II.2 Alternative II

Gated portion: 12.5H x 12.0W x 6 nos.

Non-gated : 100 m x 2 lanes

FLOOD ROUTING AGOS NO.1 RESERVOIR : CASE 1 (MODIFIED CRITICAL ARRANGEMENT)

INFLOW=PMF BY PMP,RESERVOIR EFFECT ON FLOOD LAG TIME NEGLECTED

H.W.L.=165.0

TIME		INFLOW	SURCHARGE VOLUME	RESERVOIR WATER LEVEL	OUTFLOW		
					NONGATED CREST	GATED CREST	TOTAL
(H.)	(M.)	(C.M.S.)	(M.C.M.)	(M.)	(C.M.S.)	(C.M.S.)	(C.M.S.)
0	0	400.0	22.1	166.07	400.0	0.	400.0
1	0	510.1	22.3	166.08	405.4	0.	405.4
2	0	669.9	22.9	166.11	423.8	0.	423.8
3	0	1090.7	24.5	166.19	470.6	0.	470.6
4	0	1593.3	27.5	166.33	564.9	0.	564.9
5	0	2028.8	31.7	166.54	709.9	0.	709.9
6	0	2391.2	36.8	166.78	899.7	0.	899.7
7	0	2685.2	42.3	167.04	1125.2	0.	1125.2
8	0	2923.6	47.9	167.30	1374.1	0.	1374.1
9	0	3119.8	53.4	167.56	1635.6	0.	1635.6
10	0	3284.0	58.5	167.80	1898.2	0.	1898.2
11	0	3425.9	63.3	168.02	2154.7	0.	2154.7
12	0	3548.9	67.7	168.23	2398.9	0.	2398.9
13	0	3663.3	71.6	168.41	2627.5	0.	2627.5
14	0	3766.5	75.1	168.57	2839.6	0.	2839.6
15	0	3874.3	78.3	168.72	3035.5	0.	3035.5
16	0	3975.7	81.2	168.85	3217.0	0.	3217.0
17	0	4062.3	83.7	168.97	3383.4	0.	3383.4
18	0	4144.4	86.1	169.07	3535.2	0.	3535.2
19	0	4219.1	88.1	169.17	3673.4	0.	3673.4
20	0	4302.5	90.0	169.25	3800.5	0.	3800.5
21	0	4383.4	91.7	169.33	3919.0	0.	3919.0
22	0	4452.8	93.3	169.40	4028.9	0.	4028.9
23	0	4520.1	94.8	169.47	4130.8	0.	4130.8
24	0	4596.9	94.3	169.45	4096.8	1090.9	5187.6
25	0	4703.8	92.6	169.37	3979.7	1080.9	5060.6
26	0	4863.0	91.8	169.33	3920.2	1075.9	4996.1
27	0	5073.7	91.7	169.33	3915.1	1075.4	4990.6
28	0	5311.4	92.4	169.36	3960.1	1079.3	5039.4
29	0	5577.0	93.6	169.42	4049.7	1086.8	5136.5
30	0	5836.2	95.5	169.50	4176.5	2194.5	6371.0
31	0	6108.9	94.2	169.44	4090.8	2180.4	6271.2
32	0	6404.0	94.2	169.44	4089.0	2180.2	6269.2
33	0	6713.9	95.1	169.49	4153.8	2190.9	6344.7

TIME (H.)	(M.)	INFLOW (C.M.S.)	SURCHARGE VOLUME (M.C.M.)	RESERVOIR WATER LEVEL (M.)	OUTFLOW NONGATED CREST (C.M.S.)	GATED CREST (C.M.S.)	TOTAL (C.M.S.)
34	0	7010.6	94.1	169.44	4083.0	3268.5	7351.5
35	0	7283.9	93.5	169.41	4040.6	3257.6	7298.2
36	0	7519.9	93.9	169.43	4064.1	3263.7	7327.8
37	0	7716.6	94.8	169.47	4127.7	3279.8	7407.5
38	0	7881.6	95.0	169.48	4146.8	4379.3	8526.1
39	0	8021.5	93.3	169.40	4025.1	4338.1	8363.2
40	0	8170.6	92.5	169.37	3969.3	4319.4	8288.8
41	0	8344.3	92.4	169.36	3963.7	4317.5	8281.2
42	0	8685.6	93.1	169.40	4015.0	4334.7	8349.8
43	0	9146.2	94.9	169.48	4138.2	4376.5	8514.7
44	0	9827.4	95.3	169.49	4167.0	5482.4	9649.4
45	0	10562.0	94.4	169.45	4105.5	6548.2	10653.6
46	0	11239.7	95.2	169.49	4161.6	6576.2	10737.8
47	0	12029.7	98.0	169.62	4356.5	6673.6	11030.1
48	0	13123.8	102.7	169.83	4697.6	6840.7	11538.2
49	0	14167.8	109.1	170.11	5172.1	7066.7	12238.8
50	0	15450.5	116.8	170.46	5769.5	7342.4	13111.9
51	0	15733.4	124.2	170.79	6356.8	7604.6	13961.4
52	0	15244.1	128.6	170.98	6721.2	7763.7	14484.8
53	0	14422.9	129.5	171.02	6799.4	7797.5	14596.8
54	0	13342.5	127.3	170.93	6617.2	7718.6	14335.9
55	0	11974.4	122.3	170.70	6204.6	7537.3	13741.9
56	0	10701.6	115.1	170.38	5632.5	7279.9	12912.5
57	0	9672.7	106.9	170.02	5007.8	6989.2	11997.0
58	0	8847.0	98.7	169.65	4405.0	6697.7	11102.7
59	0	8170.2	90.9	169.29	3857.4	6421.4	10278.8
60	0	7611.9	83.6	168.96	3374.7	6167.6	9542.3
61	0	7128.3	77.0	168.66	2954.5	5936.6	8891.1
62	0	6702.6	70.9	168.38	2588.8	5726.6	8315.4
63	0	6333.7	65.4	168.12	2270.7	5535.7	7806.4
64	0	6000.3	60.3	167.89	1993.2	5361.7	7354.8
65	0	5707.9	55.6	167.67	1750.3	5202.7	6953.1
66	0	5458.6	51.4	167.47	1538.6	5057.7	6596.3
67	0	5239.3	47.5	167.28	1354.4	4925.6	6280.0
68	0	5046.0	43.9	167.11	1193.8	4805.4	5999.2

