	1.0000	720	21,263
26	2018	0	720	720	21,263	1.0000	720	21,263
27	2019	0	720	720	21,263	1.0000	720	21,263
28	2020	0	720	720	21,263	1.0000	720	21,263
29	2021	0	720	720	21,263	1.0000	720	21,263
30	2022	0	720	720	21,263	1.0000	720	21,263
31	2023	0	720	720	21,263	1.0000	720	21,263
32	2024	0	720	720	21,263	1.0000	720	21,263
33	2025	0	720	720	21,263	1.0000	720	21,263
34	2026	0	720	720	21,263	1.0000	720	21,263
35	2027	0	720	720	21,263	1.0000	720	21,263
36	2028	0	720	720	21,263	1.0000	720	21,263
37	2029	0	720	720	21,263	1.0000	720	21,263
38	2030	0	720	720	21,263	1.0000	720	21,263
39	2031	0	720	720	21,263	1.0000	720	21,263
40	2032	0	720	720	21,263	1.0000	720	21,263
41	2033	0	720	720	21,263	1.0000	720	21,263
42	2034	0	720	720	21,263	1.0000	720	21,263
43	2035	0	720	720	21,263	1.0000	720	21,263
44	2036	0	720	720	21,263	1.0000	720	21,263
45	2037	0	720	720	21,263	1.0000	720	21,263
46	2038	0	720	720	21,263	1.0000	720	21,263
47	2039	0	720	720	21,263	1.0000	720	21,263
48	2040	0	720	720	21,263	1.0000	720	21,263
49	2041	0	720	720	21,263	1.0000	720	21,263
50	2042	0	720	720	21,263	1.0000	720	21,263
Total (Lp)		103,234	32,400	135,634	880,312		135,634	880,312
(US \$)		51,617	16,200	67,817	440,156		67,817	440,156

B/C = 6.49  
 B-C = 744,678  
 FIRR = 0.00 %

Table H.1-11 FIRR Cash Flow of Cost and Benefit  
(20 % Decrease in Benefit)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,459	0	1,459	0	1.0000	1,459	0
2	1994	1,575	0	1,575	0	0.8898	1,401	0
3	1995	7,129	0	7,129	0	0.7918	5,644	0
4	1996	36,931	0	36,931	0	0.7045	26,019	0
5	1997	31,010	0	31,010	0	0.6269	19,440	0
6	1998	25,130	720	25,850	3,758	0.5578	14,419	2,096
7	1999	0	720	720	7,833	0.4963	357	3,888
8	2000	0	720	720	12,242	0.4417	318	5,407
9	2001	0	720	720	17,010	0.3930	283	6,685
10	2002	0	720	720	17,010	0.3497	252	5,948
11	2003	0	720	720	17,010	0.3112	224	5,293
12	2004	0	720	720	17,010	0.2769	199	4,710
13	2005	0	720	720	17,010	0.2464	177	4,191
14	2006	0	720	720	17,010	0.2192	158	3,729
15	2007	0	720	720	17,010	0.1951	140	3,318
16	2008	0	720	720	17,010	0.1736	125	2,952
17	2009	0	720	720	17,010	0.1544	111	2,627
18	2010	0	720	720	17,010	0.1374	99	2,338
19	2011	0	720	720	17,010	0.1223	88	2,080
20	2012	0	720	720	17,010	0.1088	78	1,851
21	2013	0	720	720	17,010	0.0968	70	1,647
22	2014	0	720	720	17,010	0.0861	62	1,465
23	2015	0	720	720	17,010	0.0767	55	1,304
24	2016	0	720	720	17,010	0.0682	49	1,160
25	2017	0	720	720	17,010	0.0607	44	1,032
26	2018	0	720	720	17,010	0.0540	39	919
27	2019	0	720	720	17,010	0.0481	35	817
28	2020	0	720	720	17,010	0.0428	31	727
29	2021	0	720	720	17,010	0.0380	27	647
30	2022	0	720	720	17,010	0.0339	24	576
31	2023	0	720	720	17,010	0.0301	22	512
32	2024	0	720	720	17,010	0.0268	19	456
33	2025	0	720	720	17,010	0.0239	17	406
34	2026	0	720	720	17,010	0.0212	15	361
35	2027	0	720	720	17,010	0.0189	14	321
36	2028	0	720	720	17,010	0.0168	12	286
37	2029	0	720	720	17,010	0.0150	11	254
38	2030	0	720	720	17,010	0.0133	10	226
39	2031	0	720	720	17,010	0.0118	9	201
40	2032	0	720	720	17,010	0.0105	8	179
41	2033	0	720	720	17,010	0.0094	7	159
42	2034	0	720	720	17,010	0.0083	6	142
43	2035	0	720	720	17,010	0.0074	5	126
44	2036	0	720	720	17,010	0.0066	5	112
45	2037	0	720	720	17,010	0.0059	4	100
46	2038	0	720	720	17,010	0.0052	4	89
47	2039	0	720	720	17,010	0.0047	3	79
48	2040	0	720	720	17,010	0.0041	3	70
49	2041	0	720	720	17,010	0.0037	3	63
50	2042	0	720	720	17,010	0.0033	2	56
Total (Lp)		103,234	32,400	135,634	738,253		71,607	71,607
(US \$)		51,617	16,200	67,817	369,127		35,804	35,804

B/C = 1.00  
B-C = 0  
FIRR = 12.38 %

Table H.1-12 FIRR Cash Flow of Cost and Benefit  
(20 % Decrease in Benefit)

		Cost			Benefit	Discount Rate	Present Value	
No.	Year	Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,459	0	1,459	0	1.0000	1,459	0
2	1994	1,575	0	1,575	0	0.8929	1,406	0
3	1995	7,129	0	7,129	0	0.7972	5,683	0
4	1996	36,931	0	36,931	0	0.7118	26,287	0
5	1997	31,010	0	31,010	0	0.6355	19,707	0
6	1998	25,130	720	25,850	3,758	0.5674	14,668	2,132
7	1999	0	720	720	7,833	0.5066	365	3,968
8	2000	0	720	720	12,242	0.4523	326	5,538
9	2001	0	720	720	17,010	0.4039	291	6,870
10	2002	0	720	720	17,010	0.3606	260	6,134
11	2003	0	720	720	17,010	0.3220	232	5,477
12	2004	0	720	720	17,010	0.2875	207	4,890
13	2005	0	720	720	17,010	0.2567	185	4,366
14	2006	0	720	720	17,010	0.2292	165	3,898
15	2007	0	720	720	17,010	0.2046	147	3,481
16	2008	0	720	720	17,010	0.1827	132	3,108
17	2009	0	720	720	17,010	0.1631	117	2,775
18	2010	0	720	720	17,010	0.1456	105	2,477
19	2011	0	720	720	17,010	0.1300	94	2,212
20	2012	0	720	720	17,010	0.1161	84	1,975
21	2013	0	720	720	17,010	0.1037	75	1,763
22	2014	0	720	720	17,010	0.0926	67	1,574
23	2015	0	720	720	17,010	0.0826	60	1,406
24	2016	0	720	720	17,010	0.0738	53	1,255
25	2017	0	720	720	17,010	0.0659	47	1,121
26	2018	0	720	720	17,010	0.0588	42	1,001
27	2019	0	720	720	17,010	0.0525	38	893
28	2020	0	720	720	17,010	0.0469	34	798
29	2021	0	720	720	17,010	0.0419	30	712
30	2022	0	720	720	17,010	0.0374	27	636
31	2023	0	720	720	17,010	0.0334	24	568
32	2024	0	720	720	17,010	0.0298	21	507
33	2025	0	720	720	17,010	0.0266	19	453
34	2026	0	720	720	17,010	0.0238	17	404
35	2027	0	720	720	17,010	0.0212	15	361
36	2028	0	720	720	17,010	0.0189	14	322
37	2029	0	720	720	17,010	0.0169	12	288
38	2030	0	720	720	17,010	0.0151	11	257
39	2031	0	720	720	17,010	0.0135	10	229
40	2032	0	720	720	17,010	0.0120	9	205
41	2033	0	720	720	17,010	0.0107	8	183
42	2034	0	720	720	17,010	0.0096	7	163
43	2035	0	720	720	17,010	0.0086	6	146
44	2036	0	720	720	17,010	0.0076	6	130
45	2037	0	720	720	17,010	0.0068	5	116
46	2038	0	720	720	17,010	0.0061	4	104
47	2039	0	720	720	17,010	0.0054	4	93
48	2040	0	720	720	17,010	0.0049	4	83
49	2041	0	720	720	17,010	0.0043	3	74
50	2042	0	720	720	17,010	0.0039	3	66
Total (Lp)		103,234	32,400	135,634	738,253		72,592	75,210
(US \$)		51,617	16,200	67,817	369,127		36,296	37,605

B/C = 1.04  
 B-C = 2,617  
 FIRR = 12.00 %

Table H.1-13 FIRR Cash Flow of Cost and Benefit  
(20 % Decrease in Benefit)

		Cost			Benefit	Discount Rate	Present Value	
No.	Year	Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,459	0	1,459	0	1.0000	1,459	0
2	1994	1,575	0	1,575	0	1.0000	1,575	0
3	1995	7,129	0	7,129	0	1.0000	7,129	0
4	1996	36,931	0	36,931	0	1.0000	36,931	0
5	1997	31,010	0	31,010	0	1.0000	31,010	0
6	1998	25,130	720	25,850	3,758	1.0000	25,850	3,758
7	1999	0	720	720	7,833	1.0000	720	7,833
8	2000	0	720	720	12,242	1.0000	720	12,242
9	2001	0	720	720	17,010	1.0000	720	17,010
10	2002	0	720	720	17,010	1.0000	720	17,010
11	2003	0	720	720	17,010	1.0000	720	17,010
12	2004	0	720	720	17,010	1.0000	720	17,010
13	2005	0	720	720	17,010	1.0000	720	17,010
14	2006	0	720	720	17,010	1.0000	720	17,010
15	2007	0	720	720	17,010	1.0000	720	17,010
16	2008	0	720	720	17,010	1.0000	720	17,010
17	2009	0	720	720	17,010	1.0000	720	17,010
18	2010	0	720	720	17,010	1.0000	720	17,010
19	2011	0	720	720	17,010	1.0000	720	17,010
20	2012	0	720	720	17,010	1.0000	720	17,010
21	2013	0	720	720	17,010	1.0000	720	17,010
22	2014	0	720	720	17,010	1.0000	720	17,010
23	2015	0	720	720	17,010	1.0000	720	17,010
24	2016	0	720	720	17,010	1.0000	720	17,010
25	2017	0	720	720	17,010	1.0000	720	17,010
26	2018	0	720	720	17,010	1.0000	720	17,010
27	2019	0	720	720	17,010	1.0000	720	17,010
28	2020	0	720	720	17,010	1.0000	720	17,010
29	2021	0	720	720	17,010	1.0000	720	17,010
30	2022	0	720	720	17,010	1.0000	720	17,010
31	2023	0	720	720	17,010	1.0000	720	17,010
32	2024	0	720	720	17,010	1.0000	720	17,010
33	2025	0	720	720	17,010	1.0000	720	17,010
34	2026	0	720	720	17,010	1.0000	720	17,010
35	2027	0	720	720	17,010	1.0000	720	17,010
36	2028	0	720	720	17,010	1.0000	720	17,010
37	2029	0	720	720	17,010	1.0000	720	17,010
38	2030	0	720	720	17,010	1.0000	720	17,010
39	2031	0	720	720	17,010	1.0000	720	17,010
40	2032	0	720	720	17,010	1.0000	720	17,010
41	2033	0	720	720	17,010	1.0000	720	17,010
42	2034	0	720	720	17,010	1.0000	720	17,010
43	2035	0	720	720	17,010	1.0000	720	17,010
44	2036	0	720	720	17,010	1.0000	720	17,010
45	2037	0	720	720	17,010	1.0000	720	17,010
46	2038	0	720	720	17,010	1.0000	720	17,010
47	2039	0	720	720	17,010	1.0000	720	17,010
48	2040	0	720	720	17,010	1.0000	720	17,010
49	2041	0	720	720	17,010	1.0000	720	17,010
50	2042	0	720	720	17,010	1.0000	720	17,010
Total (lp)		103,234	32,400	135,634	738,253		135,634	738,253
(US \$)		51,617	16,200	67,817	369,127		67,817	369,127

B/C = 5.44  
 B-C = 602,619  
 FIRR = 0.00 %

Table H.1-14 FIRR Cash Flow of Cost and Benefit  
(20 % Decrease in Benefit)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,897	0	1,897	0	1.0000	1,897	0
2	1994	2,048	0	2,048	0	0.8932	1,829	0
3	1995	9,268	0	9,268	0	0.7978	7,393	0
4	1996	48,010	0	48,010	0	0.7126	34,210	0
5	1997	40,313	0	40,313	0	0.6364	25,657	0
6	1998	32,669	936	33,605	4,698	0.5685	19,103	2,671
7	1999	0	936	936	9,791	0.5077	475	4,971
8	2000	0	936	936	15,303	0.4535	424	6,940
9	2001	0	936	936	21,263	0.4051	379	8,613
10	2002	0	936	936	21,263	0.3618	339	7,693
11	2003	0	936	936	21,263	0.3231	302	6,871
12	2004	0	936	936	21,263	0.2886	270	6,137
13	2005	0	936	936	21,263	0.2578	241	5,481
14	2006	0	936	936	21,263	0.2303	216	4,896
15	2007	0	936	936	21,263	0.2057	192	4,373
16	2008	0	936	936	21,263	0.1837	172	3,906
17	2009	0	936	936	21,263	0.1641	154	3,489
18	2010	0	936	936	21,263	0.1465	137	3,116
19	2011	0	936	936	21,263	0.1309	123	2,783
20	2012	0	936	936	21,263	0.1169	109	2,486
21	2013	0	936	936	21,263	0.1044	98	2,220
22	2014	0	936	936	21,263	0.0933	87	1,983
23	2015	0	936	936	21,263	0.0833	78	1,771
24	2016	0	936	936	21,263	0.0744	70	1,582
25	2017	0	936	936	21,263	0.0665	62	1,413
26	2018	0	936	936	21,263	0.0594	56	1,262
27	2019	0	936	936	21,263	0.0530	50	1,127
28	2020	0	936	936	21,263	0.0474	44	1,007
29	2021	0	936	936	21,263	0.0423	40	899
30	2022	0	936	936	21,263	0.0378	35	803
31	2023	0	936	936	21,263	0.0337	32	717
32	2024	0	936	936	21,263	0.0301	28	641
33	2025	0	936	936	21,263	0.0269	25	572
34	2026	0	936	936	21,263	0.0240	23	511
35	2027	0	936	936	21,263	0.0215	20	457
36	2028	0	936	936	21,263	0.0192	18	408
37	2029	0	936	936	21,263	0.0171	16	364
38	2030	0	936	936	21,263	0.0153	14	325
39	2031	0	936	936	21,263	0.0137	13	291
40	2032	0	936	936	21,263	0.0122	11	260
41	2033	0	936	936	21,263	0.0109	10	232
42	2034	0	936	936	21,263	0.0097	9	207
43	2035	0	936	936	21,263	0.0087	8	185
44	2036	0	936	936	21,263	0.0078	7	165
45	2037	0	936	936	21,263	0.0069	6	148
46	2038	0	936	936	21,263	0.0062	6	132
47	2039	0	936	936	21,263	0.0055	5	118
48	2040	0	936	936	21,263	0.0049	5	105
49	2041	0	936	936	21,263	0.0044	4	94
50	2042	0	936	936	21,263	0.0039	4	84
Total (Lp)		134,204	42,120	176,324	922,838		94,506	94,507
(US \$)		67,102	21,060	88,162	461,419		47,253	47,253

B/C = 1.00  
 B-C = 0  
 FIRR = 11.96 %



Table H.1-15 FIRR Cash Flow of Cost and Benefit  
(30 % Increase in Cost)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,897	0	1,897	0	1.0000	1,897	0
2	1994	2,048	0	2,048	0	0.8929	1,829	0
3	1995	9,268	0	9,268	0	0.7972	7,388	0
4	1996	48,010	0	48,010	0	0.7118	34,173	0
5	1997	40,313	0	40,313	0	0.6355	25,620	0
6	1998	32,669	936	33,605	4,698	0.5674	19,068	2,666
7	1999	0	936	936	9,791	0.5066	474	4,960
8	2000	0	936	936	15,303	0.4523	423	6,922
9	2001	0	936	936	21,263	0.4039	378	8,588
10	2002	0	936	936	21,263	0.3606	338	7,668
11	2003	0	936	936	21,263	0.3220	301	6,846
12	2004	0	936	936	21,263	0.2875	269	6,113
13	2005	0	936	936	21,263	0.2567	240	5,458
14	2006	0	936	936	21,263	0.2292	215	4,873
15	2007	0	936	936	21,263	0.2046	192	4,351
16	2008	0	936	936	21,263	0.1827	171	3,885
17	2009	0	936	936	21,263	0.1631	153	3,468
18	2010	0	936	936	21,263	0.1456	136	3,097
19	2011	0	936	936	21,263	0.1300	122	2,765
20	2012	0	936	936	21,263	0.1161	109	2,469
21	2013	0	936	936	21,263	0.1037	97	2,204
22	2014	0	936	936	21,263	0.0926	87	1,968
23	2015	0	936	936	21,263	0.0826	77	1,757
24	2016	0	936	936	21,263	0.0738	69	1,569
25	2017	0	936	936	21,263	0.0659	62	1,401
26	2018	0	936	936	21,263	0.0588	55	1,251
27	2019	0	936	936	21,263	0.0525	49	1,117
28	2020	0	936	936	21,263	0.0469	44	997
29	2021	0	936	936	21,263	0.0419	39	890
30	2022	0	936	936	21,263	0.0374	35	795
31	2023	0	936	936	21,263	0.0334	31	710
32	2024	0	936	936	21,263	0.0298	28	634
33	2025	0	936	936	21,263	0.0266	25	566
34	2026	0	936	936	21,263	0.0238	22	505
35	2027	0	936	936	21,263	0.0212	20	451
36	2028	0	936	936	21,263	0.0189	18	403
37	2029	0	936	936	21,263	0.0169	16	360
38	2030	0	936	936	21,263	0.0151	14	321
39	2031	0	936	936	21,263	0.0135	13	287
40	2032	0	936	936	21,263	0.0120	11	256
41	2033	0	936	936	21,263	0.0107	10	229
42	2034	0	936	936	21,263	0.0096	9	204
43	2035	0	936	936	21,263	0.0086	8	182
44	2036	0	936	936	21,263	0.0076	7	163
45	2037	0	936	936	21,263	0.0068	6	145
46	2038	0	936	936	21,263	0.0061	6	130
47	2039	0	936	936	21,263	0.0054	5	116
48	2040	0	936	936	21,263	0.0049	5	103
49	2041	0	936	936	21,263	0.0043	4	92
50	2042	0	936	936	21,263	0.0039	4	82
Total (Lp)		134,205	42,120	176,325	922,838		94,370	94,014
(US \$)		67,103	21,060	88,163	461,419		47,185	47,007

B/C = 1.00  
B-C = -355  
FIRR = 12.00 %

Table H.1-16 FIRR Cash Flow of Cost and Benefit  
(30 % Increase in Cost)

		Cost			Benefit	Discount Rate	(Unit: 1000Lps) Present Value	
No.	Year	Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,897	0	1,897	0	1.0000	1,897	0
2	1994	2,048	0	2,048	0	1.0000	2,048	0
3	1995	9,268	0	9,268	0	1.0000	9,268	0
4	1996	48,010	0	48,010	0	1.0000	48,010	0
5	1997	40,313	0	40,313	0	1.0000	40,313	0
6	1998	32,669	936	33,605	4,698	1.0000	33,605	4,698
7	1999	0	936	936	9,791	1.0000	936	9,791
8	2000	0	936	936	15,303	1.0000	936	15,303
9	2001	0	936	936	21,263	1.0000	936	21,263
10	2002	0	936	936	21,263	1.0000	936	21,263
11	2003	0	936	936	21,263	1.0000	936	21,263
12	2004	0	936	936	21,263	1.0000	936	21,263
13	2005	0	936	936	21,263	1.0000	936	21,263
14	2006	0	936	936	21,263	1.0000	936	21,263
15	2007	0	936	936	21,263	1.0000	936	21,263
16	2008	0	936	936	21,263	1.0000	936	21,263
17	2009	0	936	936	21,263	1.0000	936	21,263
18	2010	0	936	936	21,263	1.0000	936	21,263
19	2011	0	936	936	21,263	1.0000	936	21,263
20	2012	0	936	936	21,263	1.0000	936	21,263
21	2013	0	936	936	21,263	1.0000	936	21,263
22	2014	0	936	936	21,263	1.0000	936	21,263
23	2015	0	936	936	21,263	1.0000	936	21,263
24	2016	0	936	936	21,263	1.0000	936	21,263
25	2017	0	936	936	21,263	1.0000	936	21,263
26	2018	0	936	936	21,263	1.0000	936	21,263
27	2019	0	936	936	21,263	1.0000	936	21,263
28	2020	0	936	936	21,263	1.0000	936	21,263
29	2021	0	936	936	21,263	1.0000	936	21,263
30	2022	0	936	936	21,263	1.0000	936	21,263
31	2023	0	936	936	21,263	1.0000	936	21,263
32	2024	0	936	936	21,263	1.0000	936	21,263
33	2025	0	936	936	21,263	1.0000	936	21,263
34	2026	0	936	936	21,263	1.0000	936	21,263
35	2027	0	936	936	21,263	1.0000	936	21,263
36	2028	0	936	936	21,263	1.0000	936	21,263
37	2029	0	936	936	21,263	1.0000	936	21,263
38	2030	0	936	936	21,263	1.0000	936	21,263
39	2031	0	936	936	21,263	1.0000	936	21,263
40	2032	0	936	936	21,263	1.0000	936	21,263
41	2033	0	936	936	21,263	1.0000	936	21,263
42	2034	0	936	936	21,263	1.0000	936	21,263
43	2035	0	936	936	21,263	1.0000	936	21,263
44	2036	0	936	936	21,263	1.0000	936	21,263
45	2037	0	936	936	21,263	1.0000	936	21,263
46	2038	0	936	936	21,263	1.0000	936	21,263
47	2039	0	936	936	21,263	1.0000	936	21,263
48	2040	0	936	936	21,263	1.0000	936	21,263
49	2041	0	936	936	21,263	1.0000	936	21,263
50	2042	0	936	936	21,263	1.0000	936	21,263
Total (Lp)		134,205	42,120	176,325	922,838		176,325	922,838
(US \$)		67,103	21,060	88,163	461,419		88,163	461,419

B/C = 5.23  
 B-C = 746,513  
 FIRR = 0.00 %

Table H.1-17 FIRR Cash Flow of Cost and Benefit  
(30 % Increase in Cost)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8696	0	0
3	1995	1,459	0	1,459	0	0.7563	1,103	0
4	1996	1,575	0	1,575	0	0.6577	1,036	0
5	1997	7,129	0	7,129	0	0.5719	4,077	0
6	1998	36,931	0	36,931	0	0.4974	18,369	0
7	1999	31,010	0	31,010	0	0.4325	13,413	0
8	2000	25,130	720	25,850	4,698	0.3762	9,724	1,767
9	2001	0	720	720	9,791	0.3271	236	3,203
10	2002	0	720	720	15,303	0.2845	205	4,353
11	2003	0	720	720	21,263	0.2474	178	5,260
12	2004	0	720	720	21,263	0.2151	155	4,574
13	2005	0	720	720	21,263	0.1871	135	3,978
14	2006	0	720	720	21,263	0.1627	117	3,460
15	2007	0	720	720	21,263	0.1415	102	3,009
16	2008	0	720	720	21,263	0.1230	89	2,616
17	2009	0	720	720	21,263	0.1070	77	2,275
18	2010	0	720	720	21,263	0.0931	67	1,979
19	2011	0	720	720	21,263	0.0809	58	1,721
20	2012	0	720	720	21,263	0.0704	51	1,496
21	2013	0	720	720	21,263	0.0612	44	1,301
22	2014	0	720	720	21,263	0.0532	38	1,132
23	2015	0	720	720	21,263	0.0463	33	984
24	2016	0	720	720	21,263	0.0403	29	856
25	2017	0	720	720	21,263	0.0350	25	744
26	2018	0	720	720	21,263	0.0304	22	647
27	2019	0	720	720	21,263	0.0265	19	563
28	2020	0	720	720	21,263	0.0230	17	489
29	2021	0	720	720	21,263	0.0200	14	426
30	2022	0	720	720	21,263	0.0174	13	370
31	2023	0	720	720	21,263	0.0151	11	322
32	2024	0	720	720	21,263	0.0132	9	280
33	2025	0	720	720	21,263	0.0115	8	243
34	2026	0	720	720	21,263	0.0100	7	212
35	2027	0	720	720	21,263	0.0087	6	184
36	2028	0	720	720	21,263	0.0075	5	160
37	2029	0	720	720	21,263	0.0065	5	139
38	2030	0	720	720	21,263	0.0057	4	121
39	2031	0	720	720	21,263	0.0050	4	105
40	2032	0	720	720	21,263	0.0043	3	92
41	2033	0	720	720	21,263	0.0037	3	80
42	2034	0	720	720	21,263	0.0033	2	69
43	2035	0	720	720	21,263	0.0028	2	60
44	2036	0	720	720	21,263	0.0025	2	52
45	2037	0	720	720	21,263	0.0021	2	46
46	2038	0	720	720	21,263	0.0019	1	40
47	2039	0	720	720	21,263	0.0016	1	34
48	2040	0	720	720	21,263	0.0014	1	30
49	2041	0	720	720	21,263	0.0012	1	26
50	2042	0	720	720	21,263	0.0011	1	23
Total (Lp)		103,234	30,960	134,194	880,312		49,524	49,523
(US \$)		51,617	15,480	67,097	440,156		24,762	24,761

B/C = 1.00  
 B-C = 0  
 FIRR = 14.99 %

Table H.1-18 FIRR Cash Flow of Cost and Benefit  
(2 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8929	0	0
3	1995	1,459	0	1,459	0	0.7972	1,163	0
4	1996	1,575	0	1,575	0	0.7118	1,121	0
5	1997	7,129	0	7,129	0	0.6355	4,531	0
6	1998	36,931	0	36,931	0	0.5674	20,956	0
7	1999	31,010	0	31,010	0	0.5066	15,711	0
8	2000	25,130	720	25,850	4,698	0.4523	11,693	2,125
9	2001	0	720	720	9,791	0.4039	291	3,954
10	2002	0	720	720	15,303	0.3606	260	5,518
11	2003	0	720	720	21,263	0.3220	232	6,846
12	2004	0	720	720	21,263	0.2875	207	6,113
13	2005	0	720	720	21,263	0.2567	185	5,458
14	2006	0	720	720	21,263	0.2292	165	4,873
15	2007	0	720	720	21,263	0.2046	147	4,351
16	2008	0	720	720	21,263	0.1827	132	3,885
17	2009	0	720	720	21,263	0.1631	117	3,468
18	2010	0	720	720	21,263	0.1456	105	3,097
19	2011	0	720	720	21,263	0.1300	94	2,765
20	2012	0	720	720	21,263	0.1161	84	2,469
21	2013	0	720	720	21,263	0.1037	75	2,204
22	2014	0	720	720	21,263	0.0926	67	1,968
23	2015	0	720	720	21,263	0.0826	60	1,757
24	2016	0	720	720	21,263	0.0738	53	1,569
25	2017	0	720	720	21,263	0.0659	47	1,401
26	2018	0	720	720	21,263	0.0588	42	1,251
27	2019	0	720	720	21,263	0.0525	38	1,117
28	2020	0	720	720	21,263	0.0469	34	997
29	2021	0	720	720	21,263	0.0419	30	890
30	2022	0	720	720	21,263	0.0374	27	795
31	2023	0	720	720	21,263	0.0334	24	710
32	2024	0	720	720	21,263	0.0298	21	634
33	2025	0	720	720	21,263	0.0266	19	566
34	2026	0	720	720	21,263	0.0238	17	505
35	2027	0	720	720	21,263	0.0212	15	451
36	2028	0	720	720	21,263	0.0189	14	403
37	2029	0	720	720	21,263	0.0169	12	360
38	2030	0	720	720	21,263	0.0151	11	321
39	2031	0	720	720	21,263	0.0135	10	287
40	2032	0	720	720	21,263	0.0120	9	256
41	2033	0	720	720	21,263	0.0107	8	229
42	2034	0	720	720	21,263	0.0096	7	204
43	2035	0	720	720	21,263	0.0086	6	182
44	2036	0	720	720	21,263	0.0076	6	163
45	2037	0	720	720	21,263	0.0068	5	145
46	2038	0	720	720	21,263	0.0061	4	130
47	2039	0	720	720	21,263	0.0054	4	116
48	2040	0	720	720	21,263	0.0049	4	103
49	2041	0	720	720	21,263	0.0043	3	92
50	2042	0	720	720	21,263	0.0039	3	82
Total (Lp)		103,234	30,960	134,194	880,312		57,865	74,808
(US \$)		51,617	15,480	67,097	440,156		28,933	37,404

