

**第10章**  
**資金計画**



## 第 10 章 資 金 計 画

### 10.1 所要資金

#### 10.1.1 基本条件

本工事の工事費は、第9章において積算されたが、その基本条件を列記すると次の通りである。

(a) 工事費の積算の範囲は、アンデカレカ第1, 第2発電所, アンデカレカ調整池ダム, アンデカレカ第2発電所～アンボヒマナンブラ発電所間 150 kV 送電線, モラマンガ開閉所～フェロクロム工場間 150 kV 送電線, アンボヒマナンブラ受電変電所までの建設費, 本工事に必要な調査工事費, 実施設計費を含むものとする。

(b) 工事費は、予備設計図に基づき 1974年のマダカスカル国内工事単価を参考にして、1974年12月時点の見積り額である。(表-9.1, 9.2参照)

(c) 工事費は、内貨分と外貨分とに分け、内貨分は、国内労務者賃金, セメント, 木材など国内で調達し得る建設用資機材の費用と、国内輸送費などであって、それ以外を外貨分とした。

(d) 工事は請負方式により実施され、設計, 施工管理はコンサルタントが行なうものとして見積る。

(e) ゲート, 水圧鉄管, 水車発電機, 電線など主要機械は運搬据付工事費と材料, 製作費とに分け計上する。

(f) 工事に必要な建物, 備品, 諸車, その他の諸経費は、監督および管理費に計上する。

(g) 予備費は土木工事に対して15%, ゲート, 鉄構主要機器に対して5%を見込んである。

(h) 建設中利息は内貨, 外貨とも年率7%とした。

(i) 輸入機器に対しては、関税が免除されるものとした。

#### 10.1.2 総所要資金

本計画の総所要資金は 27,483MFMG である。なお工事費の総括表は第9章に示してある。

### 10.2 資金調達

本計画の総工事費は、10.1に述べた通りである。その工期ごとの工事費は次の通りである。

単位：MFMG

工 期	工 事 費		
	内 貨	外 貨	計
第1期(第1発電所 35.2 MW) 1977~1980	5,614	8,245	13,859
第2期( , 調整池, 35.2 MW) 1982~1985	783	3,359	4,142
第3期(第2発電所 36.0 MW) 1985~1988	2,780	6,702	9,482
合 計	9,177	18,306	27,483

但し建設中利息を含む。

この所要資金は、全額借入れ金とする。(外貨分：18,306 MFMG, 内貨分：9,177 MFMG)

借入金は内外貨分とも借入条件は同じとし、下記条件とする。

年利率：7%

償還方法：元利均等払い

償還期限：措置7年を含む30年償還

### 10.3 資金返済能力

#### 10.3.1 発電原価

発電原価は償却の進行と発電電力量の増加に伴って、低減して行く。そこで、ここでは初年度原価、耐用年数平均原価および当初5カ年計画平均原価を表-10.1~3に示す。

#### 10.3.2 電気料金

電気料金のもととなる原価は、当該年度の原価を基礎に算定するのである。ここでは、フェロクロム鉱業にも受け入れられ、かつ、電力企業にとっても健全な経営が維持出来る価格を妥当な卸売原価とし、これを見出そうとするものである。

上記の点から原価は、当初5カ年平均原価をとり、上記の目的を達するアンデカレカ水力発電の原価配分を見出すため、表-10.4に示す4つのケースの原価配分を行ない発電端での原価を試算した。その結果、ケース4.1の配分によればフェロクロム鉱業向3.9 FMG/kWh、一般需要向7.2 FMG/kWhでアンデカレカ水力発電平均原価5.6 FMG/kWhが妥当と考えられる。

6年目以降の原価は資金返済能力を考慮して、毎年のキャッシュフローをにらみながら試算すると、フェロクロム鉱業向3.5 FMG/kWh、一般需要向6.5 FMG/kWhと下げることが可能である。

なお、重要事項を補足すると、

(a) 上記原価は発電端価格であるので、卸売原価は送電損失分およびその販売に要する諸経費を加算する必要がある。

(b) フェロクロム鉱業向原価はアンデカレカ水力発電を優先して割当てたものであり、一般需要向原価は、アンデカレカ水力発電以外のディーゼル、ガスタービン発電の諸経費もおり込んだ1980年からの増分の原価である。

(c) フェロクロム鉱業向原価配分に当って上記ケース4.1ではアンデカレカ水力発電可能量が低下した時点で、30%のピーク調整を条件としたものである。

#### 10.3.3 返済能力

表-A.6.1~A.6.6により返済能力を考察すると次のことが明かとなる。

(a) 一般需要向卸売原価を1981年から5年の間7.2 FMG/kWh、1986年以降6.5 FMG/kWh

とし、フェロクロム鉱業向原価を1981～5年間に3.9 FMG/kWh, 1986年以降を3.5 FMG/kWhとすると下記年度をのぞいて、赤字にならず全般に安定した財務状況である。

(b) 苦しい年度

1981年にアンデカレカ水力発電所が運転開始となると、収入が約9.1億FMG増加するが運転維持費も0.6億FMG増加しそのうえ金利9.7億FMGを支払うと差引1.2億FMGの赤字となる。1983年には第1期分の返済(2.6億FMG)から始まるので、料金収入増(7.7億FMG)、燃料費の減少分(4.6億FMG)の収入増に対し、運転維持費その他年経費増(14億FMG)、利息支払(9.7億FMG)、さらに資金返済分2.6億FMGが加わり、差し引き1.4億FMGの赤字となる。1989年にはアンデカレカ第2発電所が運転を開始し、収入も増加するが、第2期工事の返済(0.8億FMG)が始まり、第3期分の利息(6.6億FMG)が増加するので、差引0.4億FMG程度の赤字となる。

なおフェロクロムの需要がない場合には、アンデカレカ発電所の建設後8年間にわたり赤字が続く。これは一般需要の増分電力量が少ないことに起因する。従って、他の需要増加策により、収入増加を計る必要がある。

なお、2期工事資金の返済のはじまる1989年は、1期工事資金の返済と重なるが、2期分の返済額が少ないことと販売電力量の増加により黒字となる。

上記の如く特定の年度をのぞいて黒字を維持出来るのは、販売電力量が少ない時点では、ディーゼル発電所の燃料費の節減が大きく寄与するからである。

以上のとおり一般需要向卸売原価を現在の9.1 FMG/kWhの20%程度下げた単価でしかも、フェロクロム鉱業向原価を3.9～3.5 FMG/kWhに保ちながら1期～3期工事分の借入資金を十分返済することが可能である。なお1960年、1961年度程度の最洪水の場合を検討すると、1986年以前はその影響は比較的少なく、その前後の年の黒字でカバーすることが出来るが、1987年以後の年となると年間1～1.5億FMGの減少となり、ディーゼル発電の燃料費が6～9億FMGかさむことになるので、この洪水に備えて準備金を積立てておく必要がある。

(表-10.8参照)

表-10.1 初年度原価

Unit: 10<sup>6</sup> FMG

Item	Const. cost	Fixed Expenses			Operation & Maintenance Ex.			Other Ex.	Total Ex.
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
		Interest	Depreciation	Sub-total	Repair Ex.	S. & W.	Sub-total		Grand Total
1st Term									
Civil					26				
El & Me	10,729	751	193	944	24	14	64	3	1,011
T & S	3,130	219	80	299	41	-	41	-	340
Total	13,859	970	273	1,243	91	14	105	3	1,351
2nd Term									
Civil					9				
El & Me	3,912	274	70	344	18	-	27	-	371
T & S	230	16	6	22	3	-	3	-	25
Total	4,142	290	76	366	30	-	30	-	396
3rd Term									
Civil					27				
El & Me	9,252	648	167	815	27	14	68	3	886
T & S	230	16	6	22	3	-	3	-	25
Total	9,482	664	173	837	57	14	71	3	911

Note: Rate of Interest = 7%

El &amp; Me: Electric and Mechanical works

T &amp; S : Transmission line and Substation works

S &amp; W : Salary and wages

表-10.2 耐用年数期間平均原価

Item	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Fixed Ex. 10 <sup>6</sup> FMG	O, M & Other 10 <sup>6</sup> FMG	Total 10 <sup>6</sup> FMG	Out Put MW	Px/RW 10 <sup>3</sup> FMG/kW	Gen. Energy 10 <sup>6</sup> kWh	FMG/kWh	Note
1st Term								Year 1981-85
Hydro	777	67						
T & S	242	41						
Sub Total	1,019	108	1,127	35.2	32.0	234	4.82	
2nd Term								
Hydro	283	27						
T & S	18	4						
Sub Total	301	31	332	35.2		186		
Amount	1,320	139	1,459	70.4	20.7	420	3.47	Year 1986-88
3rd Term								
Hydro	670	68						
T & S	18	3						
Sub Total	688	71	759	36.0				
Amount	2,008	210	2,218	106.4	20.8	579	3.83	Year 1989-95

Note: Fixed Ex. (1) Hydro Construction Cost x 0.07246

T &amp; S " x 0.07723

Energy Average during the years noted in Note (8)

表-10.3 当初5年平均原価

Item	(1)	(2)	(3)	(4)	(5)	(6)	(7)	Note
	Fixed Ex. 10 <sup>6</sup> FMG	O & M Ex. 10 <sup>6</sup> FMG	Total 10 <sup>6</sup> FMG	Out Put MW	Unit Px/kW 10 <sup>3</sup> FMG/kW	Gen. Energy GWh	Unit Px/kWh FMG/kWh	
Hydro	917	67	984					
T & S	288	41	329					
Total	1,205	108	1,313	35.2	37.3	234	5.61	

Note: T & S : Transmission line and Substation  
O & M : Operation & Maintenance Expenses

表-10.4 原価配分 (5年平均)

Case	Total	Fe-Cr	Pub.	Note
Case-1 Total kW Alloc. (MW)	35.2	16.5	18.7	
Rate of Alloc. (%)	100	46.9	53.1	
Hydro Cost (10 <sup>6</sup> FMG)	984	461	523	
T & S Cost (10 <sup>6</sup> FMG)	329	66	263	See Table-10.6
Total (10 <sup>6</sup> FMG)	1,303	527	786	
Unit Px/kWh (FMG/kWh)	5.57	4.71	6.44	
Case-2 Total kWh Alloc. (GWh)	234	112	122	
Rate of Alloc. (%)	100	47.9	52.1	
Hydro Cost (10 <sup>6</sup> FMG)	984	471	513	
T & S Cost (10 <sup>6</sup> FMG)	329	66	263	
Total (10 <sup>6</sup> FMG)	1,303	537	776	
Unit Px/kWh (FMG/kWh)	5.57	4.79	6.36	
Case-3 (kW : kWh = 3 : 1)				
Rate of Alloc. (%)				
kW Alloc.	75	35.2	39.8	
kWh Alloc.	25	12.0	13.0	
Gross Alloc.	100	47.2	52.8	
Hydro Cost (10 <sup>6</sup> FMG)	984	464	520	
T & S Cost (10 <sup>6</sup> FMG)	329	66	263	
Total (10 <sup>6</sup> FMG)	1,303	530	783	
Unit Px/kWh (FMG/kWh)	5.57	4.73	6.42	
Case-4-1				
Total of Cost (10 <sup>6</sup> FMG)	1,303	438	875	See Table-10.5
Unit Px/kWh (FMG/kWh)	5.57	3.91	7.17	
Case-4-2				
Total of Cost (10 <sup>6</sup> FMG)	1,303	507	806	"
Unit Px/kWh (FMG/kWh)	5.57	4.53	6.61	

Note: T & S : Transmission line and Substation

表-10.5 原価配分(ケース4)

Case 4		Case 4.1			Case 4.2		
Installed Cap.	35.2 MW	3.5 MW	C 3.5 MW	10%	3.5 MW	10%	
	Capable Cap.	31.7 MW	B 20.2 MW	57%	17.7 MW	50%	
		A 11.5 MW = 16.5x70%	33%	16.5x85%	L.R		
			L.R	14.0 MW	40%		
		Rate of Alloc.	Cost	Rate of Alloc.	Cost		
A Alloc. of Fe-Cr kW		33%	325	40%	394		
B Alloc. of Pub. kW		57	561	50	492		
C Alloc. of kWh		10	98	10	98		
Total		100	984	100	984		
Item	Case 4-1			Case 4-2			
	Fe-Cr	Pub.	Total	Fe-Cr	Pub.	Total	
A	325		325	394		394	
Hydro B		561	561		492	492	
C	47	51	98	47	51	88	
T & S	66	263	329	66	263	329	
Total	438	875	1,313	507	806	1,303	
GWh	112	122	234	112	122	234	
FMG/kWh	3.91	7.17	5.61	4.53	6.61	5.57	

Note: L. R : Load Regulation  
T & S : Transmission line and Substation



表-10.6 原価配分(送変電設備)

Unit: 10<sup>6</sup> FMG

Item	Total	Fe-Cr	Pub.
<b>Transmission Line</b>			
Amb. - Mo. 86.5 km	1,081		1,081
Mo. - No.2 - No.1 77 km	999	333	666
163.5 km	2,080		
Mo. -Fe-Cr 5 km	51	51	
<b>Sub-total</b>	<b>2,131</b>	<b>384</b>	<b>1,747</b>
<b>Switching Station and Substation</b>			
Moramanga Switching Station	174	174	
Ambohimanambola Substation.	455		455
<b>Sub Total</b>	<b>629</b>	<b>174</b>	<b>455</b>
<b>Grand Total</b>	<b>2,760</b>	<b>558</b>	<b>2,202</b>
<b>Rate of Allocation (%)</b>	<b>100</b>	<b>20</b>	<b>80</b>
<b>Construction Cost</b>	<b>3,130</b>	<b>626</b>	<b>2,504</b>
<b>Average Cost of five years</b>			
Fixed Expens	288	58	230
O & M Expenses	41	8	33
<b>Total</b>	<b>329</b>	<b>66</b>	<b>263</b>

Note : Amb : Ambohimanambola Substation  
 Mo : Moramanga Switching Station  
 No. 2 : Andekaleka No. 2 Power Station  
 No. 1 : Andekaleka No. 1 Power Station  
 O & M : Operation & Maintenance Expenses

表-10.7 キャッシュフロー

Year	2 Furnaces			No Furnace		Note
	Unit Price		Net Cash Provided	Unit Px	Net Cash Provided	
	Public	Fe-Cr		Public		
FMG/kWh	FMG/kWh	10 <sup>6</sup> FMG	FMG/kWh	10 <sup>6</sup> FNM		
1981	7.20	3.90	-121	7.20	-442	
82	"	"	47	"	-340	
83	"	"	-140	"	-483 (*)	
84	"	"	3	"	-360	
85	"	"	67	"	-224	
86	6.50	3.50	72	6.50	-131	
87	"	"	254	"	-302	
88	"	"	319	"	-141	
89	"	"	-43	"	42	
90	"	"	76	"	146	
91	6.20	3.20	164	6.20	291	
92	"	"	125	"	470	
93	"	"	208	"	25	
94	"	"	371	"	267	
95	"	"	428	"	514	

Note: (\*) Start of Stage Repayment

表-10.8 平水年および渇水年発電電力量

Year	Unit: GWh		
	Normal Years	Driest Years	Dry/Normal
1981	181	181	100
82	212	210	99.1
83	238	232	97.5
84	263	250	95.1
85	276	259	93.8
86	391	319	81.6
87	427	333	78.0
88	442	338	76.5
89	504	440	87.4
90	527	454	86.1
91	559	469	83.9
92	587	481	81.9
93	615	492	80.0
94	642	502	78.2
95	666	510	76.6

## 第11章

# アンデカレカ水力発電計画の 実施に必要な諸施策

## 第 11 章 アンデカレカ水力発電計画の実施に必要な諸施策

今まで述べてきたように、アンデカレカ水力発電計画はマ国の電力事情から出来るだけ速かに開発する必要があると考えられるが、S.E.M としては、現有施設の 2 倍に当る設備容量をもつ発電所を建設し、160 Km におよぶ送電線と特殊な工業炉に、電力を供給するなど、今回新たに設置または導入される施設が多く、しかもそれを適確にかつ速かに実施しなければならない立場にある。ここに、それらに関する問題点を整理し、諸施策を列記して計画実施のガイドラインとする。

本開発計画の問題点は、本工事着工までの準備期間中の問題点と、建設期間中の問題および工事完了後の発電所運営上の問題とに分けられる。

なお、当面、建設はアンデカレカ第 1 発電所の第 1 期工事分 ( 35.2 MW ) を実施するものとするが、第 2 発電所についても将来開発に支障のないよう必要な、調査、設計、検討を予め実施しておく必要がある。

### 1 1.1 本工事着工までの諸問題

本水力発電計画を早急に着工するために、次の手順を適確にしかも迅速に推進しなければならない。

- (a) 基本設計の確立 1975 年 4 月～7 月
  - (b) 調査工事の実施 1975 年 8 月～76 年 11 月
  - (c) 建設費の確立 1975 年 8 月
  - (d) 借款契約の確立 1975 年 8 月～76 年 10 月末
  - (e) 実施設計の推進 1976 年 2 月～77 年 3 月
  - (f) 工事入札
  - (g) 業者決定
- } 1976 年 11 月～77 年 3 月

このためには、S.E.M ( S.I.N.E.E ) にはアンデカレカ開発準備機構をつくり、数名の技術者と事務関係者がこの機構の要員として必要であろう。さらに、現地での調査工事のための管理機構が必要である。

建設工事工程にあわせるためには、マ国側で基本設計、調査工事、実施設計に着手できる様上記機構により早急に手配し、1975 年 4 月から 1977 年 3 月までにこれらを完了する必要がある。

### 1 1.2 建設中における施策

本工事が実施された段階においては、次の問題点が挙げられる。

- (a) 工事資金に関するもの
- (b) 工事資材に関するもの
- (c) 建設工事の推進、監理

建設工事の発注の方式にもよるが、多額の工事資金の借入、調達、支出に関する管理、建設資材の国内調達および輸入資材の管理の業務が一時的に増大する。これらは、前記アンデカレカ準備機構の拡張とアンデカレカ建設機構により運営することができる。しかし、建設に伴なり詳細設計および工事監理業務は、多数の経験を積んだ技術者が必要である。

また、本計画は発電機容量も、送電容量もいずれも大容量となるほか負荷の約半分は、特殊な電炉であることをも含めて建設工事中から運転開始時に備えて

- (a) 運転要員のトレーニング
- (b) 給電規程の確立
- (c) 送電技術の研修

等を実施して、運転開始後スムーズな運転により、合理的かつ経済的な運営を期すべきである。

### 1.1.3 施設運用上の施策

建設工事も完了し、営業運転に入ったアンデカレカ第1発電所は直ちにその効力を発揮することが望まれている。

したがって、建設中から運転開始に備えて、前記諸施策を実施し万全を期するのであるが、下記の問題が具体的に出てくるであろう。

- (a) 給電運用の確立
- (b) 既設貯水池を含めた水力の運営
- (c) 水力の運営によるディーゼル負荷の軽減による原価の節減
- (d) ディーゼルの負荷急減による諸問題
- (e) フェロクロム工場との関係運用
- (f) 補修体制の確立
- (g) フェロクロム工場電炉による電圧変動現象
- (h) 洪水対策

給電運用については、給電指令系統を確立して、アンデカレカ発電所の有効な運用を行なうが、この場合、既設水力の貯水池、発電所も含めた水力の合理的運用ルールを確立し、これによって既設ディーゼルの負荷を軽減し、燃料費を節減し電力原価の低減を計るのがアンデカレカ発電所の大きな使命である。

この場合、ディーゼルの負荷が急減するので(約 $1/10$ )保守上、また、運転要員の面などその波及するところは少なくない。一方、長大な送電線と大規模水力がマンドラカからアンデカレ

かまでに分散しているが、モラマンガに開閉所を置き、これらの施設の維持、運営に当らせ補修体制を確立する必要がある。

フェロクロム工場には、連絡官を派遣し工場の生産計画と発電所の運用との調整を計り、相互に経済的かつ計画的連係運用を行なう。

また、電炉はフェロクロム生産中、系統に電圧の変動を起こすこともあるが日本の実例では大した問題ではない。しかし、タナナリブ周辺の系統はまだ十分大きくないので工場に対して十分な指導を行ない、系統電圧の安定を計ることが必要と考える。

以上、豊水年または平水年に対しては水力の有効な運転も可能であるが、ある周期で洪水が来るので、ディーゼル発電の追補等によって供給力を確保しなければならない。このため、洪水対策資金として洪水準備金を予め年々の内部留保により確保しておくことが必要である。

付 録

Table-A.3.1 Demand Forecast for Most Probable Case in Public Sector

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Growth rate of C.D.P %	Increase rate of Energy %	Sales Energy 10 <sup>6</sup> kWh	Loss rate %	Gene-rated Energy 10 <sup>6</sup> kWh	Load Factor %	Peak Demand MW
1974	2	2.6	136	11.0	153	51	34.3
1975	3	3.9	141	"	158	"	35.3
1976	4	5.2	148	"	166	"	37.1
1977	5	6.5	158	"	178	"	39.8
1978	5.0	6.5	168	"	189	52	41.5
1979	"	"	179	"	201	"	44.0
1980	"	"	191	"	215	"	47.1
1981	"	"	203	"	228	"	50.0
1982	"	"	216	"	243	"	53.3
1983	5.5	7.0	231	"	260	53	55.0
1984	"	"	247	"	278	"	59.8
1985	"	"	264	"	297	"	64.0
1986	"	"	282	12.0	320	"	68.9
1987	"	"	302	"	343	"	74.0
1988	6.0	7.7	325	"	369	54	78.0
1989	"	"	350	"	398	"	84.1
1990	"	"	377	"	428	"	90.6
1991	"	"	406	13.0	467	"	98.7
1992	"	"	437	"	502	"	106.1
1993	"	"	471	"	541	55	112.4
1994	"	"	507	"	583	"	121.1
1995	"	"	546	"	628	"	130.4

Table-A.3.2 Peak Balance (1-0-B)

unit: MW

Year	Peak Demand			Capable Output					(8) Total	(9) Reserve
	(1) Public Sector	(2) Ferro-chrome	(3) Total	(4) Exist Hydro	(5) Ande-kaleka	(6) Diesel	(7) Gas Turbine			
	1974	34.3		34.3	27		*1(9) 12			
1975	35.3		35.3	27		12		39	3.7	
1976	37.1		37.1	27		18		45	7.9	
1977	39.8		39.8	27		18		45	5.2	
1978	41.5		41.5	27		18		45	3.5	
1979	44.0		44.0	27		24		51	7.0	
1980	47.1		47.1	27		24		51	3.9	
1981	50.0	16.5	66.5	27	48	24		99	32.5	
1982	53.0	16.5	69.8	27	48	24		99	29.2	
1983	55.0	16.5	71.5	27	48	24		99	27.5	
1984	59.8	16.5	76.3	27	48	24		99	22.7	
1985	64.0	16.5	80.5	27	48	24		99	18.5	
1986	68.9	32.5	101.4	27	81	24		132	30.6	
1987	74.0	32.5	106.5	27	81	24		132	25.5	
1988	78.0	32.5	110.5	27	97.3	24		148.3	37.8	
1989	84.1	32.5	116.6	27	97.3	24		148.3	31.7	
1990	90.6	32.5	123.1	27	97.3	24		148.3	25.2	
1991	98.7	32.5	131.2	27	97.3	24	15	163.3	32.1	
1992	106.1	32.5	138.6	27	97.3	24	15	163.3	24.7	
1993	112.4	32.5	144.9	27	97.3	35	15	174.3	29.4	
1994	121.1	32.5	153.6	27	97.3	46	15	185.3	31.7	
1995	130.9	32.5	162.9	27	97.3	46	15	185.3	22.4	

Note: \*1 shows cold reserve, not included in capable out put.



Table-A.3.3 Peak Balance (2-1-A & 2-2-A)

unit: MW

Year	Peak Demand			Capable Output					Reserve
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
	Public Sector	Ferro-chrome	Total	Exist Hydro	Ando-kaleka	Diesel	Gas Turbine	Total	
1974	34.3		34.3	27		12		39	*1(9) 4.7
1975	35.3		35.3	27		12		39	3.7
1976	37.1		37.1	27		18		45	7.9
1977	39.8		39.8	27		18		45	5.2
1978	41.5		41.5	27		18		45	3.5
1979	44.0		44.0	27		24		51	7.0
1980	47.1		47.1	27		24		51	3.9
1981	50.0	16.5	66.5	27	31.7	24		82.7	16.2
1982	53.3	16.5	69.8	27	31.7	24		82.7	12.9
1983	55.0	16.5	71.5	27	31.7	24	15	97.7	26.2
1984	59.8	16.5	76.3	27	31.7	24	15	97.7	21.4
1985	64.0	16.5	80.5	27	31.7	24	15	97.7	17.2
1986	68.9	32.5	101.4	27	52.8	24	15	118.8	17.4
1987	74.0	32.5	106.5	27	60.4	24	15	126.4	19.9
1988	78.0	32.5	110.5	27	60.4	24	15	126.4	15.9
1989	84.1	32.5	116.6	27	78.4	24	15	144.4	27.8
1990	90.6	32.5	123.1	27	78.4	24	15	144.4	21.3
1991	98.7	32.5	131.2	27	95.7	24	15	161.7	30.5
1992	106.1	32.5	138.6	27	95.7	24	15	161.7	23.1
1993	112.4	32.5	144.9	27	95.7	35	15	172.7	27.8
1994	121.1	32.5	153.6	27	95.7	35	15	172.7	19.1
1995	130.4	32.5	162.9	27	95.7	46	15	183.7	20.8

Note: \*1 shows cold reserve, not included in capable out put.

Table-A.3.4 Energy Balance (1-0-B)

unit: GWh

Year	Energy Demand			Generated Energy						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
	Public Sector	Ferro-chrome	Total	Exist	Hydro	Total	Diesel	Thermal	Total	
					Ando-kaleka			G.T.		
1974	153		153	128		128	25		25	
1975	158		158	128		128	30		30	
1976	166		166	128		128	38		38	
1977	178		178	128		128	50		50	
1978	189		189	128		128	61		61	
1979	201		201	128		128	73		73	
1980	215		215	128		128	87		87	
1981	228	87	315	128	180	308	7		7	
1982	243	104	347	128	212	340	7		7	
1983	260	115	375	128	240	368	7		7	
1984	278	127	405	128	269	397	8		8	
1985	297	127	424	128	287	415	9		9	
1986	320	232	552	128	411	539	13		13	
1987	343	254	597	128	453	581	16		16	
1988	369	254	623	128	476	604	19		19	
1989	398	254	652	128	502	630	22		22	
1990	428	254	682	128	526	654	28		28	
1991	467	254	721	128	560	688	26	5	31	
1992	502	254	756	128	588	716	32	8	40	
1993	541	254	795	128	618	746	44	5	49	
1994	583	254	837	128	645	773	59	5	64	
1995	628	254	882	128	670	798	76	8	84	

Table-A.3.5 Energy Balance (2-1-A & 2-2-A)

Unit: GWh

Year	Energy Demand			Generated Energy						
	(1) Public Sector	(2) Ferro-chrome	(3) Total	Hydro.			Thermal			
				(4) Exist	(5) Additions	(6) Total	(7) Diesel	(8) G. T.	(9) Total	
1974	153		153	128		128	25			25
1975	158		158	128		128	30			30
1976	166		166	128		128	38			38
1977	178		178	128		128	50			50
1978	189		189	128		128	61			61
1979	201		201	128		128	73			73
1980	215		215	128		128	87			87
1981	228	87	315	128	181	309	6			6
1982	243	104	347	128	212	340	7			7
1983	260	115	375	128	238	366	9			9
1984	278	127	405	128	263	391	14			14
1985	297	127	424	128	276	404	15	5		20
1986	320	232	552	128	391	519	28	5		33
1987	343	254	597	128	427	555	35	5		40
1988	369	254	623	128	442	570	45	8		53
1989	398	254	652	128	504	632	20	-		20
1990	428	254	682	128	527	655	22	5		27
1991	467	254	721	128	559	687	34	-		34
1992	502	254	756	128	587	715	36	5		41
1993	541	254	795	128	615	743	47	5		52
1994	583	254	837	128	642	770	62	5		67
1995	628	254	882	128	666	794	83	5		88

Table-A.3.6 Demand Forecast for Maximum Case in Public Sector

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Growth rate of G.D.P. %	Increase rate of Energy %	Sales Energy 10 <sup>6</sup> kWh	Loss rate %	Gene-rated Energy 10 <sup>6</sup> kWh	Load Factor %	Peak Demand MW
1974	2	2.6	136	11.0	153	51	34.3
1975	3	3.9	141	"	158	"	35.3
1976	4	5.2	148	"	166	"	37.1
1977	5	6.5	158	"	178	"	39.8
1978	5.0	6.5	168	"	189	52	41.5
1979	"	"	179	"	201	"	44.0
1980	"	"	191	"	215	"	47.1
1981	"	"	203	"	228	"	50.0
1982	"	"	216	"	243	"	53.3
1983	6.0	7.7	233	"	262	53	56.4
1984	"	"	251	"	282	"	60.8
1985	"	"	270	"	303	"	65.3
1986	"	"	291	12.0	331	"	71.3
1987	"	"	313	"	356	"	76.6
1988	7.0	9.0	341	"	388	54	82.0
1989	"	"	372	"	423	"	89.4
1990	"	"	405	"	460	"	97.2
1991	"	"	441	13.0	507	"	107.2
1992	"	"	481	"	553	"	116.9
1993	8.0	10.0	529	"	608	55	126.2
1994	"	"	582	"	669	"	138.9
1995	"	"	640	"	736	"	152.7

Table-A.3.7 Peak Balance (1-0-B)

unit: MW

Year	Peak Demand			Capable Output					Reserve
	(1) Public Sector	(2) Ferro-chrome	(3) Total	(4) Exist Hydro	(5) Ande-kaleka	(6) Diesel	(7) Gas Turbine	(8) Total	
1974	34.3		34.3	27		12		39	*1(9) 4.7
1975	35.3		35.3	27		12		39	3.7
1976	37.1		37.1	27		18		45	7.9
1977	39.8		39.8	27		18		45	5.2
1978	41.5		41.5	27		18		45	3.5
1979	44.0		44.0	27		24		51	7.0
1980	47.1		47.1	27		24		51	3.9
1981	50.0	16.5	66.5	27	48	24		99	32.5
1982	53.3	16.5	69.8	27	48	24		99	29.2
1983	56.4	16.5	72.9	27	48	24		99	26.1
1984	60.8	16.5	77.3	27	48	24		99	21.7
1985	65.3	16.5	81.8	27	48	24		99	17.2
1986	71.3	32.5	103.8	27	81	24		132	28.2
1987	76.6	32.5	109.1	27	81	24		132	22.9
1988	82.0	32.5	114.5	27	97.3	24		148.3	33.8
1989	89.4	32.5	121.9	27	97.3	24		148.3	26.4
1990	97.2	32.5	129.7	27	97.3	24	15	163.3	33.6
1991	107.2	48.5	155.7	27	97.3	35	30	189.3	33.6
1992	116.9	48.5	165.4	27	97.3	46	30	200.3	34.9
1993	126.2	48.5	174.7	27	97.3	46	30	200.3	25.6
1994	138.9	48.5	187.4	27	97.3	57	30	211.3	23.9
1995	152.7	48.5	201.2	27	97.3	57	45	226.3	25.1

Note: \*1 shows cold reserve, not included in capabl out put.

Table-A.3.8 Peak Balance (2-1-A & 2-2-A)

unit: MW

Year	Peak Demand			Capable Output					Total Reserve
	(1) Public Sector	(2) Ferro-chrome	(3) Total	(4) Exist Hydro	(5) Ande-kaleka	(6) Diesel	(7) Gas Turbine	(8) Total	
1974	34.3		34.3	27		12		39	*1(9) 4.7
1975	35.3		35.3	27		12		39	3.7
1976	37.1		37.1	27		18		45	7.9
1977	39.8		39.8	27		18		45	5.2
1978	41.5		41.5	27		18		45	3.5
1979	44.0		44.0	27		24		51	7.0
1980	47.1		47.1	27		24		51	3.9
1981	50.0	16.5	66.5	27	31.7	24		82.7	16.2
1982	53.3	16.5	69.8	27	31.7	24		82.7	12.9
1983	56.4	16.5	72.9	27	31.7	24	15	97.7	24.8
1984	60.8	16.5	77.3	27	31.7	24	15	97.7	20.4
1985	65.3	16.5	81.8	27	31.7	24	15	97.7	15.9
1986	71.3	32.5	103.8	27	60.4	24	15	128.4	22.6
1987	76.6	32.5	109.1	27	60.4	24	15	128.4	17.3
1988	82.0	32.5	114.5	27	60.4	35	15	137.4	22.9
1989	89.4	32.5	121.9	27	60.4	35	15	137.4	15.5
1990	97.2	32.5	129.7	27	78.4	35	15	155.4	25.7
1991	107.2	48.5	155.7	27	95.7	35	15	172.7	17.0
1992	116.9	48.5	165.4	27	95.7	35	30	187.7	22.3
1993	126.2	48.5	174.7	27	95.7	46	30	198.7	24.0
1994	138.9	48.5	187.4	27	95.7	57	30	209.7	22.3
1995	152.7	48.5	201.2	27	95.7	68	30	220.7	19.5

Note: \*1 shows cold reserve, not included in capable out put.

Table-A.3.9 Energy Balance (1-0-B)

Unit: GWh

Year	Energy Demand			Generated Energy						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
	Public Sector	Ferro-chrome	Total	Exist	Hydro Available	Total	Diesel	Thermal G.T.	Total	
1974	153		153	128		128	25		25	
1975	158		158	128		128	30		30	
1976	166		166	128		128	38		38	
1977	178		178	128		128	50		50	
1978	189		189	128		128	61		61	
1979	201		201	128		128	73		73	
1980	215		215	128		128	87		87	
1981	228	87	315	128	180	308	7		7	
1982	243	104	347	128	212	340	7		7	
1983	262	115	377	128	241	369	8		8	
1984	282	127	409	128	273	401	8		8	
1985	303	127	430	128	293	421	9		9	
1986	331	232	563	128	421	549	14		14	
1987	356	254	610	128	464	592	18		18	
1988	388	254	642	128	493	621	21		21	
1989	423	254	677	128	524	652	25		25	
1990	460	254	714	128	555	683	26	5	31	
1991	507	360	867	128	666	794	64	9	73	
1992	553	383	936	128	702	830	97	9	106	
1993	608	383	991	128	725	853	126	12	138	
1994	669	383	1,052	128	746	874	163	15	178	
1995	736	383	1,119	128	761	889	215	15	230	

Table-A.3.10 Energy Balance (2-1-A & 2-2-A)

Unit: GWh

Year	Energy Demand			Generated Energy						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
	Public Sector	Ferro-chrome	Total	Exist	Hydro Available	Total	Diesel	Thermal G.T.	Total	
1974	153		153	128		128	25		25	
1975	158		158	128		128	30		30	
1976	166		166	128		128	38		38	
1977	178		178	128		128	50		50	
1978	189		189	128		128	61		61	
1979	201		201	128		128	73		73	
1980	215		215	128		128	87		87	
1981	228	87	315	128	181	309	6		6	
1982	243	104	347	128	212	340	7		7	
1983	262	115	377	128	239	367	10		10	
1984	282	127	409	128	266	394	15		15	
1985	303	127	430	128	278	406	19	5	24	
1986	331	232	563	128	398	526	37	-	37	
1987	356	254	610	128	434	562	43	5	48	
1988	388	254	642	128	452	580	57	5	62	
1989	423	254	677	128	468	596	73	8	81	
1990	460	254	714	128	553	681	33	-	33	
1991	507	360	867	128	662	790	71	6	77	
1992	553	383	936	128	697	825	106	5	111	
1993	608	383	991	128	719	847	139	5	144	
1994	669	383	1,052	128	738	866	181	5	186	
1995	736	383	1,119	128	752	880	231	8	239	

Table-A.3.11 Demand Forecast for Minimum Case in Public Sector

Year	(1)	(2)	(3)	(4)	(5)	(6)	(7)
	Growth rate of C.D.P %	Increase rate of Energy %	Sales Energy 10 <sup>6</sup> kWh	Loss rate %	Gene-rated Energy 10 <sup>6</sup> kWh	Load Factor %	Peak Demand MW
1974	2	2.6	136	11.0	153	51	34.3
1975	3	3.9	141	"	158	"	35.3
1976	4	5.2	148	"	166	"	37.1
1977	5	6.5	158	"	178	"	39.8
1978	5.0	6.5	168	"	189	52	41.5
1979	"	"	179	"	201	"	44.0
1980	"	"	191	"	215	"	47.1
1981	"	"	203	"	228	"	50.0
1982	"	"	216	"	243	"	53.3
1983	5.5	7.0	231	"	260	53	55.0
1984	"	"	247	"	278	"	59.8
1985	"	"	264	"	297	"	64.0
1986	"	"	282	12.0	320	"	68.9
1987	"	"	302	"	343	"	74.0
1988	6.0	7.7	325	"	369	54	78.0
1989	"	"	350	"	398	"	84.1
1990	"	"	377	"	428	"	90.6
1991	"	"	406	13.0	467	"	98.7
1992	"	"	437	"	502	"	106.1
1993	"	"	471	"	541	55	112.4
1994	"	"	507	"	583	"	121.1
1995	"	"	546	"	628	"	130.4

Table-A.3.12 Peak Balance (1-0-B)

unit: MW

Year	Capable Output						
	(1) Public Sector	(2) Exist Hydro	(3) Ande-kataka	(4) Diesel	(5) Gas Turbine	(6) Total	(7) Reserve
1974	34.3	27		12		39	4.7
1975	35.3	27		12		39	3.7
1976	37.1	27		18		45	7.9
1977	39.8	27		18		45	5.2
1978	41.5	27		18		45	3.5
1979	44.0	27		24		51	7.0
1980	47.1	27		24		51	3.9
1981	50.0	27	27	24		78	28.0
1982	53.3	27	27	24		78	24.7
1983	55.0	27	27	24		78	23.0
1984	59.8	27	27	24		78	18.2
1985	64.0	27	27	24		78	14.0
1986	68.9	27	48	24		99	30.1
1987	74.0	27	48	24		99	25.0
1988	78.0	27	48	24		99	21.0
1989	84.1	27	48	24		99	14.9
1990	90.6	27	81	24		132	41.4
1991	98.7	27	81	24		132	33.3
1992	106.1	27	81	24		132	25.9
1993	112.4	27	81	24		132	19.6
1994	121.1	27	108	24		159	37.9
1995	130.4	27	108	24		159	28.6

Note: \*1 shows cold reserve, not included in capable out put.

Table-A.3.13 Peak Balance (2-1-A & 2-2-A)

unit: MW

Year	Demand		Capable Output					Reserve
	(1)	(2)	(3)	(4)	(5)	(6)		
	Public Sector	Exist Hydro	Andeka-loka	Diesel	Gas Turbine	Total		
1974	34.3	27		*1(9)		39	*1(9)	
1975	35.3	27		12		39	4.7	
1976	37.1	27		12		39	3.7	
1977	39.8	27		18		45	7.9	
1978	41.5	27		18		45	5.2	
1979	44.0	27		18		45	3.5	
1980	47.1	27		24		51	7.0	
1981	50.0	27	17.6	24		51	3.9	
1982	53.3	27	17.6	24		68.6	18.6	
1983	55.0	27	31.7	24		68.6	15.3	
1984	59.8	27	31.7	24		82.7	27.7	
1985	64.0	27	31.7	24		82.7	22.9	
1986	68.9	27	31.7	24		82.7	18.7	
1987	74.0	27	52.8	24		82.7	13.8	
1988	78.0	27	52.8	24		103.8	29.8	
1989	84.1	27	52.8	24		103.8	25.8	
1990	90.6	27	52.8	24		103.8	19.7	
1991	98.7	27	70.4	24		101.8	13.2	
1992	106.1	27	70.4	24		121.4	22.7	
1993	112.4	27	88.4	24		121.4	15.3	
1994	121.1	27	88.4	24		139.4	27.0	
1995	130.4	27	106.4	24		139.4	18.3	
1996	140.4	27	106.4	24	15	157.4	27.0	
1997	151.2	27	106.4	24	15	172.4	32.0	
1998	162.8	27	106.4	35	15	172.4	21.2	
1999	175.3	27	106.4	46	15	183.4	20.6	
2000	188.8	27	106.4	46	30	194.4	19.1	
						209.4	20.6	

Note: \*1 shows cold reserve, not included in capable out put.

Table-A.3.14 Energy Balance (1-0-B)

unit: GWh

Year	Energy Demand			Generated Energy						
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	
	Public Sector	Ferro-chrome	Total	Exist	Hydro Available	Total	Diesel	Thermal G.I.	Total	
1974	153		153	128		128	25		25	
1975	158		158	128		128	30		30	
1976	166		166	128		128	38		38	
1977	178		178	128		128	50		50	
1978	189		189	128		128	61		61	
1979	201		201	128		128	73		73	
1980	215		215	128		128	87		87	
1981	228		228	128	97	225	3		3	
1982	243		243	128	111	239	4		4	
1983	260		260	128	127	255	5		5	
1984	278		278	128	144	272	6		6	
1985	297		297	128	163	291	6		6	
1986	320		320	128	186	314	6		6	
1987	343		343	128	209	337	6		6	
1988	369		369	128	234	362	7		7	
1989	398		398	128	262	390	8		8	
1990	428		428	128	291	419	9		9	
1991	467		467	128	329	457	10		10	
1992	502		502	128	363	491	11		11	
1993	541		541	128	400	528	13		13	
1994	583		583	128	440	568	20		20	
1995	628		628	128	480	608	20		20	

Table-A.3.15 Energy Balance (2-1-A & 2-2-A)

unit: GWh

Year	Energy Demand			Generated Energy								
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)			
	Public Sector	Ferro-chrome	Total	Exist	Hydro	Total	Diesel	Thermal	Total			
				Annulus			G. T.	G. T.				
1974	153		153	128		128	25		25			25
1975	158		158	128		128	30		30			30
1976	166		166	128		128	38		38			38
1977	178		178	128		128	50		50			50
1978	189		189	128		128	61		61			61
1979	201		201	128		128	73		73			73
1980	215		215	128		128	87		87			87
1981	228		228	128	97	225	3		3			3
1982	243		243	128	111	239	4		4			4
1983	260		260	128	130	258	5		5			5
1984	278		278	128	150	278	6		6			6
1985	297		297	128	170	298	6		6			6
1986	320		320	128	196	324	6		6			6
1987	343		343	128	209	337	6		6			6
1988	369		369	128	234	362	7		7			7
1989	398		398	128	261	389	8		8			8
1990	428		428	128	290	418	10		10			10
1991	467		467	128	324	452	15		15			15
1992	502		502	128	353	481	21		21			21
1993	541		541	128	400	528	13		13			13
1994	583		583	128	439	567	16		16			16
1995	628		628	128	479	607	21		21			21
1996	676		676	128	510	638	38		38			38
1997	728		728	128	550	678	55	5	60			60
1998	784		784	128	590	718	61	5	66			66
1999	844		844	128	630	758	81	5	86			86
2000	909		909	128	670	798	103	8	111			111

Table A.4.1-(1) Repayment Schedule

Item	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993
1st Term													
Loan Fund	4,000,000												
Interest (A)		320,000	320,000	320,000	320,000	320,000	320,000	320,000	320,000	320,000	320,000	288,000	256,000
Principal (B)												400,000	400,000
(A) + (B)		320,000	320,000	320,000	320,000	320,000	320,000	320,000	320,000	320,000	320,000	688,000	656,000
Balance	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	3,600,000	3,200,000	2,800,000
2nd Term													
Loan Fund						3,000,000							
Interest (A)							240,000					240,000	240,000
Principal (B)													
(A) + (B)							240,000					240,000	240,000
Balance						3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000	3,000,000
Total													
Loan Fund	4,000,000					3,000,000							
Interest (A)		320,000	320,000	320,000	320,000	320,000	560,000	560,000	560,000	560,000	560,000	528,000	496,000
Principal (B)												400,000	400,000
(A) + (B)		320,000	320,000	320,000	320,000	320,000	560,000	560,000	560,000	560,000	560,000	928,000	896,000
Balance	4,000,000	4,000,000	4,000,000	4,000,000	4,000,000	7,000,000	7,000,000	7,000,000	7,000,000	7,000,000	6,600,000	6,200,000	5,800,000
1st Term													
Loan Fund													
Interest (A)						64,000	32,000						
Principal (B)													
(A) + (B)						64,000	32,000						
Balance	2,400,000	2,000,000	1,600,000	1,200,000	800,000	400,000	0						
2nd Term													
Loan Fund													
Interest (A)		240,000	240,000	216,000	192,000	168,000	144,000	120,000	96,000	72,000	48,000	24,000	
Principal (B)													
(A) + (B)		240,000	240,000	216,000	192,000	168,000	144,000	120,000	96,000	72,000	48,000	24,000	
Balance	3,000,000	3,000,000	2,700,000	2,400,000	2,100,000	1,800,000	1,500,000	1,200,000	900,000	600,000	300,000	0	
Total													
Loan Fund													
Interest (A)		432,000	400,000	344,000	288,000	232,000	176,000	120,000	96,000	72,000	48,000	24,000	
Principal (B)													
(A) + (B)		432,000	400,000	344,000	288,000	232,000	176,000	120,000	96,000	72,000	48,000	24,000	
Balance	5,400,000	5,000,000	4,300,000	3,600,000	2,900,000	2,200,000	1,500,000	1,200,000	900,000	600,000	300,000	0	



Table-A.4.1-(2) Repayment Schedule

(Total Construction Cost at Standard Estimation)

Item	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Profit	498,280	293,266	103,109	80,200	153,250	350,443	659,577	678,909	678,909	678,909
Depreciation	378,000	378,000	378,000	378,000	378,000	609,500	609,500	609,500	609,500	609,500
Repayment		320,000	320,000	320,000	320,000	560,000	560,000	560,000	560,000	560,000
Net Balance	120,280	253,266	45,109	138,200	211,250	399,943	709,077	728,409	728,409	728,409
Total	120,280	373,546	418,655	280,455	69,205	330,738	1,039,815	1,768,224	2,496,633	3,285,042

Item	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Profit	1,099,109	1,099,109	1,099,109	1,099,109	1,099,109	1,271,009	1,271,009	1,271,009	1,271,009	1,271,009
Depreciation	189,300	189,300	189,300	189,300	189,300	17,400	17,400	17,400	17,400	17,400
Repayment	960,000	928,000	896,000	864,000	832,000	1,100,000	1,044,000	988,000	932,000	876,000
Net Balance	328,409	360,409	392,409	424,409	456,409	188,409	244,409	300,409	356,409	412,409
Total	3,613,451	3,973,860	4,366,269	4,790,678	5,247,087	5,435,496	5,679,905	5,980,314	6,336,723	6,749,132

Item	2001	2002	2003	2004	2005
Profit	1,271,009	1,271,009	1,271,009	1,271,009	1,271,009
Depreciation	17,400	17,400	17,400	17,400	17,400
Repayment	420,000	396,000	372,000	348,000	324,000
Net Balance	868,409	892,409	916,409	940,409	964,409
Total	7,617,541	8,509,950	9,426,359	10,366,768	11,331,177

**Table-A.4.1-(3) Repayment Schedule**

(Total Construction Cost at Standard Estimation - 4,000 FMG)

Item	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Profit	438,280	217,266	15,109	180,200	253,250	526,443	859,577	879,909	879,909	879,909
Depreciation	378,000	378,000	378,000	378,000	378,000	609,500	609,500	609,500	609,500	609,500
Repayment		320,000	320,000	320,000	320,000	560,000	560,000	560,000	560,000	560,000
Net Balance	60,280	159,266	42,891	238,200	311,250	575,943	909,077	929,409	929,409	929,409
Total	60,280	219,546	176,655	61,545	372,795	948,738	1,857,815	2,787,224	3,716,633	4,646,042

Item	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Profit	1,300,109	1,300,109	1,300,109	1,300,109	1,300,109	1,472,009	1,472,009	1,472,009	1,472,009	1,472,009
Depreciation	189,300	189,300	189,300	189,300	189,300	17,400	17,400	17,400	17,400	17,400
Repayment	960,000	928,000	896,000	864,000	832,000	1,100,000	1,044,000	988,000	932,000	876,000
Net Balance	529,409	561,409	593,409	625,409	657,409	389,409	445,409	501,409	557,409	613,409
Total	5,175,451	5,736,860	6,330,269	6,955,678	7,613,087	8,002,496	8,447,905	8,949,314	9,506,723	1,012,132

Item	2001	2002	2003	2004	2005
Profit	1,472,009	1,472,009	1,472,009	1,472,009	1,472,009
Depreciation	17,400	17,400	17,400	17,400	17,400
Repayment	420,000	396,000	372,000	348,000	324,000
Net Balance	1,069,409	1,093,409	1,117,409	1,141,409	1,165,409
Total	11,189,541	12,282,950	13,400,359	14,541,768	15,707,177

**Table-A.4.1-(4) Repayment Schedule**  
(Total Construction Cost at Standard Estimation + 4,000 FMG)

Item	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Profit	558,280	369,266	191,109	19,800	53,250	174,443	429,577	478,909	478,909	478,909
Depreciation	378,000	378,000	378,000	378,000	378,000	609,500	609,500	609,500	609,500	609,500
Repayment	180,280	320,000	320,000	320,000	320,000	320,000	560,000	560,000	560,000	560,000
Net Balance	180,280	311,266	133,109	38,200	111,250	463,943	479,077	528,409	528,409	528,409
Total	180,280	491,546	624,655	586,455	475,205	11,262	467,815	996,224	1,524,633	2,053,942

Item	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Profit	899,109	899,109	899,109	899,109	899,109	1,071,009	1,071,009	1,071,009	1,071,009	1,071,009
Depreciation	189,300	189,300	189,300	189,300	189,300	17,400	17,400	17,400	17,400	17,400
Repayment	960,000	928,000	896,000	864,000	832,000	1,100,000	1,044,000	988,000	932,000	876,000
Net Balance	128,409	160,409	192,409	224,409	256,409	11,591	44,409	100,409	156,409	212,409
Total	2,181,451	2,341,860	2,534,269	2,758,678	3,015,087	3,003,496	3,047,905	3,148,314	3,304,723	3,517,132

Item	2001	2002	2003	2004	2005
Profit	1,071,009	1,071,009	1,071,009	1,071,009	1,071,009
Depreciation	17,400	17,400	17,400	17,400	17,400
Repayment	420,000	396,000	372,000	348,000	324,000
Net Balance	668,409	692,409	716,409	740,409	764,409
Total	4,185,541	4,877,950	5,594,359	6,334,768	7,099,177

**Table-A.4.1-(5) Repayment Schedule**

(Total Construction Cost at Standard Estimation - 10 % Rate of Interest)

Item	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990
Profit	588,462	384,787	195,443	12,830	60,305	188,102	495,346	514,678	514,678	514,678
Depreciation	378,000	378,000	378,000	378,000	378,000	609,500	609,500	609,500	609,500	609,500
Repayment	400,000	400,000	400,000	400,000	400,000	700,000	700,000	700,000	700,000	700,000
Net Balance	210,462	406,787	217,443	34,830	38,305	97,602	404,846	424,178	424,178	424,178
Total	210,462	617,249	834,692	869,522	831,217	733,615	328,769	95,409	519,587	943,765

Item	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000
Profit	934,878	934,878	934,878	934,878	934,878	1,106,778	1,106,778	1,106,778	1,106,778	1,106,778
Depreciation	189,300	189,300	189,300	189,300	189,300	17,400	17,400	17,400	17,400	17,400
Repayment	1,100,000	1,060,000	1,020,000	980,000	940,000	1,200,000	1,130,000	1,060,400	990,000	920,000
Net Balance	24,178	64,178	104,178	144,178	184,178	75,822	5,822	63,778	134,178	204,178
Total	967,943	1,032,121	1,136,299	1,280,477	1,464,655	1,388,833	1,383,011	1,446,789	1,580,967	1,785,145

Item	2001	2002	2003	2004	2005
Profit	1,106,778	1,106,778	1,106,778	1,106,778	1,106,778
Depreciation	17,400	17,400	17,400	17,400	17,400
Repayment	450,000	420,000	390,000	360,000	330,000
Net Balance	674,178	704,178	734,178	764,178	794,178
Total	2,459,323	3,163,501	3,897,679	4,661,857	5,456,035

Table-A.4.2 Production Cost (Standard Condition)

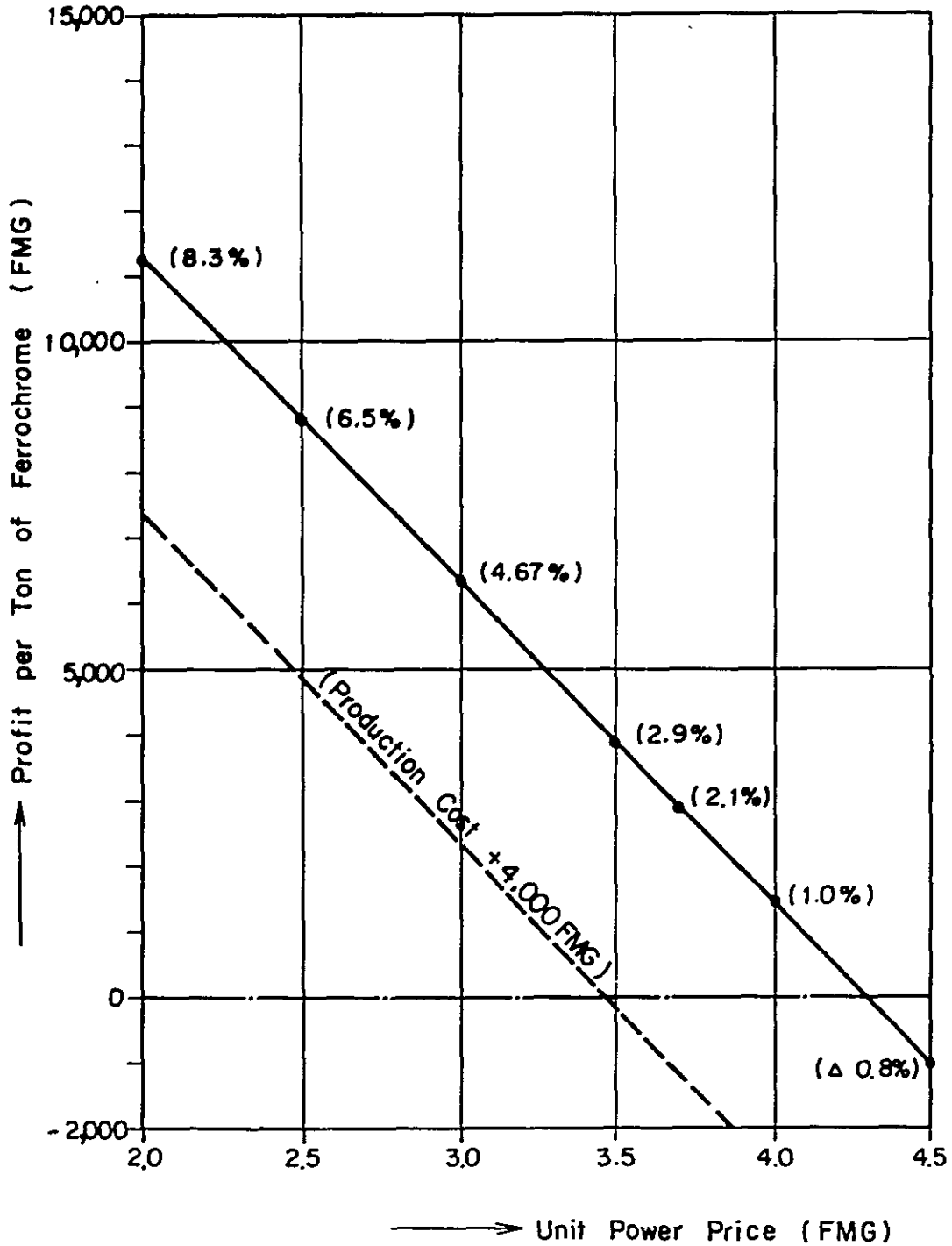
Item	Unit Consumption (t)	Unit Price	Electric Power Unit Price 3.70		Electric Power Unit Price 4.00	
			Cost Per Ton	Ratio %	Cost Per Ton	Ratio %
Chromite Ore	2.4	8,000	19,200	25.4	19,200	25.0
Wood Charcoal	0.75	8,000	6,000	8.0	6,000	7.8
Quartzite and Lime Stone	0.2	3,200	640	0.8	640	0.8
Electrode Paste	0.04	120,000	4,800	6.4	4,800	6.2
Electric Power	kWh 4,950	3.70	18,320	24.3	-	-
Industrial Water	75	4.00	-	-	19,800	25.8
Sub-total		2.00	150	0.2	150	0.2
Maintenance Cost and Operating Supplies Cost			(49,110)	65.1	(49,110)	65.8
Labor Cost			4,800		4,800	
Total			3,500		3,500	
Depreciation			(57,410)	76.1	(58,990)	76.6
General Plant Overhead and Insurance Premium			14,200		14,200	
Total			3,800		3,800	
Production Cost			(18,000)	23.9	(18,000)	23.4
Standard Cost (71,940)			75,410	100	76,890	100
			3,470	4.8	4,950	6.9

Unit: FMG

Table -A.4.3 List of Personnel by Job Classifications

Classifications	1 Furnace		2 Furnaces	
	1981 Number	1986 Number	1981 Number	1986 Number
Laborer of all-work	76	133		
Operator	28	53		
Skilled worker	34	36		
Skilled electrician	13	16		
Vehicle Driver and Operator	14	17		
Cook	1	1		
Guard	7	7		
Nurse	2	2		
Clerk	8	8		
Engineer	4	4		
Manager	3	3		
Total	190	280		

Fig-A.4.1 Unit Power Price and Profit per Ton of Ferrochrome



Note : Figure in parenthesis shows ratio attained as against sales price -136,000 FMG.

Table-A.5.1 Rainfall Observatories and Observation Period

Rain fall Data

N°	Station	Monthly Rainfall Observation Period	Max. 24 hours Rainfall Observation Period	Remarks
1	Mouneyres	1936 - 1970	1936 - 1970	1965, 1970
8	Moramanga	1931 - 1974/6	1931 - 1970	1951, 1952, 1954 1973
3	Andekaleka	1935/7 - 1973/11	1935/6 - 1973/11	1953, 1954, 1955
7	Masse =Ampasimpotsy	1938 - 1974/6	1938 - 1974/6	1971
13	Didy	1936 - 1970	1936 - 1970	1947, 1948, 1949
6	Andasibe (=Analama)	1931 - 1974/6	1931 - 1970	
11	Ambasary	1951 - 1973	1963 - 1974/6	1968, 1969, 1970 1972, 1973, 1974
10	Ambohidray	1949 - 1974/6	1954/11 - 1974/6	1969, 1970
16	Beforona	1973 - 1974/4	1973 - 1974/4	
12	Andaingo	1961/10 - 1974/6	1961/10 - 1974/6	1970, 1971, 1973

Total 10 stations

Temperature

N°	Station	Observation Period	Remarks
8	Moramanga	1941 - 1970	Monthly Max and Min.
6	Anaramazaotra	1941 - 1970	"
16	Beforona	1974/1 - 1974/4	"

Total 3 stations

Table-A.5.2 Monthly Total Rainfall

Amboasary Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1957			374.5	26.5	0.0	31.3			4.4	0.0		361.7	798.4
1958	251.6	101.3	188.4	39.8		24.6	34.0			140.0	122.3	455.4	1357.4
1959	463.1	261.1	754.1	11.8	8.8	22.7		13.5		6.2	320.9	129.8	1992.0
1960	370.6	107.7	166.4	6.8	9.9	23.0	13.2	0.0	19.0	20.3	133.1	202.8	1072.8
1961	374.6			183.6	0.0	17.6	47.2	40.7	5.8	21.4	148.8	182.0	1021.7
1962		214.7	76.8	19.9	34.5	4.1	38.8	12.4		12.7	162.4		576.3
1963	242.0	111.7	63.4	37.0			9.8					242.2	706.1
1964	89.9	209.5	296.6	7.6		21.3	52.8	74.5		5.2	40.8	37.2	835.4
1965		36.0		8.0	0.9	0.0	18.4	16.3	0.9	0.1		201.3	281.9
1966	109.9	182.5	96.2	26.1	0.7				0.4		205.4	307.7	928.9
1967	202.8	24.6	199.6	48.0	22.5		0.6	150.8	22.2	112.4	154.7		938.2
1968	92.6	128.1	132.8	109.3								275.1	737.9
1969	163.0	112.9	173.3	117.0	7.5				0.0	104.5	147.0		825.2
1970	320.6	94.5	279.3	124.6	88.7	33.3	100.1	54.0	0.0	0.0	126.3	144.9	1366.3
1971	472.3	196.1		26.4			15.8			20.8	405.2	217.2	1353.8
1972	77.7	288.7	266.5		9.0	21.5		22.0		109.0	152.0	127.0	1073.4
1973	220.5	140.2					50.8	46.0	0.0		0.7		458.2
1974				86.0		139.7							225.7
Total	3451.2	2209.6	3067.9	878.4	182.5	339.1	381.5	430.2	52.7	552.6	2119.6	2884.3	16549.6
Average	246.5	147.3	217.9	54.9	16.6	30.8	34.7	43.0	5.9	42.5	163.0	221.9	
Max.	472.3	288.7	754.1	183.6	88.7	139.7	100.1	150.8	22.2	140.0	405.2	455.4	
Min.	13.2	31.5	31.0	6.8	0.0	0.0	0.6	0.0	0.0	0.0	0.7	12.0	

Ambohivray Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1949											94.1	27.6	121.7
1950	327.8	290.2	103.8	13.8	0.2		25.8	3.3	0.8	14.7		20.3	800.7
1951		67.3			0.5	1.0	2.6	1.0	1.1	14.1	183.4	72.2	343.2
1952	267.2	109.5	113.7	30.3	79.7	146.5	3.0	35.6	57.1	1.5	283.6	57.6	1185.3
1953	78.3	93.7	94.8	70.2			26.2	24.2	41.1				428.5
1954	111.5	40.0	83.8	15.8	10.8	57.8	3.1	26.6	12.6		191.4	77.6	631.0
1955	173.4	26.4	169.5	4.8	17.5	48.4	58.2	44.5		24.5	76.5	166.4	810.1
1956	270.9	19.2		19.9	48.5	3.6			0.0	0.0	160.0	200.5	722.6
1957	8.5	112.5	89.3	20.0		8.8	46.4		20.5	15.7	55.4	149.9	527.0
1958	217.1	51.6	158.8	11.3	21.4	0.0	26.0	34.8	66.4	115.9	145.1	310.3	1158.7
1959	296.4	263.4	650.1	2.2	4.1	12.4	38.3	10.3		38.8	201.7	91.1	1608.8
1960	347.7	108.2	97.3			26.0	14.6	8.8	9.5	22.7	101.8	219.8	956.4
1961	176.4	14.8	151.8	67.6	10.6	16.2	62.0	35.7		12.6	104.5	320.3	972.5
1962	70.6	202.2	75.1	8.9	34.0	8.1	54.5	24.9	5.2	26.9	119.7	326.4	956.5
1963	333.8	88.2	151.4	43.3	41.3	17.3	5.3	23.8	19.1	42.3	203.3	210.9	1180.0
1964	109.7	242.0	219.8	15.5	3.6	26.8	68.3	32.9	19.6	50.1	142.7	395.1	1326.1
1965	348.3	293.6	89.9	97.1	3.5		30.6	45.5	22.7	3.2	123.1	273.7	1331.2
1966	108.1	134.7	50.3	24.2	51.7	7.3	11.9	72.2	3.2	16.1	73.6	231.7	785.0
1967	289.4	147.9	235.0	35.8	8.1	25.7	27.4	118.9	22.9	44.0	368.0	454.9	1778.0
1968	338.2	147.5	276.6	92.3	36.8	18.2	42.6	6.3		6.2	191.5	236.5	1392.7
1969	132.6	135.2	57.4	126.7		7.5							459.4
1970										2.5	96.9	158.8	258.2
1971	303.4			29.1	93.4	30.0	59.8	33.2	24.6	81.5	294.0	123.5	1072.5



Ambohidray Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1972	126.0	533.0	338.9	131.0	34.3	16.0	40.3		5.3	58.3	119.5	246.9	1649.5
1973	525.0	411.9	236.1	57.5		49.8	24.6	15.8	6.4	11.5	25.3	207.3	1571.2
1974	455.0	231.7	166.1	86.1	19.7	73.2							1031.8
<b>Total</b>	<b>5415.3</b>	<b>3764.7</b>	<b>3609.5</b>	<b>1003.4</b>	<b>519.7</b>	<b>600.6</b>	<b>671.5</b>	<b>598.3</b>	<b>338.1</b>	<b>603.1</b>	<b>3355.1</b>	<b>4574.3</b>	<b>25053.6</b>
<b>Average</b>	<b>235.4</b>	<b>163.7</b>	<b>171.9</b>	<b>45.6</b>	<b>27.4</b>	<b>28.6</b>	<b>32.0</b>	<b>31.5</b>	<b>18.8</b>	<b>28.7</b>	<b>152.5</b>	<b>198.9</b>	
<b>Max.</b>	<b>525.0</b>	<b>533.0</b>	<b>650.1</b>	<b>131.0</b>	<b>93.4</b>	<b>146.5</b>	<b>68.3</b>	<b>118.9</b>	<b>66.4</b>	<b>115.9</b>	<b>368.0</b>	<b>454.9</b>	
<b>Min.</b>	<b>8.5</b>	<b>19.2</b>	<b>50.3</b>	<b>2.2</b>	<b>0.2</b>	<b>0.0</b>	<b>2.6</b>	<b>1.0</b>	<b>0.0</b>	<b>0.0</b>	<b>25.3</b>	<b>20.3</b>	

Andaingo Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1961										0.0	158.4	136.9	295.3
1962	96.9	182.7	195.8	56.0	23.0	4.8	5.0	15.0	7.0	43.8	124.6	204.2	958.8
1963	243.7	201.9		163.3	56.3	18.9	18.1	5.7	2.5	81.0	318.8	329.3	1439.5
1964	20.2		117.5	34.1	1.3	32.9	68.6	7.6	0.0	66.7	97.1	264.3	710.3
1965	232.5	108.0	66.1	3.1	5.9	12.8	50.4	46.6	3.9	12.4	59.5	279.0	880.2
1966	36.7	116.7		28.8	5.5	52.4	37.8	47.6	4.2	5.5	172.6	231.4	739.2
1967	279.5	144.6	157.5	36.8		15.0	9.1	16.0		44.8	369.0	375.5	1447.8
1968	151.2	194.9	121.3			17.0		1.3	4.9	4.2	220.7	486.1	1359.4
1969	157.8	106.8	154.6	79.8		2.9	5.3	13.9		74.1	151.8	331.5	1078.5
1970	432.4	200.5	187.6					2.5			129.8	150.2	1103.0
1971	308.6	125.3	78.0							23.4	344.0	243.4	1122.7
1972	158.8	474.3	231.5	75.1	4.5	2.5	26.0	24.2		19.8	152.7	247.4	1416.8
1973	253.5	308.4	200.8	94.4		2.2		4.8			8.9	153.1	1026.1
1974	332.7	152.5	94.0	45.0		39.7							663.9
<b>Total</b>	<b>2704.5</b>	<b>2316.6</b>	<b>1611.9</b>	<b>616.4</b>	<b>96.5</b>	<b>201.1</b>	<b>220.3</b>	<b>185.2</b>	<b>22.5</b>	<b>375.7</b>	<b>2307.9</b>	<b>3432.5</b>	<b>14090.9</b>
<b>Average</b>	<b>208.0</b>	<b>193.1</b>	<b>146.5</b>	<b>61.6</b>	<b>16.1</b>	<b>18.3</b>	<b>27.5</b>	<b>16.8</b>	<b>3.8</b>	<b>34.2</b>	<b>177.5</b>	<b>264.0</b>	
<b>Max.</b>	<b>432.4</b>	<b>474.3</b>	<b>231.5</b>	<b>163.3</b>	<b>56.3</b>	<b>52.4</b>	<b>50.4</b>	<b>47.6</b>	<b>7.0</b>	<b>81.0</b>	<b>369.0</b>	<b>486.1</b>	
<b>Min.</b>	<b>20.2</b>	<b>108.0</b>	<b>66.1</b>	<b>3.1</b>	<b>1.3</b>	<b>2.2</b>	<b>5.0</b>	<b>1.3</b>	<b>0.0</b>	<b>0.0</b>	<b>8.9</b>	<b>136.9</b>	

Beforona Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1973	854.0	907.4	412.2	143.1	43.4	206.2	197.7	168.2	66.7	55.3	10.6	306.9	3371.7
1974	689.1	507.6	449.7	377.1									2023.5
Total	1543.1	1415.0	861.9	520.2	43.4	206.2	197.7	168.2	66.7	55.3	10.6	306.9	5335.2
Average	771.6	707.5	431.0	260.1									
Max.													
Min.													

