CHAPTER 15 LOAN REPAYMENT SCHEDULE

CHAPTER 15 LOAN REPAYMENT SCHEDULE

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CHAPTER 15 LOAN REPAYMENT SCHEDULE

15.1 Basic Consideration

In general, construction of electric power facilities requires a large amount of initial investment during the construction period, and the return to that investment starts only after the construction is completed. The time required to recover the investment is much longer than that required for production of durable consumer goods. Accordingly, it is quite usual to obtain loans having low interest rate, long grace period and long repayment period.

It can be assumed that a large portion of the fund required for implementation of the Project will be supplied by international financing institutions, and the rest by ICE's own fund. As the proportions of the foreign and domestic funds can not be predicted at this moment, the JICA team consulted with ICE to assume the following financing conditions, and the repayment schedule is formulated based on these assumptions.

Interest rate:	8.5% for foreign funds and 0.0% for domestic funds, with no considerations for commitment charge.
Terms of repayment:	Repayment is deferred during the period of construction of the Project. Repayment of principal and interest in equal amounts in 15 years.

15.2 Required Amount of Fund

The required amount of fund is estimated based on the prices as of January 1991. The Project is scheduled to be connected to the power grid in 2001, therefore, the escalation of the prices upto and including the construction period may be taken into account as additional cost. However, it is difficult for the JICA team to make any projection of the price escalation in Costa Rica

in the future. For this reason, the loan repayment schedule is formulated based on the amount of fund requirement estimated at January 1991 prices.

Pirris Project Cost (including the construction cost of the transmission line from the Project site to Escazu substation)

Foreign Currency	108,550 x 10^3US$
Local Currency	85,880 x 10^3US$
Total	194,430 x 10^3US$

15.3 Income and Cost

The return on investment is the income from electricity sale. It is assumed that the electric power generated by the Project will be supplied to demand area through Escazu Substation. The average tariff rate of ICE as of January 1991, which is 0.0533 US$/kWh is used as the basis of revenue calculation.

The annual operation and maintenance cost of the facilities of the Project is assumed as below.

Civil facility construction cost	x 0.5%
Hydraulic equipment cost	x 1.5%
Electro-Mechanical equipment cost	x 1.5%
Transmission facility cost	x 1.5%

The depreciations are calculated by the straight line method with zero residual values and the service lives assumed as below.

Civil facilities	:	50 years
Hydraulic equipment	:	35 years
Electro-Mechanical equipment	:	35 years
Transmission facilities	:	30 years

15.4 Loan Repayment Schedule

The source of funds for loan repayment is to be the operating income (the electricity sales revenue minus operation and maintenance cost, depreciation, interest, etc.) and the reserve for depreciation.

Fund requirement and repayment schedule are shown in Table 15-1, Profit and loss statement in Table 15-2, and Cash flow in Table 15-3.

As indicated in Table 15-3, the capital costs are recovered from revenues in the third year after the commencement of operation, and thereafter revenues exceed capital costs producing profits. Thus it is judged that the capital investment on the Project can be safely recovered.

Table 15-1 Fund Requirement and Repayment Schedule

(unit: 10^3 US$)

No.	Year	FUND REQUIREMENT			REPAYMENT SCHEDULE							
					Foreign Currency				Domestic Currency			
		Foreign	Domestic	Total	Interest	Principal	Total	Balance	Interest	Principal	Total	Balance
-1	1995	7,974	9,249	17,223	(339)							
1	1996	7,774	6,604	14,378	(827)							
2	1997	13,314	7,480	20,795	(1,904)							
3	1998	24,315	19,721	44,036	(3,504)							
4	1999	40,204	27,515	67,718	(6,246)							
5	2000	14,966	15,109	30,075	(8,590)							
6	2001	4	202	206	(3,076)			108,550				85,880
					6,151	2,563	8,714	105,987	0	3,817	3,817	82,063
7	2002				9,009	4,063	13,072	101,924	0	5,725	5,725	76,338
8	2003				8,664	4,408	13,072	97,516	0	5,725	5,725	70,613
9	2004				8,289	4,783	13,072	92,733	0	5,725	5,725	64,887
10	2005				7,882	5,189	13,072	87,544	0	5,725	5,725	59,162
11	2006				7,441	5,630	13,072	81,913	0	5,725	5,725	53,437
12	2007				6,963	6,109	13,072	75,804	0	5,725	5,725	47,711
13	2008				6,443	6,628	13,072	69,176	0	5,725	5,725	41,986
14	2009				5,880	7,192	13,072	61,984	0	5,725	5,725	36,261
15	2010				5,269	7,803	13,072	54,181	0	5,725	5,725	30,535
16	2011				4,605	8,466	13,072	45,715	0	5,725	5,725	24,810
17	2012				3,886	9,186	13,072	36,529	0	5,725	5,725	19,085
18	2013				3,105	9,967	13,072	26,563	0	5,725	5,725	13,359
19	2014				2,258	10,814	13,072	15,749	0	5,725	5,725	7,634
20	2015				1,339	11,733	13,072	4,016	0	5,725	5,725	1,908
21	2016				341	4,016	4,357	0	0	1,908	1,908	0
Total		108,550	85,880	194,430	112,010	108,550	196,074		0	85,880	85,880	

