N

Left bank solution

Right bank solution

AGOS RIVER

KANAN RIVER

KALIWA RIVER

Gabion with Geotext

SCALE 0 100 500m

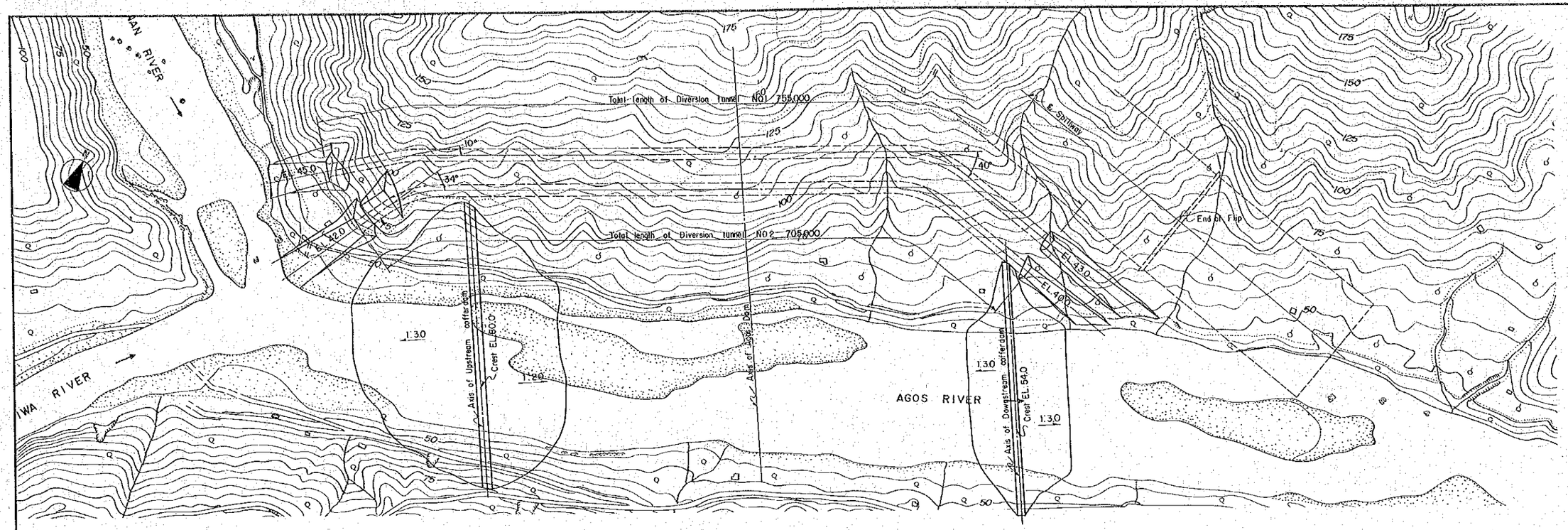
REPUBLIC OF THE PHILIPPINES
NATIONAL POWER CORPORATION

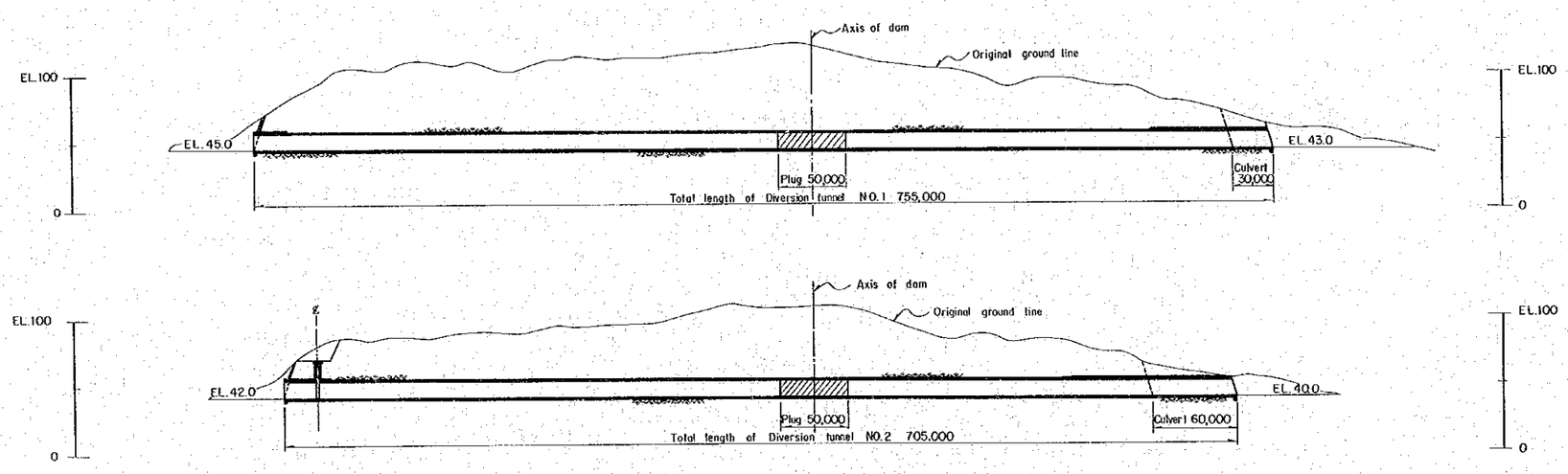
AGOS RIVER HYDROPOWER PROJELT

ALTERNATIVE LAYOUT OF DIVERSION TUNNELS

DATE	DEC. 1980	DWG. NO.	3

JAPAN INTERNATIONAL COOPEPATION AGENCY





SCALE 0 100 200m

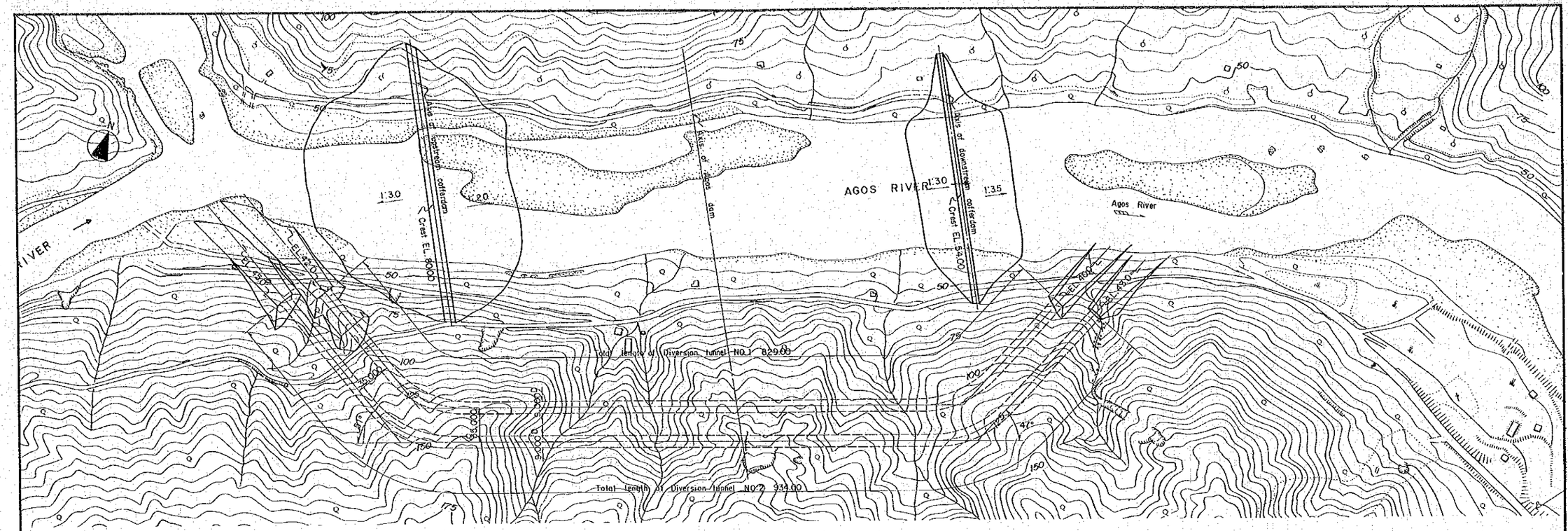
REPUBLIC OF THE PHILIPPINES
NATIONAL POWER CORPORATION