Analamazaotra Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1931	595.5	355.7	425.0	145.7	59.2	57.2	64.4	71.8	20.5	19.5	281.9	175.3	2271.7
1932	456.7	241.5	134.1	143.3	111.1	42.1	71.6	39.9	129.8	26.0	108.6	193.6	1698.3
1933	285.8	563.3	126.9	294.0	68.1	185.7	52.2	50.7	68.1	25.9	30.1	188.7	1939.5
1934	215.2	221.3	244.1	104.2	94.1	95.3	73.1	124.9	87.7	22.2	141.2	452.5	1875.8
1935	305.4	331.1	89.9	177.4	10.1	167.0	83.2	62.1	41.1	19.8	118.4	354.2	1759.7
1936	236.4	71.9	167.2	89.6	47.2	150.2	139.6	48.1	35.7	77.9	107.1	166.3	1337.2
1937	253.8	421.3	540.9	39.2	81.0	23.2	49.0	91.8	51.7	65.2	25.4	149.3	1791.8
1938	125.1	445.8	106.2	39.7	29.0	82.4	59.6	5.7	48.9	43.5	58.2	68.1	1112.2
1939	224.1	368.8	231.2	86.4	62.4	45.6	64.2	65.6	43.3	7.0	49.9	516.7	1765.2
1940	340.6	700.7	306.2	52.3	45.3	32.7	85.4	71.1	28.1	121.4	13.1	378.1	2175.0
1941	422.2	322.9	203.3	128.7	54.3	41.3	76.5	119.4	45.9	82.3	169.1	154.8	1820.7
1942	144.6	66.5	166.2	48.5	46.7	55.7	86.7	101.2	39.3	86.7	133.3	119.8	1095.2
1943	444.5	308.3	164.6	10.4	11.2	76.7	78.5	27.4	89.9	24.3	3.5	341.7	1581.0
1944	149.7	200.4	363.3	217.8	66.0	38.3	161.2	29.7	43.5	90.6	97.1	322.5	1780.1
1945	152.3	409.5	96.4	138.3	33.6	3.2	33.7	51.7	18.8	36.8	71.9	245.9	1292.1
1946	201.9	341.2	199.5	97.0	71.1	62.2	64.1	51.7	80.3	58.9	194.8	193.5	1616.2
1947	233.3	224.7	284.0	96.1	58.2	134.8	90.7	106.0	61.1	39.5	46.8	122.4	1497.6
1948	490.5	217.9	291.6	73.0	23.6	76.4	122.6	66.5	96.2	143.6	194.8	338.8	2135.5
1949	114.7	205.8	542.5	101.0	127.6	96.0	103.5	23.1	30.3	24.9	108.2	195.3	1672.9
1950	233.1	637.9	126.0	69.6	20.2	34.9	107.8	50.3	47.7	19.7	65.1	49.6	1461.9
1951	597.7	617.1	260.7	51.3	36.2	63.8	35.0	53.0	15.2	23.4	147.7	177.6	2078.7
1952	239.0	111.0		73.7	282.4	170.6	75.6	123.2	38.5	27.4	297.4	168.5	1607.3
1953	125.8	104.7	205.1	71.6	21.6	100.0	66.9	160.4	96.3	43.8	78.5	327.0	1401.7
1954	536.2	128.5	203.4	53.0	66.2	109.1	50.4	63.6	39.6	15.1	172.7	237.0	1674.8
1955	269.1	260.9	312.3	28.7	72.4	91.0	125.1	28.8	49.2	22.9	95.5	180.5	1536.4

Analamazaotra Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1956	537.2	619.5	86.3	169.6	70.4	47.0	32.4	23.2	19.1	6.5	273.3	187.7	2072.2
1957	182.0	299.6	253.3	143.6	31.9	48.3	60.3	44.5	57.5	12.8	38.5	395.8	1568.1
1958	222.1	155.0	367.0	33.5	69.9	108.4	73.7	124.3	36.3	76.4	105.3	311.2	1683.1
1959	273.0	163.9	1208.2	40.5	22.1	56.4	109.2	27.3	44.6	51.8	230.7	185.1	2412.8
1960	480.8	140.9	151.2	17.0	40.0	87.0	52.3	42.3	43.1	36.1	150.8	164.9	1406.4
1961	229.5	32.1	181.7	89.6	23.7	4.0	152.0	106.4	63.4	14.2	134.6	507.7	1368.9
1962	189.2	236.2	75.0	30.7	75.5	33.4	73.6	105.0	89.2	86.1	89.2	132.2	1215.3
1963	275.8	271.3	299.9	103.4	59.3	52.0	67.0	48.0	30.4	63.1	204.1	471.1	1945.4
1964	100.5	219.4	504.4	59.8	37.3	76.2	204.7	106.4	118.5	118.9	90.4	156.4	1792.9
1965	414.4	292.1	323.4	69.5	30.7	26.1	130.9	117.0	65.5	34.2	118.8	372.9	1995.5
1966	165.5	213.7	125.9	39.5	103.8	97.0	81.4	100.5	49.3	24.2	49.8	302.7	1353.3
1967	367.2	148.5	197.5	51.8	76.3	120.9	90.0	236.9	49.0	48.6	210.3	272.4	1739.4
1968	459.7	196.3	188.2	53.1	29.7	33.0	130.5	33.5	21.4	30.4	254.0	139.9	1569.7
1969	385.8	301.4	95.3	124.9	28.0	60.9	90.2	310.0	69.0	47.5	91.1	551.7	2155.8
1970	591.7	303.3	342.2	423.8	101.9	111.0	114.4	149.3	19.8	12.7	118.2	142.7	2431.0
1971	1071.5	371.5	87.4	63.0	61.3	46.6	118.7	79.6	43.1	69.5	161.4	181.3	2354.9
1972	228.9	572.4		96.1	43.1	16.0	125.4	25.7	30.9	165.2	115.5	323.3	1742.5
1973	650.2	537.3	210.6	90.1	13.9	100.2	101.8	89.7	15.2	28.9	2.0	176.9	2016.8
1974	438.5	203.2	309.5	201.4	32.5	132.0							1317.1
Total	14656.7	13156.3	10722.6	4331.4	2550.1	3291.8	3829.1	3457.3	2212.0	2095.4	5248.3	10793.6	76344.6
Average	333.1	299.0	255.3	98.4	58.0	74.8	89.0	80.4	51.4	48.7	122.0	251.0	
Max.	1071.5	700.7	1208.2	423.8	282.4	185.7	204.7	310.0	129.8	165.2	297.4	551.7	
Min.	100.5	32.1	75.0	17.0	13.9	3.2	32.4	5.7	15.2	6.5	2.0	49.6	

Didy Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1936	296.0	36.7	207.2	78.4	27.5	118.3	172.8	12.4	17.7	53.8	83.8	194.2	1298.8
1937	285.1	226.5	938.0	14.7	165.2	10.0	112.5	151.9		9.5	8.5	136.8	2058.7
1938	205.0	387.3	341.2	50.2	18.9	62.7	58.8	17.1	49.1	35.4	32.0	36.1	1293.8
1939	241.9	203.6	335.2	55.8	47.5	24.4	50.4	65.9	27.8	13.0	40.5	511.4	1617.4
1940	212.0	422.3	170.8	27.6	21.7	35.5	54.7	56.0	21.0	38.8	43.4	411.6	1515.4
1941	454.1	345.4	290.4	76.8	48.1	39.4	88.4	80.3	27.0	115.2	82.4	72.8	1720.3
1942	269.0	173.2	190.4	52.3	47.6	54.7	77.0	56.9	26.0	69.5	132.6	219.5	1368.7
1943	540.8	246.9	215.7	18.1	3.8	57.2	69.6	37.4	87.1	9.8	1.5	288.4	1576.3
1944	102.3	169.7	377.0	144.0	37.0	26.7	117.8	29.2	54.5	43.4	70.0	251.5	1423.1
1945	150.8	390.5	126.4	50.3	26.4	5.3	52.4	81.8	10.5	13.4	66.8	422.6	1397.2
1946	231.2	428.1	148.8	82.6	34.8	38.2	41.4	37.5	61.6	49.1	246.2	160.1	1559.6
1947	257.0	344.6	349.9	97.1									1048.6
1948													
1949									22.9	22.0	60.4	54.9	160.2
1950	217.1	426.9	85.2	35.0	4.5	28.0	65.0	20.3	7.4	0.7	44.7	38.3	973.1
1951	384.7	153.4	94.9	14.7	17.3	41.9	23.5	41.4	13.8		92.7	107.7	986.0
1952	257.3	141.2	100.5	81.0	136.5	86.9	37.5	63.7	10.2	14.1	191.2		1120.1
1953	107.5	142.0	193.0	109.8	17.2	18.5	46.7	100.5	51.6	19.9	89.1	58.5	954.3
1954	252.0	86.3	48.4	1.2	36.0	72.1	46.3	54.3	46.9	21.0	115.5	274.4	1054.4
1955	223.2	84.4	194.5	35.5	36.0	79.3	58.0	45.3	32.3	14.0	63.5	148.8	1014.8
1956	421.7	378.4	107.9	98.6	73.5	8.6	3.7	4.1	2.9	1.2	152.2	244.3	1497.1
1957	284.3	131.5	275.3	113.0	12.2	5.8	41.3	47.0	38.7	14.2	16.0	131.7	1111.0
1958	298.4	101.8	275.6	46.9	13.7	96.4	17.7	62.0	65.9	220.6	61.6	172.7	1433.3
1959	184.0	128.9	616.5	58.0	14.0	44.8	25.3	46.3	33.1	82.2	280.8	223.0	1678.9
1960	201.5	53.0	42.5	7.5	13.6	41.1	4.9	47.3	2.9	7.7	117.8	115.3	655.3

Didy Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1961	146.2	46.4	82.3	119.5	0.9	1.4	17.3				102.7	294.2	810.9
1962	113.4	232.5	61.0	12.7	27.4	20.1	27.1	47.0	30.0	90.9	140.1	110.1	912.3
1963	188.0	132.4	120.4	16.6	32.2	33.7	77.8	17.4	16.2	44.0	88.5		767.2
1964	16.5	174.5	395.1	19.2	34.9	43.3	74.3	34.8	22.7	64.0	19.0	128.1	1026.4
1965	301.3	95.6	98.4	9.0	22.2	7.0	118.9	80.1	24.5	9.3	72.5	140.2	979.0
1966	46.7	174.5	56.1	16.9	19.7	77.1	43.3	82.9	57.6	9.8	24.1	350.2	958.9
1967			216.8	28.7		102.9	58.2	181.2	17.2	60.4	57.0		722.4
1968	62.1			11.6	8.0		94.7		11.5	22.7	79.9	198.5	511.5
1969		156.0				21.8	46.3	66.5	8.6				299.2
1970						34.4		35.3	38.3	13.1		137.2	258.3
1971	297.0	159.9	80.5	24.6	56.8	24.6	103.5		36.8	78.6	262.6	162.2	1287.1
1972	110.2					30.0	76.0	44.2	26.7				287.1
<b>Total</b>	<b>7506.8</b>	<b>6374.4</b>	<b>6825.9</b>	<b>1607.9</b>	<b>1055.1</b>	<b>1392.1</b>	<b>2003.1</b>	<b>1748.0</b>	<b>1001.0</b>	<b>1261.3</b>	<b>2939.6</b>	<b>5795.5</b>	<b>39510.7</b>
<b>Average</b>	<b>220.8</b>	<b>193.2</b>	<b>206.8</b>	<b>47.3</b>	<b>33.0</b>	<b>39.8</b>	<b>57.2</b>	<b>53.0</b>	<b>27.8</b>	<b>37.1</b>	<b>86.5</b>	<b>175.6</b>	
<b>Max.</b>	<b>540.8</b>	<b>426.9</b>	<b>938.0</b>	<b>144.0</b>	<b>165.2</b>	<b>118.3</b>	<b>172.8</b>	<b>181.2</b>	<b>87.1</b>	<b>220.6</b>	<b>280.8</b>	<b>511.4</b>	
<b>Min.</b>	<b>16.5</b>	<b>36.7</b>	<b>42.5</b>	<b>1.2</b>	<b>0.9</b>	<b>1.4</b>	<b>3.7</b>	<b>4.1</b>	<b>2.9</b>	<b>0.7</b>	<b>8.5</b>	<b>36.1</b>	

Masse Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1938	165.1	462.0	137.3	45.1	21.5	63.0	49.8	19.1	36.5	58.9	45.6	60.3	1164.2
1939	263.6	339.9	279.6	72.3	71.6	40.2	62.9	56.8	36.4	11.6	52.8	518.8	1806.5
1940	292.0	537.7	278.3	37.6	45.7	42.5	94.9	83.9	30.9	102.4	27.4	427.5	2000.8
1941	373.9	332.8	219.0	92.1	42.6	44.1	55.7	91.4	33.9	104.0	173.9	91.3	1654.7
1942	207.3	140.5	192.3	51.6	47.6	41.7	65.8	59.6	19.1	53.5	156.4	99.0	1134.4
1943	635.8	251.6	251.4	40.4	5.4	40.9	49.1	20.5	54.4	6.8	0.6	459.9	1816.8
1944	204.1	269.7	403.5	215.5	72.5	26.1	95.2	22.1	37.2	110.8	93.0	245.6	1795.3
1945	105.1	378.2	123.0	122.0	42.7	2.3	32.9	37.5	7.5	29.2	66.2	298.8	1245.4
1946	183.5	421.5	285.9	40.5	49.9	71.2	34.0	47.4	63.8	69.7	238.3	241.5	1747.2
1947	219.4	183.3	406.1	85.7	68.9	75.6	34.3	73.8	28.2	17.6	58.7	118.3	1369.9
1948	484.7	189.4	176.0	42.6	23.8	47.1	94.0	40.9	65.8	77.0	205.8	328.7	1775.8
1949	95.9	131.6	389.6	93.3	92.0	66.7	74.0	10.4	23.4	29.2	43.3	85.8	1135.2
1950	256.0	442.8	143.1	52.5	20.1	24.5	91.4	77.5	45.5	26.0	89.1	47.9	1316.4
1951	555.0	443.6	278.9	81.9	29.8	81.1	32.0	89.9	16.7	33.9	191.6	114.3	1948.7
1952	287.5	254.5	173.3	87.8	142.7	124.0	69.3	96.2	36.9	28.6	234.4	183.7	1718.9
1953	101.7	104.6	248.9	102.2	26.6	92.2	74.7	116.4	98.2	66.3	108.4	258.4	1398.6
1954	506.2	197.2	233.2	33.8	71.4	93.3	49.9	62.4	50.1	15.2	194.8	181.0	1688.5
1955	288.7	183.8	340.0	34.7	76.6	87.1	90.3		37.5	30.6	162.3	249.8	1581.4
1956	500.7	507.8	174.2	174.6		70.6	61.4	34.6	18.7	8.3	282.3	171.8	2005.0
1957	153.9	297.4	253.9	141.2	35.6	60.7	42.9		73.7	18.2	36.7	374.8	1489.0
1958	319.5	194.7	454.3	28.1	81.1	144.6	125.6	97.7	63.3	85.2	135.5	355.8	2085.4
1959	332.7	178.1	991.4	12.8	2.5	24.6	64.1	11.3	18.9	45.9	84.1	125.6	1892.0
1960	234.0	100.8		12.7	19.3	16.8	13.2	10.6		32.9	138.3	96.2	674.8
1961	190.9	21.4	124.2	103.5	5.4	18.7	103.5	81.8	32.4	7.2	70.7	523.8	1283.5
1962	130.8	242.4	82.5	35.7	95.8	12.6	31.3	71.8	58.8	57.5	213.6	167.7	1200.5

Masse Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1963	327.7	216.5	255.5	137.0	39.4	68.9	48.1	28.1	19.6	38.1	192.4	298.3	1669.6
1964	96.1	152.5	407.2	34.8	33.5	51.3	129.4	61.2	70.7	73.1	98.4	222.7	1430.9
1965	421.7	218.9	293.0	58.8	41.6	21.5	151.2	42.5			128.0	187.3	1564.5
1966		134.7	99.5	63.9	172.9	64.2	136.5	12.8	42.4	6.9	59.2	315.9	1108.9
1967	284.7	89.2	98.4	88.5		51.1	17.8	135.3	17.6	46.0	300.9	395.2	1524.7
1968	306.2	302.7	167.2	94.2	20.7	48.4	37.8			5.2	160.1	226.4	1368.9
1969	172.8	215.6	169.4	146.8	27.8	25.6	45.8		5.9	45.1	79.3	453.1	1387.2
1970	487.4	262.4	132.3	186.3	57.2	61.2	59.4	67.4	9.2	3.3	122.3	220.0	1668.4
1971							74.5	84.2	29.7	40.4	124.5	214.5	567.8
1972	233.7	430.7	405.8	38.8	33.5	27.3	83.2	15.1	17.5	80.8	130.7	263.3	1760.4
1973	533.0	388.0	184.8	63.7	10.0	78.7	69.2	59.3	9.1	6.2	5.1	177.7	1584.8
1974	305.9	232.3	177.2	157.3	38.6	141.2							1052.5
Total	10257.2	9450.8	9030.2	2910.3	1666.3	1927.6	2445.1	1819.5	1209.5	1471.6	4504.7	8800.7	55493.5
Average	293.1	262.5	258.0	80.8	49.0	53.5	67.9	56.9	36.7	42.0	125.1	244.5	
Max.	555.0	537.7	991.4	215.5	172.9	144.6	151.2	135.3	98.2	110.8	300.9	523.8	
Min.	95.9	21.4	82.5	12.7	2.5	2.3	13.2	10.4	5.9	3.3	0.6	47.9	

Andekaleka Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1935							97.1	33.8	63.7	21.8	200.8	748.8	1166.0
1936	585.8	133.8	443.8	201.4	69.4	281.7	274.8	106.2	123.0	169.1	162.4	617.9	3169.3
1937	548.3	616.5	729.4	75.1	135.8	47.9	74.6	252.4	85.6	83.6	29.1	258.9	2937.2
1938	287.8	608.6	334.5	215.3	78.1	113.4	128.9	57.7	91.6	138.0	95.6	123.1	2272.6
1939	348.4	276.4	423.4	158.4	120.0		113.0	172.0	76.5	29.7	72.7	682.6	2473.1
1940	513.1	1227.6	478.2	66.2	97.6	75.0	133.4	167.8	116.7	126.6	77.9	407.8	3487.9
1941	636.7	568.2	403.8	140.0	76.1	81.3	126.2	213.9	100.6	147.4	157.8	211.4	2863.4
1942	261.0	226.0	353.8	169.8	94.6	143.8	134.5	187.3	126.9	155.0	223.2	224.8	2300.7
1943	763.1	437.0	417.0	36.5	345.0	91.2	93.2	47.9	115.8	24.7	21.2	399.1	2791.7
1944	280.8	211.8	600.7	441.0	79.0	93.0	264.7	51.6	124.4	113.8	220.5	545.0	3026.3
1945	184.4	573.3	348.9	231.6	93.4	19.0	51.5	89.9	69.8	96.2	193.6	449.0	2400.6
1946	370.5	574.4	446.6	243.4	141.8	91.6	113.4	181.0	139.8	91.7	293.7	534.5	3222.4
1947	337.7	410.0	949.5	298.8	158.2	229.8			130.6	57.4	82.0	128.3	2782.3
1948	623.2	431.1	464.9	112.7	72.3	172.9	257.8	134.2	174.3	159.5	168.4	570.5	3341.8
1949	257.8	337.9		267.0	188.4	173.1	164.4	48.4	53.5	53.9	154.1	162.2	1860.7
1950	452.7	795.5	318.4		51.2	68.3	45.0	37.0	49.0	53.0	108.0	38.0	2016.1
1951							99.5	207.7				384.3	691.5
1952	598.9	333.6	535.7	234.4	548.7	288.4	157.9	332.5	71.4	122.9	484.9	362.0	4071.3
1953	358.0	435.6	252.5	303.7	47.0	188.5	100.9	311.6					1997.8
1954	591.8												591.8
1955													
1956		926.0	290.1	260.6	262.4	110.3	140.4	98.6	43.8	13.4	273.0	315.8	2734.4
1957	258.5	500.0	434.8	254.7	136.8	124.5	124.9	104.8	118.5	13.4	72.4	494.7	2638.0
1958	385.3	368.4	544.1	56.8	104.6	205.0	171.3	137.0	47.9	139.8	112.7	323.6	2596.5

Andekaleka Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1959	513.1	326.4	1566.0	87.3	97.6	118.6	236.4	56.2	79.6	115.7	316.9	120.9	3634.7
1960	724.2	192.7	247.2	71.9	91.3	158.2	101.3	85.2	150.0	100.0	177.4	128.6	2228.0
1961	310.0	73.5	183.3	212.0	56.5	90.6	338.6	256.0	93.3	18.7	173.9	831.9	2638.3
1962	230.4	456.4	138.2	80.8	128.1	36.2	123.0	139.8	118.8	171.2	258.7	287.0	2168.6
1963	437.9	523.1	751.9	109.8	178.8	240.5	208.7	103.9	137.0	213.1	473.0		3377.7
1964	308.0	350.6	636.0	69.9	147.2	180.5	177.1	126.0	190.0	232.2	229.3	498.2	3145.0
1965	596.9	319.2	523.9	113.6	42.8	34.0	322.3	250.7	133.6	110.0	214.3	510.1	3171.4
1966	198.6	347.2	193.2	105.8	102.6	122.6	186.4	231.9	51.8	42.3	126.3	413.9	2122.6
1967	353.3	407.0	347.1	159.0	140.3	158.2	147.9	325.3	90.9	98.5	283.0	465.0	2975.5
1968	693.6	322.6	225.3	65.8	38.2	49.5	242.7	88.8	55.3	30.5	295.6	506.6	2614.5
1969	366.2	364.8	251.0	308.0		95.2	182.4	239.2	58.8	47.1	95.6	623.6	2631.9
1970	405.9	154.2	300.2	309.1	160.7	129.6	259.4	232.6	58.9	42.7			2053.3
1971	1041.2	326.4	149.4	158.7	94.1	70.2	273.3	152.3	75.7	79.1	277.7	256.5	2954.6
1972	351.5	701.3	557.6	197.6	81.5	31.1	162.7	78.3	49.5	304.7	358.8	524.7	3399.3
1973	888.9	808.6	487.5	103.5		174.8			55.9	30.3	13.9		2563.4
Total	16063.5	15665.7	15327.9	5920.2	4260.1	4288.5	5829.6	5339.5	3322.5	3447.0	6498.4	13149.3	99112.2
Average	459.0	447.6	450.8	174.1	129.1	126.1	166.6	152.6	94.9	98.5	191.1	398.5	
Max.	1041.2	1227.6	1566.0	441.0	548.7	288.4	338.6	332.5	190.0	304.7	484.9	831.9	
Min.	184.4	73.5	138.2	36.5	38.2	19.0	45.0	33.8	43.8	13.4	13.9	38.0	

Moramanga Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1931	360.8	140.2	298.9	68.5	28.2	30.0	35.3	29.0	12.5	6.4	192.3	306.0	1508.1
1932	321.4	239.4	171.5	75.1	62.5	32.6	41.5	14.0	42.1	4.4	91.1	109.9	1205.5
1933	176.0	438.2	53.5	147.0	28.3	88.5	19.5	18.0	28.5	0.0	12.0	279.0	1288.5
1934	191.0	141.2	95.0	58.7	79.8	65.3	36.6	66.6	35.8	15.8	132.0	601.5	1519.3
1935	613.9	297.9	138.3	147.5	8.7	33.5	41.1	24.6	14.7	24.9	154.0	340.3	1839.4
1936	393.8	76.9	122.9	80.5	38.0	80.5	87.9	30.6	21.8	45.5	162.0	256.6	1397.0
1937	419.0	401.3	249.9	40.6	180.1	0.0	75.0	71.8	26.1	86.2	7.7	384.0	1866.7
1938	108.4	645.6	153.3	57.3	7.6	140.4	25.6	5.9	25.8	36.0	43.7	78.7	1328.3
1939	125.0	128.5	217.0		35.6	20.6	32.8	29.2	12.6	6.2	82.8	667.4	1357.7
1940	239.8	396.7	184.0	21.3	14.6	15.4	42.0	40.4	16.4	46.1	31.1	410.3	1458.1
1941	447.7	407.0	217.3	57.1	42.9	24.1	34.0	81.6	18.1	89.5	131.9	106.1	1657.3
1942	193.8	176.6	138.4	46.6	25.8	26.8	63.7	35.8	20.2	33.2	288.2	144.1	1193.2
1943	509.4	246.7	238.5	22.2	4.3	34.7	29.5	7.9	29.2	5.3	0.2	445.3	1573.2
1944	144.4	272.5	405.7	171.5	65.5	29.1	40.9	13.9	23.9	69.9	98.2	250.0	1585.5
1945	128.1	283.6	117.3	147.8	18.8	2.0	16.1	25.0	10.1	26.0	93.3	274.0	1142.1
1946	117.6	387.0	151.3	49.9	55.4	55.7	49.0	24.9	33.8	67.5	246.8	233.6	1472.5
1947	268.0	153.0			51.4	52.1	27.9	54.7	17.6	9.7	89.5	128.0	851.9
1948	502.5	141.7	127.2	27.4			50.6	18.7	30.2	66.1	154.6	314.8	1433.8
1949		139.8	284.0	69.4	66.6	25.9	54.6	3.6	14.4	18.4	185.1	72.7	934.5
1950	284.2	386.5	173.6	50.0	8.6	13.7	53.4	17.8	16.8	33.2	79.0	38.1	1154.9
1951	423.4	284.5	194.2	83.5	20.9								1006.5
1952					85.4	76.7	28.1	61.4	49.3	9.6	312.4	145.8	768.7
1953	96.9	142.5	232.9	138.0	9.5	59.3	39.7	77.8	40.5	21.8	59.8	211.8	1130.5
1954		119.9	205.8	21.4	29.2	36.2	24.2						436.7
1955	291.5	98.4	320.3	16.8	46.0	46.9	78.9	48.9	35.2	37.3	112.9	263.0	1396.1

## Moramanga Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1956	439.9	444.5	129.0	91.5	64.7	46.6	56.2	22.5	14.0	4.7	321.8	215.0	1850.4
1957	172.3	326.1	202.0	114.2	35.1	38.3	34.9	43.6	33.4	11.3	42.6	349.0	1402.8
1958	330.9	171.8	371.2	59.7	47.0	76.1	50.9	67.3	62.4	181.1	174.9	421.2	2014.5
1959	537.6	243.9	1101.9	34.5	20.2	49.5	98.2	24.7	18.6	132.9	325.0	143.3	2730.3
1960	434.2	178.6	182.3	19.5	48.3	79.4	49.6	32.1	27.6	27.2	170.1	281.5	1530.4
1961	254.8	48.2	164.5	117.5	26.6	21.1	149.7	98.7	38.6	33.3	132.2	607.8	1693.0
1962	95.8	251.1	172.2	29.1	133.5	28.5	77.4	91.6	66.9	57.8	246.5	257.0	1507.4
1963	442.5	227.9	431.5	142.3	36.7	109.5	64.5		32.2	81.1	330.9	393.3	2292.4
1964	182.5	419.9	147.6	42.6	37.0	69.1	140.3		69.5	137.6	233.6	311.1	1790.8
1965	403.4	187.7	192.9	56.3	20.2	12.4	76.3	87.5	26.3	10.0	201.7	435.4	1710.1
1966	213.0	121.5	72.9	15.5	135.5	43.7	54.7	71.4	52.0	69.8	94.3	279.5	1223.8
1967	295.6	95.5	218.1	35.3	42.0	56.8	35.8	94.0	16.1	33.5	412.5	453.1	1783.3
1968	299.3	193.6	146.8	59.3	12.0	35.4	91.2	25.1	8.9	6.2	214.5	293.2	1385.5
1969	199.8	271.8	178.6	95.6	19.5	42.7	51.4		5.5	44.8			909.7
1970		133.5	119.6	164.6	46.7	55.8	59.2	73.1	10.2	2.6	142.3	176.5	984.1
1971		308.5	183.7	33.0	63.2	37.5	63.4	44.3	20.9		297.1	147.3	1198.9
1972	171.0	532.5		35.6	53.6	19.8	54.9	15.6	9.1	106.9	94.2	286.2	1379.4
1973	501.9								5.0	16.4			523.3
1974	315.6	287.0	119.2	159.3	56.1	72.6							1009.8
Total	11646.7	10589.2	8624.8	2903.5	1911.6	1884.8	2236.5	1593.6	1092.8	1716.2	6194.8	11111.4	61505.9
Average	298.6	258.3	215.6	72.6	45.5	46.0	54.6	43.0	26.7	42.9	158.8	284.9	
Max.	613.9	645.6	1101.9	171.5	180.1	140.4	149.7	98.7	69.5	181.1	325.0	667.4	
Min.	95.8	48.2	53.5	16.8	4.3	0.0	16.1	3.6	5.0	0.0	0.2	38.1	

## Mouneyres Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1936	338.9	81.9	398.2	199.1	68.8	299.5	243.4	108.5	131.6	117.5	75.1	483.7	2546.2
1937	466.6	523.0	891.6	62.0	164.7	78.7	80.2	260.4	76.2	103.5	26.9	160.0	2893.8
1938	289.1	439.1	343.9	401.1	71.3	263.4	122.5	290.1	102.0	89.4	54.0	42.0	2507.9
1939	394.2	299.0	278.4	245.3	116.6	202.8	293.9	143.3	149.5	31.1	28.4	356.1	2538.6
1940	464.3	1212.9	487.9	69.9	112.3	59.9	163.2	131.1	76.0	83.7	136.9	213.6	3211.7
1941	633.2	361.5	310.5	174.6	121.9	85.2	89.1	215.2	107.2	82.0	155.4	195.3	2531.1
1942	296.6	269.8	473.0	164.2	102.9	161.5	127.1	188.5	108.0	48.4	134.3	277.4	2351.7
1943	743.3	362.6	312.7	35.9	28.2	141.2	122.3	69.8	176.0	12.0	17.1	267.6	2288.7
1944	233.4	231.8	621.0	525.9	51.6	116.0	190.2	29.3	138.5	104.9	254.0	255.2	2751.8
1945	81.9	332.9	108.5	225.5	123.1	13.7	92.4	106.1	56.8	22.8	164.1	398.0	1725.8
1946	519.0	307.3	462.7	261.5	170.7	96.1	134.7	117.3	142.7	85.9	312.0	375.5	2985.4
1947	287.1	250.8	1081.3	282.3	87.7	199.2	144.3	137.4	110.9	54.5	142.7	77.3	2855.0
1948	449.8	132.6	348.9	119.2	104.1	118.3	268.1	162.3	223.2	158.1	85.1	520.8	2690.5
1949	196.9	422.3	818.4	352.0	285.5	169.7	182.8	47.2	66.8	40.0	67.8	100.5	2749.9
1950	335.9	903.5	303.4	188.7	75.8	57.1	159.5	109.5	57.2	26.7	104.6	200.0	2521.9
1951	727.7	678.3	401.0	237.3	169.9	145.8	77.1	215.4	81.0		481.4	247.0	3461.9
1952	452.5	274.6	333.1	230.4	503.1	220.0	92.6	227.6	53.2	101.0	194.9	206.7	2889.7
1953	249.7	214.3	209.0	209.1	58.2	307.6	78.7	330.8	145.7	82.2	118.5	453.9	2457.7
1954	389.2	228.0	317.3	81.4	115.6	250.0	99.9	129.9	98.4	42.5	196.4	171.0	2119.6
1955	373.8	294.5	412.4	61.4	81.4	213.3	242.7	100.5	98.1	55.0	239.5	298.0	2470.6
1956	773.8	1105.4	395.6	265.7	203.2	121.1	104.0	96.1	44.3	10.7	214.3	353.1	3687.3
1957	246.3	379.6	382.6	335.3	98.0	73.7	136.6	107.4	81.8	20.2		508.7	2370.2
1958	366.1	311.5	384.5	55.8	74.6	222.8	49.5	226.6	48.9	112.6	116.5	226.4	2195.8
1959	224.0	359.7		187.8	78.5	99.2	196.7	57.2	55.3	114.9	286.9	101.5	1761.7
1960	742.1	177.2	205.1	107.0	86.9	185.1	114.8	101.8	186.6	76.4	120.5	245.0	2348.5

Mouneyres Station

Unit: mm

Month A. D.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Total
1961	302.5	80.1	154.6	189.8	53.6	130.2	379.0	235.5	85.0	30.7	151.6	862.2	2654.8
1962	331.5	442.8	176.9	130.8	296.9	20.2	212.7	328.8	199.8	169.5	156.8	168.3	2635.0
1963	366.2	454.0	845.5	113.7	158.1	226.5	165.3	116.2	76.0	167.4	438.9	424.7	3552.5
1964	139.1	219.5	642.2	96.6	115.2	115.2	285.2	157.0	184.6	108.6	138.6	217.3	2419.1
1965	642.1	263.4	770.4	138.8			342.2	189.7	99.9	86.4	276.2	461.6	3270.7
1966	252.6	331.2	307.0	87.9	222.6	153.7	220.6	225.0	38.2	60.1	108.7	333.3	2340.9
1967	296.8	222.9	342.9	213.2	93.3	175.4	173.0	290.4	88.0	134.0	194.1	430.0	2654.0
1968	458.9	280.0	375.2	56.5	19.0	59.0	184.2	73.0	25.0	43.0	303.9	380.2	2257.9
1969	194.6	218.9	152.0	200.5	74.5		146.1	245.6	44.5	46.8	64.5	258.0	1646.0
1970	276.8	175.6	294.8	351.1	201.5		183.6	251.1		44.6		199.2	1978.3
1971	1116.0		243.3	112.2	193.8	176.4	450.7	143.3	62.5	49.1	299.2	219.3	3065.8
1972	499.4	559.6	616.3	146.2	162.8	58.4	271.1	45.9	50.8	27.0			2437.5
Total	15151.9	13402.1	15202.1	6910.7	4745.9	5015.9	6620.0	6010.8	3570.2	2643.2	5859.3	10688.4	95820.5
Average	409.5	372.3	422.3	186.8	131.8	147.5	178.9	162.5	99.2	73.4	172.3	296.9	
Max.	1116.0	1212.9	1081.3	525.9	503.1	307.6	450.7	330.8	223.2	169.5	481.4	862.2	
Min.	81.9	80.1	108.5	35.9	19.0	13.7	49.5	29.3	25.0	20.2	17.1	42.0	

Table-A.5.3 Maximum 24 Hours Rainfall

Unit: mm/day

Station A. D.	Analama- zaotra	Ambohi- dray	Didy	Masse	Ande- kaleka	Mora- manga	Mouney- res	Andaingo	Amboa- sary	Beforona
1931	93.1					100.6				
1932	83.8					90.6				
1933	83.2					63.0				
1934	65.5					116.0				
1935	138.0				73.9	117.0				
1936	51.0		70.8		122.8	71.5	157.2			
1937	259.2		61.9		182.0	177.8	200.9			
1938	126.2		78.3	105.1	195.3	280.0	98.0			
1939	74.3		85.7	110.1	92.3	88.9	108.7			
1940	150.6		71.6	94.3	224.0	80.1	211.7			
1941	112.6		97.0	81.0	103.6	69.4	77.9			
1942	54.5		110.6	89.9	126.2	63.3	180.0			
1943	217.2		144.7	168.3	161.8	119.0	146.7			
1944	150.1		66.1	136.2	228.0	115.7	247.9			
1945	157.2		139.9	129.9	181.3	115.1	107.3			
1946	56.6		91.7	59.2	104.7	78.9	116.8			
1947	73.2		83.2	102.5	268.1	56.4	236.4			
1948	104.5			149.0	103.6	76.2	130.2			
1949	180.8			140.6	52.2	58.0	72.6			
1950	150.5		189.3	114.2	158.2	101.7	166.1			
1951	139.0		82.2	91.2		67.7	173.8			
1952	85.5		80.6	53.5	118.0	58.4	123.3			
1953	100.5		58.9	75.4	72.2	79.1	98.0			
1954	222.7	73.4	147.7	239.2	176.6	38.0	138.5			
1955	52.5	42.7	63.2	58.9		71.8	107.8			



Unit: mm/day

Station A. D.	Analama- zaotra	Ambohi- dray	Didy	Masse	Ande- kaleka	Mora- manga	Mouney- res	Andaingo	Amboa- sary	Beforona
1956	180.0	86.6	146.4	130.4	214.5	105.2	207.3			
1957	64.5	40.0	40.5	69.4	77.1	87.3	118.0			
1958	83.3	72.1	85.1	83.6	78.6	99.6	99.0			
1959	208.9	93.2	147.8	158.5	373.3	163.2	124.8			
1960	74.1	72.2	52.2	78.5	110.3	61.5	100.4			
1961	82.7	53.2	70.9	66.3	166.0	102.6	107.6	53.8		
1962	112.5	95.7	52.7	85.1	107.8	87.2	115.6	76.2		
1963	117.6	84.3	60.2	83.6	189.3	105.5	222.2	65.6	63.4	
1964	243.0	71.5	78.5	198.0	208.0	73.9	163.3	57.0	85.8	
1965	125.5	88.7	40.0	126.1	123.1	107.1	142.8	39.3	25.2	
1966	109.9	65.8	45.2	123.3	96.6	102.1	117.3	49.3	34.8	
1967	74.8	106.9	40.0	70.0	91.9	94.7	60.6	71.7	30.5	
1968	150.8	110.5	37.8	46.3	113.7	71.4	93.0	87.9	27.0	
1969	77.0	50.0	50.4	58.7	148.7	78.2	34.4	106.0	67.0	
1970		60.2	40.0	115.6	117.4	111.7	102.5	135.2	70.0	
1971				95.4	153.3			54.9	43.0	
1972		134.2		116.8	175.9			104.4	86.0	
1973		79.6		82.4	132.2			78.6	31.5	149.0
1974		72.9		67.6				68.9	19.8	120.6

Table-A.5.4 Monthly Average Discharge

Unit: m<sup>3</sup>

Month A. D.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Total	Ave- rage
1948 - 49	47.2	141.0	69.0	95.0	243.0	117.0	102.0	93.0	94.0	68.0	53.0	40.6	1162.8	96.9
1949 - 50	(40.8)	(36.9)											(77.7)	(38.9)
1950 - 51														
1951 - 52							(100.0)	(105.0)	(77.0)	(89.0)	(61.0)	(49.8)	(481.8)	(80.3)
1952 - 53	67.0	61.0	56.0	58.0	79.0	66.0	44.8	57.0	51.0	72.0	67.0	64.0	742.8	61.9
1953 - 54	44.7	64.0	209.0	88.0	78.0	65.0	56.0	79.0	60.0	54.0	43.0	35.7	876.4	73.0
1954 - 55	34.5	61.0	73.0	74.0	117.0	71.0	56.0	63.0	68.0	53.0	43.6	33.9	748.0	62.3
1955 - 56	31.5	61.0	196.0	379.0	162.0	117.0	89.0	79.0	60.0	50.0	38.9	29.4	1292.8	107.7
1956 - 57	43.7	64.0	46.0	99.0	86.0	96.0	67.0	56.0	50.0	45.1	45.8	29.1	727.7	60.6
1957 - 58	27.6	55.8	62.0	83.0	152.0	56.0	46.3	63.0	65.0	65.0	44.0	43.2	762.9	63.6
1958 - 59	53.0	75.0	141.0	86.0	564.0	224.0	105.0	81.0	90.0	71.0	45.0	40.8	1575.8	131.3
1959 - 60	74.0	37.7	113.0	82.0	75.0	51.0	34.6	53.0	48.5	37.3	32.9	27.0	666.0	55.5
1960 - 61	23.5	53.0	47.0	32.0	34.9	32.0	25.2	23.9	52.0	79.0	48.0	27.3	477.8	39.8
1961 - 62	45.5	104.0	63.0	156.0	44.9	28.6	27.8	35.0	56.0	46.9	39.8	38.6	686.1	57.2
1962 - 63	26.5	35.2	116.0	100.0	166.0	86.0	33.1	31.3	40.9	37.6	37.9	24.7	735.2	61.3
1963 - 64	42.9	75.0	41.7	59.0	208.0	26.9	45.8	53.0	76.0	74.0	71.0	62.0	835.3	69.6
1964 - 65	61.0	75.0	126.0	130.0	136.0	54.0	24.7	19.7	39.3	78.0	53.0	40.3	837.0	69.8
1965 - 66	53.0	96.0	79.0	97.0	73.0	54.0	46.7	46.4	57.0	56.0	44.0	32.3	734.4	61.2
1966 - 67	28.2	50.0	88.0	82.0	87.0	64.0	52.0	57.0	63.0	81.0	75.0	46.1	773.3	64.4
1967 - 68	77.0	93.0	108.0	92.4	89.6	55.7	40.1	46.4	53.9	63.5	31.8	26.3	777.7	64.8
1968 - 69	34.6	81.0	80.0	87.0	54.0	60.0	38.3	39.5	48.5	85.0	56.0	37.1	701.0	58.4
1969 - 70	33.8	77.0	103.0	100.0	81.0	110.0	77.0	68.0	67.0	87.0	57.0	40.0	900.8	75.1
1970 - 71	39.9	41.6	175.0	160.0	89.3	65.3	58.4	46.3	65.0	55.9	48.4	36.2	881.3	73.4
1971 - 72	48.3	62.1	69.6	222.0	203.0	95.1	65.0	49.2	60.8	39.0	31.8	42.8	988.7	82.4
Total	978.2	1500.3	2061.3	2361.4	2822.7	1594.6	1234.8	1244.7	1342.9	1387.3	1067.9	847.2		
Average	44.5	68.2	98.2	112.4	134.4	75.9	56.1	56.6	61.0	63.1	48.5	38.5		

Table-A.5.5 Daily Average Discharge

1948 - 1949												1949-1950														
Unit: m <sup>3</sup> /s												Unit: m <sup>3</sup> /s														
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May.	Jun.	Jul.	Aug.	Sep.	Oct.	
1	54	123	103	54	100	119	88	94	92	83	58	40.2	1	36.4	40.2											
2	51	119	105	47.7	108	141	82	94	94	79	60	40.2	2	34.5	38.3											
3	48.4	118	90	44.6	168	170	88	88	97	80	60	40.9	3	34.5	36.4											
4	44.6	109	76	44.6	100	144	82	88	112	79	60	46.9	4	37.0	35.1											
5	43.8	112	72	48.4	90	128	88	88	91	82	57	50	5	36.4	34.5											
6	42.3	155	70	108	92	130	91	88	85	79	60	44.6	6	35.1	32.7											
7	41.5	185	67	87	142	119	111	83	82	82	60	44.6	7	34.5	33.3											
8	40.9	146	71	66	1520	113	107	72	83	74	54	43.0	8	36.4	32.7											
9	40.2	112	84	67	560	107	107	71	85	76	53	49.2	9	36.4	32.7											
10	39.6	95	69	63	720	119	114	73	85	73	54	47.7	10	36.3	32.7											
11	38.9	80	74	61	670	104	104	97	84	71	54	45.4	11	49.2	32.7											
12	37.7	70	71	76	468	125	100	86	86	71	60	44.6	12	63	33.3											
13	37.0	63	96	119	310	105	111	112	83	65	54	43.0	13	63	31.0											
14	36.4	60	85	108	256	92	102	104	74	71	54	40.2	14	49.2	31.0											
15	38.9	58	73	98	198	89	98	82	88	66	54	45.3	15	44.6	31.6											
16	40.9	53	74	89	184	109	100	85	85	69	52	40.9	16	43.0	79											
17	40.2	50	70	80	173	106	97	85	79	65	52	38.9	17	42.3	42.3											
18	46.1	49.2	65	91	158	114	133	82	85	63	63	38.9	18	32.7	32.7											
19	43.0	46.9	62	170	151	119	118	79	100	65	53	38.3	19	32.2	32.7											
20	41.5	46.1	60	119	135	114	107	68	111	65	49.2	36.4	20	37.0	31.0											
21	40.2	46.1	59	119	120	107	97	79	100	63	49.2	37.0	21	38.3	31.0											
22	37.7	46.9	55	106	107	139	100	114	88	63	45.4	37.0	22	34.5	31.0											
23	51	44.6	54	107	94	175	129	118	85	63	46.9	37.0	23	32.7	31.0											
24	46.1	94	58	161	85	128	112	107	82	63	43.0	36.4	24	37.0	33.3											
25	49.2	98	55	148	106	120	114	111	94	60	52	36.4	25	36.4	34.5											
26	58	950	61	141	114	108	107	136	129	57	54	36.4	26	38.3	36.4											
27	60	352	53	117	111	104	97	116	129	57	50	37.0	27	54	44.6											
28	78	378	50	114	135	85	94	104	133	60	47.7	35.1	28	52	54											
29	68	219	49.2		130	87	95	87	111	60	47.7	34.5	29	44.6	52											
30	82	166	53		127	91	91	91	100	57	40.9	40.2	30	40.9	36.4											
31		130	53		114		97		97	57		36.4	31		32.7											
Ave.	47.2	141	69	95	243	117	102	93	94	68	53	40.6	Ave.	40.8	36.9											

Annual Average:

Annual Average: 97 m<sup>3</sup>/s

1951 - 1952

		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1							65	144	89	63	71	52	
2							62	152	94	76	72	51	
3							60	111	89	69	72	50	
4							58	114	97	66	72	49.2	
5							57	111	89	81	63	48.4	
6							57	109	85	94	63	47.7	
7							57	100	81	91	62	67	
8							56	99	79	108	61	61	
9							56	95	87	84	60	62	
10							56	90	91	78	57	68	
11							56	86	88	84	56	69	
12							56	83	83	85	56	57	
13							53	81	79	111	55	53	
14							50	80	77	94	54	53	
15							56	79	75	94	63	50	
16							56	83	74	91	55	48.4	
17							52	113	72	118	55	47.7	
18							51	111	79	114	56	46.9	
19							50	95	72	135	58	46.9	
20							47.7	89	71	123	62	46.1	
21							56	98	70	108	61	44.6	
22							111	123	68	95	68	44.6	
23							111	123	67	91	72	46.1	
24							172	120	65	85	70	44.6	
25							303	129	66	82	62	43.8	
26							330	130	70	79	61	42.3	
27							238	113	74	76	59	43.0	
28							196	105	69	73	56	40.9	
29							170	98	68	72	55	40.2	
30							159	92	69	71	54	39.6	
31							142		65	72		38.9	
Ave.							100	105	77	89	61	49.8	

Annual Average:

1952 - 1953

		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	38.3	44.6	45.4	46.9	44.6	84	54	40.2	43.0	42.3	61	54	
2	37.7	43.8	44.6	48.4	43.0	90	53	49.9	42.3	40.9	63	52	
3	37.7	43.0	42.3	43.0	46.1	70	51	43.8	41.5	40.2	66	51	
4	37.0	41.5	40.9	41.5	52	66	50	47.7	40.9	43.8	113	50	
5	47.7	40.9	40.2	50	63	64	48.4	46.1	47.7	43.0	90	49.2	
6	51	42.3	39.6	46.9	135	72	47.7	40.2	54	45.4	80	51	
7	56	46.1	38.9	67	91	61	47.7	43.8	57	52	73	48.4	
8	61	43.0	38.3	54	81	71	46.9	41.5	54	63	68	46.9	
9	62	63	43.0	49.2	80	63	46.1	40.2	46.9	74	84	64	
10	83	47.7	47.7	46.1	106	60	46.9	43.8	43.8	62	72	54	
11	116	52	46.1	45.4	108	58	48.4	59	44.6	60	67	53	
12	114	71	80	44.6	98	61	46.1	55	86	86	63	46.9	
13	127	87	51	85	91	59	48.4	49.2	61	178	62	46.1	
14	131	67	61	65	114	61	50	46.1	50	169	60	44.6	
15	123	63	86	54	82	103	46.9	43.0	61	114	59	55	
16	95	60	66	57	80	71	44.6	42.3	55	92	57	48.4	
17	87	59	80	62	81	65	43.8	41.5	54	80	56	46.1	
18	76	56	74	87	76	62	43.0	40.9	57	74	55	46.9	
19	66	72	69	81	67	57	43.0	106	53	68	56	51	
20	57	113	65	67	63	56	42.3	107	51	63	54	50	
21	54	98	60	62	64	54	40.9	157	49.2	63	53	60	
22	52	78	54	61	96	53	40.9	96	48.4	68	50	47.7	
23	49.2	77	52	63	82	54	40.2	75	54	66	51	49.2	
24	52	75	48.4	54	72	69	40.2	65	53	62	53	52	
25	50	77	95	82	66	67	39.6	57	54	59	63	47.7	
26	49.2	65	72	49.2	63	73	39.6	53	50	56	90	46.1	
27	46.1	58	56	52	61	72	38.9	50	47.7	73	91	44.6	
28	47.7	54	52	46.9	95	63	38.3	47.7	46.9	79	69	43.8	
29	46.9	52	47.7		67	60	37.7	45.4	45.4	74	61	43.0	
30	46.1	48.4	46.1		61	58	42.3	43.8	43.8	66	56	41.5	
31	46.9	47.7	47.7		116		42.3		41.5	62		40.9	
Ave.	67	61	56	58	79	66	44.8	57	51	72	67	64	

Annual Average: 62 m<sup>3</sup>/s

1954 - 1955

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	27.2	67	41.5	99	69	100	57	49.2	65	88	47.7	35.1
2	27.0	82	78	93	63	94	56	47.7	69	72	45.4	34.5
3	28.2	72	80	89	90	88	58	46.9	99	64	43.0	35.7
4	28.7	63	82	81	80	86	61	46.1	80	61	42.3	38.3
5	31.6	70	67	95	147	81	65	44.6	71	59	49.2	40.2
6	37.0	61	63	68	164	79	62	52	65	56	65	40.9
7	34.5	90	61	59	98	77	60	48.4	62	54	52	37.0
8	63	74	162	54	139	74	57	45.4	59	53	46.9	35.1
9	40.9	60	90	49.2	106	72	54	43.8	56	52	51	33.3
10	35.7	63	70	46.9	108	74	53	43.0	54	54	47.7	33.3
11	32.2	53	78	44.6	88	79	56	42.3	55	63	44.6	33.9
12	31.0	45.4	108	43.0	83	84	54	43.8	84	60	46.1	32.2
13	29.2	42.3	127	42.3	92	74	52	59	70	57	42.3	32.7
14	28.7	72	80	69	95	70	50	74	65	54	40.2	32.7
15	29.2	89	70	67	100	68	48.4	69	67	53	38.9	32.2
16	28.2	112	58	54	89	65	46.9	59	63	55	38.3	31.6
17	48.4	79	51	49.2	135	68	48.4	63	57	52	37.7	30.4
18	37.7	72	54	47.7	146	69	50	86	56	50	37.0	31.0
19	33.3	90	49.2	54	153	65	81	78	70	48.4	54	31.0
20	30.4	65	47.7	60	131	63	62	67	63	47.7	51	32.2
21	29.2	55	48.4	64	123	64	56	64	59	46.9	46.6	37.0
22	28.2	47.7	81	184	133	52	53	78	56	46.1	42.3	40.9
23	28.0	45.4	62	85	111	63	54	66	54	45.4	39.6	37.0
24	27.8	42.3	56	87	107	62	50	62	52	44.6	37.7	33.9
25	27.6	40.2	59	153	119	63	51	58	90	43.8	38.3	32.2
26	28.2	44.6	64	93	201	65	53	60	71	43.0	37.0	32.2
27	32.7	41.5	67	80	134	63	63	129	63	42.3	36.4	31.0
28	52	40.2	111	75	112	61	70	99	68	43.0	38.3	31.0
29	54	38.3	71	155	58	58	62	83	92	41.5	37.0	29.8
30	46.9	37.0	63	148	56	56	55	72	69	40.9	35.7	31.0
31	35.7	53	53	113	113	55	52	52	97	51	35.7	30.4
Ave.	34.6	61	73	74	117	71	56	63	68	53	43.6	33.9

Annual Average: 62 m<sup>3</sup>/s

1953 - 1954

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	40.2	37.7	166	112	65	114	53	51	58	50	43.0	40.2
2	40.2	37.0	106	113	63	89	52	48.4	56	49.2	42.3	39.6
3	39.6	36.4	92	178	66	72	51	55	55	47.7	41.5	39.6
4	40.2	39.6	117	148	65	79	50	49.2	54	46.1	40.9	38.9
5	39.6	38.9	90	123	63	77	48.4	47.7	67	45.4	42.3	40.9
6	38.9	69	76	106	56	80	47.7	48.4	63	43.8	54	40.2
7	39.6	79	68	98	60	75	48.4	57	59	47.7	46.1	39.6
8	40.2	61	62	95	63	65	47.7	64	62	50	49.2	38.9
9	46.9	54	63	90	62	65	46.9	54	76	52	46.1	39.6
10	44.6	52	60	86	64	63	46.1	51	88	57	43.8	38.9
11	42.3	63	54	82	102	66	45.4	58	74	59	40.9	39.6
12	41.5	54	53	85	119	63	46.1	388	70	54	39.6	40.2
13	41.5	72	52	78	139	61	47.7	152	65	51	40.2	43.8
14	40.9	79	950	75	107	66	48.4	114	67	72	51	47.7
15	37.7	63	1240	72	123	62	62	96	65	68	43.8	46.1
16	37.0	60	805	70	102	60	58	74	62	61	41.5	37.0
17	36.4	65	570	67	88	58	56	85	60	54	39.6	35.7
18	37.7	69	326	66	93	56	53	78	58	52	40.2	33.9
19	37.7	97	162	65	84	55	49.2	71	56	56	38.9	33.3
20	43.0	70	184	68	77	56	47.7	66	57	80	40.2	32.7
21	48.4	75	150	73	71	54	48.4	64	60	64	49.2	31.6
22	56	67	127	92	68	53	66	63	57	61	47.7	31.0
23	48.4	62	109	75	65	54	77	66	55	58	46.1	30.4
24	43.8	54	100	72	66	53	89	74	53	55	43.8	29.8
25	45.1	51	99	69	68	54	73	72	52	54	41.5	29.2
26	99	46.9	108	72	70	64	62	72	51	52	39.6	28.7
27	57	45.4	98	72	66	62	72	68	50	49.2	40.2	28.2
28	48.4	44.6	92	74	69	60	62	63	48.4	46.9	38.9	28.0
29	44.6	51	84	71	71	56	60	60	49.2	46.1	39.6	27.8
30	43.0	113	85	69	69	54	56	59	51	44.6	38.9	27.6
31	175	140	140	66	66	54	54	49.2	43.8	43.8	27.4	27.4
Ave.	44.7	64	209	88	78	65	56	79	60	54	43.0	36.9

Annual Average: 73 m<sup>3</sup>/s

1955 - 1956

1955 - 1956		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	30.4	41.5	38.3	242	237	108	105	84	65	59	43.8	33.3	
2	29.8	63	35.7	189	221	129	102	81	63	61	45.4	33.9	
3	29.2	51	43.0	157	193	174	94	84	62	58	48.4	34.5	
4	28.2	63	60	217	177	153	99	93	68	60	46.1	33.9	
5	59	69	84	625	179	128	105	88	72	57	45.4	32.7	
6	37.0	48.4	272	1460	164	119	102	99	70	62	43.8	32.2	
7	32.2	40.2	172	995	155	113	90	95	68	57	44.6	31.6	
8	29.2	36.4	135	730	147	111	86	91	68	55	43.0	30.4	
9	28.2	47.7	111	540	145	105	92	86	64	54	42.3	30.4	
10	35.7	53	91	406	140	102	90	90	63	63	40.9	30.4	
11	32.2	62	69	276	144	99	88	94	61	52	40.2	29.8	
12	29.2	72	231	299	135	103	94	87	59	63	39.6	29.8	
13	28.2	69	139	303	191	112	96	81	57	52	38.9	29.8	
14	28.0	70	156	258	193	105	88	78	55	50	38.3	29.2	
15	27.8	68	136	238	188	100	84	76	56	49.2	37.7	29.2	
16	27.6	94	161	317	237	96	89	73	54	47.7	38.3	29.2	
17	27.4	72	156	254	202	117	86	76	56	46.9	37.7	29.2	
18	27.2	94	113	231	169	150	84	85	56	46.1	37.0	28.7	
19	28.2	80	106	196	159	141	75	82	54	45.4	36.4	28.7	
20	29.2	70	99	183	146	133	72	78	57	44.6	35.7	28.2	
21	34.5	111	90	179	136	168	77	72	54	43.8	35.1	28.0	
22	31.6	79	86	169	145	130	74	70	55	43.0	36.4	27.8	
23	29.8	65	111	159	123	117	79	67	57	42.3	35.7	27.6	
24	28.2	56	88	395	118	107	76	64	61	43.0	35.1	27.4	
25	28.0	50	84	423	114	107	82	66	65	41.5	34.5	27.2	
26	27.8	44.6	1090	448	120	100	78	69	57	43.0	33.9	27.0	
27	27.6	41.5	715	535	124	97	85	67	60	42.3	33.3	26.8	
28	35.1	43.0	550	308	123	95	105	65	57	43.8	33.9	26.6	
29	37.7	38.9	343	265	130	90	100	63	55	42.3	33.3	25.1	
30	41.5	51	296	125	92	88	92	66	66	43.0	32.7	26.2	
31		41.5	201	238	90					42.3		26.0	
Ave.	31.5	61	196	379	162	117	89	79	60	50	38.9	29.4	

Annual Average: 107 m<sup>3</sup>/s

1956 - 1957

1956 - 1957		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	25.8	79	52	109	68	129	72	54	52	51	44.6	34.6	
2	25.6	74	49.2	135	63	144	79	53	49.2	47.7	43.0	33.9	
3	25.4	66	47.7	142	66	122	85	51	47.7	46.1	43.0	33.9	
4	25.2	76	46.1	150	69	105	105	52	45.4	43.8	41.5	32.7	
5	25.0	59	42.3	147	65	96	96	53	50	42.3	40.2	32.7	
6	24.8	49.2	38.9	119	68	87	81	52	54	41.5	54	32.7	
7	24.7	47.7	37.7	134	64	122	76	51	51	40.2	77	32.2	
8	24.5	51	36.4	147	61	97	74	52	48.4	72	70	32.2	
9	24.3	54	35.1	163	87	84	73	51	46.9	64	63	32.7	
10	24.1	50	34.5	138	78	89	75	53	44.6	53	51	32.2	
11	23.7	56	33.9	107	75	94	72	54	43.8	45.4	45.4	31.6	
12	23.7	59	32.7	98	79	111	72	56	43.0	43.8	43.8	30.4	
13	23.5	49.2	34.5	91	105	134	70	54	46.1	42.3	41.5	29.2	
14	23.3	56	33.3	88	100	112	68	52	44.6	40.9	40.2	28.7	
15	23.1	48.4	32.7	84	81	94	66	50	43.8	40.2	43.0	28.2	
16	28.2	56	31.6	74	85	91	63	58	43.0	38.9	45.4	28.0	
17	29.2	67	31.0	75	80	86	62	55	42.3	39.6	42.3	27.8	
18	56	63	29.8	70	94	100	63	59	45.4	38.9	40.9	27.6	
19	72	88	29.2	64	89	120	62	71	44.6	38.3	43.0	27.4	
20	47.7	105	31.6	60	96	94	61	57	46.1	40.2	41.5	27.2	
21	49.2	89	33.9	63	90	90	60	53	54	51	40.2	27.0	
22	54	77	37.0	67	79	78	59	50	56	49.2	39.6	26.8	
23	52	69	54	62	87	84	55	48.4	60	45.4	60	26.6	
24	47.7	58	111	69	90	89	58	47.7	79	42.3	47.7	26.4	
25	61	52	72	74	84	80	56	68	64	44.6	41.5	26.2	
26	71	56	54	86	96	76	55	63	57	47.7	40.2	26.0	
27	105	80	56	75	102	72	54	61	54	43.8	38.9	25.8	
28	107	74	52	72	108	70	54	65	52	40.9	37.0	25.6	
29	84	69	47.7		112	67	52	63	49.2	38.9	35.7	25.4	
30	82	62	45.4		123	70	53	58	46.9	40.2	35.1	25.2	
31		56	114		114		53	58	44.6	42.3		25.0	
Ave.	{43.7}	64	46	99	86	96	67	56	50	45.1	45.8	29.1	

Annual Average: 60.3 m<sup>3</sup>/s

1958 - 1959

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	52	40.2	105	72	148	640	133	89	80	94	53	36.4
2	56	40.2	103	70	254	565	128	88	92	93	67	35.7
3	52	40.2	108	68	185	451	123	87	84	91	67	35.1
4	52	40.2	129	66	175	347	122	85	81	89	64	33.9
5	56	40.2	141	64	157	294	119	84	79	89	62	33.3
6	61	40.2	145	61	161	265	116	83	80	86	57	32.2
7	61	40.2	163	59	163	233	113	82	91	85	55	31.0
8	74	40.2	210	56	163	217	111	81	129	83	52	31.0
9	79	56	162	54	155	212	109	80	134	78	48.4	30.4
10	65	47.7	362	57	146	207	108	79	129	76	42.3	28.7
11	64	47.7	332	56	139	202	106	78	122	75	40.3	28.7
12	56	47.7	272	72	133	201	105	77	116	72	38.9	28.2
13	56	47.7	210	83	142	201	105	77	108	71	37.7	27.8
14	52	47.7	190	76	151	194	105	76	104	67	35.1	27.3
15	52	105	159	76	157	178	104	76	95	64	33.9	27.3
16	52	117	138	73	168	175	103	75	88	66	33.3	27.3
17	56	99	129	72	630	172	102	75	84	67	32.7	67
18	52	141	117	71	140	168	100	98	81	67	31.6	58
19	52	119	105	68	1795	166	99	91	78	66	31.0	49.2
20	47.7	81	96	73	1300	162	98	89	74	64	40.9	47.7
21	47.7	74	105	99	985	158	97	83	72	64	54	45.4
22	47.7	77	94	130	735	155	96	80	71	63	48.4	49.2
23	43.8	87	91	184	585	150	96	78	70	63	46.1	60
24	43.8	102	84	138	382	148	96	77	69	63	42.3	58
25	43.8	86	84	123	343	146	96	76	68	63	40.9	57
26	40.2	103	96	129	1770	145	95	79	65	61	39.6	54
27	40.2	86	107	120	2020	142	94	82	66	60	38.9	50
28	40.2	144	99	139	1335	141	93	78	102	59	38.9	47.7
29	40.2	105	89		855	139	92	74	95	57	38.9	44.6
30	40.2	89	82		760	136	91	72	98	55	38.3	42.3
31		102	74		685	90			94	54		40.2
Ave.	53	75	141	86	584	224	105	81	90	71	45.0	40.8

Annual Average: 134 m<sup>3</sup>/s

1957 - 1958

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	24.8	25.6	56	105	69	47.7	56	70	47.7	47.7	43.8	43.8
2	24.7	25.4	47.7	131	65	47.7	65	117	47.7	47.7	43.8	43.8
3	24.5	25.2	40.2	133	111	46.9	70	105	47.7	43.8	43.8	43.8
4	24.3	40.2	47.7	130	96	46.9	72	94	47.7	43.8	43.8	43.8
5	24.1	47.7	37.0	116	84	44.6	68	89	47.7	43.8	43.8	43.8
6	33.9	94	33.9	94	298	60	44.6	72	84	47.7	43.8	56
7	28.2	94	33.9	84	170	59	44.6	84	79	47.7	47.7	47.7
8	28.0	65	33.9	94	245	58	44.6	89	79	47.7	43.8	43.8
9	27.8	56	31.0	74	237	56	43.8	71	74	47.7	43.8	43.8
10	27.6	28.2	28.2	72	705	55	43.8	65	74	52	43.8	43.8
11	27.4	28.0	28.0	68	237	55	43.8	65	70	52	43.8	40.2
12	27.2	27.8	27.8	129	228	57	43.8	56	70	52	40.2	40.2
13	27.0	27.6	47.7	94	178	56	43.0	56	65	56	37.0	37.0
14	26.8	27.4	52	74	172	55	43.0	56	65	56	33.9	33.9
15	33.9	37.0	55	71	155	54	43.8	56	61	162	43.8	33.9
16	33.9	65	58	67	152	54	43.8	65	61	190	43.8	33.9
17	33.9	74	61	59	138	54	43.8	56	65	129	43.8	33.9
18	28.2	131	57	56	123	53	43.0	56	61	94	33.9	33.9
19	28.0	135	54	52	118	53	43.0	74	56	79	33.9	33.9
20	27.8	94	47.7	52	107	53	43.0	56	56	70	43.8	33.9
21	27.6	74	46.9	56	105	54	43.8	56	52	61	43.8	33.9
22	27.4	70	52	79	104	54	53	56	47.7	56	43.8	40.2
23	27.2	57	56	74	94	55	51	56	47.7	65	52	52
24	27.0	46.9	63	70	89	54	51	52	47.7	61	47.7	47.7
25	26.8	40.2	67	63	85	54	51	47.7	47.7	56	43.8	47.7
26	26.6	33.9	128	57	79	54	50	56	47.7	56	43.8	47.7
27	26.4	29.8	119	81	79	52	50	61	47.7	52	52	52
28	26.2	56	133	(93)	75	52	50	65	47.7	47.7	52	52
29	26.0	84	130		77	51	50	70	47.7	47.7	52	52
30	25.8	47.7	128		73	50	47.7	74	47.7	47.7	43.8	52
31		43.8	131		72		47.7		47.7	47.7	47.7	52
Ave.	(27.6)	(55.8)	62	83	152	56	46.3	63	65	65	(44.1)	43.2