Note: Figures in parentheses are I.D.C.

Remarks: Repayment condition - Foreign currency: 8.5% annum
Local currency : 0%
Grace Period : 6 years (construction period)
Repayment method : 15 years with principal and interest in equal installment
Capital recovory factor - 0.120424

Table 15-2 Profit and Loss Statement

(unit: 10^3 US$)

No.	Year	Operating Revenue (A)	Operating Expenses: O & M	Operating Expenses: Depreciation	Total (B)	Operating Income (C)=A-B	Financial Expenses*: F.C.	Financial Expenses*: D.C.	Total* (D)	Net Income (E)=C-D
-1	1995						(339)	0	(339)	
1	1996						(827)	0	(827)	
2	1997						(1,904)	0	(1,904)	
3	1998						(3,504)	0	(3,504)	
4	1999						(6,246)	0	(6,246)	
5	2000						(8,590)	0	(8,590)	
6	2001						(3,076)	0	(3,076)	
		21,544	1,072	3,363	4,435	17,108	6,151	0	6,151	10,957
7	2002	32,316	1,608	5,045	6,653	25,663	9,009	0	9,009	16,654
8	2003	32,316	1,608	5,045	6,653	25,663	8,664	0	8,664	16,999
9	2004	32,316	1,608	5,045	6,653	25,663	8,289	0	8,289	17,374
10	2005	32,316	1,608	5,045	6,653	25,663	7,882	0	7,882	17,780
11	2006	32,316	1,608	5,045	6,653	25,663	7,441	0	7,441	18,221
12	2007	32,316	1,608	5,045	6,653	25,663	6,963	0	6,963	18,700
13	2008	32,316	1,608	5,045	6,653	25,663	6,443	0	6,443	19,219
14	2009	32,316	1,608	5,045	6,653	25,663	5,880	0	5,880	19,783
15	2010	32,316	1,608	5,045	6,653	25,663	5,269	0	5,269	20,394
16	2011	32,316	1,608	5,045	6,653	25,663	4,605	0	4,605	21,057
17	2012	32,316	1,608	5,045	6,653	25,663	3,886	0	3,886	21,777
18	2013	32,316	1,608	5,045	6,653	25,663	3,105	0	3,105	22,558
19	2014	32,316	1,608	5,045	6,653	25,663	2,258	0	2,258	23,405
20	2015	32,316	1,608	5,045	6,653	25,663	1,339	0	1,339	24,324
21	2016	32,316	1,608	5,045	6,653	25,663	341	0	341	25,321
Total		506,281	25,195	79,038	104,233	402,047	112,010	0	112,010	314,523

*Note: Figures in parentheses are I.D.C.

Remarks: Operating revenue : 606.3GWh x 0.0533US$/kWh
Operation and Maintenance: see 14.2.2
Depreciation: construction cost including I.D.C. - Civil: 147,359.8 (50 years) =2947.2
- Hydro: 24,617.8 (35 years) = 703.4
- Elec.: 32,194.0 (35 years) = 919.8
- T/L : 14,238.3 (30 years) = 474.6
Total 5045.0

Table 15-3 Cash Flow Sheet

(unit: 10^3 US$)