B/C = 1.29  
 B-C = 16,943  
 PIRR = 12.00 %

Table H.1-19 FIRR Cash Flow of Cost and Benefit  
(2 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	1.0000	0	0
3	1995	1,459	0	1,459	0	1.0000	1,459	0
4	1996	1,575	0	1,575	0	1.0000	1,575	0
5	1997	7,129	0	7,129	0	1.0000	7,129	0
6	1998	36,931	0	36,931	0	1.0000	36,931	0
7	1999	31,010	0	31,010	0	1.0000	31,010	0
8	2000	25,130	720	25,850	4,698	1.0000	25,850	4,698
9	2001	0	720	720	9,791	1.0000	720	9,791
10	2002	0	720	720	15,303	1.0000	720	15,303
11	2003	0	720	720	21,263	1.0000	720	21,263
12	2004	0	720	720	21,263	1.0000	720	21,263
13	2005	0	720	720	21,263	1.0000	720	21,263
14	2006	0	720	720	21,263	1.0000	720	21,263
15	2007	0	720	720	21,263	1.0000	720	21,263
16	2008	0	720	720	21,263	1.0000	720	21,263
17	2009	0	720	720	21,263	1.0000	720	21,263
18	2010	0	720	720	21,263	1.0000	720	21,263
19	2011	0	720	720	21,263	1.0000	720	21,263
20	2012	0	720	720	21,263	1.0000	720	21,263
21	2013	0	720	720	21,263	1.0000	720	21,263
22	2014	0	720	720	21,263	1.0000	720	21,263
23	2015	0	720	720	21,263	1.0000	720	21,263
24	2016	0	720	720	21,263	1.0000	720	21,263
25	2017	0	720	720	21,263	1.0000	720	21,263
26	2018	0	720	720	21,263	1.0000	720	21,263
27	2019	0	720	720	21,263	1.0000	720	21,263
28	2020	0	720	720	21,263	1.0000	720	21,263
29	2021	0	720	720	21,263	1.0000	720	21,263
30	2022	0	720	720	21,263	1.0000	720	21,263
31	2023	0	720	720	21,263	1.0000	720	21,263
32	2024	0	720	720	21,263	1.0000	720	21,263
33	2025	0	720	720	21,263	1.0000	720	21,263
34	2026	0	720	720	21,263	1.0000	720	21,263
35	2027	0	720	720	21,263	1.0000	720	21,263
36	2028	0	720	720	21,263	1.0000	720	21,263
37	2029	0	720	720	21,263	1.0000	720	21,263
38	2030	0	720	720	21,263	1.0000	720	21,263
39	2031	0	720	720	21,263	1.0000	720	21,263
40	2032	0	720	720	21,263	1.0000	720	21,263
41	2033	0	720	720	21,263	1.0000	720	21,263
42	2034	0	720	720	21,263	1.0000	720	21,263
43	2035	0	720	720	21,263	1.0000	720	21,263
44	2036	0	720	720	21,263	1.0000	720	21,263
45	2037	0	720	720	21,263	1.0000	720	21,263
46	2038	0	720	720	21,263	1.0000	720	21,263
47	2039	0	720	720	21,263	1.0000	720	21,263
48	2040	0	720	720	21,263	1.0000	720	21,263
49	2041	0	720	720	21,263	1.0000	720	21,263
50	2042	0	720	720	21,263	1.0000	720	21,263
Total (Lp)		103,234	30,960	134,194	880,312		134,194	880,312
(US \$)		51,617	15,480	67,097	440,156		67,097	440,156

B/C = 6.56  
 B-C = 746,118  
 FIRR = 0.00 %

Table H.1-20 FIRR Cash Flow of Cost and Benefit  
(2 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8696	0	0
3	1995	1,459	0	1,459	0	0.7563	1,103	0
4	1996	1,575	0	1,575	0	0.6577	1,036	0
5	1997	7,129	0	7,129	0	0.5720	4,077	0
6	1998	36,931	0	36,931	0	0.4974	18,369	0
7	1999	31,010	0	31,010	0	0.4326	13,419	0
8	2000	25,130	720	25,850	4,698	0.3762	9,724	1,767
9	2001	0	720	720	9,791	0.3271	236	3,203
10	2002	0	720	720	15,303	0.2845	205	4,353
11	2003	0	720	720	21,263	0.2474	178	5,260
12	2004	0	720	720	21,263	0.2151	155	4,575
13	2005	0	720	720	21,263	0.1871	135	3,978
14	2006	0	720	720	21,263	0.1627	117	3,460
15	2007	0	720	720	21,263	0.1415	102	3,009
16	2008	0	720	720	21,263	0.1231	89	2,616
17	2009	0	720	720	21,263	0.1070	77	2,275
18	2010	0	720	720	21,263	0.0931	67	1,979
19	2011	0	720	720	21,263	0.0809	58	1,721
20	2012	0	720	720	21,263	0.0704	51	1,496
21	2013	0	720	720	21,263	0.0612	44	1,301
22	2014	0	720	720	21,263	0.0532	38	1,132
23	2015	0	720	720	21,263	0.0463	33	984
24	2016	0	720	720	21,263	0.0403	29	856
25	2017	0	720	720	21,263	0.0350	25	744
26	2018	0	720	720	21,263	0.0304	22	647
27	2019	0	720	720	21,263	0.0265	19	563
28	2020	0	720	720	21,263	0.0230	17	490
29	2021	0	720	720	21,263	0.0200	14	426
30	2022	0	720	720	21,263	0.0174	13	370
31	2023	0	720	720	21,263	0.0151	11	322
32	2024	0	720	720	21,263	0.0132	9	280
33	2025	0	720	720	21,263	0.0115	8	243
34	2026	0	720	720	21,263	0.0100	7	212
35	2027	0	720	720	21,263	0.0087	6	184
36	2028	0	720	720	21,263	0.0075	5	160
37	2029	0	720	720	21,263	0.0065	5	139
38	2030	0	720	720	21,263	0.0057	4	121
39	2031	0	720	720	21,263	0.0050	4	105
40	2032	0	720	720	21,263	0.0043	3	92
41	2033	0	720	720	21,263	0.0037	3	80
42	2034	0	720	720	21,263	0.0033	2	69
43	2035	0	720	720	21,263	0.0028	2	60
44	2036	0	720	720	21,263	0.0025	2	52
45	2037	0	720	720	21,263	0.0021	2	46
46	2038	0	720	720	21,263	0.0019	1	40
47	2039	0	720	720	21,263	0.0016	1	34
48	2040	0	720	720	21,263	0.0014	1	30
49	2041	0	720	720	21,263	0.0012	1	26
50	2042	0	720	720	21,263	0.0011	1	23
Total (Lp)		103,234	30,960	134,194	880,312		49,525	49,525
(US \$)		51,617	15,480	67,097	440,156		24,762	24,763

B/C = 1.00  
 B-C = 0  
 FIRR = 14.99 %

Table H.1-21 FIRR Cash Flow of Cost and Benefit  
(5 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8698	0	0
3	1995	0	0	0	0	0.7565	0	0
4	1996	0	0	0	0	0.6580	0	0
5	1997	0	0	0	0	0.5723	0	0
6	1998	1,459	0	1,459	0	0.4978	726	0
7	1999	1,575	0	1,575	0	0.4330	682	0
8	2000	7,129	0	7,129	0	0.3766	2,685	0
9	2001	36,931	0	36,931	0	0.3276	12,097	0
10	2002	31,010	0	31,010	0	0.2849	8,835	0
11	2003	25,130	720	25,850	4,698	0.2478	6,406	1,164
12	2004	0	720	720	9,791	0.2155	155	2,110
13	2005	0	720	720	15,303	0.1875	135	2,869
14	2006	0	720	720	21,263	0.1631	117	3,467
15	2007	0	720	720	21,263	0.1418	102	3,016
16	2008	0	720	720	21,263	0.1234	89	2,623
17	2009	0	720	720	21,263	0.1073	77	2,281
18	2010	0	720	720	21,263	0.0933	67	1,984
19	2011	0	720	720	21,263	0.0812	58	1,726
20	2012	0	720	720	21,263	0.0706	51	1,501
21	2013	0	720	720	21,263	0.0614	44	1,306
22	2014	0	720	720	21,263	0.0534	38	1,136
23	2015	0	720	720	21,263	0.0465	33	988
24	2016	0	720	720	21,263	0.0404	29	859
25	2017	0	720	720	21,263	0.0351	25	747
26	2018	0	720	720	21,263	0.0306	22	650
27	2019	0	720	720	21,263	0.0266	19	565
28	2020	0	720	720	21,263	0.0231	17	492
29	2021	0	720	720	21,263	0.0201	14	428
30	2022	0	720	720	21,263	0.0175	13	372
31	2023	0	720	720	21,263	0.0152	11	324
32	2024	0	720	720	21,263	0.0132	10	281
33	2025	0	720	720	21,263	0.0115	8	245
34	2026	0	720	720	21,263	0.0100	7	213
35	2027	0	720	720	21,263	0.0087	6	185
36	2028	0	720	720	21,263	0.0076	5	161
37	2029	0	720	720	21,263	0.0066	5	140
38	2030	0	720	720	21,263	0.0057	4	122
39	2031	0	720	720	21,263	0.0050	4	106
40	2032	0	720	720	21,263	0.0043	3	92
41	2033	0	720	720	21,263	0.0038	3	80
42	2034	0	720	720	21,263	0.0033	2	70
43	2035	0	720	720	21,263	0.0029	2	61
44	2036	0	720	720	21,263	0.0025	2	53
45	2037	0	720	720	21,263	0.0022	2	46
46	2038	0	720	720	21,263	0.0019	1	40
47	2039	0	720	720	21,263	0.0016	1	35
48	2040	0	720	720	21,263	0.0014	1	30
49	2041	0	720	720	21,263	0.0012	1	26
50	2042	0	720	720	21,263	0.0011	1	23
Total (Lp)		103,234	28,800	132,034	816,523		32,618	32,617
(US \$)		51,617	14,400	66,017	408,262		16,309	16,309

B/C = 1.00  
 B-C = 0  
 FIRR = 14.97 %

Table H.1-22 FIRR Cash Flow of Cost and Benefit  
(5 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8929	0	0
3	1995	0	0	0	0	0.7972	0	0
4	1996	0	0	0	0	0.7118	0	0
5	1997	0	0	0	0	0.6355	0	0
6	1998	1,459	0	1,459	0	0.5674	828	0
7	1999	1,575	0	1,575	0	0.5066	798	0
8	2000	7,129	0	7,129	0	0.4523	3,225	0
9	2001	36,931	0	36,931	0	0.4039	14,916	0
10	2002	31,010	0	31,010	0	0.3606	11,183	0
11	2003	25,130	720	25,850	4,698	0.3220	8,323	1,513
12	2004	0	720	720	9,791	0.2875	207	2,815
13	2005	0	720	720	15,303	0.2567	185	3,928
14	2006	0	720	720	21,263	0.2292	165	4,873
15	2007	0	720	720	21,263	0.2046	147	4,351
16	2008	0	720	720	21,263	0.1827	132	3,885
17	2009	0	720	720	21,263	0.1631	117	3,468
18	2010	0	720	720	21,263	0.1456	105	3,097
19	2011	0	720	720	21,263	0.1300	94	2,765
20	2012	0	720	720	21,263	0.1161	84	2,469
21	2013	0	720	720	21,263	0.1037	75	2,204
22	2014	0	720	720	21,263	0.0926	67	1,968
23	2015	0	720	720	21,263	0.0826	60	1,757
24	2016	0	720	720	21,263	0.0738	53	1,569
25	2017	0	720	720	21,263	0.0659	47	1,401
26	2018	0	720	720	21,263	0.0588	42	1,251
27	2019	0	720	720	21,263	0.0525	38	1,117
28	2020	0	720	720	21,263	0.0469	34	997
29	2021	0	720	720	21,263	0.0419	30	890
30	2022	0	720	720	21,263	0.0374	27	795
31	2023	0	720	720	21,263	0.0334	24	710
32	2024	0	720	720	21,263	0.0298	21	634
33	2025	0	720	720	21,263	0.0266	19	566
34	2026	0	720	720	21,263	0.0238	17	505
35	2027	0	720	720	21,263	0.0212	15	451
36	2028	0	720	720	21,263	0.0189	14	403
37	2029	0	720	720	21,263	0.0169	12	360
38	2030	0	720	720	21,263	0.0151	11	321
39	2031	0	720	720	21,263	0.0135	10	287
40	2032	0	720	720	21,263	0.0120	9	256
41	2033	0	720	720	21,263	0.0107	8	229
42	2034	0	720	720	21,263	0.0096	7	204
43	2035	0	720	720	21,263	0.0086	6	182
44	2036	0	720	720	21,263	0.0076	6	163
45	2037	0	720	720	21,263	0.0068	5	145
46	2038	0	720	720	21,263	0.0061	4	130
47	2039	0	720	720	21,263	0.0054	4	116
48	2040	0	720	720	21,263	0.0049	4	103
49	2041	0	720	720	21,263	0.0043	3	92
50	2042	0	720	720	21,263	0.0039	3	82
Total (Lp)		103,234	28,800	132,034	816,523		41,181	53,049
(US \$)		51,617	14,400	66,017	408,262		20,590	26,525

B/C = 1.29  
 B-C = 11,868  
 FIRR = 12.00 %



Table H.1-23 FIRR Cash Flow of Cost and Benefit

(5 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	1.0000	0	0
3	1995	0	0	0	0	1.0000	0	0
4	1996	0	0	0	0	1.0000	0	0
5	1997	0	0	0	0	1.0000	0	0
6	1998	1,459	0	1,459	0	1.0000	1,459	0
7	1999	1,575	0	1,575	0	1.0000	1,575	0
8	2000	7,129	0	7,129	0	1.0000	7,129	0
9	2001	36,931	0	36,931	0	1.0000	36,931	0
10	2002	31,010	0	31,010	0	1.0000	31,010	0
11	2003	25,130	720	25,850	4,698	1.0000	25,850	4,698
12	2004	0	720	720	9,791	1.0000	720	9,791
13	2005	0	720	720	15,303	1.0000	720	15,303
14	2006	0	720	720	21,263	1.0000	720	21,263
15	2007	0	720	720	21,263	1.0000	720	21,263
16	2008	0	720	720	21,263	1.0000	720	21,263
17	2009	0	720	720	21,263	1.0000	720	21,263
18	2010	0	720	720	21,263	1.0000	720	21,263
19	2011	0	720	720	21,263	1.0000	720	21,263
20	2012	0	720	720	21,263	1.0000	720	21,263
21	2013	0	720	720	21,263	1.0000	720	21,263
22	2014	0	720	720	21,263	1.0000	720	21,263
23	2015	0	720	720	21,263	1.0000	720	21,263
24	2016	0	720	720	21,263	1.0000	720	21,263
25	2017	0	720	720	21,263	1.0000	720	21,263
26	2018	0	720	720	21,263	1.0000	720	21,263
27	2019	0	720	720	21,263	1.0000	720	21,263
28	2020	0	720	720	21,263	1.0000	720	21,263
29	2021	0	720	720	21,263	1.0000	720	21,263
30	2022	0	720	720	21,263	1.0000	720	21,263
31	2023	0	720	720	21,263	1.0000	720	21,263
32	2024	0	720	720	21,263	1.0000	720	21,263
33	2025	0	720	720	21,263	1.0000	720	21,263
34	2026	0	720	720	21,263	1.0000	720	21,263
35	2027	0	720	720	21,263	1.0000	720	21,263
36	2028	0	720	720	21,263	1.0000	720	21,263
37	2029	0	720	720	21,263	1.0000	720	21,263
38	2030	0	720	720	21,263	1.0000	720	21,263
39	2031	0	720	720	21,263	1.0000	720	21,263
40	2032	0	720	720	21,263	1.0000	720	21,263
41	2033	0	720	720	21,263	1.0000	720	21,263
42	2034	0	720	720	21,263	1.0000	720	21,263
43	2035	0	720	720	21,263	1.0000	720	21,263
44	2036	0	720	720	21,263	1.0000	720	21,263
45	2037	0	720	720	21,263	1.0000	720	21,263
46	2038	0	720	720	21,263	1.0000	720	21,263
47	2039	0	720	720	21,263	1.0000	720	21,263
48	2040	0	720	720	21,263	1.0000	720	21,263
49	2041	0	720	720	21,263	1.0000	720	21,263
50	2042	0	720	720	21,263	1.0000	720	21,263
Total (Lp)		103,234	28,800	132,034	816,523		132,034	816,523
(US \$)		51,617	14,400	66,017	408,262		66,017	408,262

B/C = 6.18  
 B-C = 684,489  
 FIRR = 0.00 %

Table H.1-24 FIRR Cash Flow of Cost and Benefit  
(30 % of Cost Hike and 20 % Decrease in Benefit)

		Cost			Benefit	Discount Rate	Present Value	
No.	Year	Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,897	0	1,897	0	1.0000	1,897	0
2	1994	2,048	0	2,048	0	0.9113	1,866	0
3	1995	9,268	0	9,268	0	0.8305	7,697	0
4	1996	48,010	0	48,010	0	0.7569	36,339	0
5	1997	40,313	0	40,313	0	0.6898	27,808	0
6	1998	32,669	936	33,605	3,758	0.6286	21,125	2,362
7	1999	0	936	936	7,833	0.5729	536	4,487
8	2000	0	936	936	12,242	0.5221	489	6,392
9	2001	0	936	936	17,010	0.4758	445	8,094
10	2002	0	936	936	17,010	0.4336	406	7,376
11	2003	0	936	936	17,010	0.3952	370	6,722
12	2004	0	936	936	17,010	0.3601	337	6,126
13	2005	0	936	936	17,010	0.3282	307	5,583
14	2006	0	936	936	17,010	0.2991	280	5,088
15	2007	0	936	936	17,010	0.2726	255	4,637
16	2008	0	936	936	17,010	0.2484	233	4,226
17	2009	0	936	936	17,010	0.2264	212	3,851
18	2010	0	936	936	17,010	0.2063	193	3,510
19	2011	0	936	936	17,010	0.1880	176	3,198
20	2012	0	936	936	17,010	0.1714	160	2,915
21	2013	0	936	936	17,010	0.1562	146	2,656
22	2014	0	936	936	17,010	0.1423	133	2,421
23	2015	0	936	936	17,010	0.1297	121	2,206
24	2016	0	936	936	17,010	0.1182	111	2,011
25	2017	0	936	936	17,010	0.1077	101	1,832
26	2018	0	936	936	17,010	0.0982	92	1,670
27	2019	0	936	936	17,010	0.0895	84	1,522
28	2020	0	936	936	17,010	0.0815	76	1,387
29	2021	0	936	936	17,010	0.0743	70	1,264
30	2022	0	936	936	17,010	0.0677	63	1,152
31	2023	0	936	936	17,010	0.0617	58	1,050
32	2024	0	936	936	17,010	0.0562	53	957
33	2025	0	936	936	17,010	0.0513	48	872
34	2026	0	936	936	17,010	0.0467	44	795
35	2027	0	936	936	17,010	0.0426	40	724
36	2028	0	936	936	17,010	0.0388	36	660
37	2029	0	936	936	17,010	0.0354	33	601
38	2030	0	936	936	17,010	0.0322	30	548
39	2031	0	936	936	17,010	0.0294	27	499
40	2032	0	936	936	17,010	0.0268	25	455
41	2033	0	936	936	17,010	0.0244	23	415
42	2034	0	936	936	17,010	0.0222	21	378
43	2035	0	936	936	17,010	0.0203	19	345
44	2036	0	936	936	17,010	0.0185	17	314
45	2037	0	936	936	17,010	0.0168	16	286
46	2038	0	936	936	17,010	0.0153	14	261
47	2039	0	936	936	17,010	0.0140	13	238
48	2040	0	936	936	17,010	0.0127	12	217
49	2041	0	936	936	17,010	0.0116	11	197
50	2042	0	936	936	17,010	0.0106	10	180
Total (Lp)		134,205	42,120	176,325	738,253		102,679	102,678
(US \$)		67,103	21,060	88,163	369,127		51,339	51,339

B/C = 1.00  
 B-C = 0  
 FIRR = 9.73 %

Table H.1-25 FIRR Cash Flow of Cost and Benefit  
(30 % of Cost Hike and 20 % Decrease in Benefit)

		Cost			Discount		Present Value	
No.	Year	Const. Cost	O & M Cost	Total	Benefit	Rate	Cost	Benefit
1	1993	1,897	0	1,897	0	1.0000	1,897	0
2	1994	2,048	0	2,048	0	0.8929	1,829	0
3	1995	9,268	0	9,268	0	0.7972	7,388	0
4	1996	48,010	0	48,010	0	0.7118	34,173	0
5	1997	40,313	0	40,313	0	0.6355	25,620	0
6	1998	32,669	936	33,605	3,758	0.5674	19,068	2,132
7	1999	0	936	936	7,833	0.5066	474	3,968
8	2000	0	936	936	12,242	0.4523	423	5,538
9	2001	0	936	936	17,010	0.4039	378	6,870
10	2002	0	936	936	17,010	0.3606	338	6,134
11	2003	0	936	936	17,010	0.3220	301	5,477
12	2004	0	936	936	17,010	0.2875	269	4,890
13	2005	0	936	936	17,010	0.2567	240	4,366
14	2006	0	936	936	17,010	0.2292	215	3,898
15	2007	0	936	936	17,010	0.2046	192	3,481
16	2008	0	936	936	17,010	0.1827	171	3,108
17	2009	0	936	936	17,010	0.1631	153	2,775
18	2010	0	936	936	17,010	0.1456	136	2,477
19	2011	0	936	936	17,010	0.1300	122	2,212
20	2012	0	936	936	17,010	0.1161	109	1,975
21	2013	0	936	936	17,010	0.1037	97	1,763
22	2014	0	936	936	17,010	0.0926	87	1,574
23	2015	0	936	936	17,010	0.0826	77	1,406
24	2016	0	936	936	17,010	0.0738	69	1,255
25	2017	0	936	936	17,010	0.0659	62	1,121
26	2018	0	936	936	17,010	0.0588	55	1,001
27	2019	0	936	936	17,010	0.0525	49	893
28	2020	0	936	936	17,010	0.0469	44	798
29	2021	0	936	936	17,010	0.0419	39	712
30	2022	0	936	936	17,010	0.0374	35	636
31	2023	0	936	936	17,010	0.0334	31	568
32	2024	0	936	936	17,010	0.0298	28	507
33	2025	0	936	936	17,010	0.0266	25	453
34	2026	0	936	936	17,010	0.0238	22	404
35	2027	0	936	936	17,010	0.0212	20	361
36	2028	0	936	936	17,010	0.0189	18	322
37	2029	0	936	936	17,010	0.0169	16	288
38	2030	0	936	936	17,010	0.0151	14	257
39	2031	0	936	936	17,010	0.0135	13	229
40	2032	0	936	936	17,010	0.0120	11	205
41	2033	0	936	936	17,010	0.0107	10	183
42	2034	0	936	936	17,010	0.0096	9	163
43	2035	0	936	936	17,010	0.0086	8	146
44	2036	0	936	936	17,010	0.0076	7	130
45	2037	0	936	936	17,010	0.0068	6	116
46	2038	0	936	936	17,010	0.0061	6	104
47	2039	0	936	936	17,010	0.0054	5	93
48	2040	0	936	936	17,010	0.0049	5	83
49	2041	0	936	936	17,010	0.0043	4	74
50	2042	0	936	936	17,010	0.0039	4	66
Total (Lp)		134,205	42,120	176,325	738,253		94,370	75,210
(US \$)		67,103	21,060	88,163	369,127		47,185	37,605

B/C = 0.80  
B-C = -19,160  
FIRR = 12.00 %

Table H.1-26 FIRR Cash Flow of Cost and Benefit  
 (30 % of Cost Hike and 20 % Decrease in Benefit)  
 (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,897	0	1,897	0	1.0000	1,897	0
2	1994	2,048	0	2,048	0	1.0000	2,048	0
3	1995	9,268	0	9,268	0	1.0000	9,268	0
4	1996	48,010	0	48,010	0	1.0000	48,010	0
5	1997	40,313	0	40,313	0	1.0000	40,313	0
6	1998	32,669	936	33,605	3,758	1.0000	33,605	3,758
7	1999	0	936	936	7,833	1.0000	936	7,833
8	2000	0	936	936	12,242	1.0000	936	12,242
9	2001	0	936	936	17,010	1.0000	936	17,010
10	2002	0	936	936	17,010	1.0000	936	17,010
11	2003	0	936	936	17,010	1.0000	936	17,010
12	2004	0	936	936	17,010	1.0000	936	17,010
13	2005	0	936	936	17,010	1.0000	936	17,010
14	2006	0	936	936	17,010	1.0000	936	17,010
15	2007	0	936	936	17,010	1.0000	936	17,010
16	2008	0	936	936	17,010	1.0000	936	17,010
17	2009	0	936	936	17,010	1.0000	936	17,010
18	2010	0	936	936	17,010	1.0000	936	17,010
19	2011	0	936	936	17,010	1.0000	936	17,010
20	2012	0	936	936	17,010	1.0000	936	17,010
21	2013	0	936	936	17,010	1.0000	936	17,010
22	2014	0	936	936	17,010	1.0000	936	17,010
23	2015	0	936	936	17,010	1.0000	936	17,010
24	2016	0	936	936	17,010	1.0000	936	17,010
25	2017	0	936	936	17,010	1.0000	936	17,010
26	2018	0	936	936	17,010	1.0000	936	17,010
27	2019	0	936	936	17,010	1.0000	936	17,010
28	2020	0	936	936	17,010	1.0000	936	17,010
29	2021	0	936	936	17,010	1.0000	936	17,010
30	2022	0	936	936	17,010	1.0000	936	17,010
31	2023	0	936	936	17,010	1.0000	936	17,010
32	2024	0	936	936	17,010	1.0000	936	17,010
33	2025	0	936	936	17,010	1.0000	936	17,010
34	2026	0	936	936	17,010	1.0000	936	17,010
35	2027	0	936	936	17,010	1.0000	936	17,010
36	2028	0	936	936	17,010	1.0000	936	17,010
37	2029	0	936	936	17,010	1.0000	936	17,010
38	2030	0	936	936	17,010	1.0000	936	17,010
39	2031	0	936	936	17,010	1.0000	936	17,010
40	2032	0	936	936	17,010	1.0000	936	17,010
41	2033	0	936	936	17,010	1.0000	936	17,010
42	2034	0	936	936	17,010	1.0000	936	17,010
43	2035	0	936	936	17,010	1.0000	936	17,010
44	2036	0	936	936	17,010	1.0000	936	17,010
45	2037	0	936	936	17,010	1.0000	936	17,010
46	2038	0	936	936	17,010	1.0000	936	17,010
47	2039	0	936	936	17,010	1.0000	936	17,010
48	2040	0	936	936	17,010	1.0000	936	17,010
49	2041	0	936	936	17,010	1.0000	936	17,010
50	2042	0	936	936	17,010	1.0000	936	17,010
Total (lp)		134,205	42,120	176,325	738,253		176,325	738,253
(US \$)		67,103	21,060	88,163	369,127		88,163	369,127