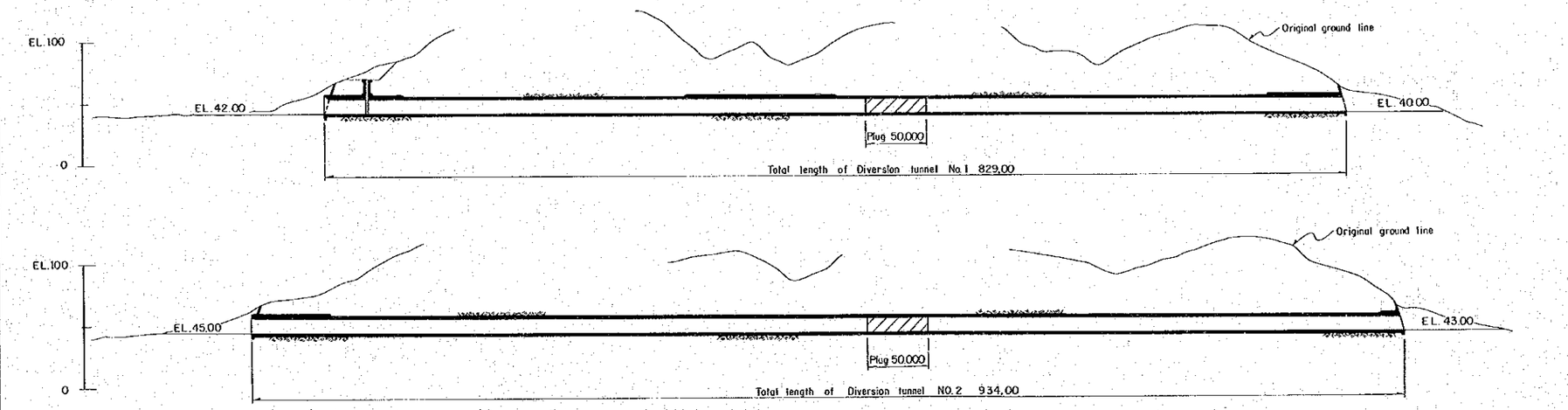
AGOS RIVER HYDROPOWER PROJECT

DIVERSION TUNNELS
LEFT BANK SOLUTION

DATE	DEC. 1980	DWG NO.	4

JAPAN INTERNATIONAL COOPERATION AGENCY





SCALE 0 100 200m

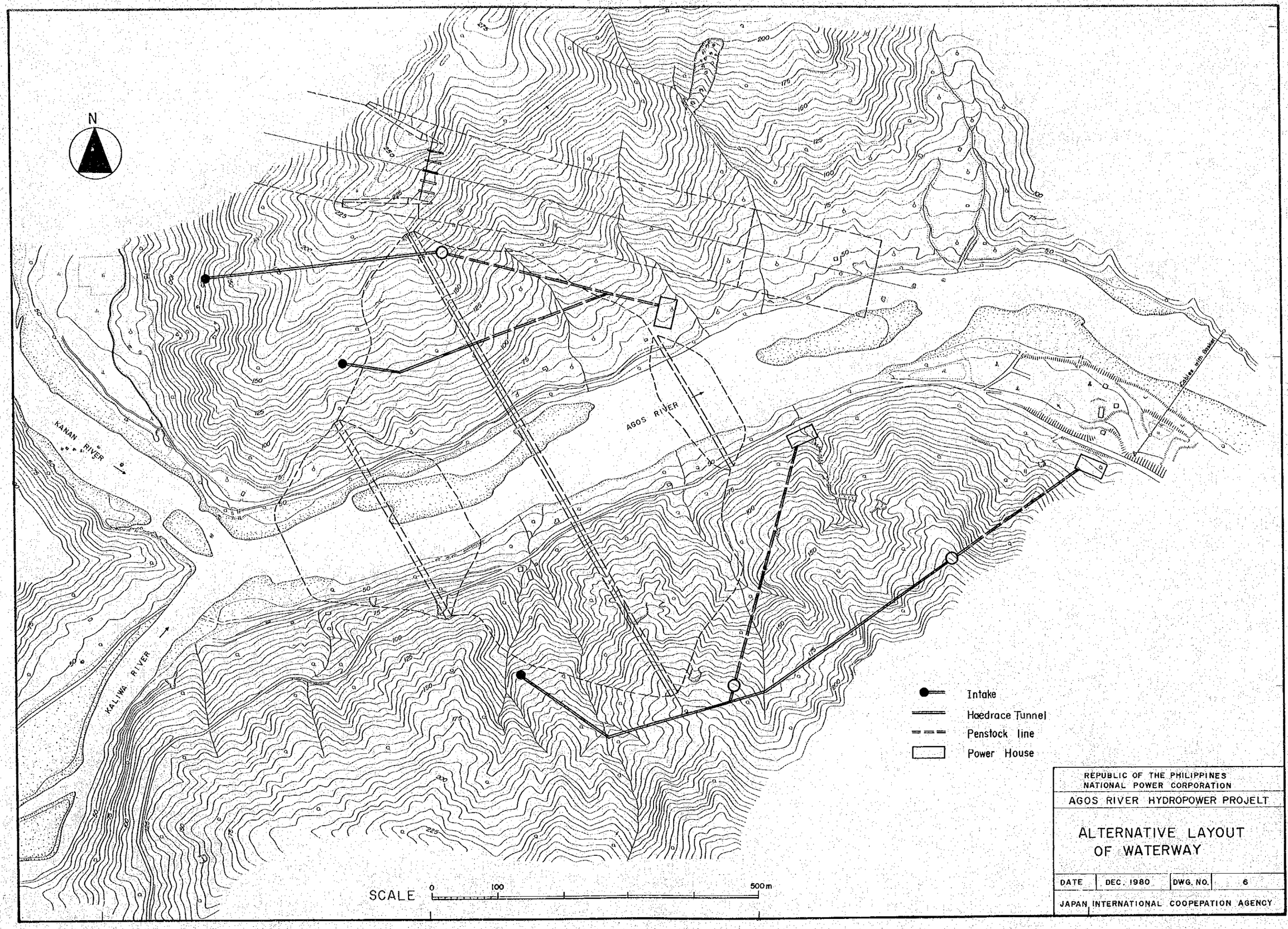
REPUBLIC OF THE PHILIPPINES
NATIONAL POWER CORPORATION

AGOS RIVER HYDROPOWER PROJECT

DIVERSION TUNNELS
RIGHT BANK SOLUTION

DATE	DEC. 1980	DWG NO.	5

JAPAN INTERNATIONAL COOPERATION AGENCY



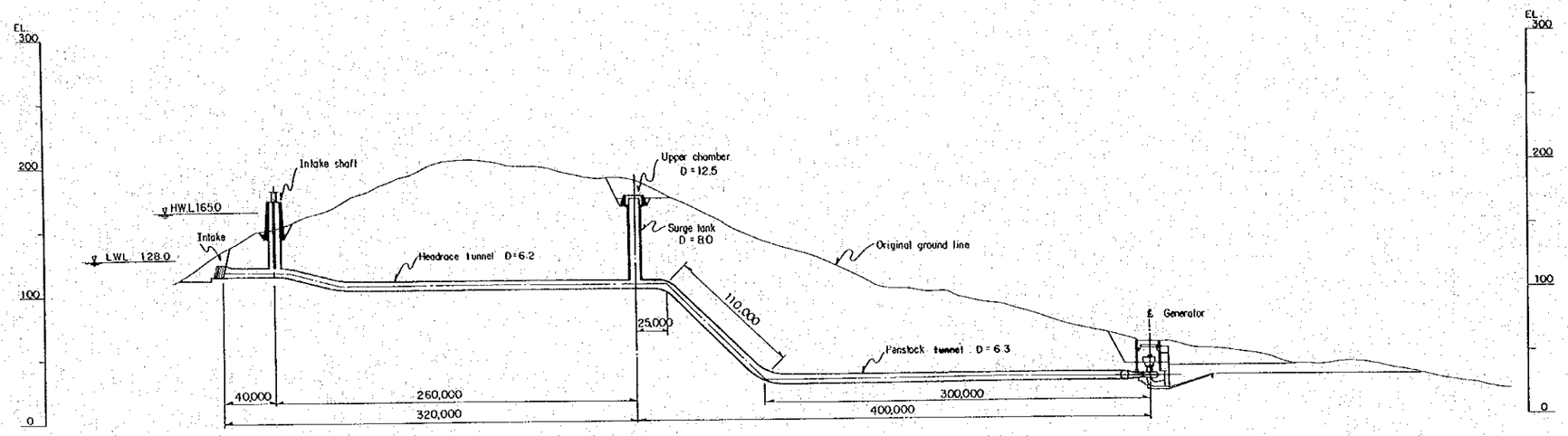
REPUBLIC OF THE PHILIPPINES
NATIONAL POWER CORPORATION