Annual Average: 63.6 m<sup>3</sup>/s

1959 - 1960

1959 - 1960		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	39.6	67	26.8	119	67	85	43.0	21.9	45.4	47.7	27.3	33.9	
2	38.9	63	25.2	103	66	76	42.3	21.4	42.3	45.4	27.3	32.7	
3	96	60	24.8	91	65	72	44.6	26.8	40.2	42.3	26.8	31.6	
4	174	58	41.5	86	63	66	46.1	29.2	38.3	40.2	26.8	29.8	
5	67	54	130	82	63	61	45.4	32.2	35.7	39.6	26.8	29.8	
6	62	53	70	77	63	57	43.8	38.3	33.9	38.9	26.4	29.2	
7	58	49.2	59	88	62	54	43.8	41.5	33.3	38.9	26.4	28.7	
8	57	48.4	88	91	61	52	43.0	40.9	29.8	38.3	32.2	28.7	
9	66	47.7	122	87	60	49.2	43.0	40.2	39.6	37.7	31.0	28.2	
10	76	45.4	168	85	58	48.4	42.3	39.6	46.9	35.1	29.2	28.2	
11	72	42.3	109	93	63	46.9	41.5	45.4	48.4	33.9	29.2	27.8	
12	68	40.9	119	90	59	46.1	40.2	44.6	58	35.1	28.7	26.8	
13	65	38.9	111	86	58	45.4	38.9	48.4	56	38.3	28.7	27.8	
14	60	37.7	109	83	57	45.4	37.0	51	54	40.2	27.8	27.8	
15	58	33.9	109	78	57	43.8	35.1	50	49.2	38.9	28.7	27.3	
16	67	32.7	276	76	58	42.3	33.9	56	52	40.2	38.3	26.8	
17	64	29.8	145	79	60	41.5	33.3	58	64	45.4	39.6	26.4	
18	58	28.2	119	86	60	43.8	32.2	87	59	42.3	40.2	26.4	
19	57	26.8	98	81	59	51	31.0	141	57	41.5	26.0	26.0	
20	63	24.8	116	76	67	50	29.2	80	55	40.9	40.9	25.6	
21	64	24.7	122	75	72	49.2	28.2	76	54	38.3	40.9	25.2	
22	68	24.5	120	75	71	47.7	27.8	72	54	37.7	38.3	25.2	
23	76	24.3	116	74	81	46.9	26.8	67	53	37.7	37.7	24.8	
24	86	24.1	109	72	102	45.4	26.0	64	52	34.5	37.0	24.7	
25	119	27.8	116	72	116	45.4	25.6	61	53	33.3	35.1	24.5	
26	102	26.0	130	72	125	43.8	25.2	57	52	32.2	34.5	24.3	
27	94	24.8	156	71	131	43.8	24.8	55	51	29.8	35.1	24.1	
28	91	24.7	138	70	107	43.0	24.7	53	51	29.2	35.1	23.9	
29	82	28.7	159	68	102	41.5	24.5	49.2	49.2	28.7	34.5	23.7	
30	75	29.8	155		95	41.5	24.3	46.9	48.4	27.8	34.5	23.5	
31		29.2	129		90		24.1		48.4	27.3		23.3	
Ave.	74	(37.7)	113	82	5	51	(34.6)	(53)	48.5	37.3	32.9	(27.0)	

Annual Average: (55.4) m<sup>3</sup>/s

1960 - 1961

1960 - 1961		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	23.1	147	40.2	42.3	28.2	27.3	26.8	25.2	29.8	62	63	38.3	
2	23.0	131	47.7	40.9	25.2	28.7	26.8	25.2	29.8	57	57	37.7	
3	22.9	107	54	48.4	24.8	28.2	26.4	24.8	29.2	49.2	55	35.7	
4	22.7	86	84	47.7	24.7	29.2	26.8	24.7	28.7	42.3	52	33.9	
5	22.5	67	87	41.5	24.5	32.2	26.8	24.5	28.2	40.9	53	33.9	
6	22.3	63	60	39.6	24.3	29.2	26.4	24.3	26.8	37.7	49.2	33.3	
7	22.1	57	45.4	38.9	24.1	28.7	26.0	24.1	26.4	32.2	49.2	32.7	
8	22.0	50	38.9	38.9	23.9	27.3	26.0	23.9	25.2	29.8	56	31.6	
9	21.8	46.1	36.4	38.3	23.7	33.9	26.0	23.7	24.8	28.2	57	31.0	
10	21.6	42.3	53	37.7	27.8	49.2	25.6	23.5	24.6	32.2	53	28.7	
11	21.4	39.6	45.4	37.7	28.2	45.4	25.6	23.3	24.5	81	53	28.2	
12	21.3	37.7	42.3	35.7	33.3	40.9	25.6	23.1	24.4	102	54	28.2	
13	21.2	35.7	43.0	30.4	35.7	37.0	25.2	23.0	26.8	120	50	27.3	
14	21.0	35.1	40.9	28.2	34.5	34.5	25.2	22.9	26.8	130	49.2	26.8	
15	20.8	34.5	43.0	26.8	37.0	38.3	25.2	22.7	27.8	144	48.4	26.8	
16	20.7	46.9	46.1	25.2	32.2	34.5	24.8	22.5	29.8	141	46.1	26.4	
17	20.5	57	46.9	24.8	28.7	32.2	24.7	22.3	30.4	130	45.4	26.0	
18	20.3	49.2	38.9	24.7	37.7	31.0	24.5	22.1	32.2	131	45.4	25.2	
19	20.2	46.9	37.0	24.5	45.4	32.2	24.3	22.0	63	120	44.6	24.8	
20	20.0	45.4	37.0	24.3	58	33.3	24.1	21.8	85	106	44.6	24.7	
21	19.8	42.3	37.0	24.1	82	31.6	23.9	21.6	131	96	43.8	24.5	
22	19.7	39.6	36.4	23.9	52	29.2	23.7	21.4	76	89	44.6	24.3	
23	19.5	35.7	35.7	23.7	42.3	29.8	23.5	21.3	78	81	43.0	24.1	
24	19.4	33.9	47.7	23.5	40.9	29.2	23.3	21.2	81	68	42.3	23.9	
25	19.3	32.2	52	23.3	40.2	28.2	23.1	21.0	86	95	42.3	23.7	
26	19.1	31.0	57	28.2	40.9	28.2	23.0	20.8	108	87	42.3	23.5	
27	19.2	29.2	51	25.6	37.7	27.8	22.9	20.7	122	65	40.9	23.3	
28	19.2	34.5	45.4	26.4	34.5	27.3	22.7	20.5	94	56	40.9	23.1	
29	19.2	41.5	46.1		32.2	27.3	22.5	22.6	75	52	39.6	23.0	
30	64	43.0	41.5		29.8	26.8	25.6	26.0	64	76	39.6	22.9	
31		41.5	42.3		28.7		25.6		58	66		22.7	
Ave.	23.5	53	47	31.9	34.9	32.0	(25.2)	(23.9)	52	79	48	27.3	

Annual Average: 40.0 m<sup>3</sup>/s

1961 - 1962

		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	22.5	40.9	85	73	77	33.3	26.0	27.3	38.3	48.4	39.6	54	
2	22.3	51	78	76	75	32.2	25.6	28.7	86	52	39.6	54	
3	22.1	64	78	69	72	31.6	25.6	32.2	89	49.2	40.9	52	
4	22.0	99	68	81	64	31.0	26.8	34.5	100	45.4	41.5	49.2	
5	21.8	96	68	70	59	29.8	25.2	38.3	96	44.6	45.4	49.2	
6	21.6	113	63	59	58	29.2	25.2	38.9	87	43.8	42.3	46.9	
7	21.4	89	60	79	55	28.7	24.8	45.4	79	41.5	41.5	45.4	
8	21.3	79	57	71	54	28.7	25.2	41.5	81	40.2	40.9	44.6	
9	21.2	73	55	97	49.2	28.2	27.8	35.7	70	49.2	40.9	43.8	
10	21.0	70	54	494	46.1	28.2	26.8	35.1	67	54	40.9	40.9	
11	20.8	205	50	276	42.3	27.8	26.8	35.7	65	52	39.6	39.6	
12	20.7	158	48.4	209	40.2	27.3	26.0	41.5	63	51	39.6	38.3	
13	20.6	99	53	178	38.3	27.3	26.8	43.8	58	49.2	38.9	38.3	
14	20.8	76	51	530	51	26.8	28.7	40.2	54	48.4	38.9	37.7	
15	32.2	66	72	316	46.1	27.3	28.2	38.3	55	47.7	37.7	37.0	
16	41.5	92	77	228	43.8	28.7	27.3	34.5	53	46.9	37.0	36.4	
17	38.3	166	84	195	40.2	27.8	28.2	34.5	52	46.9	37.0	35.1	
18	48.4	162	77	183	37.7	27.3	31.0	33.3	49.2	46.1	36.4	34.5	
19	54	164	72	169	35.7	26.8	29.8	33.9	48.4	45.4	36.4	33.9	
20	50	148	67	152	35.1	26.0	33.9	32.2	45.4	48.4	35.7	33.9	
21	96	108	69	138	34.5	26.4	32.7	33.9	42.3	50	35.7	33.3	
22	108	99	63	111	33.3	28.2	31.0	33.3	40.9	51	35.1	32.7	
23	99	86	55	96	32.2	31.0	28.7	32.2	38.3	52	34.5	32.7	
24	97	83	52	92	31.0	32.7	27.8	32.2	37.7	48.4	34.5	32.7	
25	87	91	50	87	30.4	29.8	27.3	33.9	35.7	47.7	37.0	32.2	
26	75	135	48.4	84	33.9	28.7	27.8	32.7	37.0	46.9	39.6	32.2	
27	63	139	47.7	81	40.2	27.8	26.8	32.7	35.1	44.6	38.9	31.6	
28	59	105	46.9	79	34.5	26.8	28.7	31.0	33.9	43.0	37.7	31.6	
29	57	96	67	79	34.5	26.8	28.7	31.0	33.3	40.9	52	31.0	
30	47.7	98	72	72	32.2	26.0	27.8	30.4	35.1	40.2	57	31.0	
31	89	89	.66	66	35.7	26.0	27.8	30.4	46.1	40.2	57	31.0	
Ave.	(45.5)	104	63	156	44.9	28.6	27.8	35.0	56	46.9	39.8	38.6	

Annual Average: 56.6 m<sup>3</sup>/s

1962 - 1963

		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	30.4	23.1	156	82	79	157	44.6	27.8	29.2	37.7	38.3	29.2	
2	30.4	23.0	147	72	86	150	41.5	27.8	31.0	39.6	48.4	28.7	
3	30.4	22.9	122	60	88	136	40.9	27.3	34.5	37.0	50	28.2	
4	29.8	22.7	172	55	79	124	40.9	33.3	38.3	35.7	47.7	27.3	
5	29.8	22.5	111	53	73	113	39.6	32.2	52	35.1	46.1	26.4	
6	29.2	22.3	105	49.2	68	105	38.3	31.0	55	34.5	45.4	25.2	
7	28.2	22.1	175	48.4	64	103	37.7	29.2	50	50	44.6	24.8	
8	28.2	22.0	153	46.9	83	100	35.1	32.2	47.7	47.7	43.8	24.7	
9	28.2	21.8	153	43.0	102	98	35.1	38.9	46.9	46.9	43.0	24.5	
10	27.8	21.6	146	46.9	90	96	34.5	35.1	49.2	42.3	42.3	24.3	
11	27.3	21.4	196	43.0	97	95	34.5	33.3	54	40.2	40.9	24.1	
12	26.8	21.3	89	52	164	94	33.3	31.0	49.2	40.2	40.9	23.9	
13	26.8	21.2	63	43.8	316	92	32.2	29.2	48.4	38.3	39.6	23.7	
14	26.4	21.0	52	51	254	91	32.2	29.8	46.1	37.0	37.0	23.5	
15	26.0	20.8	76	166	217	88	31.0	32.7	42.3	36.4	35.7	23.3	
16	26.0	20.7	129	485	185	85	30.4	31.6	40.9	39.6	35.1	25.6	
17	26.0	20.5	163	230	173	81	30.4	29.8	38.3	37.0	34.5	25.6	
18	25.6	20.3	128	210	164	76	29.8	38.3	35.1	35.7	34.5	25.2	
19	25.6	20.2	91	181	144	72	29.2	34.5	37.0	35.7	33.9	24.8	
20	25.2	20.0	125	136	133	67	28.7	31.6	35.7	35.1	33.3	24.7	
21	25.2	19.8	98	107	125	67	28.7	29.8	34.5	35.1	33.3	24.5	
22	24.8	19.7	91	97	139	64	28.2	28.7	33.9	33.9	33.3	24.3	
23	24.7	19.5	122	83	129	60	34.5	28.7	33.9	33.9	32.7	24.1	
24	24.5	19.4	147	74	123	58	31.0	28.2	33.3	33.3	32.2	23.9	
25	24.3	19.3	108	69	156	56	30.4	28.2	32.7	32.7	32.2	23.7	
26	24.1	31.0	88	72	420	55	29.2	27.8	34.5	38.3	32.2	23.5	
27	23.9	64	81	69	400	54	29.2	33.9	37.7	37.0	31.6	23.3	
28	23.7	89	67	79	371	51	28.7	33.3	39.6	36.4	31.6	23.1	
29	23.5	107	67	67	237	49.2	28.7	33.3	35.1	35.7	31.0	23.0	
30	23.3	112	88	88	209	46.9	28.2	31.0	35.1	35.1	31.0	22.9	
31	163	163	97	97	181	181	28.2	31.0	35.7	33.9	33.9	22.7	
Ave.	26.5	35.2	116	100	166	86	33.1	31.3	40.9	37.6	37.9	(24.7)	

Annual Average: 61.1 m<sup>3</sup>/s



1963 - 1964

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	30.4	32.7	71	32.2	42.3	26.0	58	44.6	43.0	119	62	50
2	54	29.8	58	31.0	46.9	27.3	49.2	43.8	44.6	184	48.4	48.4
3	42.3	33.9	50	30.4	49.2	26.0	67	42.3	47.7	145	58	46.9
4	34.5	29.8	54	29.8	46.1	26.8	49.2	41.5	51	99	56	48.6
5	34.5	48.4	47.7	41.5	42.3	28.2	58	51	48.4	92	54	45.4
6	31.0	43.0	41.5	61	43.0	28.2	49.2	58	53	86	53	46.9
7	28.2	36.4	53	60	180	27.8	41.5	68	54	78	61	65
8	39.6	36.4	47.7	88	1 080	26.8	49.2	81	56	81	63	89
9	79	35.1	40.9	116	1 060	26.0	41.5	66	59	76	62	98
10	51	32.7	40.2	96	710	26.8	41.5	63	69	73	65	109
11	37.7	33.9	39.6	118	550	27.8	58	60	81	72	58	118
12	37.0	33.3	37.7	88	414	27.8	41.5	58	86	68	54	120
13	32.7	32.2	36.4	79	317	27.8	49.2	52	102	65	88	103
14	29.8	43.8	35.7	72	265	26.0	41.5	51	134	64	156	86
15	62	78	51	72	233	26.4	35.1	51	159	63	138	67
16	54	89	44.6	62	194	26.4	35.1	50	139	62	119	63
17	50	95	40.2	53	163	26.4	41.5	52	125	61	106	59
18	46.1	373	38.3	78	147	26.4	41.5	54	106	61	91	55
19	43.0	177	36.4	74	133	26.4	41.5	55	102	60	84	52
20	50	145	35.1	66	122	27.3	35.1	57	65	61	76	52
21	43.8	112	34.5	53	109	26.4	35.1	58	58	60	70	50
22	40.2	76	37.7	44.6	98	26.4	41.5	56	56	60	63	47.7
23	55	80	34.5	43.0	84	26.8	35.1	54	54	59	61	44.6
24	49.2	78	33.9	39.6	72	27.3	35.1	52	47.7	57	58	44.6
25	41.5	84	45.4	46.9	60	26.8	35.1	49.2	57	55	57	42.3
26	39.6	73	39.6	40.9	50	26.4	58	49.2	60	55	55	40.2
27	37.0	87	35.7	37.7	40.2	27.3	64	47.7	67	54	54	44.6
28	42.3	75	33.9	37.0	31.6	26.4	51	46.1	70	53	53	46.9
29	37.7	66	33.3	35.1	26.8	26.4	49.2	44.6	72	51	52	44.6
30	34.5	61	32.2	25.6	25.6	26.8	46.1	41.5	86	56	50	45.4
31		70	32.7	25.6	25.6		45.4		94	58		47.7
Ave.	42.9	75	41.7	59	208	26.9	45.8	53	76	74	71	62

Annual Average: 70 m<sup>3</sup>/s

1964 - 1965

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	55	58	60	130	117	109	26.8	22.0	17.5	48.4	54	44.6
2	47.7	51	57	178	107	100	26.8	21.8	17.4	54	52	41.5
3	63	63	54	194	97	91	26.8	21.6	17.3	68	50	39.6
4	75	100	50	336	88	83	26.4	21.4	17.2	66	48.4	38.3
5	95	75	46.9	265	70	75	26.4	21.3	17.0	64	46.1	37.0
6	94	79	43.0	219	62	69	26.4	21.2	16.8	62	43.8	37.7
7	99	79	41.5	198	55	65	26.0	21.0	16.7	58	43.0	41.5
8	96	102	40.2	181	51	63	26.0	20.8	16.6	56	42.3	43.0
9	75	98	37.7	166	47.7	62	26.0	20.7	16.5	50	41.5	45.4
10	63	85	34.5	153	44.6	59	25.6	20.5	16.3	47.7	84	56
11	56	77	40.2	141	43.0	58	25.6	20.3	16.2	59	77	50
12	53	67	37.0	129	40.9	56	25.6	20.2	16.1	62	73	45.4
13	50	63	34.5	116	38.9	56	25.6	20.0	16.0	63	72	40.9
14	49.2	59	49.2	104	92	54	25.2	19.8	15.9	64	71	39.6
15	48.4	57	46.1	94	140	50	25.2	19.7	15.7	66	58	38.3
16	47.7	60	80	82	178	47.7	24.8	19.5	25.6	67	54	38.3
17	45.4	113	104	67	162	45.4	24.7	19.4	26.8	63	52	37.7
18	42.3	72	90	55	155	44.6	24.5	19.3	27.3	95	51	40.2
19	41.5	63	86	50	148	42.3	24.3	19.1	27.8	127	50	40.2
20	41.5	57	80	46.9	144	40.9	24.1	19.0	105	156	49.2	38.3
21	38.9	54	570	43.8	169	39.6	23.9	18.9	111	131	45.4	37.0
22	35.7	81	466	41.5	343	38.3	23.7	18.7	112	124	43.8	38.3
23	35.1	92	328	84	307	37.0	23.5	18.6	77	117	49.2	38.9
24	34.5	82	312	78	289	35.7	23.3	18.5	63	112	55	39.6
25	50	80	231	104	271	34.5	23.1	18.3	63	92	54	41.5
26	138	95	198	119	249	33.3	23.0	18.1	61	86	47.7	41.5
27	64	92	168	133	179	32.2	22.9	18.0	58	86	44.6	38.3
28	72	86	141	127	152	30.4	22.7	17.9	56	84	43.0	35.7
29	60	79	135	135	138	29.2	22.5	17.8	54	69	47.7	34.5
30	63	72	125	130	130	27.8	22.3	17.6	53	66	46.9	35.7
31		63	125	123	123	22.1	22.1	17.6	49.2	56		34.5
Ave.	61	75	126	130	136	54	(24.7)	(19.7)	(39.3)	78	53	40.3

Annual Average: 69.5 m<sup>3</sup>/s

1965 - 1966

1965 - 1966		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	35.3	44.3	124	60	63	61	51	34.5	69	43.0	64	37.0	
2	39.3	79	114	57	64	60	55	38.3	62	42.3	62	35.1	
3	43.6	79	103	65	63	58	52	37.0	53	41.5	58	35.9	
4	113	73	96	65	66	58	49.2	35.7	49.2	42.3	54	37.0	
5	99	56	92	91	68	57	48.4	35.1	53	43.8	57	35.1	
6	68	114	86	94	87	56	84	36.4	57	46.9	52	33.7	
7	54	112	80	75	75	62	77	37.7	62	50	49.2	33.1	
8	49.8	92	77	69	69	60	70	44.6	66	54	47.7	33.9	
9	64	82	79	65	65	56	57	51	69	52	45.4	33.9	
10	69	77	87	57	64	53	51	42.3	65	54	44.6	32.5	
11	61	85	92	55	69	51	47.7	38.9	55	51	44.6	31.4	
12	55	113	138	70	108	49.7	45.4	37.7	47.7	53	43.8	30.6	
13	47.9	102	100	60	89	50	43.0	36.4	53	54	42.3	30.8	
14	44.3	102	89	111	106	57	43.0	34.5	57	56	41.5	29.6	
15	41.3	94	84	189	86	65	40.2	33.3	55	54	41.5	29.2	
16	40.4	85	78	170	84	65	38.3	32.7	53	52	40.9	28.9	
17	39.1	77	74	153	89	67	37.7	34.5	57	48.4	40.2	29.0	
18	41.1	69	72	188	88	61	40.9	36.4	62	45.4	39.6	29.2	
19	39.6	61	68	160	78	54	39.6	38.3	66	43.8	38.3	43.0	
20	39.8	64	64	144	74	50	38.9	46.9	72	41.5	37.7	33.7	
21	44.3	64	64	119	71	48.2	37.7	44.6	68	40.2	38.3	33.3	
22	51	80	65	98	67	47.7	37.0	40.9	62	38.9	40.2	31.8	
23	57	148	60	85	65	46.6	40.2	47.7	59	40.9	43.0	33.3	
24	54	100	58	78	64	45.9	45.4	54	55	71	38.3	32.4	
25	50	86	65	83	63	44.9	43.8	64	51	80	39.6	33.5	
26	57	101	65	81	60	43.5	42.3	72	48.4	108	37.7	32.9	
27	57	182	58	72	60	42.5	40.9	75	46.9	85	36.4	30.4	
28	51	146	55	67	61	44.9	39.6	79	45.4	82	35.1	28.9	
29	46.1	171	54	59	59	46.6	38.3	77	50	74	33.9	28.2	
30	45.1	127	52	58	45.6	37.0	37.0	75	46.9	77	33.3	27.8	
31	105		53	54	35.1				43.8	73		27.1	
Ave.	53	96	79	97	73	54	46.7	46.4	57	56	44.0	32.3	

Annual Average: 61 m<sup>3</sup>/s

1966 - 1967

1966 - 1967		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	26.5	23.6	74	89	58	61	47.7	46.1	73	55	156	52	
2	25.9	23.3	74	84	56	63	48.4	44.6	78	54	117	49.7	
3	26.1	23.1	80	83	57	67	47.7	43.0	62	72	110	49.5	
4	25.9	22.3	86	83	57	62	48.4	42.3	57	61	101	48.2	
5	26.0	21.5	117	74	56	58	46.9	42.3	54	54	93	47.2	
6	25.9	21.2	153	67	69	57	45.4	44.6	50	52	89	47.4	
7	26.9	20.8	100	66	91	58	46.9	43.0	53	57	84	45.9	
8	24.8	23.8	80	63	120	80	46.1	42.3	50	54	79	44.3	
9	24.5	25.1	71	61	123	101	58	41.5	47.7	50	74	42.8	
10	25.9	25.7	60	59	124	79	47.7	43.0	46.9	67	72	43.0	
11	29.2	25.6	52	56	119	88	45.4	40.9	47.7	58	71	43.0	
12	25.2	24.9	45.9	55	114	91	54	43.8	46.9	56	70	45.4	
13	27.3	25.1	40.9	138	113	87	51	40.9	188	61	72	57	
14	32.7	27.8	38.1	94	96	77	49.2	47.7	106	54	73	52	
15	30.5	30.0	37.0	81	95	73	52	49.2	93	72	69	47.7	
16	27.4	74	36.0	80	100	71	49.2	56	77	66	67	45.6	
17	27.3	112	203	80	97	65	46.9	46.1	67	61	63	43.0	
18	28.1	71	90	103	93	62	49.2	51	62	51	61	44.1	
19	33.9	51	78	87	88	58	48.4	92	58	49.2	59	45.4	
20	34.7	49.0	78	114	84	57	57	84	57	47.7	58	43.0	
21	32.2	86	89	103	80	56	62	78	54	49.2	62	44.6	
22	30.4	80	102	108	75	56	66	72	54	57	70	48.7	
23	28.6	80	108	91	72	54	64	65	53	82	73	47.4	
24	28.9	111	102	91	69	55	58	71	51	78	64	43.0	
25	32.7	123	94	82	67	52	52	67	54	73	57	41.6	
26	32.5	86	165	74	113	50	59	65	51	152	56	40.4	
27	28.2	70	105	69	108	48.9	62	63	53	186	54	39.8	
28	26.0	55	101	60	84	47.9	58	75	54	135	54	38.7	
29	24.9	51	101	78	78	47.2	51	81	59	150	60	40.9	
30	25.6	43.0	91	71	71	46.9	49.2	77	56	190	58	46.4	
31	47.0		88	65	65	47.7			52	213	61		
Ave.	28.2	50	88	82	87	64	52	57	63	81	75	46.1	

Annual Average: 64.4 m<sup>3</sup>/s

1967 - 1968

1967 - 1968		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	72	62									(34.5)	27.8	
2	78	66									(33.9)	27.3	
3	54	84									33.3	26.8	
4	58	77									32.7	26.4	
5	68	89									32.2	26.3	
6	76	80									34.5	25.6	
7	91	90									33.9	28.1	
8	80	75									32.7	29.8	
9	69	70									31.0	27.8	
10	62	103									33.9	26.1	
11	56	124									35.1	25.5	
12	48.7	193									34.5	25.2	
13	45.9	106									32.7	24.4	
14	42.5	102									31.6	24.5	
15	64	90									30.4	24.8	
16	94	77									32.7	28.9	
17	107	66									31.6	28.2	
18	125	64									39.6	27.1	
19	81	63									39.6	29.2 (26.0)	
20	89	90									40.2	28.7 (25.2)	
21	82	84									40.2	28.2	
22	85	73									40.2	32.7	
23	112	66									40.2	37.0	
24	102	64									39.6	31.6	
25	97	66									(38.9)	29.8	
26	90	66									(38.3)	29.2 (29.2)	
27	83	107									(37.7)	29.8 (26.0)	
28	74	145									28	23.9	
29	66	125									(36.4)	29.2	
30	57	160									(35.7)	28.2	
31		148									(35.1)	22.0	
Ave.	77	93									(31.8)	26.3	

1968 - 1969

1968 - 1969		Unit: m <sup>3</sup> /s											
Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	
1	23.0	70	57	63	51	44.3	44.6	42.3	43.8	63	83	40.9	
2	26.4	57	66	60	48.7	43.5	43.8	46.9	41.5	63	78	41.3	
3	24.7	54	101	57	46.9	41.8	43.0	43.0	37.0	52	73	39.8	
4	23.9	41.6	166	52	46.1	40.0	42.3	52	35.7	48.4	70	39.6	
5	22.5	36.0	102	54	44.9	52.9	41.5	49.2	35.1	44.6	66	39.1	
6	22.2	34.9	82	125	43.5	47.9	40.9	47.7	35.1	42.3	63	40.2	
7	22.3	33.3	80	196	42.8	47.4	40.2	38.9	36.4	40.9	61	40.2	
8	21.7	31.4	71	203	79	50	39.6	35.1	34.5	44.6	61	38.7	
9	21.3	31.6	63	170	97	44.6	39.6	35.1	32.7	101	58	38.1	
10	21.0	47.0	60	168	63	42.8	38.9	37.7	75	79	56	37.2	
11	23.0	79	74	130	54	44.6	38.9	36.4	75	64	56	36.2	
12	22.4	77	76	103	51	46.6	38.3	35.1	66	56	57	35.7	
13	24.1	72	70	99	45.4	66	38.3	33.9	58	58	55	35.3	
14	24.6	76	84	93	46.1	53	37.7	33.9	54	142	54	34.3	
15	22.6	110	97	86	45.1	52	37.0	33.3	48.4	128	52	33.9	
16	26.1	85	96	67	44.1	193	37.0	33.3	46.9	112	49.2	33.7	
17	33.4	94	88	54	42.7	111	36.4	31.6	45.5	110	48.4	33.1	
18	30.4	136	69	44.1	41.5	77	36.4	31.0	43.8	118	47.7	32.5	
19	34.1	125	68	63	42.8	72	35.7	30.4	63	126	46.9	32.2	
20	30.2	140	56	63	44.8	66	35.7	30.4	47.7	113	46.1	31.4	
21	29.1	99	52	62	70	62	35.1	31.0	42.3	94	72	31.0	
22	38.1	120	49	61	62	61	37.7	30.4	40.9	89	67	31.0	
23	58	121	52	62	60	61	37.0	30.4	39.6	106	52	30.4	
24	39.4	117	60	62	65	60	36.4	31.0	51	76	49.2	30.4	
25	33.5	86	80	61	71	58	35.1	52	43.0	78	49.2	30.4	
26	34.9	71	112	58	57	55	34.5	54	43.8	97	47.7	33.4	
27	53	58	101	56	57	53	33.9	53	40.2	88	45.4	46.6	
28	115	84	118	53	62	47.9	35.7	52	40.9	100	44.6	45.4	
29	72	145	95	55	55	47.9	37.0	46.9	74	114	43.0	45.1	
30	65	99	79	51	51	46.1	38.3	47.7	63	97	41.5	46.4	
31		64	63	46.4			39.6		71	93		45.6	
Ave.	34.6	81	80	87	54	60	38.3	39.5	48.5	85	56	37.1	

Annual Average: 58.3m<sup>3</sup>/s

1970 - 1971

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	May	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	33.3	29.9	72.4	228	112	70.6	52.9	45.9	52.8	80.9	64.3	35.1
2	33.1	29.5	62.0	188	126	74.1	54.8	44.8	59.6	65.0	85.6	34.7
3	32.2	31.0	62.8	162	121	75.0	54.0	44.0	53.9	60.1	85.4	34.1
4	32.7	37.9	77.9	167	115	77.4	58.2	43.2	49.8	55.9	71.8	33.3
5	33.9	49.0	87.5	153	115	83.5	64.3	42.5	46.9	54.0	61.2	33.3
6	44.7	42.9	90.4	150	113	77.0	57.5	42.5	49.6	51.0	56.6	33.3
7	70.2	37.7	102	144	105	76.9	53.5	44.6	88.5	49.1	53.0	32.7
8	79.7	34.7	114	140	97.4	83.0	52.0	45.4	105	51.4	50.8	32.2
9	53.2	31.9	102	118	111	73.2	50.4	44.8	96.0	56.7	48.5	30.6
10	46.9	30.1	89.2	117	96.3	67.8	56.3	44.1	75.0	59.2	47.6	32.9
11	43.8	29.2	80.0	180	90.2	64.4	70.0	45.7	63.0	53.7	47.7	37.5
12	40.2	29.1	79.7	189	91.7	64.2	108	52.1	56.0	50.6	46.9	38.0
13	37.5	29.1	91.1	399	88.7	67.8	86.2	61.1	51.0	48.0	46.0	44.3
14	36.1	28.9	73.0	276	83.8	68.3	75.2	49.5	48.4	46.3	45.0	38.0
15	35.8	28.5	57.4	220	80.8	64.1	65.6	45.4	46.9	46.1	44.4	38.8
16	37.7	33.4	52.7	194	79.6	61.6	60.9	43.2	46.9	46.1	43.1	37.2
17	46.1	64.8	58.0	157	76.8	59.7	57.3	42.7	46.9	45.4	42.1	34.2
18	39.7	42.7	61.5	134	81.1	58.0	54.8	48.2	44.6	44.6	41.1	32.9
19	38.2	41.1	88.6	139	102	56.2	53.0	56.1	50.8	45.3	42.4	34.7
20	36.4	38.7	99.8	119	83.8	56.8	52.8	47.9	83.1	49.8	42.8	38.5
21	35.0	36.3	245	120	79.0	55.2	54.0	45.7	74.6	52.8	41.6	53.2
22	38.0	33.2	535	107	76.3	55.8	52.4	45.1	143	49.8	40.4	57.3
23	41.0	30.4	432	120	74.4	63.3	51.5	44.9	83.9	59.4	38.8	42.3
24	37.5	28.3	314	102	72.2	70.2	49.5	43.6	68.6	56.3	38.4	37.7
25	34.8	28.6	367	101	69.9	63.3	48.9	43.0	61.0	92.3	41.6	34.9
26	33.2	30.9	292	103	68.2	58.0	52.9	45.9	55.8	66.4	40.1	33.4
27	32.3	30.1	283	96.7	70.6	55.0	53.8	44.4	55.5	54.7	37.9	32.7
28	31.6	73.0	400	144	72.3	54.0	58.1	44.6	60.8	49.8	36.7	32.2
29	31.4	84.0	272		69.3	53.0	52.5	50.0	56.7	49.9	35.7	31.3
30	30.9	100	388		72.1	51.3	50.7	49.4	63.2	74.3	35.6	30.4
31		94.5	308		73.1		47.6		76.8	58.6		
Ave.	39.9	41.6	175	160	89.3	65.3	58.4	46.3	65.0	55.9	48.4	36.2

Annual Average: 73.0 m<sup>3</sup>/s

1969 - 1970

Unit: m<sup>3</sup>/s

Day	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.
1	39.3	25.5	109	123*	68*	70	72	64	60	135*	76	46.9
2	38.3	32.2	106	203	70*	69	70	61	57	126	72	45.3
3	34.5	30.6	127	162	65*	70	66	60	56	99	70	44.6
4	33.1	45.1	115	145	68*	69	72	64	54	86	68	44.2
5	31.8	86	134	116	60	72	120	61	55	79	65	43.2
6	30.8	58	101	104	73	65	86	60	54	77	64	42.1
7	37.4	51	90	103	77	142*	77	59	53	74	62	41.2
8	34.9	42.7	152	171	76	567*	74	61	51	72	60	40.6
9	33.9	39.1	143	127	68	283*	72	63	50	71	62	40.2
10	33.7	36.8	137	100	67	146	70	66	50	69	61	40.2
11	32.5	57	76	115	66	112	67	72	49.2	65	68	39.9
12	40.9	90	69	124	62	130	65	81	48.4	63	62	39.3
13	39.1	83	69	92	65	117	66	103	47.6	66	57	38.8
14	38.1	76	70*	84	73	108	64	85	46.9	69	55	38.6
15	41.6	61	105*	98	63	96	62	69	46.5	67	54	38.3
16	37.5	63	92*	91	58	93	80	72	48.6	76	53	38.3
17	35.1	82	78*	85	58	89	76	67	67	68	52	37.7
18	34.5	97	72	76	55	84	66	64	70	64	52	37.2
19	38.7	87	65	73	80	82	79	65	74	64	52	38.0
20	39.6	102	57	72	176	82	111	67	85	71	50	47.0
21	37.0	110	54	70	137	82	118	63	65	81	49.0	47.6
22	34.5	107	53	68	104	78	110	59	68	104	48.4	40.1
23	29.6	122	52	69	103	73	95	61	83	108	48.0	37.8
24	29.0	138	48.7	68	100	72	87	76	70	115	47.3	36.2
25	27.8	96	53*	63	90	78	75	76	82	137	48.6	35.6
26	26.8	89	78*	61	94	76	63	73	81	138	51	35.4
27	26.8	79	100*	59	94	72	65	68	72	103	57	38.5
28	26.0	82	98*	75*	98	70	60	66	94	89	57	40.2
29	25.6	88	92*		88	68	61	64	77	87	51	37.0
30	25.2	116	193*		81	73	61	61	70*	83	48.3	35.0
31		104	410*		75	69	69	178*	80			34.1
Ave.	33.8	77	103	100	81	110	77	68	67	87	57	40.0

\* Surveyed Discharge

Annual Average: 74.9 m<sup>3</sup>/s

Table-A.5.6 Maximum-Minimum Temperature

Unit: °C

Station		Jan.	Feb.	Mar.	Apr.	May	Jun.	Jul.	Aug.	Sep.	Oct.	Nov.	Dec.	Remarks
Moramanga	Max.	27.7	27.8	26.7	25.8	23.5	21.4	20.2	20.9	23.0	25.6	27.4	27.7	1941 - 1970
	Min.	17.2	17.2	17.0	15.5	13.2	11.3	10.6	10.5	11.3	12.8	15.1	16.5	
Analamazaotra	Max.	26.8	27.1	26.0	25.3	23.1	21.3	20.0	20.2	21.9	23.9	25.9	26.6	1941 - 1970
	Min.	16.7	16.7	16.6	15.4	13.0	11.2	10.5	10.3	11.0	12.4	14.7	16.2	
Beforona	Max.	27.5	27.4	27.6	24.6	25.2	22.2	22.0	21.6	24.1	26.0	28.5	a	1973
	Min.	19.5	20.1	a	a	15.9	15.1	13.0	12.6	14.7	16.5	16.7	a	
Beforona	Max.	a	a	a	26.4									1974
	Min.	17.2	17.8	18.2	18.2									

Table-A.6.1-(1) Economic Comparison. Table

UNIT : MFHG

1 STEP

MOST PROBABLE, 2 FURNACES

	HYDRD				D & GT				T A S				FUEL EXPENS				O & M				TOTAL			
	N I	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04
1 76	1454	1475	1398	1372	582	571	560	549	0	0	0	0	223	219	214	210	24	24	23	23	2283	2239	2195	2154
2 77	2791	2683	2580	2484	0	0	0	0	121	116	112	108	294	283	272	262	31	30	29	28	3237	3112	2993	2882
3 78	2371	2234	2108	1991	0	0	0	0	1149	1120	1057	948	359	338	319	301	37	35	33	31	3956	3727	3517	3321
4 79	2123	2085	2019	2474	582	538	497	451	939	867	803	744	429	396	367	340	44	41	38	35	5117	4727	4375	4054
5 80	2649	2399	2177	1979	0	0	0	0	472	428	388	353	512	464	421	383	52	47	43	39	3685	3338	3029	2754
6 81	0	0	0	0	0	0	0	0	0	0	0	0	41	36	32	29	131	116	104	92	172	152	136	121
7 82	672	585	511	447	0	0	0	0	0	0	0	0	41	36	31	27	131	114	100	87	844	735	642	561
8 83	1111	948	812	697	0	0	0	0	0	0	0	0	41	35	30	26	131	112	96	82	1283	1095	938	805
9 84	1031	863	724	610	840	703	590	497	140	131	126	107	47	39	33	28	132	110	93	78	2230	1866	1566	1320
10 85	1132	929	765	632	0	0	0	0	30	25	20	17	53	43	36	30	132	108	89	74	1347	1105	919	753
11 86	0	0	0	0	0	0	0	0	0	0	0	0	76	61	49	40	170	137	110	90	246	198	159	130
12 87	0	0	0	0	0	0	0	0	140	142	112	89	94	74	59	47	171	135	107	85	445	351	278	221
13 88	0	0	0	0	0	0	0	0	30	23	14	14	112	87	67	53	173	134	104	81	315	244	189	148
14 89	0	0	0	0	542	432	323	243	0	0	0	0	124	98	74	57	178	135	103	79	307	233	177	136
15 90	0	0	0	0	0	0	0	0	0	0	0	0	165	123	92	69	181	134	101	76	928	689	516	388
16 91	0	0	0	0	0	0	0	0	0	0	0	0	217	158	116	85	182	133	97	72	359	291	213	157
17 92	0	0	0	0	1374	967	678	481	0	0	0	0	290	207	149	108	186	133	95	69	476	340	244	177
18 93	0	0	0	0	742	544	376	262	0	0	0	0	323	226	159	113	195	137	96	68	1892	1325	933	662
19 94	0	0	0	0	0	0	0	0	0	0	0	0	411	282	195	136	203	139	96	67	1406	965	667	465
20 95	0	0	0	0	0	0	0	0	0	0	0	0	549	369	251	171	213	143	97	66	762	512	348	237
TOTAL	16334	14951	13745	12686	4742	3750	3024	2492	3141	2872	2636	2430	4406	3574	2966	2515	2697	2097	1654	1322	3133	2724	2425	21446

	HYDRD				D & GT				T A S				FUEL EXPENS				O & M				TOTAL			
	N I	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12
1 76	1346	1322	1294	1275	579	524	520	511	0	0	0	0	206	203	199	196	22	22	21	21	2113	2076	2038	2003
2 77	2393	2307	2225	2148	0	0	0	0	104	100	96	93	252	243	234	226	27	26	25	24	2774	2616	2580	2491
3 78	1882	1781	1688	1600	478	398	370	345	944	893	846	803	285	270	256	242	29	28	26	25	3140	2972	2816	2670
4 79	2296	2133	1985	1849	0	0	0	0	690	641	597	556	315	293	273	254	32	30	28	26	3761	3495	3253	3030
5 80	1803	1645	1503	1376	0	0	0	0	321	293	264	245	348	318	291	266	35	32	30	27	2507	2288	2092	1914
6 81	0	0	0	0	0	0	0	0	0	0	0	0	26	23	21	19	43	37	34	31	109	97	87	79
7 82	392	345	304	269	0	0	0	0	0	0	0	0	24	21	19	16	76	67	59	52	492	433	382	337
8 83	600	518	449	389	0	0	0	0	0	0	0	0	22	19	17	14	71	61	53	46	693	598	519	449
9 84	516	437	372	317	470	356	303	258	40	36	32	28	24	20	17	14	66	56	48	41	1116	945	805	685
10 85	524	436	364	305	0	0	0	0	14	12	10	8	25	20	17	14	61	51	43	36	624	519	434	363
11 86	0	0	0	0	0	0	0	0	0	0	0	0	33	27	22	18	73	60	49	40	106	87	71	58
12 87	0	0	0	0	0	0	0	0	71	57	46	37	37	30	24	20	68	54	44	35	176	141	114	92
13 88	0	0	0	0	0	0	0	0	11	9	7	5	41	32	26	20	64	50	40	31	116	91	73	56
14 89	0	0	0	0	0	0	0	0	0	0	0	0	44	34	26	21	61	47	36	28	105	81	62	48
15 90	0	0	0	0	143	139	106	82	0	0	0	0	52	40	30	23	57	43	33	25	292	222	169	130
16 91	0	0	0	0	0	0	0	0	0	0	0	0	63	47	35	27	53	40	30	22	116	87	65	49
17 92	0	0	0	0	0	0	0	0	0	0	0	0	78	57	42	31	50	37	27	20	128	94	69	51
18 93	0	0	0	0	344	247	179	130	0	0	0	0	81	58	42	31	49	35	25	18	474	348	266	179
19 94	0	0	0	0	144	130	92	66	0	0	0	0	95	67	48	34	47	33	24	17	326	230	164	117
20 95	0	0	0	0	0	0	0	0	0	0	0	0	118	82	57	40	46	32	22	15	164	114	79	55
TOTAL	11752	10924	10188	9528	2098	1799	1570	1392	2245	2081	1935	1802	2169	1904	1696	1526	1070	878	729	609	1933	1758	1611	14857

Table-A.6.1-(2) Internal Rate of Return

NO YEAR	ROGEZ PROJECT			BENEFIT			NET BENE.			PRESENT VALUE		COEFFICIENT
	(1) INVESTMENT	(2) O & M	(3) FUEL EX	(4) FIXED EX	(5) O & M	(6) FUEL EX	(7) NET	(8) INVESTMENT NET BENE.	(9) INVESTMENT NET BENE.	(10) COEFFICIENT		
1 1976	1454	0	0	0	0	0	0	1282	0	0.8415		
2 1977	2912	0	0	0	0	0	0	2263	0	0.7771		
3 1978	3560	0	0	0	0	0	0	2439	0	0.6850		
4 1979	4062	0	0	0	0	0	0	2453	0	0.6039		
5 1980	3121	0	0	0	0	0	0	1661	0	0.5324		
6 1981	0	79	-471	269	65	625	1351	0	634	0.4693		
7 1982	672	79	-471	269	84	781	1526	278	631	0.4137		
8 1983	1111	79	-471	269	101	957	1719	405	627	0.3647		
9 1984	2051	80	-465	269	117	1148	1919	659	617	0.3215		
10 1985	1162	80	-459	364	131	1240	2114	329	599	0.2834		
11 1986	0	118	-436	459	202	2015	2994	0	748	0.2498		
12 1987	180	119	-418	554	254	2239	3333	40	734	0.2202		
13 1988	30	121	-400	554	254	2407	3494	6	678	0.1941		
14 1989	0	124	-382	744	275	2551	3827	0	655	0.1711		
15 1990	0	129	-347	744	291	2748	4001	0	604	0.1509		
16 1991	0	130	-295	839	313	2915	4232	0	563	0.1330		
17 1992	0	134	-222	934	334	3121	4477	0	525	0.1172		
18 1993	792	143	-189	934	363	3359	4702	82	486	0.1034		
19 1994	792	151	-101	1029	390	3574	4943	72	450	0.0911		
20 1995	0	161	-37	1217	418	3832	5270	0	423	0.0803		
SUB TOTAL 1	21899	1729	-5091	9448	3579	33513	49902	11969	8974			
SUB TOTAL 2	7989	4830	1110	36510	12540	114990	158100	83	3078			
TOTAL (1+2)	29888	6559	-3981	45958	16119	148503	208002	12052	12052	13.44 %		

UNIT : MFMG

Table-A.6.1-(3) Present Value at Each Discount Rate

	(4)	(6)	(8)	(10)	(12)	(14)	(16)
RATE OF RETURN (%)							
INVESTMENT (MFMG)	19544	17050	15256	13874	12748	11799	10981
NET BENEFIT (MFMG)	70039	44468	29696	20693	14948	11123	8484

Table-A.6.1-(4) Expenses for Diesel Plant

MOST PROBABLY 2 FURNACES 1 STP.

NO YEAR	(1) DIESEL INVEST. AMOUNT FIXED EX		(2) DIESEL INVEST. AMOUNT FIXED EX		(3) DIESEL INVEST. AMOUNT FIXED EX		(4) GAS TURBIN INVEST. AMOUNT FIXED EX		(5) GAS TURBIN INVEST. AMOUNT FIXED EX		(6) GAS TURBIN INVEST. AMOUNT FIXED EX		(7) T/L & S/S INVEST. AMOUNT FIXED EX		(8) T/L & S/S INVEST. AMOUNT FIXED EX		(9) T/L & S/S INVEST. AMOUNT FIXED EX		TOTAL FIXED EX		INCRE-MENTAL (11) U & M EX		FUEL EX (12) DIESEL		FUEL EX (13) G.T.		INCRE-MENTAL (14) FUEL EX	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)	(18)	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)	(28)
5 1980	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	50	512	0	512	0	512	0	512
6 1981	1584	1584	174	174	840	840	74	74	206	206	206	206	206	206	206	206	206	206	206	206	65	1035	102	1035	102	1035	102	1035
7 1982	0	1584	174	174	0	840	74	74	0	206	0	206	0	206	0	206	0	206	0	206	84	1229	64	1229	64	1229	64	1229
8 1983	0	1584	174	174	0	840	74	74	0	206	0	206	0	206	0	206	0	206	0	206	101	1405	64	1405	64	1405	64	1405
9 1984	0	1584	174	174	0	840	74	74	0	206	0	206	0	206	0	206	0	206	0	206	117	1558	102	1558	102	1558	102	1558
10 1985	792	2376	261	261	0	840	74	74	103	309	103	309	103	309	103	309	103	309	103	309	131	1688	64	1688	64	1688	64	1688
11 1986	792	3144	348	348	0	840	74	74	103	412	103	412	103	412	103	412	103	412	103	412	202	2387	140	2387	140	2387	140	2387
12 1987	792	3420	334	334	0	840	74	74	103	515	103	515	103	515	103	515	103	515	103	515	241	2687	64	2687	64	2687	64	2687
13 1988	0	3420	334	334	0	840	74	74	0	515	0	515	0	515	0	515	0	515	0	515	254	2817	102	2817	102	2817	102	2817
14 1989	1584	5544	604	604	0	840	74	74	206	721	206	721	206	721	206	721	206	721	206	721	275	2999	64	2999	64	2999	64	2999
15 1990	0	5544	604	604	0	840	74	74	0	721	0	721	0	721	0	721	0	721	0	721	291	3158	102	3158	102	3158	102	3158
16 1991	792	6376	696	696	0	840	74	74	103	824	103	824	103	824	103	824	103	824	103	824	313	3363	64	3363	64	3363	64	3363
17 1992	792	7128	783	783	0	840	74	74	103	927	103	927	103	927	103	927	103	927	103	927	334	3569	64	3569	64	3569	64	3569
18 1993	0	7128	783	783	0	840	74	74	0	927	0	927	0	927	0	927	0	927	0	927	363	3769	102	3769	102	3769	102	3769
19 1994	792	7420	470	470	0	840	74	74	103	1030	103	1030	103	1030	103	1030	103	1030	103	1030	390	4022	64	4022	64	4022	64	4022
20 1995	1584	9504	1043	1043	0	840	74	74	206	1236	206	1236	206	1236	206	1236	206	1236	206	1236	418	4281	64	4281	64	4281	64	4281



Table A.6.1-(5) Repayment Schedule

UNIT : MFMG

MO. YEAR	1 <sup>ST</sup> STAGE				2 <sup>ND</sup> STAGE				3 <sup>RD</sup> STAGE				TOTAL (1) (2) (1) (2) (1) (2) (1) (2)		
	AMOUNT OF LOAN	INTER-EST	REPAY-MENT	AMOUNT BALANCE	AMOUNT OF LOAN	INTER-EST	REPAY-MENT	AMOUNT BALANCE	AMOUNT OF LOAN	INTER-EST	REPAY-MENT	AMOUNT BALANCE		PAY-MENT	REPAY-MENT
6 1981	17611	1233	0	17611	0	0	0	0	0	0	0	0	0	1233	0
7 1982	0	1233	0	17611	0	0	0	0	0	0	0	0	0	1233	0
8 1983	0	1233	330	1562	0	0	0	0	0	0	0	0	0	1233	330
9 1984	0	1210	353	1562	0	0	0	0	0	0	0	0	0	1210	353
10 1985	0	1185	377	1562	0	0	0	0	0	0	0	0	0	1185	377
11 1986	0	1159	404	1562	4713	0	0	0	0	0	0	0	0	1489	404
12 1987	0	1130	432	1562	15716	0	0	0	0	0	0	0	0	1460	432
13 1988	0	1100	462	1562	15253	0	0	0	0	0	0	0	0	1430	462
14 1989	0	1068	495	1562	14759	0	0	0	0	0	0	0	0	1398	495
15 1990	0	1033	524	1562	14230	0	0	0	0	0	0	0	0	1357	524
16 1991	0	996	566	1562	13663	0	0	0	0	0	0	0	0	1313	566
17 1992	0	956	606	1562	13057	0	0	0	0	0	0	0	0	1266	606
18 1993	0	914	648	1562	12409	0	0	0	0	0	0	0	0	1217	648
19 1994	0	869	694	1562	11715	0	0	0	0	0	0	0	0	1163	694
20 1995	0	820	742	1562	10973	0	0	0	0	0	0	0	0	1106	742
21 1996	0	768	794	1562	10174	0	0	0	0	0	0	0	0	1045	794
22 1997	0	713	850	1562	9329	0	0	0	0	0	0	0	0	979	850
23 1998	0	653	909	1562	8420	0	0	0	0	0	0	0	0	909	909
24 1999	0	589	973	1562	7447	0	0	0	0	0	0	0	0	834	973
25 2000	0	521	1041	1562	6406	0	0	0	0	0	0	0	0	754	1041
26 2001	0	448	1114	1562	5292	0	0	0	0	0	0	0	0	668	1114
27 2002	0	370	1192	1562	4100	0	0	0	0	0	0	0	0	576	1192
28 2003	0	287	1275	1562	2824	0	0	0	0	0	0	0	0	478	1275
29 2004	0	198	1365	1562	1460	0	0	0	0	0	0	0	0	372	1365
30 2005	0	102	1460	1562	0	0	0	0	0	0	0	0	0	260	1460
31 2006	0	0	0	0	0	0	0	0	0	0	0	0	0	139	0
32 2007	0	0	0	0	0	0	0	0	0	0	0	0	0	120	0
33 2008	0	0	0	0	0	0	0	0	0	0	0	0	0	99	0
34 2009	0	0	0	0	0	0	0	0	0	0	0	0	0	77	0
35 2010	0	0	0	0	0	0	0	0	0	0	0	0	0	53	0
36 2011	0	0	0	0	0	0	0	0	0	0	0	0	0	27	0

Table A.6.1-(6) Income Statement

NO	YEAR	MOST PHOSPHORIC FURNACES		1 STEP		REVENUES		(4)		(5)		(6)		(7)		EXPENSES		(9)		(10)		(11)		(12)		(13)		(14)		(15)		
		GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW	FMG/KWH	FMG	GW
6	1981	13	7.20	94	87	3.90	339	433	79	3	341	423	10	471	1233	752	10	471	1233	752	10	471	1233	752	10	471	1233	752	10	471	1233	752
7	1982	28	7.20	202	104	3.90	406	608	79	3	341	423	185	471	1233	577	185	471	1233	577	185	471	1233	577	185	471	1233	577	185	471	1233	577
8	1983	45	7.20	324	115	3.90	449	773	79	3	341	423	350	471	1233	412	350	471	1233	412	350	471	1233	412	350	471	1233	412	350	471	1233	412
9	1984	63	7.20	454	127	3.90	495	949	80	42	341	503	446	465	1210	299	446	465	1210	299	446	465	1210	299	446	465	1210	299	446	465	1210	299
10	1985	82	7.20	590	127	3.90	495	1085	80	42	341	503	582	459	1185	144	582	459	1185	144	582	459	1185	144	582	459	1185	144	582	459	1185	144
11	1986	105	6.50	683	232	3.50	612	1495	118	42	428	628	867	436	1489	186	867	436	1489	186	867	436	1489	186	867	436	1489	186	867	436	1489	186
12	1987	128	6.50	832	254	3.50	689	1721	119	42	428	629	1092	418	1460	50	1092	418	1460	50	1092	418	1460	50	1092	418	1460	50	1092	418	1460	50
13	1988	154	6.50	1001	254	3.50	889	1890	121	42	428	631	1259	400	1430	229	1259	400	1430	229	1259	400	1430	229	1259	400	1430	229	1259	400	1430	229
14	1989	183	6.50	1190	254	3.50	889	2079	126	102	428	656	1423	383	1398	408	1423	383	1398	408	1423	383	1398	408	1423	383	1398	408	1423	383	1398	408
15	1990	213	6.50	1385	254	3.50	889	2274	129	102	428	659	1615	347	1357	605	1615	347	1357	605	1615	347	1357	605	1615	347	1357	605	1615	347	1357	605
16	1991	252	6.20	1562	254	3.20	813	2375	130	102	428	660	1715	295	1313	697	1715	295	1313	697	1715	295	1313	697	1715	295	1313	697	1715	295	1313	697
17	1992	287	6.20	1779	254	3.20	813	2592	134	102	428	664	1928	222	1266	884	1928	222	1266	884	1928	222	1266	884	1928	222	1266	884	1928	222	1266	884
18	1993	326	6.20	2021	254	3.20	813	2834	143	189	428	760	2074	189	1217	1046	2074	189	1217	1046	2074	189	1217	1046	2074	189	1217	1046	2074	189	1217	1046
19	1994	368	6.20	2242	254	3.20	813	3095	151	276	428	855	2240	101	1163	1178	2240	101	1163	1178	2240	101	1163	1178	2240	101	1163	1178	2240	101	1163	1178
20	1995	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	1106	1366	2509	-37	1106	1366	2509	-37	1106	1366	2509	-37	1106	1366	2509	-37	1106	1366
21	1996	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	1045	1427	2509	-37	1045	1427	2509	-37	1045	1427	2509	-37	1045	1427	2509	-37	1045	1427
22	1997	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	979	1493	2509	-37	979	1493	2509	-37	979	1493	2509	-37	979	1493	2509	-37	979	1493
23	1998	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	909	1563	2509	-37	909	1563	2509	-37	909	1563	2509	-37	909	1563	2509	-37	909	1563
24	1999	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	834	1638	2509	-37	834	1638	2509	-37	834	1638	2509	-37	834	1638	2509	-37	834	1638
25	2000	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	754	1718	2509	-37	754	1718	2509	-37	754	1718	2509	-37	754	1718	2509	-37	754	1718
26	2001	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	668	1804	2509	-37	668	1804	2509	-37	668	1804	2509	-37	668	1804	2509	-37	668	1804
27	2002	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	576	1896	2509	-37	576	1896	2509	-37	576	1896	2509	-37	576	1896	2509	-37	576	1896
28	2003	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	478	1984	2509	-37	478	1984	2509	-37	478	1984	2509	-37	478	1984	2509	-37	478	1984
29	2004	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	372	2100	2509	-37	372	2100	2509	-37	372	2100	2509	-37	372	2100	2509	-37	372	2100
30	2005	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	260	2212	2509	-37	260	2212	2509	-37	260	2212	2509	-37	260	2212	2509	-37	260	2212
31	2006	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	139	2333	2509	-37	139	2333	2509	-37	139	2333	2509	-37	139	2333	2509	-37	139	2333
32	2007	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	120	2352	2509	-37	120	2352	2509	-37	120	2352	2509	-37	120	2352	2509	-37	120	2352
33	2008	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	99	2373	2509	-37	99	2373	2509	-37	99	2373	2509	-37	99	2373	2509	-37	99	2373
34	2009	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	77	2395	2509	-37	77	2395	2509	-37	77	2395	2509	-37	77	2395	2509	-37	77	2395
35	2010	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	53	2419	2509	-37	53	2419	2509	-37	53	2419	2509	-37	53	2419	2509	-37	53	2419
36	2011	413	6.20	2561	254	3.20	813	3374	161	276	428	865	2509	-37	27	2445	2509	-37	27	2445	2509	-37	27	2445	2509	-37	27	2445	2509	-37	27	2445

Table-A.6.1-(7) Cash Flow

MOST PROBABLE, 2 FURNACES, 1 STEP UNIT : MFG

NO YEAR	(1) CASH FROM INCOME	(2) NET INCOME	(3) DEPRECIATION	(4) REPAYMENT OF DEBT	(5) NET CASH PROVIDED
6 1981	-411	-752	341	0	-411
7 1982	-236	-577	341	0	-236
8 1983	-71	-412	341	330	-401
9 1984	42	-299	341	353	-311
10 1985	197	-144	341	377	-180
11 1986	242	-186	428	404	-162
12 1987	478	50	428	432	46
13 1988	657	229	428	462	195
14 1989	836	408	428	583	253
15 1990	1033	605	428	624	404
16 1991	1125	697	428	667	458
17 1992	1312	884	428	714	598
18 1993	1474	1046	428	764	710
19 1994	1606	1174	428	817	789
20 1995	1794	1366	428	875	919
21 1996	1855	1427	428	934	919
22 1997	1921	1493	428	1001	920
23 1998	1991	1563	428	1071	920
24 1999	2066	1630	428	1146	920
25 2000	2146	1714	428	1227	919
26 2001	2232	1804	428	1313	919
27 2002	2324	1896	428	1404	920
28 2003	2422	1994	428	1503	919
29 2004	2528	2100	428	1608	920
30 2005	2640	2212	428	1721	919
31 2006	2761	2333	428	279	2482
32 2007	2780	2352	428	298	2482
33 2008	2801	2373	428	319	2482
34 2009	2823	2395	428	341	2482
35 2010	2847	2419	428	365	2482
36 2011	2873	2445	428	391	2482



Table-A.6.2-(2) Internal Rate of Return

NO YEAR	ROGEZ PROJECT		BENEFIT		NET BENE.		PRESENT VALUE		COEFFICIENT (10) 13.56 %
	(1) INVESTMENT	(2) O & M	(3) FUEL EX	(4) FIXED EX	(5) O & M	(6) FUEL EX	(7) NET	(8) INVESTMENT NET BENE.	
1 1976	1454	0	0	0	0	0	0	1280	0
2 1977	2294	0	0	0	0	0	0	1779	0
3 1978	2873	0	0	0	0	0	0	1962	0
4 1979	2972	0	0	0	0	0	0	1787	0
5 1980	2205	0	0	0	0	0	0	1167	0
6 1981	524	58	-477	269	65	625	1378	0	642
7 1982	1088	59	-471	269	84	781	1546	215	635
8 1983	1828	61	-459	269	101	957	1725	661	624
9 1984	1088	64	-430	269	117	1148	1900	346	605
10 1985	2906	66	-360	364	131	1240	2029	815	569
11 1986	1955	104	-283	459	202	2015	2855	483	705
12 1987	2517	108	-242	554	241	2239	3168	547	689
13 1988	1975	114	-145	554	254	2407	3246	378	621
14 1989	0	170	-394	744	275	2551	3794	0	639
15 1990	0	172	-319	744	291	2748	3930	0	583
16 1991	0	178	-312	839	313	2915	4201	0	549
17 1992	0	180	-236	934	334	3121	4445	0	511
18 1993	792	188	-172	934	363	3359	4640	80	470
19 1994	0	197	-83	1029	390	3574	4879	0	435
20 1995	792	204	40	1217	418	3833	5219	62	410
SUB TOTAL 1	26175	1426	-4343	9448	3579	33513	48955	11562	8687
SUB TOTAL 2	8027	6270	1200	36510	12540	114990	156570	82	2957
TOTAL (1+2)	34202	8194	-3143	45958	16119	148503	205525	11644	11644

Table-A.6.2-(3) Present Value at Each Discount Rate

	(4)	(6)	(8)	(10)	(12)	(14)	(16)
RATE OF RETURN (MFMG)	21444	18227	15860	14041	12591	11401	10408
INVESTMENT (MFMG)	69088	43826	29244	20370	14705	10942	8349

Table-A.6.2-(4) Expenses for Diesel Plant

MO. YEAR	DIESEL (1) INVEST. AMOUNT		GAS TURBIN (4) INVEST. AMOUNT		T/L & S/S (7) INVEST. AMOUNT		TOTAL FIXED EX (110)	INCRE- MENTAL (11) O & M EX	UNIT : MFMG		INCRE- MENTAL (14) FUEL EX
	(2) INVEST. AMOUNT	(3) FIXED EX	(5) INVEST. AMOUNT	(6) FIXED EX	(8) INVEST. AMOUNT	(9) FIXED EX			(12) DIESEL	(13) G.Y.	
5 1980	0	0	0	0	0	0	0	50	512	0	512
6 1981	1584	174	840	74	206	16	264	65	1035	102	625
7 1982	0	174	840	74	0	16	264	84	1229	64	781
8 1983	0	174	840	74	206	16	264	101	1405	64	957
9 1984	0	174	840	74	0	16	264	117	1558	102	1148
10 1985	792	681	840	74	309	24	364	131	1688	64	1240
11 1986	792	348	840	74	103	32	454	202	2387	140	2015
12 1987	792	435	840	74	103	40	554	241	2687	64	2239
13 1988	0	435	840	74	515	40	554	254	2817	102	2407
14 1989	1584	609	840	74	721	56	744	275	2999	64	2551
15 1990	0	609	840	74	0	56	744	291	3158	102	2748
16 1991	792	696	840	74	824	64	839	313	3363	64	2915
17 1992	792	783	840	74	103	72	934	334	3569	64	3121
18 1993	0	783	840	74	0	80	1029	363	3769	102	3359
19 1994	792	870	840	74	103	80	1029	390	4022	64	3574
20 1995	1584	1043	840	74	206	95	1217	418	4281	64	3833

Table-A.6.2-(5) Repayment Schedule

MOST PROBABLE 2 FURNACES 2-STEP

NO YEAR	1ST STAGE			2ND STAGE			3RD STAGE			TOTAL					
	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY- MENT DEBT	(4) AMOUNT BALAN- CE	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY- MENT DEBT	(4) AMOUNT BALAN- CE	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY- MENT DEBT	(4) AMOUNT BALAN- CE	(1) PAY- OF IN- TEREST	(2) REPAY- MENT DEBT	
6 1981	13859	970	0	13859	0	0	0	0	0	0	0	0	970	0	
7 1982	0	970	0	13859	0	0	0	0	0	0	0	0	970	0	
8 1983	0	970	259	1229	13600	0	0	0	0	0	0	0	970	259	
9 1984	0	952	278	1229	13322	0	0	0	0	0	0	0	952	278	
10 1985	0	933	297	1229	13025	0	0	0	0	0	0	0	933	297	
11 1986	0	912	318	1229	12707	4142	0	4142	0	0	0	0	1202	318	
12 1987	0	890	340	1229	12367	0	0	4142	0	0	0	0	1179	340	
13 1988	0	866	364	1229	12004	0	0	4142	0	0	0	0	1156	364	
14 1989	0	840	389	1229	11614	0	290	4064	0	0	0	9482	1794	467	
15 1990	0	813	416	1229	11194	0	285	3982	0	0	0	9482	1761	499	
16 1991	0	784	446	1229	10752	0	279	3893	0	0	0	9482	1726	534	
17 1992	0	753	477	1229	10276	0	272	3798	0	654	177	841	9305	1689	749
18 1993	0	719	510	1229	9745	0	266	3696	0	651	190	841	9115	1636	802
19 1994	0	684	546	1229	9219	0	259	3588	0	638	203	841	8912	1580	858
20 1995	0	645	584	1229	8635	0	251	3471	0	624	217	841	8694	1520	918
21 1996	0	604	625	1229	8010	0	243	3347	0	609	233	841	8462	1456	982
22 1997	0	561	669	1229	7341	0	234	3214	0	592	249	841	8213	1387	1051
23 1998	0	514	716	1229	6626	0	225	3071	0	575	266	841	7946	1314	1124
24 1999	0	464	766	1229	5860	0	215	2919	0	556	285	841	7661	1235	1203
25 2000	0	410	819	1229	5041	0	204	2755	0	536	305	841	7357	1151	1287
26 2001	0	353	877	1229	4164	0	193	2581	0	515	326	841	7030	1061	1377
27 2002	0	291	938	1229	3226	0	181	2394	0	492	349	841	6681	964	1474
28 2003	0	224	1004	1229	2223	0	168	2194	0	468	374	841	6308	861	1577
29 2004	0	156	1074	1229	1149	0	154	1980	0	442	400	841	5908	751	1687
30 2005	0	80	1149	1229	0	0	139	1751	0	414	428	841	5480	633	1806
31 2006	0	0	0	0	0	0	123	1507	0	384	458	841	5023	506	702
32 2007	0	0	0	0	0	0	105	1245	0	352	490	841	4533	457	752
33 2008	0	0	0	0	0	0	87	964	0	317	524	841	4009	404	804
34 2009	0	0	0	0	0	0	67	664	0	281	561	841	3449	348	860
35 2010	0	0	0	0	0	0	47	343	0	241	600	841	2849	288	921
36 2011	0	0	0	0	0	0	24	367	0	199	642	841	2287	223	985
37 2012	0	0	0	0	0	0	0	0	0	155	687	841	1521	155	687
38 2013	0	0	0	0	0	0	0	0	0	106	735	841	786	106	735
39 2014	0	0	0	0	0	0	0	0	0	55	786	841	55	55	786