No.	Year	Cash Inflow				Cash Outflow						Balance	
		Fund Requirement	Net Income	Depreciation	Total (A)	Construction cost	Principal Repayment F.C.	Principal Repayment D.C.	Principal Repayment Subtotal	I.D.C.	Total (B)	Yearly (A)-(B)	Accummulation
-1	1995	17,223	0	0	17,223	17,223	0	0	0	339	17,562	-339	-339
1	1996	14,378	0	0	14,378	14,378	0	0	0	827	15,204	-827	-1,166
2	1997	20,795	0	0	20,795	20,795	0	0	0	1,904	22,699	-1,904	-3,070
3	1998	44,036	0	0	44,036	44,036	0	0	0	3,504	47,540	-3,504	-6,574
4	1999	67,718	0	0	67,718	67,718	0	0	0	6,246	73,964	-6,246	-12,819
5	2000	30,075	0	0	30,075	30,075	0	0	0	8,590	38,665	-8,590	-21,410
6	2001	206	0	0		206	0	0	0	3,076	3,281		
		0	10,957	3,363	14,526	0	2,563	3,817	6,380	0	6,380	4,865	-16,545
7	2002	0	16,654	5,045	21,699	0	4,063	5,725	9,788	0	9,788	11,911	-4,634
8	2003	0	16,999	5,045	22,044	0	4,408	5,725	10,133	0	10,133	11,911	7,276
9	2004	0	17,374	5,045	22,419	0	4,783	5,725	10,508	0	10,508	11,911	19,187
10	2005	0	17,780	5,045	22,825	0	5,189	5,725	10,915	0	10,915	11,911	31,098
11	2006	0	18,221	5,045	23,266	0	5,630	5,725	11,356	0	11,356	11,911	43,008
12	2007	0	18,700	5,045	23,745	0	6,109	5,725	11,834	0	11,834	11,911	54,919
13	2008	0	19,219	5,045	24,264	0	6,628	5,725	12,354	0	12,354	11,911	66,829
14	2009	0	19,783	5,045	24,828	0	7,192	5,725	12,917	0	12,917	11,911	78,740
15	2010	0	20,394	5,045	25,439	0	7,803	5,725	13,528	0	13,528	11,911	90,651
16	2011	0	21,057	5,045	26,102	0	8,466	5,725	14,192	0	14,192	11,911	102,561
17	2012	0	21,777	5,045	26,822	0	9,186	5,725	14,911	0	14,911	11,911	114,472
18	2013	0	22,558	5,045	27,603	0	9,967	5,725	15,692	0	15,692	11,911	126,382
19	2014	0	23,405	5,045	28,450	0	10,814	5,725	16,539	0	16,539	11,911	138,293
20	2015	0	24,324	5,045	29,369	0	11,733	5,725	17,458	0	17,458	11,911	150,204
21	2016	0	25,321	5,045	30,366	0	4,016	1,908	5,924	0	5,924	24,442	174,646
Total		194,430	314,523	79,038	587,991	194,430	108,550	85,880	194,430	24,485	413,346	174,646	1,131,710

CHAPTER 16 FURTHER INVESTIGATIONS

CHAPTER 16 FURTHER INVESTIGATIONS

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CHAPTER 16 FURTHER INVESTIGATIONS

For the purpose of promoting the Project to the detailed design stage, more detailed information is required about topographic, geologic and geotechnic conditions of various civil structure sites proposed in the feasibility design. This Chapter presents planning of additional investigation works, such as, topographical survey, geological investigations, and geotechnical investigations including rock mechanic tests and hydrogeological tests, and hydrological monitoring data at damsite and power station site which should be done promptly.

16.1 Topographical Survey

Topographical survey works, as shown in Table 16-1 are necessary at the Pirris Project area prior to additional investigations and tests and, also, detailed design works.

Table 16-1 The Necessity of Topographical Survey Works

Site	Survey Method	Scale of Map	Remarks
Damsite	Topographical surveying	1/500	Includes intake site
Reservoir area and damsite	Mapping by aero-photographs	1/1000	Includes quarry site and access roads to the damsite
Penstock and P/S site	Mapping by aero-photographs	1/1000	Includes surgetank site & access roads to P/S
Main structure site	Triangulating (T.S.) and leveling (B.M.)		Connecting with Dam and Power Plant sites

Note: Areas to be surveyed are shown in Fig.16-1.