AGOS RIVER HYDROPOWER PROJELT

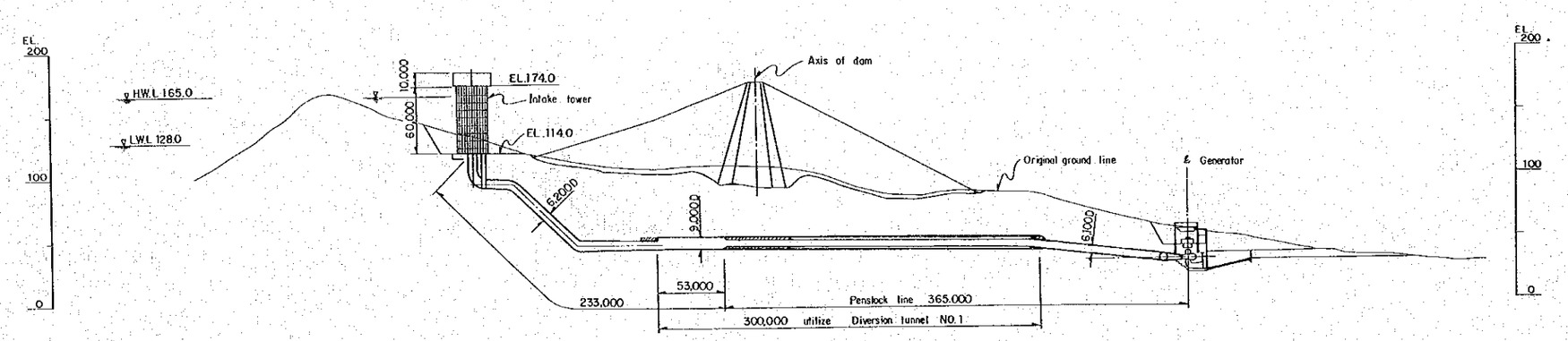
ALTERNATIVE LAYOUT OF WATERWAY

DATE	DEC. 1980	DWG. NO.	6

JAPAN INTERNATIONAL COOPEPATION AGENCY



ALTERNATIVE I



ALTERNATIVE II

SCALE 0 100 200m

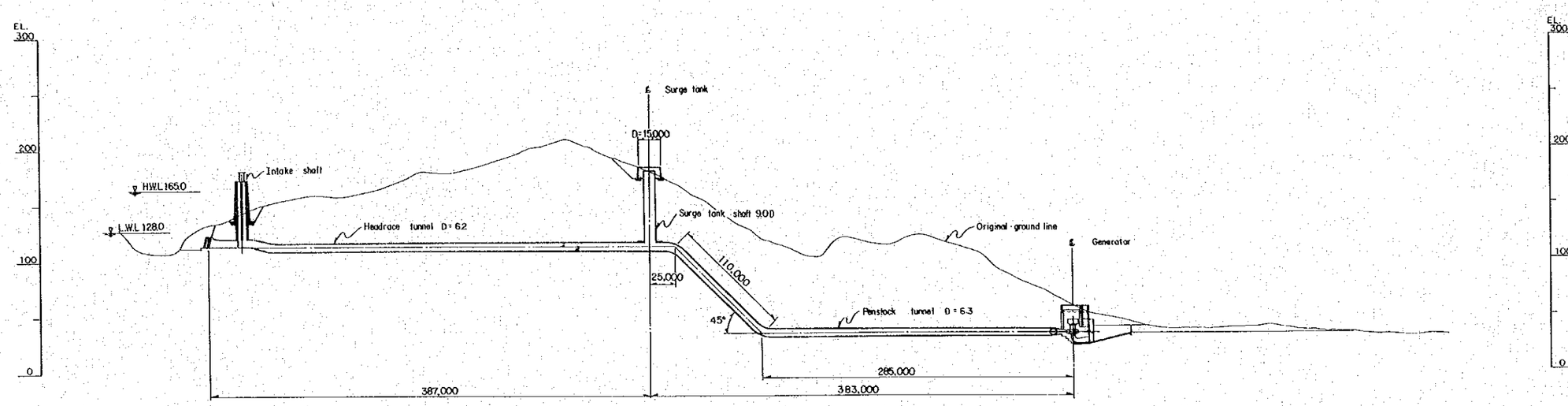
REPUBLIC OF THE PHILIPPINES
NATIONAL POWER CORPORATION