TIME (H.)	(M.)	INFLOW (C.M.S.)	SURCHARGE VOLUME (M.C.M.)	RESERVOIR WATER LEVEL (M.)	OUTFLOW NONGATED CREST (C.M.S.)	GATED CREST (C.M.S.)	TOTAL (C.M.S.)
69	0	4859.9	40.6	166.96	1052.6	4695.1	5747.7
70	0	4688.4	37.5	166.81	927.1	4592.1	5519.3
71	0	4538.8	34.6	166.67	815.6	4496.9	5312.5
72	0	4406.8	31.9	166.55	717.0	4408.6	5125.6
73	0	4282.9	29.4	166.43	629.5	4326.4	4955.9
74	0	4169.6	27.1	166.31	551.6	4249.6	4801.2
75	0	4043.8	24.8	166.21	481.0	4176.5	4657.5
76	0	3921.1	22.7	166.10	415.8	4105.5	4521.3
77	0	3796.0	20.5	166.00	355.2	4036.0	4391.2
78	0	3671.9	18.4	165.89	298.6	3967.1	4265.8
79	0	3561.4	16.2	165.79	246.4	3899.2	4145.6
80	0	3448.1	14.1	165.69	198.5	3832.2	4030.6
81	0	3342.3	12.1	165.59	154.8	3765.7	3920.5
82	0	3252.0	10.0	165.49	115.9	3700.6	3816.5
83	0	3174.4	8.0	165.39	82.2	3637.6	3719.8
84	0	3100.0	6.1	165.30	53.8	3576.7	3630.4
85	0	3031.4	4.2	165.21	30.5	3517.8	3548.3
86	0	2953.4	2.3	165.11	12.5	3459.9	3472.4
87	0	2877.4	0.4	165.02	1.0	3402.4	3403.4
88	0	2804.9	-1.5	164.93	0.	3334.9	3334.9
89	0	2738.9	-3.4	164.84	0.	3266.3	3266.3
90	0	2664.0	-5.3	164.74	0.	3197.5	3197.5
91	0	2591.5	-7.2	164.65	0.	3128.1	3128.1
92	0	2530.2	-9.1	164.55	0.	3059.0	3059.0
93	0	2470.8	-10.9	164.46	0.	2991.0	2991.0
94	0	2415.9	-12.8	164.37	0.	2924.3	2924.3
95	0	2350.6	-14.6	164.28	0.	2858.4	2858.4
96	0	2278.9	-16.4	164.19	0.	2792.1	2792.1
97	0	2177.6	-18.3	164.10	0.	2723.4	2723.4
98	0	2053.7	-20.3	164.00	0.	2649.3	2649.3
99	0	1848.8	-22.6	163.88	0.	2564.1	2564.1
100	0	1634.7	-25.3	163.74	0.	2463.8	2463.8
101	0	1459.3	-28.3	163.59	0.	2352.0	2352.0
102	0	1315.4	-31.5	163.43	0.	2234.5	2234.5
103	0	1196.8	-34.7	163.27	0.	2115.3	2115.3

TIME (H.)	(M.)	INFLOW (C.M.S.)	SURCHARGE VOLUME (M.C.M.)	RESERVOIR WATER LEVEL (M.)	OUTFLOW NONGATED CREST (C.M.S.)	GATED CREST (C.M.S.)	TOTAL (C.M.S.)
104	0	1098.8	-37.9	163.11	0.	1997.4	1997.4
105	0	1016.5	-41.0	162.95	0.	1883.0	1883.0
106	0	946.2	-43.9	162.80	0.	1773.2	1773.2
107	0	884.8	-46.7	162.66	0.	1668.8	1668.8
108	0	831.1	-49.3	162.53	0.	1570.0	1570.0

II.3 Alternative III

Gated portion: 12.5H x 12.0W x 6 nos.

Non-gated : 185 m x 2 lanes

FLOOD ROUTING AGOS NO.1 RESERVOIR : CASE 11

INFLOW=PME (WITH AGOS NO.1)

H.W.L.=165.0

TIME (H.)	(M.)	INFLOW (C.M.S.)	SURCHARGE VOLUME (M.C.M.)	RESERVOIR WATER LEVEL (M.)	OUTFLOW NONGATED CREST (C.M.S.)	GATED CREST (C.M.S.)	TOTAL (C.M.S.)
0	0	400.0	15.1	165.74	400.0	0.	400.0
1	0	579.0	15.4	165.75	412.2	0.	412.2
2	0	1106.0	16.9	165.82	473.4	0.	473.4
3	0	1761.0	20.1	165.98	621.7	0.	621.7
4	0	2295.0	24.8	166.20	862.0	0.	862.0
5	0	2712.0	30.1	166.46	1178.7	0.	1178.7
6	0	3025.0	35.6	166.72	1536.8	0.	1536.8
7	0	3271.0	40.7	166.96	1906.1	0.	1906.1
8	0	3469.0	45.3	167.18	2264.4	0.	2264.4
9	0	3631.0	49.3	167.37	2596.5	0.	2596.5
10	0	3766.0	52.8	167.53	2893.6	0.	2893.6
11	0	3876.0	55.6	167.67	3151.1	0.	3151.1
12	0	3968.0	58.0	167.78	3369.3	0.	3369.3
13	0	4058.0	60.0	167.87	3557.1	0.	3557.1
14	0	4158.0	61.7	167.95	3719.4	0.	3719.4
15	0	4255.0	62.2	167.97	3771.8	1082.3	4854.1
16	0	4334.0	60.5	167.90	3608.8	1073.6	4682.4
17	0	4400.0	59.6	167.85	3518.4	1067.4	4585.8
18	0	4467.0	59.1	167.83	3475.4	1064.1	4539.5
19	0	4546.0	59.0	167.83	3466.6	1063.4	4530.0
20	0	4627.0	59.2	167.83	3483.4	1064.7	4548.1
21	0	4690.0	59.6	167.85	3515.5	1067.2	4582.7
22	0	4742.0	60.0	167.87	3554.2	1070.0	4624.2
23	0	4796.0	60.4	167.89	3596.5	1072.8	4669.3
24	0	4888.0	60.9	167.91	3647.4	1075.9	4723.3
25	0	5050.0	61.7	167.95	3720.6	1079.9	4800.5
26	0	5280.0	62.8	168.00	3830.2	2169.4	5999.6
27	0	5559.0	61.1	167.92	3663.6	2151.4	5815.0
28	0	5852.0	60.8	167.91	3634.6	2147.9	5782.5
29	0	6128.0	61.4	167.94	3696.9	2155.3	5852.2
30	0	6414.0	62.7	168.00	3821.7	2168.5	5990.2
31	0	6739.0	62.0	167.96	3747.3	3240.5	6987.8
32	0	7082.0	61.8	167.95	3728.2	3237.3	6965.4
33	0	7415.0	62.6	167.99	3813.2	3251.3	7064.5