16.2 Geological Investigation

16.2.1 Detailed Geological and/or Engineering Geological Mapping

Prior to commencement of the detailed design works for the Pirris Project, detailed geological and/or engineering geological mappings are necessary at the following site/area: Damsite, intake site, reservoir area, waterway alignment area, landslide area located at the upstream side of power station (P/S) site and quarry site. General specifications of each mapping are shown in Table 16-2.

Table 16-2 General Specifications of Additional Geological and Engineering Geological Mapping for the Design Stage

Location / Specification	Damsite & Intake Site	Reservoir Area	Waterway Alignment Route*1)	Landside Area	Quarry Site	Remarks
Topographic Map to be used (in scale)	1/500 *2)	1/2000	1/2000	1/2000	1/1000 ~ 1/500	*2) Not available as of July 1991
Outcrop(Bed-rock) Survey	o	o	o	o	o	
Overburden Survey	o	o	o	o	o	
Surface Water Outcrop Survey		o	o	o		
Landslide/Collapse (or Failure) Survey		o	o	o		
Additional Aerophoto Interpretation		o	o	o		If new photos are available

Notes: *1) "Waterway alignment" includes headrace tunnel, surgetank (if necessary), penstock and powerstation.

*2) The 1/500 scale map should be provided by a topographical survey.

16.2.2 Core Drilling

Subsurface explorations by core drilling with Lugeon tests and groundwater monitoring are additionally necessary at main civil structure sites and quarry site in order to realize the detailed designs on the Project, as shown in Table 16-3 and Figs. 16-2, 16-3, 16-4, 16-5 and 16-6.

Table 16-3 Additional Core Drilling

Location		Temporary No.	EL. (m)	Length (m)	Direction	Lugeon Test	Groundwater Monitoring	Remarks
Lower (Downstream) Damsite	On the Left Bank	LB-101	± 1,270	150.00	Vertical	o	o	
		LB-102	± 1,149	70.00	Vertical	o	o	Drilling from Adit LA-1
		LB-103	± 1,150	70.00	S15°W 60°SW	o	o	
		LB-104	± 1,085	50.00	N30°W 65°NW	o	o	
	On the Right Bank	LB-201	± 1,090	80.00	Vertical	o	o	
		LB-202	± 1,085	30.00	Vertical	o	o	
		LB-203	± 1,085	50.00	S30°E 45°SE	o	o	
		LB-204	± 1,250	150.00	Vertical	o	o	
		LB-205	± 1,245	150.00	Vertical	o	o	
		LB-206	± 1,255	150.00	Vertical	o	o	Sub Total: 10 Holes/950 m
Intake Site		IB-1	1,245~ 1,250	50.00	Vertical	-	o	Sub Total: 1 Hole/50 m
Tunnel Route		TB-1		70.00	Vertical	Δ (Partial)	o	Quebrada Seca
		TB-2		80.00	Vertical	Δ (Partial)	o	Quebrada Napoleon Sub Total: 2 holes/150 m
Surgetank ⋮ Penstock Route		PB-101	850 ± 50	50.00	Vertical	Δ (Partial)	o	
		PB-102	750 ± 10	30.00	Vertical	-	-	
		PB-103	650 ± 10	30.00	Vertical	-	-	Sub Total: 3 Holes/110 m
Powerhouse Site		PB-104	± 320	50.00	Vertical	-	o	Sub Total: 1 Hole/50 m
Quarry Site		QB-1		30.00	Vertical	-	o	
		QB-2		30.00	Vertical	-	o	Sub Total 2 Holes/60 m
							Total:	19 Holes/ 1,370m

16.2.3 Adit Exploration

Further exploratory adits are to be excavated at the downstream damsite to confirm geological conditions and geotechnical properties of the dam abutments as shown in Table 16-4 and Figs. 16-2 and 16-3. Additional in-situ rock mechanical tests in to-be-excavated adits are proposed as shown in Table 16-4.