B/C = 4.19  
 B-C = 561.928  
 FIRR = 0.00 %

Table H.1-27 EIRR Cash Flow of Cost and Benefit (Base Case)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.8642	912	0
3	1995	3,974	0	3,974	0	0.7469	2,968	0
4	1996	24,972	0	24,972	0	0.6455	16,118	0
5	1997	17,793	0	17,793	0	0.5578	9,925	0
6	1998	14,178	412	14,590	3,396	0.4821	7,034	1,637
7	1999	0	412	412	6,792	0.4166	172	2,830
8	2000	0	412	412	10,188	0.3601	148	3,668
9	2001	0	412	412	13,584	0.3112	128	4,227
10	2002	0	412	412	13,584	0.2689	111	3,653
11	2003	0	412	412	13,584	0.2324	96	3,157
12	2004	0	412	412	13,584	0.2008	83	2,728
13	2005	0	412	412	13,584	0.1736	72	2,358
14	2006	0	412	412	13,584	0.1500	62	2,038
15	2007	0	412	412	13,584	0.1296	53	1,761
16	2008	0	412	412	13,584	0.1120	46	1,522
17	2009	0	412	412	13,584	0.0968	40	1,315
18	2010	0	412	412	13,584	0.0837	34	1,137
19	2011	0	412	412	13,584	0.0723	30	982
20	2012	0	412	412	13,584	0.0625	26	849
21	2013	0	412	412	13,584	0.0540	22	734
22	2014	0	412	412	13,584	0.0467	19	634
23	2015	0	412	412	13,584	0.0403	17	548
24	2016	0	412	412	13,584	0.0349	14	474
25	2017	0	412	412	13,584	0.0301	12	409
26	2018	0	412	412	13,584	0.0260	11	354
27	2019	0	412	412	13,584	0.0225	9	306
28	2020	0	412	412	13,584	0.0194	8	264
29	2021	0	412	412	13,584	0.0168	7	228
30	2022	0	412	412	13,584	0.0145	6	197
31	2023	0	412	412	13,584	0.0126	5	171
32	2024	0	412	412	13,584	0.0108	4	147
33	2025	0	412	412	13,584	0.0094	4	127
34	2026	0	412	412	13,584	0.0081	3	110
35	2027	0	412	412	13,584	0.0070	3	95
36	2028	0	412	412	13,584	0.0061	2	82
37	2029	0	412	412	13,584	0.0052	2	71
38	2030	0	412	412	13,584	0.0045	2	61
39	2031	0	412	412	13,584	0.0039	2	53
40	2032	0	412	412	13,584	0.0034	1	46
41	2033	0	412	412	13,584	0.0029	1	40
42	2034	0	412	412	13,584	0.0025	1	34
43	2035	0	412	412	13,584	0.0022	1	30
44	2036	0	412	412	13,584	0.0019	1	26
45	2037	0	412	412	13,584	0.0016	1	22
46	2038	0	412	412	13,584	0.0014	1	19
47	2039	0	412	412	13,584	0.0012	1	17
48	2040	0	412	412	13,584	0.0011	0	14
49	2041	0	412	412	13,584	0.0009	0	12
50	2042	0	412	412	13,584	0.0008	0	11
Total (Lp)		62,950	18,540	81,490	590,904		39,197	39,197
(US \$)		31,475	9,270	40,745	295,452		19,599	19,598

B/C = 1.00  
 B-C = 0  
 EIRR = 15.71 %

Table H.1-28 EIRR Cash Flow of Cost and Benefit (Base Case)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.8929	942	0
3	1995	3,974	0	3,974	0	0.7972	3,168	0
4	1996	24,972	0	24,972	0	0.7118	17,775	0
5	1997	17,793	0	17,793	0	0.6355	11,308	0
6	1998	14,178	412	14,590	3,396	0.5674	8,279	1,927
7	1999	0	412	412	6,792	0.5066	209	3,441
8	2000	0	412	412	10,188	0.4523	186	4,609
9	2001	0	412	412	13,584	0.4039	166	5,486
10	2002	0	412	412	13,584	0.3606	149	4,899
11	2003	0	412	412	13,584	0.3220	133	4,374
12	2004	0	412	412	13,584	0.2875	118	3,905
13	2005	0	412	412	13,584	0.2567	106	3,487
14	2006	0	412	412	13,584	0.2292	94	3,113
15	2007	0	412	412	13,584	0.2046	84	2,780
16	2008	0	412	412	13,584	0.1827	75	2,482
17	2009	0	412	412	13,584	0.1631	67	2,216
18	2010	0	412	412	13,584	0.1456	60	1,978
19	2011	0	412	412	13,584	0.1300	54	1,766
20	2012	0	412	412	13,584	0.1161	48	1,577
21	2013	0	412	412	13,584	0.1037	43	1,408
22	2014	0	412	412	13,584	0.0926	38	1,257
23	2015	0	412	412	13,584	0.0826	34	1,123
24	2016	0	412	412	13,584	0.0738	30	1,002
25	2017	0	412	412	13,584	0.0659	27	895
26	2018	0	412	412	13,584	0.0588	24	799
27	2019	0	412	412	13,584	0.0525	22	713
28	2020	0	412	412	13,584	0.0469	19	637
29	2021	0	412	412	13,584	0.0419	17	569
30	2022	0	412	412	13,584	0.0374	15	508
31	2023	0	412	412	13,584	0.0334	14	453
32	2024	0	412	412	13,584	0.0298	12	405
33	2025	0	412	412	13,584	0.0266	11	361
34	2026	0	412	412	13,584	0.0238	10	323
35	2027	0	412	412	13,584	0.0212	9	288
36	2028	0	412	412	13,584	0.0189	8	257
37	2029	0	412	412	13,584	0.0169	7	230
38	2030	0	412	412	13,584	0.0151	6	205
39	2031	0	412	412	13,584	0.0135	6	183
40	2032	0	412	412	13,584	0.0120	5	164
41	2033	0	412	412	13,584	0.0107	4	146
42	2034	0	412	412	13,584	0.0096	4	130
43	2035	0	412	412	13,584	0.0086	4	116
44	2036	0	412	412	13,584	0.0076	3	104
45	2037	0	412	412	13,584	0.0068	3	93
46	2038	0	412	412	13,584	0.0061	3	83
47	2039	0	412	412	13,584	0.0054	2	74
48	2040	0	412	412	13,584	0.0049	2	66
49	2041	0	412	412	13,584	0.0043	2	59
50	2042	0	412	412	13,584	0.0039	2	53
Total (Lp)		62,950	18,540	81,490	590,904		44,384	60,744
(US \$)		31,475	9,270	40,745	295,452		22,192	30,372

B/C = 1.37  
 B-C = 16,359  
 EIRR = 12.00 %

Table H.1-29 EIRR Cash Flow of Cost and Benefit (Base Case)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	1.0000	1,055	0
3	1995	3,974	0	3,974	0	1.0000	3,974	0
4	1996	24,972	0	24,972	0	1.0000	24,972	0
5	1997	17,793	0	17,793	0	1.0000	17,793	0
6	1998	14,178	412	14,590	3,396	1.0000	14,590	3,396
7	1999	0	412	412	6,792	1.0000	412	6,792
8	2000	0	412	412	10,188	1.0000	412	10,188
9	2001	0	412	412	13,584	1.0000	412	13,584
10	2002	0	412	412	13,584	1.0000	412	13,584
11	2003	0	412	412	13,584	1.0000	412	13,584
12	2004	0	412	412	13,584	1.0000	412	13,584
13	2005	0	412	412	13,584	1.0000	412	13,584
14	2006	0	412	412	13,584	1.0000	412	13,584
15	2007	0	412	412	13,584	1.0000	412	13,584
16	2008	0	412	412	13,584	1.0000	412	13,584
17	2009	0	412	412	13,584	1.0000	412	13,584
18	2010	0	412	412	13,584	1.0000	412	13,584
19	2011	0	412	412	13,584	1.0000	412	13,584
20	2012	0	412	412	13,584	1.0000	412	13,584
21	2013	0	412	412	13,584	1.0000	412	13,584
22	2014	0	412	412	13,584	1.0000	412	13,584
23	2015	0	412	412	13,584	1.0000	412	13,584
24	2016	0	412	412	13,584	1.0000	412	13,584
25	2017	0	412	412	13,584	1.0000	412	13,584
26	2018	0	412	412	13,584	1.0000	412	13,584
27	2019	0	412	412	13,584	1.0000	412	13,584
28	2020	0	412	412	13,584	1.0000	412	13,584
29	2021	0	412	412	13,584	1.0000	412	13,584
30	2022	0	412	412	13,584	1.0000	412	13,584
31	2023	0	412	412	13,584	1.0000	412	13,584
32	2024	0	412	412	13,584	1.0000	412	13,584
33	2025	0	412	412	13,584	1.0000	412	13,584
34	2026	0	412	412	13,584	1.0000	412	13,584
35	2027	0	412	412	13,584	1.0000	412	13,584
36	2028	0	412	412	13,584	1.0000	412	13,584
37	2029	0	412	412	13,584	1.0000	412	13,584
38	2030	0	412	412	13,584	1.0000	412	13,584
39	2031	0	412	412	13,584	1.0000	412	13,584
40	2032	0	412	412	13,584	1.0000	412	13,584
41	2033	0	412	412	13,584	1.0000	412	13,584
42	2034	0	412	412	13,584	1.0000	412	13,584
43	2035	0	412	412	13,584	1.0000	412	13,584
44	2036	0	412	412	13,584	1.0000	412	13,584
45	2037	0	412	412	13,584	1.0000	412	13,584
46	2038	0	412	412	13,584	1.0000	412	13,584
47	2039	0	412	412	13,584	1.0000	412	13,584
48	2040	0	412	412	13,584	1.0000	412	13,584
49	2041	0	412	412	13,584	1.0000	412	13,584
50	2042	0	412	412	13,584	1.0000	412	13,584
Total (Lp)		62,950	18,540	81,490	590,904		81,490	590,904
(US \$)		31,475	9,270	40,745	295,452		40,745	295,452

B/C = 7.25  
 B-C = 509,414  
 EIRR = 0.00 %

Table H.1-30 EIRR Cash Flow of Cost and Benefit  
(5 years Delay in Benefit Accrual) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.9077	958	0
3	1995	3,974	0	3,974	0	0.8239	3,274	0
4	1996	24,972	0	24,972	0	0.7478	18,674	0
5	1997	17,793	0	17,793	0	0.6787	12,077	0
6	1998	14,178	412	14,590	0	0.6161	8,988	0
7	1999	0	412	412	0	0.5592	230	0
8	2000	0	412	412	0	0.5075	209	0
9	2001	0	412	412	0	0.4607	190	0
10	2002	0	412	412	0	0.4181	172	0
11	2003	0	412	412	3,396	0.3795	156	1,289
12	2004	0	412	412	6,792	0.3445	142	2,340
13	2005	0	412	412	10,188	0.3127	129	3,186
14	2006	0	412	412	13,584	0.2838	117	3,855
15	2007	0	412	412	13,584	0.2576	106	3,499
16	2008	0	412	412	13,584	0.2338	96	3,176
17	2009	0	412	412	13,584	0.2122	87	2,883
18	2010	0	412	412	13,584	0.1926	79	2,617
19	2011	0	412	412	13,584	0.1748	72	2,375
20	2012	0	412	412	13,584	0.1587	65	2,156
21	2013	0	412	412	13,584	0.1440	59	1,957
22	2014	0	412	412	13,584	0.1307	54	1,776
23	2015	0	412	412	13,584	0.1187	49	1,612
24	2016	0	412	412	13,584	0.1077	44	1,463
25	2017	0	412	412	13,584	0.0978	40	1,328
26	2018	0	412	412	13,584	0.0887	37	1,205
27	2019	0	412	412	13,584	0.0805	33	1,094
28	2020	0	412	412	13,584	0.0731	30	993
29	2021	0	412	412	13,584	0.0664	27	901
30	2022	0	412	412	13,584	0.0602	25	818
31	2023	0	412	412	13,584	0.0547	23	743
32	2024	0	412	412	13,584	0.0496	20	674
33	2025	0	412	412	13,584	0.0450	19	612
34	2026	0	412	412	13,584	0.0409	17	555
35	2027	0	412	412	13,584	0.0371	15	504
36	2028	0	412	412	13,584	0.0337	14	458
37	2029	0	412	412	13,584	0.0306	13	415
38	2030	0	412	412	13,584	0.0277	11	377
39	2031	0	412	412	13,584	0.0252	10	342
40	2032	0	412	412	13,584	0.0229	9	311
41	2033	0	412	412	13,584	0.0207	9	282
42	2034	0	412	412	13,584	0.0188	8	256
43	2035	0	412	412	13,584	0.0171	7	232
44	2036	0	412	412	13,584	0.0155	6	211
45	2037	0	412	412	13,584	0.0141	6	191
46	2038	0	412	412	13,584	0.0128	5	174
47	2039	0	412	412	13,584	0.0116	5	158
48	2040	0	412	412	13,584	0.0105	4	143
49	2041	0	412	412	13,584	0.0096	4	130
50	2042	0	412	412	13,584	0.0087	4	118
Total (Lp)		62,950	18,540	81,490	522,984		47,408	47,408
(US \$)		31,475	9,270	40,745	261,492		23,704	23,704

B/C = 1.00  
B-C = 0  
EIRR = 10.17 %



Table H.1-31 EIRR Cash Flow of Cost and Benefit  
(5 years Delay in Benefit Accrual) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.8929	942	0
3	1995	3,974	0	3,974	0	0.7972	3,168	0
4	1996	24,972	0	24,972	0	0.7118	17,775	0
5	1997	17,793	0	17,793	0	0.6355	11,308	0
6	1998	14,178	412	14,590	0	0.5674	8,279	0
7	1999	0	412	412	0	0.5066	209	0
8	2000	0	412	412	0	0.4523	186	0
9	2001	0	412	412	0	0.4039	166	0
10	2002	0	412	412	0	0.3606	149	0
11	2003	0	412	412	3,396	0.3220	133	1,093
12	2004	0	412	412	6,792	0.2875	118	1,953
13	2005	0	412	412	10,188	0.2567	106	2,615
14	2006	0	412	412	13,584	0.2292	94	3,113
15	2007	0	412	412	13,584	0.2046	84	2,780
16	2008	0	412	412	13,584	0.1827	75	2,482
17	2009	0	412	412	13,584	0.1631	67	2,216
18	2010	0	412	412	13,584	0.1456	60	1,978
19	2011	0	412	412	13,584	0.1300	54	1,766
20	2012	0	412	412	13,584	0.1161	48	1,577
21	2013	0	412	412	13,584	0.1037	43	1,408
22	2014	0	412	412	13,584	0.0926	38	1,257
23	2015	0	412	412	13,584	0.0826	34	1,123
24	2016	0	412	412	13,584	0.0738	30	1,002
25	2017	0	412	412	13,584	0.0659	27	895
26	2018	0	412	412	13,584	0.0588	24	799
27	2019	0	412	412	13,584	0.0525	22	713
28	2020	0	412	412	13,584	0.0469	19	637
29	2021	0	412	412	13,584	0.0419	17	569
30	2022	0	412	412	13,584	0.0374	15	508
31	2023	0	412	412	13,584	0.0334	14	453
32	2024	0	412	412	13,584	0.0298	12	405
33	2025	0	412	412	13,584	0.0266	11	361
34	2026	0	412	412	13,584	0.0238	10	323
35	2027	0	412	412	13,584	0.0212	9	288
36	2028	0	412	412	13,584	0.0189	8	257
37	2029	0	412	412	13,584	0.0169	7	230
38	2030	0	412	412	13,584	0.0151	6	205
39	2031	0	412	412	13,584	0.0135	6	183
40	2032	0	412	412	13,584	0.0120	5	164
41	2033	0	412	412	13,584	0.0107	4	146
42	2034	0	412	412	13,584	0.0096	4	130
43	2035	0	412	412	13,584	0.0086	4	116
44	2036	0	412	412	13,584	0.0076	3	104
45	2037	0	412	412	13,584	0.0068	3	93
46	2038	0	412	412	13,584	0.0061	3	83
47	2039	0	412	412	13,584	0.0054	2	74
48	2040	0	412	412	13,584	0.0049	2	66
49	2041	0	412	412	13,584	0.0043	2	59
50	2042	0	412	412	13,584	0.0039	2	53
Total (Lp)		62,950	18,540	81,490	522,984		44,384	34,278
(US \$)		31,475	9,270	40,745	261,492		22,192	17,139

B/C = 0.77  
 B-C = -10,106  
 EIRR = 12.00 %

Table H.1-32 EIRR Cash Flow of Cost and Benefit  
(5 years Delay in Benefit Accrual) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	1.0000	1,055	0
3	1995	3,974	0	3,974	0	1.0000	3,974	0
4	1996	24,972	0	24,972	0	1.0000	24,972	0
5	1997	17,793	0	17,793	0	1.0000	17,793	0
6	1998	14,178	412	14,590	0	1.0000	14,590	0
7	1999	0	412	412	0	1.0000	412	0
8	2000	0	412	412	0	1.0000	412	0
9	2001	0	412	412	0	1.0000	412	0
10	2002	0	412	412	0	1.0000	412	0
11	2003	0	412	412	3,396	1.0000	412	3,396
12	2004	0	412	412	6,792	1.0000	412	6,792
13	2005	0	412	412	10,188	1.0000	412	10,188
14	2006	0	412	412	13,584	1.0000	412	13,584
15	2007	0	412	412	13,584	1.0000	412	13,584
16	2008	0	412	412	13,584	1.0000	412	13,584
17	2009	0	412	412	13,584	1.0000	412	13,584
18	2010	0	412	412	13,584	1.0000	412	13,584
19	2011	0	412	412	13,584	1.0000	412	13,584
20	2012	0	412	412	13,584	1.0000	412	13,584
21	2013	0	412	412	13,584	1.0000	412	13,584
22	2014	0	412	412	13,584	1.0000	412	13,584
23	2015	0	412	412	13,584	1.0000	412	13,584
24	2016	0	412	412	13,584	1.0000	412	13,584
25	2017	0	412	412	13,584	1.0000	412	13,584
26	2018	0	412	412	13,584	1.0000	412	13,584
27	2019	0	412	412	13,584	1.0000	412	13,584
28	2020	0	412	412	13,584	1.0000	412	13,584
29	2021	0	412	412	13,584	1.0000	412	13,584
30	2022	0	412	412	13,584	1.0000	412	13,584
31	2023	0	412	412	13,584	1.0000	412	13,584
32	2024	0	412	412	13,584	1.0000	412	13,584
33	2025	0	412	412	13,584	1.0000	412	13,584
34	2026	0	412	412	13,584	1.0000	412	13,584
35	2027	0	412	412	13,584	1.0000	412	13,584
36	2028	0	412	412	13,584	1.0000	412	13,584
37	2029	0	412	412	13,584	1.0000	412	13,584
38	2030	0	412	412	13,584	1.0000	412	13,584
39	2031	0	412	412	13,584	1.0000	412	13,584
40	2032	0	412	412	13,584	1.0000	412	13,584
41	2033	0	412	412	13,584	1.0000	412	13,584
42	2034	0	412	412	13,584	1.0000	412	13,584
43	2035	0	412	412	13,584	1.0000	412	13,584
44	2036	0	412	412	13,584	1.0000	412	13,584
45	2037	0	412	412	13,584	1.0000	412	13,584
46	2038	0	412	412	13,584	1.0000	412	13,584
47	2039	0	412	412	13,584	1.0000	412	13,584
48	2040	0	412	412	13,584	1.0000	412	13,584
49	2041	0	412	412	13,584	1.0000	412	13,584
50	2042	0	412	412	13,584	1.0000	412	13,584
Total (Lp)		62,950	18,540	81,490	522,984		81,490	522,984
(US \$)		31,475	9,270	40,745	261,492		40,745	261,492

B/C = 6.42  
 B-C = 441,494  
 EIRR = 0.00 %

Table H.1-33 EIRR Cash Flow of Cost and Benefit  
(2 years Delay in Benefit Accrual) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.8866	935	0
3	1995	3,974	0	3,974	0	0.7861	3,124	0
4	1996	24,972	0	24,972	0	0.6970	17,406	0
5	1997	17,793	0	17,793	0	0.6180	10,996	0
6	1998	14,178	412	14,590	0	0.5479	7,994	0
7	1999	0	412	412	0	0.4858	200	0
8	2000	0	412	412	3,396	0.4307	177	1,463
9	2001	0	412	412	6,792	0.3819	157	2,594
10	2002	0	412	412	10,188	0.3386	140	3,450
11	2003	0	412	412	13,584	0.3002	124	4,078
12	2004	0	412	412	13,584	0.2662	110	3,616
13	2005	0	412	412	13,584	0.2360	97	3,206
14	2006	0	412	412	13,584	0.2093	86	2,843
15	2007	0	412	412	13,584	0.1855	76	2,520
16	2008	0	412	412	13,584	0.1645	68	2,235
17	2009	0	412	412	13,584	0.1459	60	1,981
18	2010	0	412	412	13,584	0.1293	53	1,757
19	2011	0	412	412	13,584	0.1147	47	1,558
20	2012	0	412	412	13,584	0.1017	42	1,381
21	2013	0	412	412	13,584	0.0901	37	1,224
22	2014	0	412	412	13,584	0.0799	33	1,086
23	2015	0	412	412	13,584	0.0709	29	963
24	2016	0	412	412	13,584	0.0628	26	853
25	2017	0	412	412	13,584	0.0557	23	757
26	2018	0	412	412	13,584	0.0494	20	671
27	2019	0	412	412	13,584	0.0438	18	595
28	2020	0	412	412	13,584	0.0388	16	527
29	2021	0	412	412	13,584	0.0344	14	468
30	2022	0	412	412	13,584	0.0305	13	415
31	2023	0	412	412	13,584	0.0271	11	368
32	2024	0	412	412	13,584	0.0240	10	326
33	2025	0	412	412	13,584	0.0213	9	289
34	2026	0	412	412	13,584	0.0189	8	256
35	2027	0	412	412	13,584	0.0167	7	227
36	2028	0	412	412	13,584	0.0148	6	201
37	2029	0	412	412	13,584	0.0131	5	179
38	2030	0	412	412	13,584	0.0117	5	158
39	2031	0	412	412	13,584	0.0103	4	140
40	2032	0	412	412	13,584	0.0092	4	124
41	2033	0	412	412	13,584	0.0081	3	110
42	2034	0	412	412	13,584	0.0072	3	98
43	2035	0	412	412	13,584	0.0064	3	87
44	2036	0	412	412	13,584	0.0057	2	77
45	2037	0	412	412	13,584	0.0050	2	68
46	2038	0	412	412	13,584	0.0045	2	60
47	2039	0	412	412	13,584	0.0039	2	54
48	2040	0	412	412	13,584	0.0035	1	48
49	2041	0	412	412	13,584	0.0031	1	42
50	2042	0	412	412	13,584	0.0028	1	37
Total (Lp)		62,950	18,540	81,490	563,736		43,190	43,189
(US \$)		31,475	9,270	40,745	281,868		21,595	21,594

B/C = 1.00  
 B-C = 0  
 EIRR = 12.79 %

Table H.1-34 EIRR Cash Flow of Cost and Benefit  
(2 years Delay in Benefit Accrual)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.8929	942	0
3	1995	3,974	0	3,974	0	0.7972	3,168	0
4	1996	24,972	0	24,972	0	0.7118	17,775	0
5	1997	17,793	0	17,793	0	0.6355	11,308	0
6	1998	14,178	412	14,590	0	0.5674	8,279	0
7	1999	0	412	412	0	0.5066	209	0
8	2000	0	412	412	3,396	0.4523	186	1,536
9	2001	0	412	412	6,792	0.4039	166	2,743
10	2002	0	412	412	10,188	0.3606	149	3,674
11	2003	0	412	412	13,584	0.3220	133	4,374
12	2004	0	412	412	13,584	0.2875	118	3,905
13	2005	0	412	412	13,584	0.2567	106	3,487
14	2006	0	412	412	13,584	0.2292	94	3,113
15	2007	0	412	412	13,584	0.2046	84	2,780
16	2008	0	412	412	13,584	0.1827	75	2,482
17	2009	0	412	412	13,584	0.1631	67	2,216
18	2010	0	412	412	13,584	0.1456	60	1,978
19	2011	0	412	412	13,584	0.1300	54	1,766
20	2012	0	412	412	13,584	0.1161	48	1,577
21	2013	0	412	412	13,584	0.1037	43	1,408
22	2014	0	412	412	13,584	0.0926	38	1,257
23	2015	0	412	412	13,584	0.0826	34	1,123
24	2016	0	412	412	13,584	0.0738	30	1,002
25	2017	0	412	412	13,584	0.0659	27	895
26	2018	0	412	412	13,584	0.0588	24	799
27	2019	0	412	412	13,584	0.0525	22	713
28	2020	0	412	412	13,584	0.0469	19	637
29	2021	0	412	412	13,584	0.0419	17	569
30	2022	0	412	412	13,584	0.0374	15	508
31	2023	0	412	412	13,584	0.0334	14	453
32	2024	0	412	412	13,584	0.0298	12	405
33	2025	0	412	412	13,584	0.0266	11	361
34	2026	0	412	412	13,584	0.0238	10	323
35	2027	0	412	412	13,584	0.0212	9	288
36	2028	0	412	412	13,584	0.0189	8	257
37	2029	0	412	412	13,584	0.0169	7	230
38	2030	0	412	412	13,584	0.0151	6	205
39	2031	0	412	412	13,584	0.0135	6	183
40	2032	0	412	412	13,584	0.0120	5	164
41	2033	0	412	412	13,584	0.0107	4	146
42	2034	0	412	412	13,584	0.0096	4	130
43	2035	0	412	412	13,584	0.0086	4	116
44	2036	0	412	412	13,584	0.0076	3	104
45	2037	0	412	412	13,584	0.0068	3	93
46	2038	0	412	412	13,584	0.0061	3	83
47	2039	0	412	412	13,584	0.0054	2	74
48	2040	0	412	412	13,584	0.0049	2	66
49	2041	0	412	412	13,584	0.0043	2	59
50	2042	0	412	412	13,584	0.0039	2	53
Total (Lp)		62,950	18,540	81,490	563,736		44,384	48,336
(US \$)		31,475	9,270	40,745	281,868		22,192	24,168

B/C = 1.09  
 B-C = 3,951  
 EIRR = 12.00 %

Table H.1-35 EIRR Cash Flow of Cost and Benefit

(2 years Delay in Benefit Accrual)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	1.0000	1,055	0
3	1995	3,974	0	3,974	0	1.0000	3,974	0
4	1996	24,972	0	24,972	0	1.0000	24,972	0
5	1997	17,793	0	17,793	0	1.0000	17,793	0
6	1998	14,178	412	14,590	0	1.0000	14,590	0
7	1999	0	412	412	0	1.0000	412	0
8	2000	0	412	412	3,396	1.0000	412	3,396
9	2001	0	412	412	6,792	1.0000	412	6,792
10	2002	0	412	412	10,188	1.0000	412	10,188
11	2003	0	412	412	13,584	1.0000	412	13,584
12	2004	0	412	412	13,584	1.0000	412	13,584
13	2005	0	412	412	13,584	1.0000	412	13,584
14	2006	0	412	412	13,584	1.0000	412	13,584
15	2007	0	412	412	13,584	1.0000	412	13,584
16	2008	0	412	412	13,584	1.0000	412	13,584
17	2009	0	412	412	13,584	1.0000	412	13,584
18	2010	0	412	412	13,584	1.0000	412	13,584
19	2011	0	412	412	13,584	1.0000	412	13,584
20	2012	0	412	412	13,584	1.0000	412	13,584
21	2013	0	412	412	13,584	1.0000	412	13,584
22	2014	0	412	412	13,584	1.0000	412	13,584
23	2015	0	412	412	13,584	1.0000	412	13,584
24	2016	0	412	412	13,584	1.0000	412	13,584
25	2017	0	412	412	13,584	1.0000	412	13,584
26	2018	0	412	412	13,584	1.0000	412	13,584
27	2019	0	412	412	13,584	1.0000	412	13,584
28	2020	0	412	412	13,584	1.0000	412	13,584
29	2021	0	412	412	13,584	1.0000	412	13,584
30	2022	0	412	412	13,584	1.0000	412	13,584
31	2023	0	412	412	13,584	1.0000	412	13,584
32	2024	0	412	412	13,584	1.0000	412	13,584
33	2025	0	412	412	13,584	1.0000	412	13,584
34	2026	0	412	412	13,584	1.0000	412	13,584
35	2027	0	412	412	13,584	1.0000	412	13,584
36	2028	0	412	412	13,584	1.0000	412	13,584
37	2029	0	412	412	13,584	1.0000	412	13,584
38	2030	0	412	412	13,584	1.0000	412	13,584
39	2031	0	412	412	13,584	1.0000	412	13,584
40	2032	0	412	412	13,584	1.0000	412	13,584
41	2033	0	412	412	13,584	1.0000	412	13,584
42	2034	0	412	412	13,584	1.0000	412	13,584
43	2035	0	412	412	13,584	1.0000	412	13,584
44	2036	0	412	412	13,584	1.0000	412	13,584
45	2037	0	412	412	13,584	1.0000	412	13,584
46	2038	0	412	412	13,584	1.0000	412	13,584
47	2039	0	412	412	13,584	1.0000	412	13,584
48	2040	0	412	412	13,584	1.0000	412	13,584
49	2041	0	412	412	13,584	1.0000	412	13,584
50	2042	0	412	412	13,584	1.0000	412	13,584
Total (Lp)		62,950	18,540	81,490	563,736		81,490	563,736
(US \$)		31,475	9,270	40,745	281,868		40,745	281,868