TIME		INFLOW	SURCHARGE VOLUME	RESERVOIR WATER LEVEL	OUTFLOW		
					NONGATED CREST	GATED CREST	TOTAL
(H.)	(M.)	(C.M.S.)	(M.C.M.)	(M.)	(C.M.S.)	(C.M.S.)	(C.M.S.)
34	0	7713.0	61.6	167.95	3714.3	4312.5	8026.8
35	0	7959.0	61.1	167.92	3662.5	4300.2	7962.7
36	0	8154.0	61.4	167.93	3690.9	4307.0	7998.0
37	0	8309.0	62.1	167.97	3759.0	4322.9	8081.8
38	0	8436.0	62.9	168.01	3843.7	5427.9	9271.6
39	0	8542.0	60.7	167.90	3623.9	5362.9	8986.8
40	0	8678.0	59.6	167.85	3520.7	5330.4	8851.0
41	0	8937.0	59.5	167.85	3511.2	5327.3	8838.5
42	0	9467.0	60.6	167.90	3617.1	5360.9	8978.0
43	0	10298.0	63.3	168.03	3881.1	6527.7	10408.9
44	0	11161.0	64.3	168.07	3981.1	6564.9	10546.1
45	0	11879.0	67.2	168.20	4269.9	6665.0	10935.0
46	0	12611.0	71.0	168.38	4664.9	6801.7	11466.6
47	0	13624.0	75.7	168.60	5179.8	6972.1	12151.9
48	0	15299.0	82.4	168.90	5930.8	7214.0	13144.7
49	0	16960.0	90.8	169.29	6939.9	7520.0	14459.9
50	0	17291.0	98.2	169.62	7861.3	7785.1	15646.4
51	0	16539.0	101.5	169.77	8295.4	7907.0	16202.4
52	0	15496.0	100.9	169.74	8212.6	7884.7	16097.2
53	0	14018.0	97.0	169.57	7719.2	7744.9	15464.1
54	0	12241.0	90.5	169.27	6894.1	7506.3	14400.4
55	0	10620.0	82.1	168.89	5895.8	7203.0	13098.8
56	0	9382.0	73.3	168.49	4912.8	6886.4	11799.2
57	0	8426.0	65.0	168.10	4048.6	6589.3	10637.9
58	0	7687.0	57.5	167.76	3325.8	6322.2	9647.9
59	0	7088.0	50.9	167.45	2732.2	6087.7	8819.9
60	0	6583.0	45.1	167.17	2244.3	5880.2	8124.4
61	0	6156.0	39.8	166.92	1840.5	5697.4	7537.9
62	0	5794.0	35.1	166.70	1505.0	5533.1	7038.1
63	0	5478.0	30.9	166.50	1224.6	5385.0	6609.6
64	0	5202.0	27.0	166.31	988.7	5250.4	6239.1
65	0	4970.0	23.5	166.14	790.3	5127.3	5917.7
66	0	4776.0	20.2	165.98	624.6	5014.0	5638.6
67	0	4600.0	17.2	165.84	485.8	4912.9	5398.7
68	0	4425.0	14.4	165.70	368.0	4818.9	5186.9

TIME		INFLOW	SURCHARGE VOLUME	RESERVOIR WATER LEVEL	OUTFLOW		TOTAL
					NONGATED CREST	GATED CREST	
(H.)	(M.)	(C.M.S.)	(M.C.M.)	(M.)	(C.M.S.)	(C.M.S.)	(C.M.S.)
69	0	4264.0	11.7	165.57	267.4	4726.1	4993.5
70	0	4128.0	9.2	165.45	182.7	4640.6	4823.2
71	0	4015.0	6.8	165.33	113.9	4560.0	4673.9
72	0	3920.0	4.5	165.22	60.3	4480.0	4540.4
73	0	3827.0	2.2	165.11	21.4	4412.5	4433.9
74	0	3723.0	0.1	165.00	0.1	4332.3	4332.4
75	0	3610.0	-2.1	164.89	0.	4229.8	4229.8
76	0	3495.0	-4.4	164.78	0.	4125.4	4125.4
77	0	3386.0	-6.6	164.67	0.	4019.9	4019.9
78	0	3288.0	-8.9	164.56	0.	3914.7	3914.7
79	0	3184.0	-11.1	164.45	0.	3810.2	3810.2
80	0	3086.0	-13.3	164.34	0.	3706.2	3706.2
81	0	3008.0	-15.5	164.23	0.	3604.7	3604.7
82	0	2944.0	-17.6	164.13	0.	3507.9	3507.9
83	0	2892.0	-19.5	164.04	0.	3417.1	3417.1
84	0	2838.0	-21.3	163.95	0.	3332.1	3332.1
85	0	2767.0	-23.0	163.86	0.	3250.6	3250.6
86	0	2696.0	-24.7	163.78	0.	3170.6	3170.6
87	0	2639.0	-26.3	163.69	0.	3093.2	3093.2
88	0	2582.0	-27.9	163.61	0.	3018.9	3018.9
89	0	2512.0	-29.4	163.54	0.	2946.2	2946.2
90	0	2441.0	-30.9	163.46	0.	2873.8	2873.8
91	0	2385.0	-32.4	163.39	0.	2802.9	2802.9
92	0	2341.0	-33.8	163.31	0.	2735.2	2735.2
93	0	2294.0	-35.2	163.25	0.	2670.9	2670.9
94	0	2230.0	-36.5	163.18	0.	2607.9	2607.9
95	0	2165.0	-37.8	163.11	0.	2544.7	2544.7
96	0	2102.0	-39.1	163.05	0.	2481.3	2481.3
97	0	1967.0	-40.5	162.97	0.	2412.4	2412.4
98	0	1723.0	-42.4	162.88	0.	2324.7	2324.7
99	0	1463.0	-44.7	162.76	0.	2211.7	2211.7

II.4 Alternative IV

Gated portion: 14.0H x 14.0W x 4 nos.