AGOS RIVER HYDROPOWER PROJECT

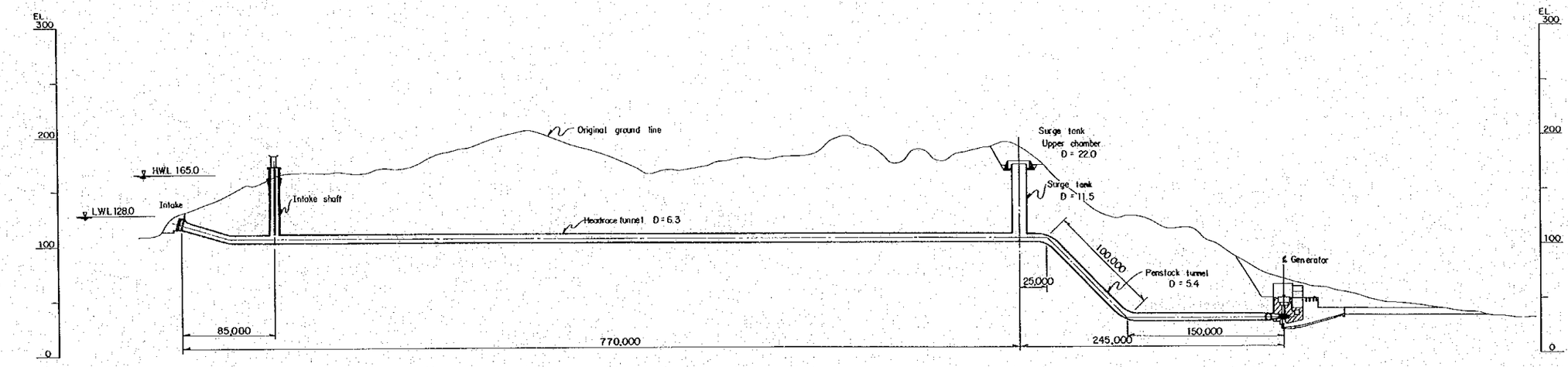
WATERWAY
ALTERNATIVE I AND II

DATE	DEC. 1980	DWG NO.	7

JAPAN INTERNATIONAL COOPERATION AGENCY



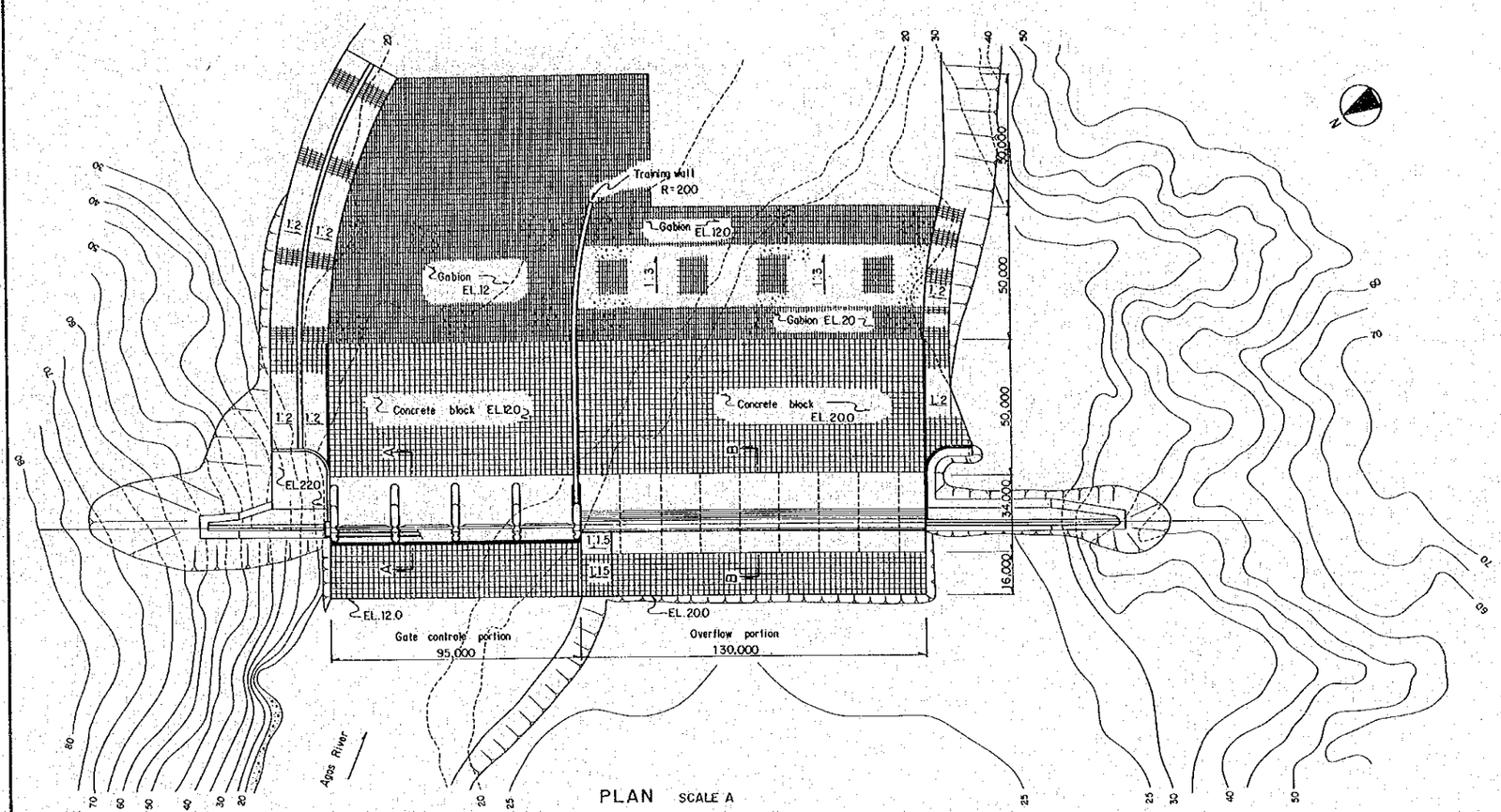
ALTERNATIVE III



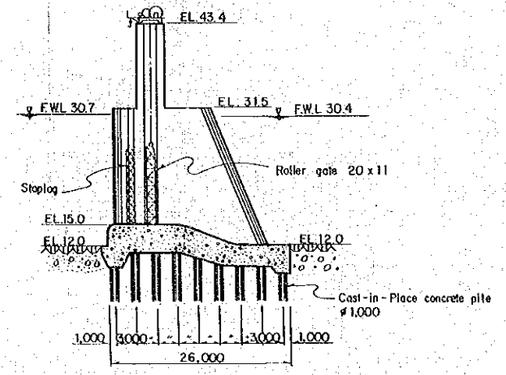
ALTERNATIVE IV

SCALE 0 100 200m

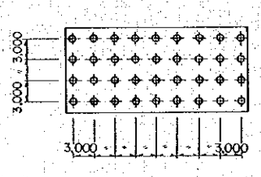
REPUBLIC OF THE PHILIPPINES NATIONAL POWER CORPORATION	
AGOS RIVER HYDROPOWER PROJECT	
WATERWAY ALTERNATIVE III AND IV	
DATE: DEC. 1980	DWG NO.: 8
JAPAN INTERNATIONAL COOPERATION AGENCY	



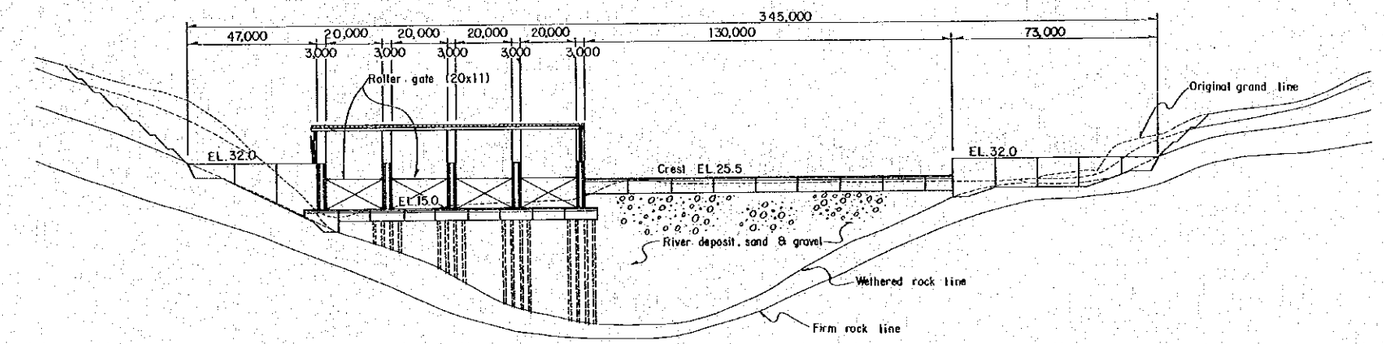
PLAN SCALE A



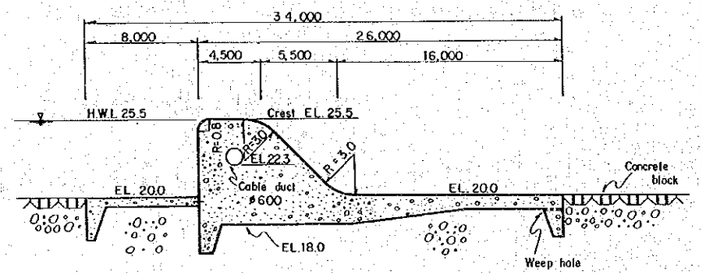
PIER (Section A-A) SCALE B



PLAN OF FOOTING SCALE B



UPSTREAMSIDE ELEVATION SCALE A



OVERFLOW PORTION (Section B-B) SCALE C

SCALE A 0 50 100m

SCALE B 0 10 20 30 40m

SCALE C 0 10 20m

REPUBLIC OF THE PHILIPPINES
NATIONAL POWER CORPORATION

AGOS RIVER HYDROPOWER PROJECT

AFTERBAY WEIR

DATE	DEC. 1980	DWG NO.	9

JAPAN INTERNATIONAL COOPERATION AGENCY

ANNEX

ANNEX-I DIVERSION TUNNEL AND COFFERDAM

Routed Flood Water Level Computation

I.1 Tunnel of 8 m Diameter

RATING TABLE OF OUTLET DISCHARGE

WATER DEPTH	FLOW DISCHARGE (CUM)
0.	0.
0.689	2.360
1.343	9.398
2.022	20.876
2.709	36.638
3.405	56.515
4.111	80.354
4.832	108.027
5.571	139.453
6.335	174.629
7.133	215.700
7.984	257.095
8.918	305.841
10.002	362.394

OUTFLOW DISCHARGE (INCLUDING PRESSURE FLOW)

RESERVOIR WATER LEVEL (EL.M)	OUTFLOW DISCHARGE (CUM/SEC)	RESERVOIR CAPACITY (CUM)
42.000	0.	0.
50.000	372.842	**********
60.000	912.765	**********
70.000	1235.890	**********
80.000	1490.540	**********
90.000	1707.628	**********
100.000	1900.073	**********
120.000	2235.810	**********
140.000	2527.333	**********
160.000	2788.545	**********
180.000	3027.301	**********
200.000	3248.556	**********