UNIT : MFMG

Table A.6.2-(6) Income Statement

NO. YEAR	REVENUES										EXPENSES				UNIT 2. MFMG			
	(1) INCR. UNIT PUBLIC ENERGY	(2) FMG/KWH	(3) INCOME FROM PUBLIC ENERGY	(4) ENERGY OF FERRO	(5) UNIT PX. OF FERRO	(6) INCOME FROM FERRO	(7) TOTAL INCOME	(8) OPE. MAIN AND EX.	(9) OTHER DEPRE- CIATIO N	(10) SUB TOTAL	(11) OPERAT- INCOME	(12) SAVING FUEL EX.	(13) INER- EST	(14) NET INCOME				
6 1981	13	7.20	94	87	3.90	339	433	58	3	274	335	98	477	970	-395			
7 1982	28	7.20	202	104	3.90	406	608	59	3	274	336	272	471	970	-227			
8 1983	45	7.20	324	115	3.90	449	773	61	82	274	417	356	459	970	-155			
9 1984	63	7.20	454	127	3.90	495	949	64	82	274	420	529	430	952	7			
10 1985	82	7.20	590	127	3.90	495	1085	66	82	274	422	663	360	933	90			
11 1986	105	6.50	683	232	3.50	812	1495	104	82	350	536	959	283	1202	40			
12 1987	126	6.50	832	254	3.50	889	1721	108	82	350	540	1181	242	1179	244			
13 1988	154	6.50	1001	254	3.50	889	1890	114	82	350	546	1344	145	1156	333			
14 1989	183	6.50	1190	254	3.50	889	2079	170	85	522	777	1302	394	1794	-98			
15 1990	213	6.50	1385	254	3.50	889	2274	172	85	522	779	1495	319	1761	53			
16 1991	252	6.20	1562	254	3.20	813	2375	178	85	522	785	1590	312	1724	176			
17 1992	287	6.20	1779	254	3.20	813	2592	180	85	522	787	1805	236	1689	352			
18 1993	326	6.20	2021	254	3.20	813	2834	188	172	522	882	172	1636	488	172			
19 1994	368	6.20	2282	254	3.20	813	3095	197	172	522	891	2304	83	1580	707			
20 1995	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	1520	824			
21 1996	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	1456	888			
22 1997	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	1387	957			
23 1998	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	1314	1030			
24 1999	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	1235	1109			
25 2000	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	1151	1193			
26 2001	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	1061	1283			
27 2002	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	964	1380			
28 2003	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	861	1483			
29 2004	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	751	1593			
30 2005	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	633	1711			
31 2006	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	506	1838			
32 2007	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	457	1887			
33 2008	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	404	1940			
34 2009	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	348	1996			
35 2010	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	288	2056			
36 2011	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	223	2121			
37 2012	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	155	2189			
38 2013	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	106	2238			
39 2014	413	6.20	2561	254	3.20	813	3374	209	259	522	990	2384	-40	55	2289			



Table A.6.2-(7) Cash Flow

MOST PROBABLE 2. FURNACES 2. STEP

UNIT : MFMG

NO YEAR	(1) CASH FROM INCOME	(2) NET INCOME	(3) DEPRECI- ATION	(4) REPAYMENT OF DEBT	(5) NET CASH PROVIDED
6 1981	-121	-395	274	0	-121
7 1982	47	-227	274	0	47
8 1983	119	-155	274	259	-140
9 1984	281	7	274	278	3
10 1985	364	90	274	297	67
11 1986	390	40	350	318	72
12 1987	594	244	350	340	254
13 1988	683	333	350	364	319
14 1989	424	-98	522	467	-43
15 1990	575	53	522	499	76
16 1991	698	176	522	534	164
17 1992	874	352	522	749	125
18 1993	1010	488	522	802	208
19 1994	1229	707	522	858	371
20 1995	1366	824	522	918	424
21 1996	1410	888	522	982	424
22 1997	1479	957	522	1051	428
23 1998	1552	1030	522	1124	424
24 1999	1631	1109	522	1203	424
25 2000	1715	1193	522	1287	428
26 2001	1805	1283	522	1377	428
27 2002	1902	1380	522	1474	428
28 2003	2005	1483	522	1577	428
29 2004	2115	1593	522	1687	428
30 2005	2233	1711	522	1806	427
31 2006	2360	1838	522	1922	1654
32 2007	2499	1987	522	2047	1657
33 2008	2662	2140	522	2184	1658
34 2009	2518	1996	522	2020	1654
35 2010	2578	2056	522	2071	1657
36 2011	2643	2121	522	2136	1658
37 2012	2711	2189	522	2204	1658
38 2013	2760	2238	522	2253	1657
39 2014	2811	2289	522	2304	1657

Table-A.6.3-(1) Economic Comparison Table

UNIT : MFMG

1 STEP

MAXIMUM 3 FURNACES

N I	HYDRO				D K GT				T K S				FUEL EXPENS				O & M				TOTAL			
	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06
1 76	1454	1425	1398	1372	542	571	560	549	0	0	0	0	223	219	214	210	24	24	23	23	2283	2239	2195	2154
2 77	2791	2683	2580	2484	0	0	0	0	121	116	112	108	294	283	272	262	31	30	29	28	3237	3112	2993	2882
3 78	2371	2234	2108	1991	0	0	0	0	1189	1170	1097	998	359	338	319	301	37	35	33	31	3956	3727	3517	3321
4 79	3123	2885	2670	2474	542	538	447	461	939	867	803	744	424	396	367	340	44	41	38	35	5117	4727	4375	4054
5 80	2649	2399	2177	1979	0	0	0	0	472	428	388	353	512	484	421	393	52	47	43	39	3685	3338	3029	2754
6 81	0	0	0	0	0	0	0	0	0	0	0	0	41	36	32	29	131	116	104	92	172	152	136	121
7 82	672	585	511	447	0	0	0	0	0	0	0	0	41	36	31	27	131	114	100	87	84	735	642	561
8 83	1111	948	812	697	0	0	0	0	0	0	0	0	47	40	34	29	132	113	96	83	1290	1101	942	809
9 84	1031	863	724	610	840	703	590	497	140	151	124	107	47	39	33	28	132	110	93	78	2230	1866	1566	1320
10 85	1132	929	765	632	0	0	0	0	30	25	20	17	53	43	36	30	132	108	89	74	1347	1105	910	753
11 86	0	0	0	0	0	0	0	0	0	0	0	0	82	66	53	43	170	137	110	90	252	203	163	133
12 87	0	0	0	0	0	0	0	0	0	0	0	0	106	84	66	53	172	136	107	85	278	220	173	138
13 88	0	0	0	0	0	0	0	0	140	139	108	84	123	95	74	58	174	135	105	82	477	369	287	224
14 89	0	0	0	0	542	432	323	243	30	23	17	13	147	111	85	65	177	134	102	78	354	268	204	156
15 90	0	0	0	0	1632	1189	871	642	0	0	0	0	217	161	120	91	182	135	101	76	981	728	544	410
16 91	0	0	0	0	0	0	0	0	0	0	0	0	490	357	262	193	206	150	110	81	2328	1696	1243	916
17 92	0	0	0	0	792	566	407	294	0	0	0	0	84	448	351	254	225	161	116	84	1701	1215	874	632
18 93	0	0	0	0	542	407	247	204	0	0	0	0	894	626	441	313	242	169	119	85	1718	1202	847	602
19 94	0	0	0	0	792	544	376	262	0	0	0	0	1149	789	545	380	265	182	126	88	2206	1515	1047	730
20 95	0	0	0	0	840	565	383	262	0	0	0	0	1455	979	664	454	295	199	135	92	2590	1743	1182	808
TOTAL	16334	14951	13745	12686	7224	5515	4294	3114	3141	2469	2631	2424	7393	5650	4320	3543	2954	2276	1779	1411	37046	31261	26869	23478

N I	HYDRO				D K GT				T K S				FUEL EXPENS				O & M				TOTAL			
	0.08	0.10	0.12	0.14	0.04	0.10	0.12	0.14	0.04	0.10	0.12	0.14	0.04	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.04	0.10	0.12	0.14
1 76	1346	1322	1298	1275	539	529	520	511	0	0	0	0	206	203	199	196	22	22	21	21	2113	2076	2038	2003
2 77	2393	2307	2225	2148	0	0	0	0	104	100	96	93	252	243	234	226	27	26	25	24	2776	2676	2580	2491
3 78	1882	1781	1688	1600	428	398	370	345	944	893	846	803	285	270	256	242	29	28	26	25	3140	2972	2816	2670
4 79	2286	2133	1995	1849	0	0	0	0	690	641	597	556	315	293	273	254	32	30	28	26	3761	3495	3253	3030
5 80	1803	1645	1503	1376	0	0	0	0	321	293	264	245	348	318	291	266	35	32	30	27	2507	2288	2092	1914
6 81	0	0	0	0	0	0	0	0	0	0	0	0	26	23	21	19	83	74	66	60	109	97	87	79
7 82	392	345	304	269	0	0	0	0	0	0	0	0	24	21	19	16	76	67	59	52	492	433	362	337
8 83	600	518	449	389	0	0	0	0	0	0	0	0	25	22	19	16	71	62	53	46	696	602	521	451
9 84	516	437	372	317	470	356	303	258	40	76	65	55	24	20	17	14	66	56	48	41	1116	945	805	685
10 85	524	436	364	305	0	0	0	0	14	12	10	8	25	20	17	14	61	51	43	36	624	519	434	363
11 86	0	0	0	0	0	0	0	0	0	0	0	0	35	29	24	19	63	60	49	40	108	89	73	59
12 87	0	0	0	0	0	0	0	0	0	0	0	0	42	34	27	22	68	55	44	36	110	89	71	58
13 88	0	0	0	0	0	0	0	0	66	52	41	33	45	36	28	22	64	50	40	32	175	138	109	87
14 89	0	0	0	0	0	0	0	0	10	8	6	5	50	39	30	23	60	47	38	28	120	94	72	56
15 90	0	0	0	0	183	139	106	82	0	0	0	0	68	52	40	30	57	44	33	25	308	235	179	137
16 91	0	0	0	0	476	355	266	201	0	0	0	0	143	107	80	60	60	45	34	25	679	507	380	286
17 92	0	0	0	0	214	157	115	85	0	0	0	0	185	135	100	74	61	45	33	24	460	337	248	183
18 93	0	0	0	0	146	105	76	55	0	0	0	0	224	161	116	85	61	44	31	23	431	310	223	163
19 94	0	0	0	0	144	130	92	66	0	0	0	0	266	188	133	95	61	43	31	22	511	361	256	183
20 95	0	0	0	0	180	125	87	61	0	0	0	0	312	216	151	106	63	44	31	21	555	385	249	186
TOTAL	11752	10924	10188	9526	2770	2294	1935	1664	2239	2075	1429	1798	2900	2430	2075	1799	1130	925	761	634	20791	18648	16888	15423

Table-A.6.3-(2) Internal Rate of Return

MAXIMUM 3 FURNACES	STEP		ROBEZ PROJECT		BENEFIT			NET BENE. (7) NET	PRESENT VALUE (8) INVESTMENT NET BENE.	UNIT : MFMG COEFFICIENT (10) 14.45 %
	NO	YEAR	(1) INVESTMENT	(2) O & M	(3) FUEL EX	(4) FIXED EX	(5) O & M			
1	1976	1454	0	0	0	0	0	0	1270	0.8738
2	1977	2912	0	0	0	0	0	0	2223	0.7634
3	1978	3560	0	0	0	0	0	0	2375	0.6671
4	1979	4062	0	0	0	0	0	0	2368	0.5828
5	1980	3121	0	0	0	0	0	0	1589	0.5093
6	1981	0	79	0	-471	269	66	1358	0	0.4450
7	1982	672	74	0	-471	364	87	1636	261	0.3888
8	1983	1111	80	0	-465	364	104	1822	377	0.3397
9	1984	2051	80	0	-465	364	121	2048	609	0.2968
10	1985	1162	80	0	-454	459	136	2255	301	0.2593
11	1986	0	118	0	-430	649	223	3217	0	0.2266
12	1987	180	120	0	-406	744	250	3610	36	0.1980
13	1988	30	122	0	-389	839	271	3869	5	0.1730
14	1989	0	125	0	-365	839	289	4080	0	0.1512
15	1990	0	130	0	-295	934	323	4331	0	0.1321
16	1991	1632	154	0	-22	1109	397	5312	188	0.1154
17	1992	792	173	0	172	1297	439	5723	80	0.1004
18	1993	0	190	0	382	1392	476	5884	0	0.0881
19	1994	792	213	0	637	1487	520	6180	61	0.0770
20	1995	840	243	0	943	1566	537	6392	56	0.0673
SUB TOTAL 1		24371	1986	-2104	12676	4239	40684	57717	11799	8968
SUB TOTAL 2		11253	7290	28290	46980	16110	164250	191760	92	2923
TOTAL (1+2)		35624	9276	26186	59656	20349	204934	249477	11891	11891

Table-A.6.3-(3) Present Value at Each Discount Rate

		(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
		RATE OF RETURN (MFMG)	INVESTMENT (MFMG)	NET BENEFIT (MFMG)	PRESENT VALUE (MFMG)	INVESTMENT (MFMG)	NET BENEFIT (MFMG)	PRESENT VALUE (MFMG)	INVESTMENT (MFMG)	NET BENEFIT (MFMG)	PRESENT VALUE (MFMG)
			18375	16141	14481	13175	12106	11204	10431		
			52322	34666	23966	17181	12685	9602	7430		

Table-A.6.3-(4). Expenses for Diesel Plant

NO YEAR	MAXIMUM 3_FURNACES		1 STEP		GAS TURBINE (14) (15) INVEST. AMOUNT	T/L & S/S (7) (8) INVEST. AMOUNT	TOTAL FIXED EX	INCRE- MENTAL (11) O & M EX	UNIT : MFHG		INCRE- MENTAL (14) FUEL EX
	(1) INVEST. AMOUNT	(2) INVEST. AMOUNT	(3) INVEST. AMOUNT	(4) INVEST. AMOUNT					(12) DIESEL	(13) G.T.	
5 1980	0	0	0	0	0	0	0	50	512	0	512
6 1981	1584	1584	174	74	840	206	264	66	1041	102	631
7 1982	792	2376	261	74	0	309	304	87	1241	64	793
8 1983	0	2376	261	74	0	309	304	104	1417	64	969
9 1984	0	2376	261	74	0	309	304	121	1588	102	1178
10 1985	792	3168	348	74	0	412	454	136	1729	64	1261
11 1986	1584	4742	522	74	0	618	644	223	2481	64	2033
12 1987	792	5544	604	74	0	721	744	250	2740	102	2330
13 1988	792	6336	696	74	0	824	834	271	2940	64	2492
14 1989	0	6336	696	74	0	824	834	289	3122	102	2712
15 1990	792	7128	783	74	0	927	934	323	3257	64	2909
16 1991	792	7920	870	159	840	1030	1104	397	4069	381	3938
17 1992	1584	9504	1043	159	0	1236	1297	439	4463	381	4332
18 1993	792	10296	1130	159	0	1339	1392	476	4833	267	4588
19 1994	792	11088	1217	159	0	1442	1487	520	5268	267	5023
20 1995	0	11088	1217	234	840	1442	1566	537	5415	572	5475

Table-A.6.3-(5) Repayment Schedule

UNIT : MFMG

NO YEAR	1ST. STAGE					2ND STAGE					3RD STAGE					TOTAL (1) (2)
	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALAN-CE	(5) BALAN-CE	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALAN-CE	(5) BALAN-CE	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALAN-CE	(5) BALAN-CE	
6.1981	17611	0	1233	0	17611	0	0	0	0	0	0	0	0	0	0	
7.1982	0	1233	0	17611	0	0	0	0	0	0	0	0	0	0	1233	
8.1983	0	1233	330	1562	17281	0	0	0	0	0	0	0	0	0	1233	
9.1984	0	1210	353	1562	16929	0	0	0	0	0	0	0	0	0	1210	
10.1985	0	1185	377	1562	16551	0	0	0	0	0	0	0	0	0	1185	
11.1986	0	1159	404	1562	16148	4713	0	0	0	0	0	0	0	0	1159	
12.1987	0	1130	432	1562	15716	0	330	0	0	0	0	0	0	0	1130	
13.1988	0	1100	462	1562	15253	0	330	0	0	0	0	0	0	0	1100	
14.1989	0	1068	495	1562	14759	0	330	84	0	0	0	0	0	0	1068	
15.1990	0	1033	524	1562	14230	0	324	94	0	0	0	0	0	0	1033	
16.1991	0	996	566	1562	13663	0	317	101	0	0	0	0	0	0	996	
17.1992	0	956	606	1562	13057	0	310	108	0	0	0	0	0	0	956	
18.1993	0	914	648	1562	12409	0	302	116	0	0	0	0	0	0	914	
19.1994	0	869	694	1562	11715	0	294	124	0	0	0	0	0	0	869	
20.1995	0	820	742	1562	10973	0	286	132	0	0	0	0	0	0	820	
21.1996	0	768	794	1562	10179	0	276	142	0	0	0	0	0	0	768	
22.1997	0	713	850	1562	9329	0	267	152	0	0	0	0	0	0	713	
23.1998	0	653	909	1562	8420	0	256	162	0	0	0	0	0	0	653	
24.1999	0	589	973	1562	7447	0	245	174	0	0	0	0	0	0	589	
25.2000	0	521	1041	1562	6406	0	232	186	0	0	0	0	0	0	521	
26.2001	0	448	1114	1562	5292	0	219	199	0	0	0	0	0	0	448	
27.2002	0	370	1192	1562	4100	0	206	213	0	0	0	0	0	0	370	
28.2003	0	287	1275	1562	2824	0	191	227	0	0	0	0	0	0	287	
29.2004	0	198	1365	1562	1460	0	175	243	0	0	0	0	0	0	198	
30.2005	0	102	1460	1562	0	0	158	260	0	0	0	0	0	0	102	
31.2006	0	0	0	0	0	0	139	279	0	0	0	0	0	0	0	
32.2007	0	0	0	0	0	0	120	298	0	0	0	0	0	0	0	
33.2008	0	0	0	0	0	0	99	319	0	0	0	0	0	0	0	
34.2009	0	0	0	0	0	0	77	341	0	0	0	0	0	0	0	
35.2010	0	0	0	0	0	0	53	365	0	0	0	0	0	0	0	
36.2011	0	0	0	0	0	0	27	391	0	0	0	0	0	0	0	

Table-A.6.3-(6) Income Statement

NO	YEAR	EXPENSES											UNIT : MFMG		
		(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
MAXIMUM 3 FURNACES		INCR. ENERGY PUBLIC	UNIT PA. OF PUBLIC ENERGY	INCR. FROM PUBLIC ENERGY	ENERGY UNIT PA. OF FERRO	INCOME FROM FERRO	TOTAL INCOME	DEPRECIATION AND MAINT.	OTHER	DEPRECIATION	SUB-TOTAL	OPERAT. INCOME	SAVING FUEL EX.	INTER-EST	NET INCOME
L. STEP		QWH	FMG/KWH	MEMB	QWH	FMG/KWH	MEMB	FMG	FMG	FMG	FMG	FMG	FMG	FMG	FMG
6	1981	13	7.20	94	87	3.90	339	79	3	341	423	10	471	1233	-752
7	1982	28	7.20	202	104	3.90	406	341	3	341	423	185	471	1233	-577
8	1983	47	7.20	338	115	3.90	449	80	3	341	424	363	465	1233	-405
9	1984	67	7.20	482	127	3.90	495	80	82	341	503	474	465	1210	-271
10	1985	88	7.20	634	127	3.90	495	80	82	341	503	626	459	1185	-189
11	1986	116	6.50	754	232	3.50	812	118	82	428	628	938	430	1489	-121
12	1987	141	6.50	917	284	3.50	889	120	82	428	630	1176	406	1460	122
13	1988	173	6.50	1125	304	3.50	1014	125	82	428	635	1382	389	1430	341
14	1989	208	6.50	1352	254	3.50	889	125	82	428	635	1606	365	1398	573
15	1990	245	6.50	1543	254	3.50	889	130	102	428	660	1822	295	1357	760
16	1991	292	6.20	1810	360	3.20	1152	154	189	428	771	2191	22	1313	900
17	1992	338	6.20	2098	383	3.20	1276	173	274	428	877	2445	-172	1266	1007
18	1993	393	6.20	2437	383	3.20	1226	190	274	428	894	2769	-382	1217	1170
19	1994	454	6.20	2815	383	3.20	1226	213	363	428	1004	3037	-637	1163	1237
20	1995	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	1106	1373
21	1996	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	1045	1434
22	1997	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	975	1500
23	1998	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	909	1570
24	1999	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	834	1645
25	2000	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	754	1725
26	2001	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	668	1811
27	2002	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	576	1903
28	2003	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	478	2001
29	2004	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	372	2107
30	2005	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	260	2219
31	2006	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	139	2340
32	2007	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	120	2359
33	2008	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	99	2380
34	2009	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	77	2402
35	2010	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	53	2426
36	2011	521	6.20	3230	383	3.20	1226	243	363	428	1034	3422	-943	27	2452

Table A.6.3-(7) Cash Flow

NO YEAR	MAXIMUM FURNACES					UNIT : MFHG				
	(1)	(2)	(3)	(4)	(5)	(1)	(2)	(3)	(4)	(5)
	CASH FROM INCOME	NET INCOME	DEPRECIATION	REPAYMENT OF DEBT	REPAYMENT NET CASH PROVIDED					
6 1981	-411	-752	341	0	-411					
7 1982	-236	-577	341	0	-236					
8 1983	-64	-405	341	330	-394					
9 1984	70	-271	341	353	-243					
10 1985	241	-100	341	377	-136					
11 1986	307	-121	428	404	-97					
12 1987	550	122	428	432	119					
13 1988	769	341	428	462	307					
14 1989	1001	573	428	583	418					
15 1990	1188	760	428	624	564					
16 1991	1328	900	428	667	661					
17 1992	1435	1007	428	714	721					
18 1993	1598	1170	428	764	834					
19 1994	1665	1237	428	817	848					
20 1995	1801	1373	428	875	926					
21 1996	1862	1434	428	936	926					
22 1997	1928	1500	428	1001	927					
23 1998	1998	1570	428	1071	927					
24 1999	2073	1645	428	1146	927					
25 2000	2153	1725	428	1227	926					
26 2001	2239	1811	428	1313	926					
27 2002	2331	1903	428	1404	927					
28 2003	2429	2001	428	1503	926					
29 2004	2535	2107	428	1608	927					
30 2005	2647	2219	428	1721	926					
31 2006	2768	2340	428	179	2489					
32 2007	2847	2359	428	298	2489					
33 2008	2808	2380	428	319	2489					
34 2009	2830	2402	428	341	2489					
35 2010	2854	2426	428	365	2489					
36 2011	2880	2452	428	391	2489					

Table-A.6.4-(1) Economic Comparison Table

UNIT : MEMG

R STEP

MAXIMUM 3 FURNACES

N I	HYDRO				H A GT				T K S				FUEL EXPENS				O & M				TOTAL						
	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04
1 76	1454	1425	1398	1372	542	571	560	549	0	0	0	0	223	219	214	210	24	24	23	23	2283	2239	2195	2154			
2 77	2173	2089	2009	1934	0	0	0	0	121	116	112	108	294	293	272	262	31	30	29	28	2619	2518	2422	2332			
3 78	1684	1587	1497	1414	542	538	497	451	1189	1120	1057	998	359	338	319	301	44	41	38	35	3269	3080	2906	2744			
4 79	2033	1878	1738	1610	0	0	0	0	939	867	803	744	429	396	367	340	54	47	43	39	4027	3720	3443	3190			
5 80	1695	1535	1393	1267	0	0	0	0	510	462	419	381	512	464	421	383	52	47	43	39	2769	2508	2276	2070			
6 81	0	0	0	0	0	0	0	0	0	0	0	0	35	31	28	25	110	98	87	74	145	129	115	103			
7 82	524	456	398	348	0	0	0	0	41	36	31	27	41	36	31	27	111	97	84	74	676	589	513	449			
8 83	988	843	722	620	440	717	614	527	0	0	0	0	59	50	43	37	114	97	83	72	2001	1707	1462	1256			
9 84	908	760	638	537	0	0	0	0	180	151	126	107	88	74	62	52	117	98	82	69	1293	1083	908	765			
10 85	2876	2359	1943	1606	0	0	0	0	30	25	20	17	176	144	119	98	120	98	81	67	3202	2626	2163	1788			
11 86	1955	1572	1270	1030	0	0	0	0	0	0	0	0	218	175	142	115	160	129	104	84	2333	1876	1516	1229			
12 87	2337	1843	1460	1161	792	612	476	371	180	142	112	89	317	250	198	158	175	135	103	82	2999	2365	1873	1490			
13 88	1945	1504	1168	912	0	0	0	0	30	23	14	14	399	308	240	187	228	173	132	101	387	294	224	171			
14 89	0	0	0	0	0	0	0	0	0	0	0	0	159	121	92	70	231	172	128	96	1007	748	559	420			
15 90	0	0	0	0	512	432	323	243	0	0	0	0	194	144	108	81	254	185	136	100	747	544	399	294			
16 91	0	0	0	0	840	600	431	312	0	0	0	0	493	359	263	194	274	196	141	102	1801	1287	925	669			
17 92	0	0	0	0	1374	962	674	481	0	0	0	0	687	491	353	255	294	206	145	103	2549	1785	1258	893			
18 93	0	0	0	0	742	544	374	262	0	0	0	0	881	617	435	309	318	218	151	105	2238	1536	1062	740			
19 94	0	0	0	0	742	533	361	247	0	0	0	0	1460	983	666	455	347	234	158	108	2599	1750	1185	810			
20 95	0	0	0	0	7176	5509	4315	3453	3179	2906	2607	2458	8152	6257	4908	3932	3206	2443	1886	1479	42285	34966	29411	25133			

N I	HYDRO				H A GT				T K S				FUEL EXPENS				O & M				TOTAL						
	0.08	0.10	0.12	0.14	0.0	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12
1 76	1346	1322	1298	1274	539	529	520	511	0	0	0	0	208	203	199	196	22	22	21	21	2113	2076	2038	2003			
2 77	1863	1796	1732	1672	0	0	0	0	104	100	96	93	252	243	234	226	27	26	25	24	2246	2165	2087	2015			
3 78	1337	1265	1190	1137	474	344	370	345	944	843	846	803	285	270	256	242	29	28	26	25	2595	2456	2327	2207			
4 79	1494	1389	1292	1204	0	0	0	0	690	641	547	556	315	293	273	254	32	30	28	26	2959	2751	2560	2385			
5 80	1154	1052	962	880	0	0	0	0	347	317	289	265	348	318	291	266	69	62	56	50	1884	1719	1572	1438			
6 81	0	0	0	0	0	0	0	0	0	0	0	0	22	20	18	16	65	57	50	44	395	347	306	269			
7 82	306	269	237	209	454	342	332	294	0	0	0	0	24	21	19	16	52	53	46	40	1082	934	808	701			
8 83	534	461	399	346	0	0	0	0	90	76	65	55	44	37	32	27	59	50	42	36	647	548	466	397			
9 84	454	385	327	279	0	0	0	0	14	12	10	8	82	68	57	47	56	46	39	32	1484	1235	1032	863			
10 85	1332	1109	926	776	0	0	0	0	0	0	0	0	93	76	63	52	69	56	46	38	1000	817	671	553			
11 86	838	685	562	463	0	0	0	0	71	57	46	37	126	101	81	66	64	51	40	34	1191	956	769	622			
12 87	928	745	600	485	241	229	182	144	11	9	7	5	147	116	91	73	78	60	47	36	1228	968	766	608			
13 88	715	563	446	354	0	0	0	0	0	0	0	0	54	42	33	25	73	55	42	32	132	102	80	61			
14 89	0	0	0	0	143	135	106	82	0	0	0	0	61	46	35	27	74	54	41	31	317	240	183	141			
15 90	0	0	0	0	227	166	122	91	0	0	0	0	144	107	80	61	74	55	41	31	218	162	121	92			
16 91	0	0	0	0	344	247	179	130	0	0	0	0	186	136	100	74	74	54	40	30	487	356	262	195			
17 92	0	0	0	0	144	130	92	66	0	0	0	0	220	158	115	83	74	53	38	28	638	458	332	241			
18 93	0	0	0	0	174	118	82	58	0	0	0	0	261	184	131	94	74	52	37	26	519	366	260	186			
19 94	0	0	0	0	174	118	82	58	0	0	0	0	313	217	151	106	74	52	36	25	557	387	269	189			
20 95	0	0	0	0	2820	2348	1992	1721	2271	2105	1956	1822	3215	2684	2283	1972	1176	947	772	637	21783	19125	16883	15232			



Table-A.6.4-(2) Internal Rate of Return

NO YEAR	MOGEZ PROJECT		SENEFIT		NET BENE. (7) NET	PRESENT VALUE (8) INVESTMENT NET BENE.	UNIT : MFMG COEFFICIENT. (10) 14.65 %
	(1) INVESTMENT	(2) O & M	(3) FUEL EX	(4) FIXED EX			
1 1976	1454	0	0	0	0	1268	0.8722
2 1977	2294	0	0	0	0	1745	0.7608
3 1978	2873	0	0	0	0	1907	0.6636
4 1979	2972	0	0	0	0	1720	0.5788
5 1980	2205	0	0	0	0	1113	0.5049
6 1981	0	58	-477	269	1385	0	0.4404
7 1982	524	54	-471	364	1656	201	0.3841
8 1983	1828	62	-453	364	1828	612	0.3350
9 1984	1088	65	-424	459	2022	318	0.2922
10 1985	2906	68	-336	649	2144	741	0.2549
11 1986	1455	108	-294	649	3091	435	0.2223
12 1987	2517	113	-195	744	3406	488	0.1939
13 1988	2767	123	-113	839	3592	468	0.1691
14 1989	0	176	-353	839	4017	593	0.1475
15 1990	0	179	-318	934	4305	554	0.1287
16 1991	0	202	-19	1109	5261	591	0.1122
17 1992	440	222	175	1297	5671	82	0.0979
18 1993	792	242	369	1392	5845	555	0.0854
19 1994	792	266	616	1447	5023	59	0.0745
20 1995	792	295	448	1566	6335	51	0.0650
SUB TOTAL 1	28599	2230	-1345	12676	56706	11276	8613
SUB TOTAL 2	12035	8450	28440	46980	190050	100	2763
TOTAL (1+2)	40634	11080	27095	59656	246756	11376	11376

Table-A.6.4-(3) Present Value at Each Discount Rate

RATF OF RETURN (%)	INVESTMENT (MFMG)	NET HENEFIT (MFMG)	(4)	(5)	(6)	(7)	(8)
			16830	14713	13069	11749	10665
16%	19674	51621	16830	14713	13069	11749	10665
18%	19674	51621	16830	14713	13069	11749	10665
20%	19674	51621	16830	14713	13069	11749	10665
22%	19674	51621	16830	14713	13069	11749	10665
24%	19674	51621	16830	14713	13069	11749	10665
26%	19674	51621	16830	14713	13069	11749	10665
28%	19674	51621	16830	14713	13069	11749	10665
30%	19674	51621	16830	14713	13069	11749	10665
32%	19674	51621	16830	14713	13069	11749	10665
34%	19674	51621	16830	14713	13069	11749	10665
36%	19674	51621	16830	14713	13069	11749	10665
38%	19674	51621	16830	14713	13069	11749	10665
40%	19674	51621	16830	14713	13069	11749	10665
42%	19674	51621	16830	14713	13069	11749	10665
44%	19674	51621	16830	14713	13069	11749	10665
46%	19674	51621	16830	14713	13069	11749	10665
48%	19674	51621	16830	14713	13069	11749	10665
50%	19674	51621	16830	14713	13069	11749	10665
52%	19674	51621	16830	14713	13069	11749	10665
54%	19674	51621	16830	14713	13069	11749	10665
56%	19674	51621	16830	14713	13069	11749	10665
58%	19674	51621	16830	14713	13069	11749	10665
60%	19674	51621	16830	14713	13069	11749	10665
62%	19674	51621	16830	14713	13069	11749	10665
64%	19674	51621	16830	14713	13069	11749	10665
66%	19674	51621	16830	14713	13069	11749	10665
68%	19674	51621	16830	14713	13069	11749	10665
70%	19674	51621	16830	14713	13069	11749	10665
72%	19674	51621	16830	14713	13069	11749	10665
74%	19674	51621	16830	14713	13069	11749	10665
76%	19674	51621	16830	14713	13069	11749	10665
78%	19674	51621	16830	14713	13069	11749	10665
80%	19674	51621	16830	14713	13069	11749	10665
82%	19674	51621	16830	14713	13069	11749	10665
84%	19674	51621	16830	14713	13069	11749	10665
86%	19674	51621	16830	14713	13069	11749	10665
88%	19674	51621	16830	14713	13069	11749	10665
90%	19674	51621	16830	14713	13069	11749	10665
92%	19674	51621	16830	14713	13069	11749	10665
94%	19674	51621	16830	14713	13069	11749	10665
96%	19674	51621	16830	14713	13069	11749	10665
98%	19674	51621	16830	14713	13069	11749	10665
100%	19674	51621	16830	14713	13069	11749	10665

Table-6.4-(4) Expenses for Diesel Plant

NO. YEAR	DIESEL (1) (2)		GAS TURBINE (4) (5)		T/L & S/S (7) (8)		TOTAL FIXED EX (10)		INCR-MENTAL (11) (12)		INCR-MENTAL (13) (14)	
	INVEST. AMOUNT	FIXED EX	INVEST. AMOUNT	FIXED EX	INVEST. AMOUNT	FIXED EX	FIXED EX	O & M EX	DIESEL	G.T.	FUEL EX	FUEL EX
5 1980	0	0	0	0	0	0	0	0	50	512	0	512
6 1981	1584	174	840	74	206	206	264	66	1041	102	631	
7 1982	792	261	840	79	103	309	364	87	1241	64	793	
8 1983	0	261	840	79	0	309	364	104	1417	64	969	
9 1984	0	261	840	79	0	309	364	121	1588	102	1178	
10 1985	792	348	840	74	103	412	454	136	1729	64	1281	
11 1986	1584	522	840	79	206	618	644	223	2481	64	2433	
12 1987	792	604	840	79	103	721	744	250	2740	102	2330	
13 1988	792	696	840	79	103	824	839	271	2940	64	2492	
14 1989	0	696	840	79	0	824	839	289	3122	102	2712	
15 1990	792	783	840	79	103	927	934	323	3357	64	2909	
16 1991	792	870	840	159	103	1030	1109	397	4069	381	3938	
17 1992	1584	1043	1680	159	206	1236	1297	439	4443	381	4332	
18 1993	792	1130	1680	159	103	1339	1392	476	4833	267	4588	
19 1994	792	1217	1680	159	103	1442	1487	520	5268	267	5023	
20 1995	0	1217	1680	234	0	1442	1566	537	5415	572	5475	

UNIT : MFHG

Table-A.6.4-(5) Repayment Schedule

UNIT : MFMG

MAXIMUM 3 FURNACES	1ST STAGE					2ND STAGE					3RD STAGE					TOTAL	
	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALANCE	(5) BALANCE	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALANCE	(5) BALANCE	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALANCE	(5) BALANCE	(1) PAY-MENT OF INTEREST	(2) REPAY-MENT DEBT
6 1981	13859	970	0	0	13859	0	0	0	0	0	0	0	0	0	0	970	0
7 1982	0	970	0	13859	0	0	0	0	0	0	0	0	0	0	0	970	0
8 1983	0	970	259	1229	13600	0	0	0	0	0	0	0	0	0	0	970	259
9 1984	0	952	278	1229	13322	0	0	0	0	0	0	0	0	0	0	952	278
10 1985	0	933	297	1229	13025	0	0	0	0	0	0	0	0	0	0	933	297
11 1986	0	912	318	1229	12707	4142	290	0	0	4142	0	0	0	0	0	1202	318
12 1987	0	890	340	1229	12367	0	290	0	0	4142	0	0	0	0	0	1179	340
13 1988	0	866	364	1229	12004	0	290	0	0	4142	0	0	0	0	0	1156	364
14 1989	0	840	389	1229	11614	0	290	78	0	4142	0	0	0	0	0	1131	389
15 1990	0	813	416	1229	11198	0	285	83	0	3982	0	0	0	0	0	1104	416
16 1991	0	786	445	1229	10752	0	279	89	0	367	0	0	0	0	0	1074	445
17 1992	0	753	477	1229	10276	0	272	95	0	337	0	0	0	0	0	1039	477
18 1993	0	719	510	1229	9765	0	266	102	0	307	0	0	0	0	0	1000	510
19 1994	0	684	546	1229	9219	0	259	109	0	275	0	0	0	0	0	957	546
20 1995	0	645	584	1229	8635	0	251	116	0	244	0	0	0	0	0	910	584
21 1996	0	604	625	1229	8010	0	243	124	0	214	0	0	0	0	0	859	625
22 1997	0	561	669	1229	7341	0	234	133	0	183	0	0	0	0	0	804	669
23 1998	0	514	716	1229	6626	0	225	143	0	152	0	0	0	0	0	745	716
24 1999	0	464	766	1229	5860	0	215	152	0	121	0	0	0	0	0	681	766
25 2000	0	410	819	1229	5041	0	204	163	0	90	0	0	0	0	0	612	819
26 2001	0	353	877	1229	4164	0	193	175	0	59	0	0	0	0	0	538	877
27 2002	0	291	938	1229	3226	0	181	187	0	28	0	0	0	0	0	460	938
28 2003	0	226	1004	1229	2223	0	168	200	0	0	0	0	0	0	0	378	1004
29 2004	0	156	1074	1229	1149	0	154	214	0	0	0	0	0	0	0	284	1074
30 2005	0	80	1149	1229	0	0	139	224	0	0	0	0	0	0	0	189	1149
31 2006	0	0	0	0	0	0	123	245	0	0	0	0	0	0	0	96	0
32 2007	0	0	0	0	0	0	105	262	0	0	0	0	0	0	0	0	0
33 2008	0	0	0	0	0	0	87	280	0	0	0	0	0	0	0	0	0
34 2009	0	0	0	0	0	0	67	300	0	0	0	0	0	0	0	0	0
35 2010	0	0	0	0	0	0	47	321	0	0	0	0	0	0	0	0	0
36 2011	0	0	0	0	0	0	24	343	0	0	0	0	0	0	0	0	0
37 2012	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38 2013	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39 2014	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table-A.6.4-(6) Income Statement

UNIT : MFMG.

NO YEAR	REVENUES		EXPENSES		(11) SUB TOTAL	(12) OPERAT. INCOME	(13) SAVING FUEL	(14) INTER-EST	(15) NET INCOME					
	(1) INCR. PUBLIC ENERGY	(2) UNIT PX. OF PUBLIC ENERGY	(3) FROM PUBLIC	(4) FROM FERRD						(5) UNIT PX. OF FERRD	(6) INCOME FROM FERRD	(7) TOTAL INCOME	(8) OPE. AND MAINT.	(9) OTHER EX.
	GMW	FMG/KWH	MFMG	GMW	FMG/KWH	MFMG	MFMG	MFMG	MFMG	MFMG	MFMG	MFMG	MFMG	MFMG
6 1981	13	7.20	94	87	3.90	339	58	3	274	335	98	477	970	-395
7 1982	28	7.20	202	104	3.90	406	59	3	274	336	272	471	970	-227
8 1983	47	7.20	338	115	3.90	449	62	82	274	418	369	453	970	-148
9 1984	67	7.20	442	127	3.90	495	65	82	274	421	556	424	952	28
10 1985	88	7.20	634	127	3.90	495	1124	68	274	424	705	336	933	108
11 1986	116	6.50	754	232	3.50	812	108	82	350	540	1026	294	1202	118
12 1987	141	6.50	917	254	3.50	889	113	82	350	545	1261	195	1179	277
13 1988	173	6.50	1125	254	3.50	1014	123	169	350	642	1372	113	1156	329
14 1989	208	6.50	1352	254	3.50	1089	176	172	522	870	1371	353	1794	-70
15 1990	245	6.50	1593	254	3.50	1242	179	172	522	873	1609	318	1761	166
16 1991	292	6.20	1811	360	3.20	1152	202	172	522	896	2066	19	1726	359
17 1992	338	6.20	2096	383	3.20	1226	222	251	522	995	2327	-175	1689	463
18 1993	393	6.20	2437	383	3.20	1226	242	338	522	1102	2561	-369	1636	556
19 1994	454	6.20	2815	383	3.20	1226	266	425	522	1213	2828	-616	1580	632
20 1995	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	1520	659
21 1996	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	1456	723
22 1997	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	1387	792
23 1998	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	1314	865
24 1999	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	1235	944
25 2000	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	1151	1028
26 2001	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	1061	1118
27 2002	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	964	1215
28 2003	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	861	1318
29 2004	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	751	1428
30 2005	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	633	1546
31 2006	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	506	1673
32 2007	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	457	1722
33 2008	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	404	1775
34 2009	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	348	1831
35 2010	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	288	1891
36 2011	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	223	1956
37 2012	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	155	2024
38 2013	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	106	2073
39 2014	521	6.20	3230	383	3.20	1226	295	512	522	1329	3127	-948	55	2124

Table A.6.4-(7) Cash Flow

UNIT : MFMB

NO YEAR	(1) CASH FROM INCOME	(2) NET INCOME	(3) DEPRECIATION	(4) REPAYMENT OF DEBT	(5) NET CASH PROVIDED
6 1981	-121	-395	274	0	-121
7 1982	47	-227	274	0	47
8 1983	126	-148	274	259	-133
9 1984	302	28	274	278	24
10 1985	382	108	274	297	85
11 1986	468	118	350	318	150
12 1987	627	277	350	340	287
13 1988	679	329	350	364	315
14 1989	452	-70	522	667	-15
15 1990	688	166	522	499	149
16 1991	881	359	522	534	347
17 1992	985	463	522	749	236
18 1993	1078	556	522	802	276
19 1994	1154	632	522	858	296
20 1995	1181	658	522	918	263
21 1996	1245	723	522	982	263
22 1997	1314	792	522	1051	263
23 1998	1367	864	522	1124	263
24 1999	1466	944	522	1203	263
25 2000	1550	1024	522	1287	263
26 2001	1640	1114	522	1377	263
27 2002	1737	1215	522	1474	263
28 2003	1840	1318	522	1577	263
29 2004	1950	1424	522	1687	263
30 2005	2068	1546	522	1806	262
31 2006	2195	1673	522	1922	1493
32 2007	2244	1722	522	2022	1492
33 2008	2297	1775	522	2104	1493
34 2009	2353	1831	522	2180	1493
35 2010	2413	1891	522	2251	1492
36 2011	2478	1956	522	2318	1493
37 2012	2546	2024	522	2381	1494
38 2013	2595	2073	522	2433	1460
39 2014	2646	2124	522	2486	1460

Table-A.6.5-(1) Economic Comparison Table

UNIT : MFHG

MINIMUM NO. FURNACE

MINIMUM NO. FURNACE

N I	HYDRO		D K GT		T K S		FUEL EXPENS		O & M		TOTAL	
	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06
1	174	1454	1425	1398	1372	542	571	560	449	24	24	23
2	77	2791	2683	2580	2484	0	0	0	0	31	30	29
3	77	2371	2234	2108	1991	0	0	0	0	37	35	33
4	79	3123	2885	2670	2474	542	538	447	441	44	41	38
5	80	2649	2399	2177	1974	0	0	0	0	52	47	43
6	81	0	0	0	0	0	0	0	0	129	115	102
7	82	0	0	0	0	0	0	0	0	129	112	98
8	83	0	0	0	0	0	0	0	0	130	111	95
9	84	0	0	0	0	0	0	0	0	130	109	91
10	85	0	0	0	0	0	0	0	0	130	107	88
11	86	672	540	437	354	0	0	0	0	130	105	84
12	87	1111	876	694	552	0	0	0	0	130	103	81
13	88	1031	797	619	483	180	139	106	44	131	101	79
14	89	1132	858	654	501	30	23	17	13	132	100	76
15	90	0	0	0	0	542	432	323	243	167	124	93
16	91	0	0	0	0	0	0	0	0	168	120	90
17	92	0	0	0	0	0	0	0	0	168	120	86
18	93	0	0	0	0	0	0	0	0	173	121	85
19	94	0	0	0	0	0	0	0	0	177	122	84
20	95	0	0	0	0	0	0	0	0	177	119	81
TOTAL	1633	14697	13337	12190	11746	1541	1380	1253	3141	2389	1868	1479

N I	HYDRO		D K GT		T K S		FUEL EXPENS		O & M		TOTAL	
	0.0	0.10	0.12	0.14	0.0	0.10	0.12	0.14	0.0	0.10	0.12	0.14
1	176	1346	1322	1298	1275	534	524	520	511	22	22	21
2	77	2393	2307	2225	2148	0	0	0	0	27	26	25
3	78	1882	1781	1688	1600	104	100	96	93	29	28	26
4	79	2296	2133	1985	1849	690	641	597	556	32	30	28
5	80	1803	1645	1503	1376	321	293	268	245	35	32	30
6	81	0	0	0	0	0	0	0	0	81	73	65
7	82	0	0	0	0	0	0	0	0	75	66	58
8	83	0	0	0	0	0	0	0	0	70	61	53
9	84	0	0	0	0	0	0	0	0	65	55	47
10	85	0	0	0	0	0	0	0	0	60	50	42
11	86	288	236	193	159	0	0	0	0	56	46	37
12	87	441	354	285	231	0	0	0	0	52	41	33
13	88	379	299	236	188	66	52	41	33	48	38	30
14	89	385	298	232	181	10	8	6	5	45	35	27
15	90	0	0	0	0	0	0	0	0	53	40	31
16	91	0	0	0	0	53	39	29	22	49	37	27
17	92	0	0	0	0	4	4	3	3	45	33	24
18	93	0	0	0	0	0	0	0	0	43	31	22
19	94	0	0	0	0	0	0	0	0	41	29	21
20	95	0	0	0	0	0	0	0	0	38	26	18
TOTAL	11213	10375	9645	9007	8580	2195	2032	1887	1760	1664	1528	1412

Table-A.6.5-(2) Internal Rate of Return

NO YEAR	ROBEZ. PROJECT		BENEFIT		NET BENE.		PRESENT VALUE		UNIT : MFMG COEFFICIENT (10) 10.92 %
	(1) INVESTMENT	(2) U & M	(3) FIXED EX	(4) O & M	(5) FUEL EX	(6) NET	(7) INVESTMENT NET BENE.	(8) INVESTMENT NET BENE.	
1 1976	1454	0	0	0	0	0	0	1311	0
2 1977	2912	0	0	0	0	0	0	2367	0
3 1978	3560	0	0	0	0	0	0	2609	0
4 1979	4062	0	0	0	0	0	0	2684	0
5 1980	3121	0	0	0	0	0	0	1859	0
6 1981	0	77	-494	190	11	58	676	0	363
7 1982	0	77	-444	190	20	147	768	0	372
8 1983	0	78	-483	269	29	281	984	0	0
9 1984	0	78	-477	269	38	381	1087	0	0
10 1985	0	78	-477	269	48	513	1229	0	0
11 1986	672	78	-477	364	63	610	1436	215	0
12 1987	1111	78	-477	364	76	746	1585	320	0
13 1988	1211	74	-471	364	77	933	1776	315	0
14 1989	1162	80	-465	459	110	1057	2011	272	0
15 1990	0	115	-459	554	124	1234	2261	0	0
16 1991	180	116	-453	554	148	1422	2461	34	0
17 1992	30	116	-447	744	173	1628	2876	5	0
18 1993	0	121	-436	744	193	1866	3118	0	0
19 1994	0	125	-394	839	219	2080	3407	0	0
20 1995	0	125	-394	834	248	2339	3720	0	0
21 1996	440	127	-313	1029	277	2615	4107	95	0
22 1997	792	141	-183	1217	311	2909	4479	81	0
23 1998	792	147	-148	1312	344	3227	4884	73	0
24 1999	840	156	-10	1407	381	3568	5210	70	0
25 2000	792	171	137	1502	419	3934	5551	59	0
SUR TOTAL 1	23531	2163	-7409	13574	3324	31552	53696	12369	8979
SUR TOTAL 2	7941	4275	3425	37550	10475	48450	138775	136	3526
TOTAL (1+2)	31472	6438	-3984	51124	13799	130002	192471	12505	12505

Table-A.6.5-(3) Present Value at Each Discount Rate

RATE OF RETURN (%)	(2)	(4)	(6)	(8)	(10)	(12)	(14)
INVESTMENT (MFMG)	23531	23117	19250	14487	13051	11927	11015
NET BENEFIT (MFMG)	103316	58833	35423	22451	14890	10281	7353

Table-A.6.5-(4) Expenses for Diesel Plant

MINIMUM NO. FURNACE	STEP											UNITS : MEMG		
	NO. YEAR.	(1) DIESEL INVEST. AMOUNT	(2) FIXED EX	(3) FIXED EX	(4) GAS TURBINE INVEST. AMOUNT	(5) FIXED EX	(6) FIXED EX	(7) & (8) T/L & S/S INVEST. AMOUNT	(9) FIXED EX	TOTAL FIXED (10) EX	INCRE- MENTAL (11) O & M EX	FUEL EX (12) DIESEL	INCRE- MENTAL (13) FUEL EX	
5	1980	0	0	0	0	0	0	0	0	0	50	512	0	512
6	1981	1584	174	0	0	0	206	16	190	11	570	0	58	
7	1982	1584	174	0	0	0	206	16	196	20	659	0	187	
8	1983	0	1584	174	840	79	0	16	269	29	729	64	281	
9	1984	0	1584	174	0	79	0	16	269	38	829	64	381	
10	1985	0	1584	174	0	79	0	16	269	48	923	102	513	
11	1986	792	2376	261	0	79	103	24	384	63	1058	64	610	
12	1987	0	2376	261	0	79	0	24	384	76	1194	64	746	
13	1988	0	2376	261	0	79	0	24	384	87	1305	140	933	
14	1989	792	3168	348	0	79	103	32	459	110	1505	64	1057	
15	1990	792	3960	435	0	79	103	40	554	129	1682	64	1234	
16	1991	0	3960	435	0	79	0	40	554	148	1870	64	1422	
17	1992	1584	5544	504	0	79	206	56	744	173	2076	64	1628	
18	1993	0	5544	504	0	79	0	56	744	193	2276	102	1866	
19	1994	792	6336	594	0	79	103	64	839	219	2528	64	2080	
20	1995	792	7128	783	0	79	103	72	934	248	2787	64	2339	
21	1996	792	7920	870	0	79	103	80	1029	277	3063	64	2615	
22	1997	1584	9504	1043	0	79	206	95	1217	311	3357	64	2909	
23	1998	792	10296	1130	0	79	103	103	1314	344	3675	64	3227	
24	1999	792	11088	1217	0	79	103	111	1407	381	4016	64	3568	
25	2000	792	11880	1304	0	79	103	119	1502	419	4386	64	3938	



Table A.6.5-(5) Repayment Schedule

UNIT : MFMG

NO YEAR	1ST STAGE			2ND STAGE			3RD STAGE			TOTAL	
	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALANCE	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAY-MENT DEBT	(4) AMOUNT BALANCE	(1) AMOUNT OF LOAN	(2) REPAY-MENT DEBT	
6 1981	17611	1233	0	17611	0	0	0	0	1233	0	
7 1982	0	1233	0	17611	0	0	0	0	1233	0	
8 1983	0	1233	330	17281	0	0	0	0	1233	330	
9 1984	0	1210	353	16929	0	0	0	0	1210	353	
10 1985	0	1185	377	16551	0	0	0	0	1185	377	
11 1986	0	1159	404	16148	0	0	0	0	1159	404	
12 1987	0	1130	432	15716	0	0	0	0	1130	432	
13 1988	0	1100	462	15253	0	0	0	0	1100	462	
14 1989	0	1068	495	14759	0	0	0	0	1068	495	
15 1990	0	1033	529	14230	4713	330	0	4713	1363	529	
16 1991	0	996	566	13663	0	330	0	4713	1326	566	
17 1992	0	956	606	13057	0	330	0	4713	1286	606	
18 1993	0	914	648	12409	0	330	48	4625	1244	737	
19 1994	0	869	694	11715	0	324	44	4530	1192	788	
20 1995	0	820	742	10973	0	317	101	4429	1137	843	
21 1996	0	768	794	10174	0	310	106	4321	1078	902	
22 1997	0	713	850	9329	0	302	116	4206	1015	965	
23 1998	0	653	909	8470	0	294	124	4082	947	1033	
24 1999	0	589	973	7447	0	286	132	3950	875	1105	
25 2000	0	521	1041	6406	0	276	142	3808	798	1183	
26 2001	0	448	1114	5292	0	267	152	3657	715	1266	
27 2002	0	370	1192	4100	0	256	162	3494	626	1354	
28 2003	0	287	1275	2824	0	245	174	3321	532	1449	
29 2004	0	198	1365	1460	0	232	186	3135	430	1550	
30 2005	0	102	1460	0	0	219	199	2937	322	1654	
31 2006	0	0	0	0	0	204	213	2724	206	1763	
32 2007	0	0	0	0	0	191	227	2497	191	1877	
33 2008	0	0	0	0	0	175	243	2253	175	2000	
34 2009	0	0	0	0	0	158	260	1993	158	2133	
35 2010	0	0	0	0	0	139	279	1714	139	2272	
36 2011	0	0	0	0	0	120	298	1416	120	2416	
37 2012	0	0	0	0	0	99	319	1097	99	2565	
38 2013	0	0	0	0	0	77	341	756	77	2706	
39 2014	0	0	0	0	0	53	365	391	53	2851	
40 2015	0	0	0	0	0	27	391	0	27	2978	

Table A.6.5-(6) Income Statement

UNIT : MFMG

NO YEAR	(1) INCR. UNIT PUBLIC ENERGY		(2) REVENUES		(3) INCOME FROM PUBLIC ENERGY		(4) ENERGY UNIT OF FERRO		(5) UNIT PA. OF FERRO		(6) INCOME FROM FERRO		(7) TOTAL INCOME		(8) EXPENSES		(9) OTHER DEPRE- CIATIO N		(10) SUB TOTAL		(11) OPERAT. INCOME		(12) SAVING FUEL EX.		(13) INTER- EST		(14) NET INCOME		
	QNH	FMG/KWH	MEMG	QNH	FMG/KWH	MEMG	QNH	FMG/KWH	MEMG	QNH	FMG/KWH	MEMG	QNH	FMG	MEMG	QNH	FMG	MEMG	QNH	FMG	MEMG	QNH	FMG	MEMG	QNH	FMG	MEMG	QNH	FMG
6 1981	13	7.20	94	0	0.0	0	0	0	0	0.0	0	94	77	341	3	341	421	3	421	327	494	1233	-327	494	1233	-1066			
7 1982	28	7.20	202	0	0.0	0	0	0	0	0.0	0	202	77	341	3	341	421	3	421	-219	488	1233	-219	488	1233	-964			
8 1983	45	7.20	324	0	0.0	0	0	0	0	0.0	0	324	78	341	3	341	422	3	422	-98	483	1233	-98	483	1233	-848			
9 1984	63	7.20	454	0	0.0	0	0	0	0	0.0	0	454	78	341	3	341	422	3	422	32	477	1210	32	477	1210	-701			
10 1985	82	7.20	590	0	0.0	0	0	0	0	0.0	0	590	78	341	3	341	422	3	422	168	477	1185	168	477	1185	-540			
11 1986	105	6.50	683	0	0.0	0	0	0	0	0.0	0	683	78	341	3	341	422	3	422	261	477	1159	261	477	1159	-421			
12 1987	128	6.50	832	0	0.0	0	0	0	0	0.0	0	832	78	341	3	341	422	3	422	410	477	1130	410	477	1130	-243			
13 1988	154	6.50	1001	0	0.0	0	0	0	0	0.0	0	1001	79	341	3	341	423	3	423	578	471	1100	578	471	1100	-51			
14 1989	183	6.50	1190	0	0.0	0	0	0	0	0.0	0	1190	80	341	3	341	424	3	424	766	465	1068	766	465	1068	163			
15 1990	213	6.50	1385	0	0.0	0	0	0	0	0.0	0	1385	115	428	3	428	546	3	546	839	459	1363	839	459	1363	-65			
16 1991	252	6.20	1562	0	0.0	0	0	0	0	0.0	0	1562	116	428	3	428	547	3	547	1015	453	1326	1015	453	1326	142			
17 1992	287	6.20	1779	0	0.0	0	0	0	0	0.0	0	1779	116	428	3	428	547	3	547	1232	447	1286	1232	447	1286	393			
18 1993	326	6.20	2021	0	0.0	0	0	0	0	0.0	0	2021	121	428	23	428	572	23	572	1449	436	1244	1449	436	1244	641			
19 1994	388	6.20	2282	0	0.0	0	0	0	0	0.0	0	2282	125	428	23	428	576	23	576	1706	394	1192	1706	394	1192	908			
20 1995	413	6.20	2561	0	0.0	0	0	0	0	0.0	0	2561	125	428	23	428	576	23	576	1985	394	1137	1985	394	1137	1242			
21 1996	461	6.20	2858	0	0.0	0	0	0	0	0.0	0	2858	127	428	102	428	657	102	657	2201	313	1078	2201	313	1078	1436			
22 1997	513	6.20	3181	0	0.0	0	0	0	0	0.0	0	3181	141	428	102	428	671	102	671	2510	183	1015	2510	183	1015	1678			
23 1998	569	6.20	3528	0	0.0	0	0	0	0	0.0	0	3528	147	428	189	428	764	189	764	2764	148	947	2764	148	947	1965			
24 1999	629	6.20	3900	0	0.0	0	0	0	0	0.0	0	3900	156	428	276	428	860	276	860	3040	10	875	3040	10	875	2175			
25 2000	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	798	3428	-137	798	2493			
26 2001	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	715	3428	-137	715	2576			
27 2002	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	626	3428	-137	626	2665			
28 2003	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	532	3428	-137	532	2759			
29 2004	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	430	3428	-137	430	2861			
30 2005	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	322	3428	-137	322	2969			
31 2006	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	206	3428	-137	206	3085			
32 2007	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	191	3428	-137	191	3100			
33 2008	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	175	3428	-137	175	3116			
34 2009	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	158	3428	-137	158	3133			
35 2010	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	139	3428	-137	139	3152			
36 2011	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	120	3428	-137	120	3171			
37 2012	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	99	3428	-137	99	3192			
38 2013	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	77	3428	-137	77	3214			
39 2014	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	53	3428	-137	53	3238			
40 2015	694	6.20	4303	0	0.0	0	0	0	0	0.0	0	4303	171	428	276	428	875	276	875	3428	-137	27	3428	-137	27	3264			

Table-A.6.5-(7) Cash Flow

MINIMUM NO. FURNACE	UNIT : MFMG				
(1)	(2)	(3)	(4)	(5)	
NO YEAR	CASH FROM NET INCOME	DEPRECIATION	REPAYMENT OF DEBT	NET CASH PROVIDED	
6 1981	-725	-1066	341	0	-725
7 1982	-623	-964	341	0	-623
8 1983	-507	-848	341	330	-837
9 1984	-360	-701	341	353	-713
10 1985	-199	-540	341	377	-576
11 1986	-80	-421	341	404	-484
12 1987	98	-243	341	432	-334
13 1988	290	-51	341	462	-172
14 1989	504	163	341	495	9
15 1990	363	-65	428	529	-166
16 1991	570	142	428	566	4
17 1992	821	393	428	606	215
18 1993	1069	641	428	737	332
19 1994	1336	908	428	788	548
20 1995	1670	1242	428	843	827
21 1996	1864	1436	428	902	962
22 1997	2106	1678	428	965	1141
23 1998	2393	1965	428	1033	1360
24 1999	2603	2175	428	1105	1498
25 2000	2921	2493	428	1183	1738
26 2001	3004	2576	428	1264	1738
27 2002	3093	2665	428	1354	1739
28 2003	3187	2759	428	1449	1738
29 2004	3289	2861	428	1550	1739
30 2005	3397	2969	428	1659	1738
31 2006	3513	3085	428	1773	3300
32 2007	3528	3100	428	1801	3301
33 2008	3544	3116	428	1833	3301
34 2009	3561	3133	428	1869	3301
35 2010	3580	3152	428	1909	3301
36 2011	3599	3171	428	1952	3301
37 2012	3620	3192	428	1999	3301
38 2013	3642	3214	428	2049	3301
39 2014	3666	3238	428	2102	3301
40 2015	3692	3264	428	2158	3301

Table A.6.6-(1) Economic Comparative Table

UNIT : MEMG

MINIMUM NO FURNACE 2 STEP

N I	HYDRO				T A S				FUEL EXPENS				O & M				TOTAL			
	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06	0.0	0.02	0.04	0.06		0.0	0.02	0.04
1 76	1454	1425	1394	1372	0	0	0	0	223	219	214	210	24	24	23	23	2283	2239	2195	2154
2 77	2173	2089	2009	1934	0	0	0	0	294	283	272	262	31	30	29	28	2519	2518	2422	2332
3 78	1684	1587	1497	1414	0	0	0	0	359	338	319	301	37	35	33	31	3269	3080	2906	2744
4 79	2033	1878	1738	1610	542	538	497	461	429	396	367	340	44	41	38	35	4827	3720	3443	3190
5 80	1495	1535	1393	1267	0	0	0	0	512	484	421	393	52	47	43	39	2769	2508	2276	2070
6 81	0	0	0	0	0	0	0	0	18	16	14	13	109	97	86	77	127	113	100	90
7 82	0	0	0	0	0	0	0	0	24	21	18	16	109	95	83	72	133	116	101	88
8 83	524	447	383	324	0	0	0	0	29	25	21	18	110	94	80	69	663	566	484	416
9 84	988	827	694	585	0	0	0	0	35	29	25	21	110	92	77	65	1133	948	796	671
10 85	908	745	613	507	0	0	0	0	35	29	24	20	110	92	74	61	1233	1012	833	689
11 86	1035	832	672	545	0	0	0	0	35	28	23	18	110	88	71	58	1210	972	785	637
12 87	0	0	0	0	0	0	0	0	35	28	22	17	141	111	88	70	176	139	110	87
13 88	0	0	0	0	0	0	0	0	41	32	25	19	142	110	85	67	183	142	110	86
14 89	1841	1395	1063	814	0	0	0	0	47	36	27	21	143	108	83	63	2031	1539	1173	898
15 90	1955	1453	1086	816	542	432	323	243	59	44	33	25	144	107	80	60	2740	2036	1522	1144
16 91	2337	1702	1248	929	0	0	0	0	88	64	47	35	147	107	78	58	2752	2004	1469	1084
17 92	1945	1389	999	722	0	0	0	0	123	88	63	46	150	107	77	56	2248	1605	1154	835
18 93	0	0	0	0	542	407	287	204	76	53	38	27	217	152	107	76	875	612	432	307
19 94	0	0	0	0	0	0	0	0	94	65	45	31	218	150	103	72	312	215	148	103
20 95	0	0	0	0	0	0	0	0	123	83	56	38	221	149	101	69	344	232	157	107
TOTAL	20572	17304	14793	12835	2328	1948	1667	1457	2679	2341	2074	1861	2369	1834	1439	1149	31127	26316	22616	19732

N I	HYDRO				T A S				FUEL EXPENS				O & M				TOTAL			
	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14	0.08	0.10	0.12	0.14		0.08	0.10	0.12
1 76	1346	1322	1298	1275	0	0	0	0	206	203	199	196	22	22	21	21	2113	2076	2038	2003
2 77	1863	1796	1732	1672	0	0	0	0	252	243	234	226	27	26	25	24	2266	2165	2087	2015
3 78	1337	1265	1199	1137	944	893	846	803	285	270	256	242	29	28	26	25	2595	2456	2327	2207
4 79	1494	1389	1292	1204	690	641	597	556	315	293	273	254	32	30	28	26	2959	2751	2560	2385
5 80	1154	1052	962	880	347	317	294	265	348	318	291	266	35	32	30	27	1884	1719	1572	1438
6 81	0	0	0	0	0	0	0	0	11	10	9	8	69	62	55	50	80	72	64	58
7 82	0	0	0	0	0	0	0	0	14	12	11	10	64	56	49	44	78	68	60	54
8 83	283	244	212	184	0	0	0	0	16	14	12	10	59	51	44	39	358	309	268	233
9 84	494	419	356	304	0	0	0	0	18	15	13	11	55	47	40	34	567	481	409	349
10 85	421	350	292	245	0	0	0	0	16	13	11	9	51	42	35	30	571	474	396	333
11 86	444	363	298	245	13	11	9	7	15	12	10	8	47	39	32	26	519	425	349	286
12 87	0	0	0	0	0	0	0	0	14	11	9	7	56	45	36	29	70	56	45	36
13 88	0	0	0	0	0	0	0	0	15	12	9	7	52	41	33	26	67	53	42	33
14 89	627	485	377	294	0	0	0	0	16	12	10	8	49	38	29	23	692	535	416	325
15 90	616	468	357	274	143	139	106	82	19	14	11	8	45	34	26	20	863	655	500	384
16 91	682	509	381	287	0	0	0	0	26	19	14	11	43	32	24	18	804	599	448	338
17 92	526	385	283	210	4	6	4	3	33	24	18	13	41	30	22	16	608	445	327	242
18 93	0	0	0	0	0	0	0	0	19	14	10	7	54	39	28	21	219	158	114	83
19 94	0	0	0	0	146	105	76	55	22	15	11	8	51	36	25	18	73	51	36	26
20 95	0	0	0	0	0	0	0	0	26	18	13	9	47	33	23	16	73	51	36	25
TOTAL	11287	10047	9039	8211	1296	1171	1072	993	1686	1542	1424	1318	928	763	631	533	17439	15599	14094	12853