Non-gated : 210 m x 2 lanes

FLOOD ROUTING AGOS NO.1 RESERVOIR : CASE 12

INFLOW=PMF (WITH AGOS NO.1)

H.W.L.=165.0

TIME (H.)	(M.)	INFLOW (C.M.S.)	SURCHARGE VOLUME (M.C.M.)	RESERVOIR WATER LEVEL (M.)	OUTFLOW NONGATED CREST (C.M.S.)	GATED CREST (C.M.S.)	TOTAL (C.M.S.)
0	0	400.0	14.4	165.70	400.0	0.	400.0
1	0	579.0	14.7	165.72	413.2	0.	413.2
2	0	1106.0	16.1	165.79	475.7	0.	475.7
3	0	1761.0	19.3	165.94	633.3	0.	633.3
4	0	2295.0	23.9	166.16	885.1	0.	885.1
5	0	2712.0	29.2	166.41	1211.5	0.	1211.5
6	0	3025.0	34.5	166.67	1583.5	0.	1583.5
7	0	3271.0	39.4	166.90	1963.2	0.	1963.2
8	0	3469.0	43.8	167.11	2327.0	0.	2327.0
9	0	3631.0	47.6	167.29	2659.6	0.	2659.6
10	0	3766.0	50.8	167.44	2952.6	0.	2952.6
11	0	3876.0	53.5	167.56	3205.2	0.	3205.2
12	0	3968.0	55.7	167.67	3419.9	0.	3419.9
13	0	4058.0	57.5	167.75	3599.8	0.	3599.8
14	0	4158.0	59.0	167.82	3756.3	0.	3756.3
15	0	4255.0	60.4	167.89	3898.4	0.	3898.4
16	0	4334.0	61.6	167.94	4023.3	0.	4023.3
17	0	4400.0	62.6	167.99	4131.7	0.	4131.7
18	0	4467.0	60.1	167.88	3872.4	1425.3	5297.7
19	0	4546.0	57.8	167.77	3632.1	1407.0	5039.1
20	0	4627.0	56.5	167.70	3496.6	1398.3	4894.9
21	0	4690.0	55.8	167.67	3426.8	1392.9	4819.8
22	0	4742.0	55.4	167.66	3396.6	1390.4	4787.0
23	0	4796.0	55.4	167.66	3391.8	1390.0	4781.8
24	0	4888.0	55.6	167.66	3410.4	1391.6	4802.0
25	0	5050.0	56.1	167.69	3461.4	1395.7	4857.0
26	0	5280.0	57.0	167.73	3555.5	1407.4	4957.9
27	0	5559.0	58.4	167.80	3698.1	1410.4	5108.5
28	0	5852.0	60.2	167.88	3883.2	1426.1	5309.4
29	0	6128.0	62.3	167.98	4098.2	1439.8	5538.0
30	0	6414.0	61.1	167.92	3976.9	2862.9	6839.8
31	0	6739.0	60.4	167.89	3899.6	2852.1	6751.7
32	0	7082.0	60.9	167.91	3951.7	2859.4	6811.1
33	0	7415.0	62.2	167.97	4090.3	2877.5	6967.8

TIME		INFLOW	SURCHARGE VOLUME	RESERVOIR WATER LEVEL	OUTFLOW		
					NONGATED CREST	GATED CREST	TOTAL
(H.)	(M.)	(C.M.S.)	(M.C.M.)	(M.)	(C.M.S.)	(C.M.S.)	(C.M.S.)
34	0	7713.0	61.7	167.95	4031.2	4304.1	8335.3
35	0	7959.0	60.2	167.88	3882.4	4273.1	8155.5
36	0	8154.0	60.0	167.87	3854.8	4267.0	8121.8
37	0	8309.0	60.3	167.88	3889.4	4274.6	8164.0
38	0	8436.0	60.9	167.91	3953.7	4288.3	8242.0
39	0	8542.0	61.6	167.95	4030.1	4303.8	8333.9
40	0	8678.0	62.5	167.98	4116.3	4320.5	8436.8
41	0	8937.0	61.2	167.93	3987.6	5726.2	9713.8
42	0	9467.0	59.8	167.86	3840.9	5684.5	9525.4
43	0	10298.0	60.9	167.91	3956.5	5717.6	9674.1
44	0	11161.0	64.1	168.06	4287.0	5809.1	10096.1
45	0	11879.0	68.2	168.25	4740.5	5930.9	10671.4
46	0	12611.0	72.7	168.46	5257.0	6065.2	11322.2
47	0	13624.0	77.8	168.69	5868.4	6218.6	12087.0
48	0	15299.0	84.6	169.01	6713.5	6418.8	13132.3
49	0	16960.0	93.0	169.39	7818.8	6671.1	14490.0
50	0	17291.0	100.2	169.71	8809.2	6888.6	15697.7
51	0	16539.0	103.4	169.86	9260.9	6983.7	16244.7
52	0	15496.0	102.6	169.82	9154.4	6960.4	16114.9
53	0	14018.0	98.8	169.65	8611.2	6845.6	15456.8
54	0	12241.0	92.2	169.35	7716.9	6649.6	14366.6
55	0	10620.0	84.0	168.98	6641.1	6402.5	13043.6
56	0	9382.0	75.5	168.59	5584.9	6146.5	11731.4
57	0	8426.0	67.4	168.22	4657.5	5907.7	10565.1
58	0	7687.0	60.2	167.88	3881.0	5696.2	9577.2
59	0	7088.0	53.9	167.58	3242.4	5507.2	8749.6
60	0	6583.0	48.3	167.32	2715.1	5344.3	8059.4
61	0	6156.0	43.3	167.08	2276.7	5198.1	7474.8
62	0	5794.0	38.8	166.87	1910.0	5067.6	6977.6
63	0	5478.0	34.7	166.68	1601.1	4950.4	6551.5
64	0	5202.0	31.1	166.50	1338.7	4844.3	6182.9
65	0	4970.0	27.7	166.34	1115.7	4747.0	5862.7
66	0	4776.0	24.6	166.20	926.9	4656.9	5583.8
67	0	4600.0	21.9	166.06	766.2	4579.7	5346.0
68	0	4425.0	19.2	165.94	627.2	4505.5	5132.7

TIME (H.)	(M.)	INFLOW (C.M.S.)	SURCHARGE VOLUME (M.C.M.)	RESERVOIR WATER LEVEL (M.)	OUTFLOW NONGATED CREST (C.M.S.)	GATED CREST (C.M.S.)	TOTAL (C.M.S.)
69	0	4266.0	16.8	165.82	504.9	4432.8	4937.7
70	0	4128.0	14.4	165.70	398.3	4368.7	4766.9
71	0	4015.0	12.2	165.60	307.1	4302.4	4609.5
72	0	3920.0	10.1	165.49	230.0	4247.8	4477.9
73	0	3827.0	8.2	165.40	165.4	4188.6	4354.0
74	0	3723.0	6.3	165.31	110.1	4140.4	4250.5
75	0	3610.0	4.4	165.21	63.2	4082.9	4146.1
76	0	3495.0	2.4	165.12	25.2	4034.6	4059.7
77	0	3386.0	0.3	165.01	1.1	3971.7	3972.8
78	0	3288.0	-1.8	164.91	0.	3883.6	3883.6
79	0	3184.0	-4.0	164.80	0.	3792.7	3792.7
80	0	3086.0	-6.2	164.70	0.	3700.4	3700.4
81	0	3008.0	-8.3	164.59	0.	3608.8	3608.8
82	0	2944.0	-10.4	164.49	0.	3520.0	3520.0
83	0	2892.0	-12.4	164.39	0.	3435.6	3435.6
84	0	2838.0	-14.3	164.29	0.	3355.6	3355.6
85	0	2767.0	-16.1	164.20	0.	3278.0	3278.0
86	0	2696.0	-17.9	164.11	0.	3201.3	3201.3
87	0	2639.0	-19.7	164.03	0.	3126.5	3126.5
88	0	2582.0	-21.4	163.94	0.	3054.1	3054.1
89	0	2512.0	-23.0	163.86	0.	2983.0	2983.0
90	0	2441.0	-24.7	163.77	0.	2911.9	2911.9
91	0	2385.0	-26.3	163.69	0.	2841.9	2841.9
92	0	2341.0	-27.9	163.61	0.	2774.8	2774.8
93	0	2294.0	-29.4	163.54	0.	2710.6	2710.6
94	0	2230.0	-30.8	163.47	0.	2647.7	2647.7
95	0	2165.0	-32.3	163.39	0.	2584.5	2584.5
96	0	2102.0	-33.8	163.32	0.	2521.2	2521.2
97	0	1967.0	-35.3	163.24	0.	2452.8	2452.8
98	0	1723.0	-37.3	163.14	0.	2367.3	2367.3
99	0	1463.0	-39.8	163.01	0.	2258.4	2258.4