TIME (HR)	INFLOW DISCHARGE (CUM)	OUTFLOW DISCHARGE (CUM)	RESERVOIR WATER LEVEL (EL-M)	RETARDING VOLUME (CUM)
0.	292.00	292.00	48.051	0.
1.0	301.00	265.47	48.125	27948.
2.0	308.00	292.43	48.275	55974.
3.0	318.00	299.95	48.436	60515.
4.0	334.00	309.47	48.640	76634.
5.0	374.00	325.75	48.990	130988.
6.0	395.00	347.23	49.451	172824.
7.0	452.00	371.46	49.970	194951.
8.0	462.00	384.25	50.211	248911.
9.0	500.00	399.64	50.496	320588.
10.0	457.00	428.09	51.023	592692.
11.0	800.00	475.86	51.908	995492.
12.0	874.00	551.30	52.972	1196713.
13.0	1127.00	607.20	54.341	1539902.
14.0	1332.00	705.77	56.166	2053846.
15.0	1550.00	822.70	58.332	2436348.
16.0	1930.00	933.89	60.654	3102145.
17.0	2317.00	1005.47	62.869	4153763.
18.0	3557.00	1121.70	66.466	6744306.
19.0	4692.00	1272.92	71.454	10537896.
20.0	4543.00	1385.46	75.881	11909557.
21.0	4534.00	1491.46	80.042	11235382.
22.0	4703.00	1557.07	83.065	11151850.
23.0	4920.00	1626.06	86.245	11726773.
24.0	4458.00	1690.98	89.233	11035724.
25.0	3770.00	1730.00	91.162	8652636.
26.0	3410.00	1755.54	92.490	6650031.
27.0	3100.00	1774.13	93.560	5360986.
28.0	2850.00	1792.60	94.415	4286280.
29.0	2650.00	1805.75	95.099	3422980.
30.0	2400.00	1815.62	95.612	2571532.
31.0	2194.00	1822.74	95.955	1721050.
32.0	2035.00	1826.25	96.164	1044929.
33.0	1850.00	1827.85	96.247	415630.
34.0	1693.00	1827.00	96.203	-219330.
35.0	1542.00	1824.06	96.050	-766911.
36.0	1438.00	1819.47	95.812	-1194348.
37.0	1332.00	1813.50	95.507	-1553351.
38.0	1250.00	1806.33	95.129	-1868095.
39.0	1170.00	1798.14	94.703	-2132037.
40.0	1100.00	1789.03	94.230	-2370903.
41.0	1050.00	1779.22	93.720	-2552860.
42.0	975.00	1768.69	93.173	-2741253.
43.0	900.00	1757.28	92.580	-2971754.
44.0	850.00	1745.16	91.950	-3156394.
45.0	820.00	1732.66	91.301	-3254086.
46.0	748.00	1719.63	90.624	-3391736.
47.0	726.00	1705.56	89.895	-3511784.
48.0	708.00	1684.64	88.941	-3520800.
49.0	691.00	1664.00	87.990	-3509353.
50.0	662.00	1643.51	87.047	-3482115.
51.0	678.00	1623.32	86.116	-3432296.
52.0	691.00	1603.64	85.210	-3344333.
53.0	700.00	1584.61	84.333	-3235060.
54.0	708.00	1566.16	83.483	-3136984.
55.0	708.00	1548.17	82.655	-3056991.
56.0	704.00	1530.52	81.842	-3000047.
57.0	700.00	1513.16	81.042	-2951424.
58.0	700.00	1496.12	80.257	-2896695.
59.0	691.00	1477.43	79.497	-2839941.
60.0	681.00	1458.44	78.768	-2766718.
61.0	691.00	1421.17	77.274	-2674010.
62.0	691.00	1382.88	74.313	-2584409.

[illegible]	[illegible]	1572.91	75.581	-2508428.
[illegible]	675.00	1349.68	74.468	-2454462.
65.0	665.00	1326.89	73.573	-2407613.
66.0	652.00	1304.69	72.694	-2365874.
67.0	640.00	1282.42	71.827	-2330844.
68.0	628.00	1260.70	70.974	-2295216.
69.0	615.00	1239.28	70.133	-2262553.
70.0	603.00	1204.05	69.015	-2205585.
71.0	603.00	1167.88	67.895	-2098669.

IN CASE OF D. B.O.H.W.L. CAN BE SET AT EL. 97.0

I.2 Tunnel of 9 m Diameter

MAIN, LINE 1 OUTFLOW DISCHARGE

WATER LEVEL	OUTFLOW DISCHARGE (CUM)
0.	0.
0.669	2.528
1.542	9.997
2.019	22.238
2.704	39.084
3.394	60.373
4.094	85.951
4.804	115.682
5.527	149.455
6.267	187.201
7.029	228.923
7.821	274.742
8.655	325.001
9.551	380.447
10.567	442.683
11.722	515.330

OUTFLOW DISCHARGE (INCLUDING PRESSURE FLOW)

RESERVOIR WATER LEVEL (EL.M)	OUTFLOW DISCHARGE (CUM/SEC)	RESERVOIR CAPACITY (CUM)
42.000	0.	0.
50.000	409.891	**********
60.000	1159.243	**********
70.000	1601.725	**********
80.000	1946.073	**********
90.000	2238.052	**********
100.000	2496.108	**********
120.000	2945.150	**********
140.000	3334.256	**********
160.000	3682.474	**********
180.000	4000.496	**********
200.000	4295.035	**********

TIME (HR)	INFLOW DISCHARGE (CUM)	OUTFLOW DISCHARGE (CUM)	RESERVOIR WATER LEVEL (EL-M)	RETARDING VOLUME (CUM)
0.	282.00	282.00	47.504	0.
1.0	301.00	295.79	47.577	27449.
2.0	308.00	293.15	47.722	54175.
3.0	319.00	309.99	47.874	57548.
4.0	334.00	330.86	48.067	72270.
5.0	374.00	327.89	48.400	124643.
6.0	395.00	350.24	48.836	163563.
7.0	432.00	375.21	49.323	182784.
8.0	462.00	403.55	49.876	207420.
9.0	500.00	423.04	50.175	243738.
10.0	657.00	456.32	50.620	499750.
11.0	800.00	514.60	51.397	874931.
12.0	874.00	583.63	52.319	1036375.
13.0	1122.00	672.36	53.503	1332012.
14.0	1332.00	791.12	55.087	1782941.
15.0	1550.00	930.27	56.944	2089097.
16.0	1930.00	1103.65	59.258	2602939.
17.0	2317.00	1221.70	61.400	3459873.
18.0	3557.00	1361.03	64.560	5925199.
19.0	4692.00	1586.73	69.650	9543132.
20.0	4883.00	1230.61	73.243	10724681.
21.0	4556.00	1458.04	77.443	9954654.
22.0	4708.00	1968.81	80.779	9750869.
23.0	4090.00	2049.70	83.549	10223069.
24.0	4458.00	2124.81	86.122	9497265.
25.0	3770.00	2190.48	88.035	7060509.
26.0	3410.00	2220.26	89.391	5002299.
27.0	3100.00	2245.43	90.286	3679757.
28.0	2850.00	2258.83	90.805	2602336.
29.0	2650.00	2267.85	91.155	1751968.
30.0	2400.00	2272.58	91.338	917220.
31.0	2194.00	2273.03	91.355	87111.
32.0	2035.00	2270.12	91.242	-565456.
33.0	1850.00	2264.10	91.009	-1168581.
34.0	1683.00	2254.95	90.655	-1774888.
35.0	1542.00	2243.15	90.198	-2291585.
36.0	1438.00	2224.69	89.542	-2678116.
37.0	1332.00	2201.11	88.735	-2980446.
38.0	1250.00	2175.55	87.859	-3230383.
39.0	1170.00	2148.43	86.931	-3427161.
40.0	1100.00	2119.97	85.956	-3597115.
41.0	1050.00	2090.62	84.951	-3709055.
42.0	975.00	2060.34	83.913	-3826723.
43.0	900.00	2028.80	82.833	-3985456.
44.0	851.00	1996.40	81.724	-4095361.
45.0	820.00	1963.78	80.606	-4122317.
46.0	748.00	1921.33	79.281	-4170791.
47.0	726.00	1867.98	77.732	-4167548.
48.0	708.00	1816.13	76.226	-4050198.
49.0	691.00	1765.85	74.766	-3929332.
50.0	682.00	1717.21	73.354	-3798079.
51.0	679.00	1670.49	71.997	-3649864.
52.0	681.00	1626.08	70.707	-3469618.
53.0	700.00	1589.94	69.282	-3249032.
54.0	708.00	1499.37	67.687	-2990366.
55.0	708.00	1454.88	66.229	-2732853.
56.0	704.00	1375.48	64.887	-2517048.
57.0	700.00	1320.59	63.647	-2325735.
58.0	700.00	1270.02	62.504	-2143106.
59.0	691.00	1223.20	61.445	-1983994.
60.0	691.00	1179.83	60.465	-1837849.
61.0	691.00	1138.66	59.525	-1631677.
62.0	691.00	1099.23	58.132	-1347601.