B/C = 6.92  
 B-C = 482,246  
 EIRR = 0.00 %

Table H.1-36 EIRR Cash Flow of Cost and Benefit  
(20 % Decrease in Benefit)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.8850	934	0
3	1995	3,974	0	3,974	0	0.7832	3,112	0
4	1996	24,972	0	24,972	0	0.6931	17,307	0
5	1997	17,793	0	17,793	0	0.6133	10,913	0
6	1998	14,178	412	14,590	2,717	0.5428	7,919	1,475
7	1999	0	412	412	5,434	0.4803	198	2,610
8	2000	0	412	412	8,150	0.4251	175	3,465
9	2001	0	412	412	10,867	0.3762	155	4,088
10	2002	0	412	412	10,867	0.3329	137	3,618
11	2003	0	412	412	10,867	0.2946	121	3,202
12	2004	0	412	412	10,867	0.2607	107	2,833
13	2005	0	412	412	10,867	0.2307	95	2,507
14	2006	0	412	412	10,867	0.2042	84	2,219
15	2007	0	412	412	10,867	0.1807	74	1,964
16	2008	0	412	412	10,867	0.1599	66	1,738
17	2009	0	412	412	10,867	0.1415	58	1,538
18	2010	0	412	412	10,867	0.1252	52	1,361
19	2011	0	412	412	10,867	0.1108	46	1,204
20	2012	0	412	412	10,867	0.0981	40	1,066
21	2013	0	412	412	10,867	0.0868	36	943
22	2014	0	412	412	10,867	0.0768	32	835
23	2015	0	412	412	10,867	0.0680	28	739
24	2016	0	412	412	10,867	0.0602	25	654
25	2017	0	412	412	10,867	0.0532	22	579
26	2018	0	412	412	10,867	0.0471	19	512
27	2019	0	412	412	10,867	0.0417	17	453
28	2020	0	412	412	10,867	0.0369	15	401
29	2021	0	412	412	10,867	0.0327	13	355
30	2022	0	412	412	10,867	0.0289	12	314
31	2023	0	412	412	10,867	0.0256	11	278
32	2024	0	412	412	10,867	0.0226	9	246
33	2025	0	412	412	10,867	0.0200	8	218
34	2026	0	412	412	10,867	0.0177	7	193
35	2027	0	412	412	10,867	0.0157	6	170
36	2028	0	412	412	10,867	0.0139	6	151
37	2029	0	412	412	10,867	0.0123	5	133
38	2030	0	412	412	10,867	0.0109	4	118
39	2031	0	412	412	10,867	0.0096	4	105
40	2032	0	412	412	10,867	0.0085	4	93
41	2033	0	412	412	10,867	0.0075	3	82
42	2034	0	412	412	10,867	0.0067	3	72
43	2035	0	412	412	10,867	0.0059	2	64
44	2036	0	412	412	10,867	0.0052	2	57
45	2037	0	412	412	10,867	0.0046	2	50
46	2038	0	412	412	10,867	0.0041	2	44
47	2039	0	412	412	10,867	0.0036	1	39
48	2040	0	412	412	10,867	0.0032	1	35
49	2041	0	412	412	10,867	0.0028	1	31
50	2042	0	412	412	10,867	0.0025	1	27
Total (Lp)		62,950	18,540	81,490	472,723		42,876	42,877
(US \$)		31,475	9,270	40,745	236,362		21,438	21,438

B/C = 1.00  
B-C = 0  
EIRR = 13.00 %

Table H.1-37 EIRR Cash Flow of Cost and Benefit  
(20 % Decrease in Benefit)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	0.8929	942	0
3	1995	3,974	0	3,974	0	0.7972	3,168	0
4	1996	24,972	0	24,972	0	0.7118	17,775	0
5	1997	17,793	0	17,793	0	0.6355	11,308	0
6	1998	14,178	412	14,590	2,717	0.5674	8,279	1,542
7	1999	0	412	412	5,434	0.5066	209	2,753
8	2000	0	412	412	8,150	0.4523	186	3,687
9	2001	0	412	412	10,867	0.4039	166	4,389
10	2002	0	412	412	10,867	0.3606	149	3,919
11	2003	0	412	412	10,867	0.3220	133	3,499
12	2004	0	412	412	10,867	0.2875	118	3,124
13	2005	0	412	412	10,867	0.2567	106	2,789
14	2006	0	412	412	10,867	0.2292	94	2,490
15	2007	0	412	412	10,867	0.2046	84	2,224
16	2008	0	412	412	10,867	0.1827	75	1,985
17	2009	0	412	412	10,867	0.1631	67	1,773
18	2010	0	412	412	10,867	0.1456	60	1,583
19	2011	0	412	412	10,867	0.1300	54	1,413
20	2012	0	412	412	10,867	0.1161	48	1,262
21	2013	0	412	412	10,867	0.1037	43	1,127
22	2014	0	412	412	10,867	0.0926	38	1,006
23	2015	0	412	412	10,867	0.0826	34	898
24	2016	0	412	412	10,867	0.0738	30	802
25	2017	0	412	412	10,867	0.0659	27	716
26	2018	0	412	412	10,867	0.0588	24	639
27	2019	0	412	412	10,867	0.0525	22	571
28	2020	0	412	412	10,867	0.0469	19	510
29	2021	0	412	412	10,867	0.0419	17	455
30	2022	0	412	412	10,867	0.0374	15	406
31	2023	0	412	412	10,867	0.0334	14	363
32	2024	0	412	412	10,867	0.0298	12	324
33	2025	0	412	412	10,867	0.0266	11	289
34	2026	0	412	412	10,867	0.0238	10	258
35	2027	0	412	412	10,867	0.0212	9	231
36	2028	0	412	412	10,867	0.0189	8	206
37	2029	0	412	412	10,867	0.0169	7	184
38	2030	0	412	412	10,867	0.0151	6	164
39	2031	0	412	412	10,867	0.0135	6	146
40	2032	0	412	412	10,867	0.0120	5	131
41	2033	0	412	412	10,867	0.0107	4	117
42	2034	0	412	412	10,867	0.0096	4	104
43	2035	0	412	412	10,867	0.0086	4	93
44	2036	0	412	412	10,867	0.0076	3	83
45	2037	0	412	412	10,867	0.0068	3	74
46	2038	0	412	412	10,867	0.0061	3	66
47	2039	0	412	412	10,867	0.0054	2	59
48	2040	0	412	412	10,867	0.0049	2	53
49	2041	0	412	412	10,867	0.0043	2	47
50	2042	0	412	412	10,867	0.0039	2	42
Total (Lp)		62,950	18,540	81,490	472,723		44,384	48,595
(US \$)		31,475	9,270	40,745	236,362		22,192	24,298

B/C = 1.09  
B-C = 4,211  
EIRR = 12.00 %

Table H.1-38 EIRR Cash Flow of Cost and Benefit  
(20 % Decrease in Benefit)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	978	0	978	0	1.0000	978	0
2	1994	1,055	0	1,055	0	1.0000	1,055	0
3	1995	3,974	0	3,974	0	1.0000	3,974	0
4	1996	24,972	0	24,972	0	1.0000	24,972	0
5	1997	17,793	0	17,793	0	1.0000	17,793	0
6	1998	14,178	412	14,590	2,717	1.0000	14,590	2,717
7	1999	0	412	412	5,434	1.0000	412	5,434
8	2000	0	412	412	8,150	1.0000	412	8,150
9	2001	0	412	412	10,867	1.0000	412	10,867
10	2002	0	412	412	10,867	1.0000	412	10,867
11	2003	0	412	412	10,867	1.0000	412	10,867
12	2004	0	412	412	10,867	1.0000	412	10,867
13	2005	0	412	412	10,867	1.0000	412	10,867
14	2006	0	412	412	10,867	1.0000	412	10,867
15	2007	0	412	412	10,867	1.0000	412	10,867
16	2008	0	412	412	10,867	1.0000	412	10,867
17	2009	0	412	412	10,867	1.0000	412	10,867
18	2010	0	412	412	10,867	1.0000	412	10,867
19	2011	0	412	412	10,867	1.0000	412	10,867
20	2012	0	412	412	10,867	1.0000	412	10,867
21	2013	0	412	412	10,867	1.0000	412	10,867
22	2014	0	412	412	10,867	1.0000	412	10,867
23	2015	0	412	412	10,867	1.0000	412	10,867
24	2016	0	412	412	10,867	1.0000	412	10,867
25	2017	0	412	412	10,867	1.0000	412	10,867
26	2018	0	412	412	10,867	1.0000	412	10,867
27	2019	0	412	412	10,867	1.0000	412	10,867
28	2020	0	412	412	10,867	1.0000	412	10,867
29	2021	0	412	412	10,867	1.0000	412	10,867
30	2022	0	412	412	10,867	1.0000	412	10,867
31	2023	0	412	412	10,867	1.0000	412	10,867
32	2024	0	412	412	10,867	1.0000	412	10,867
33	2025	0	412	412	10,867	1.0000	412	10,867
34	2026	0	412	412	10,867	1.0000	412	10,867
35	2027	0	412	412	10,867	1.0000	412	10,867
36	2028	0	412	412	10,867	1.0000	412	10,867
37	2029	0	412	412	10,867	1.0000	412	10,867
38	2030	0	412	412	10,867	1.0000	412	10,867
39	2031	0	412	412	10,867	1.0000	412	10,867
40	2032	0	412	412	10,867	1.0000	412	10,867
41	2033	0	412	412	10,867	1.0000	412	10,867
42	2034	0	412	412	10,867	1.0000	412	10,867
43	2035	0	412	412	10,867	1.0000	412	10,867
44	2036	0	412	412	10,867	1.0000	412	10,867
45	2037	0	412	412	10,867	1.0000	412	10,867
46	2038	0	412	412	10,867	1.0000	412	10,867
47	2039	0	412	412	10,867	1.0000	412	10,867
48	2040	0	412	412	10,867	1.0000	412	10,867
49	2041	0	412	412	10,867	1.0000	412	10,867
50	2042	0	412	412	10,867	1.0000	412	10,867
Total (Lp)		62,950	18,540	81,490	472,723		81,490	472,723
(US \$)		31,475	9,270	40,745	236,362		40,745	236,362

B/C = 5.80  
 B-C = 391,233  
 EIRR = 0.00 %



Table H.1-39 EIRR Cash Flow of Cost and Benefit  
(30 % increase in Cost)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,271	0	1,271	0	1.0000	1,271	0
2	1994	1,372	0	1,372	0	0.8884	1,218	0
3	1995	5,166	0	5,166	0	0.7893	4,078	0
4	1996	32,464	0	32,464	0	0.7012	22,764	0
5	1997	23,131	0	23,131	0	0.6230	14,410	0
6	1998	18,431	536	18,967	3,396	0.5535	10,497	1,880
7	1999	0	536	536	6,792	0.4917	263	3,340
8	2000	0	536	536	10,188	0.4368	234	4,450
9	2001	0	536	536	13,584	0.3881	208	5,272
10	2002	0	536	536	13,584	0.3448	185	4,684
11	2003	0	536	536	13,584	0.3063	164	4,161
12	2004	0	536	536	13,584	0.2721	146	3,697
13	2005	0	536	536	13,584	0.2418	129	3,284
14	2006	0	536	536	13,584	0.2148	115	2,918
15	2007	0	536	536	13,584	0.1908	102	2,592
16	2008	0	536	536	13,584	0.1695	91	2,303
17	2009	0	536	536	13,584	0.1506	81	2,046
18	2010	0	536	536	13,584	0.1338	72	1,818
19	2011	0	536	536	13,584	0.1189	64	1,615
20	2012	0	536	536	13,584	0.1056	57	1,435
21	2013	0	536	536	13,584	0.0938	50	1,275
22	2014	0	536	536	13,584	0.0834	45	1,132
23	2015	0	536	536	13,584	0.0741	40	1,006
24	2016	0	536	536	13,584	0.0658	35	894
25	2017	0	536	536	13,584	0.0584	31	794
26	2018	0	536	536	13,584	0.0519	28	705
27	2019	0	536	536	13,584	0.0461	25	627
28	2020	0	536	536	13,584	0.0410	22	557
29	2021	0	536	536	13,584	0.0364	20	495
30	2022	0	536	536	13,584	0.0323	17	439
31	2023	0	536	536	13,584	0.0287	15	390
32	2024	0	536	536	13,584	0.0255	14	347
33	2025	0	536	536	13,584	0.0227	12	308
34	2026	0	536	536	13,584	0.0202	11	274
35	2027	0	536	536	13,584	0.0179	10	243
36	2028	0	536	536	13,584	0.0159	9	216
37	2029	0	536	536	13,584	0.0141	8	192
38	2030	0	536	536	13,584	0.0126	7	171
39	2031	0	536	536	13,584	0.0112	6	152
40	2032	0	536	536	13,584	0.0099	5	135
41	2033	0	536	536	13,584	0.0088	5	120
42	2034	0	536	536	13,584	0.0078	4	106
43	2035	0	536	536	13,584	0.0069	4	94
44	2036	0	536	536	13,584	0.0062	3	84
45	2037	0	536	536	13,584	0.0055	3	74
46	2038	0	536	536	13,584	0.0049	3	66
47	2039	0	536	536	13,584	0.0043	2	59
48	2040	0	536	536	13,584	0.0038	2	52
49	2041	0	536	536	13,584	0.0034	2	46
50	2042	0	536	536	13,584	0.0030	2	41
Total (Lp)		81,835	24,102	105,937	590,904		56,585	56,586
(US \$)		40,918	12,051	52,969	295,452		28,293	28,293

B/C = 1.00  
B-C = 0  
EIRR = 12.56 %

Table H.1-40 EIRR Cash Flow of Cost and Benefit

(30 % Increase in Cost)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,271	0	1,271	0	1.0000	1,271	0
2	1994	1,372	0	1,372	0	0.8929	1,225	0
3	1995	5,166	0	5,166	0	0.7972	4,118	0
4	1996	32,464	0	32,464	0	0.7118	23,107	0
5	1997	23,131	0	23,131	0	0.6355	14,700	0
6	1998	18,431	536	18,967	3,396	0.5674	10,762	1,927
7	1999	0	536	536	6,792	0.5066	271	3,441
8	2000	0	536	536	10,188	0.4523	242	4,609
9	2001	0	536	536	13,584	0.4039	216	5,486
10	2002	0	536	536	13,584	0.3606	193	4,899
11	2003	0	536	536	13,584	0.3220	172	4,374
12	2004	0	536	536	13,584	0.2875	154	3,905
13	2005	0	536	536	13,584	0.2567	137	3,487
14	2006	0	536	536	13,584	0.2292	123	3,113
15	2007	0	536	536	13,584	0.2046	110	2,780
16	2008	0	536	536	13,584	0.1827	98	2,482
17	2009	0	536	536	13,584	0.1631	87	2,216
18	2010	0	536	536	13,584	0.1456	78	1,978
19	2011	0	536	536	13,584	0.1300	70	1,766
20	2012	0	536	536	13,584	0.1161	62	1,577
21	2013	0	536	536	13,584	0.1037	56	1,408
22	2014	0	536	536	13,584	0.0926	50	1,257
23	2015	0	536	536	13,584	0.0826	44	1,123
24	2016	0	536	536	13,584	0.0738	40	1,002
25	2017	0	536	536	13,584	0.0659	35	895
26	2018	0	536	536	13,584	0.0588	32	799
27	2019	0	536	536	13,584	0.0525	28	713
28	2020	0	536	536	13,584	0.0469	25	637
29	2021	0	536	536	13,584	0.0419	22	569
30	2022	0	536	536	13,584	0.0374	20	508
31	2023	0	536	536	13,584	0.0334	18	453
32	2024	0	536	536	13,584	0.0298	16	405
33	2025	0	536	536	13,584	0.0266	14	361
34	2026	0	536	536	13,584	0.0238	13	323
35	2027	0	536	536	13,584	0.0212	11	288
36	2028	0	536	536	13,584	0.0189	10	257
37	2029	0	536	536	13,584	0.0169	9	230
38	2030	0	536	536	13,584	0.0151	8	205
39	2031	0	536	536	13,584	0.0135	7	183
40	2032	0	536	536	13,584	0.0120	6	164
41	2033	0	536	536	13,584	0.0107	6	146
42	2034	0	536	536	13,584	0.0096	5	130
43	2035	0	536	536	13,584	0.0086	5	116
44	2036	0	536	536	13,584	0.0076	4	104
45	2037	0	536	536	13,584	0.0068	4	93
46	2038	0	536	536	13,584	0.0061	3	83
47	2039	0	536	536	13,584	0.0054	3	74
48	2040	0	536	536	13,584	0.0049	3	66
49	2041	0	536	536	13,584	0.0043	2	59
50	2042	0	536	536	13,584	0.0039	2	53
Total (Lp)		81,835	24,102	105,937	590,904		57,699	60,744
(US \$)		40,918	12,051	52,969	295,452		28,850	30,372

B/C = 1.05  
 B-C = 3,044  
 EIRR = 12.00 %

Table H.1-41 EIRR Cash Flow of Cost and Benefit  
(30 % Increase in Cost)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,271	0	1,271	0	1.0000	1,271	0
2	1994	1,372	0	1,372	0	1.0000	1,372	0
3	1995	5,166	0	5,166	0	1.0000	5,166	0
4	1996	32,464	0	32,464	0	1.0000	32,464	0
5	1997	23,131	0	23,131	0	1.0000	23,131	0
6	1998	18,431	536	18,967	3,396	1.0000	18,967	3,396
7	1999	0	536	536	6,792	1.0000	536	6,792
8	2000	0	536	536	10,188	1.0000	536	10,188
9	2001	0	536	536	13,584	1.0000	536	13,584
10	2002	0	536	536	13,584	1.0000	536	13,584
11	2003	0	536	536	13,584	1.0000	536	13,584
12	2004	0	536	536	13,584	1.0000	536	13,584
13	2005	0	536	536	13,584	1.0000	536	13,584
14	2006	0	536	536	13,584	1.0000	536	13,584
15	2007	0	536	536	13,584	1.0000	536	13,584
16	2008	0	536	536	13,584	1.0000	536	13,584
17	2009	0	536	536	13,584	1.0000	536	13,584
18	2010	0	536	536	13,584	1.0000	536	13,584
19	2011	0	536	536	13,584	1.0000	536	13,584
20	2012	0	536	536	13,584	1.0000	536	13,584
21	2013	0	536	536	13,584	1.0000	536	13,584
22	2014	0	536	536	13,584	1.0000	536	13,584
23	2015	0	536	536	13,584	1.0000	536	13,584
24	2016	0	536	536	13,584	1.0000	536	13,584
25	2017	0	536	536	13,584	1.0000	536	13,584
26	2018	0	536	536	13,584	1.0000	536	13,584
27	2019	0	536	536	13,584	1.0000	536	13,584
28	2020	0	536	536	13,584	1.0000	536	13,584
29	2021	0	536	536	13,584	1.0000	536	13,584
30	2022	0	536	536	13,584	1.0000	536	13,584
31	2023	0	536	536	13,584	1.0000	536	13,584
32	2024	0	536	536	13,584	1.0000	536	13,584
33	2025	0	536	536	13,584	1.0000	536	13,584
34	2026	0	536	536	13,584	1.0000	536	13,584
35	2027	0	536	536	13,584	1.0000	536	13,584
36	2028	0	536	536	13,584	1.0000	536	13,584
37	2029	0	536	536	13,584	1.0000	536	13,584
38	2030	0	536	536	13,584	1.0000	536	13,584
39	2031	0	536	536	13,584	1.0000	536	13,584
40	2032	0	536	536	13,584	1.0000	536	13,584
41	2033	0	536	536	13,584	1.0000	536	13,584
42	2034	0	536	536	13,584	1.0000	536	13,584
43	2035	0	536	536	13,584	1.0000	536	13,584
44	2036	0	536	536	13,584	1.0000	536	13,584
45	2037	0	536	536	13,584	1.0000	536	13,584
46	2038	0	536	536	13,584	1.0000	536	13,584
47	2039	0	536	536	13,584	1.0000	536	13,584
48	2040	0	536	536	13,584	1.0000	536	13,584
49	2041	0	536	536	13,584	1.0000	536	13,584
50	2042	0	536	536	13,584	1.0000	536	13,584
Total (Lp)		81,835	24,102	105,937	590,904		105,937	590,904
(US \$)		40,918	12,051	52,969	295,452		52,969	295,452

B/C = 5.58  
 B-C = 484,967  
 EIRR = 0.00 %

Table H.1-42 EIRR Cash Flow of Cost and Benefit  
(2 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8643	0	0
3	1995	978	0	978	0	0.7470	731	0
4	1996	1,055	0	1,055	0	0.6456	681	0
5	1997	3,974	0	3,974	0	0.5580	2,217	0
6	1998	24,972	0	24,972	0	0.4822	12,042	0
7	1999	17,793	0	17,793	0	0.4168	7,416	0
8	2000	14,178	412	14,590	3,396	0.3602	5,256	1,223
9	2001	0	412	412	6,792	0.3113	128	2,115
10	2002	0	412	412	10,188	0.2691	111	2,741
11	2003	0	412	412	13,584	0.2325	96	3,159
12	2004	0	412	412	13,584	0.2010	83	2,730
13	2005	0	412	412	13,584	0.1737	72	2,360
14	2006	0	412	412	13,584	0.1501	62	2,039
15	2007	0	412	412	13,584	0.1298	53	1,763
16	2008	0	412	412	13,584	0.1121	46	1,523
17	2009	0	412	412	13,584	0.0969	40	1,317
18	2010	0	412	412	13,584	0.0838	35	1,138
19	2011	0	412	412	13,584	0.0724	30	983
20	2012	0	412	412	13,584	0.0626	26	850
21	2013	0	412	412	13,584	0.0541	22	735
22	2014	0	412	412	13,584	0.0467	19	635
23	2015	0	412	412	13,584	0.0404	17	549
24	2016	0	412	412	13,584	0.0349	14	474
25	2017	0	412	412	13,584	0.0302	12	410
26	2018	0	412	412	13,584	0.0261	11	354
27	2019	0	412	412	13,584	0.0225	9	306
28	2020	0	412	412	13,584	0.0195	8	265
29	2021	0	412	412	13,584	0.0168	7	229
30	2022	0	412	412	13,584	0.0146	6	198
31	2023	0	412	412	13,584	0.0126	5	171
32	2024	0	412	412	13,584	0.0109	4	148
33	2025	0	412	412	13,584	0.0094	4	128
34	2026	0	412	412	13,584	0.0081	3	110
35	2027	0	412	412	13,584	0.0070	3	95
36	2028	0	412	412	13,584	0.0061	2	82
37	2029	0	412	412	13,584	0.0052	2	71
38	2030	0	412	412	13,584	0.0045	2	62
39	2031	0	412	412	13,584	0.0039	2	53
40	2032	0	412	412	13,584	0.0034	1	46
41	2033	0	412	412	13,584	0.0029	1	40
42	2034	0	412	412	13,584	0.0025	1	34
43	2035	0	412	412	13,584	0.0022	1	30
44	2036	0	412	412	13,584	0.0019	1	26
45	2037	0	412	412	13,584	0.0016	1	22
46	2038	0	412	412	13,584	0.0014	1	19
47	2039	0	412	412	13,584	0.0012	1	17
48	2040	0	412	412	13,584	0.0011	0	14
49	2041	0	412	412	13,584	0.0009	0	12
50	2042	0	412	412	13,584	0.0008	0	11
Total (Lp)		62,950	17,716	80,666	563,736		29,286	29,286
(US \$)		31,475	8,858	40,333	281,868		14,643	14,643

B/C = 1.00  
B-C = 0  
EIRR = 15.70 %

Table H.1-43 EIRR Cash Flow of Cost and Benefit  
(2 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8929	0	0
3	1995	978	0	978	0	0.7972	780	0
4	1996	1,055	0	1,055	0	0.7118	751	0
5	1997	3,974	0	3,974	0	0.6355	2,526	0
6	1998	24,972	0	24,972	0	0.5674	14,170	0
7	1999	17,793	0	17,793	0	0.5066	9,014	0
8	2000	14,178	412	14,590	3,396	0.4523	6,600	1,536
9	2001	0	412	412	6,792	0.4039	166	2,743
10	2002	0	412	412	10,188	0.3606	149	3,674
11	2003	0	412	412	13,584	0.3220	133	4,374
12	2004	0	412	412	13,584	0.2875	118	3,905
13	2005	0	412	412	13,584	0.2567	106	3,487
14	2006	0	412	412	13,584	0.2292	94	3,113
15	2007	0	412	412	13,584	0.2046	84	2,780
16	2008	0	412	412	13,584	0.1827	75	2,482
17	2009	0	412	412	13,584	0.1631	67	2,216
18	2010	0	412	412	13,584	0.1456	60	1,978
19	2011	0	412	412	13,584	0.1300	54	1,766
20	2012	0	412	412	13,584	0.1161	48	1,577
21	2013	0	412	412	13,584	0.1037	43	1,408
22	2014	0	412	412	13,584	0.0926	38	1,257
23	2015	0	412	412	13,584	0.0826	34	1,123
24	2016	0	412	412	13,584	0.0738	30	1,002
25	2017	0	412	412	13,584	0.0659	27	895
26	2018	0	412	412	13,584	0.0588	24	799
27	2019	0	412	412	13,584	0.0525	22	713
28	2020	0	412	412	13,584	0.0469	19	637
29	2021	0	412	412	13,584	0.0419	17	569
30	2022	0	412	412	13,584	0.0374	15	508
31	2023	0	412	412	13,584	0.0334	14	453
32	2024	0	412	412	13,584	0.0298	12	405
33	2025	0	412	412	13,584	0.0266	11	361
34	2026	0	412	412	13,584	0.0238	10	323
35	2027	0	412	412	13,584	0.0212	9	288
36	2028	0	412	412	13,584	0.0189	8	257
37	2029	0	412	412	13,584	0.0169	7	230
38	2030	0	412	412	13,584	0.0151	6	205
39	2031	0	412	412	13,584	0.0135	6	183
40	2032	0	412	412	13,584	0.0120	5	164
41	2033	0	412	412	13,584	0.0107	4	146
42	2034	0	412	412	13,584	0.0096	4	130
43	2035	0	412	412	13,584	0.0086	4	116
44	2036	0	412	412	13,584	0.0076	3	104
45	2037	0	412	412	13,584	0.0068	3	93
46	2038	0	412	412	13,584	0.0061	3	83
47	2039	0	412	412	13,584	0.0054	2	74
48	2040	0	412	412	13,584	0.0049	2	66
49	2041	0	412	412	13,584	0.0043	2	59
50	2042	0	412	412	13,584	0.0039	2	53
Total (Lp)		62,950	17,716	80,666	563,736		35,380	48,336
(US \$)		31,475	8,858	40,333	281,868		17,690	24,168