Table-A.6.6-(2) Internal Rate of Return

MINIMUM NO. FURNACE	ROGEZ PROJECT		BENEFIT			NET BENE- (7) NET	PRESENT VALUE		UNIT : MFMG COEFFICIENT (10) 11.23 %
	(1) INVESTMENT	(2) O & M	(3) FUEL EX	(4) FIXED EX	(5) O & M		(6) FUEL EX	(8) INVESTMENT NET BENE.	
1 1976	1454	0	0	0	0	0	1307	0	0.8991
2 1977	2294	0	0	0	0	0	1854	0	0.8083
3 1978	2873	0	0	0	0	0	2088	0	0.7267
4 1979	2972	0	0	0	0	0	1942	0	0.6534
5 1980	2205	0	0	0	0	0	1295	0	0.5874
6 1981	0	57	-494	190	11	696	0	368	0.5281
7 1982	0	57	-488	190	20	786	0	374	0.4748
8 1983	524	58	-583	269	29	1004	224	429	0.4269
9 1984	988	58	-477	269	38	1107	379	425	0.3838
10 1985	1088	58	-477	269	48	1249	375	431	0.3451
11 1986	1065	58	-477	269	63	1456	330	452	0.3103
12 1987	0	89	-477	364	76	1574	0	439	0.2789
13 1988	0	90	-471	364	87	1765	0	443	0.2508
14 1989	1841	91	-465	459	110	2000	415	451	0.2255
15 1990	1955	92	-453	554	129	2278	396	462	0.2027
16 1991	2517	95	-424	554	148	2453	459	447	0.1823
17 1992	1975	98	-389	744	173	2836	324	465	0.1639
18 1993	0	165	-436	744	193	1866	3074	0	0.1473
19 1994	0	166	-418	839	219	2080	0	449	0.1325
20 1995	0	164	-389	934	238	2339	0	445	0.1191
21 1996	840	179	-289	1029	277	4031	90	432	0.1071
22 1997	0	191	-125	1217	311	4371	0	421	0.0963
23 1998	792	196	-89	1312	344	4776	69	413	0.0865
24 1999	792	208	28	1407	381	5120	62	398	0.0778
25 2000	840	221	158	1502	419	5480	59	383	0.0700
SUR TOTAL 1	27015	2396	-7135	13574	3324	53189	11668	6580	
SUR TOTAL 2	5573	5525	3950	37550	10475	137000	87	3175	
TOTAL (1+2)	32588	7921	-3185	51124	13799	190189	11755	11755	

Table-A.6.6-(3) Present Value at Each Discount Rate

MINIMUM NO. FURNACE	2. STEP	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
INVESTMENT (MFMG)		27015	2396	-7135	13574	3324	53189	11668	6580						
NET BENEFIT (MFMG)		5573	5525	3950	37550	10475	137000	87	3175						
TOTAL		32588	7921	-3185	51124	13799	190189	11755	11755						

Table A.6.6-(4) Expenses for Diesel Plant

NO YEAR	MINIMUM NO FURNACE		2 STEP		GAS TURBINE (4) (5) INVEST. AMOUNT	T/L & S/S (7) (8) INVEST. AMOUNT	TOTAL FIXED EX (10)	INCR- MENTAL (11) O & M EX	UNIT : MFMG		
	(1) DIESEL INVEST. AMOUNT	(2) (3) FIXED EX	(12) DIESEL	(13) G.T.					(14) FUEL EX	INCR- MENTAL FUEL EX	
5 1980	0	0	0	0	0	0	0	50	512	0	512
6 1981	1584	1584	174	0	0	206	190	11	570	0	58
7 1982	0	1584	174	0	0	0	190	20	659	0	147
8 1983	0	1584	174	840	74	0	264	29	729	64	281
9 1984	0	1584	174	0	74	0	264	38	829	64	381
10 1985	0	1584	174	0	74	0	264	48	923	102	513
11 1986	792	2376	261	0	74	103	364	63	1054	64	610
12 1987	0	2376	261	0	74	0	364	76	1194	64	746
13 1988	0	2376	261	0	74	0	364	87	1305	140	933
14 1989	792	3144	344	0	74	103	454	110	1505	64	1057
15 1990	792	3960	435	0	74	103	554	129	1682	64	1234
16 1991	0	3960	435	0	74	0	554	148	1870	64	1422
17 1992	1584	5544	609	0	74	206	744	173	2076	64	1628
18 1993	0	5544	609	0	74	0	744	193	2276	102	1866
19 1994	792	6336	696	0	74	103	834	219	2528	64	2080
20 1995	792	7128	783	0	74	103	934	248	2787	64	2339
21 1996	792	7920	870	0	74	103	1029	277	3063	64	2615
22 1997	1584	9504	1043	0	74	206	1217	311	3357	64	2909
23 1998	792	10296	1130	0	74	103	1312	344	3675	64	3227
24 1999	792	11088	1217	0	74	103	1407	381	4016	64	3564
25 2000	792	11880	1304	0	74	103	1502	419	4386	64	3938

Table A.6.6-(5) Repayment Schedule

NO YEAR	1ST STAGE			2ND STAGE			3RD STAGE			TOTAL		
	(1) AMOUNT OF LOAN	(2) INTER-EST	(3) REPAYMENT DEBT	(4) AMOUNT OF LOAN	(5) BALANCE	(6) REPAYMENT DEBT	(7) AMOUNT OF LOAN	(8) INTER-EST	(9) REPAYMENT DEBT	(10) AMOUNT OF LOAN	(11) INTER-EST	(12) REPAYMENT DEBT
6 1981	13859	910	0	13859	0	0	0	0	0	0	970	0
7 1982	0	970	259	13859	0	0	0	0	0	0	970	259
8 1983	0	970	278	13322	0	0	0	0	0	0	952	278
9 1984	0	933	297	13025	0	0	0	0	0	0	933	297
10 1985	0	912	318	12707	0	0	0	0	0	0	912	318
11 1986	0	890	340	12367	4142	290	0	0	0	0	1179	340
12 1987	0	866	364	12004	0	290	0	0	0	0	1156	364
13 1988	0	840	389	11614	0	290	0	0	0	0	1130	389
14 1989	0	813	416	11198	0	290	78	0	0	0	1103	494
15 1990	0	784	446	10752	0	285	83	0	0	0	1068	529
16 1991	0	753	477	10276	0	279	89	0	0	0	1031	566
17 1992	0	719	510	9765	0	272	95	0	0	0	9482	608
18 1993	0	684	546	9219	0	266	102	0	0	0	9482	648
19 1994	0	645	584	8635	0	259	109	0	0	0	9482	693
20 1995	0	604	625	8010	0	251	116	0	0	0	9305	749
21 1996	0	561	669	7341	0	243	124	0	0	0	9115	803
22 1997	0	514	716	6626	0	234	133	0	0	0	8912	858
23 1998	0	464	766	5860	0	225	143	0	0	0	8694	912
24 1999	0	410	819	5041	0	215	152	0	0	0	8462	966
25 2000	0	353	877	4164	0	204	163	0	0	0	8213	1020
26 2001	0	291	938	3226	0	193	175	0	0	0	7946	1074
27 2002	0	226	1004	2223	0	181	187	0	0	0	7661	1128
28 2003	0	156	1074	1149	0	168	200	0	0	0	7357	1182
29 2004	0	80	1149	0	0	159	214	0	0	0	7030	1236
30 2005	0	0	0	0	0	139	229	0	0	0	6681	1290
31 2006	0	0	0	0	0	123	245	0	0	0	6308	1344
32 2007	0	0	0	0	0	105	262	0	0	0	5908	1398
33 2008	0	0	0	0	0	87	280	0	0	0	5480	1452
34 2009	0	0	0	0	0	67	300	0	0	0	5023	1506
35 2010	0	0	0	0	0	47	321	0	0	0	4533	1560
36 2011	0	0	0	0	0	24	343	0	0	0	4009	1614
37 2012	0	0	0	0	0	0	367	0	0	0	3449	1668
38 2013	0	0	0	0	0	0	0	0	0	0	2811	1722
39 2014	0	0	0	0	0	0	0	0	0	0	2141	1776
40 2015	0	0	0	0	0	0	0	0	0	0	1499	1830
41 2016	0	0	0	0	0	0	0	0	0	0	887	1884
42 2017	0	0	0	0	0	0	0	0	0	0	335	1938
43 2018	0	0	0	0	0	0	0	0	0	0	55	2000

UNIT : MFPG

Table-A.6.6-(6) Income Statement

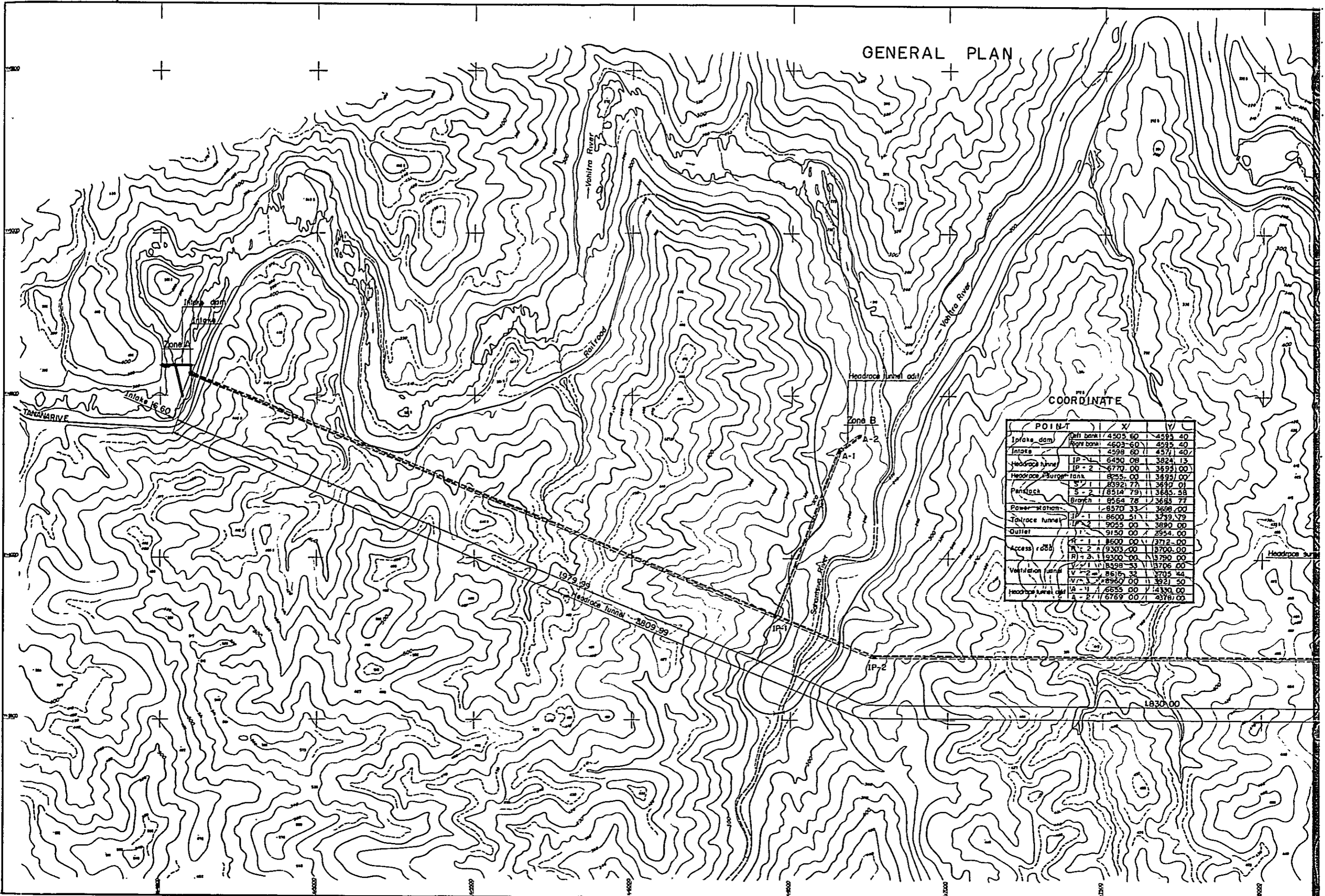
MINIMUM NO. FURNACE	NO. YEAR	REVENUES		EXPENSES		OPERAT. INCOME		OTHER DEPRECIATION		SUBTOTAL		UNIT : MFHG			
		(1) INCH. PUBLIC ENERGY	(2) UNIT FROM PUBLIC ENERGY	(3) INCOME FROM PUBLIC ENERGY	(4) UNIT FROM PUBLIC ENERGY	(5) PA. OF FERRO	(6) INCOME FROM FERRO	(7) TOTAL INCOME	(8) OPE. MAIN.	(9) OTHER EX.	(10) DEPRECIATION	(11) SUBTOTAL	(12) OPERAT. INCOME	(13) SAVING FUEL EX.	(14) INTER-EST
6	1981	13	7.20	94	0	0.0	0	94	3	274	334	-240	494	970	-716
7	1982	28	7.20	202	0	0.0	0	202	3	274	334	-132	488	970	-614
8	1983	45	7.20	324	0	0.0	0	324	3	274	335	-11	483	970	-498
9	1984	63	7.20	454	0	0.0	0	454	3	274	335	119	477	952	-356
10	1985	82	7.20	590	0	0.0	0	590	3	274	335	255	477	933	-201
11	1986	105	6.50	683	0	0.0	0	683	3	274	335	348	477	912	-87
12	1987	128	6.50	832	0	0.0	0	832	3	356	449	384	477	1179	-318
13	1988	154	6.50	1001	0	0.0	0	1001	3	356	449	552	471	1156	-133
14	1989	183	6.50	1190	0	0.0	0	1190	3	356	450	740	465	1130	75
15	1990	213	6.50	1385	0	0.0	0	1385	3	356	451	934	453	1103	284
16	1991	252	6.20	1562	0	0.0	0	1562	3	356	454	1108	424	1068	464
17	1992	287	6.20	1779	0	0.0	0	1779	3	522	623	1156	389	1031	514
18	1993	326	6.20	2021	0	0.0	0	2021	6	522	693	1328	436	1656	108
19	1994	368	6.20	2282	0	0.0	0	2282	6	522	694	1588	418	1613	393
20	1995	413	6.20	2561	0	0.0	0	2561	6	522	697	1864	389	1568	685
21	1996	461	6.20	2858	0	0.0	0	2858	85	522	786	2072	289	1519	842
22	1997	513	6.20	3181	0	0.0	0	3181	85	522	788	2383	125	1455	1053
23	1998	569	6.20	3528	0	0.0	0	3528	172	522	890	2638	89	1386	1341
24	1999	629	6.20	3900	0	0.0	0	3900	208	522	989	2911	-28	1313	1570
25	2000	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	1234	1909
26	2001	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	1149	1994
27	2002	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	1059	2084
28	2003	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	963	2180
29	2004	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	859	2284
30	2005	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	749	2394
31	2006	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	631	2512
32	2007	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	590	2553
33	2008	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	547	2596
34	2009	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	501	2642
35	2010	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	451	2692
36	2011	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	398	2745
37	2012	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	341	2802
38	2013	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	281	2862
39	2014	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	241	2902
40	2015	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	199	2944
41	2016	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	155	2988
42	2017	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	106	3037
43	2018	694	6.20	4303	0	0.0	0	4303	221	522	1002	3301	-158	55	3088



Table A.6.6-(7) Cash Flow

MINIMUM NO. EURNACE	2. STEP	UNIT : MFNG			
NO YEAR	(1) CASH FROM INCOME	(2) NET INCOME	(3) DEPRECI- ATION	(4) REPAYMENT OF DEBT	(5) NET CASH PROVIDED
6 1981	-442	-716	274	0	-442
7 1982	-340	-614	274	0	-340
8 1983	-224	-438	274	259	-483
9 1984	-62	-356	274	207	-360
10 1985	73	-201	274	207	-224
11 1986	187	-87	274	318	-131
12 1987	38	-318	356	340	-302
13 1988	223	-133	356	364	-141
14 1989	431	75	356	389	42
15 1990	640	284	356	494	146
16 1991	820	464	356	529	291
17 1992	1036	514	522	566	470
18 1993	630	108	522	605	25
19 1994	915	393	522	648	267
20 1995	1207	685	522	683	514
21 1996	1364	842	522	919	445
22 1997	1575	1053	522	983	592
23 1998	1863	1341	522	1052	811
24 1999	2092	1570	522	1126	966
25 2000	2431	1909	522	1204	1227
26 2001	2514	1994	522	1289	1227
27 2002	2606	2084	522	1379	1227
28 2003	2702	2180	522	1475	1227
29 2004	2806	2284	522	1579	1227
30 2005	2916	2394	522	1689	1227
31 2006	3034	2512	522	1789	2456
32 2007	3075	2553	522	1889	2457
33 2008	3118	2596	522	1989	2456
34 2009	3164	2642	522	2089	2456
35 2010	3214	2692	522	2189	2456
36 2011	3267	2745	522	2289	2456
37 2012	3324	2802	522	2389	2457
38 2013	3384	2862	522	2489	2457
39 2014	3424	2902	522	2589	2456
40 2015	3466	2944	522	2689	2456
41 2016	3510	2988	522	2789	2456
42 2017	3559	3037	522	2889	2456
43 2018	3610	3088	522	2989	2456

# GENERAL PLAN



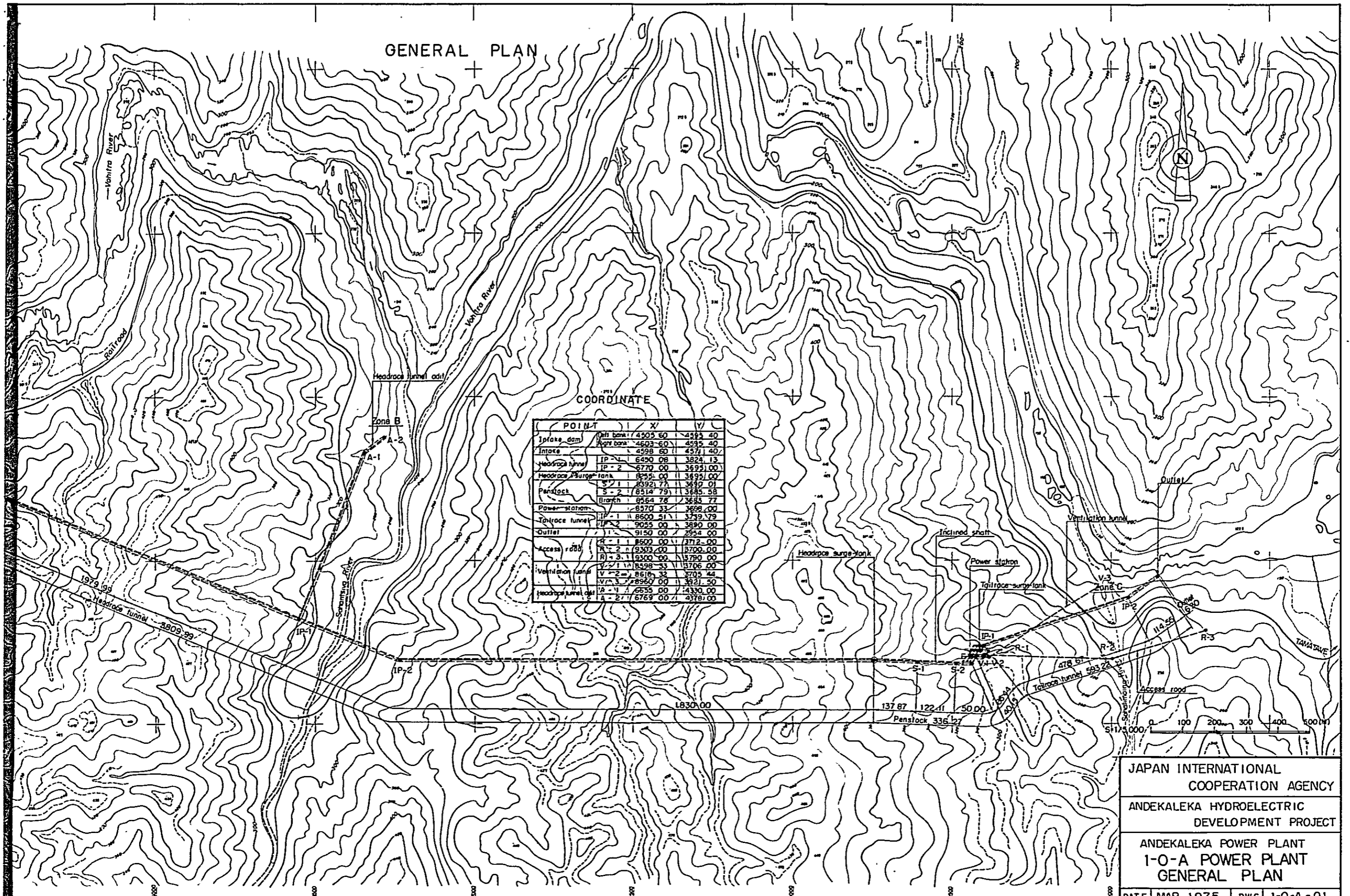
## COORDINATE

POINT	X	Y
Intake dam	4503.60	4593.40
Intake dam	4603.60	4593.40
Intake	4598.60	4571.40
Headrace tunnel	6490.08	3824.13
Headrace tunnel	IP-2	6770.00
Headrace surge tank	8255.00	3893.00
Pentlatch	S-1	8521.77
Pentlatch	S-2	8514.79
Pentlatch	Branch	8564.78
Power station	R-1	8570.33
Power station	R-2	8600.51
Power station	R-3	9045.00
Tailrace tunnel	IP-1	9150.00
Tailrace tunnel	IP-2	9150.00
Outlet	R-1	8600.00
Outlet	R-2	9303.00
Outlet	R-3	9300.00
Access road	V-1	8598.33
Access road	V-2	8615.32
Access road	V-3	8960.00
Ventilation tunnel	A-1	6655.00
Ventilation tunnel	A-2	6769.00

# GENERAL PLAN

## COORDINATE

POINT	X	Y
Intake dam	4503.60	4585.40
Intake	4598.60	4571.40
Headrace tunnel	6490.08	3824.13
Headrace surge tank	6770.00	3695.00
Penstock	8592.77	3690.01
Power station	8514.79	3685.58
Tailrace tunnel	8564.74	3685.77
Outlet	8570.33	3698.00
Access road	8600.41	3719.79
Ventilation tunnel	9025.00	3890.00
Headrace surge tank	9150.00	2954.00
Tailrace surge tank	8502.00	3712.00
Access road	8303.00	3700.00
Ventilation tunnel	8300.00	3780.00
Headrace surge tank	8598.33	3706.00
Access road	8518.33	3705.44
Ventilation tunnel	8560.00	3821.50
Headrace surge tank	6655.00	4330.00
Access road	6769.00	4378.00



JAPAN INTERNATIONAL  
COOPERATION AGENCY

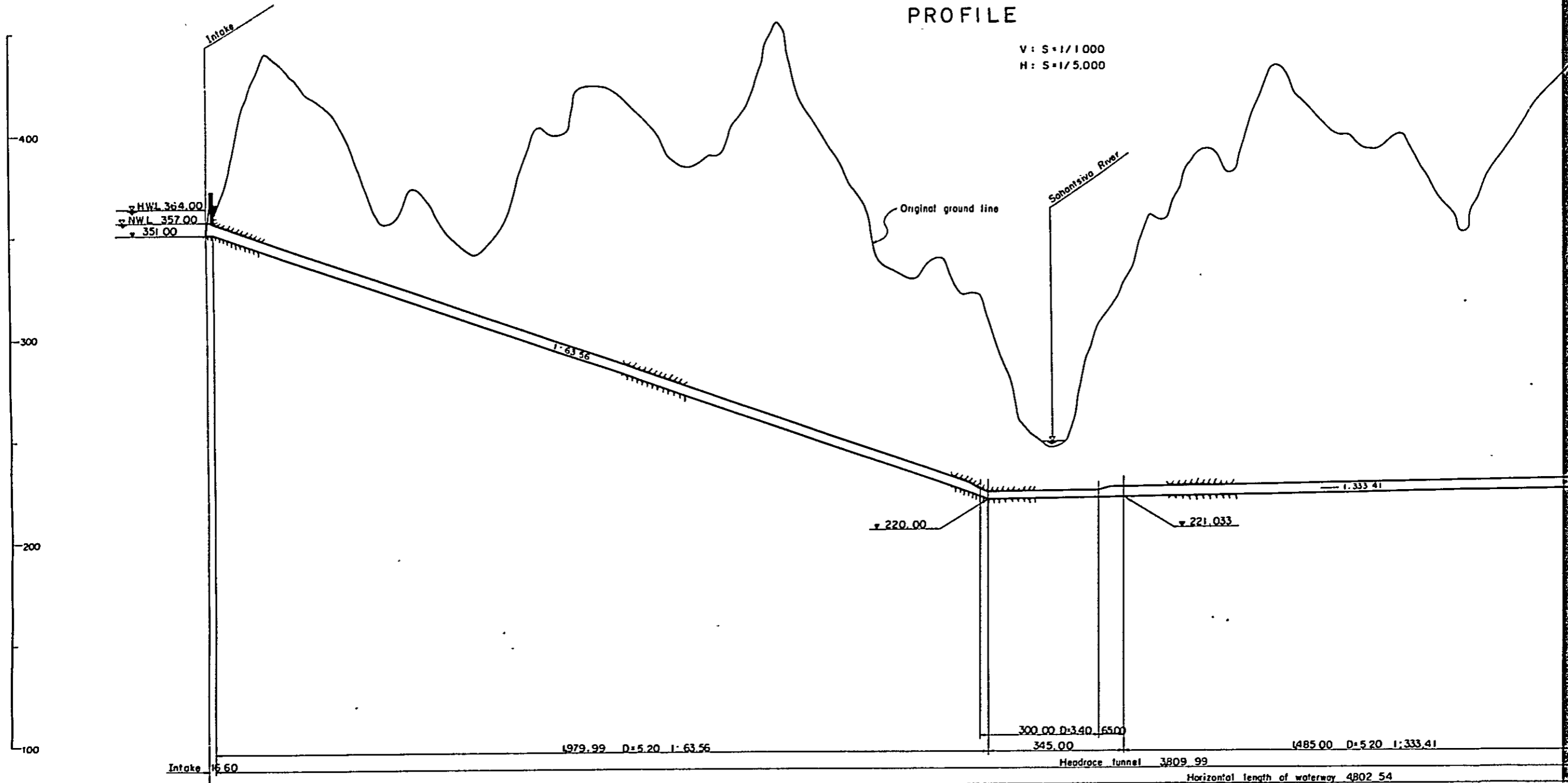
ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT

ANDEKALEKA POWER PLANT  
1-0-A POWER PLANT  
GENERAL PLAN

DATE | MAR. 1975 | DWG | 1-0-A-01

# PROFILE

V: S=1/1000  
H: S=1/5000

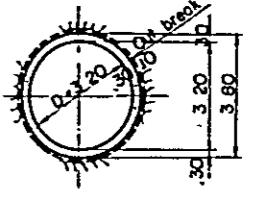
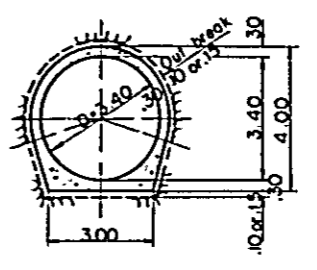
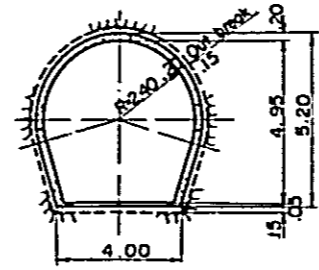
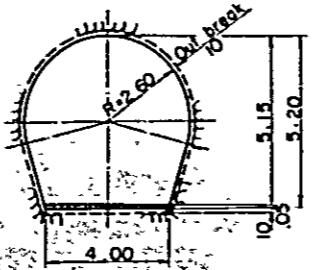


# TYPICAL SECTION

S=1/100

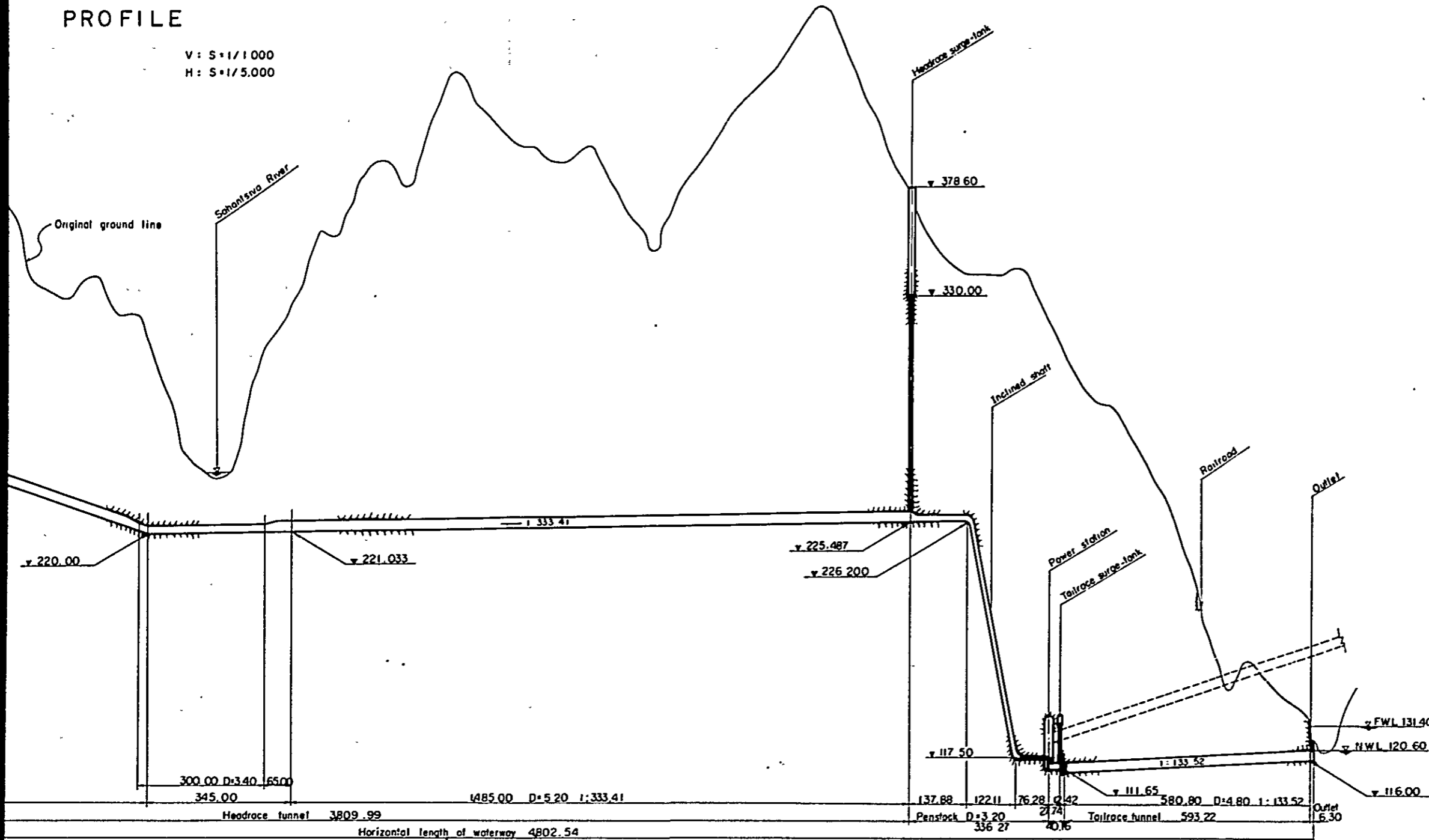
## HEADRACE TUNNEL AND TAILRACE TUNNEL

## PENSTOCK



# PROFILE

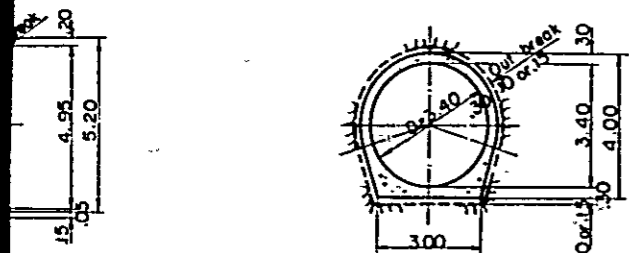
V: S+1/1000  
H: S+1/5.000



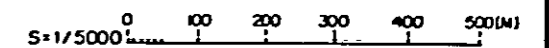
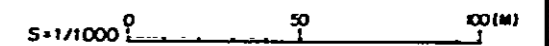
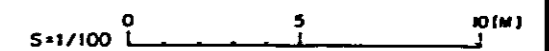
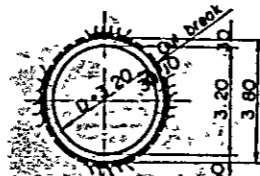
## TYPICAL SECTION

S+1/100

TAILRACE TUNNEL



PENSTOCK



JAPAN INTERNATIONAL  
COOPERATION AGENCY

ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT

ANDEKALEKA POWER PLANT  
1-O-A POWER PLANT

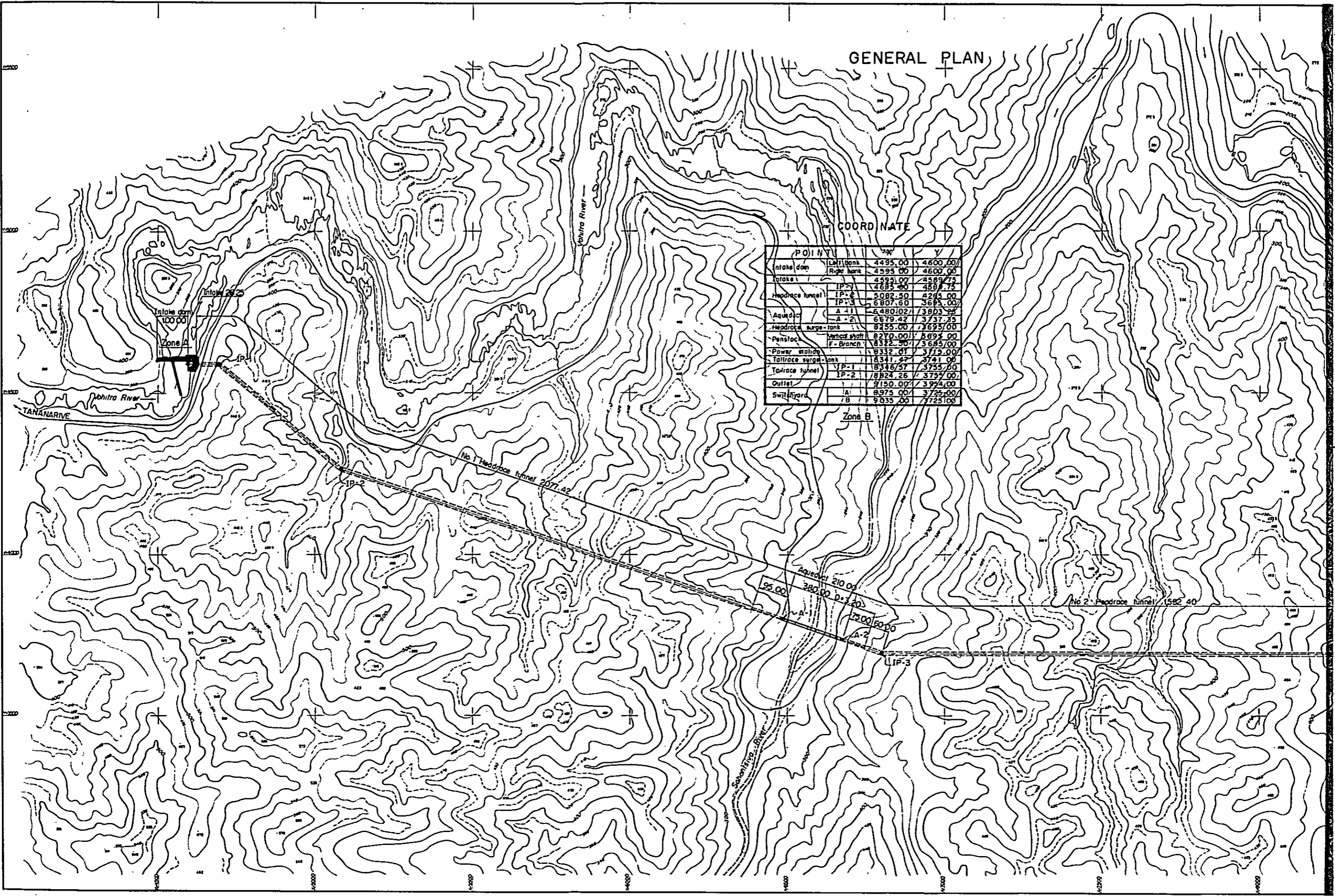
PROFILE & TYPICAL SECTION

DATE | MAR. 1975 | DWG. | 1-O-A-02

# GENERAL PLAN

COORD NATE

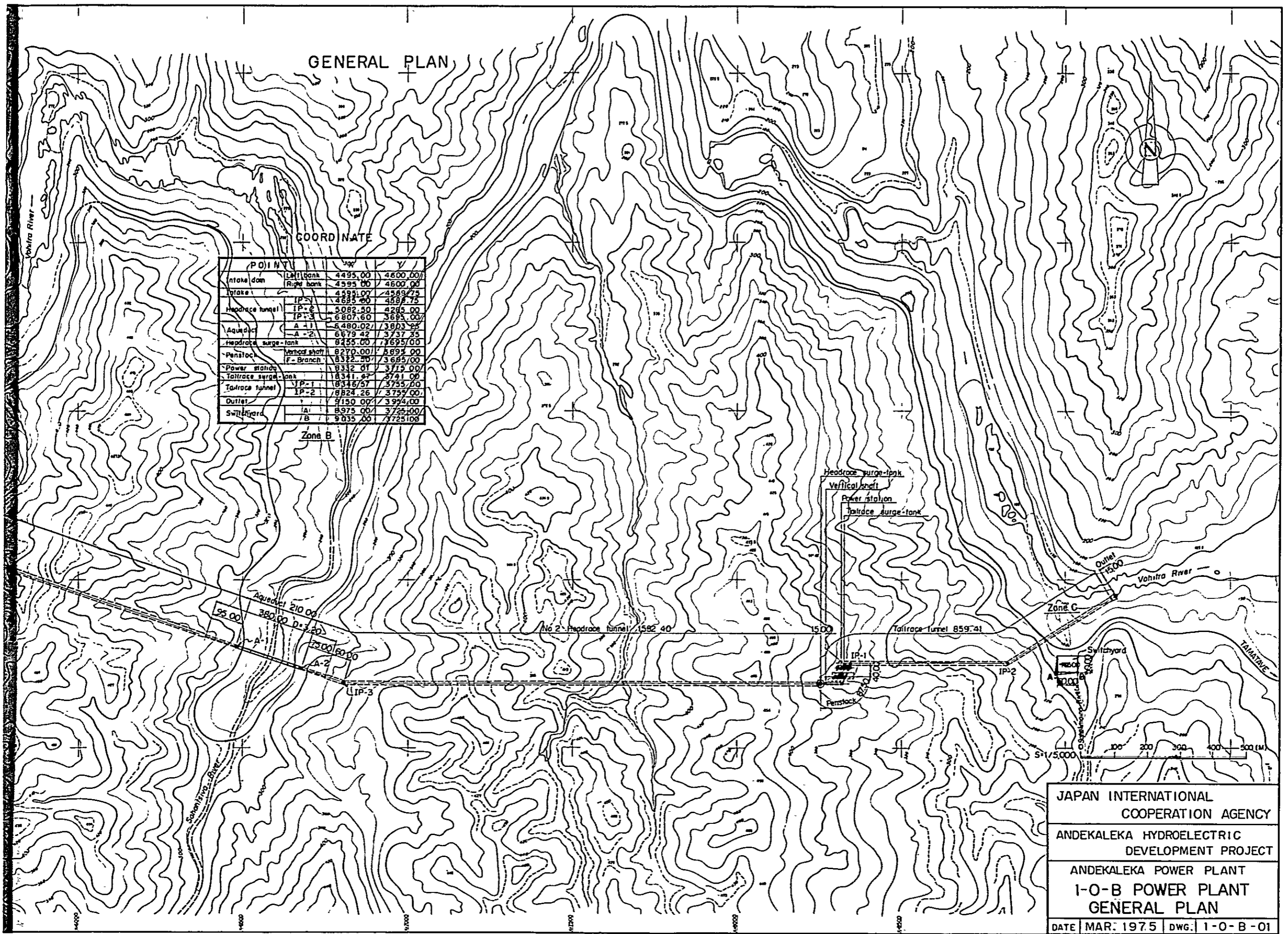
POINT	X	Y
Intake dam	4495.00	4600.00
Intake	4593.00	4600.00
Headrace tunnel	5082.50	4245.00
Aqueduct	6480.02	3803.25
Headrace surge-tank	8255.00	3695.00
Penstock	8270.00	3695.00
Tailrace surge-tank	8341.42	3741.00
Tailrace tunnel	8346.57	3755.00
Outlet	8150.00	3954.00
Switchyard	8975.00	3725.00



# GENERAL PLAN

## COORDINATE

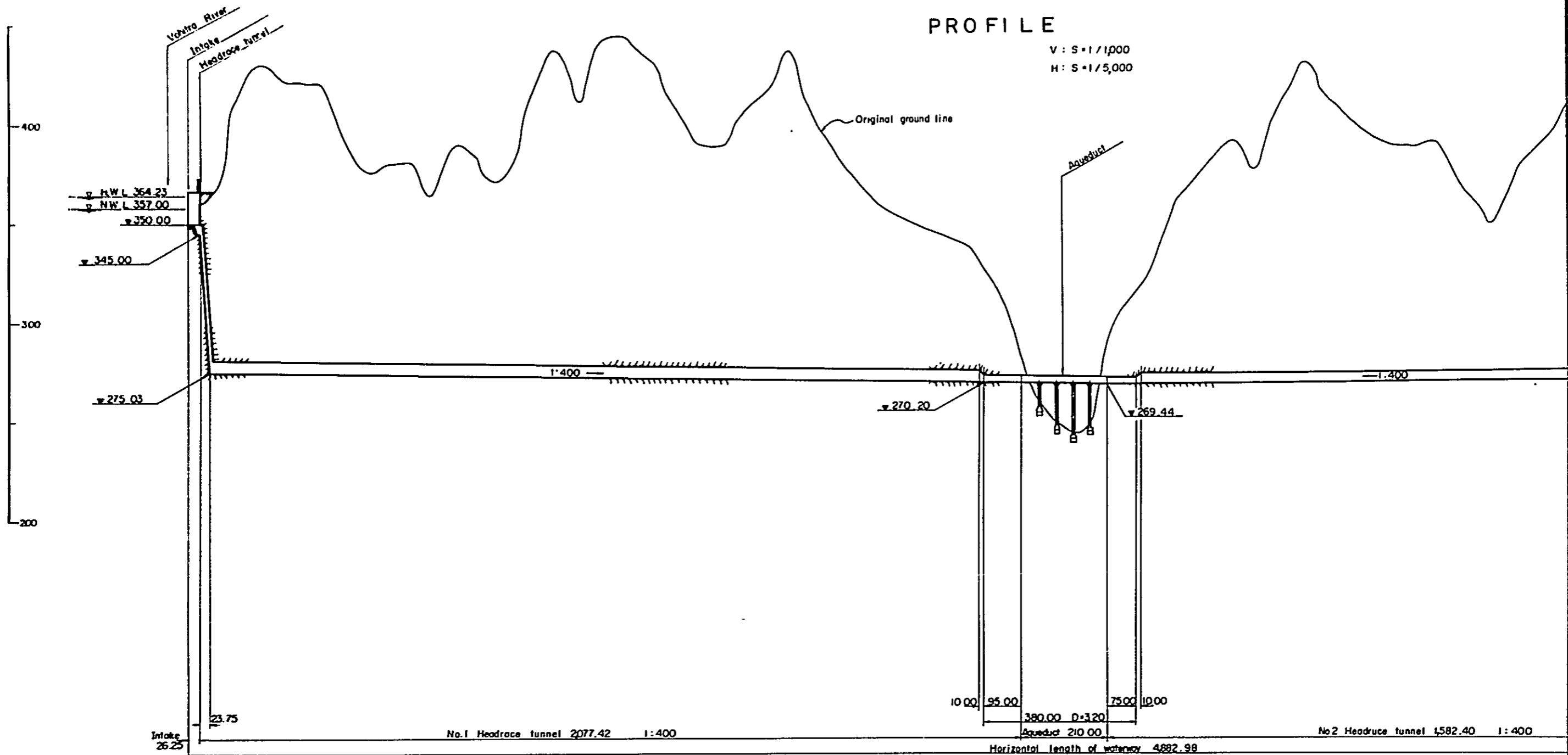
POINT	U <sup>o</sup>	V
Intake dam		
Left bank	4495.00	4600.00
Right bank	4595.00	4600.00
Intake		
IP-1	4595.00	4589.75
IP-2	5082.50	4265.00
IP-3	6807.60	3695.00
Headrace tunnel		
A-1	6480.02	3803.85
A-2	6679.42	3737.35
Headrace surge-tank	8235.00	3695.00
Penstock		
Vertical shaft	8270.00	3695.00
F-Branch	8332.50	3695.00
Power station	8332.01	3715.00
Tailrace surge-tank	8341.47	3741.00
Tailrace tunnel		
IP-1	8345.57	3755.00
IP-2	8824.26	3755.00
Outlet	9150.00	3994.00
Switchyard		
A	8975.00	3725.00
B	9035.00	3725.00



JAPAN INTERNATIONAL COOPERATION AGENCY
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT
ANDEKALEKA POWER PLANT I-O-B POWER PLANT GENERAL PLAN
DATE MAR. 1975 DWG. I-O-B-01

# PROFILE

V : S = 1/1000  
H : S = 1/5,000

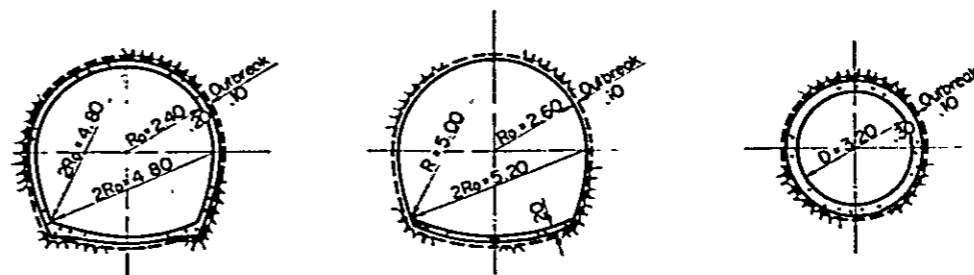


# TYPICAL SECTION

S = 1/100

HEADRACE TUNNEL AND TAILRACE

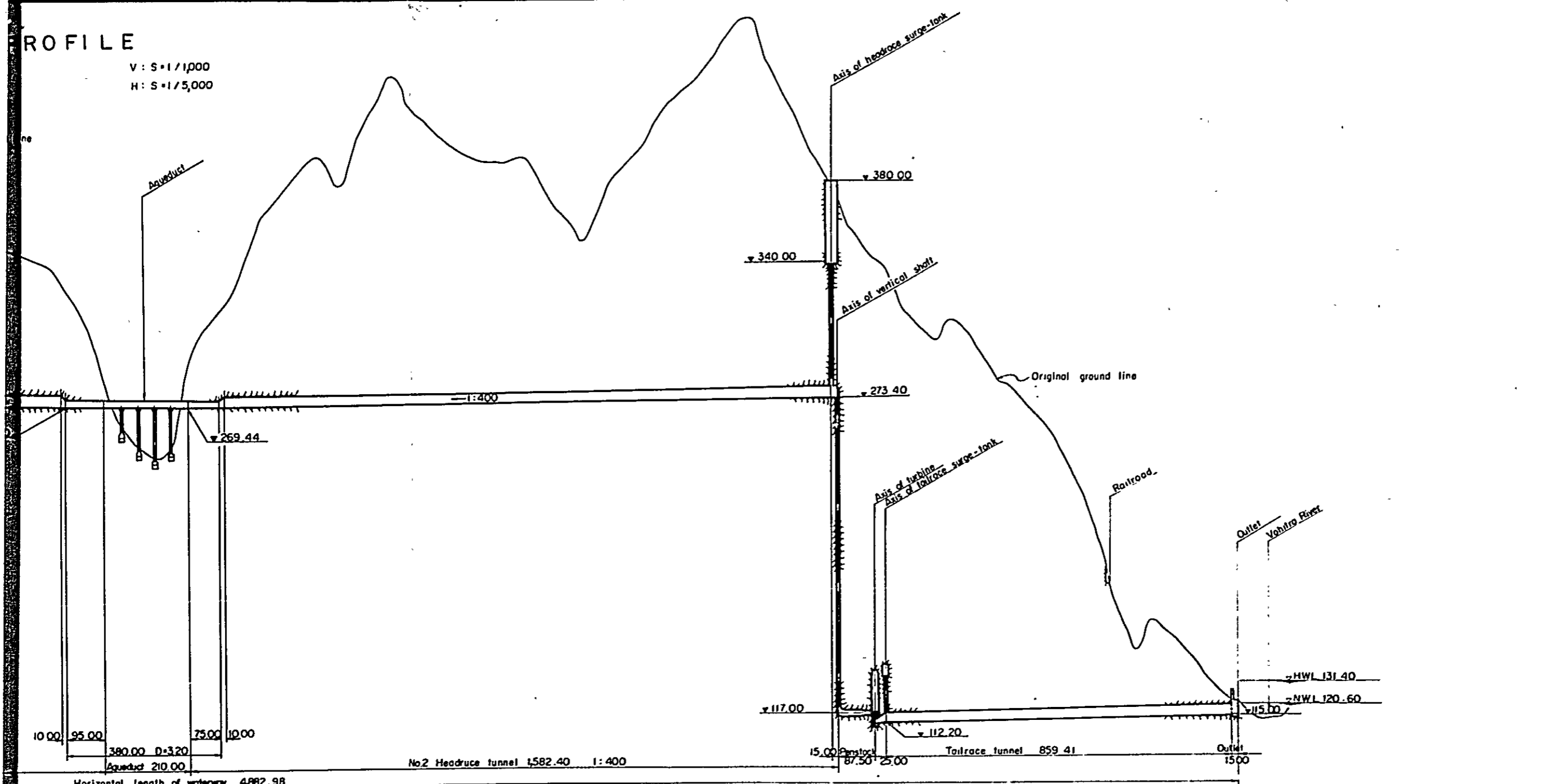
VERTICAL SHAFT





# PROFILE

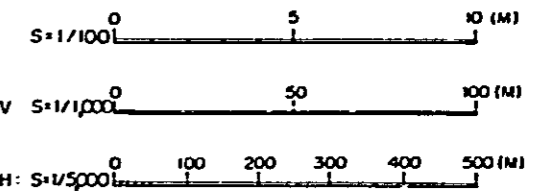
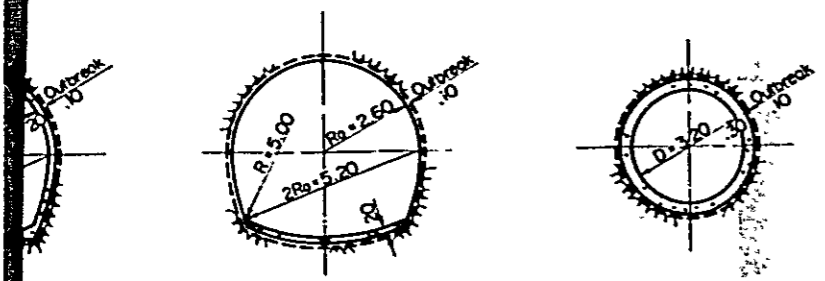
V: S=1/1,000  
H: S=1/5,000



## TYPICAL SECTION

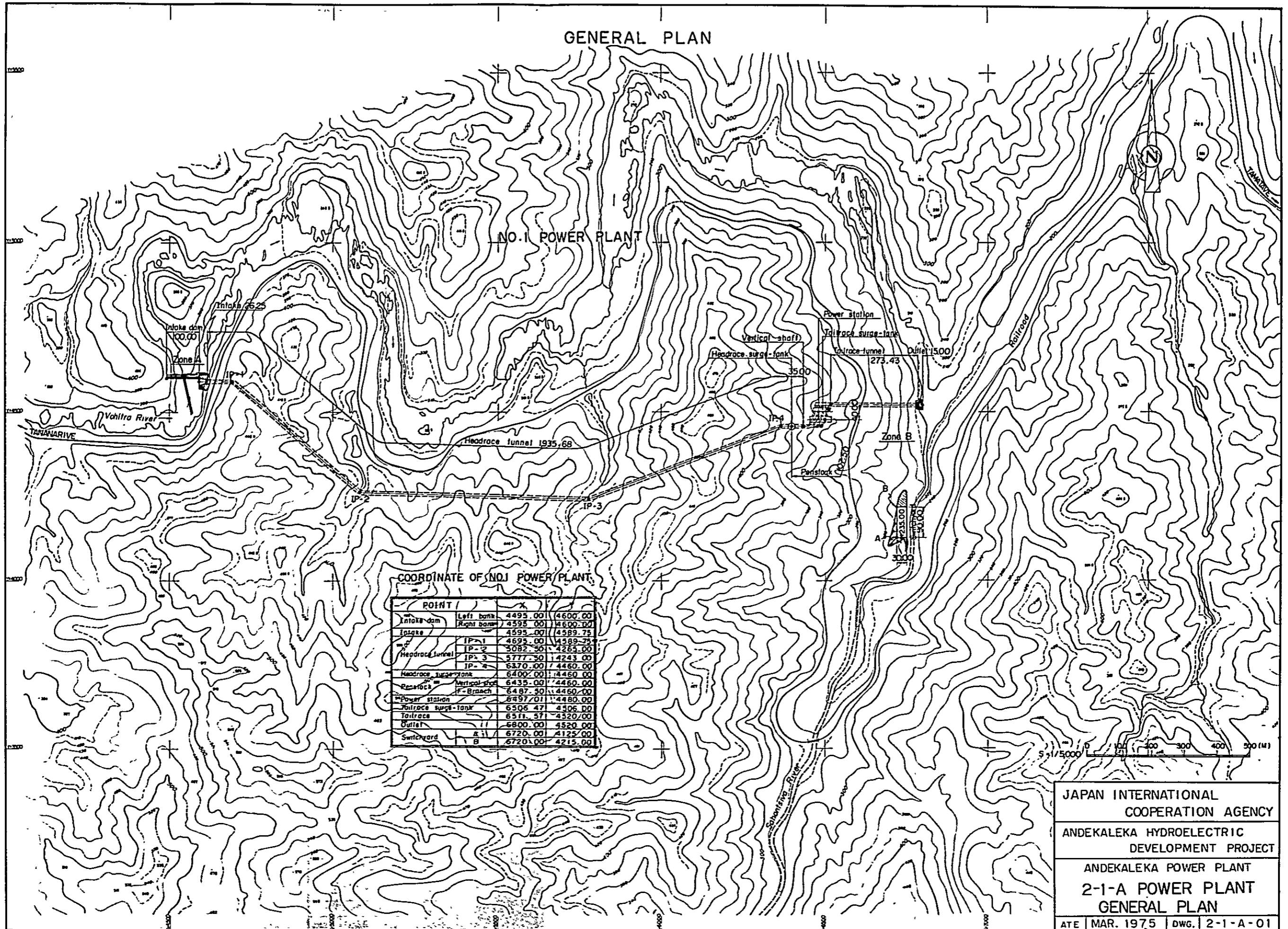
S=1/100

FACE TUNNEL AND TAILRACE      VERTICAL SHAFT



JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA POWER PLANT		
1-O-B POWER PLANT		
PROFILE & TYPICAL SECTION		
DATE	MAR. 1975	DWG. 1-O-B-02

# GENERAL PLAN



COORDINATE OF NO.1 POWER PLANT

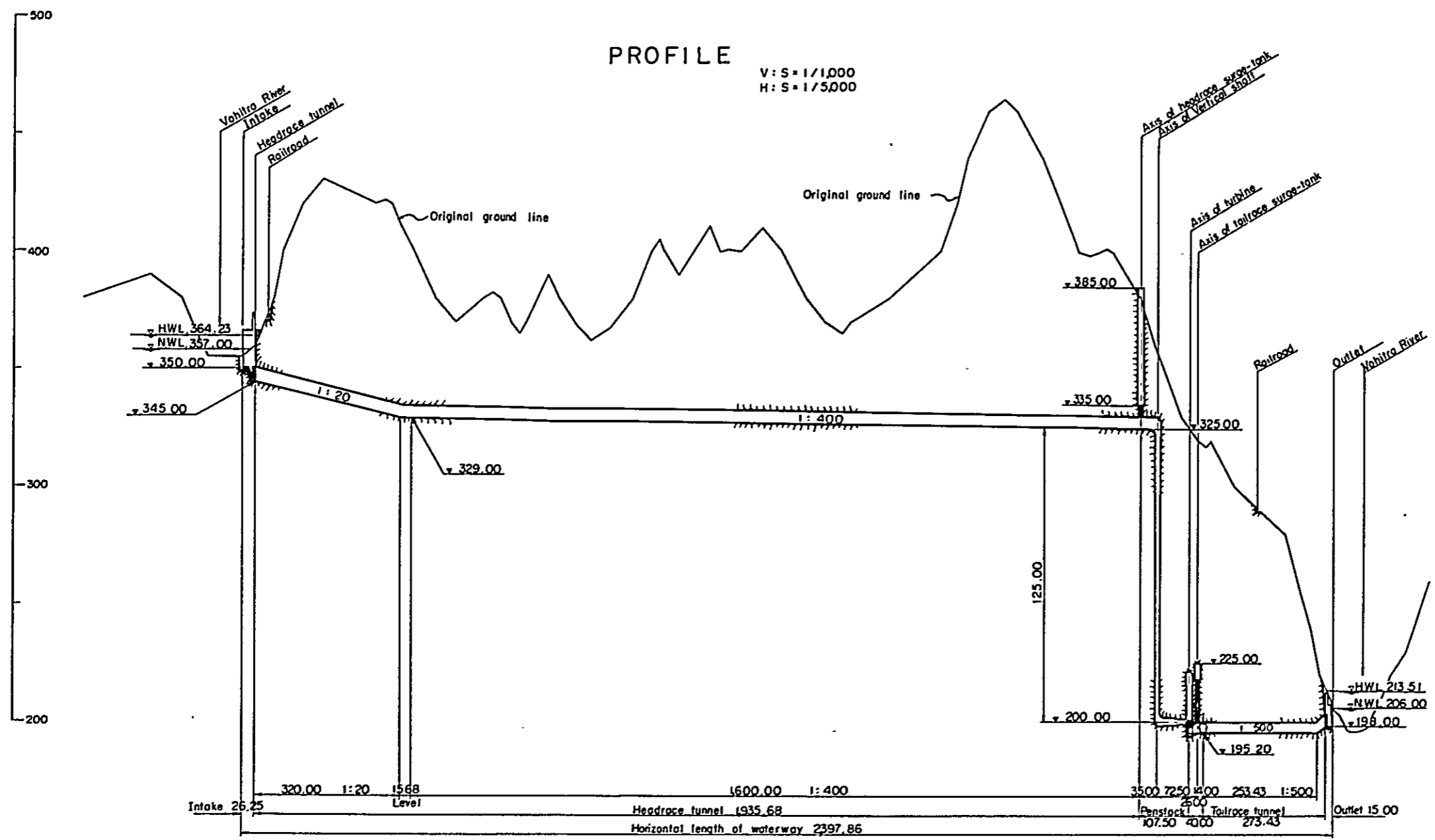
POINT	X	Y
Intake dam	4495.00	4600.00
Intake dam	4595.00	4600.00
Intake	4595.00	4589.72
Headrace tunnel	IP-1	4595.00 / 4589.72
Headrace tunnel	IP-2	5082.50 / 4253.00
Headrace tunnel	IP-3	5777.50 / 4243.00
Headrace tunnel	IP-4	6370.00 / 4460.00
Headrace surge tank	6400.00	4460.00
Penstock	Vertical shaft	6435.00 / 4460.00
Penstock	F-Branch	6487.50 / 4460.00
Power station	6497.00	4480.00
Tailrace surge tank	6506.47	4505.00
Tailrace	6511.57	4520.00
Outlet	6800.00	4520.00
Switchyard	A	6720.00 / 4125.00
Switchyard	B	6720.00 / 4215.00

JAPAN INTERNATIONAL  
COOPERATION AGENCY

ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT

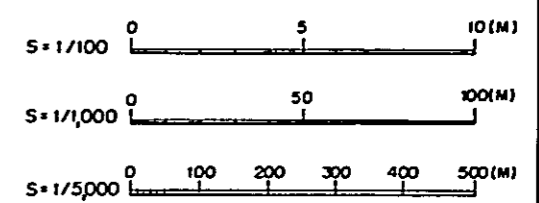
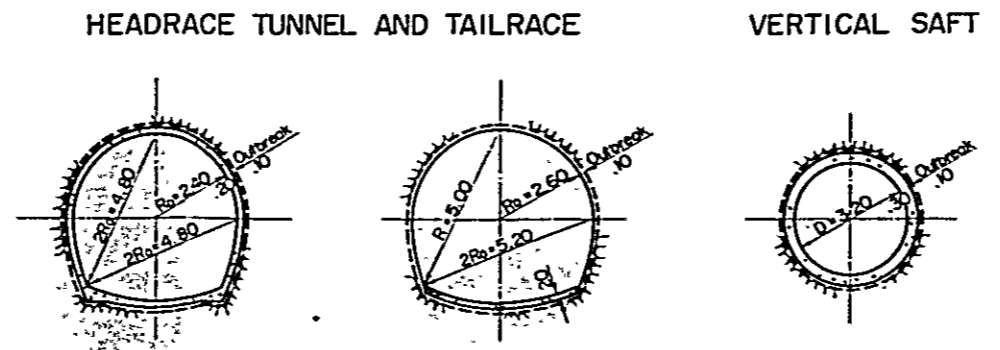
ANDEKALEKA POWER PLANT  
2-1-A POWER PLANT  
GENERAL PLAN

ATE | MAR. 1975 | DWG. | 2-1-A-01



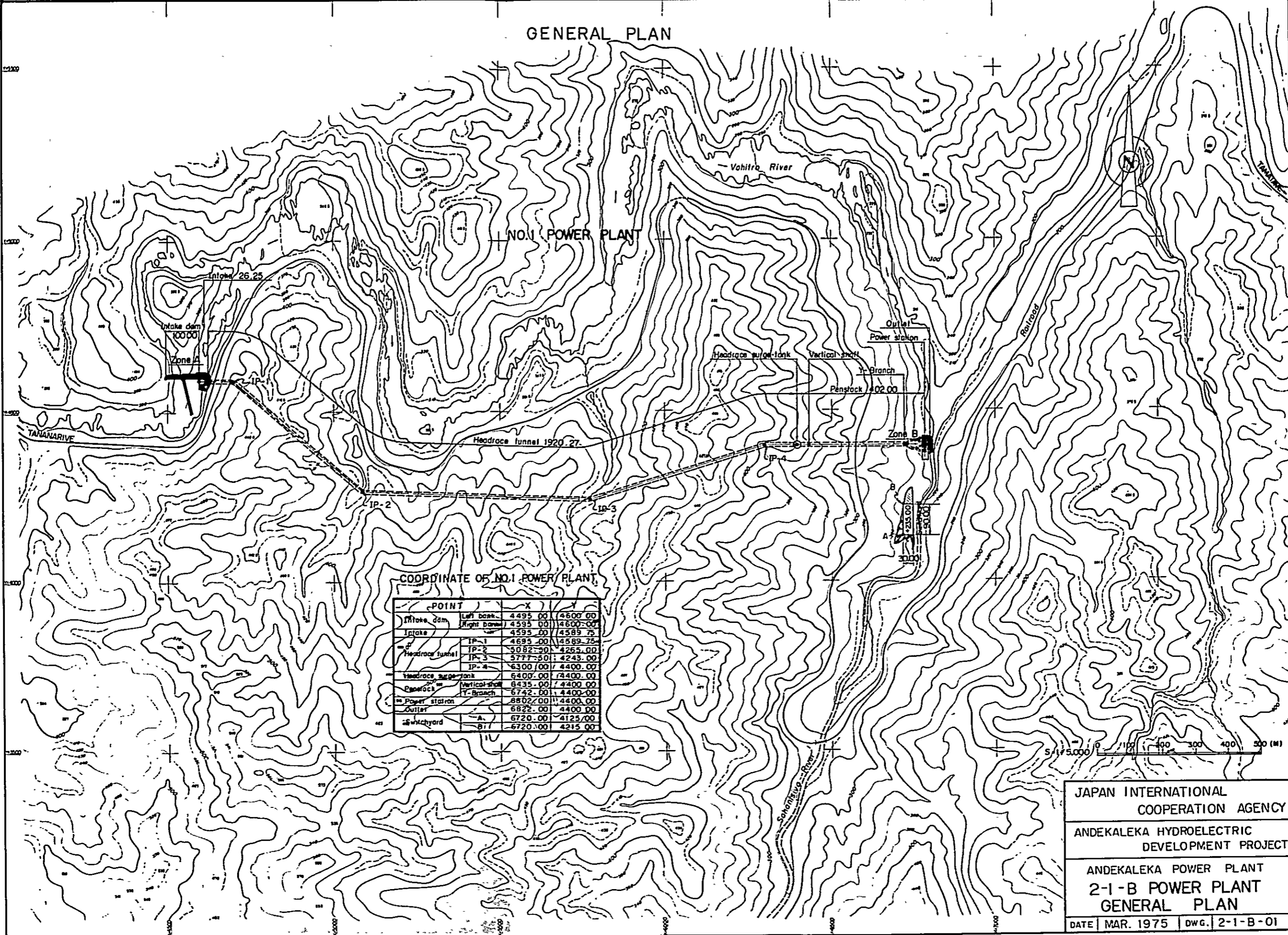
### TYPICAL SECTION

S = 1/100



JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA POWER PLANT 2-1-A POWER PLANT PROFILE & TYPICAL SECTION	
DATE: MAR. 1975	DWG. 2-1-A-02

# GENERAL PLAN



COORDINATE OF NO.1 POWER PLANT

POINT	X	Y
Intake dam	Left bank	4495.00 / 4600.00
	Right bank	4595.00 / 4600.00
Intake		4595.00 / 4589.75
	IP-1	4695.00 / 4589.75
Headrace tunnel	IP-2	5082.90 / 4265.00
	IP-3	5777.50 / 4243.00
	IP-4	6300.00 / 4400.00
	Headrace surge tank	6400.00 / 4400.00
Penstock	Vertical shaft	6435.00 / 4400.00
	Y-Branch	6742.00 / 4400.00
Power station		6802.00 / 4400.00
Outlet	A	6822.00 / 4400.00
	B	6720.00 / 4125.00