Table 16-4 Additional Exploratory Adits at the Damsite

Location		Adit No.	El. (m)	Length (m)		Plate Jack Test	Block Shear Test	Remarks
				(Existing)	(Additional)			
Lower (Downstream) Damsite	On the Left Bank	LA-1	1,148.73	50.00	30.00	Δ	o	Place of B.S.T in the Existing Adit
		LA-5	↳ 1,110	0	50.00	o	o	
	On the Right Bank	LA-2	1,160.66	50.00	30.00	Δ	o	Place of B.S.T in the Existing Adit
		LA-3	↳ 1,195	0	80.00 +70.00	-	-	
		LA-4	↳ 1,110	0	50.00 +40.00	o	o	*Access adit from the downstream side

Total: 100.00/350 m

o : Necessary
Δ : If necessary

16.2.4 Seismic Prospecting

Seismic prospectings at the damsite (in adits to be excavated), the tunnel route and the quarry site are to be carried out, as shown in Table 16-5.

Table 16-5 Additional Seismic Prospecting

Location	Method of Prospecting	Total Traverse Length (m)	Remarks
Damsite	Vp measurement in adits LA-1, LA-2, LA-3, LA-4 and LA-5	210 m - 250 m (80 m + 80 m)*1)	To measure in to-be-excavated adits
Quarry site	Refraction prospecting	400 m - 1,000 m	Located on the right bank around the upstream dam site
Tunnel Route			
1. Queb. Seca*2)	Refraction prospecting	500 m	To be cross- checked by a core drilling
2. Queb. Napoleon*3)	Refraction prospecting	500 m	To be cross-checked by a core drilling

Note: *1) Executions of Vp measurement between adits LA-2 and LA-3 should be decided according to their geological conditions.

*2) *3) Refraction prospectings are to be carried out along both Quebradas around crossing points of the tunnel routes.

16.3 Material Test (for Coarse aggregates)

Crushing Test shall be conducted for concrete aggregate of the proposed Quarry site at the right bank of up-stream damsite.