[illegible]	[illegible]	948.51	57.185	-1064766.
64.	[illegible]	890.75	56.417	-864102.
65.0	665.00	843.38	55.785	-711226.
66.0	652.00	803.79	55.257	-594298.
67.0	640.00	770.00	54.806	-507229.
68.0	628.00	740.88	54.417	-437196.
69.0	615.00	715.32	54.076	-383766.
70.0	603.00	692.56	53.772	-341776.
71.0	603.00	673.38	53.516	-287882.

IN CASE II = 9.0 cH.W.L. CAN BE SET AT EL. 62.0

I.3 Tunnel of 10 m Diameter

CASE 1 D=10.00

RATING TABLE OF OUTFLOW DISCHARGE

WATER DEPTH	OUTFLOW DISCHARGE (CUM)
0.	0.
0.668	2.667
1.341	10.562
2.017	23.521
2.699	41.388
3.386	64.004
4.081	91.221
4.784	122.899
5.497	158.916
6.223	199.174
6.963	243.614
7.724	292.243
8.511	345.168
9.333	402.668
10.204	465.324
11.148	534.282
12.210	611.852

OUTFLOW DISCHARGE (INCLUDING PRESSURE FLOW)

RESERVOIR WATER LEVEL (EL.M)	OUTFLOW DISCHARGE (CUM/SEC)	RESERVOIR CAPACITY (CUM)
42.000	0.	0.
50.000	443.933	**********
60.000	1415.758	**********
70.000	2002.184	**********
80.000	2452.164	**********
90.000	2831.515	**********
100.000	3165.730	**********
120.000	3745.743	**********
140.000	4247.273	**********
160.000	4695.537	**********
180.000	5104.587	**********
200.000	5483.206	**********

TIME (HR)	INFLOW DISCHARGE (CUM)	OUTFLOW DISCHARGE (CUM)	RESERVOIR WATER LEVEL (EL-M)	RETARDING VOLUME (CUM)
0.	282.00	282.00	47.082	0.
1.0	301.00	286.00	47.154	27007.
2.0	308.00	293.28	47.294	52602.
3.0	318.00	301.87	47.440	54638.
4.0	334.00	312.02	47.623	68609.
5.0	374.00	329.68	47.941	119346.
6.0	395.00	352.74	48.357	155846.
7.0	432.00	378.30	48.817	172727.
8.0	462.00	407.20	49.338	195300.
9.0	500.00	438.25	49.898	209798.
10.0	657.00	478.04	50.351	433283.
11.0	800.00	545.45	51.045	780317.
12.0	874.00	623.92	51.852	908344.
13.0	1122.00	724.60	52.888	1165480.
14.0	1332.00	859.81	54.229	1565271.
15.0	1550.00	1016.23	55.889	1810730.
16.0	1930.00	1211.02	57.893	2254950.
17.0	2317.00	1451.93	60.276	2887280.
18.0	3557.00	1592.36	63.012	5129464.
19.0	4492.00	1862.27	67.614	8629857.
20.0	4583.00	2087.69	71.900	9585069.
21.0	4544.00	2232.19	75.112	8638412.
22.0	4708.00	2371.90	78.216	8351831.
23.0	4990.00	2492.29	81.058	8700864.
24.0	4456.00	2573.38	83.195	7888201.
25.0	3770.00	2629.34	84.671	5445461.
26.0	3410.00	2666.22	85.591	3395459.
27.0	3100.00	2685.74	86.157	2087991.
28.0	2850.00	2696.25	86.434	1022430.
29.0	2650.00	2698.20	86.486	180994.
30.0	2400.00	2691.91	86.320	-612193.
31.0	2194.00	2677.56	85.942	-1395834.
32.0	2035.00	2657.10	85.402	-1990175.
33.0	1850.00	2631.13	84.718	-2525808.
34.0	1684.00	2599.71	83.889	-3056115.
35.0	1542.00	2563.84	82.944	-3489389.
36.0	1438.00	2524.82	81.915	-3795583.
37.0	1332.00	2483.40	80.823	-4028794.
38.0	1250.00	2442.71	79.568	-4201396.
39.0	1170.00	2361.23	77.979	-4273088.
40.0	1100.00	2289.54	76.386	-4285392.
41.0	1050.00	2219.54	74.808	-4244554.
42.0	975.00	2148.04	73.241	-4214839.
43.0	900.00	2077.27	71.669	-4230547.
44.0	853.00	2006.98	70.107	-4201650.
45.0	820.00	1896.01	68.019	-4001386.
46.0	748.00	1768.54	66.016	-3755794.
47.0	720.00	1658.27	64.135	-3525859.
48.0	708.00	1557.62	62.419	-3218190.
49.0	691.00	1466.15	60.859	-2924572.
50.0	682.00	1383.15	59.150	-2567339.
51.0	678.00	1157.37	57.341	-2034935.
52.0	691.00	1030.10	56.032	-1473242.
53.0	700.00	940.05	55.105	-1042470.
54.0	708.00	876.52	54.451	-735422.
55.0	708.00	831.16	53.985	-525032.
56.0	704.00	797.44	53.638	-389958.
57.0	700.00	771.79	53.374	-297469.
58.0	700.00	752.46	53.175	-223640.
59.0	691.00	737.15	53.017	-177471.
60.0	691.00	724.72	52.889	-143727.
61.0	691.00	715.64	52.796	-105045.
62.0	691.00	707.91	52.728	-76774.

[illegible]	[illegible]	703.36	52,669	-65458.
[illegible]	676.00	696.94	52,603	-74323.
[illegible]	665.00	689.55	52,527	-85476.
66.0	652.00	681.19	52,441	-96742.
67.0	640.00	671.72	52,344	-109650.
68.0	628.00	661.57	52,239	-117526.
69.0	615.00	650.79	52,128	-124840.
70.0	603.00	639.54	52,013	-130185.
71.0	603.00	629.71	51,912	-113842.

IN CASE IF D= 10.0 ,H.W.L. CAN BE SET AT EL. 87.0

I.4 Tunnel of 11 m Diameter

CASE 1 (211.D

RATING TABLE OF OUTFLOW DISCHARGE

WATER DEPTH	OUTFLOW, DISCHARGE (CUM)
0.	0.
0.660	2.800
1.340	11.098
2.015	24.739
2.695	43.571
3.380	67.444
4.071	96.212
4.769	129.737
5.475	167.892
6.191	210.566
6.918	257.672
7.660	309.161
8.420	365.041
9.202	425.409
10.015	490.500
10.868	560.781
11.778	637.127
12.775	721.160
13.904	816.040

OUTFLOW DISCHARGE (INCLUDING PRESSURE FLOW)

RESERVOIR WATER LEVEL (EL.M)	OUTFLOW DISCHARGE (CUM/SEC)	RESERVOIR CAPACITY (CUM)
42.000	0.	0.
50.000	475.575	**********
60.000	1674.210	**********
70.000	2432.570	**********
80.000	3005.298	**********
90.000	3485.145	**********
100.000	3906.489	**********
120.000	4635.677	**********
140.000	5264.821	**********
160.000	5826.421	**********
180.000	6338.456	**********
200.000	6812.111	**********