B/C = 1.37  
B-C = 12,955  
EIRR = 12.00 %

Table H.1-44 EIRR Cash Flow of Cost and Benefit  
(2 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	1.0000	0	0
3	1995	978	0	978	0	1.0000	978	0
4	1996	1,055	0	1,055	0	1.0000	1,055	0
5	1997	3,974	0	3,974	0	1.0000	3,974	0
6	1998	24,972	0	24,972	0	1.0000	24,972	0
7	1999	17,793	0	17,793	0	1.0000	17,793	0
8	2000	14,178	412	14,590	3,396	1.0000	14,590	3,396
9	2001	0	412	412	6,792	1.0000	412	6,792
10	2002	0	412	412	10,188	1.0000	412	10,188
11	2003	0	412	412	13,584	1.0000	412	13,584
12	2004	0	412	412	13,584	1.0000	412	13,584
13	2005	0	412	412	13,584	1.0000	412	13,584
14	2006	0	412	412	13,584	1.0000	412	13,584
15	2007	0	412	412	13,584	1.0000	412	13,584
16	2008	0	412	412	13,584	1.0000	412	13,584
17	2009	0	412	412	13,584	1.0000	412	13,584
18	2010	0	412	412	13,584	1.0000	412	13,584
19	2011	0	412	412	13,584	1.0000	412	13,584
20	2012	0	412	412	13,584	1.0000	412	13,584
21	2013	0	412	412	13,584	1.0000	412	13,584
22	2014	0	412	412	13,584	1.0000	412	13,584
23	2015	0	412	412	13,584	1.0000	412	13,584
24	2016	0	412	412	13,584	1.0000	412	13,584
25	2017	0	412	412	13,584	1.0000	412	13,584
26	2018	0	412	412	13,584	1.0000	412	13,584
27	2019	0	412	412	13,584	1.0000	412	13,584
28	2020	0	412	412	13,584	1.0000	412	13,584
29	2021	0	412	412	13,584	1.0000	412	13,584
30	2022	0	412	412	13,584	1.0000	412	13,584
31	2023	0	412	412	13,584	1.0000	412	13,584
32	2024	0	412	412	13,584	1.0000	412	13,584
33	2025	0	412	412	13,584	1.0000	412	13,584
34	2026	0	412	412	13,584	1.0000	412	13,584
35	2027	0	412	412	13,584	1.0000	412	13,584
36	2028	0	412	412	13,584	1.0000	412	13,584
37	2029	0	412	412	13,584	1.0000	412	13,584
38	2030	0	412	412	13,584	1.0000	412	13,584
39	2031	0	412	412	13,584	1.0000	412	13,584
40	2032	0	412	412	13,584	1.0000	412	13,584
41	2033	0	412	412	13,584	1.0000	412	13,584
42	2034	0	412	412	13,584	1.0000	412	13,584
43	2035	0	412	412	13,584	1.0000	412	13,584
44	2036	0	412	412	13,584	1.0000	412	13,584
45	2037	0	412	412	13,584	1.0000	412	13,584
46	2038	0	412	412	13,584	1.0000	412	13,584
47	2039	0	412	412	13,584	1.0000	412	13,584
48	2040	0	412	412	13,584	1.0000	412	13,584
49	2041	0	412	412	13,584	1.0000	412	13,584
50	2042	0	412	412	13,584	1.0000	412	13,584
Total (Lp)		62,950	17,716	80,666	563,736		80,666	563,736
(US \$)		31,475	8,858	40,333	281,868		40,333	281,868

B/C = 6.99  
 B-C = 483,070  
 EIRR = 0.00 %

Table H.1-45 EIRR Cash Flow of Cost and Benefit  
(5 years Delay of Construction) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8544	0	0
3	1995	0	0	0	0	0.7472	0	0
4	1996	0	0	0	0	0.6458	0	0
5	1997	0	0	0	0	0.5583	0	0
6	1998	978	0	978	0	0.4826	472	0
7	1999	1,055	0	1,055	0	0.4171	440	0
8	2000	3,974	0	3,974	0	0.3606	1,433	0
9	2001	24,972	0	24,972	0	0.3117	7,783	0
10	2002	17,793	0	17,793	0	0.2694	4,793	0
11	2003	14,178	412	14,590	3,396	0.2329	3,397	791
12	2004	0	412	412	6,792	0.2013	83	1,367
13	2005	0	412	412	10,188	0.1740	72	1,773
14	2006	0	412	412	13,584	0.1504	62	2,043
15	2007	0	412	412	13,584	0.1300	54	1,766
16	2008	0	412	412	13,584	0.1124	46	1,526
17	2009	0	412	412	13,584	0.0971	40	1,319
18	2010	0	412	412	13,584	0.0840	35	1,141
19	2011	0	412	412	13,584	0.0726	30	986
20	2012	0	412	412	13,584	0.0627	26	852
21	2013	0	412	412	13,584	0.0542	22	737
22	2014	0	412	412	13,584	0.0469	19	637
23	2015	0	412	412	13,584	0.0405	17	550
24	2016	0	412	412	13,584	0.0350	14	476
25	2017	0	412	412	13,584	0.0303	12	411
26	2018	0	412	412	13,584	0.0262	11	355
27	2019	0	412	412	13,584	0.0226	9	307
28	2020	0	412	412	13,584	0.0196	8	266
29	2021	0	412	412	13,584	0.0169	7	230
30	2022	0	412	412	13,584	0.0146	6	198
31	2023	0	412	412	13,584	0.0126	5	172
32	2024	0	412	412	13,584	0.0109	4	148
33	2025	0	412	412	13,584	0.0094	4	128
34	2026	0	412	412	13,584	0.0082	3	111
35	2027	0	412	412	13,584	0.0070	3	96
36	2028	0	412	412	13,584	0.0061	3	83
37	2029	0	412	412	13,584	0.0053	2	72
38	2030	0	412	412	13,584	0.0046	2	62
39	2031	0	412	412	13,584	0.0039	2	53
40	2032	0	412	412	13,584	0.0034	1	46
41	2033	0	412	412	13,584	0.0029	1	40
42	2034	0	412	412	13,584	0.0025	1	35
43	2035	0	412	412	13,584	0.0022	1	30
44	2036	0	412	412	13,584	0.0019	1	26
45	2037	0	412	412	13,584	0.0016	1	22
46	2038	0	412	412	13,584	0.0014	1	19
47	2039	0	412	412	13,584	0.0012	1	17
48	2040	0	412	412	13,584	0.0011	0	14
49	2041	0	412	412	13,584	0.0009	0	12
50	2042	0	412	412	13,584	0.0008	0	11
Total (Lp)		62,950	16,480	79,430	522,984		18,928	18,927
(US \$)		31,475	8,240	39,715	261,492		9,464	9,464

B/C = 1.00  
B-C = 0  
EIRR = 15.69 %

Table H.1-46 EIRR Cash Flow of Cost and Benefit  
(5 years Delay of Construction)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	0.8929	0	0
3	1995	0	0	0	0	0.7972	0	0
4	1996	0	0	0	0	0.7118	0	0
5	1997	0	0	0	0	0.6355	0	0
6	1998	978	0	978	0	0.5674	555	0
7	1999	1,055	0	1,055	0	0.5066	534	0
8	2000	3,974	0	3,974	0	0.4523	1,798	0
9	2001	24,972	0	24,972	0	0.4039	10,086	0
10	2002	17,793	0	17,793	0	0.3606	6,416	0
11	2003	14,178	412	14,590	3,396	0.3220	4,698	1,093
12	2004	0	412	412	6,792	0.2875	118	1,953
13	2005	0	412	412	10,188	0.2567	106	2,615
14	2006	0	412	412	13,584	0.2292	94	3,113
15	2007	0	412	412	13,584	0.2046	84	2,780
16	2008	0	412	412	13,584	0.1827	75	2,482
17	2009	0	412	412	13,584	0.1631	67	2,216
18	2010	0	412	412	13,584	0.1456	60	1,978
19	2011	0	412	412	13,584	0.1300	54	1,766
20	2012	0	412	412	13,584	0.1161	48	1,577
21	2013	0	412	412	13,584	0.1037	43	1,408
22	2014	0	412	412	13,584	0.0926	38	1,257
23	2015	0	412	412	13,584	0.0826	34	1,123
24	2016	0	412	412	13,584	0.0738	30	1,002
25	2017	0	412	412	13,584	0.0659	27	895
26	2018	0	412	412	13,584	0.0588	24	799
27	2019	0	412	412	13,584	0.0525	22	713
28	2020	0	412	412	13,584	0.0469	19	637
29	2021	0	412	412	13,584	0.0419	17	569
30	2022	0	412	412	13,584	0.0374	15	508
31	2023	0	412	412	13,584	0.0334	14	453
32	2024	0	412	412	13,584	0.0298	12	405
33	2025	0	412	412	13,584	0.0266	11	361
34	2026	0	412	412	13,584	0.0238	10	323
35	2027	0	412	412	13,584	0.0212	9	288
36	2028	0	412	412	13,584	0.0189	8	257
37	2029	0	412	412	13,584	0.0169	7	230
38	2030	0	412	412	13,584	0.0151	6	205
39	2031	0	412	412	13,584	0.0135	6	183
40	2032	0	412	412	13,584	0.0120	5	164
41	2033	0	412	412	13,584	0.0107	4	146
42	2034	0	412	412	13,584	0.0096	4	130
43	2035	0	412	412	13,584	0.0086	4	116
44	2036	0	412	412	13,584	0.0076	3	104
45	2037	0	412	412	13,584	0.0068	3	93
46	2038	0	412	412	13,584	0.0061	3	83
47	2039	0	412	412	13,584	0.0054	2	74
48	2040	0	412	412	13,584	0.0049	2	66
49	2041	0	412	412	13,584	0.0043	2	59
50	2042	0	412	412	13,584	0.0039	2	53
Total (Lp)		62,950	16,480	79,430	522,984		25,179	34,278
(US \$)		31,475	8,240	39,715	261,492		12,589	17,139

B/C = 1.36  
B-C = 9.098  
EIRR = 12.00 %



Table H.1-47 EIRR Cash Flow of Cost and Benefit  
(5 years Delay of Construction) (Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	0	0	0	0	1.0000	0	0
2	1994	0	0	0	0	1.0000	0	0
3	1995	0	0	0	0	1.0000	0	0
4	1996	0	0	0	0	1.0000	0	0
5	1997	0	0	0	0	1.0000	0	0
6	1998	978	0	978	0	1.0000	978	0
7	1999	1,055	0	1,055	0	1.0000	1,055	0
8	2000	3,974	0	3,974	0	1.0000	3,974	0
9	2001	24,972	0	24,972	0	1.0000	24,972	0
10	2002	17,793	0	17,793	0	1.0000	17,793	0
11	2003	14,178	412	14,590	3,396	1.0000	14,590	3,396
12	2004	0	412	412	6,792	1.0000	412	6,792
13	2005	0	412	412	10,188	1.0000	412	10,188
14	2006	0	412	412	13,584	1.0000	412	13,584
15	2007	0	412	412	13,584	1.0000	412	13,584
16	2008	0	412	412	13,584	1.0000	412	13,584
17	2009	0	412	412	13,584	1.0000	412	13,584
18	2010	0	412	412	13,584	1.0000	412	13,584
19	2011	0	412	412	13,584	1.0000	412	13,584
20	2012	0	412	412	13,584	1.0000	412	13,584
21	2013	0	412	412	13,584	1.0000	412	13,584
22	2014	0	412	412	13,584	1.0000	412	13,584
23	2015	0	412	412	13,584	1.0000	412	13,584
24	2016	0	412	412	13,584	1.0000	412	13,584
25	2017	0	412	412	13,584	1.0000	412	13,584
26	2018	0	412	412	13,584	1.0000	412	13,584
27	2019	0	412	412	13,584	1.0000	412	13,584
28	2020	0	412	412	13,584	1.0000	412	13,584
29	2021	0	412	412	13,584	1.0000	412	13,584
30	2022	0	412	412	13,584	1.0000	412	13,584
31	2023	0	412	412	13,584	1.0000	412	13,584
32	2024	0	412	412	13,584	1.0000	412	13,584
33	2025	0	412	412	13,584	1.0000	412	13,584
34	2026	0	412	412	13,584	1.0000	412	13,584
35	2027	0	412	412	13,584	1.0000	412	13,584
36	2028	0	412	412	13,584	1.0000	412	13,584
37	2029	0	412	412	13,584	1.0000	412	13,584
38	2030	0	412	412	13,584	1.0000	412	13,584
39	2031	0	412	412	13,584	1.0000	412	13,584
40	2032	0	412	412	13,584	1.0000	412	13,584
41	2033	0	412	412	13,584	1.0000	412	13,584
42	2034	0	412	412	13,584	1.0000	412	13,584
43	2035	0	412	412	13,584	1.0000	412	13,584
44	2036	0	412	412	13,584	1.0000	412	13,584
45	2037	0	412	412	13,584	1.0000	412	13,584
46	2038	0	412	412	13,584	1.0000	412	13,584
47	2039	0	412	412	13,584	1.0000	412	13,584
48	2040	0	412	412	13,584	1.0000	412	13,584
49	2041	0	412	412	13,584	1.0000	412	13,584
50	2042	0	412	412	13,584	1.0000	412	13,584
Total (Lp)		62,950	16,480	79,430	522,984		79,430	522,984
(US \$)		31,475	8,240	39,715	261,492		39,715	261,492

B/C = 6.58  
 B-C = 443,554  
 EIRR = 0.00 %

Table H.1-48 EIRR Cash Flow of Cost and Benefit  
(30 % of Cost Hike and 20 % Decrease in Benefit)

(Unit: 1000Lps)

No.	Year	Cost			Benefit	Discount Rate	Present Value	
		Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,271	0	1,271	0	1.0000	1,271	0
2	1994	1,372	0	1,372	0	1.0000	1,372	0
3	1995	5,166	0	5,166	0	1.0000	5,166	0
4	1996	32,464	0	32,464	0	1.0000	32,464	0
5	1997	23,131	0	23,131	0	1.0000	23,131	0
6	1998	18,431	536	18,967	2,717	1.0000	18,967	2,717
7	1999	0	536	536	5,434	1.0000	536	5,434
8	2000	0	536	536	8,150	1.0000	536	8,150
9	2001	0	536	536	10,867	1.0000	536	10,867
10	2002	0	536	536	10,867	1.0000	536	10,867
11	2003	0	536	536	10,867	1.0000	536	10,867
12	2004	0	536	536	10,867	1.0000	536	10,867
13	2005	0	536	536	10,867	1.0000	536	10,867
14	2006	0	536	536	10,867	1.0000	536	10,867
15	2007	0	536	536	10,867	1.0000	536	10,867
16	2008	0	536	536	10,867	1.0000	536	10,867
17	2009	0	536	536	10,867	1.0000	536	10,867
18	2010	0	536	536	10,867	1.0000	536	10,867
19	2011	0	536	536	10,867	1.0000	536	10,867
20	2012	0	536	536	10,867	1.0000	536	10,867
21	2013	0	536	536	10,867	1.0000	536	10,867
22	2014	0	536	536	10,867	1.0000	536	10,867
23	2015	0	536	536	10,867	1.0000	536	10,867
24	2016	0	536	536	10,867	1.0000	536	10,867
25	2017	0	536	536	10,867	1.0000	536	10,867
26	2018	0	536	536	10,867	1.0000	536	10,867
27	2019	0	536	536	10,867	1.0000	536	10,867
28	2020	0	536	536	10,867	1.0000	536	10,867
29	2021	0	536	536	10,867	1.0000	536	10,867
30	2022	0	536	536	10,867	1.0000	536	10,867
31	2023	0	536	536	10,867	1.0000	536	10,867
32	2024	0	536	536	10,867	1.0000	536	10,867
33	2025	0	536	536	10,867	1.0000	536	10,867
34	2026	0	536	536	10,867	1.0000	536	10,867
35	2027	0	536	536	10,867	1.0000	536	10,867
36	2028	0	536	536	10,867	1.0000	536	10,867
37	2029	0	536	536	10,867	1.0000	536	10,867
38	2030	0	536	536	10,867	1.0000	536	10,867
39	2031	0	536	536	10,867	1.0000	536	10,867
40	2032	0	536	536	10,867	1.0000	536	10,867
41	2033	0	536	536	10,867	1.0000	536	10,867
42	2034	0	536	536	10,867	1.0000	536	10,867
43	2035	0	536	536	10,867	1.0000	536	10,867
44	2036	0	536	536	10,867	1.0000	536	10,867
45	2037	0	536	536	10,867	1.0000	536	10,867
46	2038	0	536	536	10,867	1.0000	536	10,867
47	2039	0	536	536	10,867	1.0000	536	10,867
48	2040	0	536	536	10,867	1.0000	536	10,867
49	2041	0	536	536	10,867	1.0000	536	10,867
50	2042	0	536	536	10,867	1.0000	536	10,867
Total (Lp)		81,835	24,102	105,937	472,723		105,937	472,723
(US \$)		40,918	12,051	52,969	236,362		52,969	236,362

B/C = 4.46  
 B-C = 366,786  
 EIRR = 0.00 %

Table H.1-49 EIRR Cash Flow of Cost and Benefit  
(30 % of Cost Hike and 20 % Decrease in Benefit)

		Cost			Benefit	Discount Rate	Present Value	
No.	Year	Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,271	0	1,271	0	1.0000	1,271	0
2	1994	1,372	0	1,372	0	0.9070	1,244	0
3	1995	5,166	0	5,166	0	0.8227	4,250	0
4	1996	32,464	0	32,464	0	0.7462	24,223	0
5	1997	23,131	0	23,131	0	0.6768	15,655	0
6	1998	18,431	536	18,967	2,717	0.6138	11,643	1,668
7	1999	0	536	536	5,434	0.5568	298	3,025
8	2000	0	536	536	8,150	0.5050	270	4,116
9	2001	0	536	536	10,867	0.4580	245	4,978
10	2002	0	536	536	10,867	0.4154	223	4,515
11	2003	0	536	536	10,867	0.3768	202	4,095
12	2004	0	536	536	10,867	0.3418	183	3,714
13	2005	0	536	536	10,867	0.3100	166	3,369
14	2006	0	536	536	10,867	0.2812	151	3,055
15	2007	0	536	536	10,867	0.2550	137	2,771
16	2008	0	536	536	10,867	0.2313	124	2,514
17	2009	0	536	536	10,867	0.2098	112	2,280
18	2010	0	536	536	10,867	0.1903	102	2,068
19	2011	0	536	536	10,867	0.1726	92	1,876
20	2012	0	536	536	10,867	0.1565	84	1,701
21	2013	0	536	536	10,867	0.1420	76	1,543
22	2014	0	536	536	10,867	0.1288	69	1,399
23	2015	0	536	536	10,867	0.1168	63	1,269
24	2016	0	536	536	10,867	0.1059	57	1,151
25	2017	0	536	536	10,867	0.0961	51	1,044
26	2018	0	536	536	10,867	0.0872	47	947
27	2019	0	536	536	10,867	0.0791	42	859
28	2020	0	536	536	10,867	0.0717	38	779
29	2021	0	536	536	10,867	0.0650	35	707
30	2022	0	536	536	10,867	0.0590	32	641
31	2023	0	536	536	10,867	0.0535	29	581
32	2024	0	536	536	10,867	0.0485	26	527
33	2025	0	536	536	10,867	0.0440	24	478
34	2026	0	536	536	10,867	0.0399	21	434
35	2027	0	536	536	10,867	0.0362	19	393
36	2028	0	536	536	10,867	0.0328	18	357
37	2029	0	536	536	10,867	0.0298	16	324
38	2030	0	536	536	10,867	0.0270	14	294
39	2031	0	536	536	10,867	0.0245	13	266
40	2032	0	536	536	10,867	0.0222	12	242
41	2033	0	536	536	10,867	0.0202	11	219
42	2034	0	536	536	10,867	0.0183	10	199
43	2035	0	536	536	10,867	0.0166	9	180
44	2036	0	536	536	10,867	0.0150	8	163
45	2037	0	536	536	10,867	0.0136	7	148
46	2038	0	536	536	10,867	0.0124	7	134
47	2039	0	536	536	10,867	0.0112	6	122
48	2040	0	536	536	10,867	0.0102	5	111
49	2041	0	536	536	10,867	0.0092	5	100
50	2042	0	536	536	10,867	0.0084	4	91
Total (lp)		81,835	24,102	105,937	472,723		61,449	61,448
(US \$)		40,918	12,051	52,969	236,362		30,725	30,724

B/C = 1.00  
B-C = 0  
EIRR = 10.25 %

Table H.1-50 EIRR Cash Flow of Cost and Benefit  
(30 % of Cost Hike and 20 % Decrease in Benefit)

		Cost			Benefit	Discount Rate	Present Value	
No.	Year	Const. Cost	O & M Cost	Total			Cost	Benefit
1	1993	1,271	0	1,271	0	1.0000	1,271	0
2	1994	1,372	0	1,372	0	0.8929	1,225	0
3	1995	5,166	0	5,166	0	0.7972	4,118	0
4	1996	32,464	0	32,464	0	0.7118	23,107	0
5	1997	23,131	0	23,131	0	0.6355	14,700	0
6	1998	18,431	536	18,967	2,717	0.5674	10,762	1,542
7	1999	0	536	536	5,434	0.5066	271	2,753
8	2000	0	536	536	8,150	0.4523	242	3,687
9	2001	0	536	536	10,867	0.4039	216	4,389
10	2002	0	536	536	10,867	0.3606	193	3,919
11	2003	0	536	536	10,867	0.3220	172	3,499
12	2004	0	536	536	10,867	0.2875	154	3,124
13	2005	0	536	536	10,867	0.2567	137	2,789
14	2006	0	536	536	10,867	0.2292	123	2,490
15	2007	0	536	536	10,867	0.2046	110	2,224
16	2008	0	536	536	10,867	0.1827	98	1,985
17	2009	0	536	536	10,867	0.1631	87	1,773
18	2010	0	536	536	10,867	0.1456	78	1,583
19	2011	0	536	536	10,867	0.1300	70	1,413
20	2012	0	536	536	10,867	0.1161	62	1,262
21	2013	0	536	536	10,867	0.1037	56	1,127
22	2014	0	536	536	10,867	0.0926	50	1,006
23	2015	0	536	536	10,867	0.0826	44	898
24	2016	0	536	536	10,867	0.0738	40	802
25	2017	0	536	536	10,867	0.0659	35	716
26	2018	0	536	536	10,867	0.0588	32	639
27	2019	0	536	536	10,867	0.0525	28	571
28	2020	0	536	536	10,867	0.0469	25	510
29	2021	0	536	536	10,867	0.0419	22	455
30	2022	0	536	536	10,867	0.0374	20	406
31	2023	0	536	536	10,867	0.0334	18	363
32	2024	0	536	536	10,867	0.0298	16	324
33	2025	0	536	536	10,867	0.0266	14	289
34	2026	0	536	536	10,867	0.0238	13	258
35	2027	0	536	536	10,867	0.0212	11	231
36	2028	0	536	536	10,867	0.0189	10	206
37	2029	0	536	536	10,867	0.0169	9	184
38	2030	0	536	536	10,867	0.0151	8	164
39	2031	0	536	536	10,867	0.0135	7	146
40	2032	0	536	536	10,867	0.0120	6	131
41	2033	0	536	536	10,867	0.0107	6	117
42	2034	0	536	536	10,867	0.0096	5	104
43	2035	0	536	536	10,867	0.0086	5	93
44	2036	0	536	536	10,867	0.0076	4	83
45	2037	0	536	536	10,867	0.0068	4	74
46	2038	0	536	536	10,867	0.0061	3	66
47	2039	0	536	536	10,867	0.0054	3	59
48	2040	0	536	536	10,867	0.0049	3	53
49	2041	0	536	536	10,867	0.0043	2	47
50	2042	0	536	536	10,867	0.0039	2	42
Total (Lp)		81,835	24,102	105,937	472,723		57,699	48,595
(US \$)		40,918	12,051	52,969	236,362		28,850	24,298

B/C = 0.84  
B-C = -9,104  
EIRR = 12.00 %

## H.2 Social Evaluation

In this chapter estimation of potential damages from the collapse of the Coyolar dam will be carried out.

### (1) Background of the estimation

The potential damages from the collapse of the Coyolar Dam are estimated as a form of social evaluation. The reasons behind this procedures are:

- 1) The probability and the exact time of collapse cannot be precisely forecasted currently from the observed status of the Dam, and hence the estimation should be treated differently from other meteorological disasters like current floods or tidal damages of the statistically predictable nature.
- 2) Although the assumed damages from the collapse cannot be economically evaluated, the current degree of water leakage and dilapidated appearance of the Dam already have already caused worries to the inhabitants and has provoked anxiety among those who are concerned with it. Under such serious circumstances, it will be socially significant to assess the importance of taking preventive measures for potential risk of collapse, by means of the estimation of possible damages coming from it.

### (2) Estimation methods

Various degrees of collapse can occur according to the causes and situations of the Dam body. However, a full scale of collapse, which entails a whole volume of torrential discharge or twelve million tons of instant discharge, is assumed here. Based on this, the area attacked by the torrential flow and that affected by submersion of flooded water are delineated on a contour map and distribution of infrastructure or registered assets are checked within the delineated areas.

The time span required for the assumed flood to reach the potential affected area is estimated at about 1.6 hours (15 km) from the instant of collapse, and this implies that any effective measures for emergency sheltering to avoid damages can hardly be taken prior to the flood attack.

Based on the topography of the San Jose and Humuya river basins, the potentially flooded area is estimated at around 1250 has with a flood depth of 0.96 m. or deeper. Late summer seems to be the season which has the highest probability of occurrence of the collapse accident. At this time, the largest run-off is expected in the catchment area of the Coyolar Dam, and hence the water level within the Dam tends to rise with all efforts to evacuate water by discharging it through the outlet/spillway.

The estimated area under flood damages covers the urban area of San Antonio, the villages of San Jose, San Benito and La Plazuela, but the urban area of Flores and the village of Los Palillos lie out of the affected area.

First of all, direct damages from torrential mud/water flow accompanying washed out boulders and pieces of rocks, and from flood submersion are estimated by infrastructure and properties, i.e., roads, bridges, buildings, houses, social facility, standing/harvesting crops, orchards, livestock and other farm properties. The estimation is based on catastral registration inventory, value assessment and rate of damage suffered by damaged items.

Then, indirect damages are estimated as those caused by paralysed traffic flow (mainly related to the National highway No 5) and as prolonged production slack of crops as well as livestock. Human casualties are most probably to happen due to the fast arrival of the flood, but this factor is too variable to estimate and evaluate, and so it was excluded from the estimation.

- Landscape of supposed damaged area

Vanishing factors of hydraulic bore:

- a. Meandering of the San Jose River.
- b. Wide alluvial fan.
- c. Dry riverbed of the Humuya River is crossed diagonally.

There is not so much livestock in the supposed damaged area and it is not an attractive property (its value may be around 23 million Lps.).

Major properties in the area according to the official data is shown as follow:

- Reasons to restrict the damage by flood on account of the landscape mentioned above even if the hydraulic bore may damage Flores District.

The damage is restricted within the San Antonio District because of wide dry riverbed.

It is not practical to assume damage by the hydraulic bore on the U.S. Army base on Comayagua City under the condition of 12 million ton of flood water.

In this regard, the damaged area is composed by the following areas:

- a. Alluvial fan: 800 ha, including Flores and Los Palillos.
- b. Apart from irrigated farm and urban area of San Antonio: 1,250 ha.

- Damaged properties and cost estimation

Area of San Antonio	35,110 ha
Urban area	560 ha
Farm	4,930 ha
Forest, etc.	29,620 ha

Estimated price of land property (per ha)

Urban area	Lps.1,930 /ha
Farm	Lps.1,830 /ha
Forest, etc.	Lps. 190 /ha

Note: Prices are quoted from data of San Antonio Registration Office.

Actual transaction prices are approximately three times above prices.