JAPAN INTERNATIONAL COOPERATION AGENCY

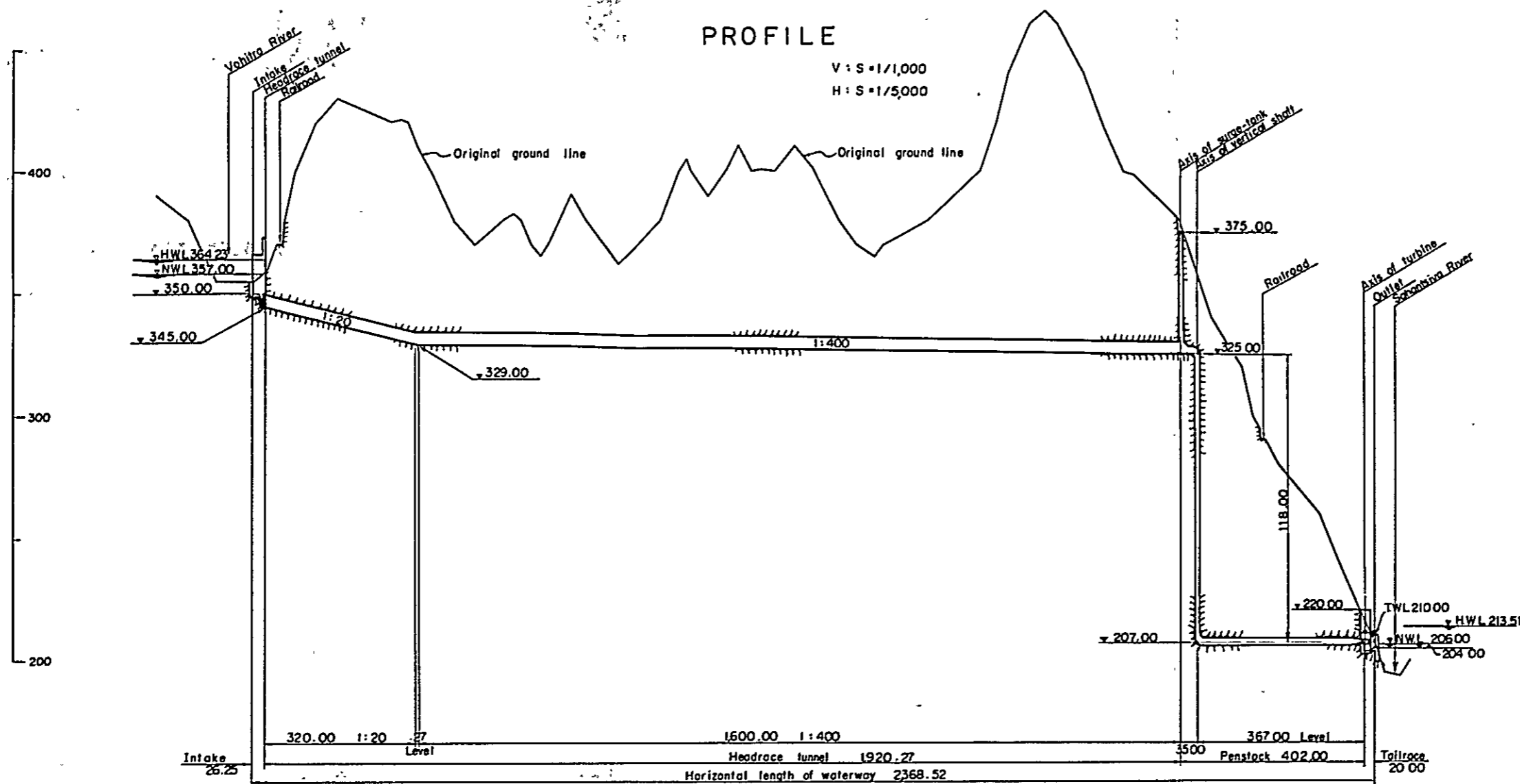
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT

ANDEKALEKA POWER PLANT  
2-1-B POWER PLANT  
GENERAL PLAN

DATE | MAR. 1975 | DWG. | 2-1-B-01

# PROFILE

V : S = 1/1,000  
H : S = 1/5,000

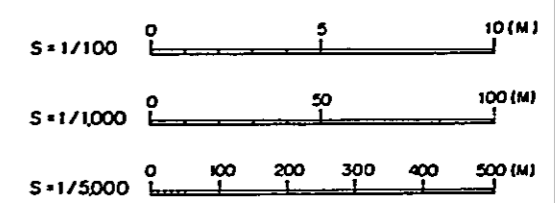
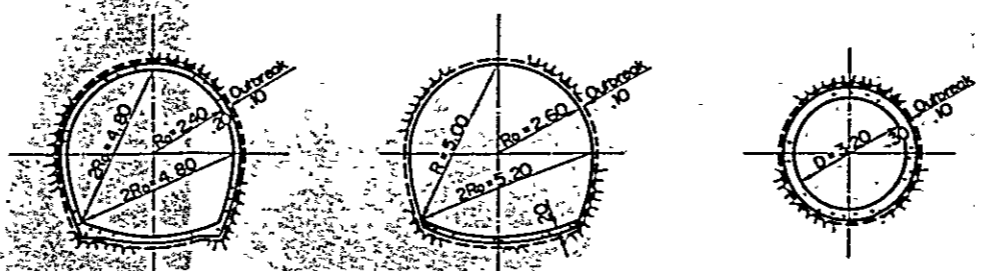


# TYPICAL SECTION

S = 1/100

HEADRACE TUNNEL

VERTICAL SHAFT



JAPAN INTERNATIONAL  
COOPERATION AGENCY  
ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT  
ANDEKALEKA POWER PLANT  
2-1-B POWER PLANT  
PROFILE & TYPICAL SECTION  
DATE: MAR. 1975 DWG: 2-1-B-02

# GENERAL PLAN

## NO. 2 POWER PLANT

### COORDINATE OF NO. 2 POWER PLANT

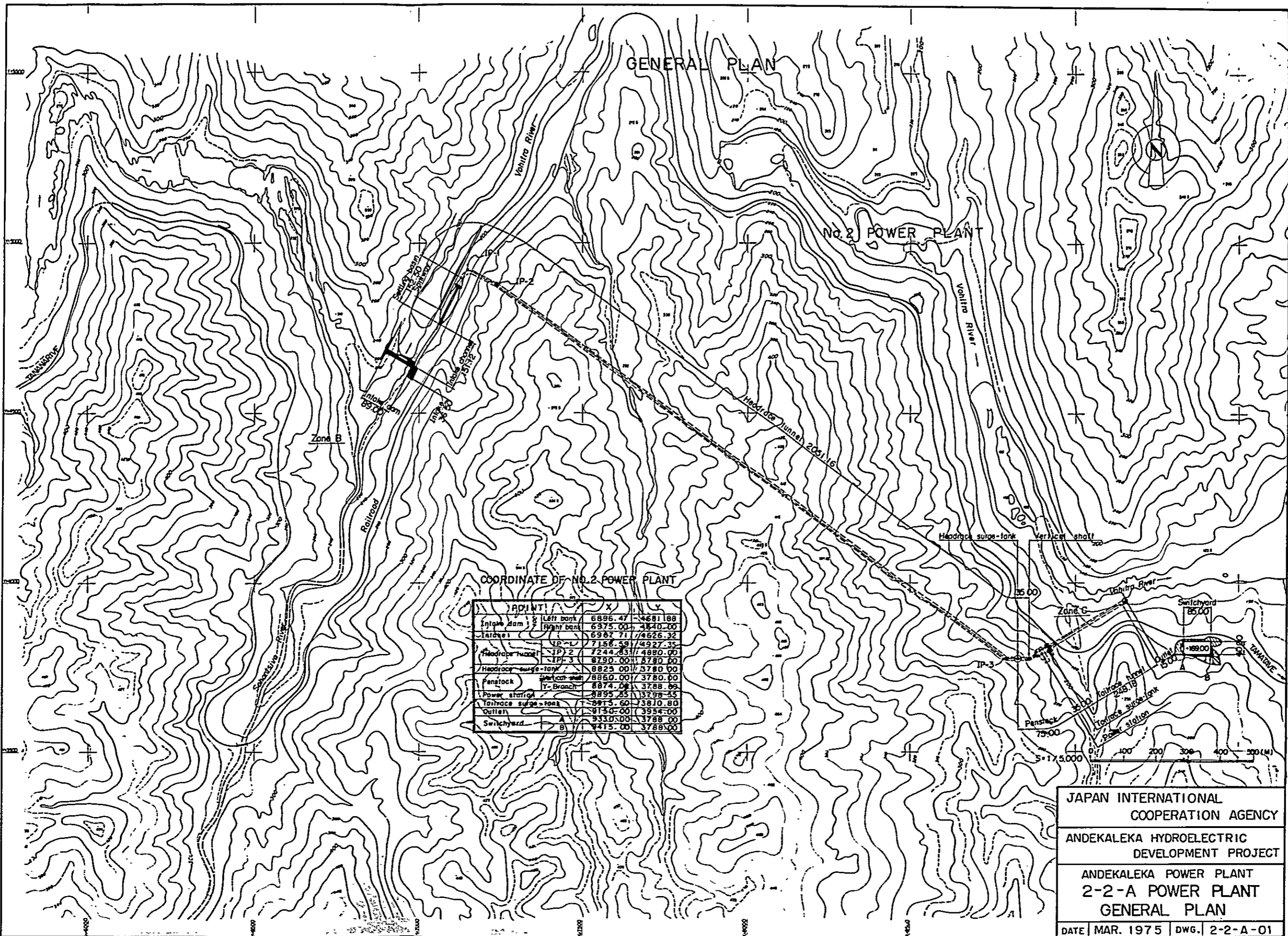
POINT		X	Y
Inflow dam	Left bank	6886.47	34681.88
	Right bank	6975.00	34240.00
Inlets	IP-1	6967.71	34626.32
	IP-2	7156.59	34927.35
Headrace tunnel	IP-2	7244.83	34880.00
	IP-3	8790.00	3780.00
Headrace surge-tank	IP-1	8823.00	3780.00
	IP-2	8860.00	3780.00
Penstock	IP-Branch	8874.00	3788.69
	IP-2	8895.25	3799.45
Tailrace surge-tank		8913.60	3810.80
Outlet		9150.00	3954.00
Switchyard		9310.00	3788.00

JAPAN INTERNATIONAL  
COOPERATION AGENCY

ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT

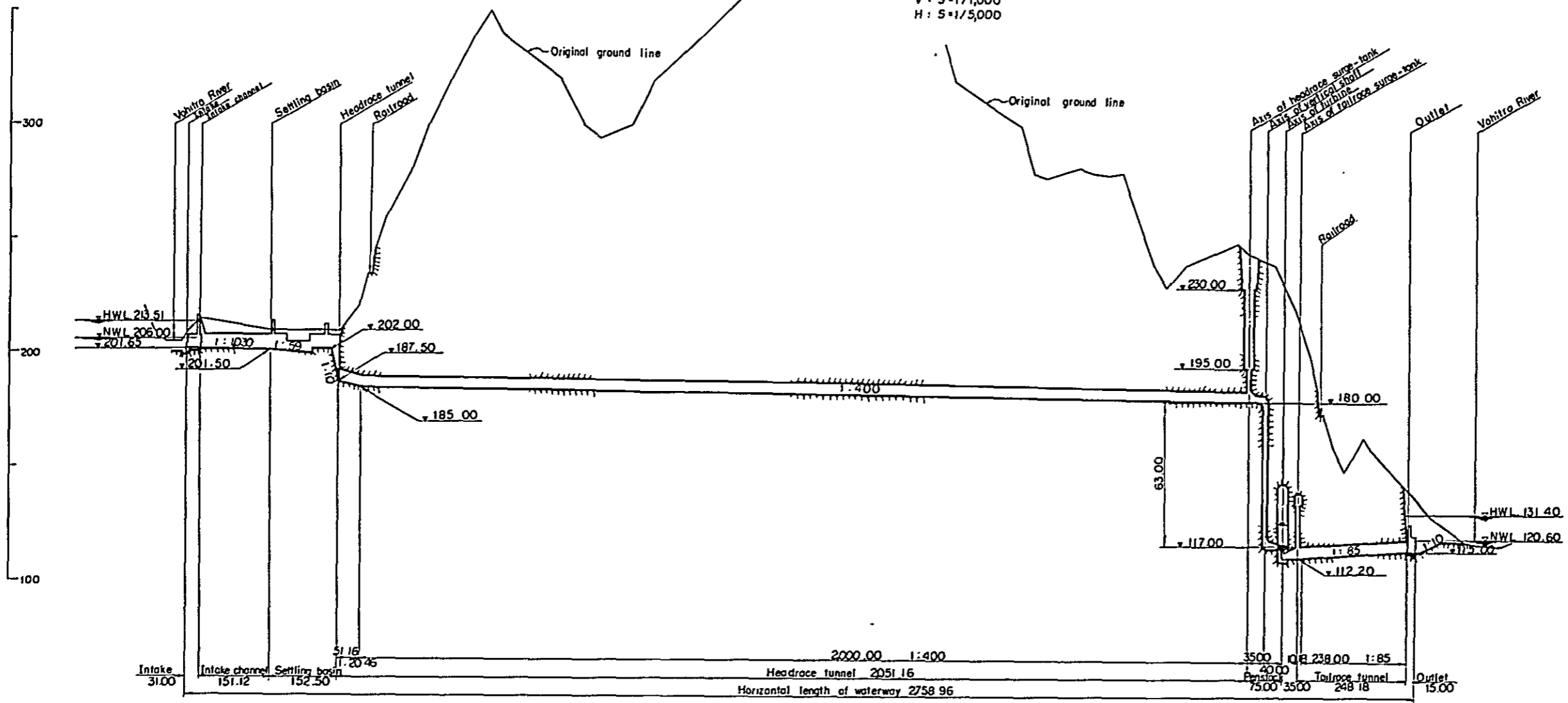
ANDEKALEKA POWER PLANT  
2-2-A POWER PLANT  
GENERAL PLAN

DATE | MAR. 1975 | DWG. | 2-2-A-01



# PROFILE

V: S=1/1,000  
H: S=1/5,000

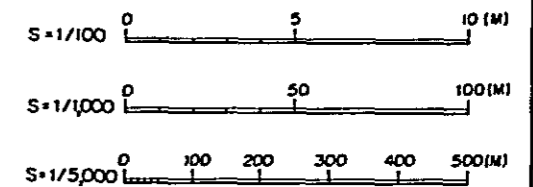
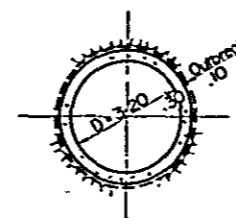
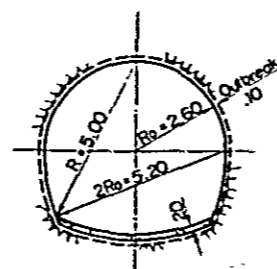
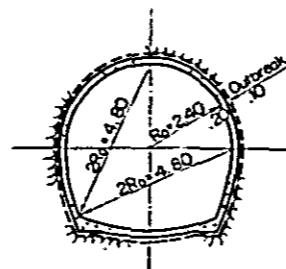


# TYPICAL SECTION

S=1/100

HEADRACE TUNNEL AND TAILRACE

VERTICAL SHAFT



JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA POWER PLANT 2-2-A POWER PLANT PROFILE & TYPICAL SECTION	
DATE	MAR. 1975
DWG.	2-2-A-02

# GENERAL PLAN

## NO. 2 POWER PLANT

COORDINATE OF NO. 2 POWER PLANT

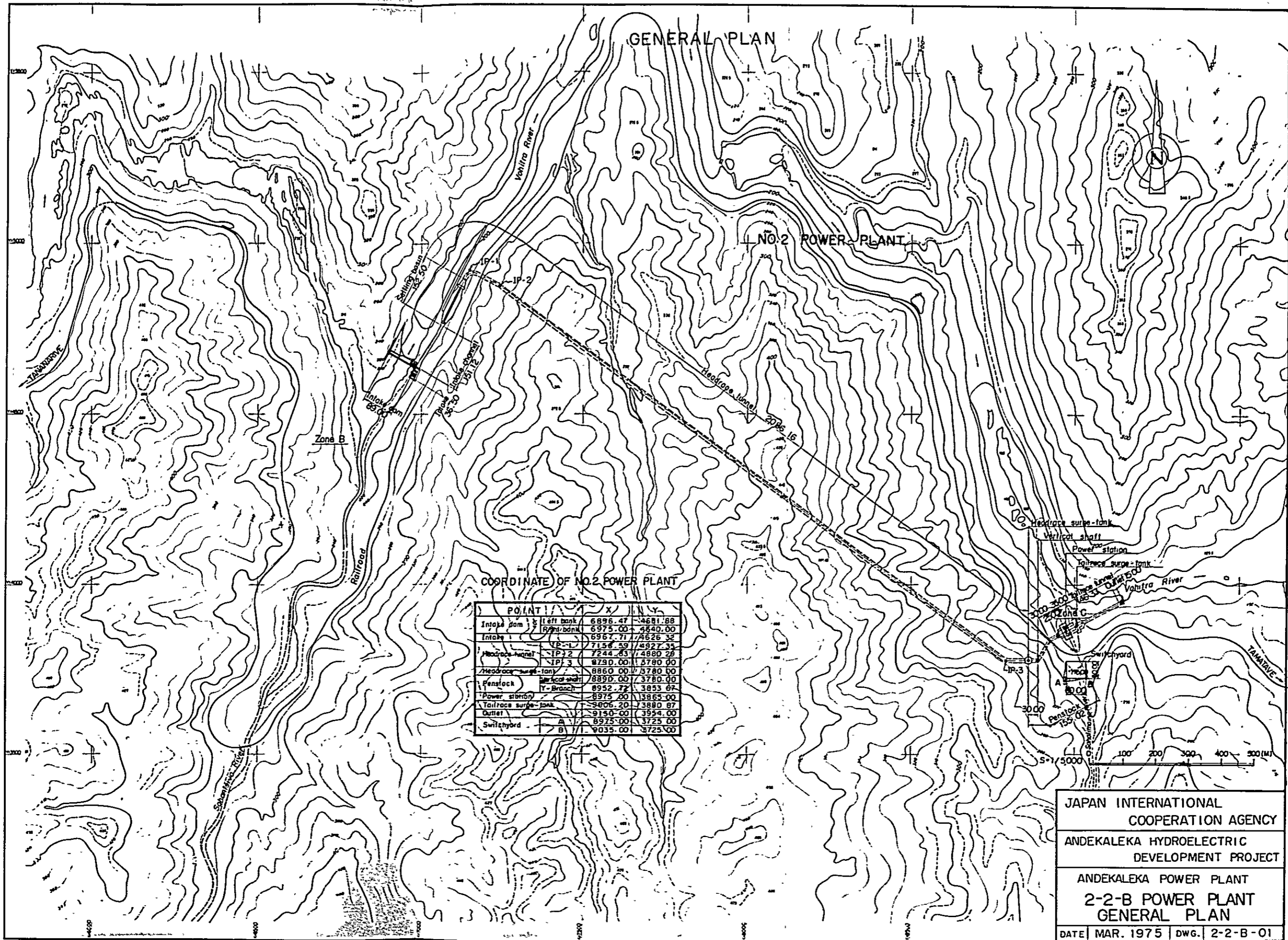
POINT	X	Y
Intake dam Left bank	6896.47	34681.88
Intake dam Right bank	6975.00	34640.00
Intake	6957.71	34626.32
Headrace tunnel	IP-1	7156.59 / 34927.35
	IP-2	7244.83 / 34880.28
	IP-3	8730.00 / 3780.00
Headrace surge-tank	8860.00	3780.00
Penstock Vertical shaft	8890.00	3780.00
Penstock Y-Branch	8952.72	3853.67
Power station	8975.00	3863.00
Tailrace surge-tank	9006.20	3880.87
Outlet	9150.00	3954.00
Switchyard	A	8975.00 / 3725.00
	B	9035.00 / 3725.00

JAPAN INTERNATIONAL  
COOPERATION AGENCY

ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT

ANDEKALEKA POWER PLANT  
2-2-B POWER PLANT  
GENERAL PLAN

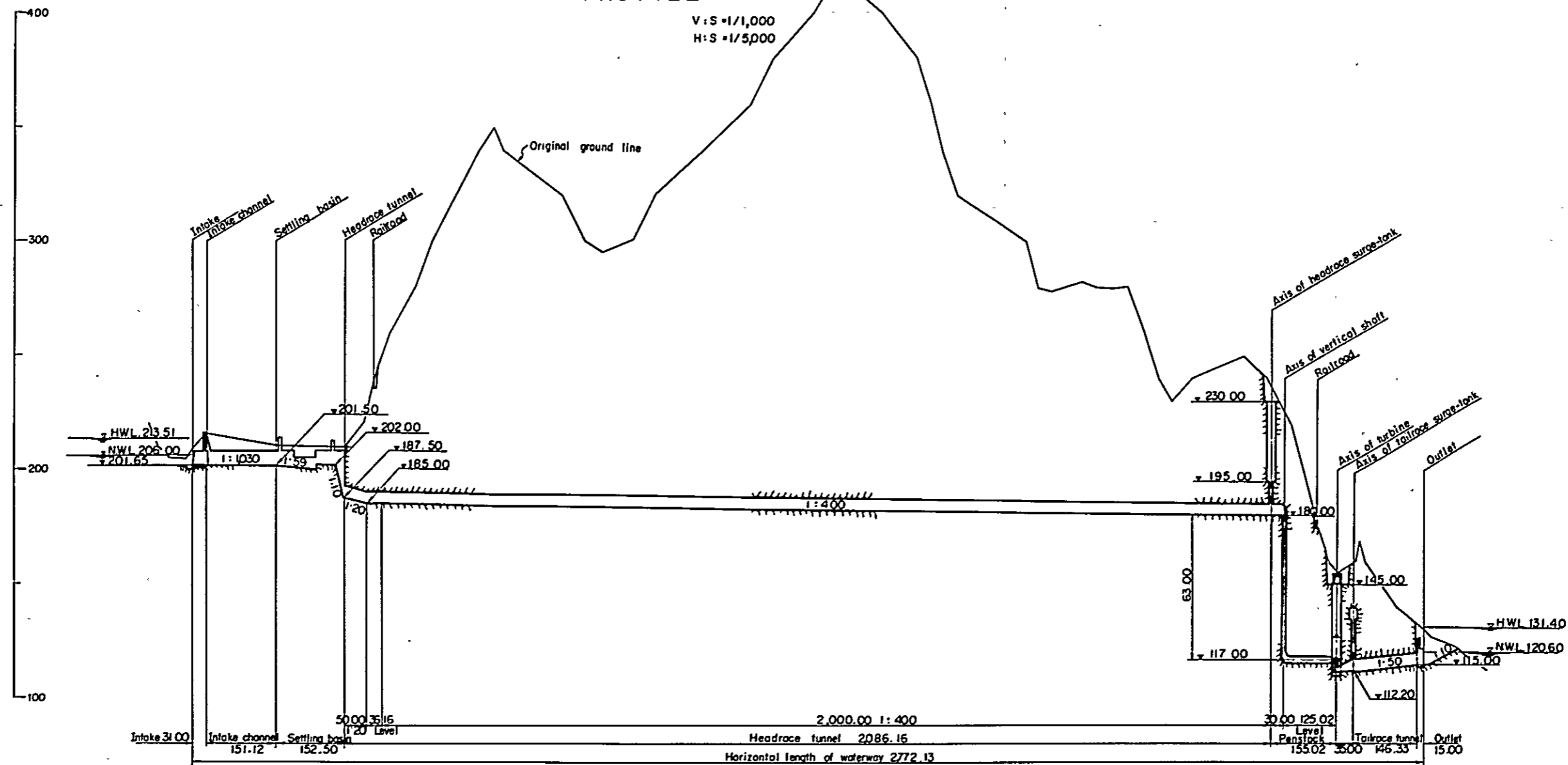
DATE | MAR. 1975 | DWG. 2-2-B-01





PROFILE

V: S = 1/1,000  
H: S = 1/5,000

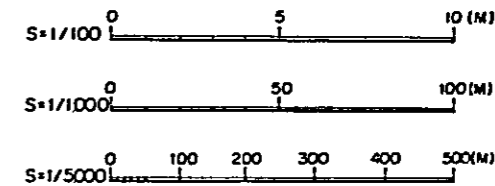
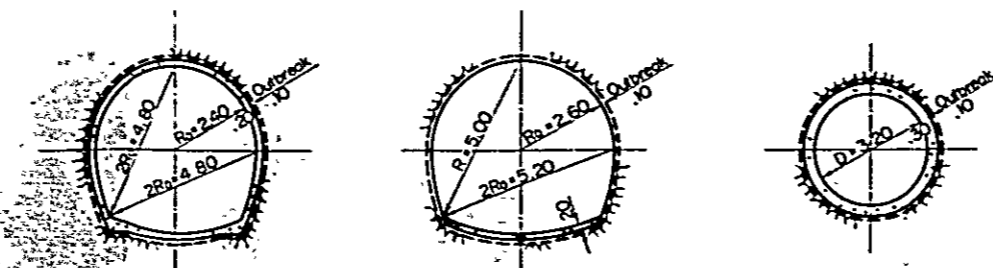


TYPICAL SECTION

S = 1/100

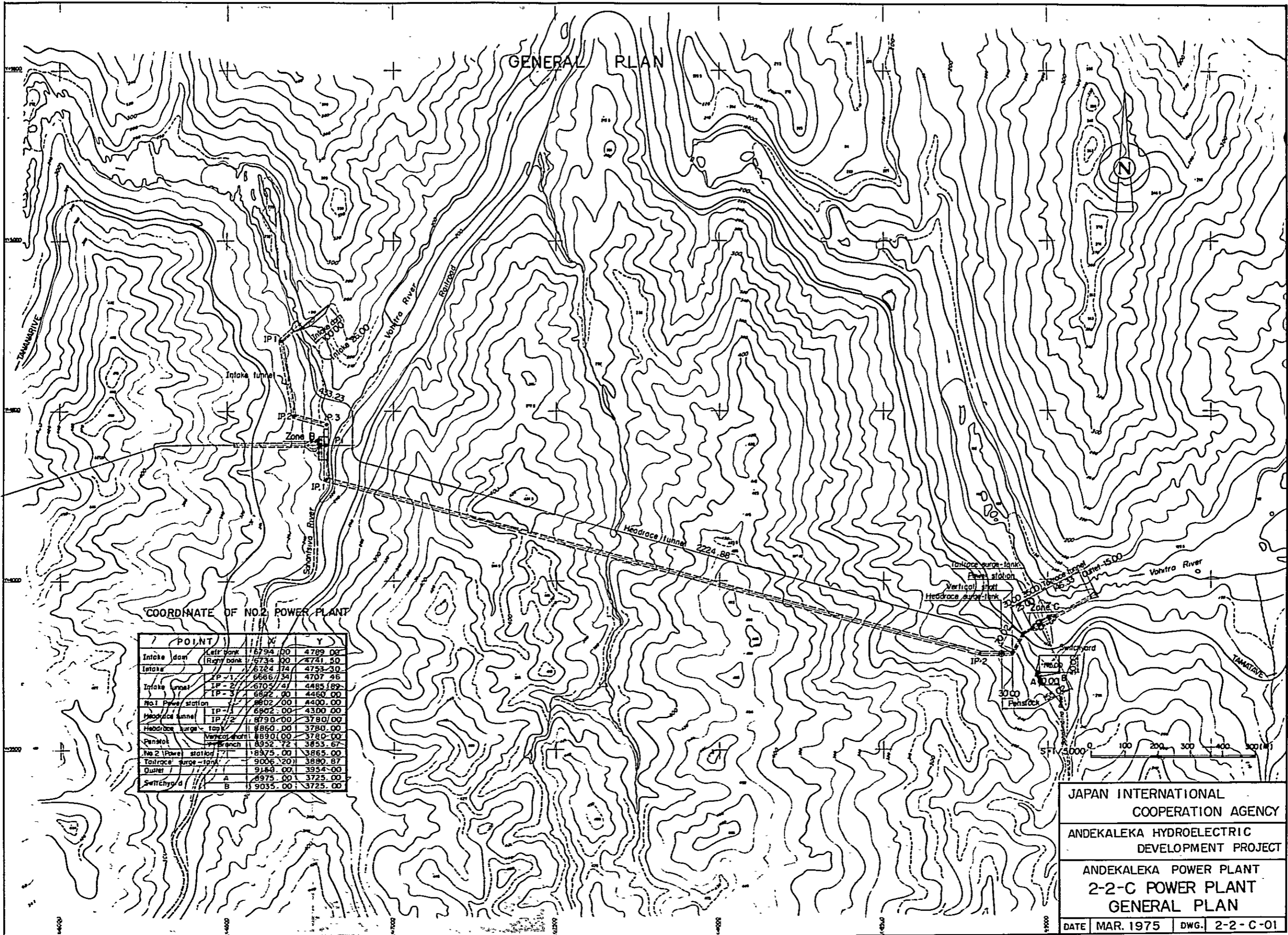
HEADRACE TUNNEL AND TAILRACE

VERTICAL SHAFT



JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA POWER PLANT 2-2-B POWER PLANT PROFILE & TYPICAL SECTION	
DATE	MAR. 1975
DWG.	2-2-B-02

# GENERAL PLAN



COORDINATE OF NO. 2 POWER PLANT

POINT	X	Y
Intake dam Left bank	6794.00	4789.00
Intake dam Right bank	6734.00	4741.50
Intake	6724.74	4753.30
Intake tunnel IP-1	6666.34	4707.96
Intake tunnel IP-2	6705.41	4485.89
Intake tunnel IP-3	6822.00	4460.00
No. 1 Power station	6902.00	4400.00
Headrace tunnel IP-1	6902.00	4300.00
Headrace tunnel IP-2	6790.00	3780.00
Headrace surge tank	6860.00	3780.00
Penstock Vertical shaft	6890.00	3780.00
Penstock Penstock	6952.72	3853.67
No. 2 Power station	8975.00	3855.00
Tailrace surge tank	9006.20	3880.87
Outlet	9163.00	3954.00
Switchyard A	8975.00	3725.00
Switchyard B	9035.00	3725.00

JAPAN INTERNATIONAL  
COOPERATION AGENCY

ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT

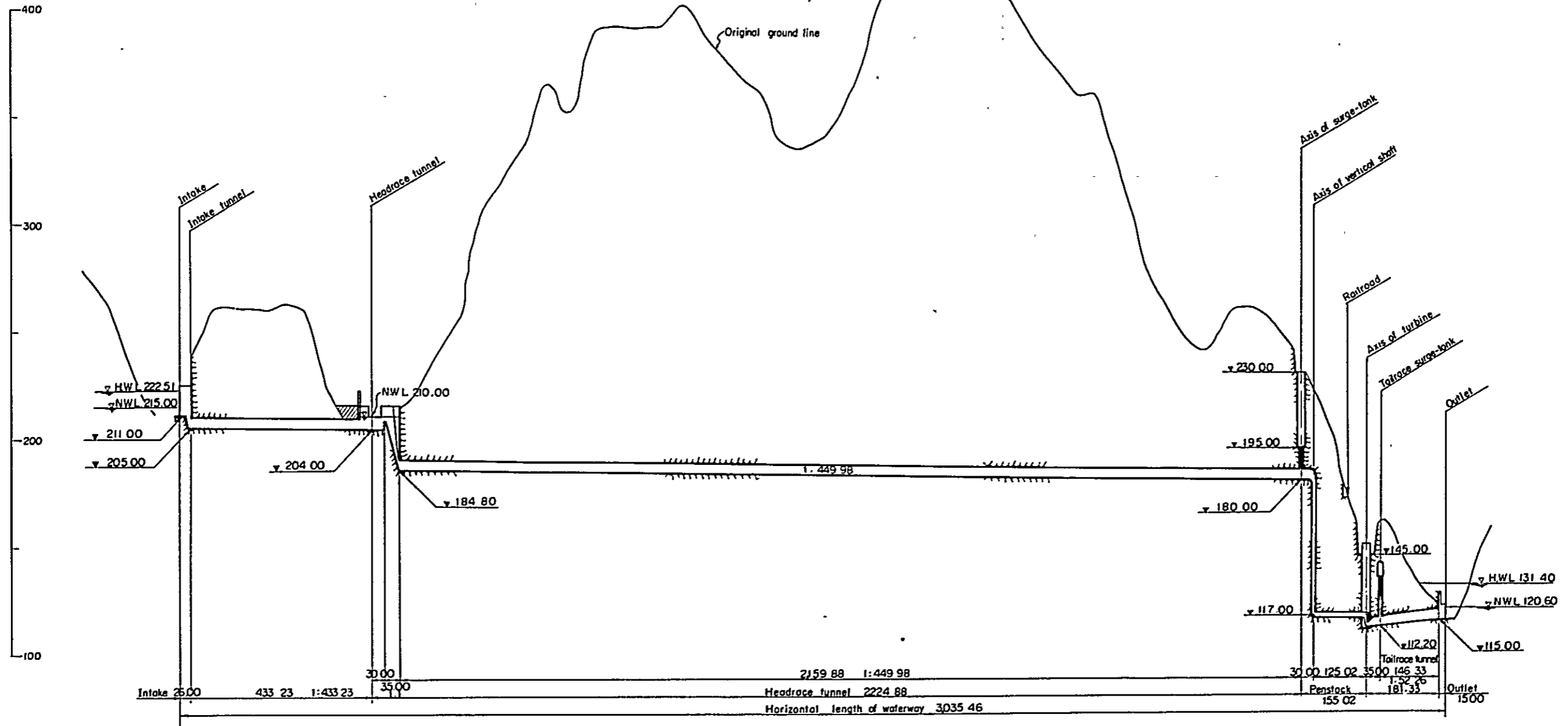
ANDEKALEKA POWER PLANT  
2-2-C POWER PLANT  
GENERAL PLAN

DATE MAR. 1975 DWG. 2-2-C-01

# PROFILE

V: S = 1/1,000  
H: S = 1/5,000

Original ground line

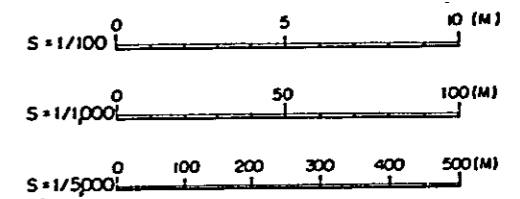
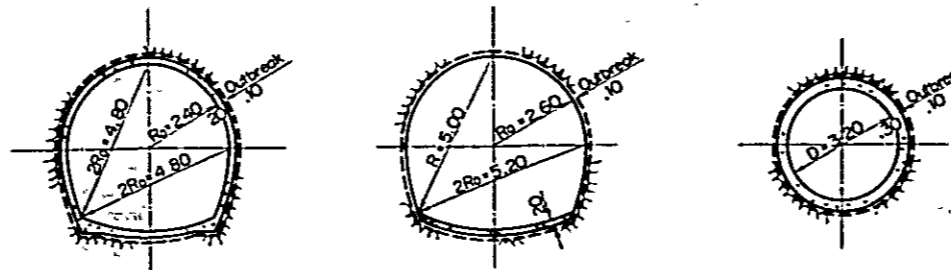


## TYPICAL SECTION

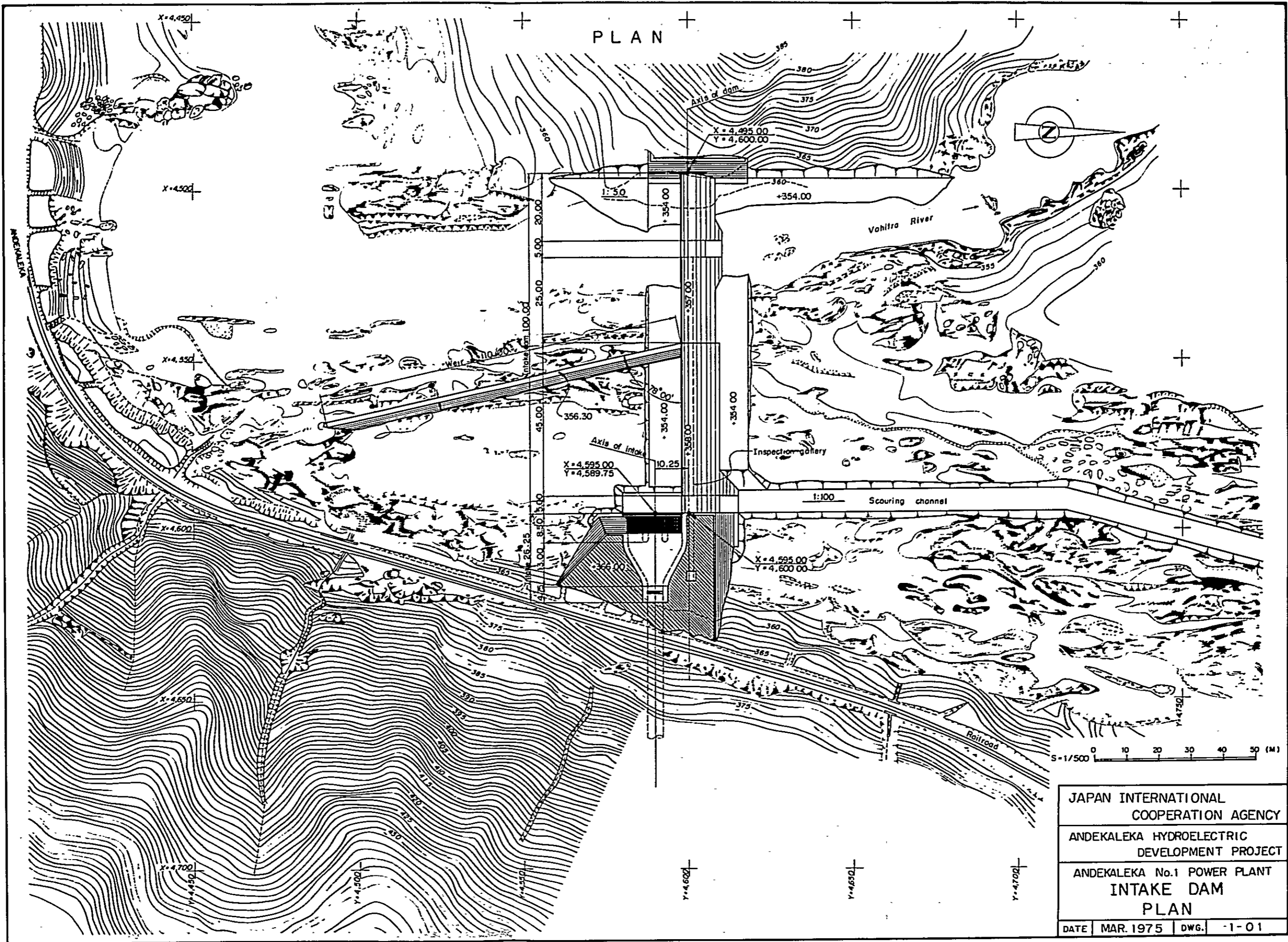
S = 1/100

HEADRACE TUNNEL AND TAILRACE

VERTICAL SHAFT

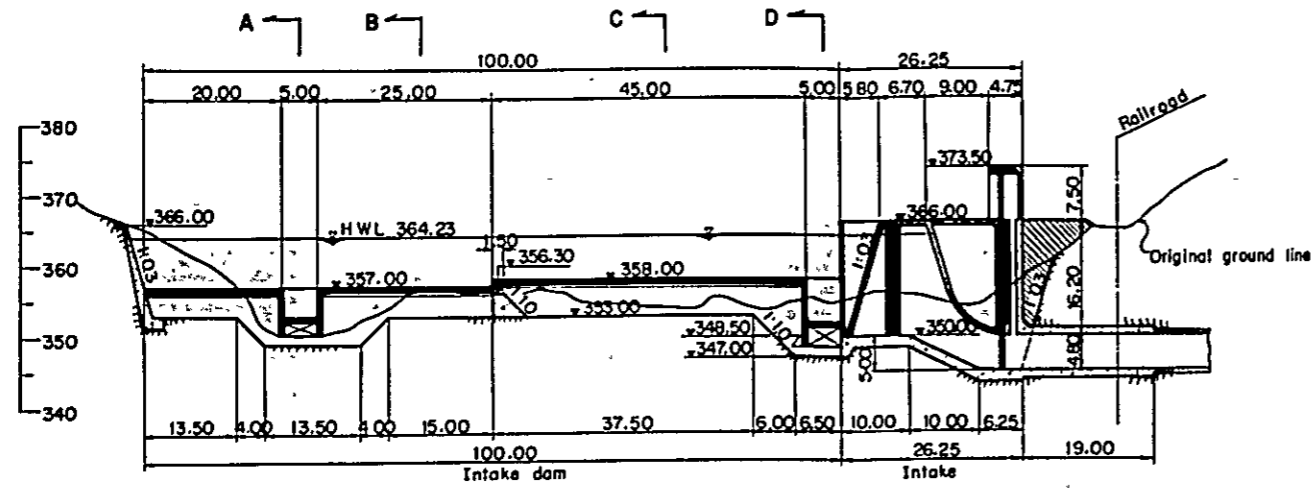


JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA POWER PLANT 2-2-C POWER PLANT PROFILE & TYPICAL SECTION	
DATE	MAR. 1975
DWG.	2-2-C-02



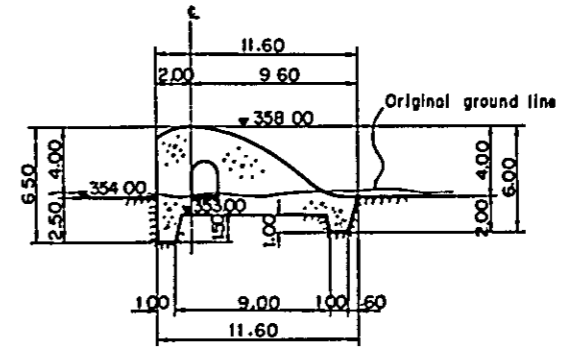
JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA No.1 POWER PLANT INTAKE DAM PLAN	
DATE	MAR. 1975
DWG.	-1-01

PROFILE S=1/500

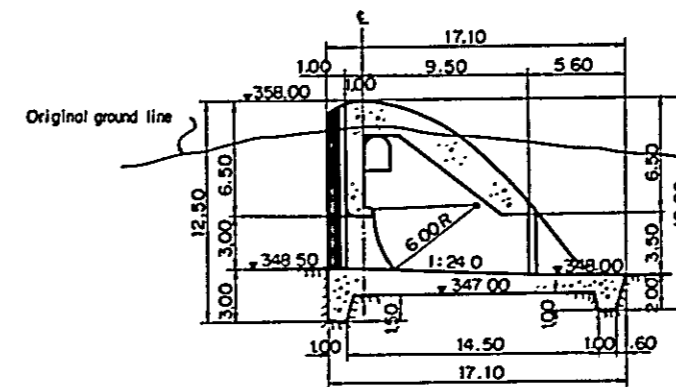


A B C D

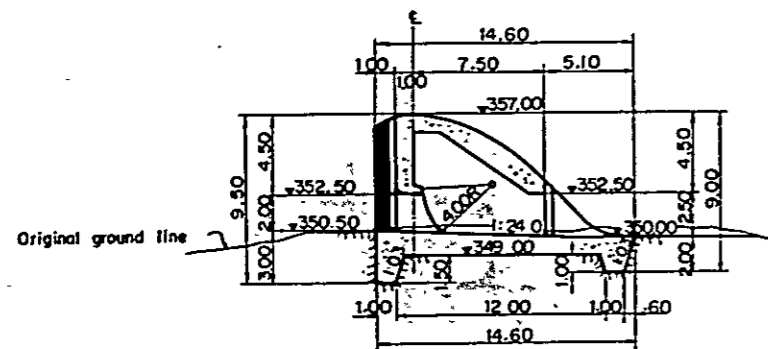
C - C S=1/200



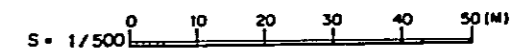
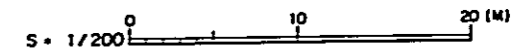
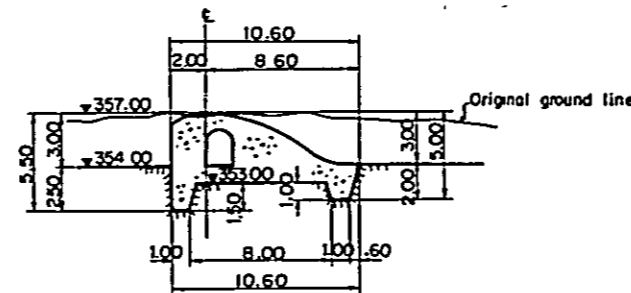
D - D S=1/200



A - A S=1/200

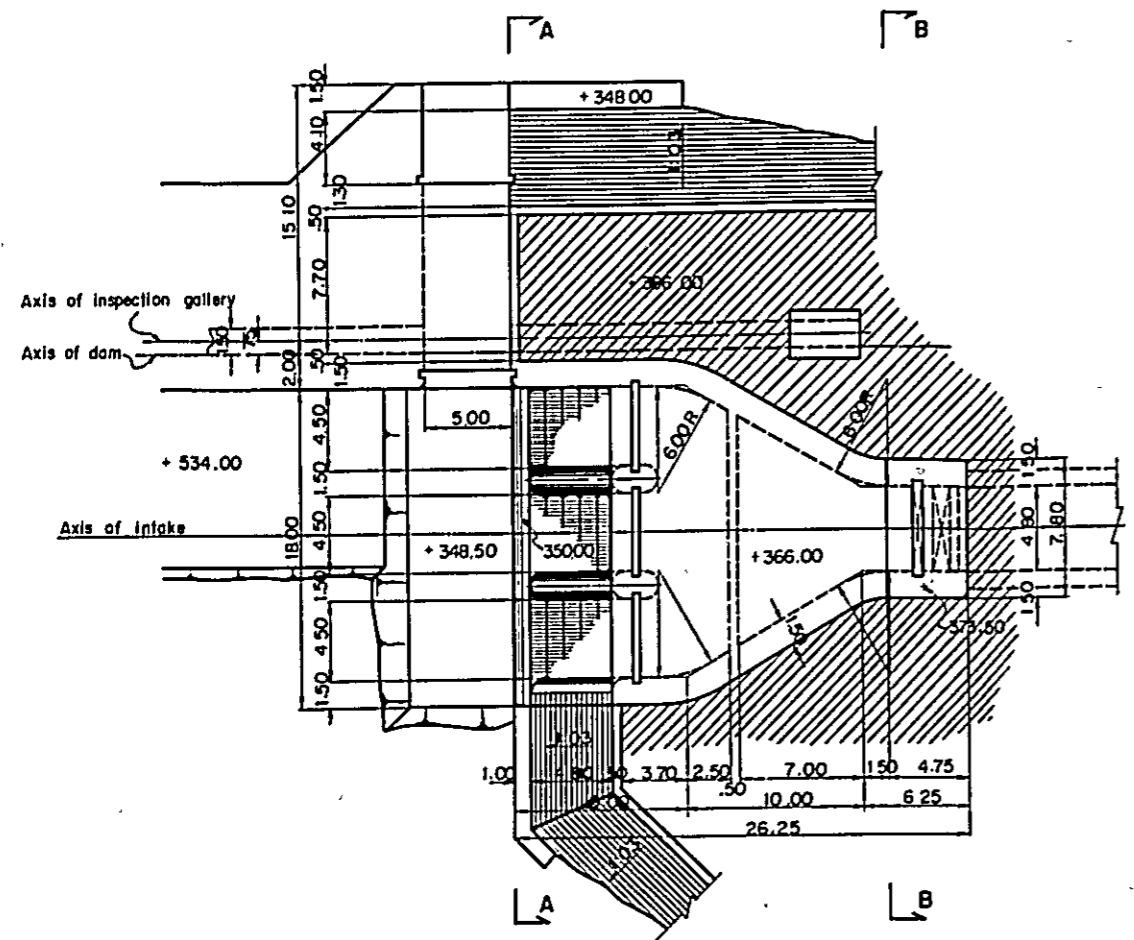


B - B S=1/200

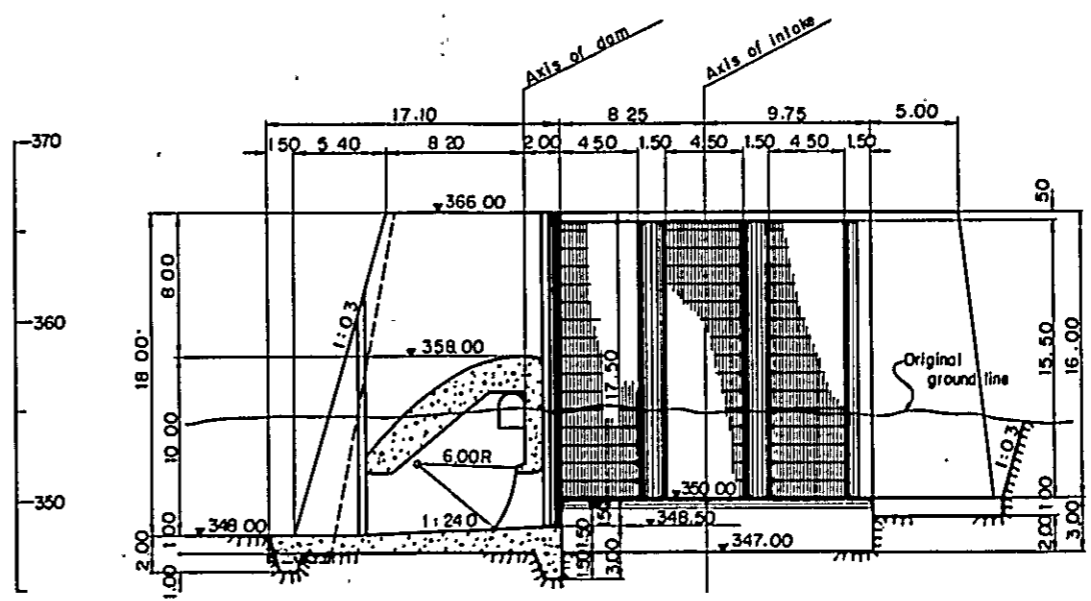


JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No.1 POWER PLANT INTAKE DAM PROFILE & SECTION		
DATE	MAR. 1975	DWG. 1-02

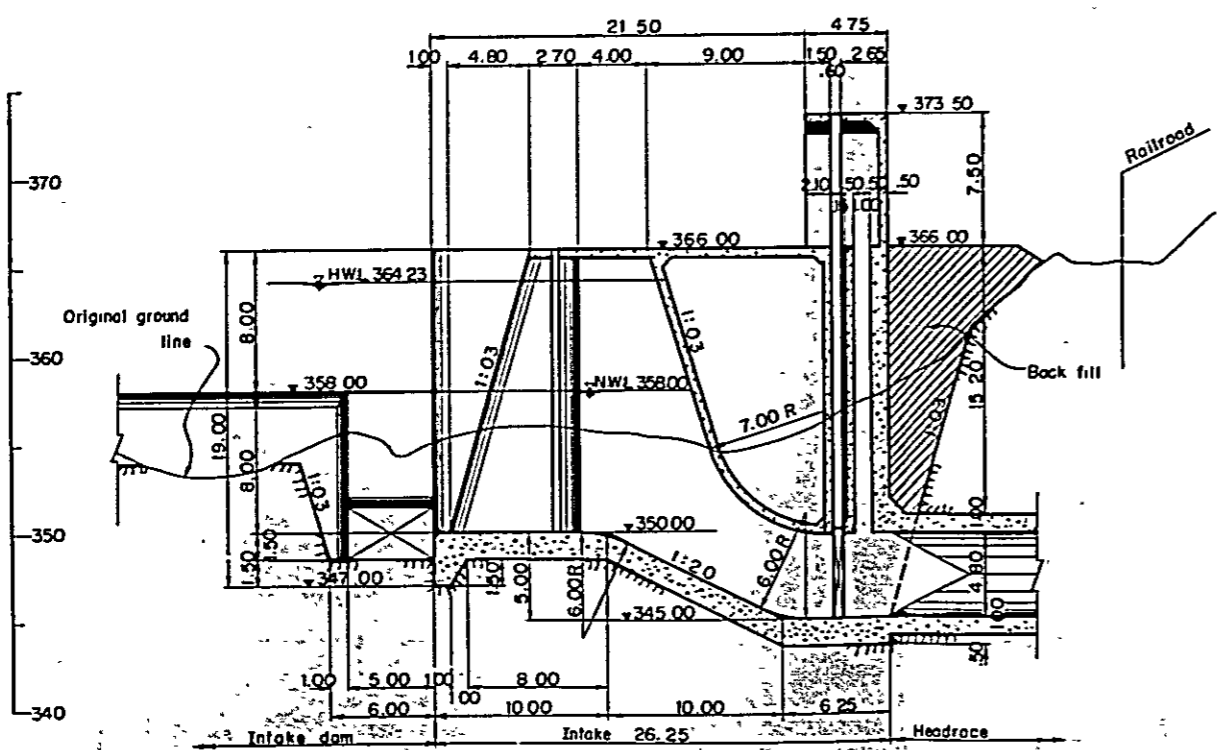
**PLAN**



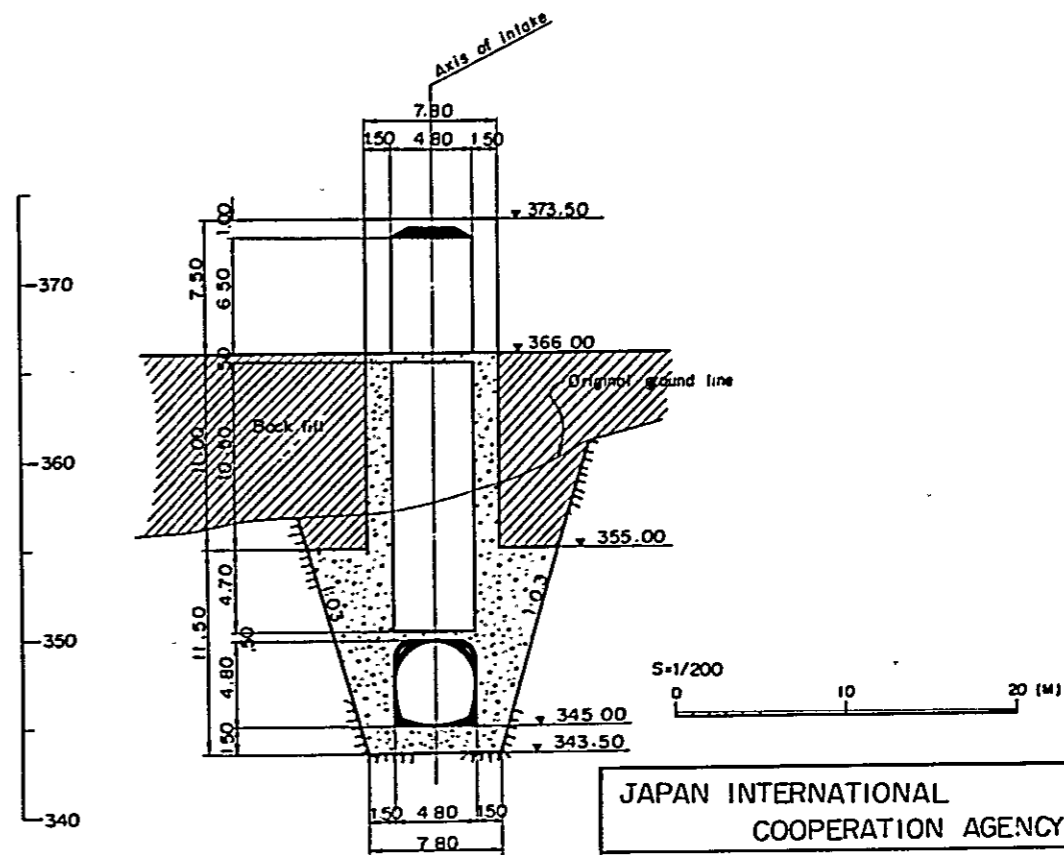
**A - A**



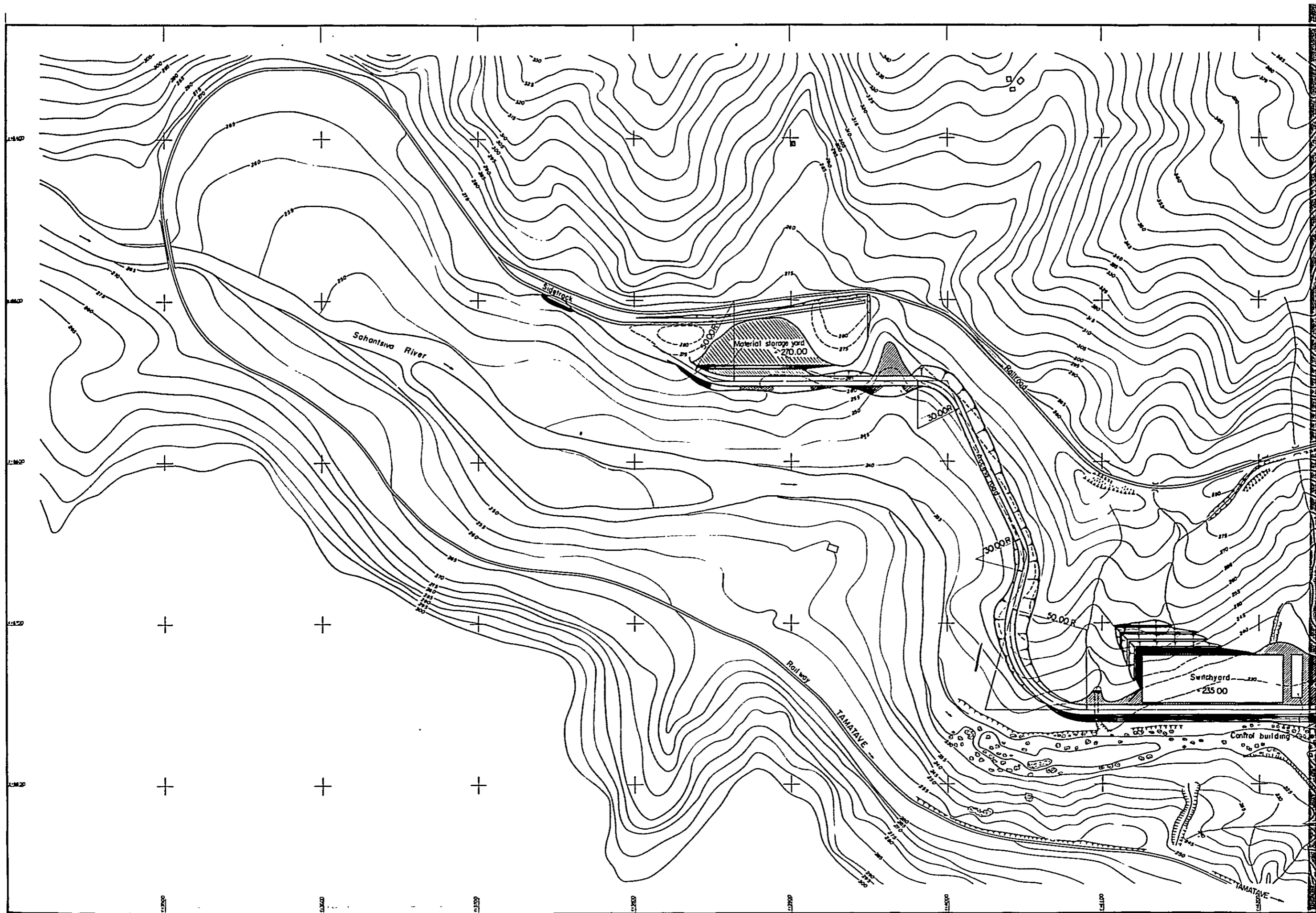
**PROFILE**

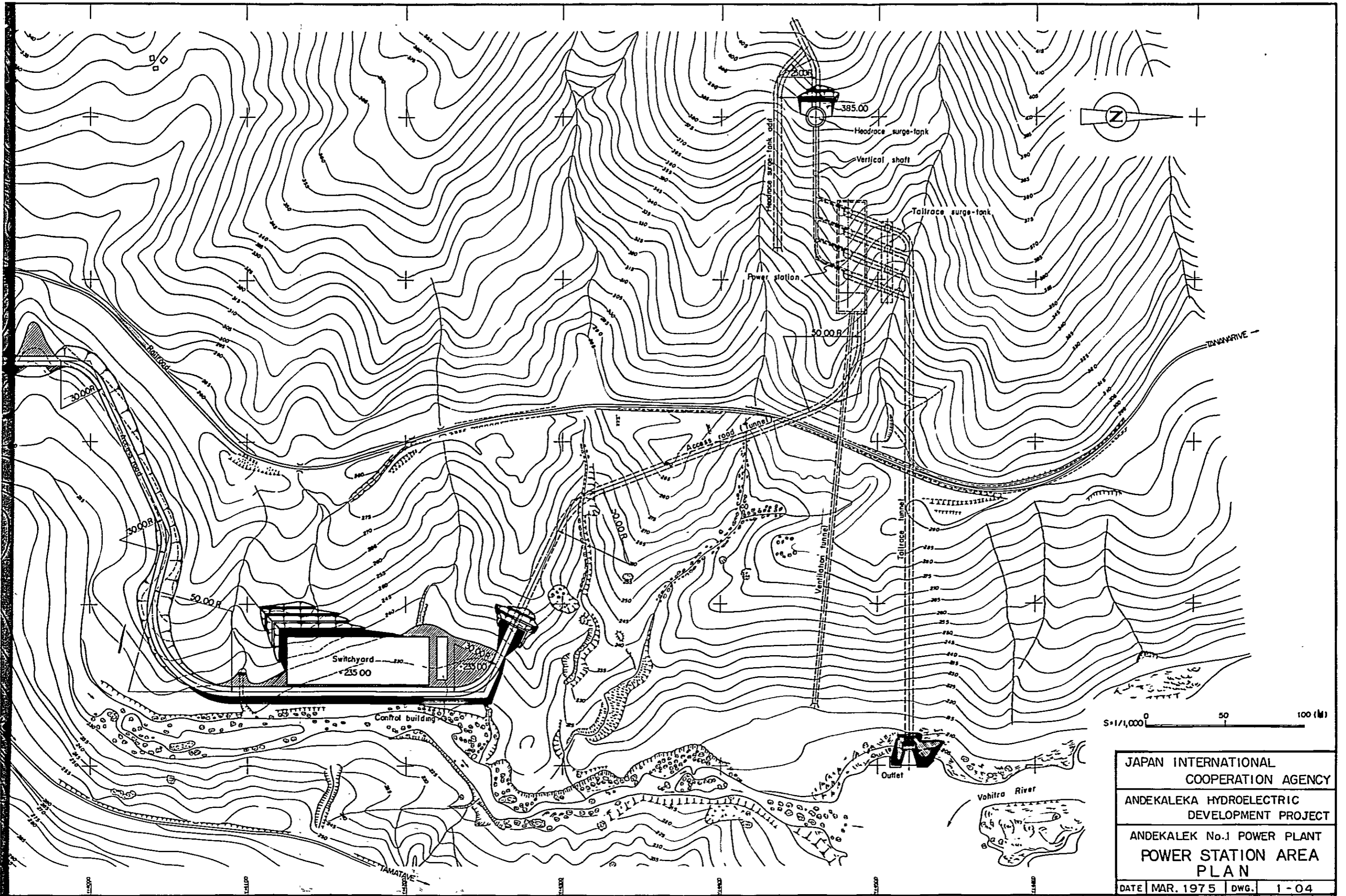


**B - B**



JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No.1 POWER PLANT INTAKE		
<b>PLAN &amp; SECTION</b>		
DATE	MAR. 1975	DWG. 1-03

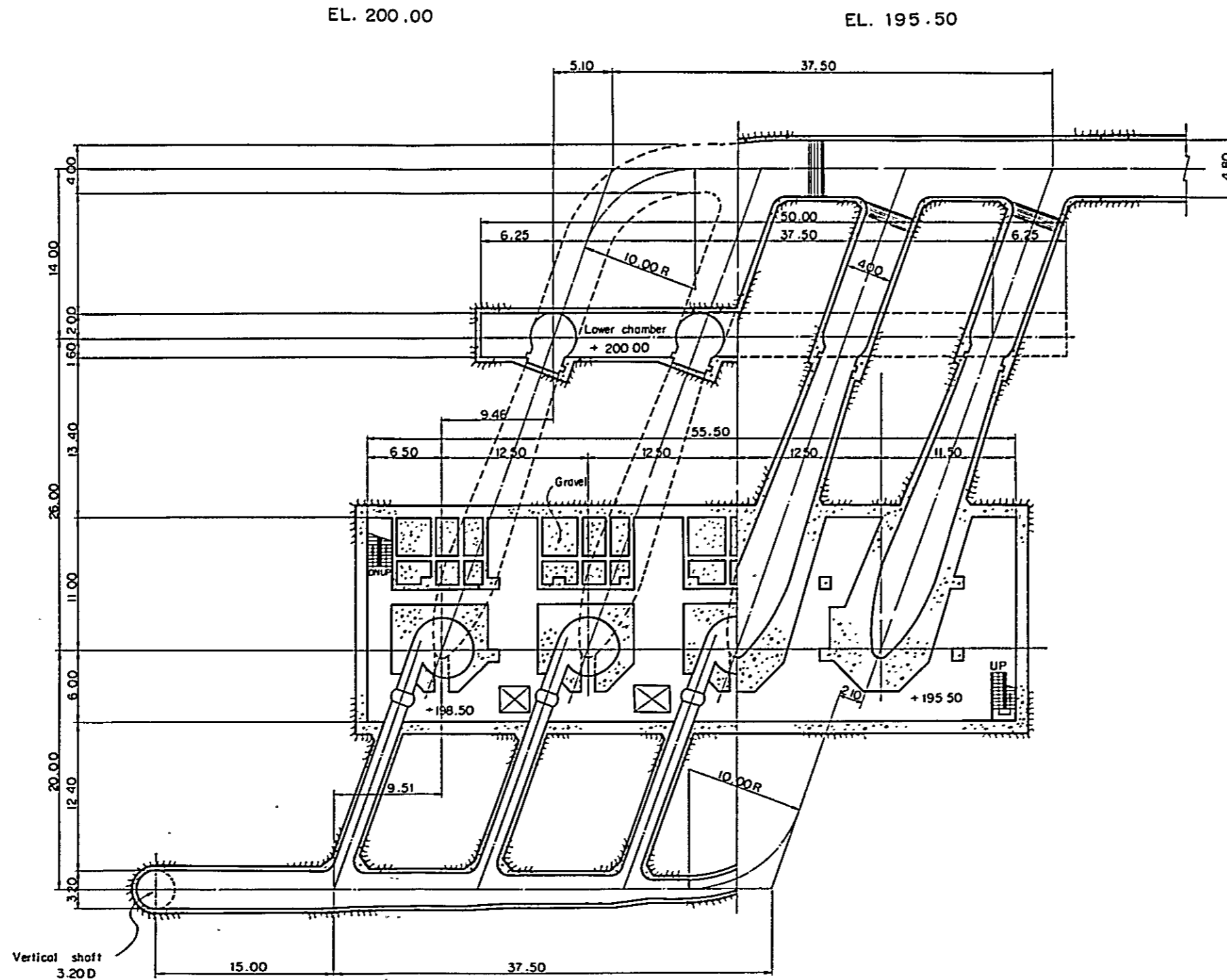




JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEK No.1 POWER PLANT		
POWER STATION AREA PLAN		
DATE	MAR. 1975	DWG. 1-04