ANNEX-III ONE DIVERSION TUNNEL OPERATION

Routed Flood Water Level Computation

CASE 1 D= 9.70

RATING TABLE OF OUTFLOW DISCHARGE

WATER DEPTH	OUTFLOW DISCHARGE (CUM)
0.	0.
0.449	2.524
1.342	9.927
2.239	27.234
2.733	39.[illegible]
3.494	[illegible].473
4.[illegible]94	75.951
4.[illegible]94	115.[illegible]42
5.327	149.455
6.247	187.201
7.023	226.923
7.521	274.747
8.[illegible]55	325.[illegible]31
9.[illegible]51	384.[illegible]47
10.567	442.[illegible]23
11.722	515.[illegible]35

OUTFLOW DISCHARGE (FLOW UNDER PRESSURE FLOW)

RESERVOIR WATER LEVEL (EL.M)	OUTFLOW DISCHARGE (CUM/SEC)	RESERVOIR CAPACITY (CUM)
[illegible].[illegible]13	0.	0.
53.[illegible]13	245.[illegible]41	**********
56.[illegible]	560.[illegible]42	**********
59.[illegible]69	915.[illegible]63	**********
61.[illegible]69	961.[illegible]43	**********
62.[illegible]00	1150.735	**********
1[illegible].[illegible]00	1271.150	**********
121.[illegible]06	1499.826	**********
1[illegible].[illegible]00	1697.[illegible]40	**********
160.[illegible]00	1875.311	**********
1[illegible].[illegible]01	2037.246	**********
2[illegible].[illegible]06	2347.259	**********

TIME (HR)	INFLOW DISCHARGE (CFS)	OUTFLOW DISCHARGE (CFS)	RESERVOIR WATER LEVEL (FEET)	RETARDING VOLUME (CUM)
1.	2[illegible]	2[illegible]	49.915	0.
1.	[illegible]	2[illegible]	49.993	29200.
2.	3[illegible]	2[illegible]	50.054	66956.
3.	3[illegible]	2[illegible]	50.133	89162.
4.0	334.[illegible]	299.94	50.245	125488.
5.0	374.[illegible]	299.53	50.431	209922.
6.0	395.[illegible]	306.56	50.494	295081.
7.0	432.[illegible]	316.47	51.020	367167.
8.0	462.[illegible]	329.43	51.418	447991.
9.0	503.[illegible]	342.81	51.883	523011.
10.0	657.[illegible]	364.74	52.602	809015.
11.0	820.[illegible]	393.69	53.712	1248614.
12.0	874.[illegible]	431.35	55.050	1504859.
13.0	1122.[illegible]	491.36	56.754	1917468.
14.0	1332.[illegible]	553.61	58.999	2525094.
15.0	1559.[illegible]	613.77	61.039	3075162.
16.0	1830.[illegible]	671.66	63.156	3968591.
17.0	2317.[illegible]	728.34	65.904	5151895.
18.0	3557.[illegible]	816.47	70.045	7801481.
19.0	4692.[illegible]	893.23	74.421	11770790.
20.0	4585.[illegible]	968.26	79.373	13323134.
21.0	4536.[illegible]	1035.77	83.008	12785709.
22.0	4[illegible]	1087.42	86.482	12817452.
23.0	4[illegible]	1140.95	90.092	13445334.
24.0	4[illegible]	1174.42	92.656	12838360.
25.0	3[illegible]	1202.25	94.757	10532024.
26.0	3[illegible]	1224.49	96.465	8555500.
27.0	3[illegible]	1243.77	97.917	7274757.
28.0	2[illegible]	1260.05	99.155	6203120.
29.0	2[illegible]	1272.59	100.153	5340710.
30.0	2[illegible]	1283.47	100.772	4494836.
31.0	2[illegible]	1285.72	101.279	3650944.
32.0	2[illegible]	1290.[illegible]	101.484	2975166.
33.0	1[illegible]	1294.[illegible]	102.007	2340894.
34.0	1[illegible]	1296.77	102.240	1695850.
35.0	1542.00	1298.53	102.397	1153426.
36.0	1434.[illegible]	1299.43	102.491	687266.
37.0	1332.[illegible]	1300.12	102.535	306448.
38.0	1250.[illegible]	1300.[illegible]	102.529	-32723.
39.0	1170.[illegible]	1299.56	102.484	-323314.
40.0	1100.[illegible]	1298.[illegible]	102.433	-590724.
41.0	1050.[illegible]	1297.38	102.292	-802774.
42.0	975.[illegible]	1295.75	102.152	-1022598.
43.0	900.[illegible]	1293.73	101.974	-1284060.
44.0	850.[illegible]	1291.[illegible]	101.767	-1505150.
45.0	7[illegible]	1289.[illegible]	101.562	-1638246.
46.0	748.[illegible]	1285.02	101.392	-1812064.
47.0	726.[illegible]	1282.42	101.021	-1970543.
48.0	7[illegible]	1279.42	100.741	-2031198.
49.0	691.[illegible]	1276.36	100.454	-2082532.
50.0	6[illegible]	1273.31	100.162	-2117426.
51.0	6[illegible]	1269.44	99.811	-2127008.
52.0	6[illegible]	1265.17	99.333	-2093106.
53.0	6[illegible]	1257.34	98.947	-2034022.
54.0	6[illegible]	1252.43	98.591	-1984446.
55.0	5[illegible]	1247.51	98.221	-1951440.
56.0	5[illegible]	1242.12	97.814	-1940286.
57.0	5[illegible]	1237.74	97.429	-1936385.
58.0	5[illegible]	1232.23	97.143	-1925349.
59.0	5[illegible]	1227.25	96.852	-1923381.
60.0	5[illegible]	1222.21	96.574	-1921426.
61.0	5[illegible]	1217.23	96.290	-1903344.
62.0	5[illegible]	1212.27	96.025	-1885477.