TIME (HR)	INFLOW DISCHARGE (CUM)	OUTFLOW DISCHARGE (CUM)	RESERVOIR WATER LEVEL (EL.-M)	RETARDING VOLUME (CUM)
0.	282.00	282.00	46.744	0.
1.0	301.00	296.22	46.815	26608.
2.0	308.00	294.34	46.951	51204.
3.0	318.00	302.62	47.091	57277.
4.0	334.00	313.00	47.265	65476.
5.0	374.00	351.20	47.571	114828.
6.0	395.00	354.87	47.969	149269.
7.0	432.00	380.90	48.407	164217.
8.0	462.00	410.25	48.901	185132.
9.0	500.00	441.66	49.430	198161.
10.0	657.00	495.03	50.162	396550.
11.0	800.00	570.17	50.789	705232.
12.0	874.00	656.05	51.506	806005.
13.0	1172.00	766.10	52.424	1032931.
14.0	1332.00	916.44	53.661	1392230.
15.0	1550.00	1083.91	55.075	1590582.
16.0	1950.00	1295.06	56.837	1981855.
17.0	2317.00	1561.69	59.061	2507449.
18.0	3557.00	1813.42	61.836	4498005.
19.0	4492.00	2127.09	65.977	7755281.
20.0	4593.00	2451.74	70.335	8453110.
21.0	4534.00	2607.35	73.051	7307876.
22.0	4708.00	2756.05	75.648	6985115.
23.0	4990.00	2910.55	78.346	7256520.
24.0	4458.00	3029.54	80.505	6314241.
25.0	3770.00	3079.15	81.539	3814769.
26.0	3410.00	3102.81	82.026	1797014.
27.0	3100.00	3109.49	82.171	536592.
28.0	2850.00	3103.34	82.043	-473088.
29.0	2650.00	3087.17	81.706	-1242921.
30.0	2420.00	3061.46	81.170	-1977539.
31.0	2194.00	3026.49	80.447	-2689106.
32.0	2035.00	2972.17	79.422	-3185394.
33.0	1850.00	2896.16	78.094	-3570009.
34.0	1683.00	2812.77	76.638	-3916690.
35.0	1542.00	2724.17	75.091	-4161502.
36.0	1438.00	2633.02	73.501	-4279030.
37.0	1332.00	2540.94	71.892	-4327205.
38.0	1250.00	2448.67	70.281	-4333688.
39.0	1170.00	2294.05	68.173	-4180890.
40.0	1100.00	2136.74	66.099	-3889420.
41.0	1050.00	1992.64	64.199	-3562873.
42.0	975.00	1859.61	62.445	-3289036.
43.0	900.00	1734.45	60.794	-3094312.
44.0	850.00	1540.46	58.886	-2744848.
45.0	820.00	1313.42	56.990	-2130977.
46.0	748.00	1143.03	55.568	-1599199.
47.0	724.00	1012.35	54.478	-1226485.
48.0	709.00	917.50	53.685	-892147.
49.0	691.00	847.20	53.100	-657894.
50.0	682.00	795.48	52.669	-485426.
51.0	675.00	758.31	52.359	-348831.
52.0	691.00	734.56	52.161	-222970.
53.0	700.00	721.99	52.056	-117982.
54.0	709.00	716.70	52.007	-54335.
55.0	708.00	713.56	51.985	-24765.
56.0	704.00	711.13	51.965	-22836.
57.0	700.00	708.19	51.941	-27569.
58.0	700.00	705.55	51.919	-24738.
59.0	691.00	702.32	51.892	-30369.
60.0	691.00	698.68	51.861	-34189.
61.0	691.00	696.71	51.844	-23185.
62.0	691.00	694.54	51.827	-15723.

	692.45	51.809	-19725.
67.0	688.27	51.774	-39052.
66.0	682.23	51.724	-56691.
65.0	674.59	51.660	-71623.
64.0	665.39	51.584	-83764.
63.0	655.29	51.499	-92817.
62.0	644.41	51.409	-102060.
61.0	633.02	51.313	-106971.
60.0	623.36	51.233	-96668.

IN CASE OF 11.0 AM WALL CAN BE SET AT EL. 83.0

I.5 Tunnel of 12 m Diameter

C-St. 1 U=12.0

RATING FOR OUTFLOW DISCHARGE

WATER DEPTH	OUTFLOW DISCHARGE (CUM)
0.	0.
0.67	2.927
1.337	11.609
2.014	25.899
2.693	45.650
3.376	70.719
4.064	100.962
4.758	136.246
5.458	176.440
6.167	221.429
6.885	271.112
7.614	325.412
8.356	384.287
9.115	447.748
9.894	515.881
10.700	588.889
11.540	667.161
12.426	751.392
13.378	842.799
14.426	943.570

OUTFLOW DISCHARGE (INCLUDING PRESSURE FLOW)

RESERVOIR WATER LEVEL (EL.M)	OUTFLOW DISCHARGE (CUM/SEC)	RESERVOIR CAPACITY (CUM)
42.000	0.	0.
50.000	505.253	**********
60.000	1927.736	**********
70.000	2891.604	**********
80.000	3606.463	**********
90.000	4201.403	**********
100.000	4721.969	**********
120.000	5620.267	**********
140.000	6393.576	**********
160.000	7082.953	**********
180.000	7710.943	**********
200.000	8291.505	**********

TIME (HR)	INFLOW DISCHARGE (CUM)	OUTFLOW DISCHARGE (CUM)	RESERVOIR WATER LEVEL (EL-M)	RETARDING VOLUME (CUM)
0.	282.00	282.00	46.465	0.
1.0	301.00	286.42	46.535	26244.
2.0	308.00	294.83	46.668	49947.
3.0	318.00	303.28	46.802	50190.
4.0	334.00	313.85	46.969	62752.
5.0	374.00	332.53	47.265	110907.
6.0	395.00	356.71	47.648	143564.
7.0	432.00	383.13	48.066	156883.
8.0	462.00	412.85	48.537	176436.
9.0	500.00	444.56	49.039	188274.
10.0	557.00	506.55	50.009	370617.
11.0	800.00	588.85	50.588	650894.
12.0	874.00	680.86	51.235	727725.
13.0	1172.00	798.46	52.061	930025.
14.0	1332.00	957.36	53.178	1256727.
15.0	1550.00	1136.70	54.439	1418298.
16.0	1930.00	1360.40	56.012	1769226.
17.0	2317.00	1643.36	58.001	2237831.
18.0	3557.00	2016.96	60.926	3984634.
19.0	4692.00	2373.95	64.629	6944570.
20.0	4523.00	2757.37	68.607	7458623.
21.0	4534.00	2983.79	71.290	6080114.
22.0	4705.00	3133.36	73.382	5628335.
23.0	4990.00	3290.00	75.573	5894352.
24.0	4458.00	3420.93	77.405	4926730.
25.0	3770.00	3484.21	78.290	2381161.
26.0	3410.00	3493.86	78.425	363474.
27.0	3100.00	3472.06	78.120	-820656.
28.0	2850.00	3426.67	77.485	-1707715.
29.0	2650.00	3364.89	76.621	-2324820.
30.0	2400.00	3288.21	75.548	-2885583.
31.0	2194.00	3197.71	74.282	-3405455.
32.0	2035.00	3098.81	72.899	-3721539.
33.0	1850.00	2993.24	71.422	-3972690.
34.0	1683.00	2872.37	69.800	-4198690.
35.0	1542.00	2658.96	67.586	-4151389.
36.0	1438.00	2460.95	65.532	-3851838.
37.0	1332.00	2278.70	63.641	-3545366.
38.0	1250.00	2111.39	61.905	-3256560.
39.0	1170.00	1958.71	60.321	-2970177.
40.0	1100.00	1490.10	58.329	-2481852.
41.0	1050.00	1462.02	56.726	-1803818.
42.0	975.00	1295.34	55.554	-1318245.
43.0	900.00	1162.65	54.621	-1049380.
44.0	850.00	1055.99	53.872	-843554.
45.0	820.00	974.05	53.296	-648065.
46.0	74.00	778.62	51.922	-1545595.
47.0	724.00	638.23	50.935	-1110317.
48.0	709.00	667.44	51.140	231011.
49.0	691.00	679.32	51.224	94032.
50.0	682.00	681.99	51.242	21041.
51.0	679.00	681.25	51.237	-5822.
52.0	691.00	682.45	51.246	9533.
53.0	700.00	687.79	51.280	38256.
54.0	709.00	693.49	51.323	48998.
55.0	708.00	698.87	51.361	42560.
56.0	704.00	701.51	51.380	20913.
57.0	700.00	701.69	51.381	1429.
58.0	700.00	701.07	51.377	-4966.
59.0	691.00	699.00	51.362	-16321.
60.0	691.00	696.03	51.341	-23466.
61.0	691.00	694.17	51.328	-14765.
62.0	691.00	692.99	51.320	-9290.