- Total estimated prices of properties excluding land (including public properties and non-tax properties)

	(x1,000 Lps.)
Urban area	1,079
Farm	9,022
Forest, etc.	5,404

Reasonable investment costs for restoration of damaged farm of 1,847 ha estimated from above data is around 3,380 thousand Lps.

Cost estimation for restoration at this stage is 9,116 thousand Lps. The overestimation rate is approximately 2.7 times.

- Property estimation for inhabitants

Urban area	453 houses; 4,670,780 Lps.
Rural area	1,356 houses; 4,519,820 Lps.
Total	1,809 houses; 9,190,600 Lps.

Reasonable investment cost for restoration: 9,191 thousand Lps.

Cost estimation for restoration at this stage (only direct damage): 28,288 thousand Lps.

Overestimation rate : approximately 3.1 times.

Total properties in the District : 22,948 thousand Lps. (for 1988).

Cost estimation at this stage : 60,070 thousand Lps.





**ANNEX I : OTHERS**



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## I.1 Preliminary Irrigation Plan in the Selguapa District

At present, the southern end section of the Selguapa Irrigation District, located adjacent to the Flores Irrigation District, is not utilized due to lack of irrigation water. If sufficient water in the reservoir of the Coyolar dam could be stored through the present Project, the conduction of surplus water to above mentioned section will be considered.

Topographically, the supposed irrigation area belongs to the Selguapa River System.

The proposed irrigation area is limited by the Humuya River to the east and has gradient slopes eastward with approximately 2%. On the other hand, the western end section of the Flores Irrigation District slopes to the Humuya River with approximately 1.5% (Fig. I.1-1,-2).

To conduct the surplus water to the Selguapa Irrigation District, it is necessary to carry out works such as syphon, canals, etc.

The proposed irrigation area is decided according to height range in the proposed irrigation area, i.e., head works. Preliminarily, the irrigable area is calculated to be as follows:

Altitude (m)	Irrigable Area (ha)
575 - 580	274
580 - 590	593
590 - 600	912
600 - 610	1,130

To conduct the surplus water to the mentioned area, it is necessary to implement some facilities such as syphon, irrigation canals, etc. Moreover, the rehabilitation of lateral canal No.6, which is the most appropriate canal for this purpose, based on the conduction capacity and location, is required. At present, the lateral canal No.6 has a conduction capacity of 0.136 m<sup>3</sup>/sec. To increase the conducted water volume, the canal section has to be enlarged to permit an increase of the conducted water volume to approximately 1.1 m<sup>3</sup>/sec; this is the minimum level required to irrigate the existing irrigated area in the Flores District and

proposed area in the Selguapa District. Therefore, an overall rehabilitation of existing irrigation works of the Flores District is needed, including the main canal and diversion works. Extension of the lateral canal No.6 to the Selguapa District is required. To cross the Humuya River section, syphon works are the most appropriate from the technical point of view, But the length of the pipeline will be quite large. Hydraulic calculation is shown in Table I.1-2.

Table I.1-1 Summary of Required Principal Facilities

Works	Quantity	Amount (US\$ million)	Irrigable Area (hectare)
Retarding pond	1 pond	2.480	
Syphon	1 syphon	0.850	
Pipeline	φ1000m/m (L=6255m)	2.302	1130
	φ 800m/m (L=5550m)	1.479	912
	φ 660m/m (L=4650m)	0.857	593
	φ 450m/m (L=3950m)	0.477	274

However, after implementation of above mentioned works, water management will be difficult due to the big distance between the diversion works and irrigation area. The operation and maintenance of irrigation facilities seem to be limited.

In consequence, this sub-project is considered as more expensive than other irrigation projects. Problems pertaining maintenance and operation are considerable. The water balance study indicates little surplus irrigation water through the present Project, It is recommended to study other projects to be carried out on the same catchment area of the Selguapa River System.

Table I.1-2 Hydraulic Calculation of Pipeline

Mark	H (m)	L (m)	l=H/L	$l^{0.54}$	Irrigation Area (ha)
A1 G	10	6225	0.00161	0.0310	1130
A2 G	20	5550	0.00360	0.0479	912
A3 G	30	4650	0.00645	0.0656	593
A4 G	40	3975	0.01006	0.0835	274
A1 F	5	5500	0.00091	0.0228	
A2 F	15	4825	0.00311	0.0443	
A3 F	25	3900	0.00641	0.0654	
A4 F	35	3200	0.01094	0.0873	

$$V = 0.355 \cdot C \cdot D^{0.63} \cdot l^{0.54}$$

D (m)	$D^{0.63}$ (m)	V (m/s) C=150			
		A1 G	A2 G	A3 G	A4 G
0.40	0.5614	0.926	1.433	1.963	2.495
0.45	0.6047	0.998	1.543	2.114	2.687
0.50	0.6462	1.066	1.649	2.259	2.872
0.60	0.7248	1.196	1.850	2.534	3.221
0.70	0.7988	1.318	2.039	2.792	3.550
0.80	0.8689	1.434	2.218	3.037	3.861
0.90	0.9358	1.544	2.389	3.271	4.159
1.00	1.0000	1.650	2.552	3.496	4.444

D (m)	$D^{0.63}$ (m)	V (m/s) C=130			
		A1 G	A2 G	A3 G	A4 G
0.40	0.5614	0.803	1.242	1.701	2.162
0.45	0.6047	0.865	1.338	1.832	2.329
0.50	0.6462	0.924	1.429	1.958	2.489
0.60	0.7248	1.037	1.603	2.196	2.792
0.70	0.7988	1.142	1.767	2.420	3.076
0.80	0.8689	1.242	1.922	2.632	3.346
0.90	0.9358	1.338	2.070	2.835	3.604
1.00	1.0000	1.430	2.212	3.030	3.852

D (m)	$D^{0.63}$ (m)	V (m/s) C=150			
		A1 F	A2 F	A3 F	A4 F
0.40	0.5614	0.681	1.323	1.956	2.610
0.45	0.6047	0.734	1.425	2.106	2.811
0.50	0.6462	0.784	1.523	2.251	3.004
0.60	0.7248	0.879	1.708	2.525	3.370
0.70	0.7988	0.969	1.882	2.783	3.713
0.80	0.8689	1.054	2.048	3.027	4.039
0.90	0.9358	1.135	2.205	3.260	4.350
1.00	1.0000	1.213	2.357	3.484	4.649

D (m)	$D^{0.63}$ (m)	V (m/s) C=130			
		A1 F	A2 F	A3 F	A4 F
0.40	0.5614	0.590	1.147	1.695	2.262
0.45	0.6047	0.636	1.236	1.826	2.436
0.50	0.6462	0.679	1.321	1.951	2.603
0.60	0.7248	0.762	1.481	2.188	2.920
0.70	0.7988	0.840	1.632	2.412	3.218
0.80	0.8689	0.914	1.776	2.623	3.501
0.90	0.9358	0.984	1.912	2.825	3.770
1.00	1.0000	1.052	2.044	3.019	4.029

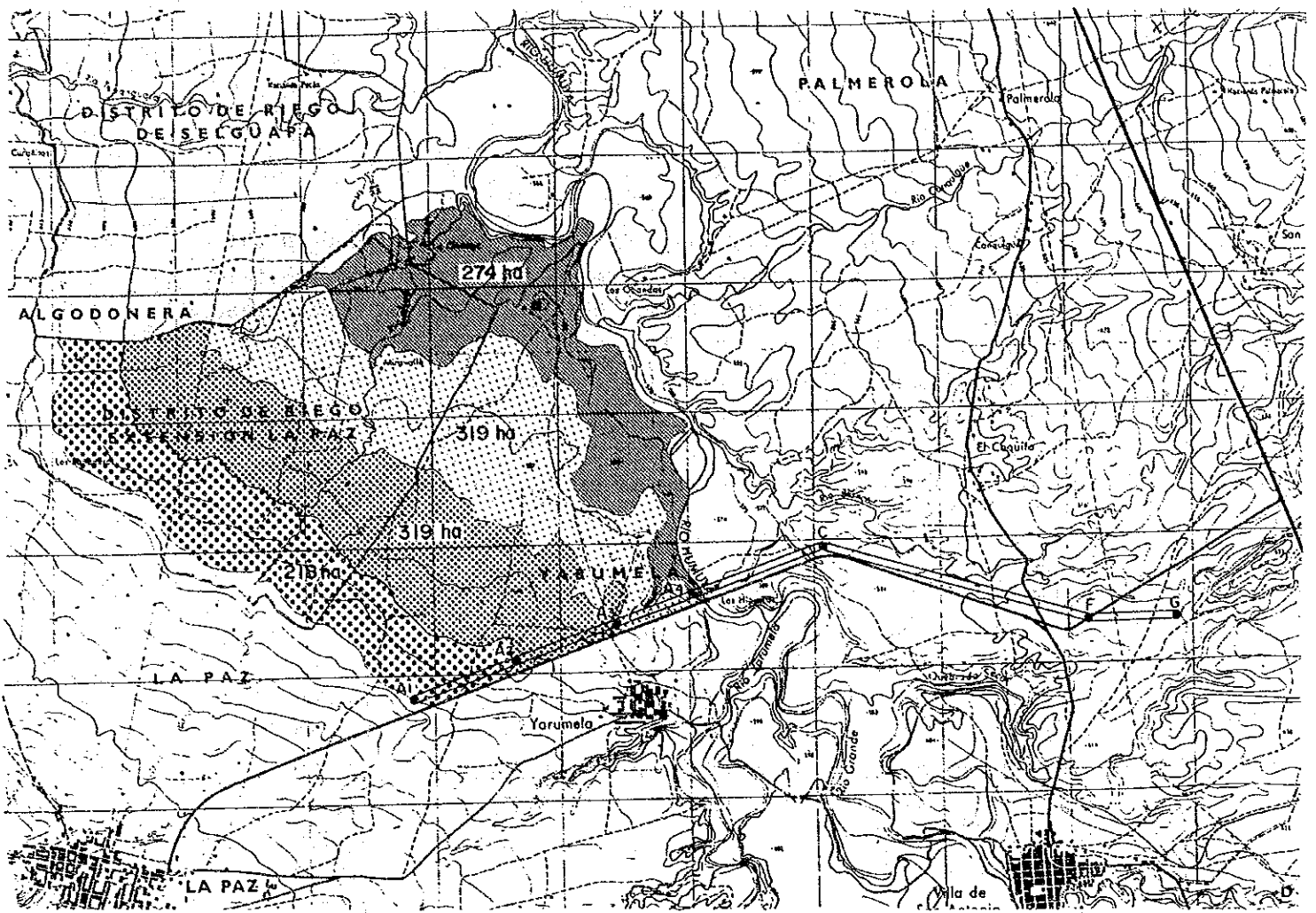


Fig. I.1-1 Location of Proposed Irrigation Area

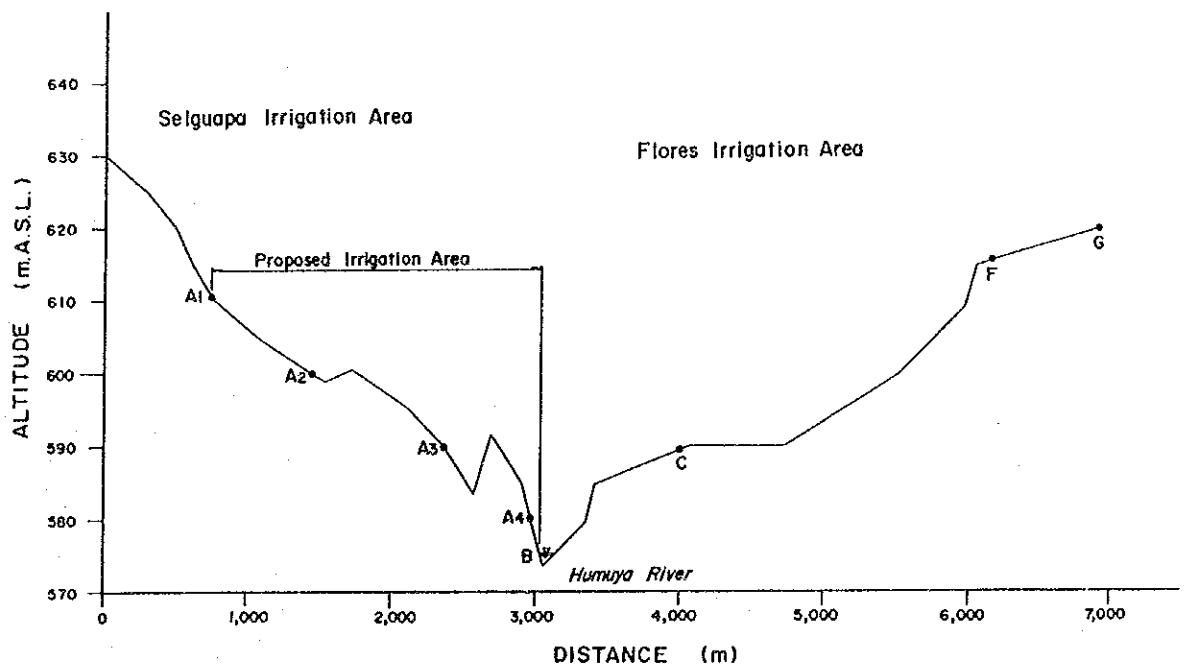


Fig. I.1-2 Cross Section of Proposed Irrigation Area



## I.2 Proposed Tertiary Irrigation System

Improvement of the tertiary canal system is not included in this Project. Therefore, irrigation system is preliminarily planned for farm lot of 19.2 ha (Fig.I.2-1). Irrigation canal and drainage canal are main works. The amount of the works and their costs are shown in Table I.2-1. Total cost is Lps.242,660 and cost per ha is Lps.12,640.

Table I.2-1 Construction Cost for Improvement of Farm Lot

Description	Quantity	Unit	U/Cost(Lps.)	Amount(Lps.)
Excavation and Earth Moving	48,000	m <sup>3</sup>	2.36	113,280
Farm Road	920	m	28.38	26,110
Irrigation Canal	1,520	m	6.92	10,520
Drainage Canal	920	m	6.78	6,240
Sub-total				156,150
Micellaneous 5%				7,810
Overhead 48%				78,700
Total Cost	19.2	ha		242,660
Cost per ha	1	ha		12,640

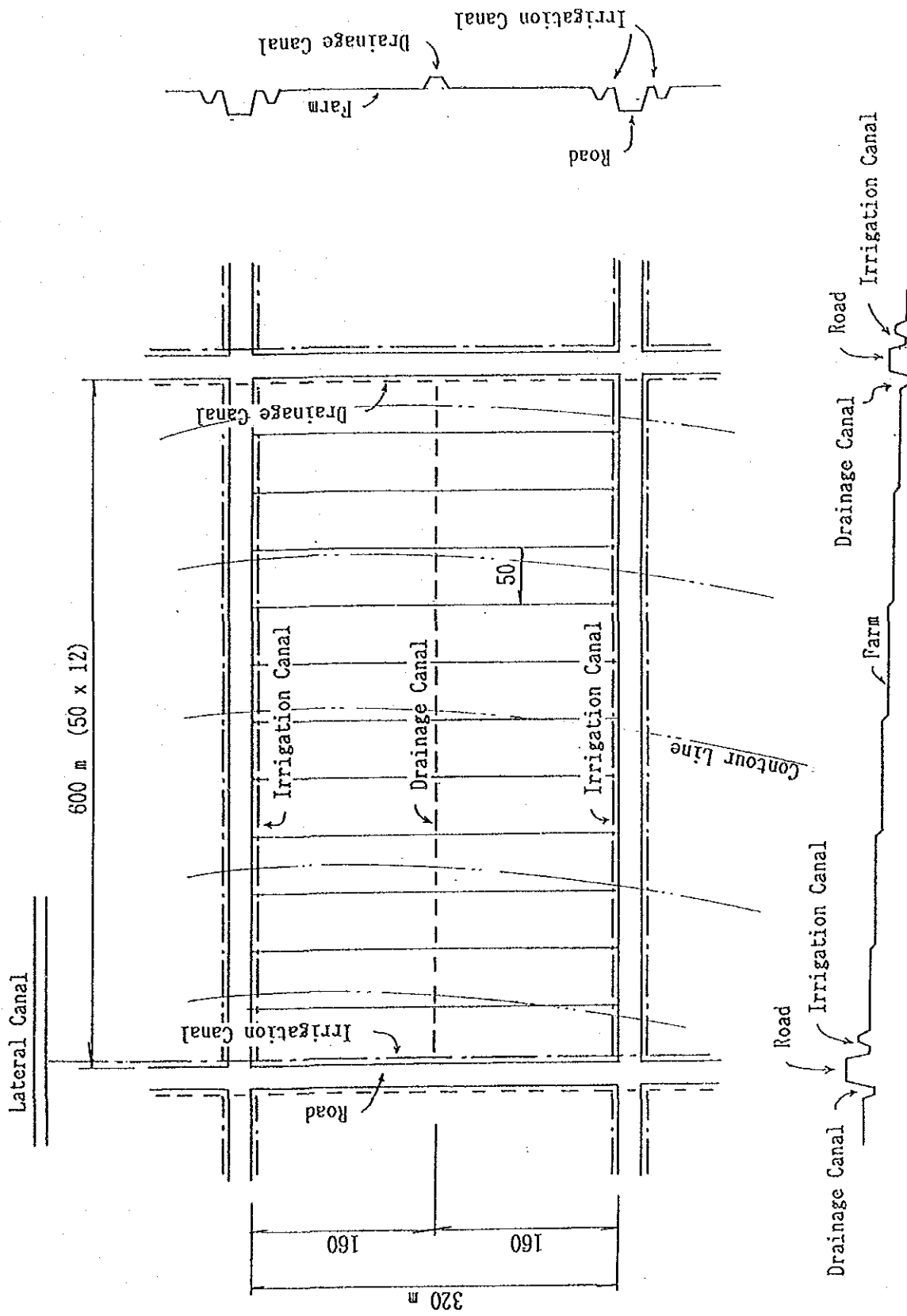


Fig. I.2-1 Typical Irrigation and Drainage System on Farm



**ANNEX J : DRAWINGS**



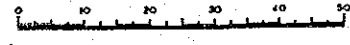
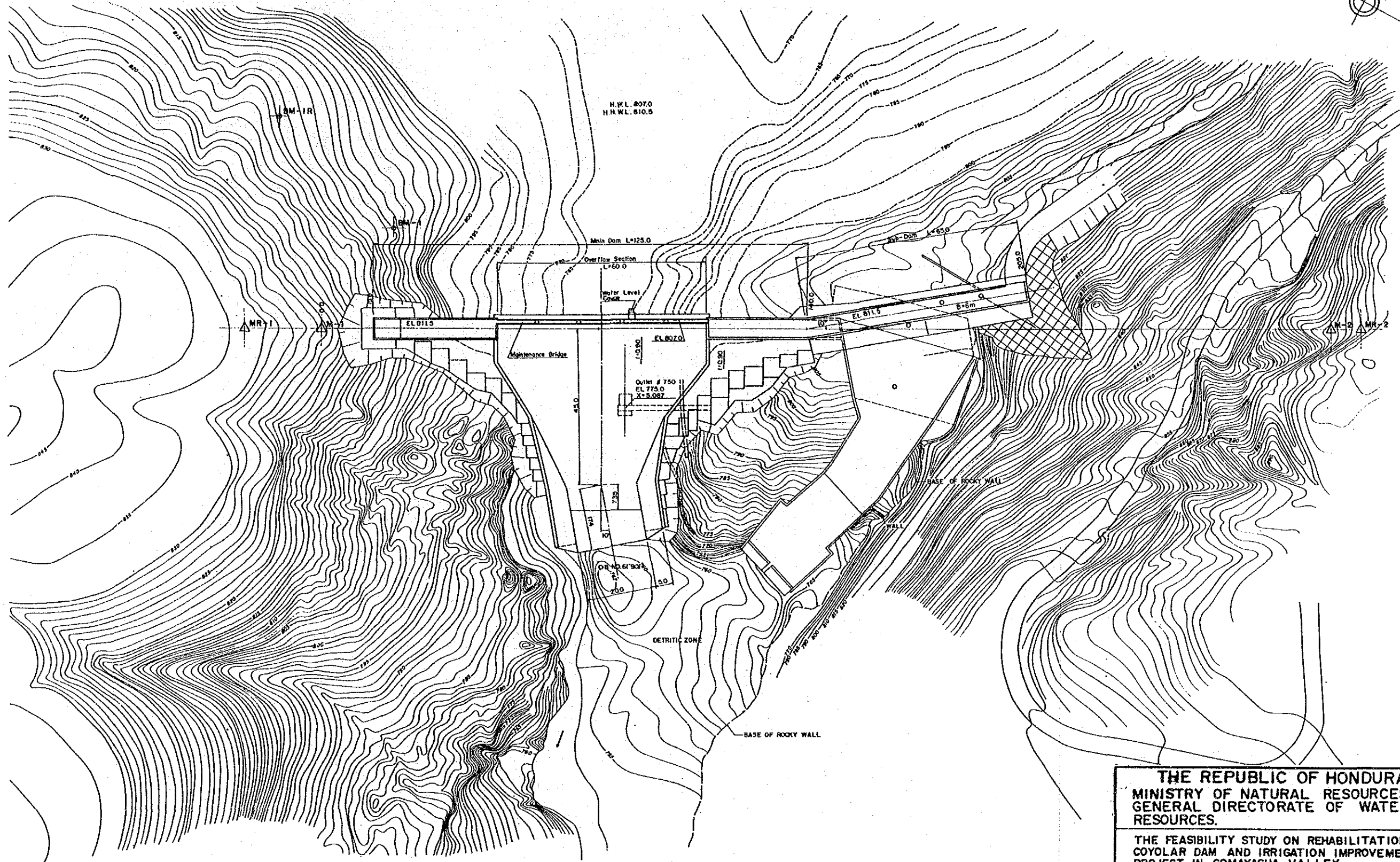
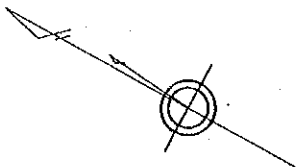
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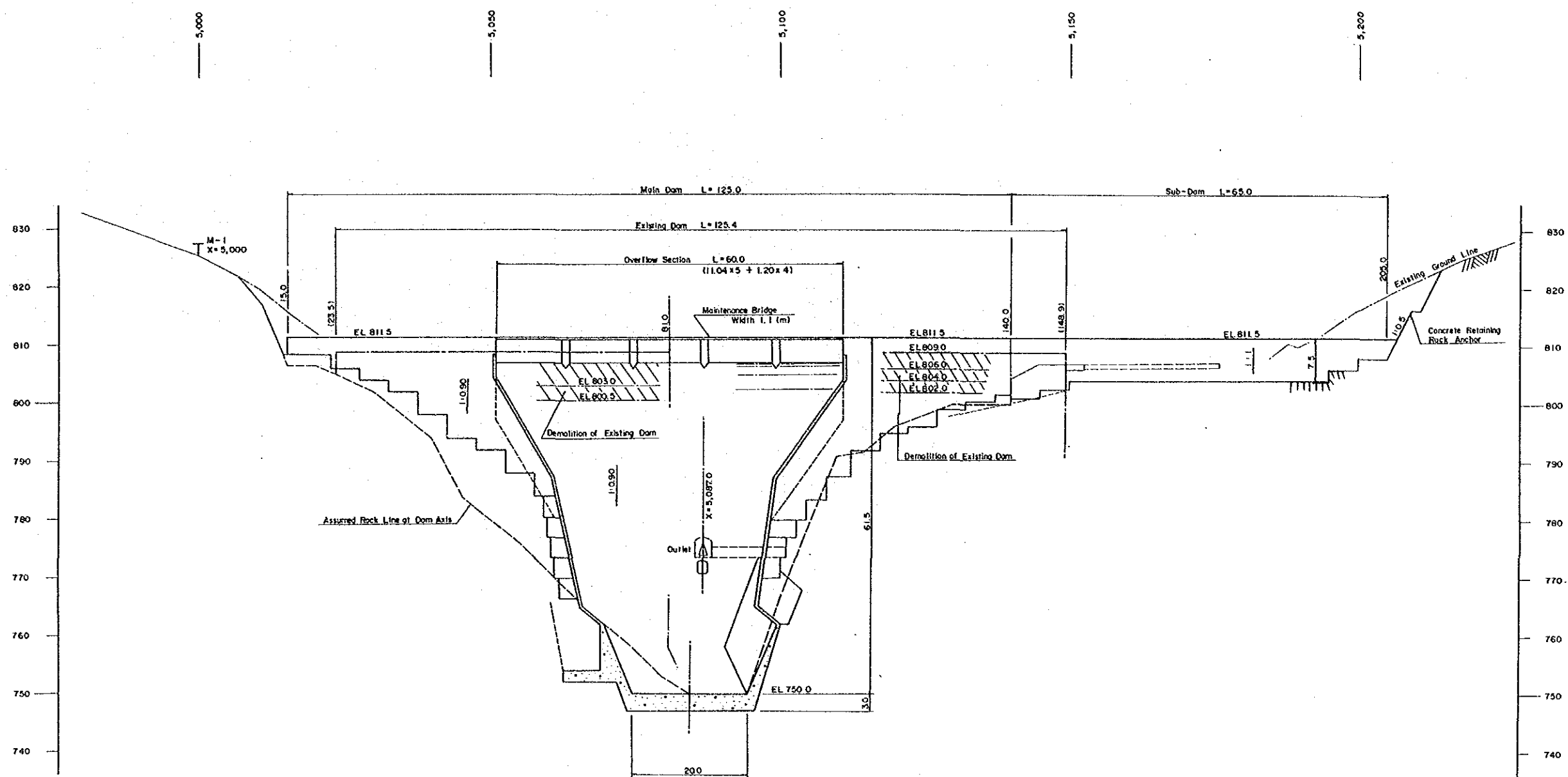
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DAM REHABILITATION PLAN