63.0	[illegible]	1207.74	95.145	-1878506.
64.0	[illegible]	1202.34	94.767	-1891307.
65.0	[illegible]	1197.37	94.386	-1909362.
66.0	[illegible]	1192.31	94.001	-1930829.
67.0	[illegible]	1187.17	93.610	-1957471.
68.0	[illegible]	1181.96	93.214	-1982072.
69.0	[illegible]	1176.71	92.813	-2008231.
70.0	[illegible]	1171.37	92.407	-2034142.
71.0	[illegible]	1165.94	92.001	-2036526.

IN CASE OF DE[illegible]0 [illegible].L. CAN BE SET AT EL. 103.0

ANNEX-IV DETAILED COST ESTIMATE

Agos Hydropower Project Cost Estimate (1/17)

Unit: FC: US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Total ($x10^3$)
				Unit Price	Amount ($x10^3$)	Unit Price	Amount ($x10^3$)	
1.	General Item				11,438		15,072 (2,010)	13,448
2.	Diversion Tunnels				7,702		28,106 (3,747)	11,449
3.	Cofferdams				9,235		7,839 (1,045)	10,280
4.	Main Dam				109,534		144,910 (19,321)	128,855
5.	Spillway				29,844		18,602 (2,480)	32,324
6.	Power Tunnel				2,374		4,297 (573)	2,947
7.	Powerhouse				3,228		2,381 (317)	3,545
8.	Tailrace				1,793		1,662 (222)	2,015
9.	Switchyard				403		371 (49)	452
10.	Architectual Works				1,938		5,774 (740)	2,678
11.	Generating Equipment				27,825		37,268 (4,969)	32,794
12.	Hydro-mechanical Works				7,828		16,148 (2,153)	9,981
	Grand-total				213,142		282,430 (37,626)	250,768

* Figures in parenthesis is expressed in US dollars.

Agos Hydropower Project Cost Estimate (2/17)

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount ($\times 10^3$)	Unit Price	Amount ($\times 10^3$)	
1.	GENERAL ITEM	L.S.						
	Sub-total				11,438		15,072	(13,448)
	(General Item)						(2,010)	
2.	DIVERSION TUNNEL (No 1 & No.2)							
	Care of river							
2-1	Dewatering & coffering in tunnel	L.S.			5		36	
	Earth work							
2-2	Excavation, common in open cut at inlet & outlet of tunnel	m^3	100,000	3.78	378	3.0	300	
2-3	Excavation, weathered rock in open cut at inlet & outlet of tunnel	m^3	45,700	4.73	216	3.7	169	To stochpile
2-4	Excavation, all classes, in tunnels	m^3	145,300	9.05	1,315	130.0	18,889	To stochpile
2-5	Permanent steel supports in tunnels	t	736	942.48	694	2,796.5	2,058	
	Concrete work							
2-6	Concrete in inlet & outlet of tunnels	m^3	3,700	61.49	228	30.9	114	
2-7	Concrete in tunnels	m^3	42,000	61.80	2,596	32.6	1,369	
2-8	Concrete in tunnel plug	m^3	7,500	61.80	464	32.6	245	
2-9	Form for construction joint	m^2	6,800	0	0	98.6	670	

Unit: FC; US$, LC: Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount ($\times 10^3$)	Unit Price	Amount ($\times 10^3$)	
2-10	Form for exposed surface	m^2	48,600	5.18	252	59.0	2,867	
2-11	Reinforcement bars	t	1,830	726.60	1,330	523.2	957	
	Grout work							
2-12	Backfill grouting in tunnel	m^3	1,350	55.78	75	15.2	21	
2-13	Consolidation grouting	m	360	67.64	24	181.4	65	
2-14	Curtain grouting	m	1,920	65.27	125	180.4	346	
	Sub-total (Diversion Tunnels)				7,702		28,106 (3,747)	(11,449)
3.	COFFERDAMS							
	Care of river							
3-1	Diversion and care of river during construction period including primary cofferdam and dewatering well	L.S.			139		156	
	Earth work							
3-2	Impervious earthfill in upstream and downstream cofferdams	m^3	231,000	10.32	2,384	6.3	1,455	
3-3	Sand and gravel fill in upstream and downstream cofferdams	m^3	232,200	6.08	1,412	3.7	859	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10^3)	Unit Price	Amount (x10^3)	
3-4	Random rockfill in initial, upstream and downstream cofferdams	m^3	1,142,250	4.64	5,300	4.7	5,369	
	Sub-total (Cofferdams)				9,235		7,839	
4.	MAIN DAM							
	Earth work							
4-1	Excavation, common, for foundation of main dam	m^3	1,523,000	4.81	7,326	2.8	4,264	
4-2	Excavation, weathered rock for foundation of main dam	m^3	368,000					Used for dam embankment
4-3	Excavation, sand and gravel of river deposit	m^3	953,000	2.70	2,573	1.8	1,715	To stockpile
4-4	Excavation, rock, in grouting gallery	m^3	11,000					Used for dam embankment
4-5	Excavation, all classes, in tunnel portion of inspection galleries	m^3	1,100	33.72	37	149.2	164	
4-6	Permanent steel supports	t	10	942.48	9	2,796.5	28	
4-7	Impervious earthfill	m^3	1,941,000	10.32	20,031	6.3	12,228	
4-8	Sand and Gravel fill	m^3	1,210,300	6.08	7,359	3.7	4,478	
4-9	Quarry rockfill	m^3	12,014,700	5.25	63,077	8.7	104,528	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
4-10	Riprap facing	m^3	252,000	5.78	1,457	9.6	2,419	
	Concrete work							
4-11	Concrete in access gallery	m^3	375	61.54	23	92.9	35	
4-12	Concrete in tunnel	m^3	1,100	66.16	73	67.4	74	
4-13	Replace concrete for foundation of main dam	m^3	1,000	59.61	60	33.0	33	
4-14	Form for concrete in tunnel	m^2	1,120	5.18	6	59.0	66	
4-15	Form for inspection gallery and construction joints of tunnel	m^2	7,000	5.18	36	59.0	413	
4-16	Reinforcement bars	t	60	726.60	44	523.2	31	
	Grout work							
4-17	Blanket grouting	m	23,720	28.40	674	171.5	4,068	
4-18	Consolidation grouting		1,750	67.23	118	181.4	317	
4-19	Curtain grouting	m	34,120	79.78	2,722	210.0	7,165	
	Stripping at material site							
4-20	Stripping, Borrow pit	m^3	800,000	3.73	2,984	2.7	2,160	
4-21	Stripping, River deposit	m^3	70,000	2.55	179	3.2	224	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Currency	Unit Price	Amount (x10³)	Currency	Unit Price	Amount (x10³)	Remarks
4-22	Stripping, Quarry site	m^3	200,000		3.73	746		2.5	500	
	Sub-total (Main Dam)					109,534			144,910 (19,321)	(128,855)
5.	SPILLWAY									
	Care of river									
5-1	Dewatering during construction period of plunge pool excavation	L.S.				2			17	
	Earth work									
5-2	Excavation, common in open cut at approach channel	m^3	620,000		5.83	3,615		3.3	2,046	
5-3	" at chuteway	m^3	888,000		7.23	6,420		4.0	3,552	
5-4	" at plunge pool	m^3	491,000		5.71	2,804		3.7	1,817	
5-5	Excavation, weathered rock in open cut at approach channel	m^3	(1,286,000)							Used for dam embankment
5-6	" at chuteway	m^3	(983,000)							"
5-7	" at plunge pool	m^3	(620,000)							"
5-8	Excavation, river deposit at plunge pool	m^3	42,000		2.59	109		3.2	135	