63.	685.00	691.14	51.307	-14643.
64.	674.00	686.82	51.276	-34140.
65.0	665.00	680.40	51.231	-50806.
66.0	652.00	672.28	51.174	-64226.
67.0	640.00	662.54	51.106	-77068.
68.0	628.00	651.95	51.031	-83682.
69.0	615.00	640.66	50.952	-89309.
70.0	603.00	628.92	50.869	-92850.
71.0	603.00	619.31	50.802	-76017.

IN CASE [illegible] = 12.0 M.W.L. CAN BE SET AT EL. 79.0

ANNEX-II SPILLWAY ALTERNATIVE DESIGN

Routed Flood Water Level Computation

II.1 Alternative I

Gated portion: 12.5H x 12.0W x 10 nos.

FLOOD ROUTING OF AGOS NO.1 RESERVOIR : CASE 4 (MODIFIED CRITICAL ARRANGEMENT)

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

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	1106.0	3.4	165.17	0.	1106.0	1106.0
1	0	1761.0	1.6	165.08	0.	2189.6	2189.6
2	0	2295.0	1.1	165.05	0.	3273.9	3273.9
3	0	2712.0	-1.6	164.92	0.	3223.4	3223.4
4	0	3025.0	-2.8	164.86	0.	3200.2	3200.2
5	0	3271.0	-3.0	164.85	0.	3196.9	3196.9
6	0	3469.0	-2.4	164.88	0.	3208.3	3208.3
7	0	3631.0	-1.2	164.94	0.	3230.8	3230.8
8	0	3766.0	0.4	165.02	0.	4348.8	4348.8
9	0	3876.0	-1.4	164.93	0.	4303.1	4303.1
10	0	3968.0	-2.7	164.87	0.	4270.2	4270.2
11	0	4058.0	-3.6	164.82	0.	4248.0	4248.0
12	0	4158.0	-4.1	164.80	0.	4235.9	4235.9
13	0	4255.0	-4.2	164.80	0.	4233.4	4233.4
14	0	4334.0	-3.9	164.81	0.	4238.7	4238.7
15	0	4400.0	-3.5	164.83	0.	4249.9	4249.9
16	0	4467.0	-2.9	164.86	0.	4265.8	4265.8
17	0	4546.0	-2.0	164.90	0.	4286.7	4286.7
18	0	4627.0	-1.0	164.95	0.	4312.7	4312.7
19	0	4690.0	0.2	165.01	0.	5428.4	5428.4
20	0	4742.0	-2.2	164.89	0.	5352.2	5352.2
21	0	4796.0	-4.2	164.79	0.	5289.8	5289.8
22	0	4888.0	-5.7	164.72	0.	5241.9	5241.9
23	0	5050.0	-6.6	164.67	0.	5212.9	5212.9
24	0	5280.0	-6.8	164.67	0.	5208.0	5208.0
25	0	5559.0	-6.1	164.70	0.	5230.9	5230.9
26	0	5852.0	-4.5	164.78	0.	5282.0	5282.0
27	0	6128.0	-2.1	164.90	0.	5358.0	5358.0
28	0	6414.0	0.1	165.00	0.	6510.9	6510.9
29	0	6739.0	-1.5	164.92	0.	7523.5	7523.5
30	0	7082.0	-3.6	164.82	0.	7434.3	7434.3
31	0	7415.0	-4.2	164.79	0.	7407.7	7407.7
32	0	7713.0	-3.6	164.82	0.	7431.1	7431.1
33	0	7959.0	-2.3	164.89	0.	7490.9	7490.9

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	8154.0	-0.4	164.98	0.	7574.2	7574.2
35	0	8309.0	-1.0	164.95	0.	8628.1	8628.1
36	0	8436.0	-1.8	164.91	0.	8586.0	8586.0
37	0	8542.0	-2.1	164.90	0.	8570.2	8570.2
38	0	8678.0	-2.0	164.90	0.	8577.1	8577.1
39	0	8937.0	-1.2	164.94	0.	8615.9	8615.9
40	0	9467.0	-0.2	164.99	0.	9749.5	9749.5
41	0	10298.0	0.3	165.01	0.	10862.8	10862.8
42	0	11161.0	-0.1	164.99	0.	10838.9	10838.9
43	0	11879.0	2.1	165.10	0.	10979.5	10979.5
44	0	12611.0	6.3	165.31	0.	11239.1	11239.1
45	0	13624.0	12.4	165.60	0.	11625.3	11625.3
46	0	15299.0	21.6	166.05	0.	12211.2	12211.2
47	0	16960.0	34.3	166.66	0.	13021.8	13021.8
48	0	17291.0	47.5	167.28	0.	13868.5	13868.5
49	0	16539.0	57.3	167.74	0.	14494.6	14494.6
50	0	15496.0	62.1	167.97	0.	14805.3	14805.3
51	0	14018.0	61.8	167.96	0.	14789.8	14789.8
52	0	12241.0	56.4	167.70	0.	14440.2	14440.2
53	0	10620.0	46.6	167.24	0.	13813.0	13813.0
54	0	9382.0	34.3	166.66	0.	13023.1	13023.1
55	0	8426.0	21.0	166.02	0.	12174.2	12174.2
56	0	7687.0	7.7	165.38	0.	11330.9	11330.9
57	0	7088.0	-5.0	164.75	0.	10528.7	10528.7
58	0	6583.0	-16.8	164.17	0.	9778.4	9778.4
59	0	6156.0	-27.6	163.63	0.	9085.9	9085.9
60	0	5794.0	-37.4	163.14	0.	8454.1	8454.1
61	0	5478.0	-46.1	162.69	0.	7881.8	7881.8
62	0	5202.0	-53.9	162.29	0.	7365.6	7365.6
63	0	4970.0	-60.9	161.93	0.	6902.7	6902.7
64	0	4776.0	-67.1	161.60	0.	6490.6	6490.6
65	0	4600.0	-72.5	161.32	0.	6124.6	6124.6
66	0	4425.0	-77.4	161.06	0.	5797.3	5797.3
67	0	4264.0	-81.7	160.83	0.	5502.2	5502.2
68	0	4128.0	-85.6	160.63	0.	5237.0	5237.0

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.)
69	0	4015.0	-89.1	160.44	0.	5000.4	5000.4
70	0	3920.0	-92.2	160.28	0.	4790.7	4790.7
71	0	3827.0	-94.9	160.13	0.	4604.4	4604.4
72	0	3723.0	-97.3	160.00	0.	4436.0	4436.0
73	0	3610.0	-99.6	159.88	0.	4279.6	4279.6
74	0	3495.0	*****	159.77	0.	4131.8	4131.8
75	0	3386.0	*****	159.66	0.	3991.3	3991.3
76	0	3288.0	*****	159.55	0.	3858.3	3858.3
77	0	3184.0	*****	159.45	0.	3731.8	3731.8
78	0	3086.0	*****	159.36	0.	3610.5	3610.5
79	0	3008.0	*****	159.27	0.	3496.0	3496.0
80	0	2944.0	*****	159.19	0.	3390.4	3390.4
81	0	2892.0	*****	159.11	0.	3294.5	3294.5
82	0	2838.0	*****	159.04	0.	3207.2	3207.2
83	0	2767.0	*****	158.98	0.	3124.9	3124.9
84	0	2696.0	*****	158.92	0.	3044.9	3044.9
85	0	2639.0	*****	158.86	0.	2968.2	2968.2
86	0	2582.0	*****	158.80	0.	2895.5	2895.5
87	0	2512.0	*****	158.75	0.	2824.6	2824.6
88	0	2441.0	*****	158.69	0.	2753.8	2753.8
89	0	2385.0	*****	158.64	0.	2684.5	2684.5
90	0	2341.0	*****	158.59	0.	2619.2	2619.2
91	0	2294.0	*****	158.54	0.	2557.9	2557.9
92	0	2230.0	*****	158.49	0.	2497.7	2497.7
93	0	2165.0	*****	158.44	0.	2436.6	2436.6
94	0	2102.0	*****	158.40	0.	2375.0	2375.0
95	0	1967.0	*****	158.34	0.	2305.5	2305.5
96	0	1723.0	*****	158.27	0.	2211.3	2211.3
97	0	1463.0	*****	158.17	0.	2085.0	2085.0
98	0	1265.0	*****	158.06	0.	1938.2	1938.2
99	0	1114.0	*****	157.94	0.	1785.9	1785.9