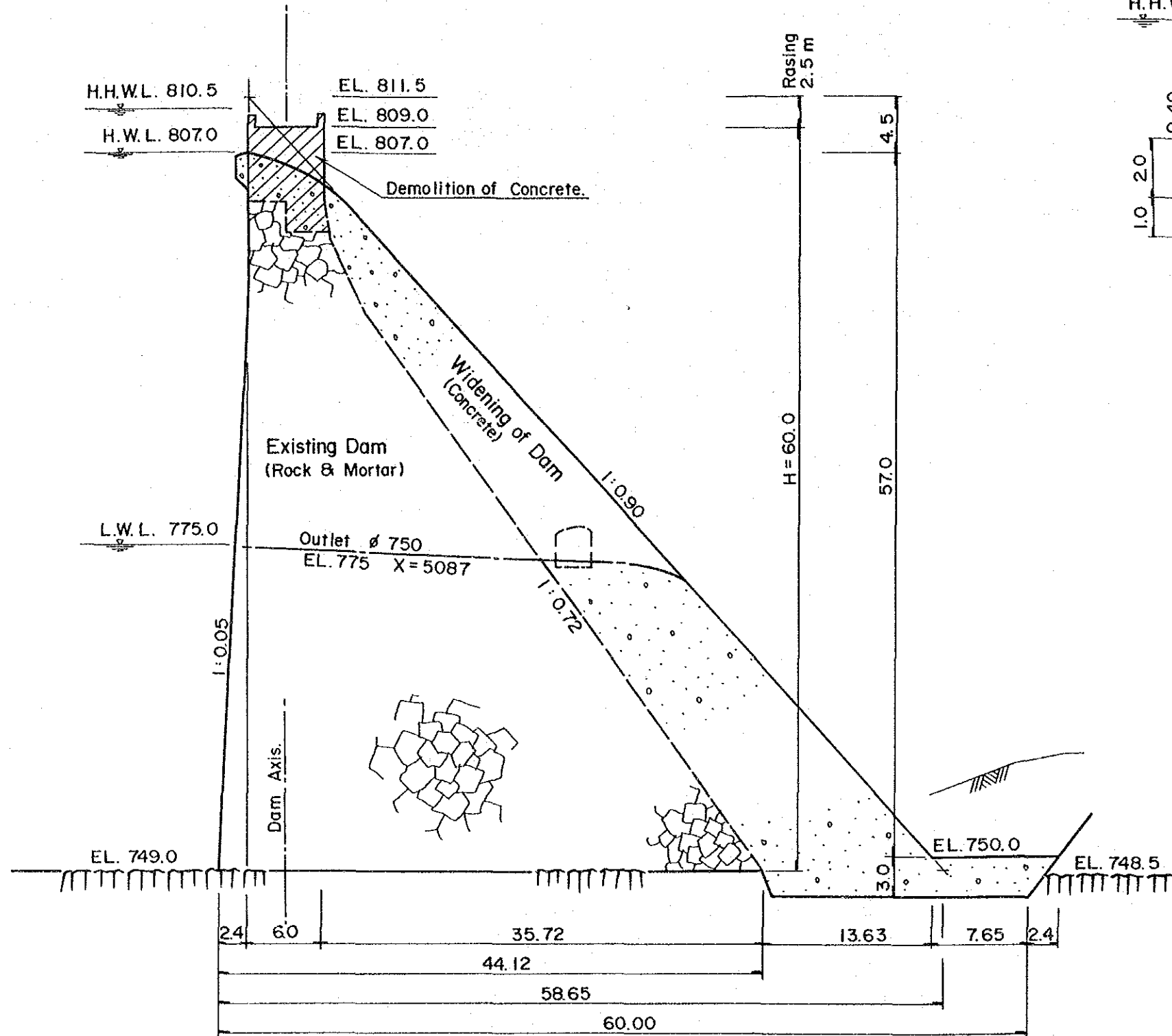
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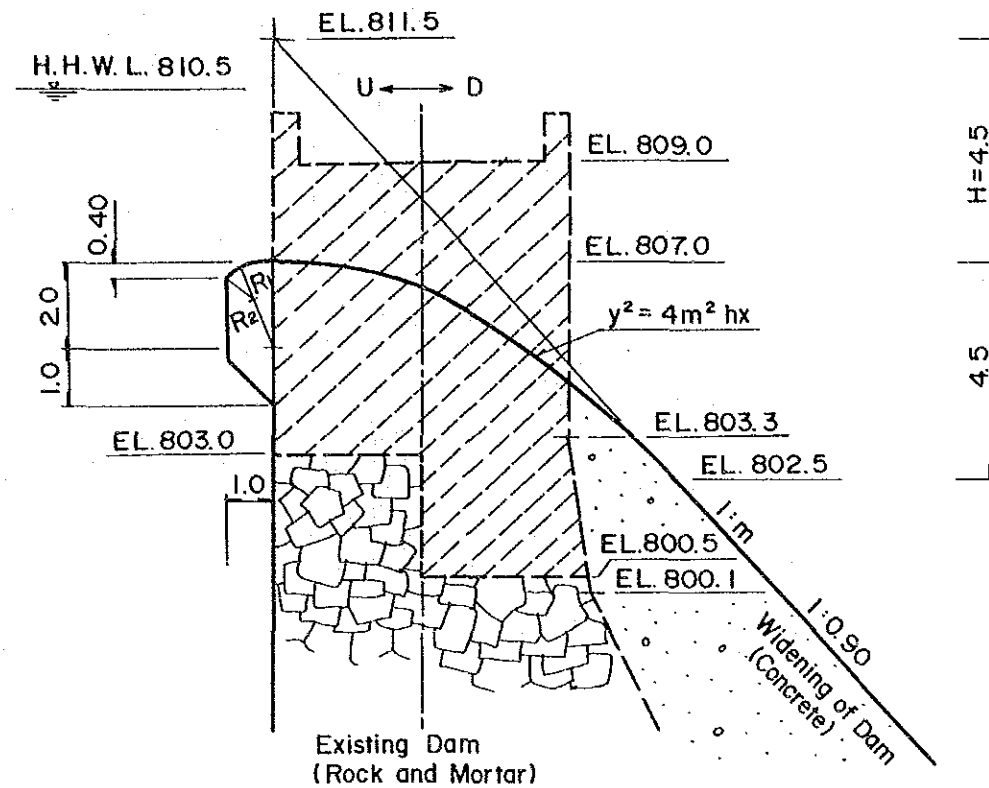


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 DAM REHABILITATION ELEVATION  
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Standard Cross Section of Over-Flow Section



Detail of Spillway Crest



DAM BODY		SPILLWAY CREST (DOWNSTREAM SIDE)			
EL. 797.0	LJ 3.00	EL. 807.00	LJ 3.00	EL. 806.00	D 0.62
803.3	D 3.00	806.90	LJ 1.79	805.50	D 1.68
800.1	D 3.45	806.80	LJ 1.29	804.52	D 3.00
794.1	D 6.25	806.60	LJ 0.59	802.50	D 5.10
SPILLWAY CREST (UPSTREAM SIDE)					
R1 $r = 1.80$ , $\xi = 21.168^\circ$ , $\Delta LJ = 0.650$ , $\Delta H = 0.121$					
R2 $r = 0.75$ , $\xi = 34.701^\circ$ , $\Delta LJ = 0.350$ , $\Delta H = 0.279$					

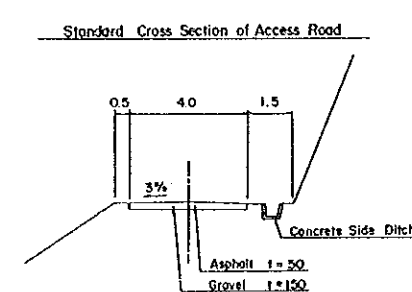
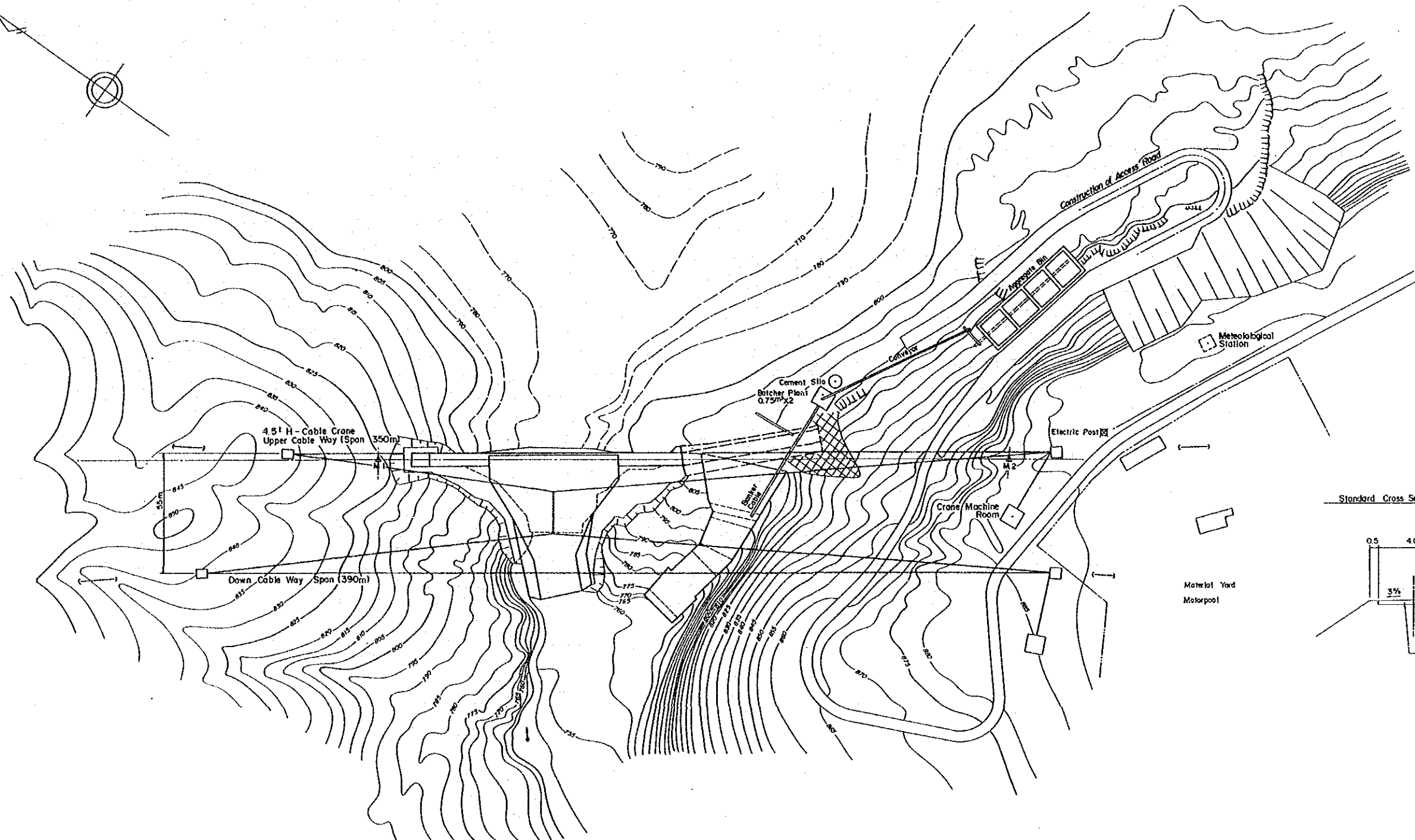
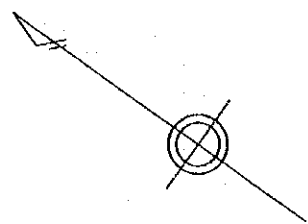
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CROSS SECTION OF DAM REHABILITATION

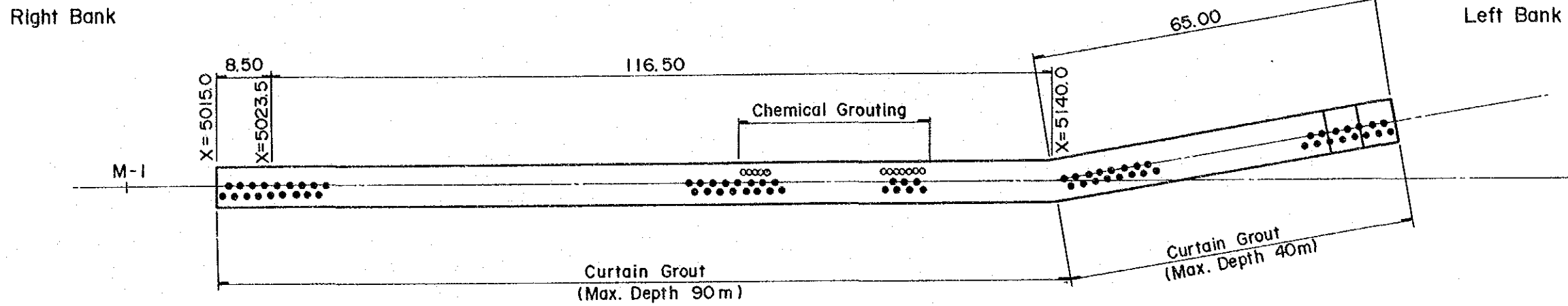
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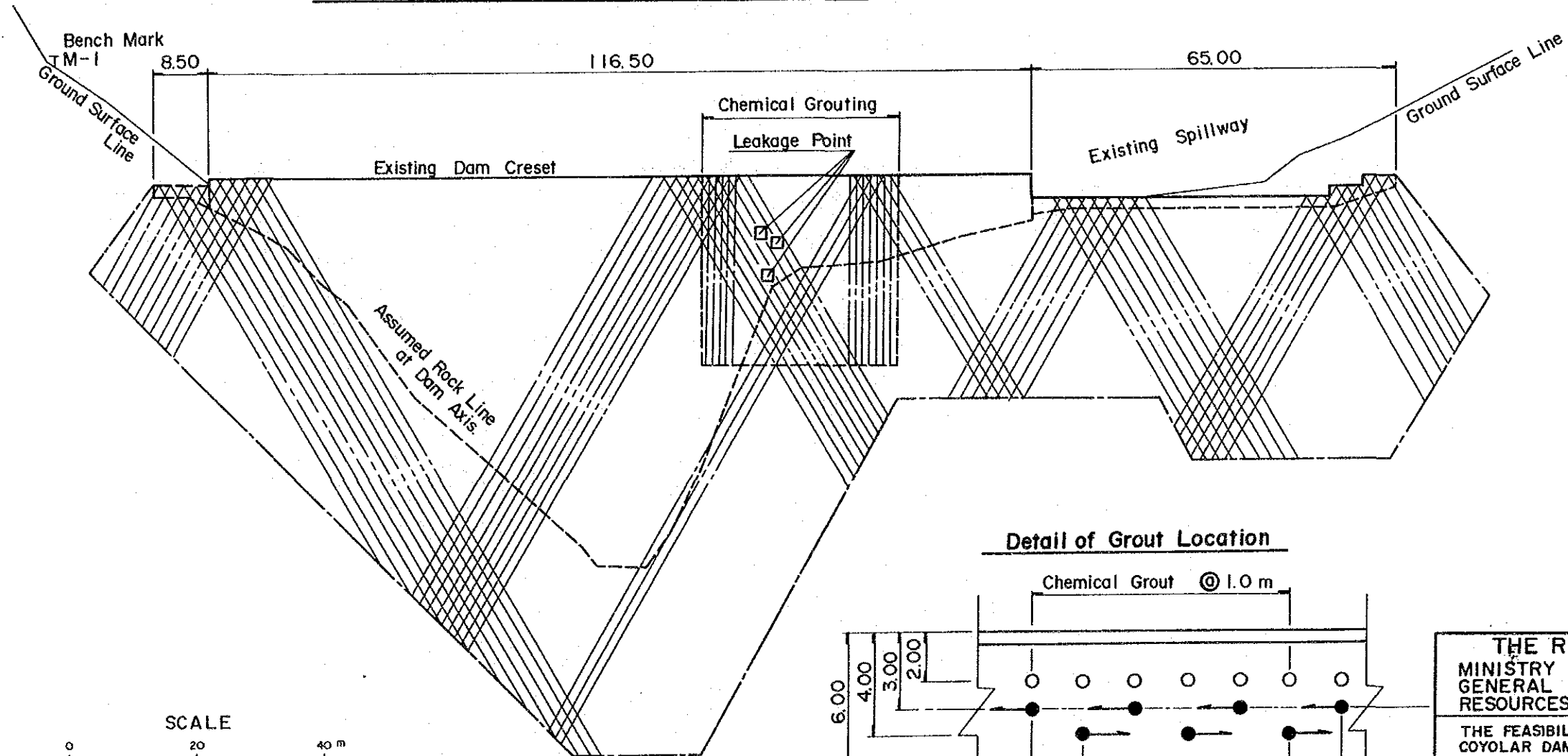


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 PLAN OF TEMPORARY WORKS  
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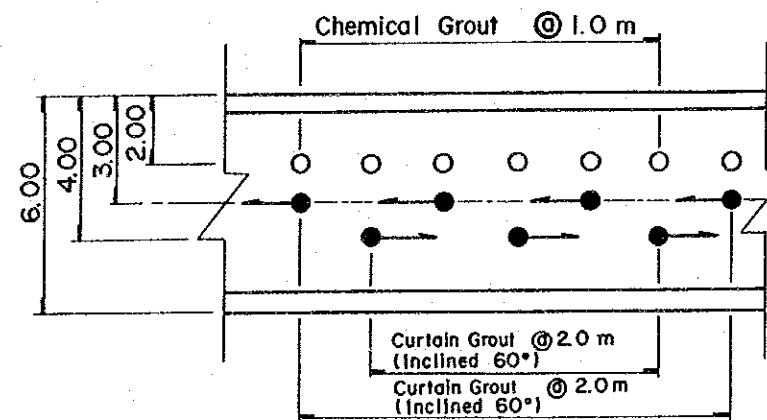
### Grout Location Plan



### Front Elevation From Downstream Side

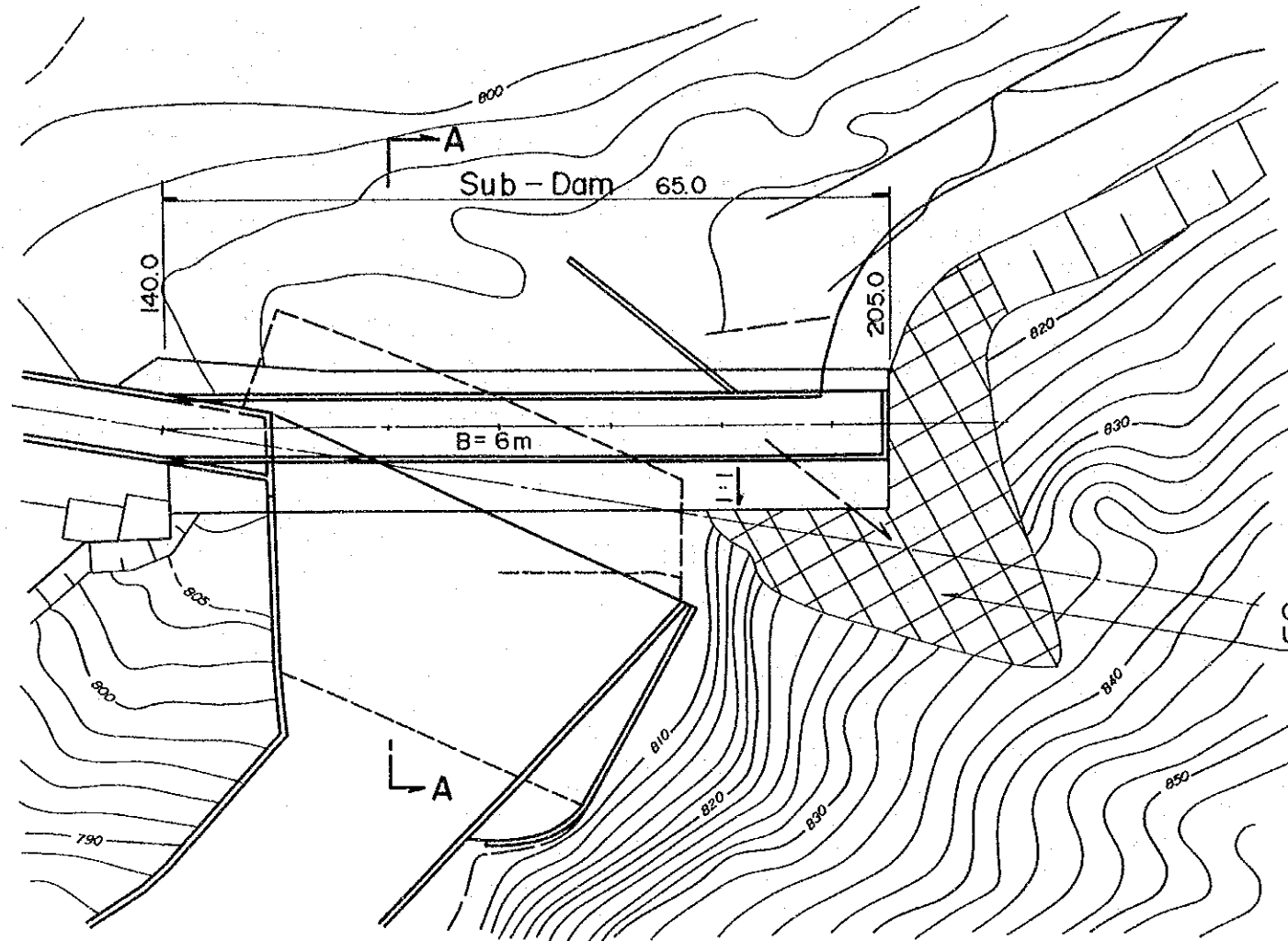


### Detail of Grout Location

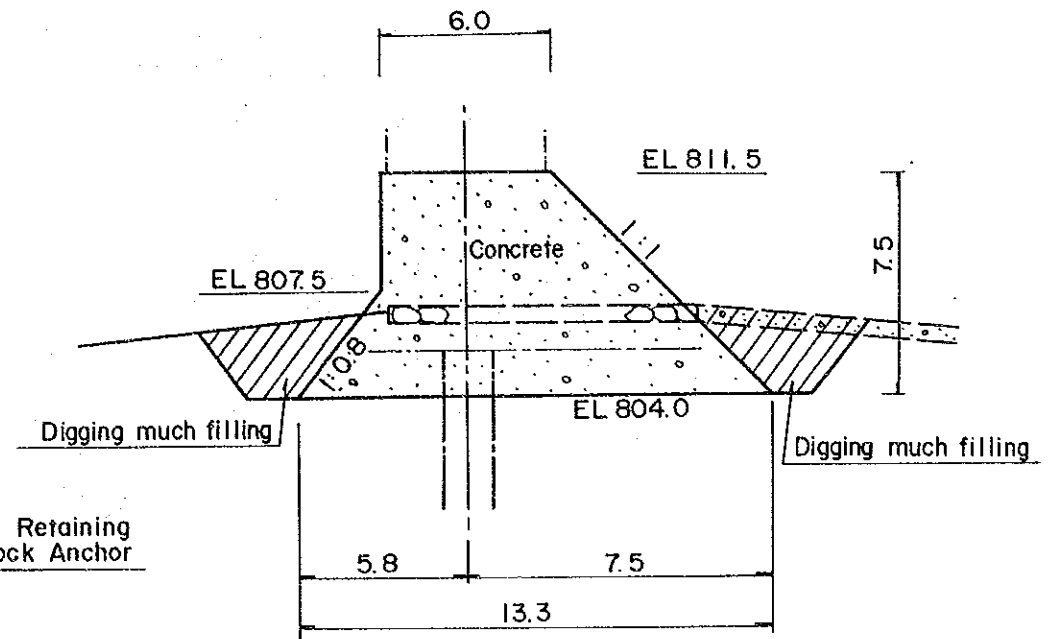


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GROUTING WORK			
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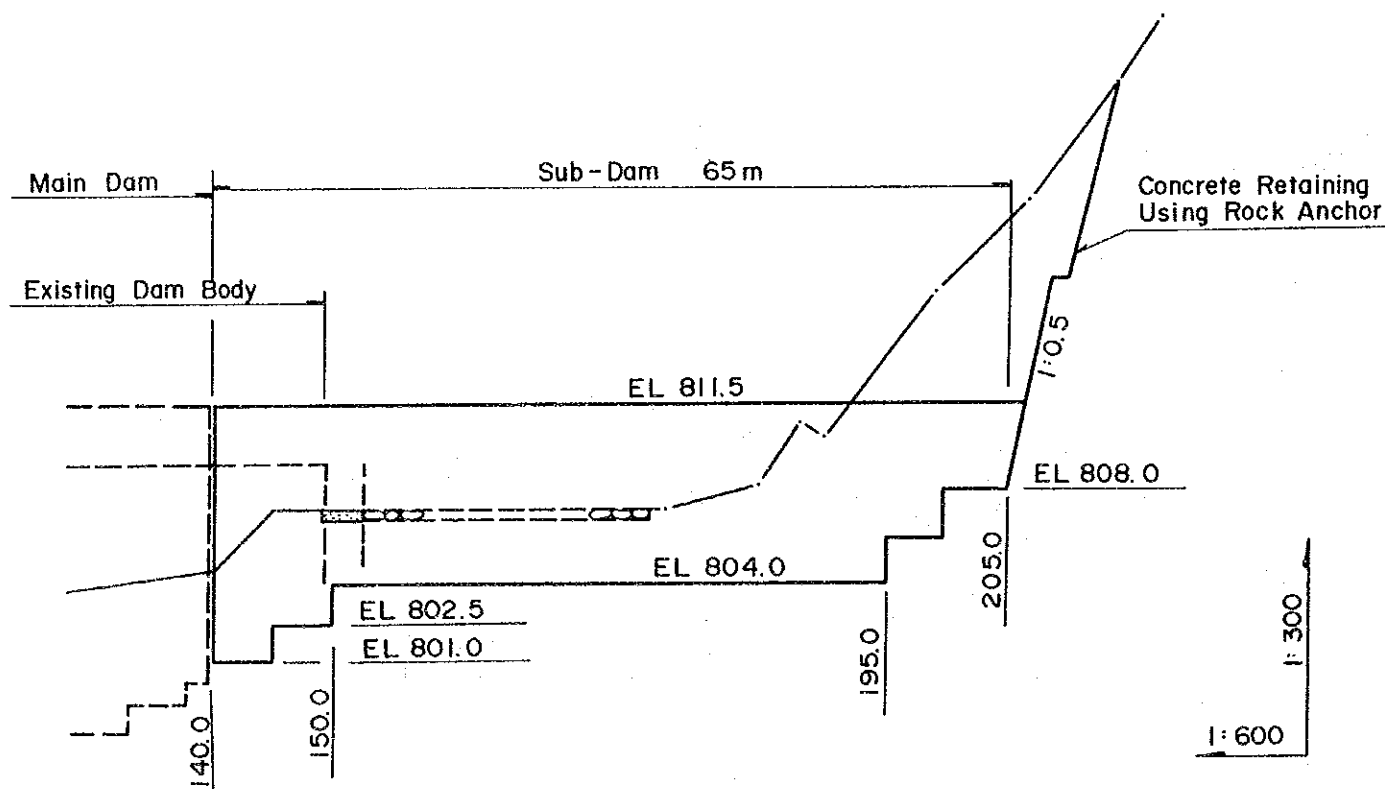
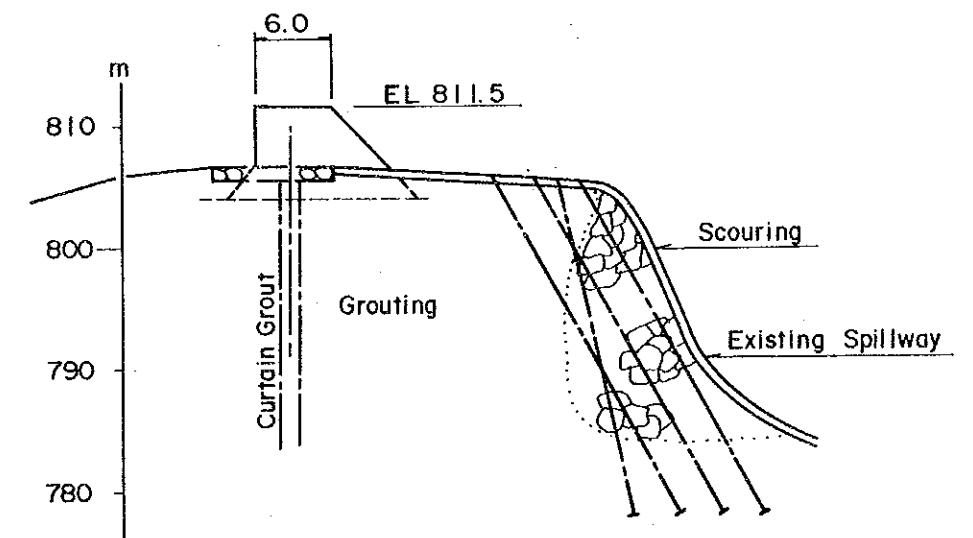
**SUB-DAM**