Agos Hydropower Project Cost Estimate (7/17)

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
5-9	Excavation, rock in open cut at approach channel	m^3	(2,153,000)					Used for dam embankment
5-10	" at chuteway	m^3	(989,000)					"
5-11	" at plunge pool	m^3	(335,000)					"
5-12	Backfill behind chuteway walls	m^3	7,000	4.74	33	4.7	33	
	Concrete work							
5-13	Concrete in crests	m^3	54,100	62.67	3,390	29.6	1,601	
5-14	Concrete in piers	m^3	28,500	62.67	1,786	29.6	844	
5-15	Concrete in walls	m^3	42,600	62.67	2,670	29.6	1,261	
5-16	Concrete in slab	m^3	47,300	62.67	2,964	29.6	1,400	
5-17	Concrete in bridge	m^3	1,000	62.67	63	29.6	30	
5-18	Concrete for backfill	m^3	21,500	59.75	1,285	33.0	710	
5-19	Form in exterior surface and construction joints	m^2	25,850	1.92	50	23.0	595	
5-20	Form in interior surface	m^2	66,500	2.39	159	12.9	858	
5-21	Reinforcement bars	t	5,850	726.60	4,251	523.2	3,061	
5-22	Anchor bars	m	31,660	6.13	194	17.4	551	

Agos Hydropower Project Cost Estimate (8/17)

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
	Miscellaneous							
5-23	Concrete drain pipe beneath chuteway slab	m	5,500	8.97	49	16.5	91	
	Sub-total (Spillway)				29,844		18,602 (2,480)	(32,324)
6.	POWER TUNNEL							
6-1	Power intake & Intake shaft							
	Earth work							
1-1	Excavation common, in open cut at power intake	m^3	60,000	4.07	244	3.6	216	
1-2	Excavation, weathered rock, in open cut at power intake	m^3	10,000	6.15	62	6.3	63	
1-3	Excavation, rock, in open cut at power intake tower	m^3	5,000	12.23	62	20.5	103	
1-4	Excavation, rock, in open cut at Inlet	m^3	7,030	12.23	86	20.5	144	
	Concrete work							
1-5	Concrete in intake tower		6,650	62.13	413	37.1	247	
1-6	Concrete in inlet		5,725	62.06	355	40.5	232	
1-7	Form for intake tower		10,944	1.46	16	58.4	639	

Unit: PC: US$, LC: Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
1-8	Form for inlet		640	1.46	1	58.4	37	
1-9	Reinforcement bars	t	700	726.60	509	523.2	366	
	Sub-total (Intake and inlet)				1,748		2,047 (273)	(2,021)
6-2	Headrace Tunnel							
	Earth work							
2-1	Excavation, all classes in inclined tunnel	m^3	4,000	10.12	40	181.0	724	
2-2	Excavation, all classes in tunnel	m^3	1,950	9.05	18	130.0	254	
2-3	Permanent steel supports in tunnel	t	65	942.48	61	2,796.5	182	
	Concrete							
2-4	Concrete in inclined tunnel lining	m^3	1,250	61.80	77	32.6	41	
2-5	Concret in tunnel lining	m^3	630	61.80	39	32.6	21	
2-6	Concrete in tunnel lining in diversion tunnel	m^3	220	61.80	14	32.6	7	
2-7	Form, in construction joint of concrete	m^2	135	0	0	98.6	13	
2-8	Form, in interior surface of concrete	m^2	2,400	2.39	6	12.9	31	
2-9	Reinforcement bars	t	85	726.60	62	523.2	44	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
	Grouting							
2-10	Backfill grouting	m^3	40	55.78	2	15.2	1	
2-11	Consolidation grouting	m	330	67.64	22	181.4	60	
	Sub-total (Headrace Tunnel)				341		1,378 (184)	(525)
6-3	Penstock Tunnel							
	Earth work							
3-1	Excavation, all classes in tunnel	m^3	4,350	9.05	39	130.0	566	
3-2	Permanent steel supports	t	46	942.48	43	2,796.5	129	
	Concrete work							
3-3	Concrete in tunnel lining	m^3	1,600	61.80	99	32.6	52	
3-4	Concrete in anchor blocks and saddle piers	m^3	400	61.80	25	32.6	13	
3-5	Form in construction joint of lining concrete, anchor blocks and saddle piers	m^2	180	0	0	98.6	18	
3-6	Reinforcement bars	t	80	726.60	58	523.2	42	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
	Grouting work							
3-7	Consolidation grouting	m	285	67.64	19	181.4	52	
3-8	Backfill grouting	m^3	30	55.78	2	15.2	0	
	Sub-total (Penstock line)	L.S.			285		872 (116)	(401)
7.	POWERHOUSE							
	Care of river							
7-1	Dewatering and care of river during construction	L.S.			7		52	
	Earth work							
7-2	Excavation, common	m^3	65,500	4.07	267	2.9	190	
7-3	" , weathered rock	m^3	46,500	6.62	308	5.1	237	
7-4	" , rock	m^3	14,100	10.26	145	18.8	265	
7-5	Fill and backfill	m^3	7,900	4.74	37	4.7	37	
	Concrete work							
7-6	Concrete for wall in substructure	m^3	12,300	60.42	743	28.9	355	
7-7	Concrete for slab in substructure	m^3	5,300	60.42	320	28.9	153	
7-8	Concrete for second stage	m^3	5,900	60.42	356	28.9	171	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Currency		Currency		Remarks
				Unit Price	Amount	Unit Price	Amount	
7-9	Form for interior surface	m^2	9,300	2.39	22	12.9	120	
7-10	Form for exterior surface	m^2	3,000	1.92	6	23.0	69	
7-11	Reinforcement bars	t	1,400	726.60	1,017	523.2	732	
	Sub-total (Powerhouse)				3,228		2,381 (317)	(3,545)
8.	TAILRACE							
	Care of river							
8-1	Dewatering and care of river during construction	L.S.			7		52	
	Earth work							
8-2	Excavation, common	m^3	34,400	4.07	140	2.9	100	
8-3	Excavation, weathered rock	m^3	18,600	6.62	123	5.1	95	
8-4	Excavation, river deposit	m^3	2,900	2.59	8	3.2	9	
	Concrete work							
8-5	Concrete in wall	m^3	14,550	60.42	879	28.9	421	
8-6	Concrete in slab	m^3	1,450	60.42	88	28.9	42	
8-7	Form for interior surface	m^2	3,500	2.39	8	12.9	45	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Currency		Currency		Remarks
				Unit Price	Amount	Unit Price	Amount	
8-8	Form for exterior surface	m^2	3,800	1.92	7	23.0	87	
8-9	Reinforcement bars	t	320	726.60	233	523.2	167	
	Missellaneous							
8-10	Gabion protection	m^3	10,600	28.29	300	60.8	644	
	Sub-total (Tailrace)				1,793		1,662 (222)	(2,015)
9.	SWITCHYARD							
	Earth work							
9-1	Excavation, sand & gravel for structural foundation	m^3	10,000	2.59	26	3.2	32	
9-2	Backfill in structural foundation	m^3	9,000	4.74	43	4.7	42	
	Concrete work							
9-3	Concrete for structural base	m^3	3,000	60.42	181	28.9	87	
9-4	Form for structural base	m^2	9,000	2.39	22	12.9	116	
9-5	Reinforcement bars	t	180	726.60	131	523.2	94	
	Sub-total (Switchyard)				403		371 (49)	(452)