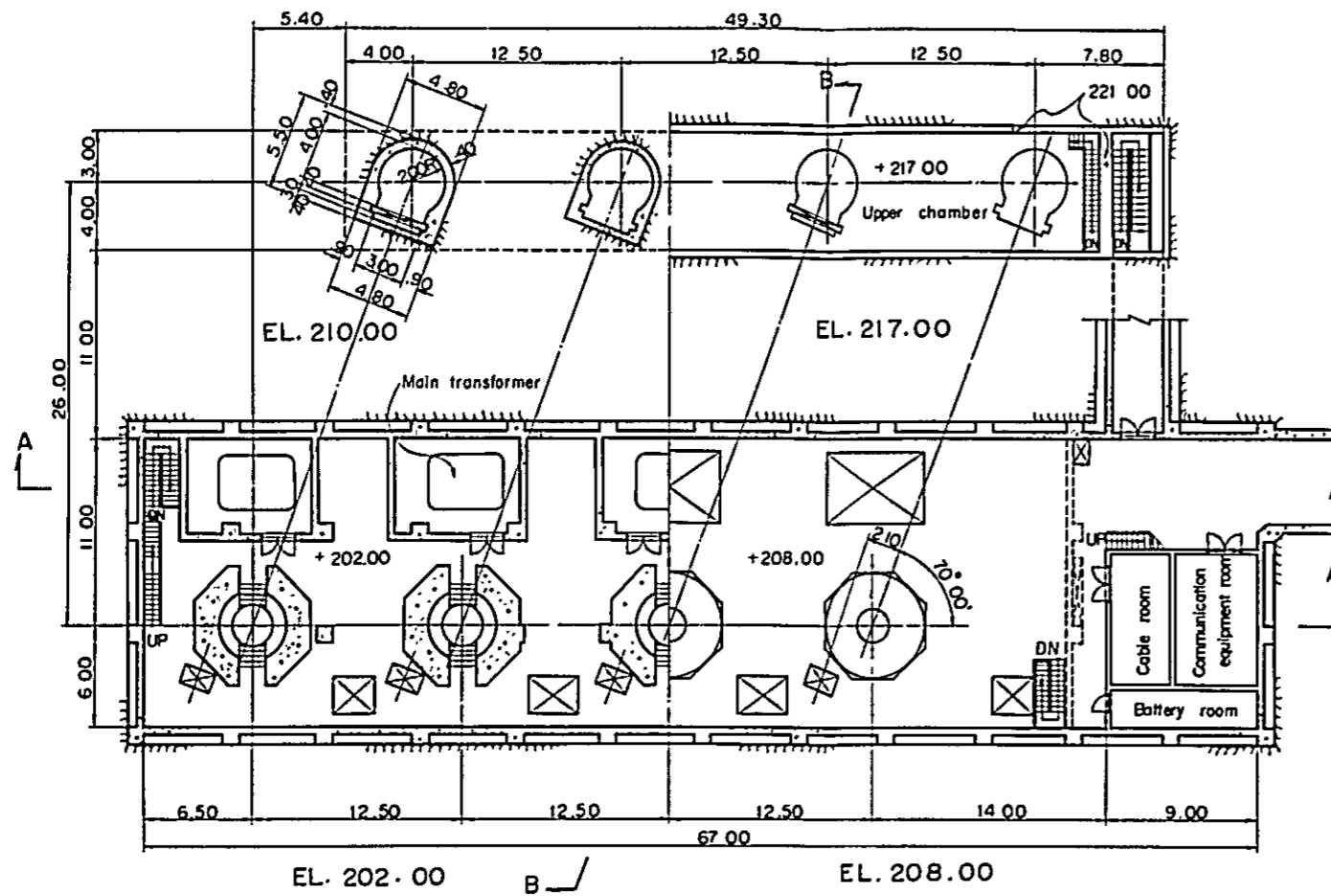


PLAN - 1

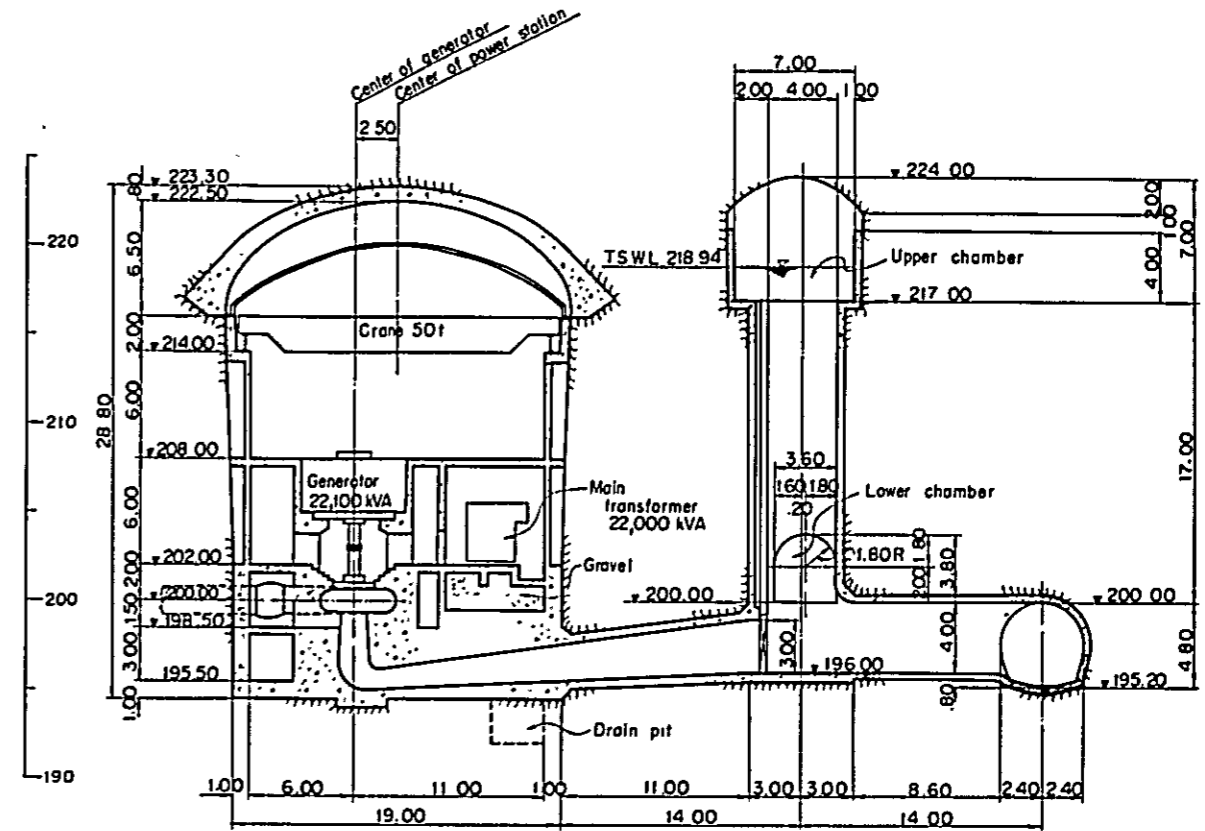


JAPAN INTERNATIONAL COOPERATION AGENCY			
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT			
ANDEKALEKA No.1 POWER PLANT			
POWER STATION			
PLAN - 1			
DATE	MAR. 1975	DWG.	1 - 05

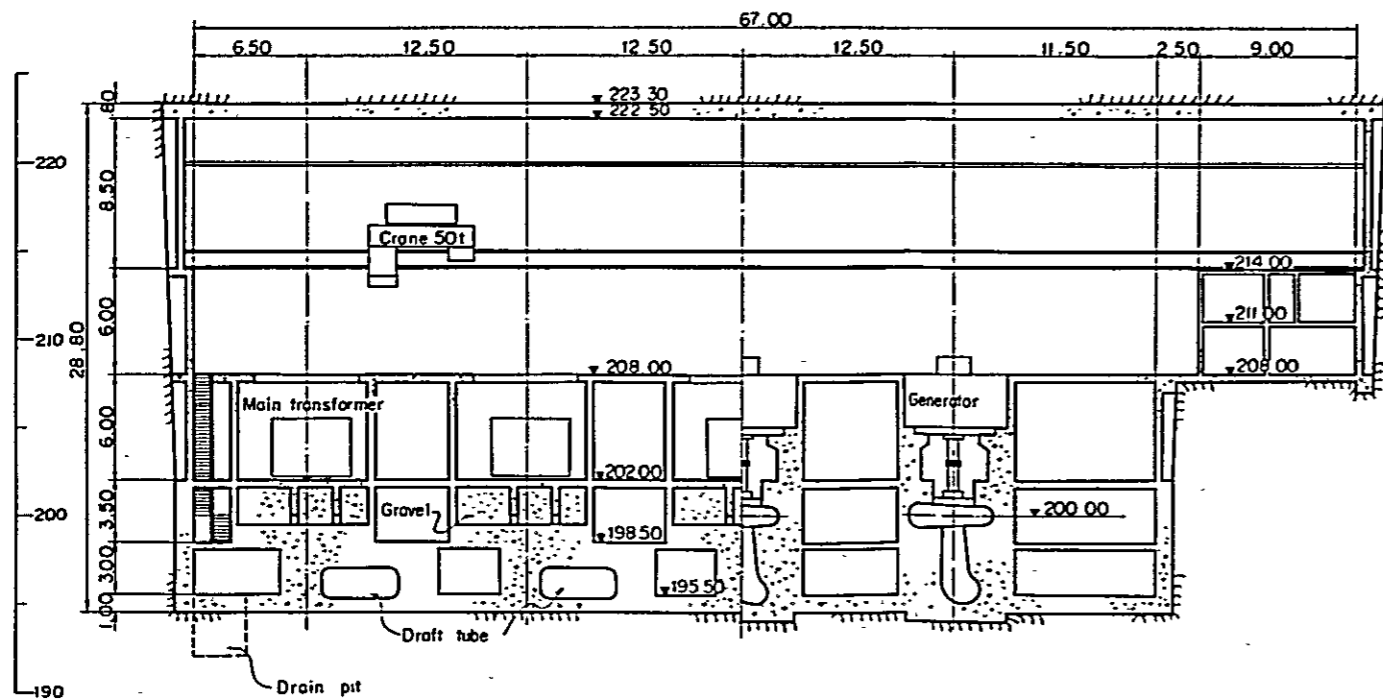
PLAN - 2



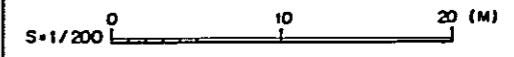
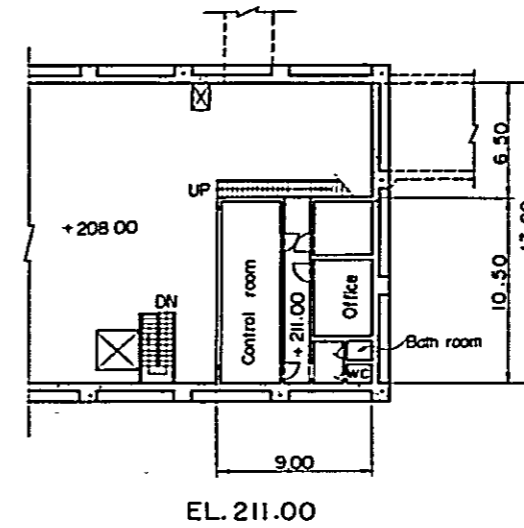
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A - A

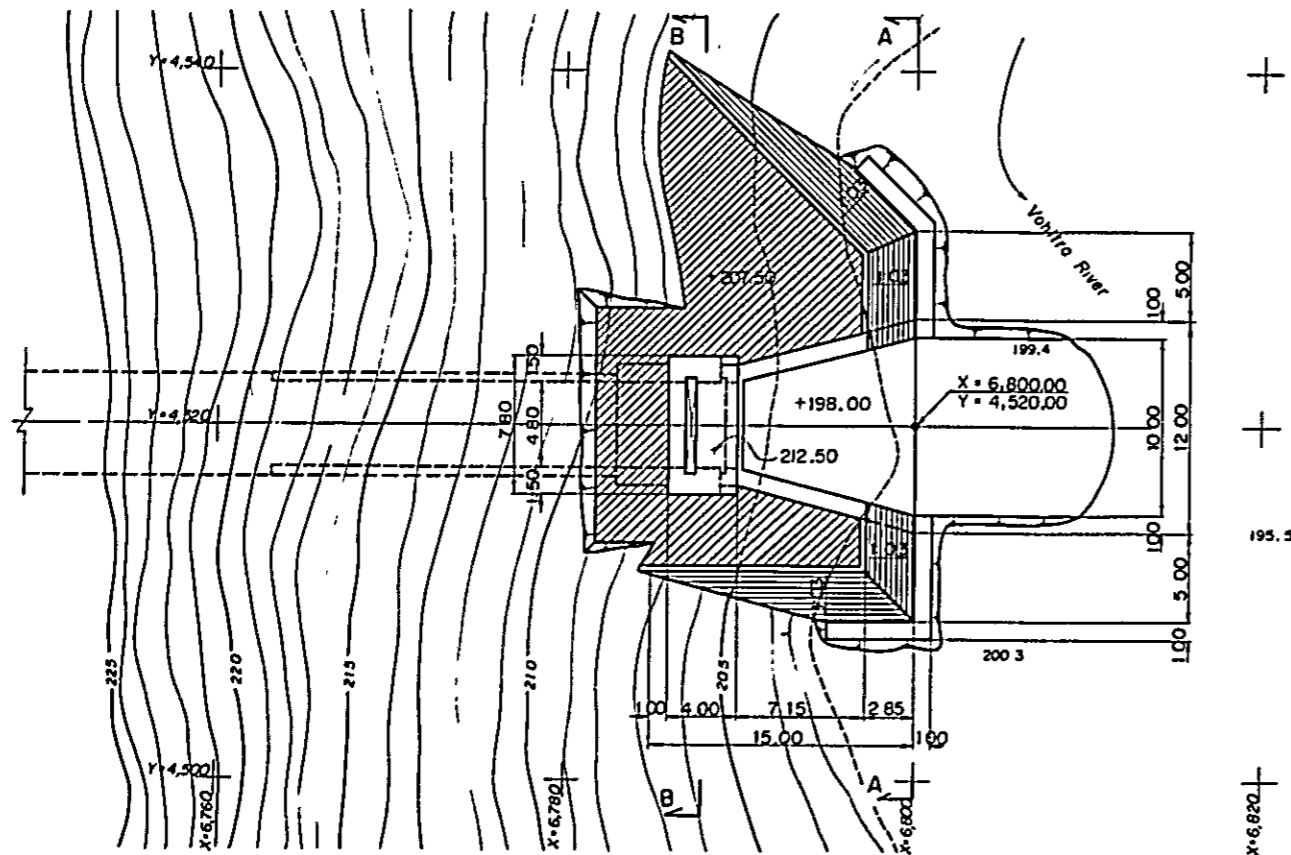


PLAN - 3

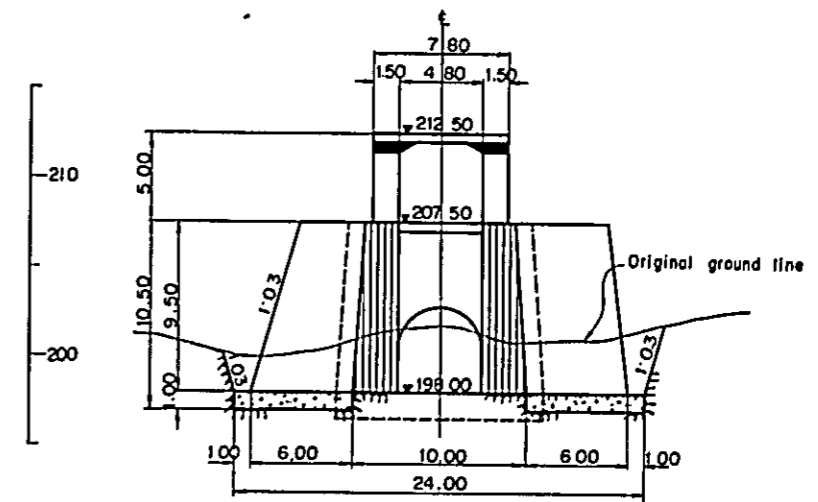


JAPAN INTERNATIONAL  
COOPERATION AGENCY  
ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT  
ANDEKALEKA No.1 POWER PLANT  
POWER STATION  
PLAN-2, PLAN-3 & SECTION  
DATE | MAR. 1975 | DWG | 1 - 06

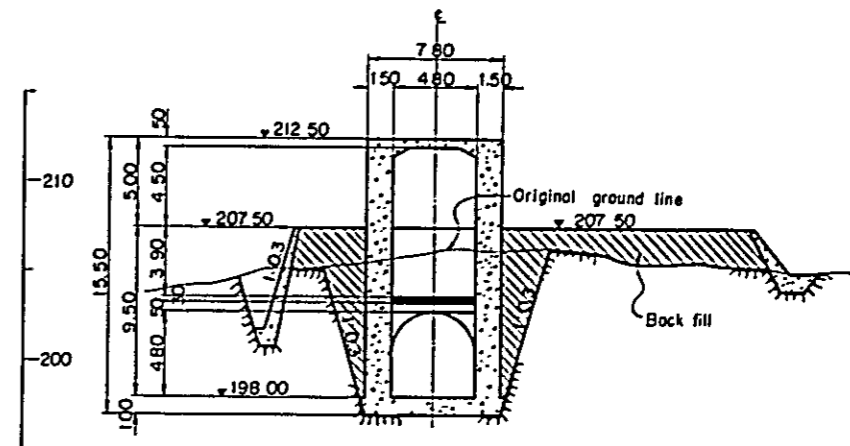
PLAN



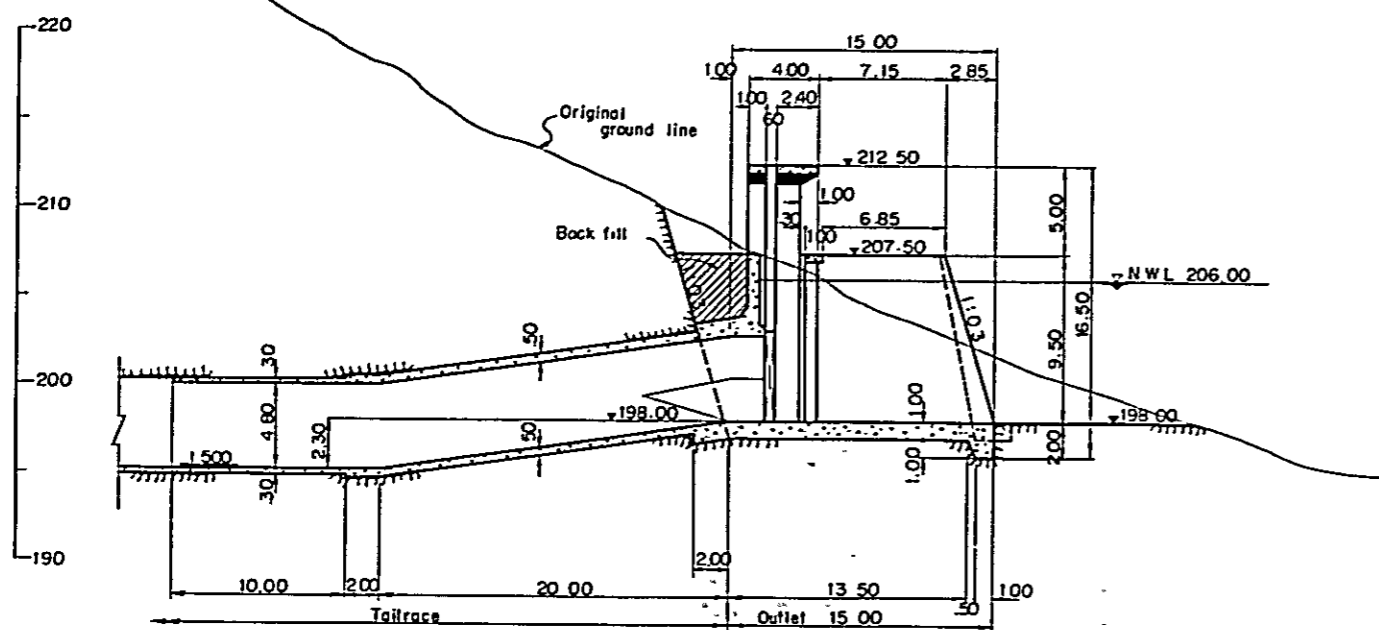
A - A



B - B



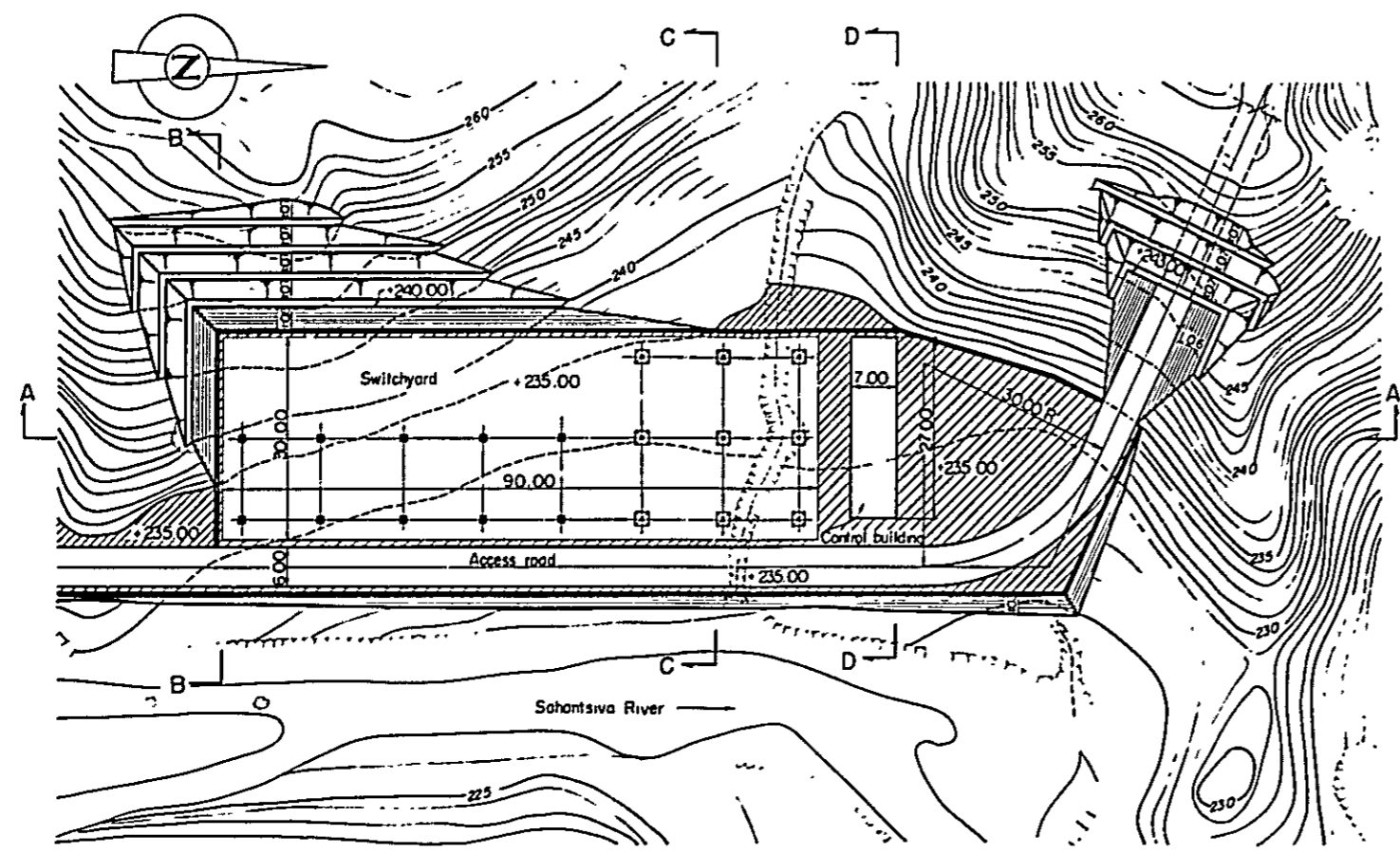
PROFILE



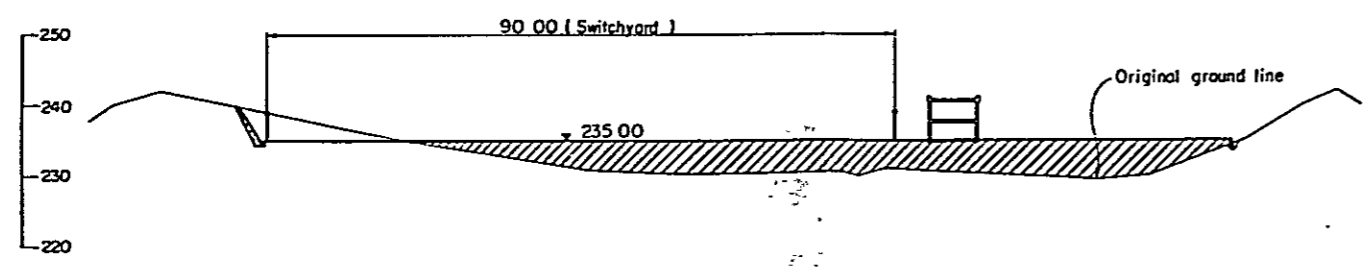
S = 1/200 0 10 20 (M)

JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No 1 POWER PLANT		
OUTLET		
PLAN & SECTION		
DATE	MAR. 1975	DWG. 1-07

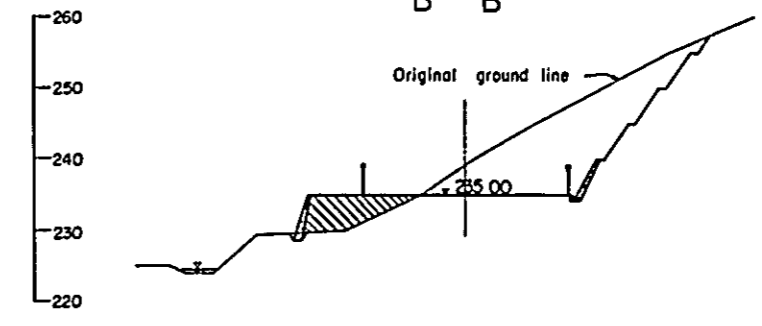
PLAN



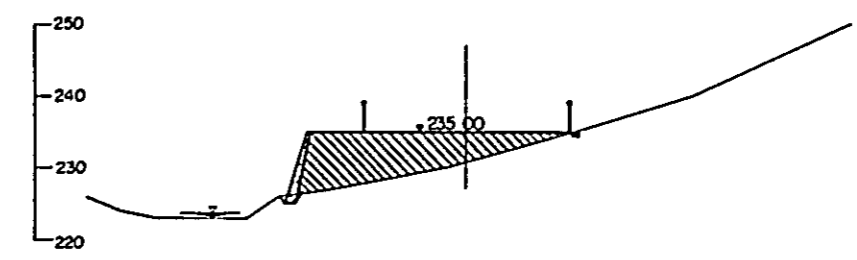
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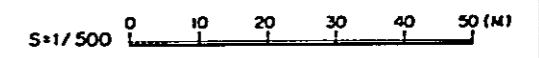
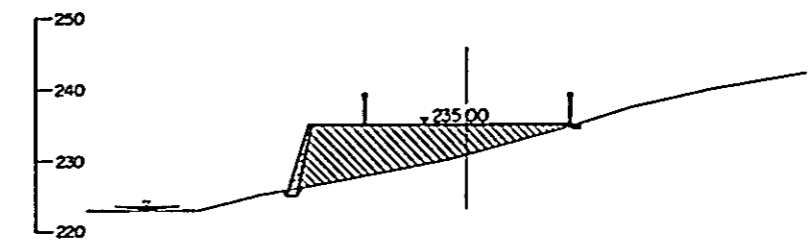
B - B



C - C

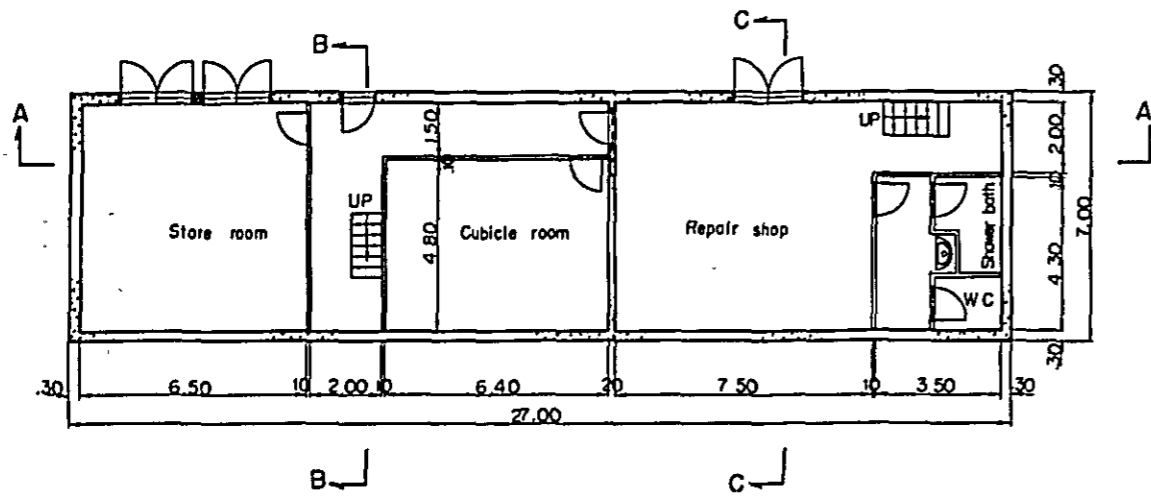


D - D

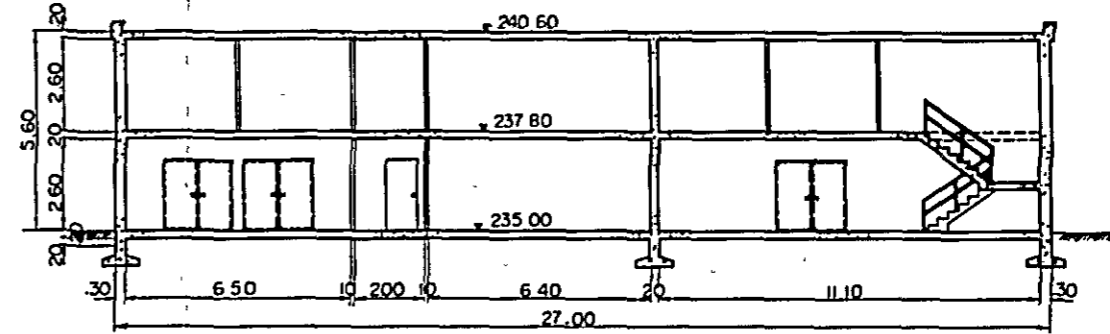


JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA No.1 POWER PLANT	
SWITCHYARD PLAN & SECTION	
DATE	MAR. 1975
DWG.	1-08

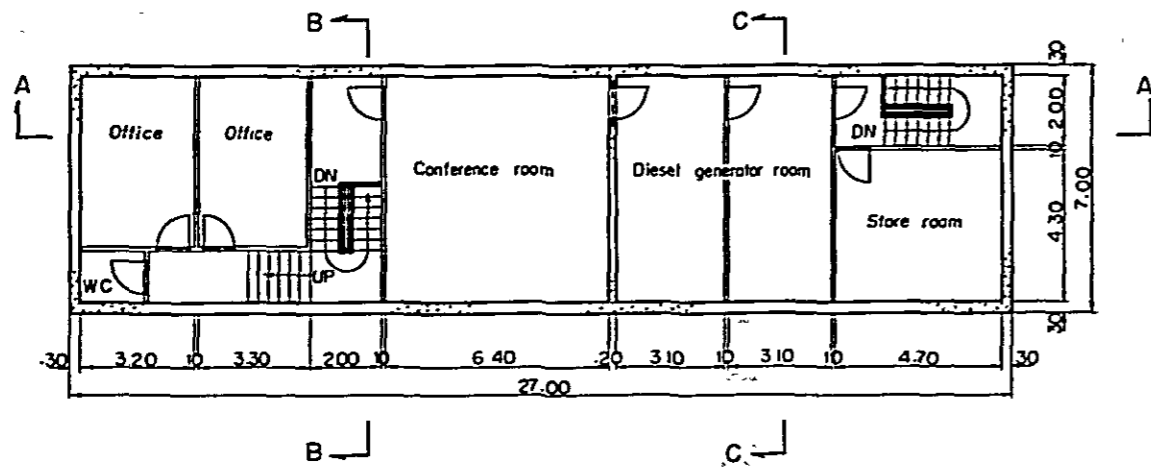
1F PLAN



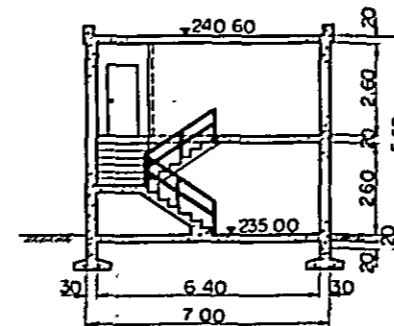
A - A



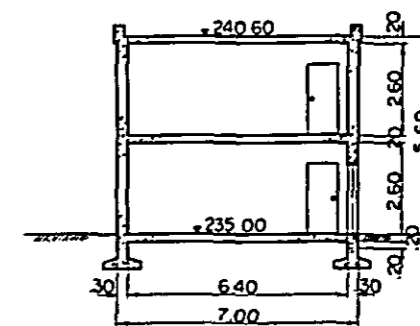
2F PLAN



B - B



C - C



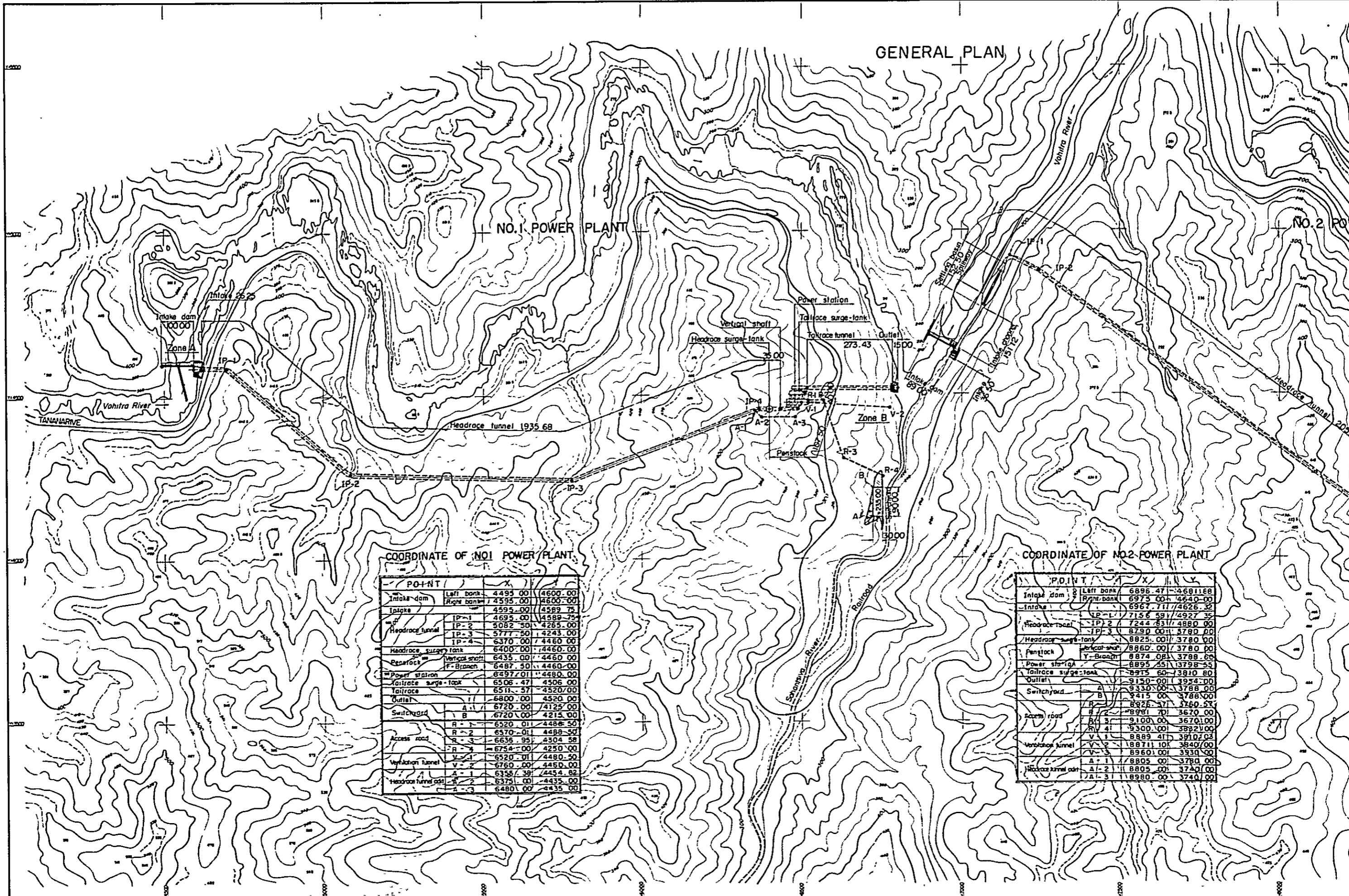
S=1/100 0 5 10 (M)

JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No.1 POWER PLANT		
CONTROL BUILDING PLAN & SECTION		
DATE	MAR. 1975	DWG. 1-09

# GENERAL PLAN

NO. 1. POWER PLANT

NO. 2 POW



COORDINATE OF NO.1 POWER PLANT

POINT	X	Y
Intake dam	Left bank	4495.00 / 4600.00
	Right bank	4595.00 / 4600.00
Intake	IP-1	4695.00 / 4589.75
	IP-2	5082.50 / 4265.00
	IP-3	5777.50 / 4243.00
	IP-4	6370.00 / 4460.00
Headrace surge tank		6400.00 / 4460.00
	Vertical shaft	6435.00 / 4460.00
Penstock	F-Branch	6487.50 / 4460.00
		6497.00 / 4480.00
Power station		6506.47 / 4506.00
Tailrace surge tank		6511.57 / 4520.00
Outlet		6800.00 / 4520.00
Switchyard	A-1	6720.00 / 4125.00
	B	6720.00 / 4215.00
Access road	R-1	6520.00 / 4480.50
	R-2	6570.00 / 4480.50
	R-3	6636.95 / 4304.58
	R-4	6754.00 / 4250.00
Ventilation tunnel	V-1	6520.00 / 4480.50
	V-2	6760.00 / 4450.00
Headrace tunnel (adj)	A-1	6358.39 / 4454.82
	A-2	6375.00 / 4435.00
	A-3	6480.00 / 4435.00

COORDINATE OF NO.2 POWER PLANT

POINT	X	Y
Intake dam	Left bank	6896.47 / 4681.68
	Right bank	6975.00 / 4640.00
Intake	IP-1	6967.71 / 4626.32
	IP-2	7156.59 / 4927.35
	IP-3	7244.83 / 4880.00
	IP-4	8290.00 / 3790.00
Headrace surge tank		8825.00 / 3780.00
	Vertical shaft	8860.00 / 3780.00
Penstock	F-Branch	8874.08 / 3788.66
		8895.25 / 3798.55
Power station		8915.60 / 3810.80
Tailrace surge tank		9150.00 / 3954.00
Outlet		9330.00 / 3788.00
Switchyard	A	9415.00 / 3788.00
	B	8926.57 / 3760.50
Access road	R-1	8981.70 / 3670.00
	R-2	9100.00 / 3670.00
	R-3	9300.00 / 3820.00
	R-4	8889.41 / 3910.00
Ventilation tunnel	V-1	8871.10 / 3840.00
	V-2	8960.00 / 3930.00
Headrace tunnel (adj)	A-1	8805.00 / 3790.00
	A-2	8805.00 / 3740.00
	A-3	8980.00 / 3740.00

GENERAL PLAN

NO. 1 POWER PLANT

NO. 2 POWER PLANT

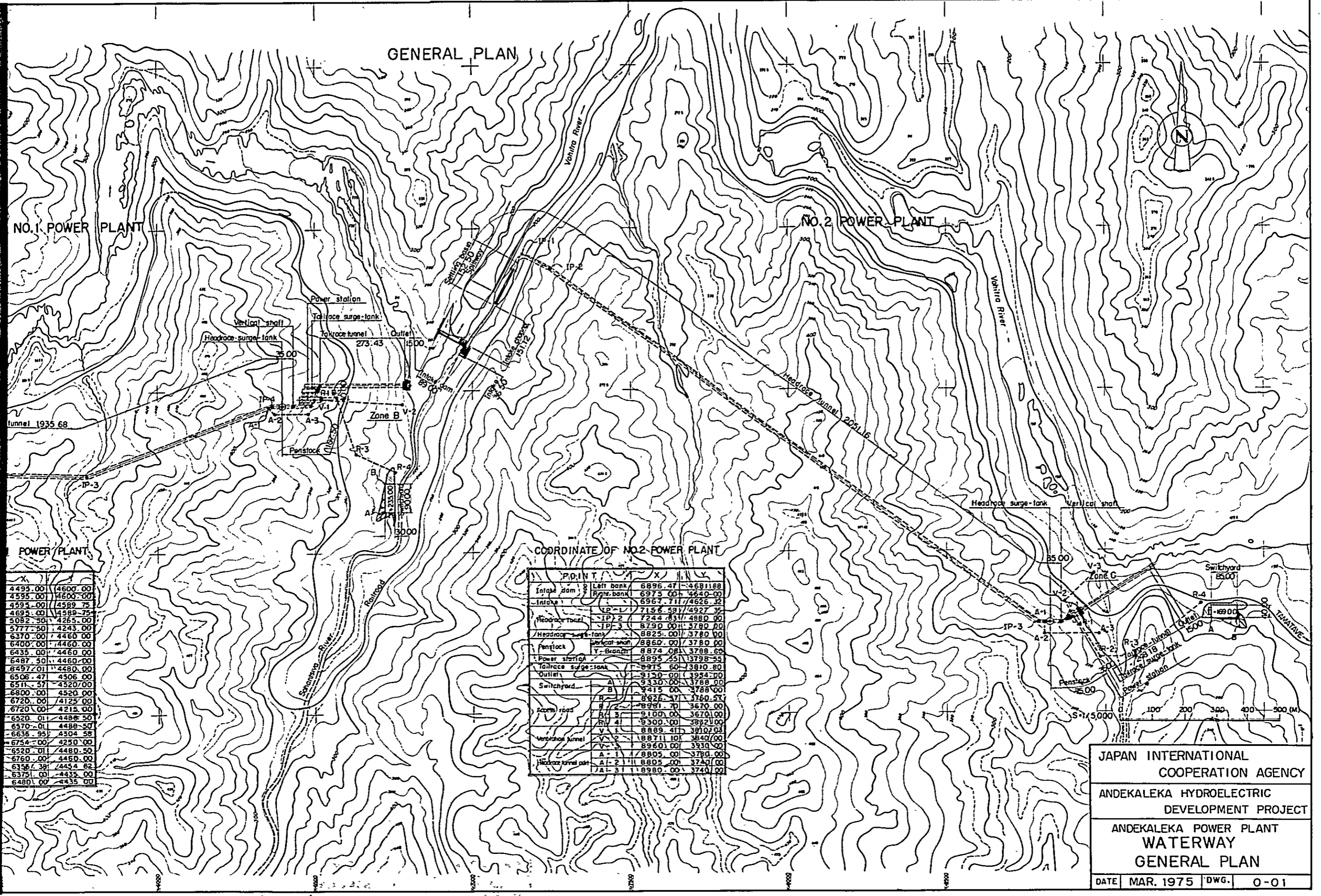
POWER PLANT

X	Y
4495.00	4600.00
4595.00	4600.00
4595.00	4589.75
4695.00	4589.75
5082.50	4265.00
5777.50	4243.00
6370.00	4460.00
6400.00	4460.00
6435.00	4460.00
6487.50	4460.00
6497.01	4480.00
6508.47	4506.00
6511.37	4520.00
6800.00	4520.00
6720.00	4125.00
6720.00	4215.00
6520.01	4488.50
6570.01	4488.50
6638.95	4304.58
6754.00	4250.00
6520.01	4480.50
6760.00	4460.00
6356.38	4454.62
6375.00	4435.00
6480.00	4435.00

COORDINATE OF NO.2 POWER PLANT

POINT	X	Y
Intake dam Left bank	6896.47	4681.88
Intake dam Right bank	6975.00	4640.00
Intake	6967.71	4626.32
Headrace tunnel IP-1	7156.59	4927.35
Headrace tunnel IP-2	7244.83	4880.00
Headrace tunnel IP-3	8790.00	3780.00
Headrace surge tank	8825.00	3780.00
Penstock vertical shaft	8860.00	3780.00
Penstock Y-Branch	8874.08	3788.63
Power station	8895.55	3798.55
Tailrace surge tank	8975.60	3810.80
Outlet	9150.00	3954.00
Switchyard A	9330.00	3788.00
Switchyard B	9415.00	3788.00
Access road R-1	8826.37	3670.00
Access road R-2	8981.70	3670.00
Access road R-3	9100.00	3670.00
Access road R-4	9300.00	3882.00
Vertical tunnel V-1	8889.41	3910.00
Vertical tunnel V-2	8871.10	3840.00
Vertical tunnel V-3	8960.00	3930.00
Headrace tunnel part A-1	8805.00	3780.00
Headrace tunnel part A-2	8805.00	3740.00
Headrace tunnel part A-3	8980.00	3740.00

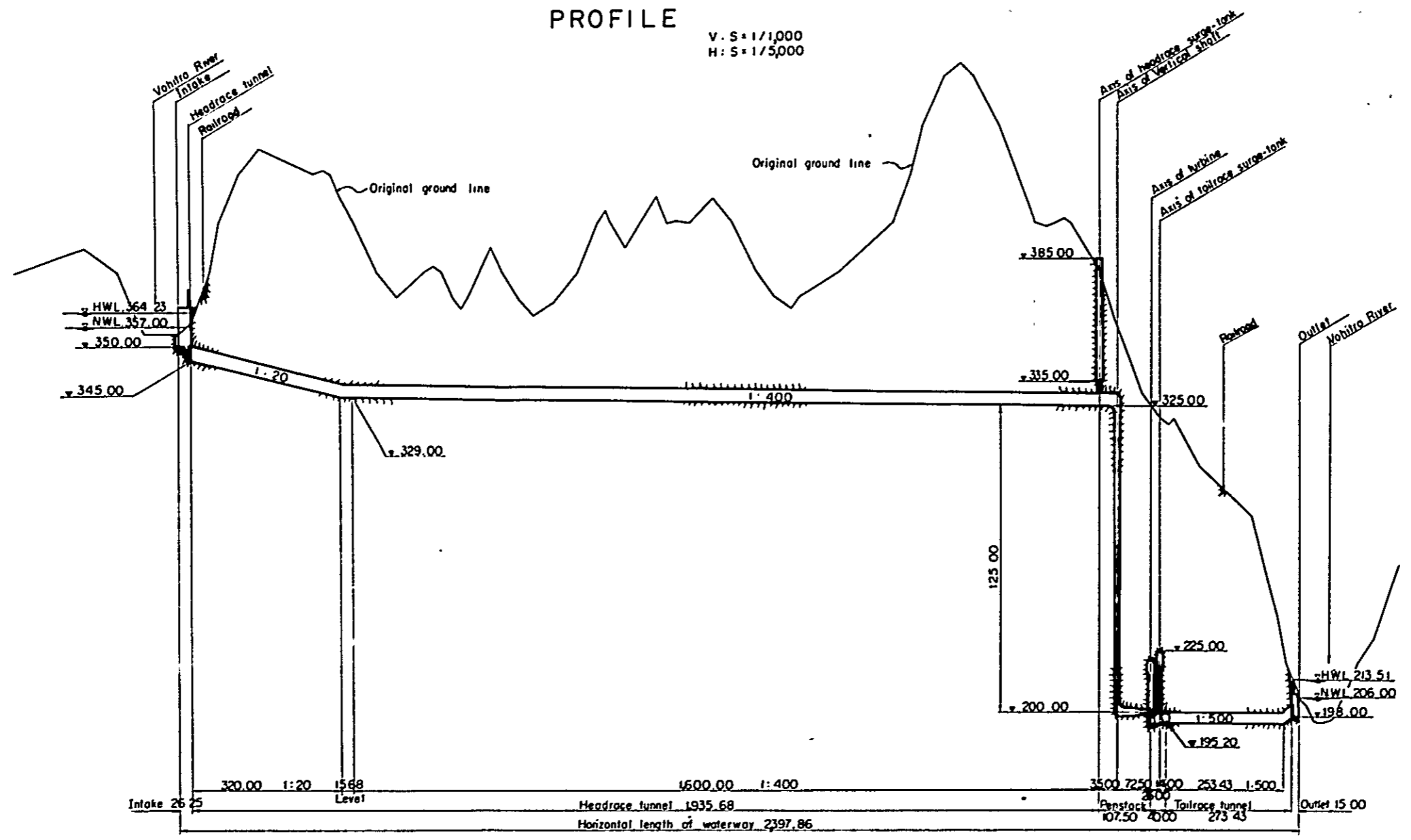
JAPAN INTERNATIONAL COOPERATION AGENCY  
 ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT  
 ANDEKALEKA POWER PLANT WATERWAY GENERAL PLAN  
 DATE MAR. 1975 DWG. 0-01



500  
400  
300  
200

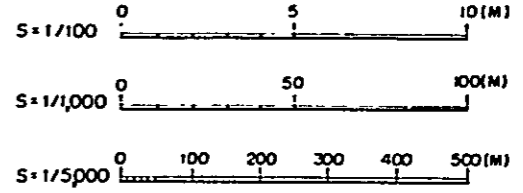
# PROFILE

V. S = 1/1,000  
H. S = 1/5,000



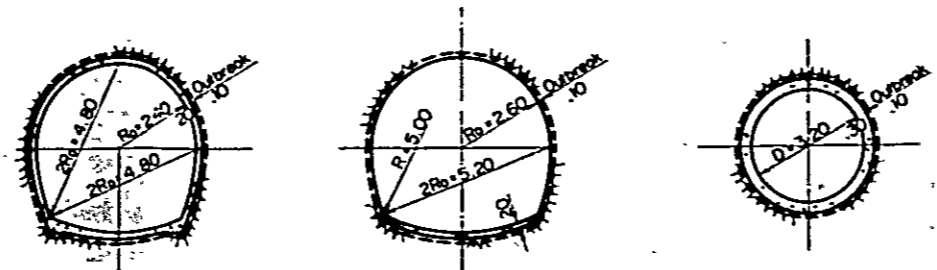
## TYPICAL SECTION

S = 1/100



### HEADRACE TUNNEL AND TAILRACE

### VERTICAL SHAFT

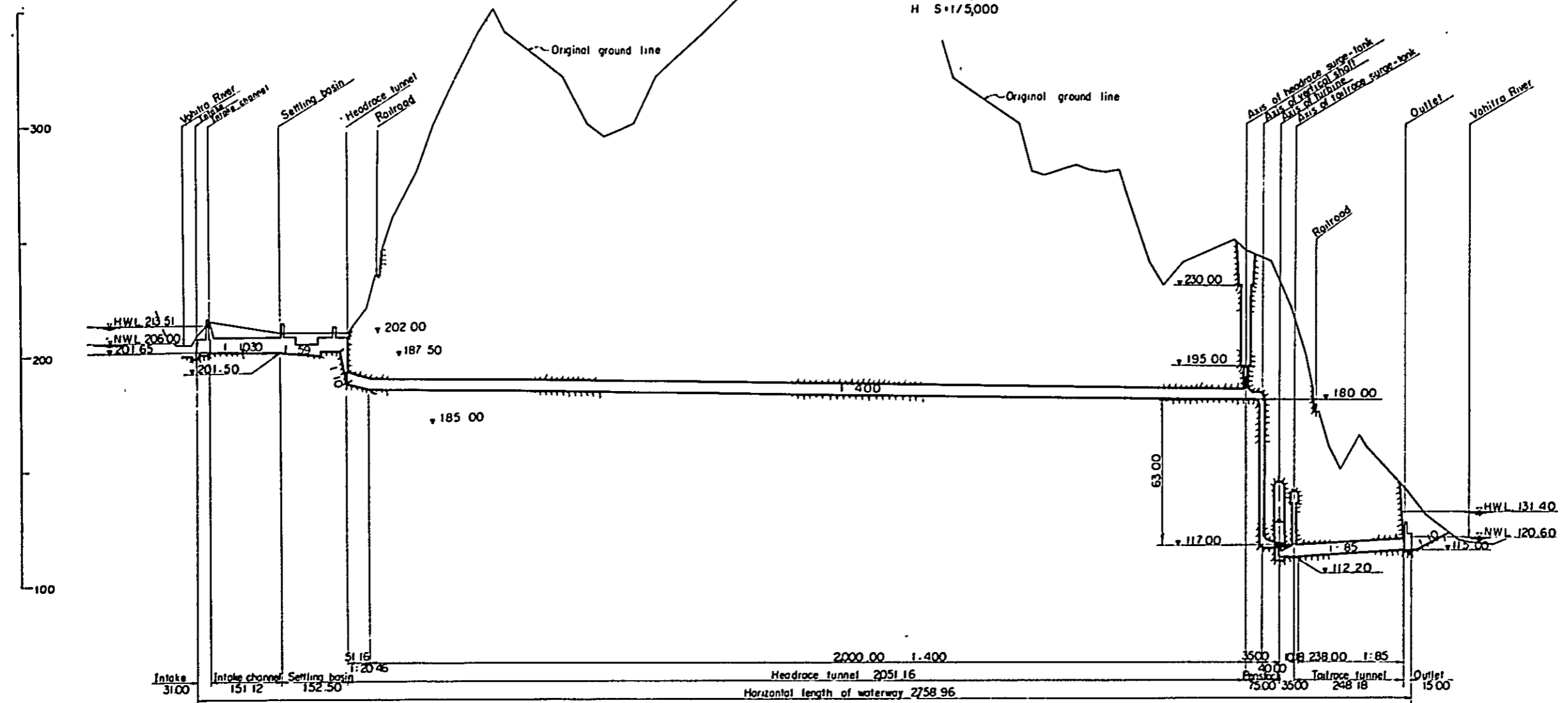


JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA POWER PLANT	
WATERWAY	
PROFILE OF No.1 POWER PLANT	
DATE	MAR. 1975
DWG.	0-02



# PROFILE

V S=1/1,000  
H S=1/5,000

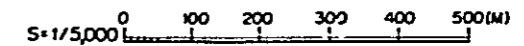
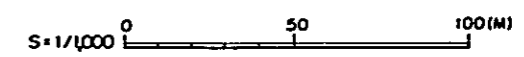
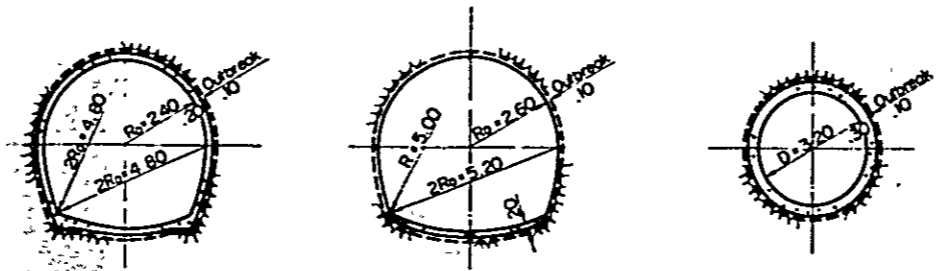


# TYPICAL SECTION

S=1/100

HEADRACE TUNNEL AND TAILRACE

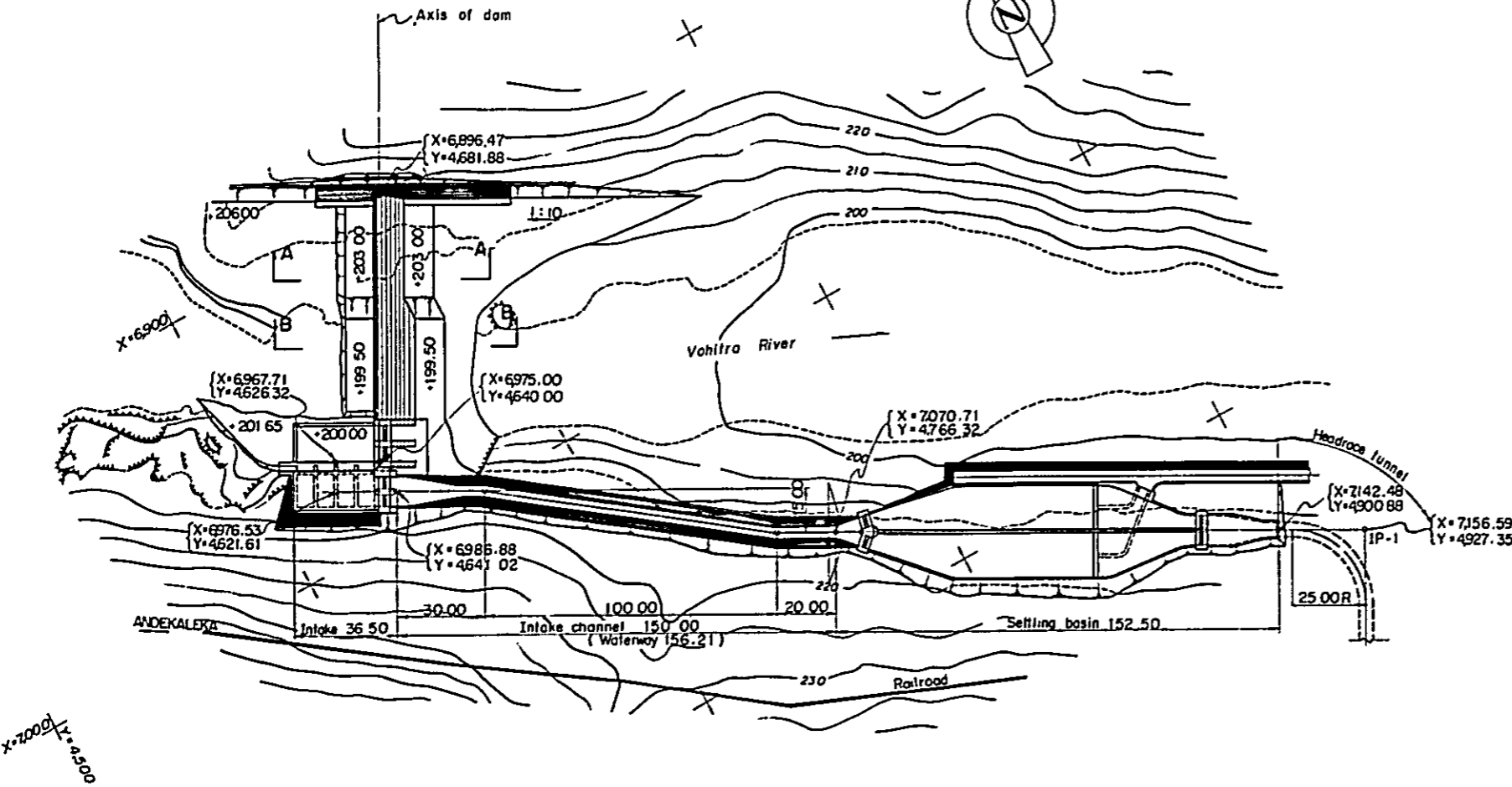
VERTICAL SHAFT



JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA POWER PLANT	
WATERWAY	
PROFILE OF No. 2 POWER PLANT	
DATE	MAR. 1975
DWG.	0-03

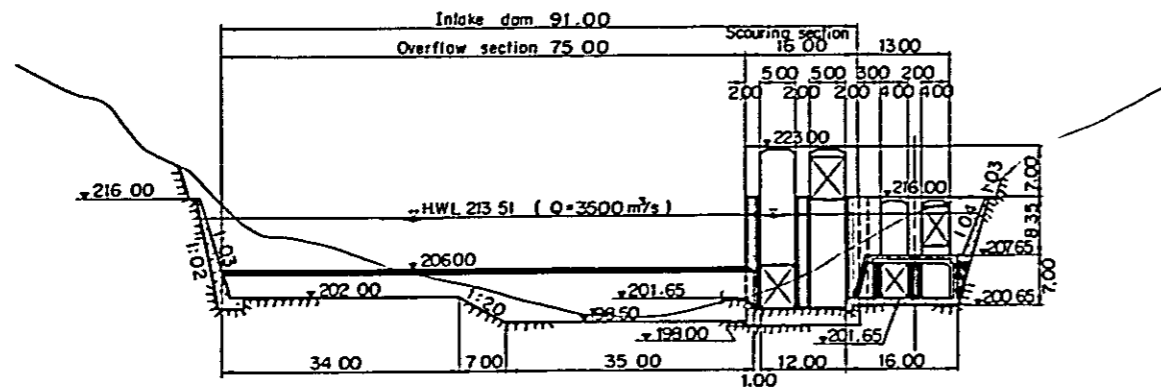
PLAN

S = 1/1,000



FRONT VIEW

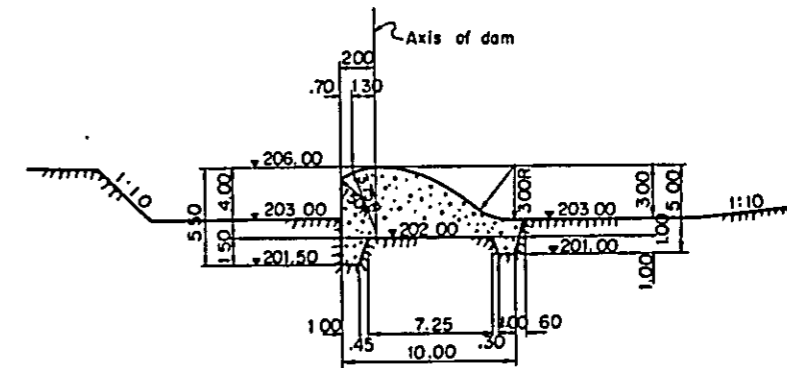
S = 1/500



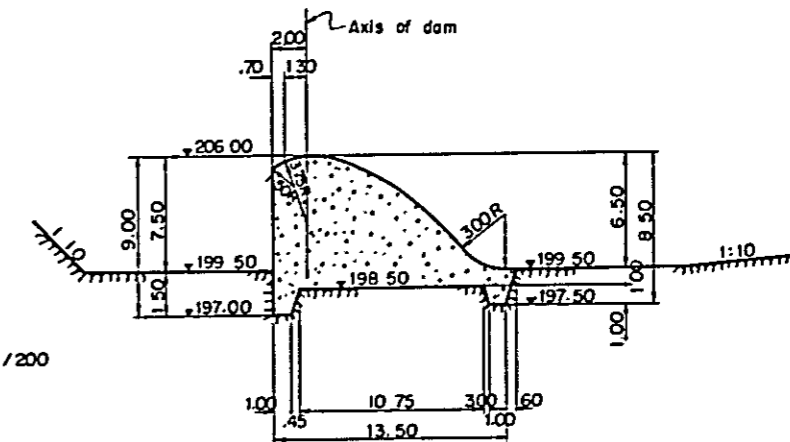
TYPICAL SECTION OF INTAKE DAM

S = 1/200

A - A

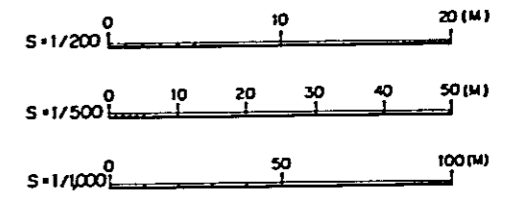
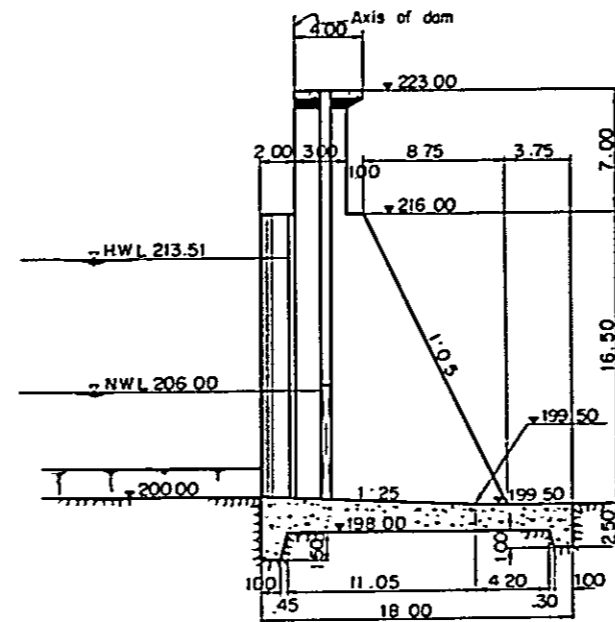