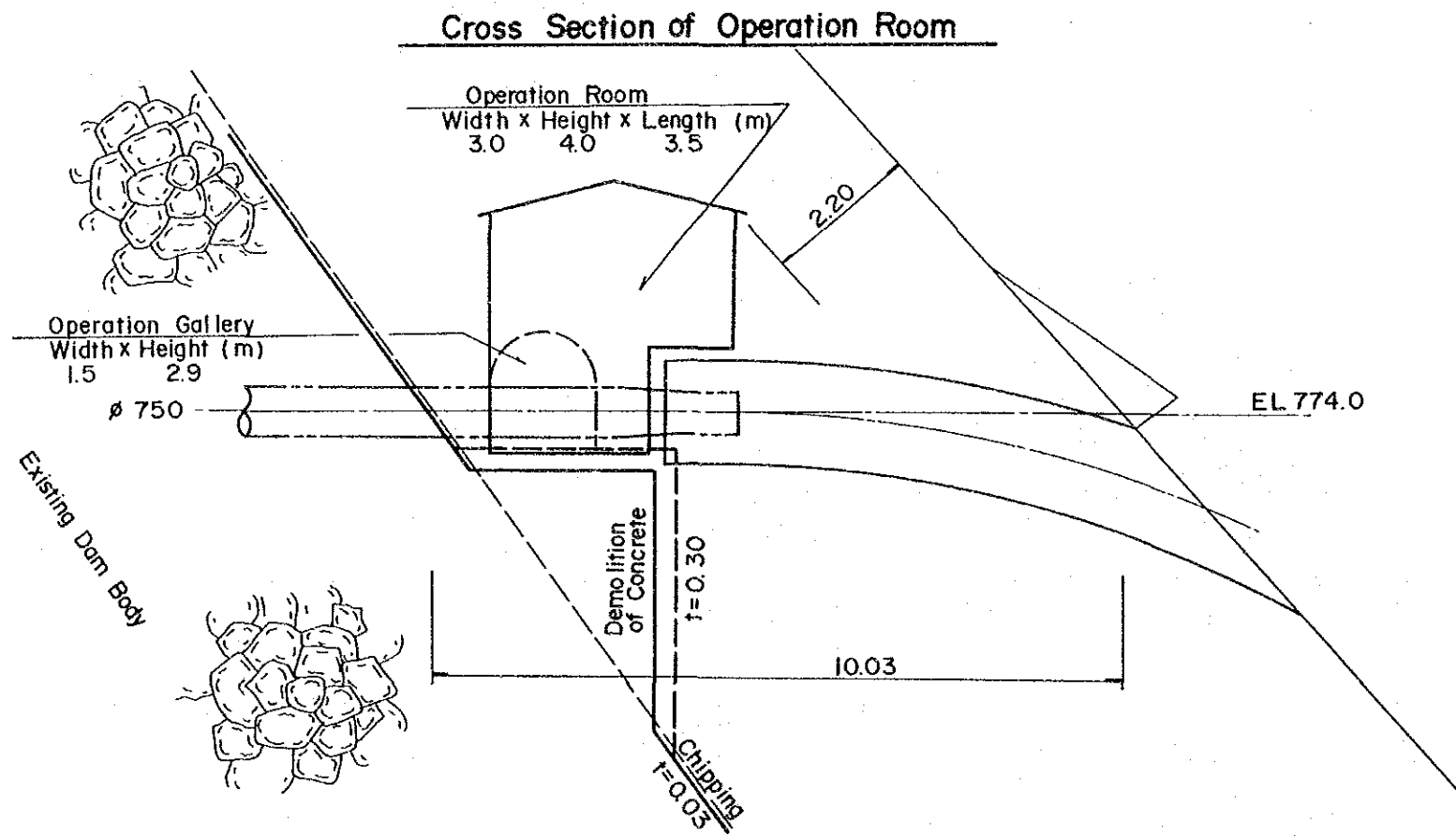
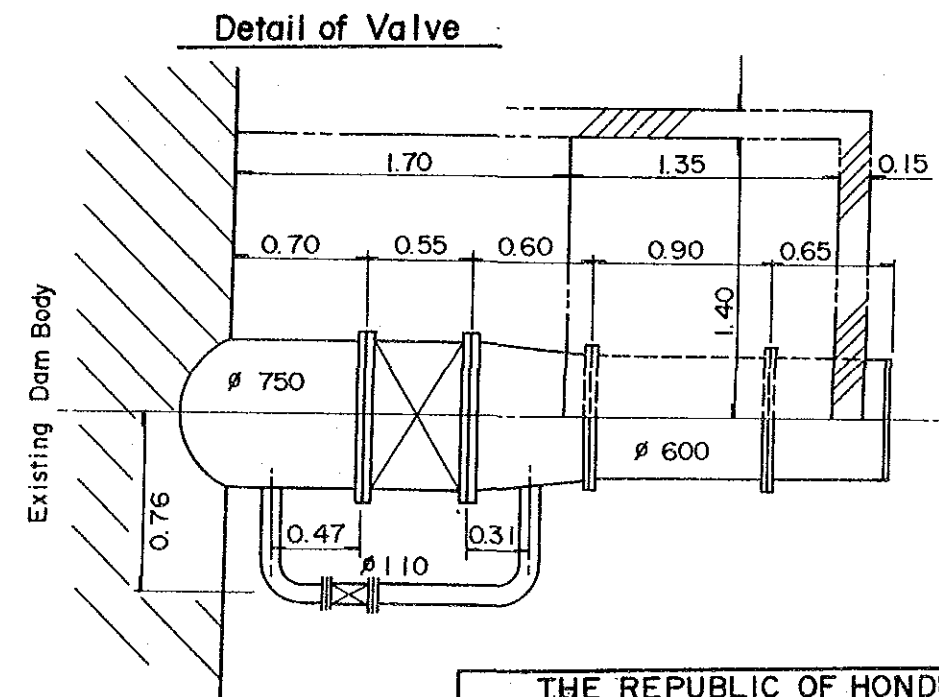
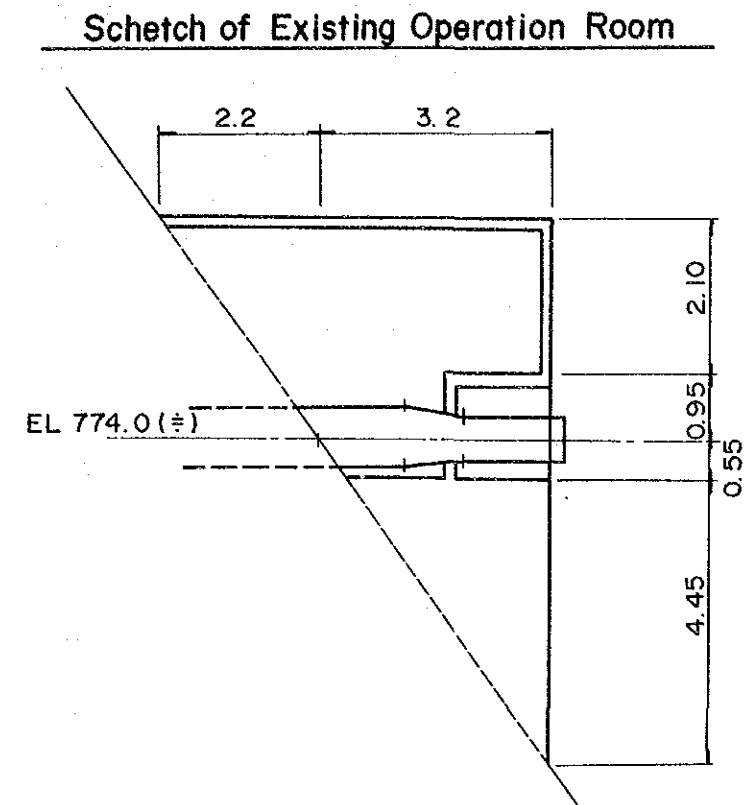
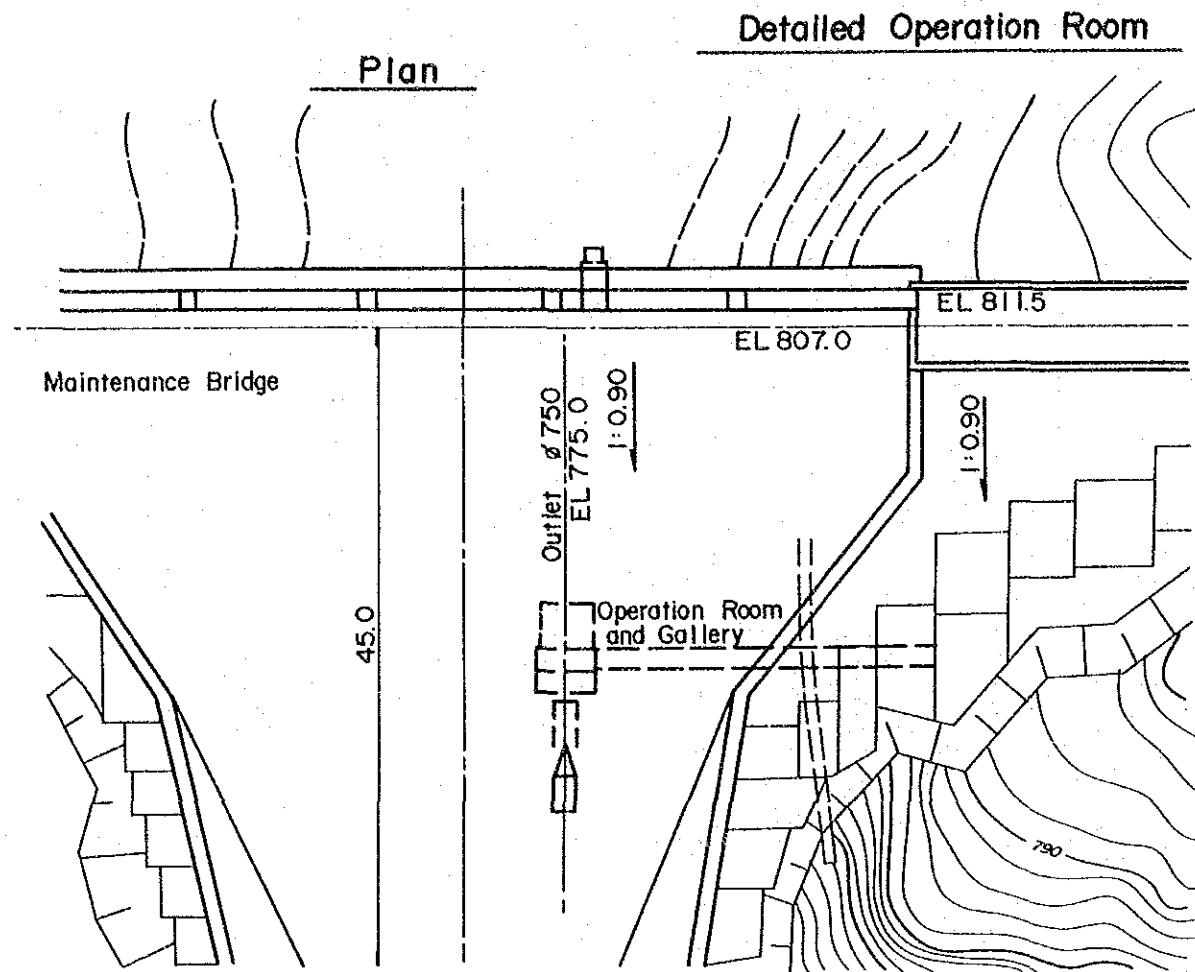
**Sub-dam Standard Cross Section**



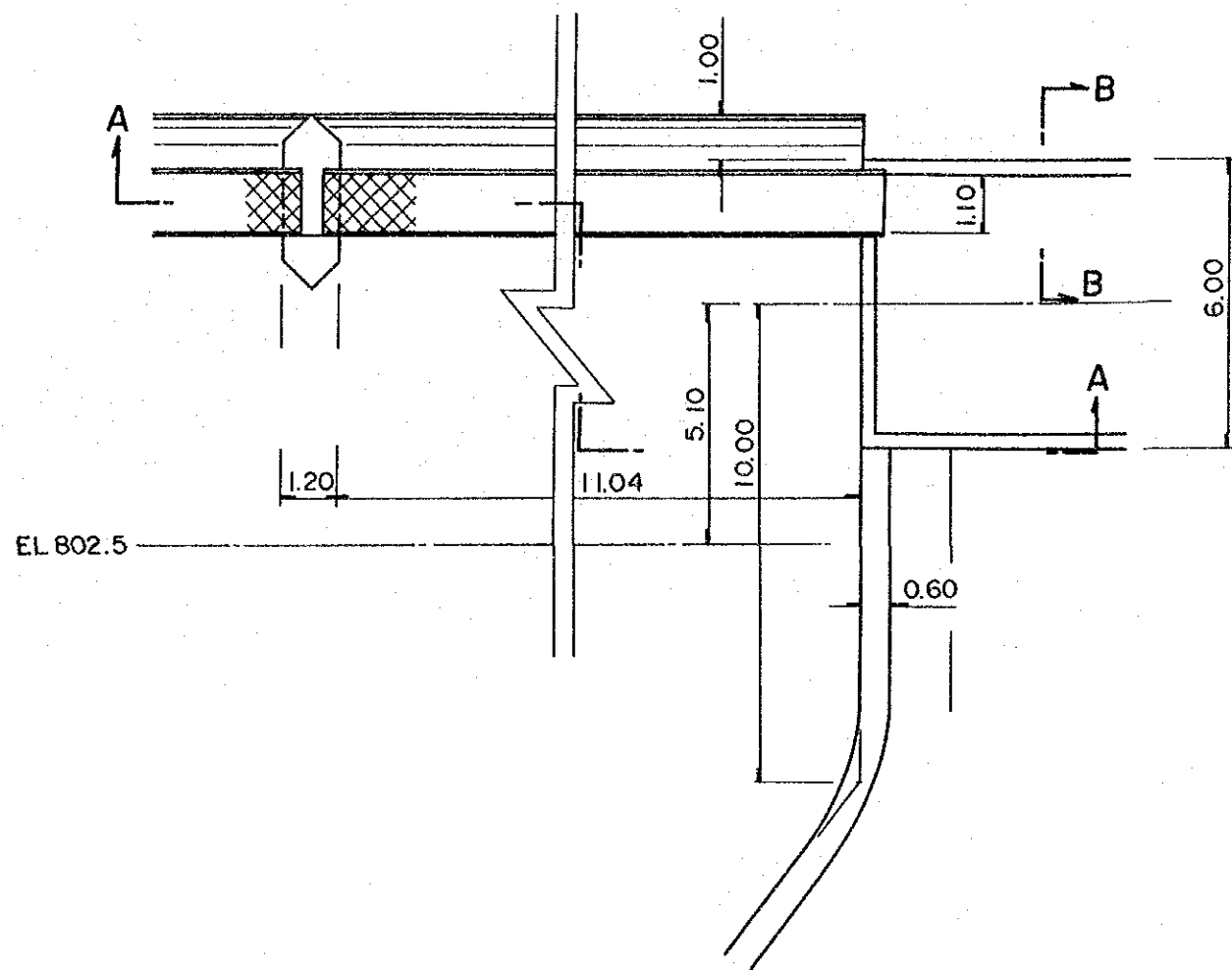
**A-A Section**



THE REPUBLIC OF HONDURAS, MINISTRY OF NATURAL RESOURCES GENERAL DIRECTORATE OF WATER RESOURCES.			
THE FEASIBILITY STUDY ON REHABILITATION OF COYLAR DAM AND IRRIGATION IMPROVEMENT PROJECT IN COMAYAGUA VALLEY.			
SUB-DAM			
DATE	Oct., 1990.	DWG	J.1- 6
JAPAN INTERNATIONAL COOPERATION AGENCY.			

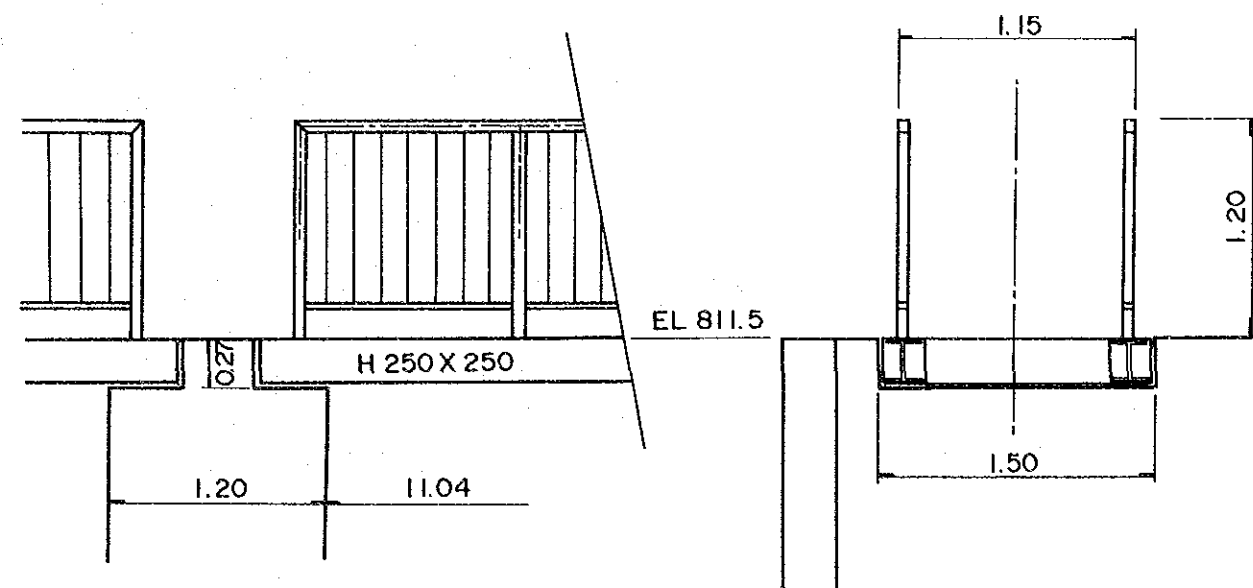


THE REPUBLIC OF HONDURAS. MINISTRY OF NATURAL RESOURCES GENERAL DIRECTORATE OF WATER RESOURCES.			
THE FEASIBILITY STUDY ON REHABILITATION OF COYOLAR DAM AND IRRIGATION IMPROVEMENT PROJECT IN COMAYAGUA VALLEY.			
VALVE OPERATION ROOM			
DATE	Oct., 1990.	DWG	J.1- 7
JAPAN INTERNATIONAL COOPERATION AGENCY.			



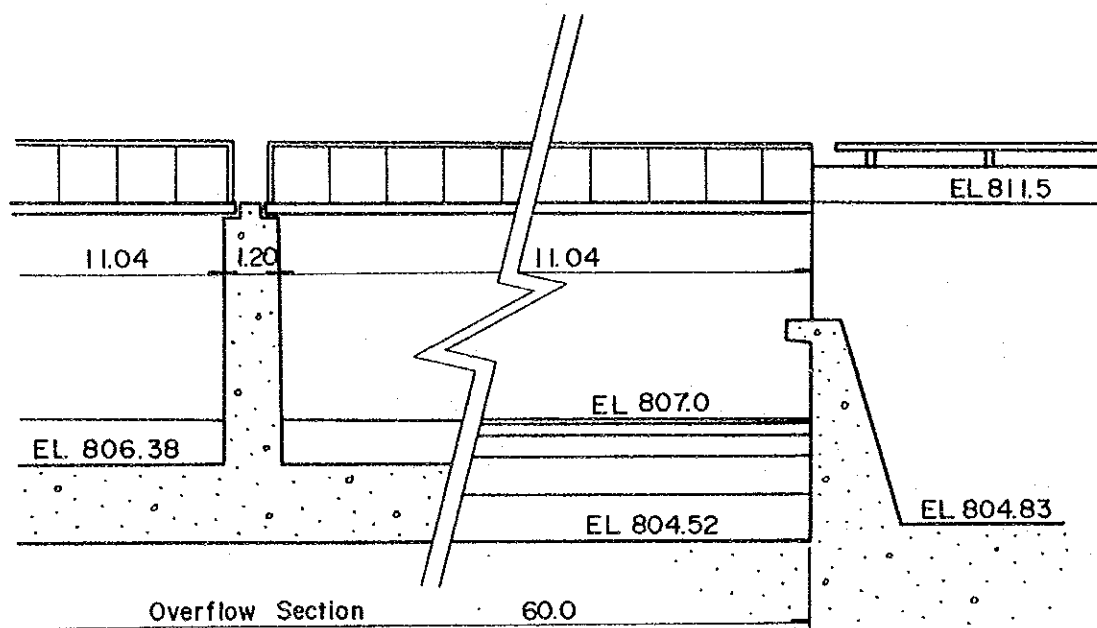
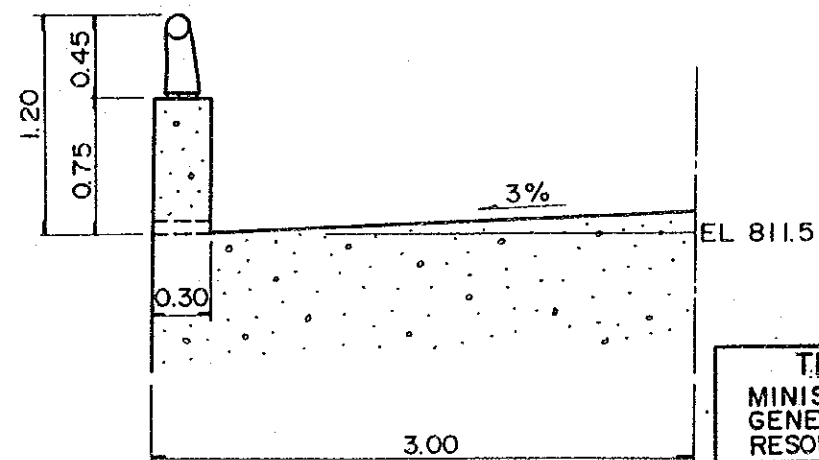
A - A Section

Detail of Maintenance Bridge



B - B Section

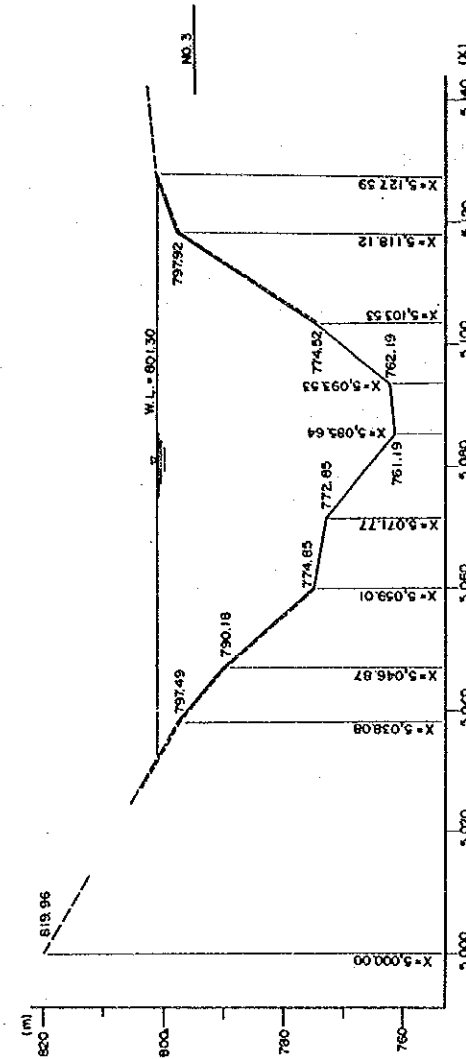
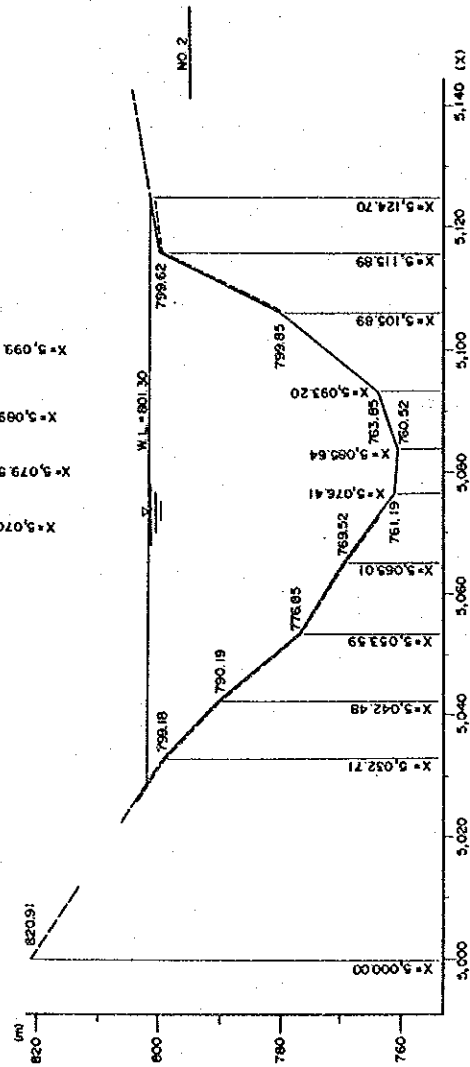
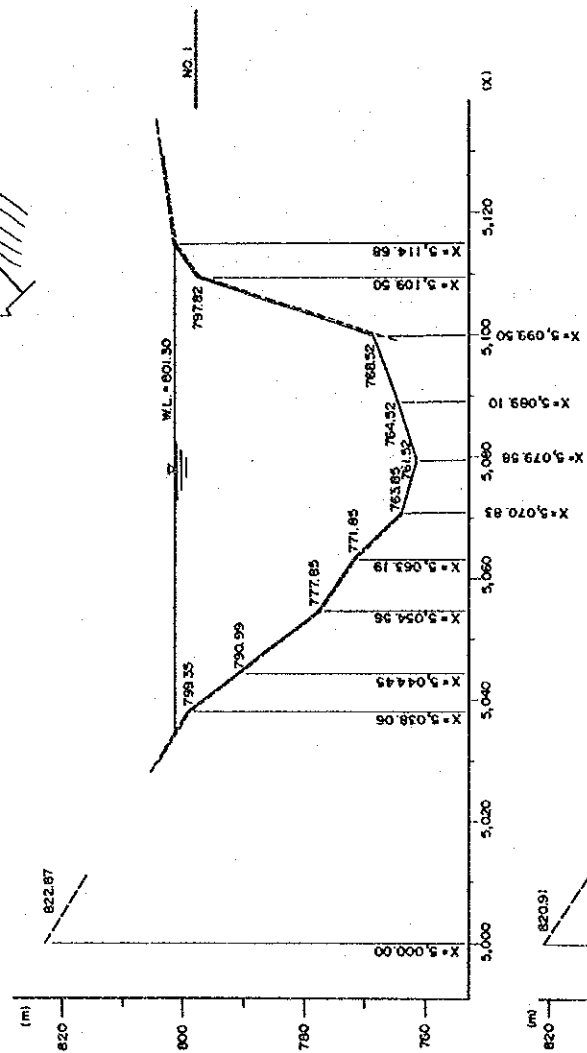
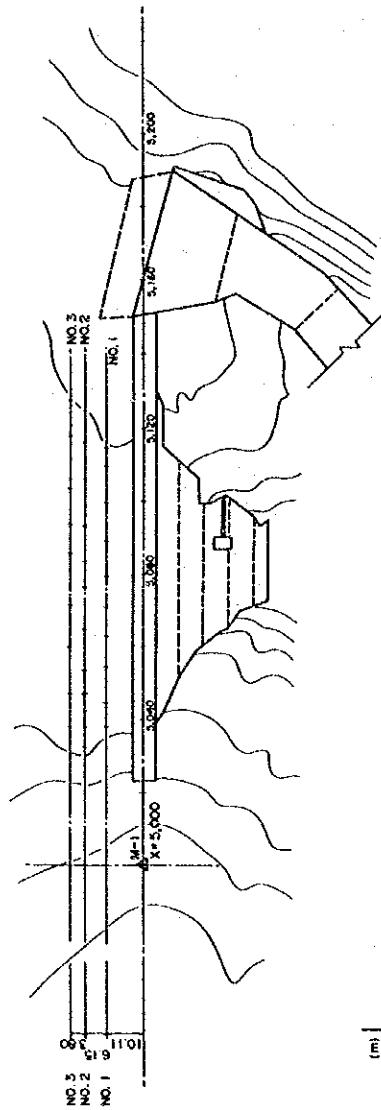
Detail of Handrail



Overflow Section

THE REPUBLIC OF HONDURAS. MINISTRY OF NATURAL RESOURCES GENERAL DIRECTORATE OF WATER RESOURCES.			
THE FEASIBILITY STUDY ON REHABILITATION OF COYOLAR DAM AND IRRIGATION IMPROVEMENT PROJECT IN COMAYAGUA VALLEY.			
MAINTENANCE BRIDGE			
DATE	Oct., 1990.	DWG	J.1- 8
JAPAN INTERNATIONAL COOPERATION AGENCY.			





THE REPUBLIC OF HONDURAS.  
 MINISTRY OF NATURAL RESOURCES  
 GENERAL DIRECTORATE OF WATER RESOURCES.

THE FEASIBILITY STUDY ON REHABILITATION OF  
 COYLAR DAM AND IRRIGATION IMPROVEMENT  
 PROJECT IN COMAYAGUA VALLEY.

RESULTS OF ECHO SOUNDING

DATE	Oct., 1990.	DWG	J.1- 9
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JAPAN INTERNATIONAL COOPERATION AGENCY.