Agos Hydropower Project Cost Estimate (14/17)

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
10.	ARCHITECTUAL WORKS							
	Powerhouse superstructure							
10-1	Concrete for powerhouse superstructure	m^3	2,720	61.49	167	30.9	84	
10-2	Form for concrete	m^2	16,320	0.70	11	115.6	1,887	
10-3	Reinforcement bars	t	272	726.60	198	523.2	142	
10-4	Permanent steel supports	t	295	942.48	278	2,796.5	825	
10-5	Finishing work	L.S.			589		626	
10-6	Building utilities, airconditioning and ventilation	L.S.			180		401	
10-7	Building electric work	L.S.			240		952	
10-8	Elevator	L.S.			41		91	
	Appurtenant buildings and outdoor work							
10-9	Dam observation house	L.S.			117		294	
10-10	Guard house	L.S.			15		38	
10-11	Garage	L.S.			48		120	
10-12	Warehouse	L.S.			40		99	
10-13	Air compressor house	L.S.			2		58	

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
10-14	Gate and fence	L.S.			10		22	
10-15	Gardening	L.S			2		135	
	Sub-total (Architectual Work)				1,938		5,774 (740)	(2,678)

Agos Hydropower Project Cost Estimate (16/17)

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount (x10³)	Unit Price	Amount (x10³)	
11.	GENERATING EQUIPMENT							
11-1	Francis turbine	set	2		6,956		7,450	
11-2	Generator	set	2		8,755		9,180	
11-3	Switch gear	lot	1		2,937		2,447	
11-4	Ancillary equipment	lot	1		2,120		1,767	
11-5	Miscellaneous equipment	lot	1		911		758	
11-6	PLC equipment	pair	1		336		360	
11-7	Outdoor substation	L.S.			3,643		6,251	
11-8	Transmission line	km	43		2,167		9,055	
	Sub-total (Generating Equipment)				27,825		37,268 (4,969)	(32,794)

Unit: FC; US$, LC; Peso

Item No.	Work	Unit	Quantity	Foreign Currency		Local Currency		Remarks
				Unit Price	Amount ($\times 10^3$)	Unit Price	Amount ($\times 10^3$)	
12.	METAL WORKS							
12-1	Spillway radial gates	t	734		2,559		4,943	
12-2	Spillway stoplog	t	132		444		636	
12-3	Intake trashracks	t	438		701		1,327	
12-4	Bulk head gate	t	112		394		667	
12-5	Intake gate	t	138		554		847	
12-6	Penstock	t	1,450		2,610		6,591	
12-7	Tailrace gates and gantry clane	t	68		218		421	
12-8	Diversion gates	t	108		348		716	
	Sub-total (Metal Works)				7,828		16,148 (2,153)	(9,981)

Summary of Unit Price (1/2)

Economic cost (US dollars)

Work Item	Unit	Unit Price
Diversion Tunnel		
Excavation (tunnel)	m^3	29.2
Concrete	m^3	58.7
Concrete (tunnel plug)	m^3	43.4
Reinforcement bar	ton	580.1
Cofferdams		
Embankment		
Core	m^3	9.3
Filter	m^3	5.5
Rock	m^3	4.4
Main Dam		
Excavation (open cut)	m^3	3.6
Embankment		
Core	m^3	9.3
Filter	m^3	5.5
Rock	m^3	6.1
Riprap	m^3	6.7
Blanket grouting	m	50.1
Curtain grouting	m	99.9
Spillway		
Excavation	m^3	5.7
Concrete	m^3	45.4
Reinforcement bar	ton	580.1
Waterway (Intake & intake shaft)		
Excavation (including weathered & rock)	m^3	5.3
Concrete intake tower	m^3	52.5
Headrace Tunnel		
Excavation inclined tunnel	m^3	56.5
tunnel	m^3	42.5
Concrete tunnel	m^3	48.2
Penstock Tunnel		
Excavation tunnel	m^3	35.6
Concrete	m^3	44.6

Summary of Unit Price (2/2)

(US dollars)

Work Item	Unit	Unit Price
Power House		
Excavation	m^3	5.4
Concrete	m^3	44.6
Tailrace		
Excavation	m^3	4.4
Concrete	m^3	43.8
Switchyard		
Excavation	m^3	3.5
Concrete	m^3	52.6
Architectural Work		1,388/m^2
Generating Equipment	kW	210.1
Transmission Line	km	78,488
Metal Works		
Spillway gates	ton	4,384
Intake trashracks	ton	2,004
Intake gate	ton	4,833
Penstock	ton	2,406
Tailrace gates & gantry crane	ton	4,031
Diversion gates	ton	4,106