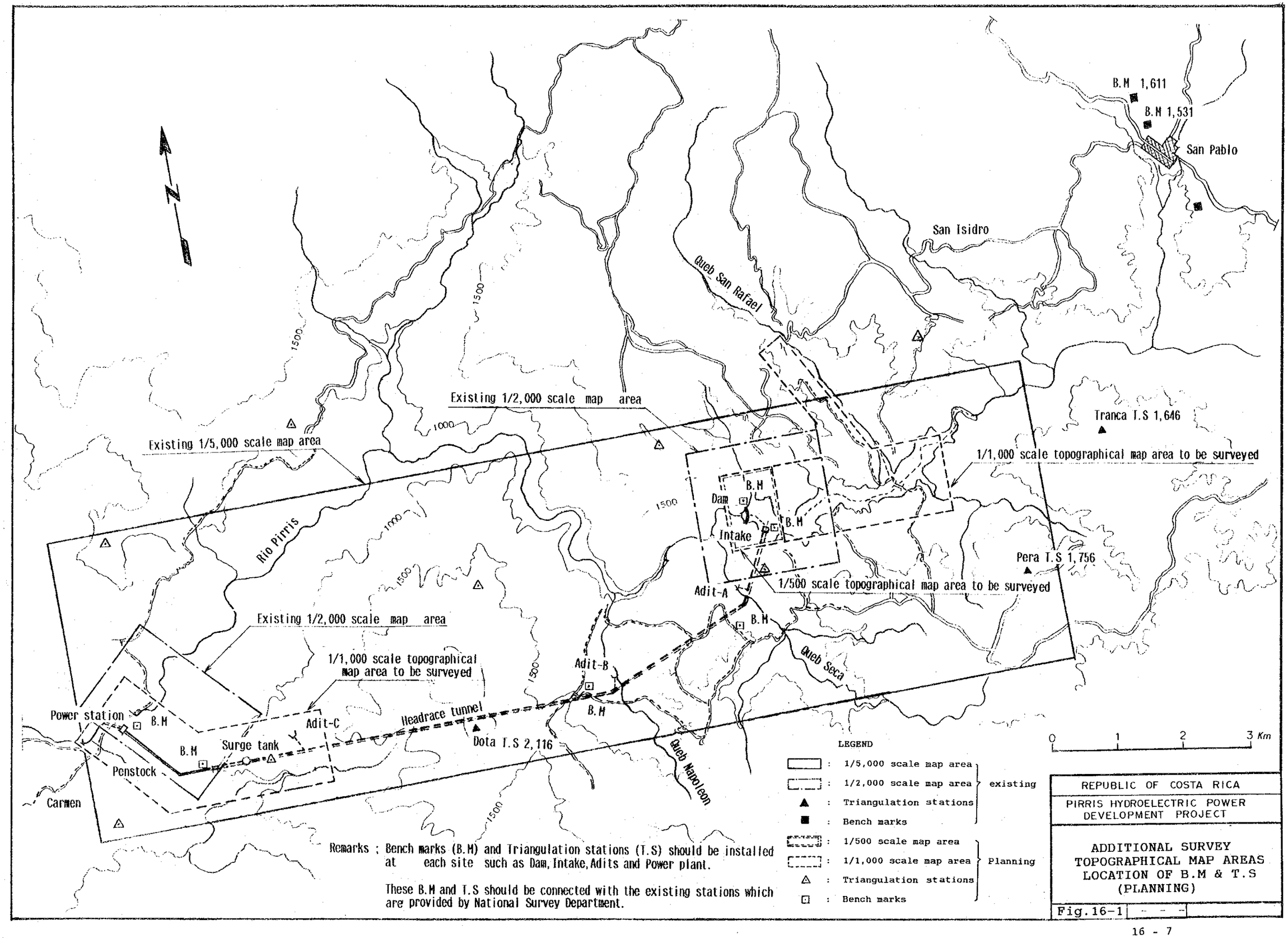
16.4 Hydrological Observation

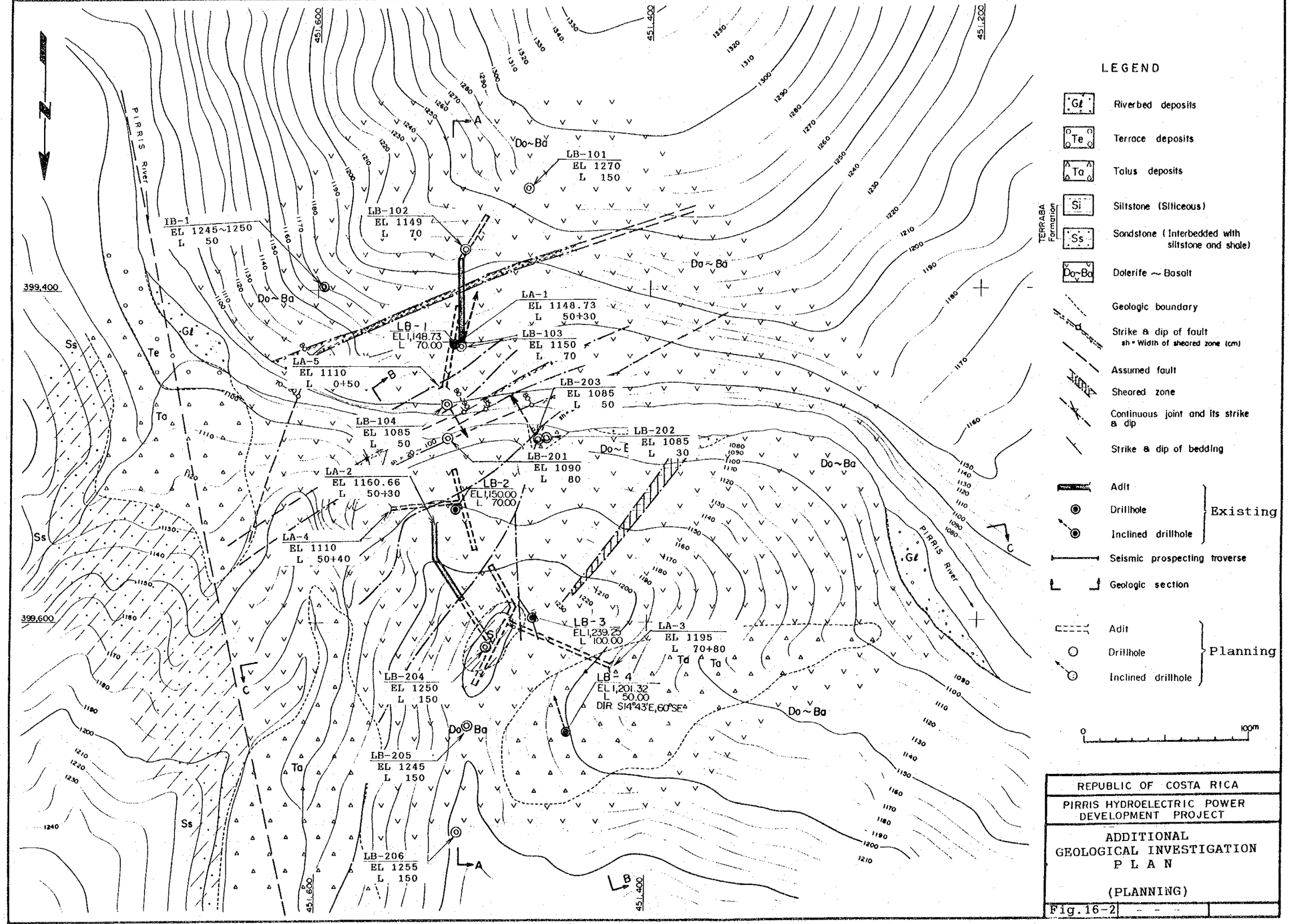
16.4.1 Installation of Flow Gauging Station at Power Station