B - B



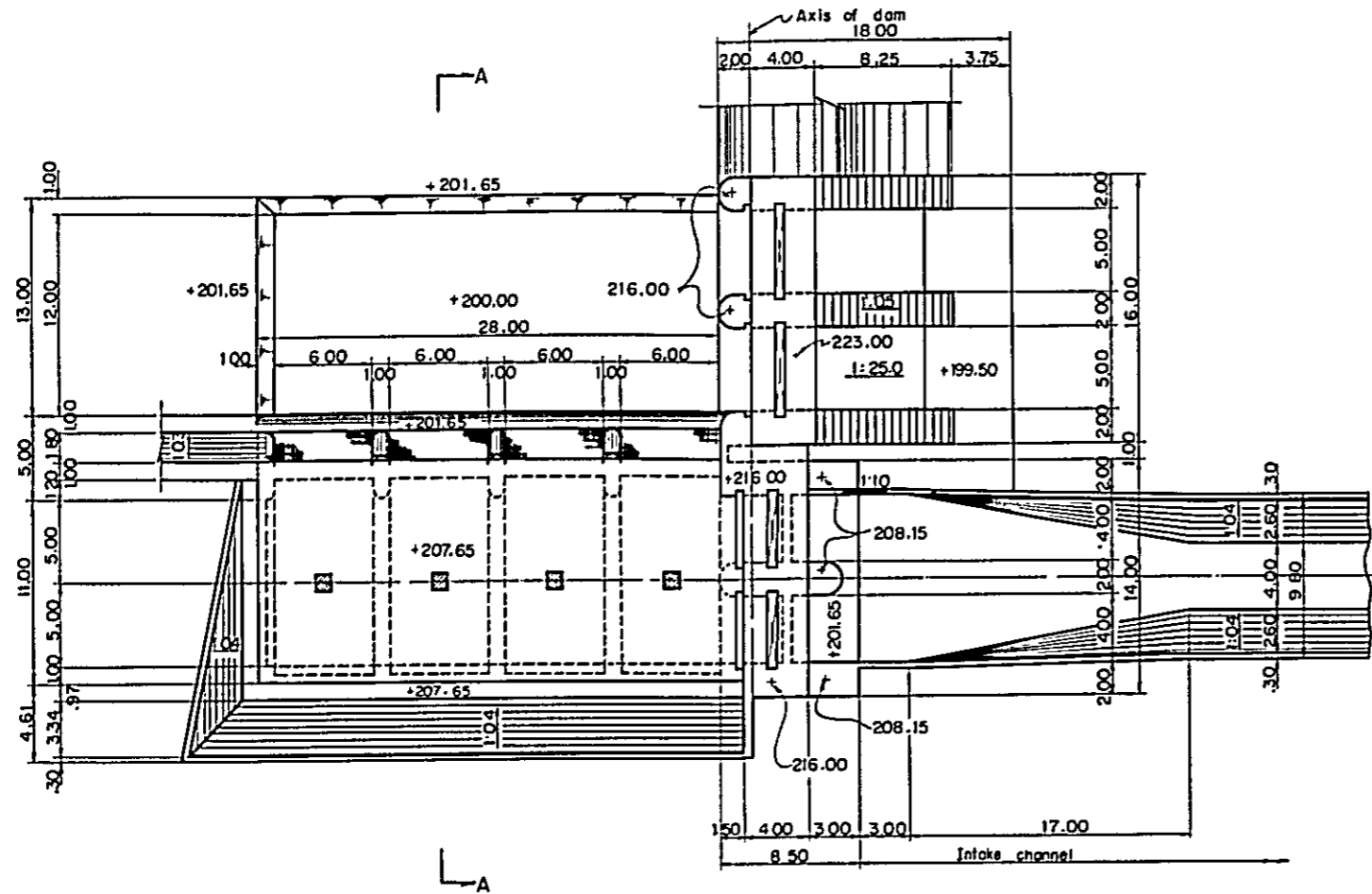
SCOURING GATE

S = 1/200

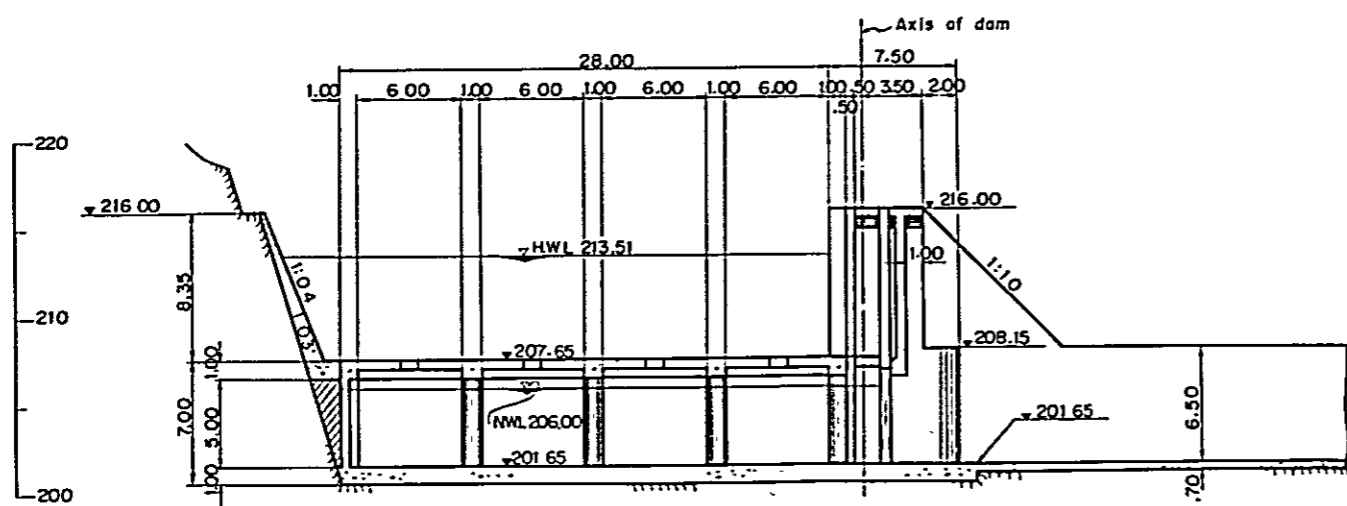


JAPAN INTERNATIONAL  
COOPERATION AGENCY  
ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT  
ANDEKALEKA No.2 POWER PLANT  
INTAKE DAM  
PLAN, PROFILE & SECTION  
DATE | MAR. 1975 | DWG. | 2-01

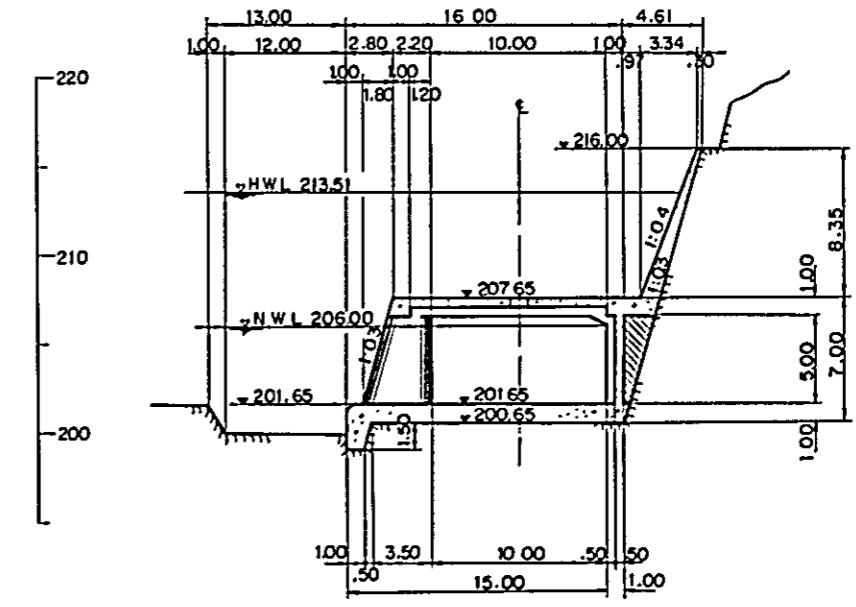
PLAN



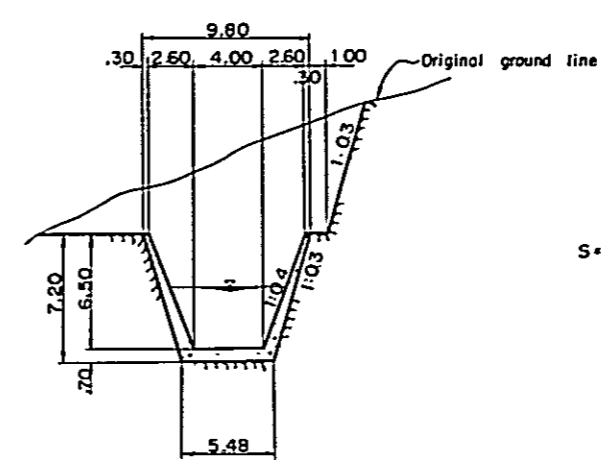
PROFILE



A - A



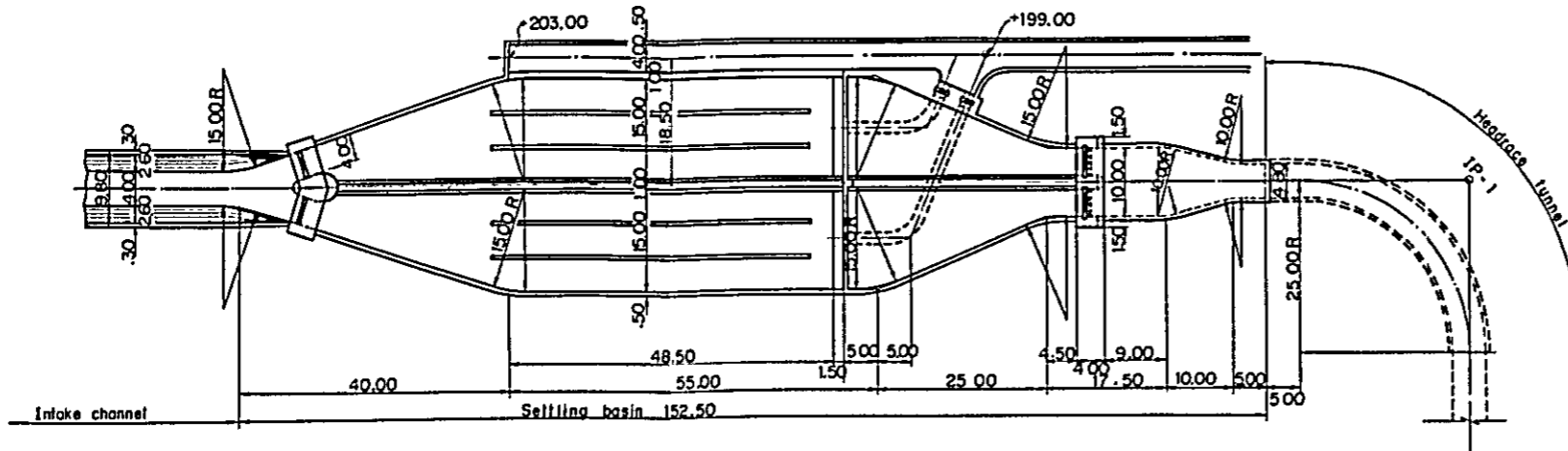
TYPICAL SECTION



JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No.2 POWER PLANT INTAKE		
PLAN & SECTION		
DATE	MAR. 1975	DWG. 2-02

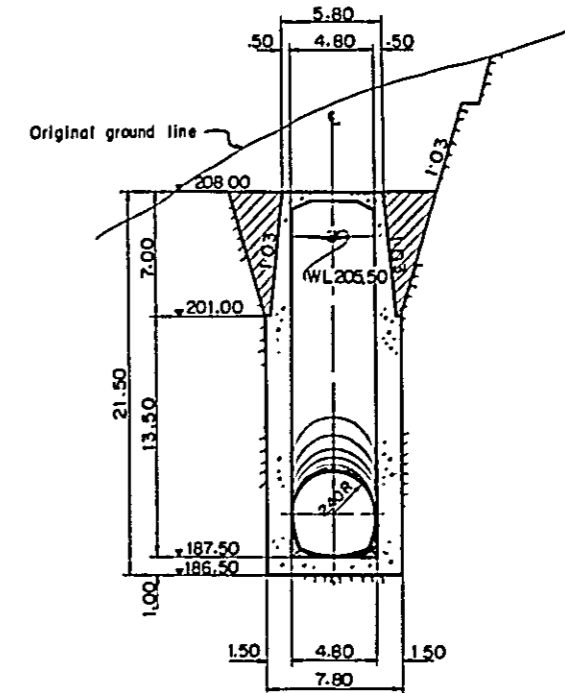
PLAN

S=1/500



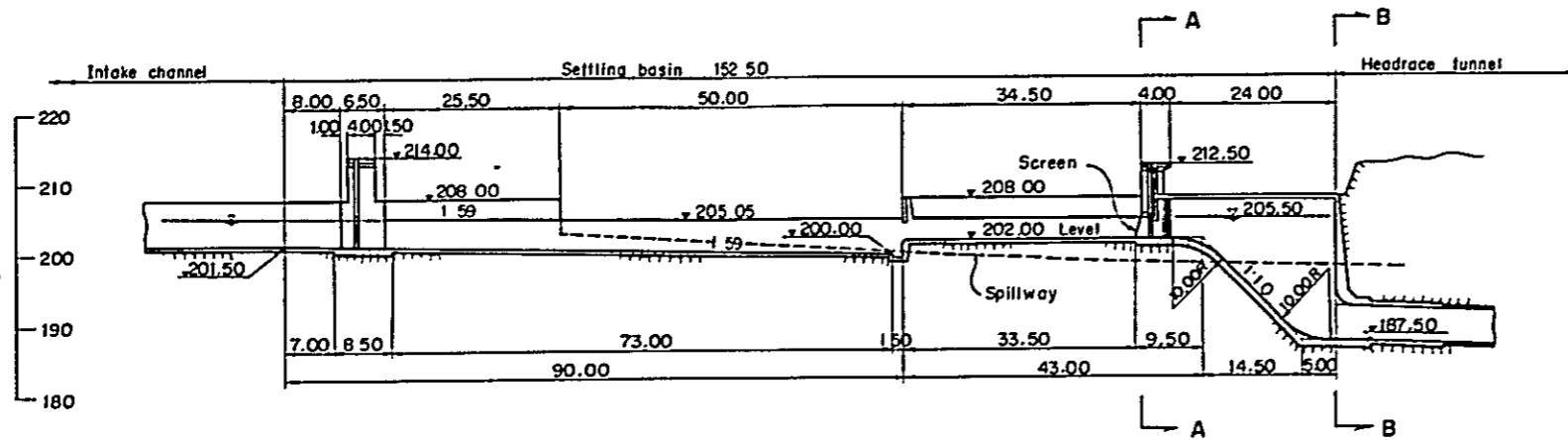
B - B

S=1/200



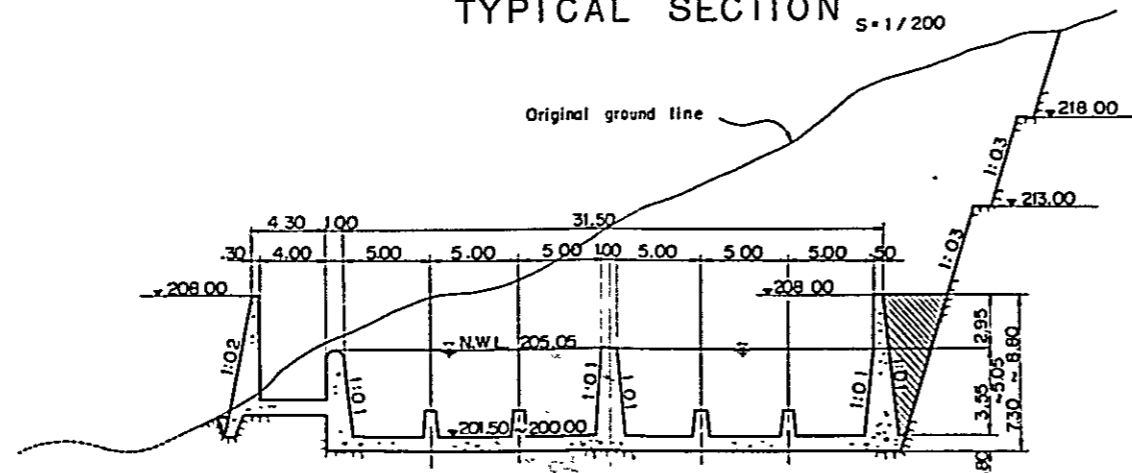
PROFILE

S=1/500



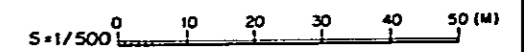
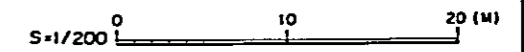
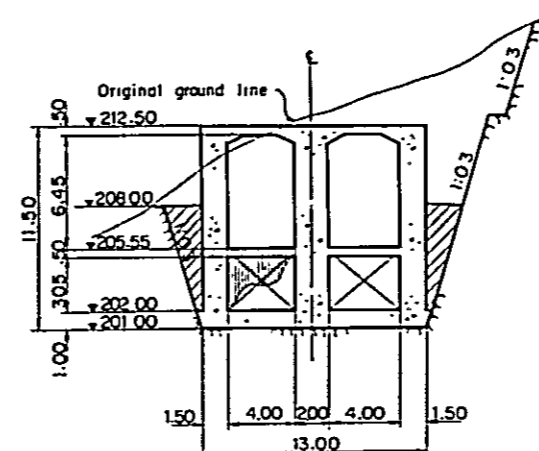
TYPICAL SECTION

S=1/200

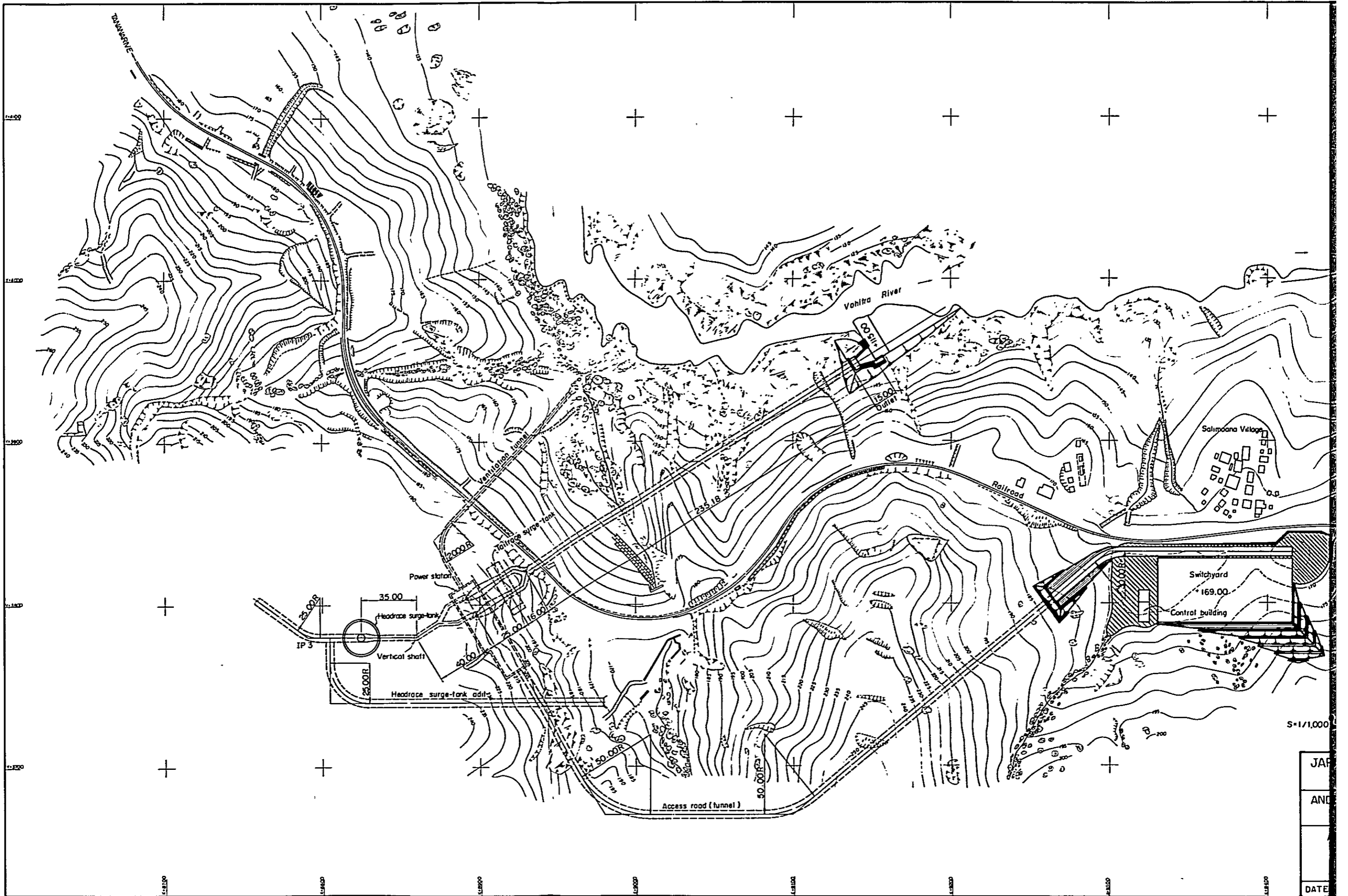


A - A

S=1/200

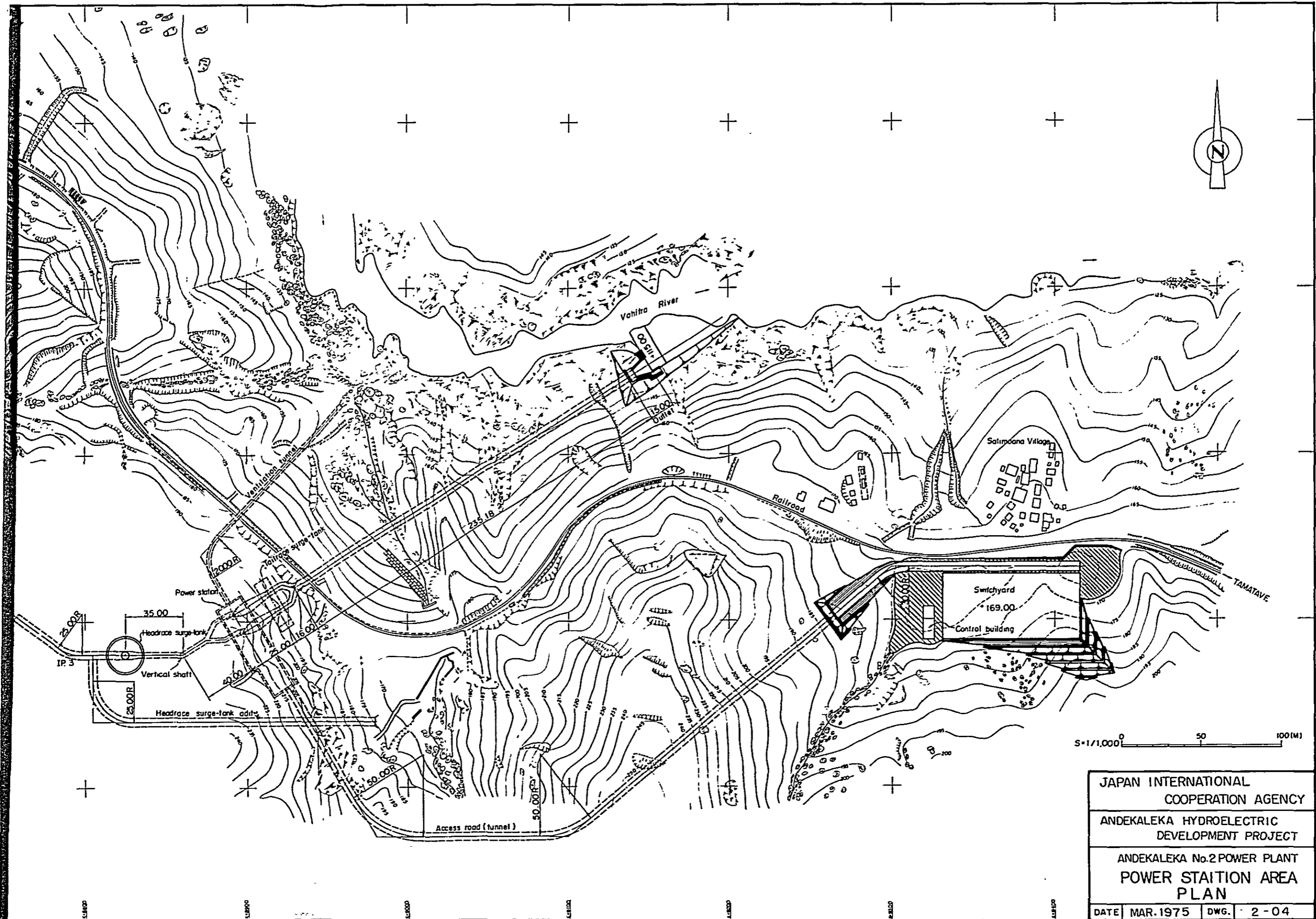


JAPAN INTERNATIONAL  
COOPERATION AGENCY  
ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT  
ANDEKALEKA No2 POWER PLANT  
SETTLING BASIN  
PLAN, PROFILE & SECTION  
DATE | MAR. 1975 | DWG. 2-03



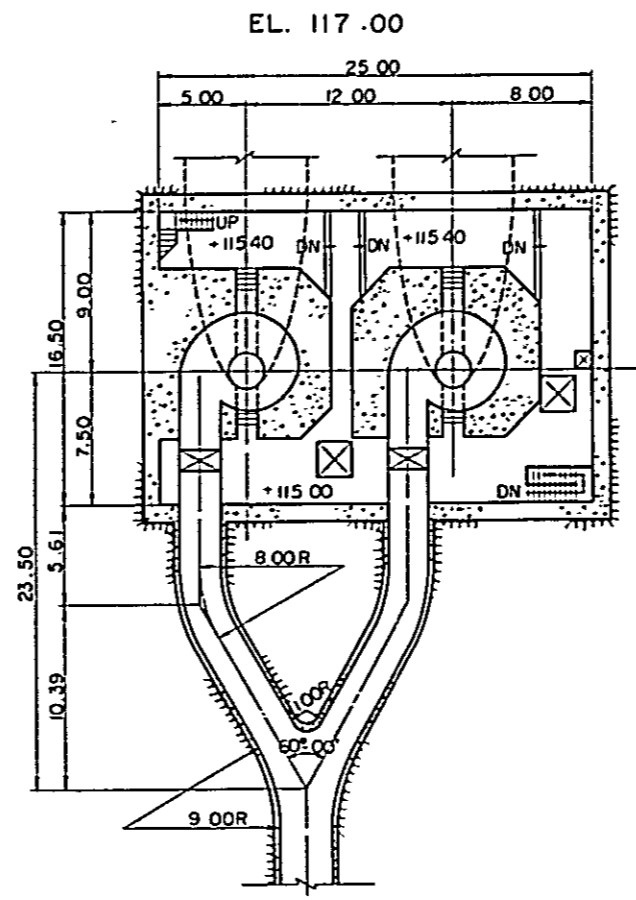
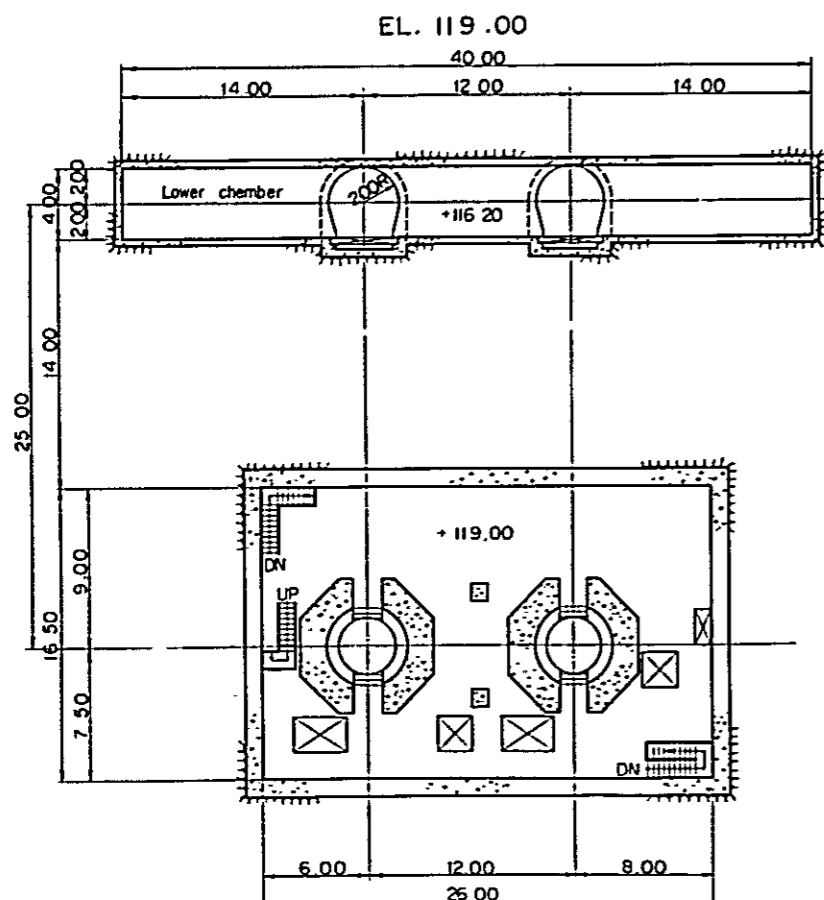
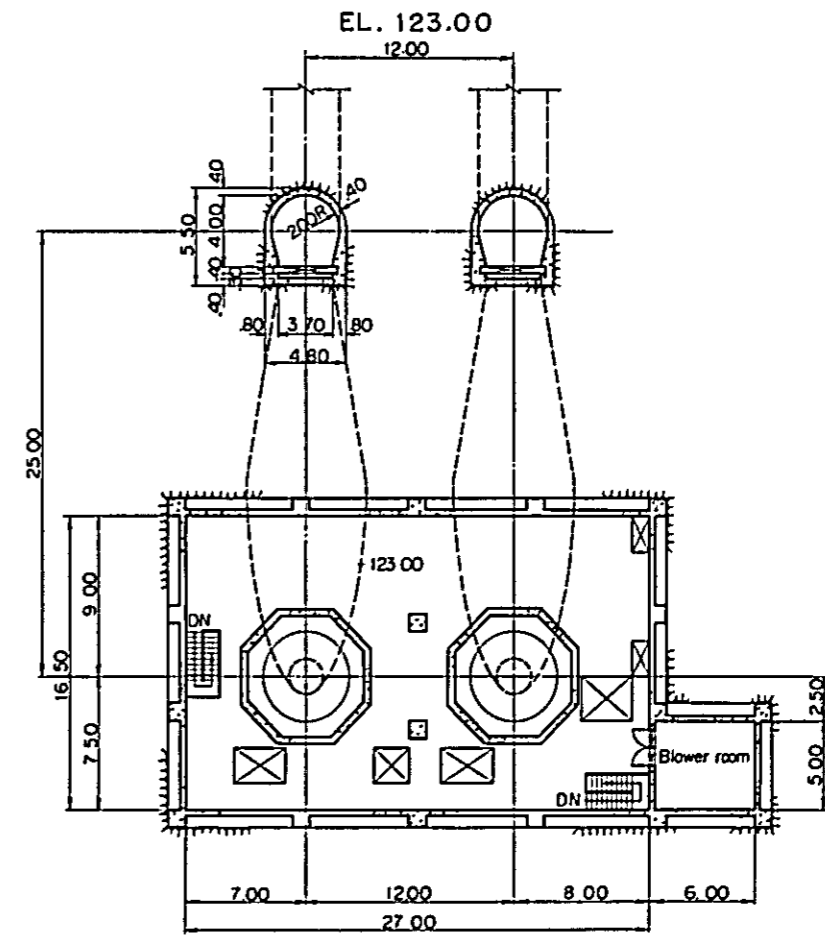
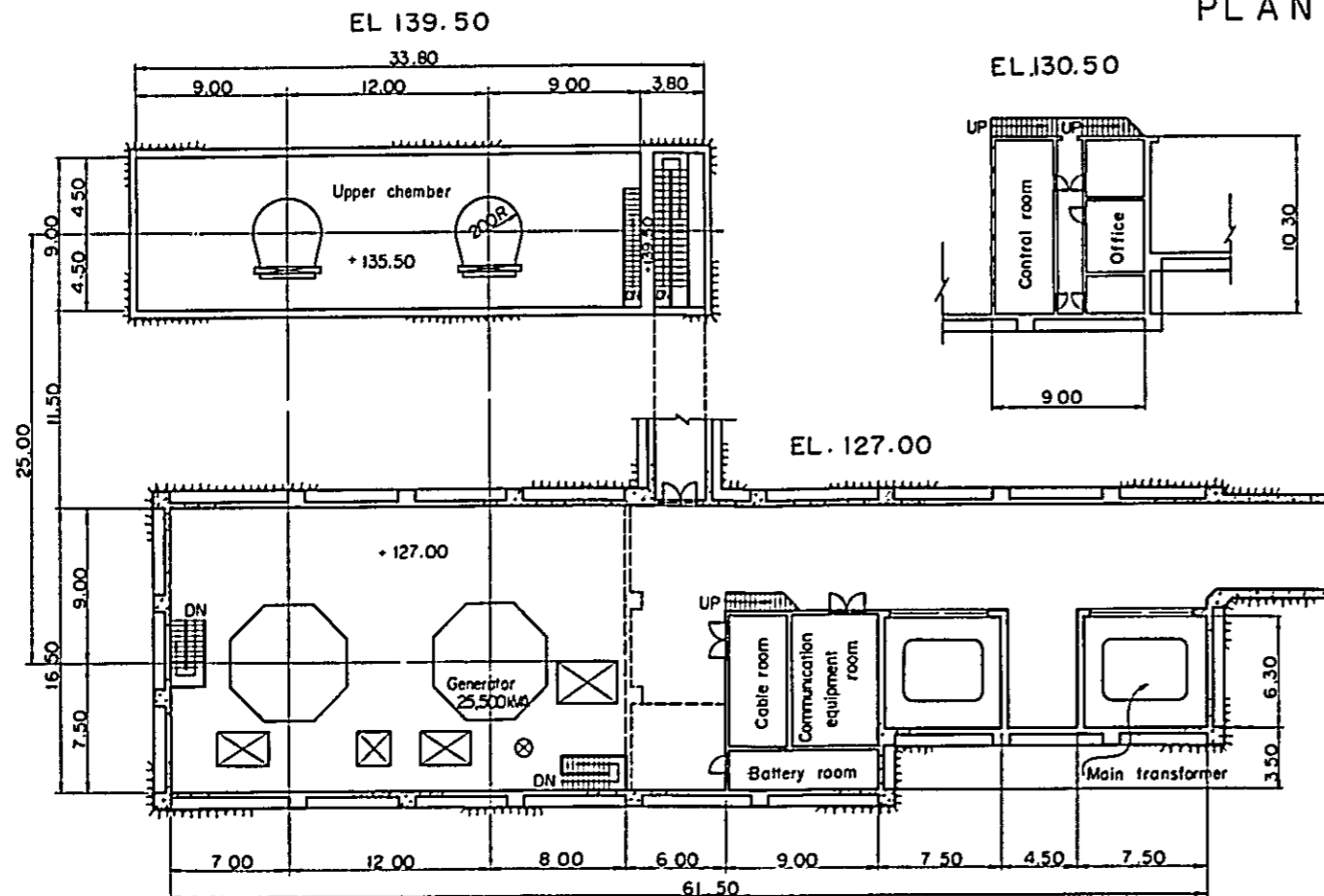
S=1/1,000

JAN
AND
DATE



JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No.2 POWER PLANT POWER STATION AREA PLAN		
DATE	MAR. 1975	DWG. 2-04

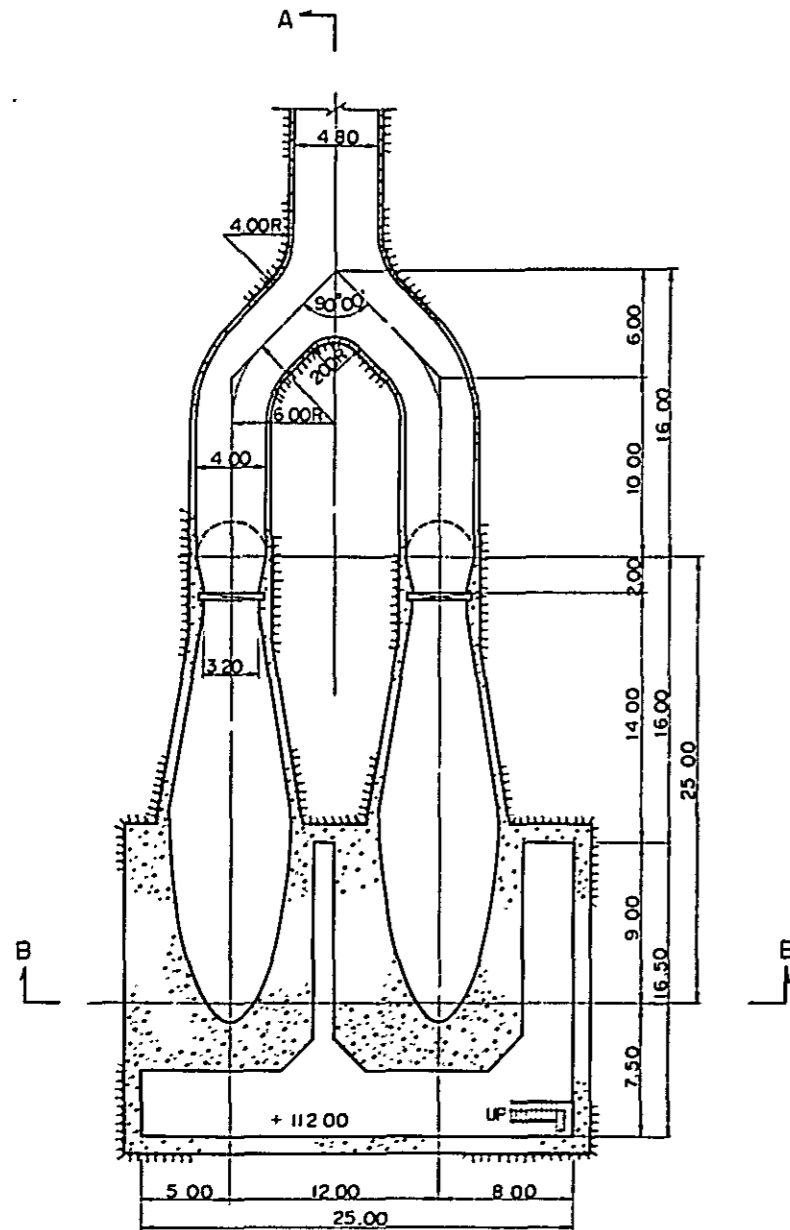
PLAN - 1



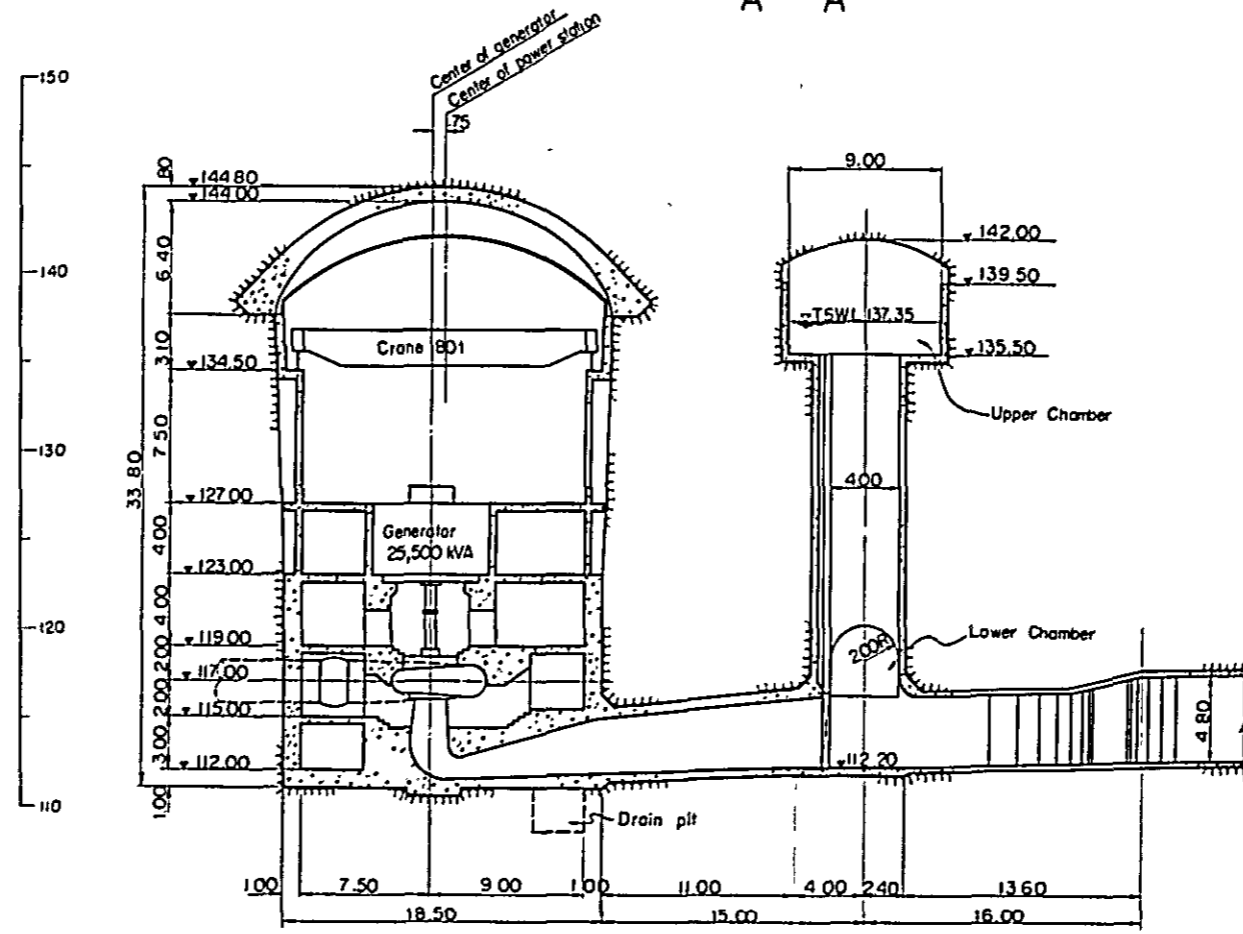
JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No.2 POWER PLANT		
POWER STATION		
PLAN - 1		
DATE	MAR. 1975	DWG. 2-05

PLAN - 2

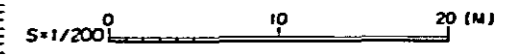
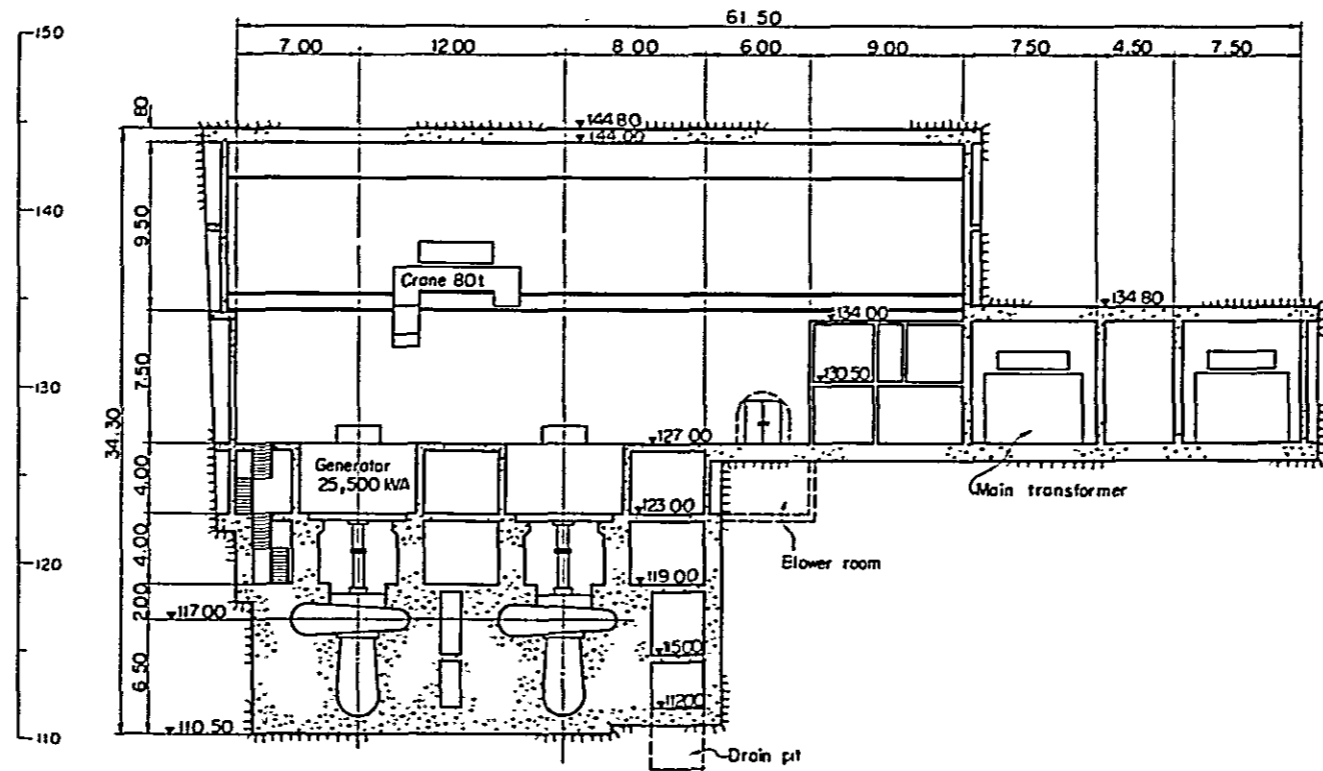
EL. 112.00



A - A



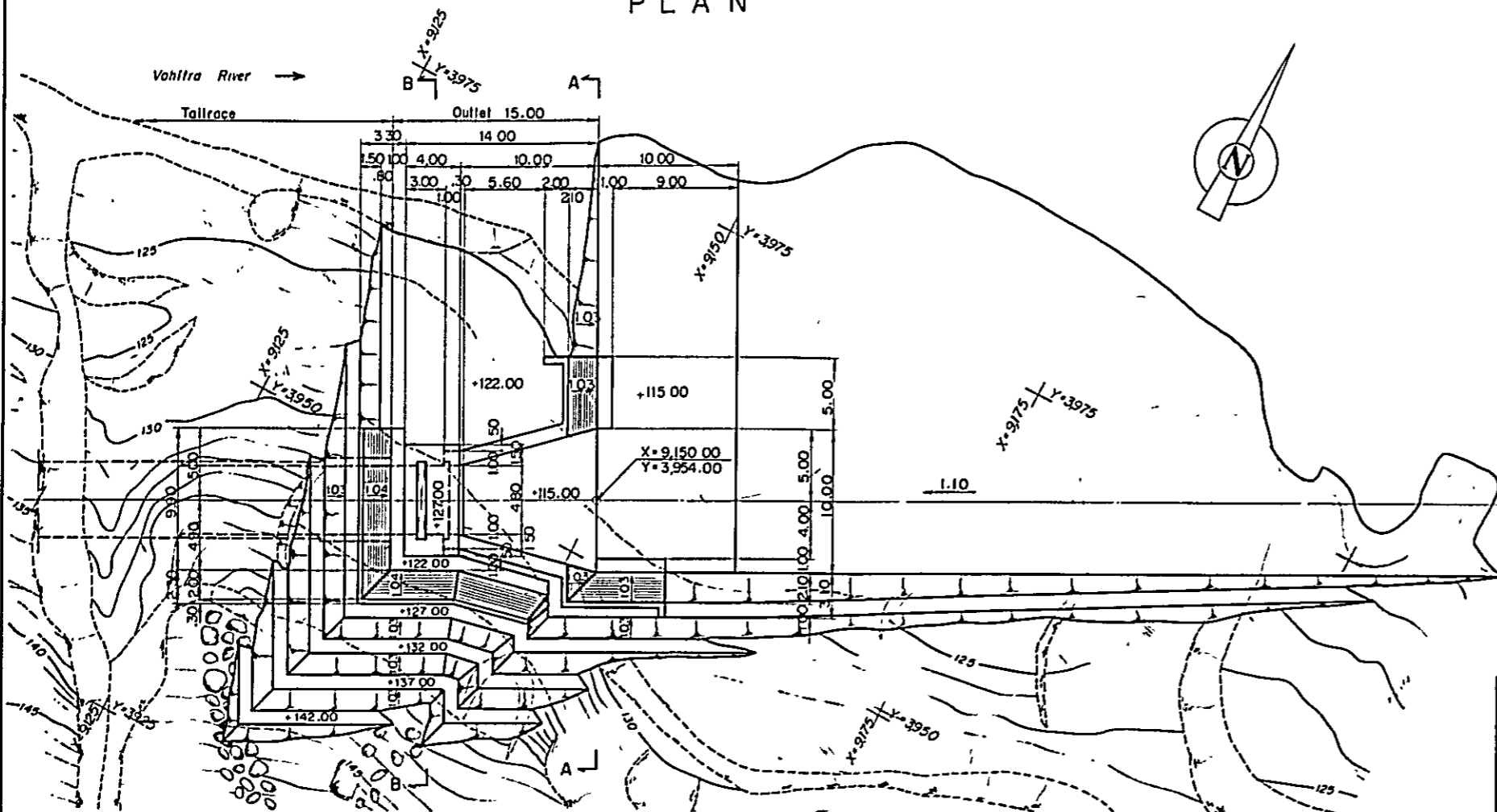
B - B



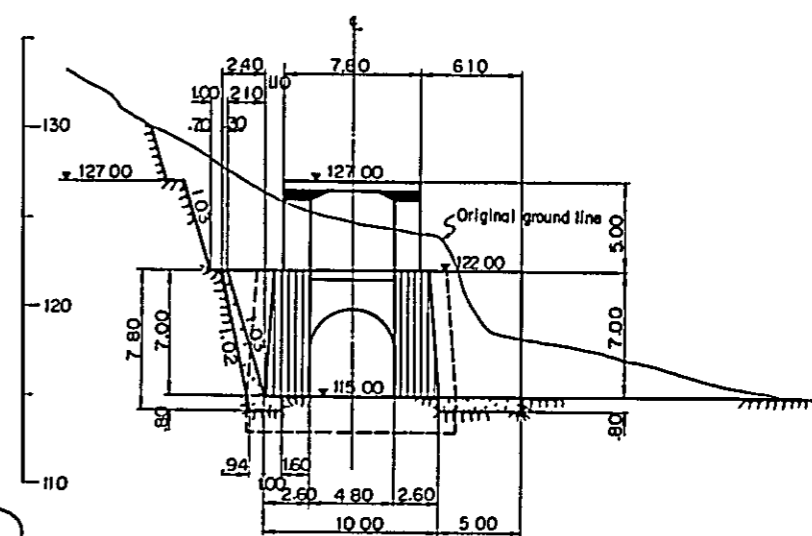
JAPAN INTERNATIONAL  
COOPERATION AGENCY  
ANDEKALEKA HYDROELECTRIC  
DEVELOPMENT PROJECT  
ANDEKALEKA No.2 POWER PLANT  
POWER STATION  
PLAN-2 & SECTION  
DATE MAR. 1975 DWG. 2-06



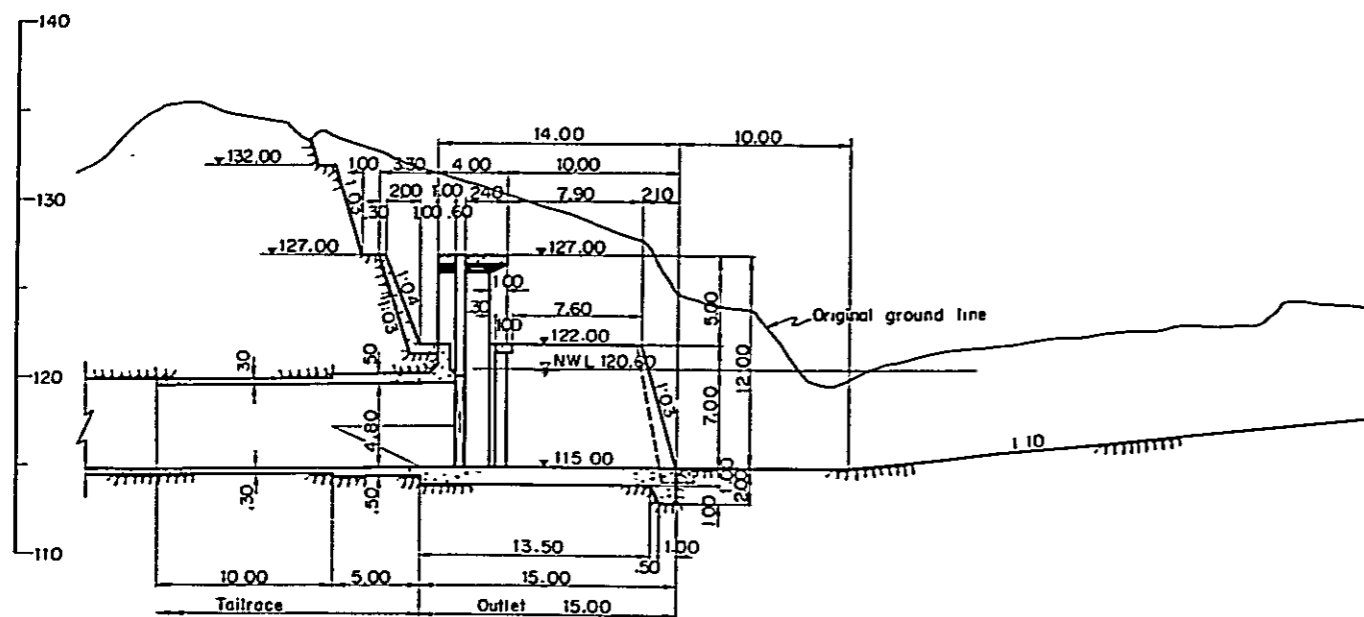
PLAN



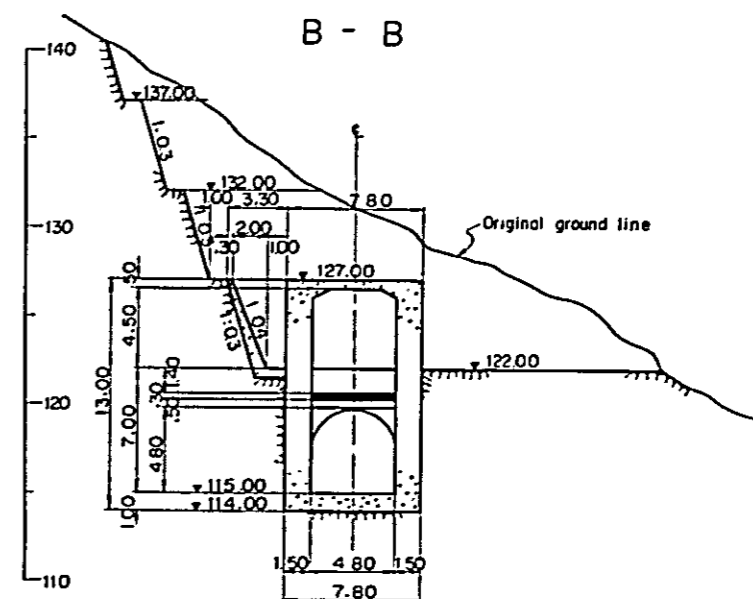
A - A



PROFILE

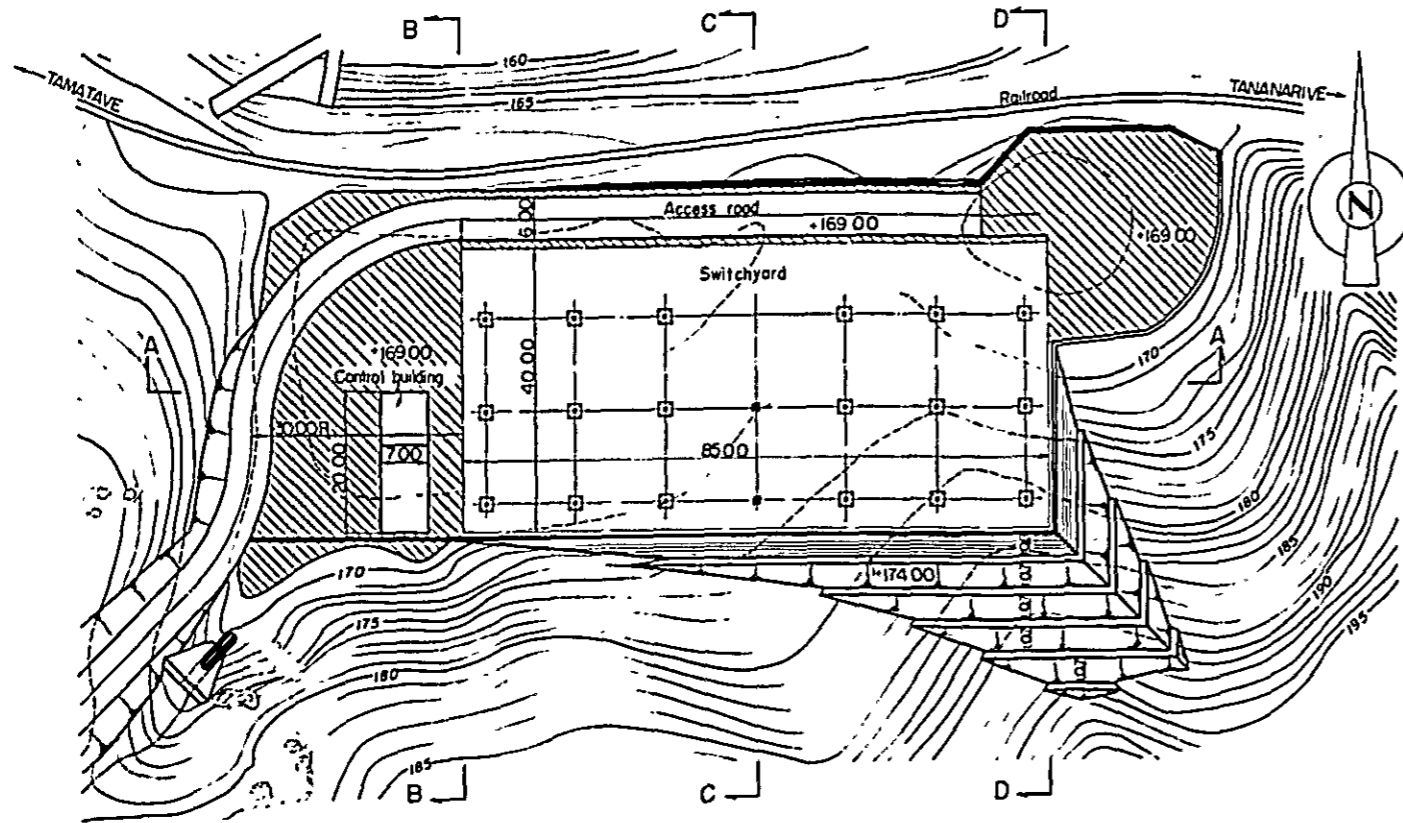


B - B

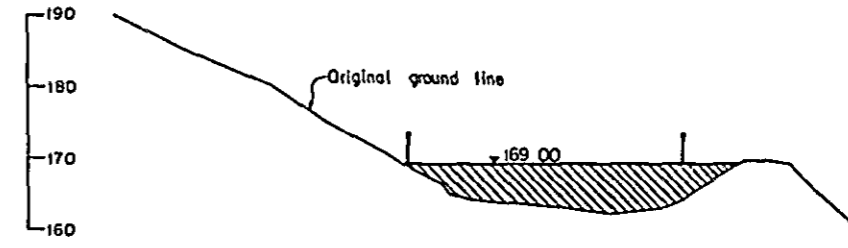


JAPAN INTERNATIONAL COOPERATION AGENCY		
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT		
ANDEKALEKA No.2 POWER PLANT		
OUTLET		
PLAN & SECTION		
DATE	MAR. 1975	DWG. 2-07

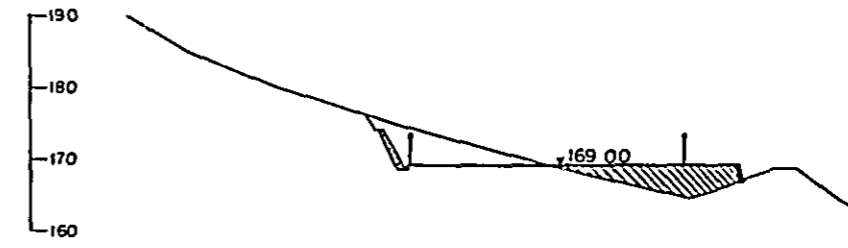
PLAN



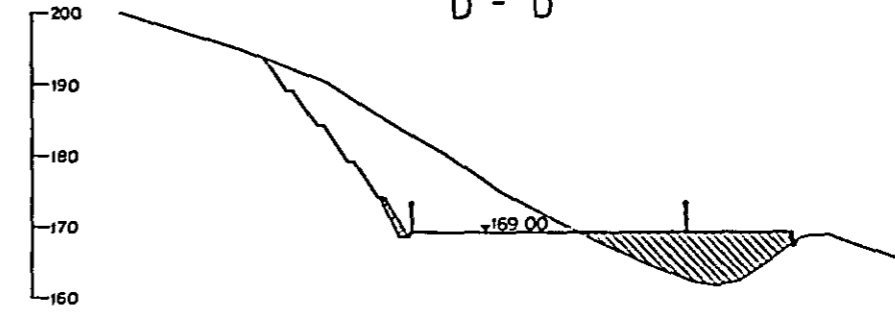
B - B



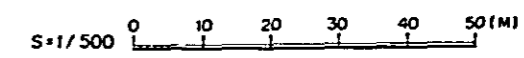
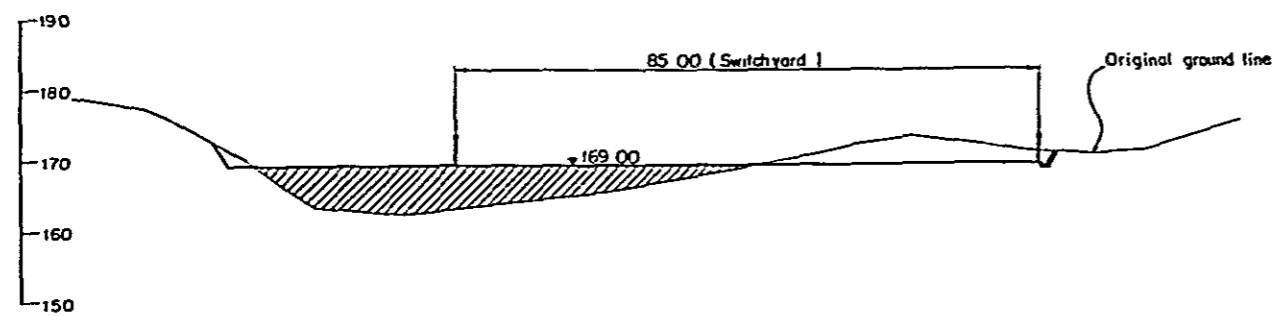
C - C



D - D

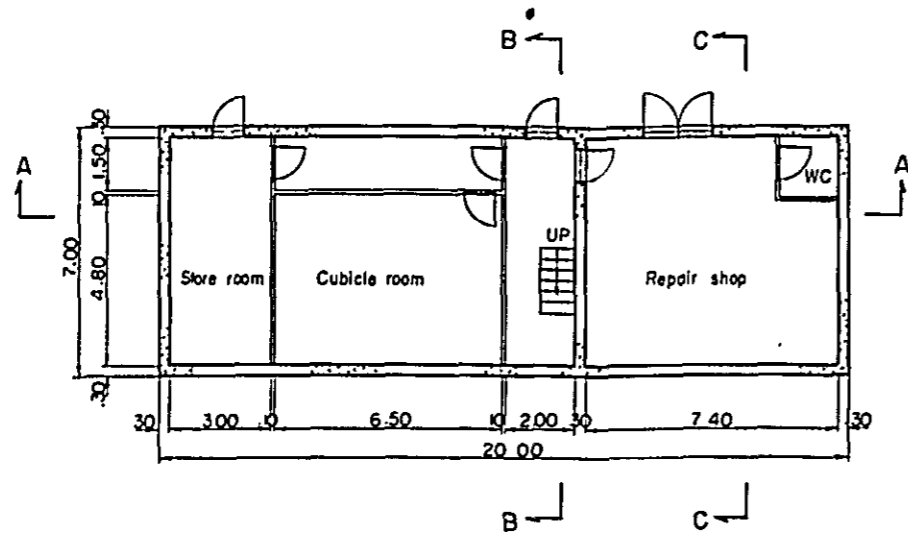


A - A

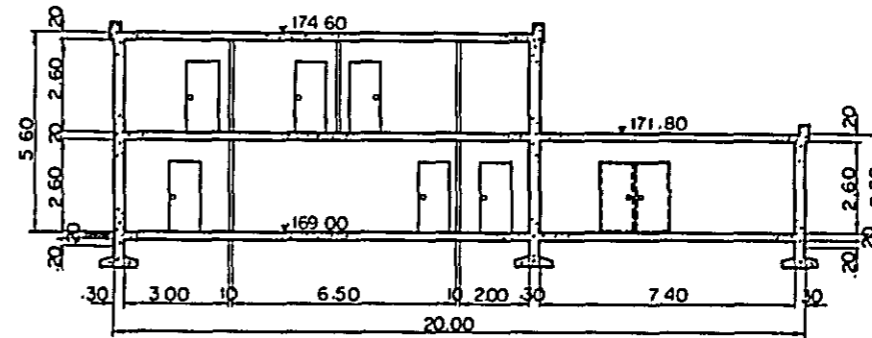


JAPAN INTERNATIONAL COOPERATION AGENCY
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT
ANDEKALEKA No.2 POWER PLANT SWITCHYARD PLAN & SECTION
DATE: MAR. 1975   DWG.   2-08

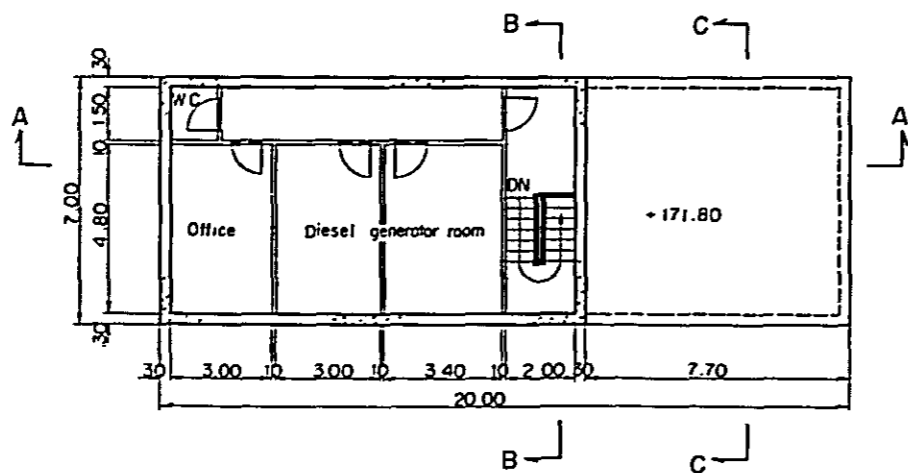
1F PLAN



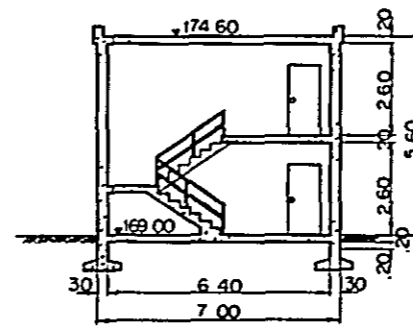
A - A



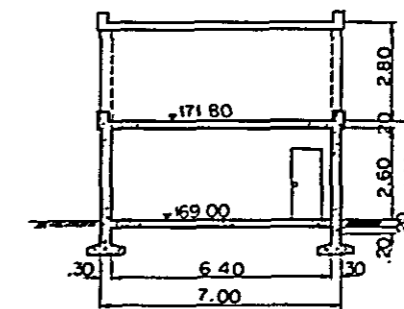
2F PLAN



B - B



C - C



Scale: 1/100 (M)

JAPAN INTERNATIONAL COOPERATION AGENCY	
ANDEKALEKA HYDROELECTRIC DEVELOPMENT PROJECT	
ANDEKALEKA No.2 POWER PLANT	
CONTROL BUILDING	
PLAN & SECTION	
DATE	MAR. 1975
DWG.	2-09