A flow gauging station shall be installed at the power station site. It is necessary to observe the water flow at the site for the study of turbine center height and tailrace water level.

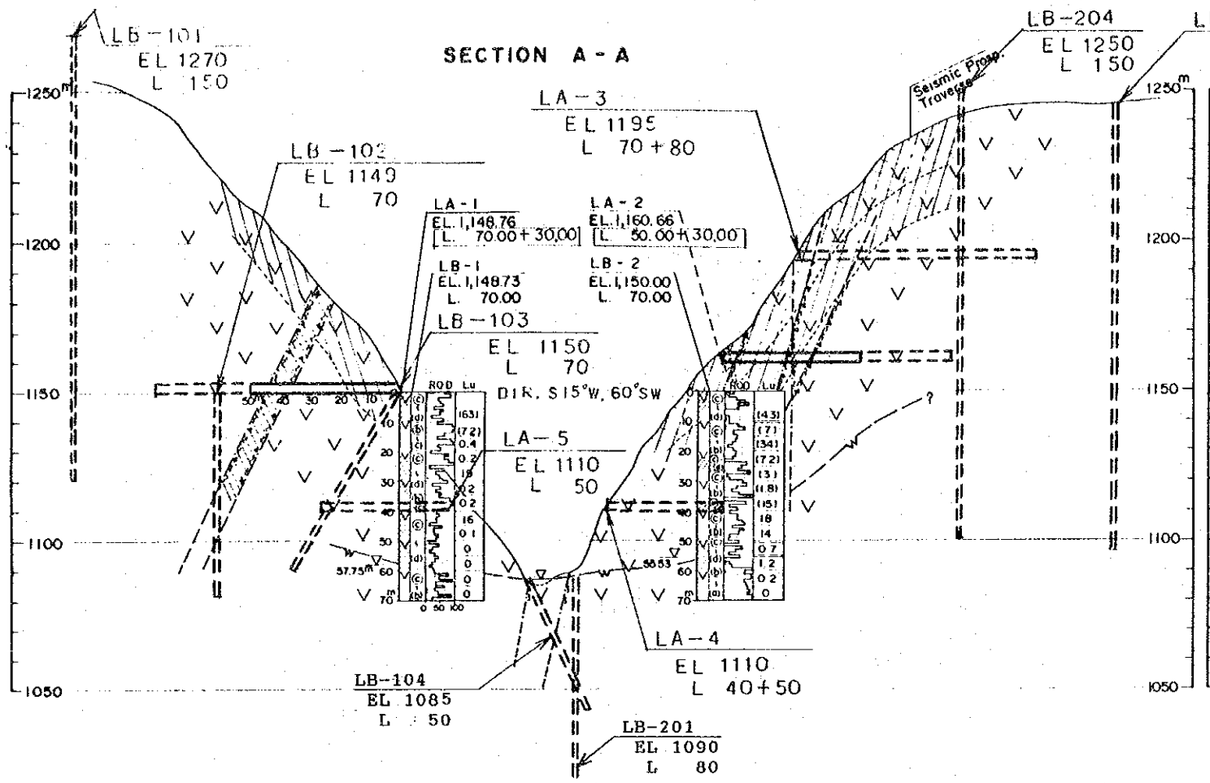
16.4.2 Measurement of River Water Temperature and Air Temperature at Damsite

It is necessary to observe the river water temperature and air temperature at damsite for the study of cooling of dam concrete.

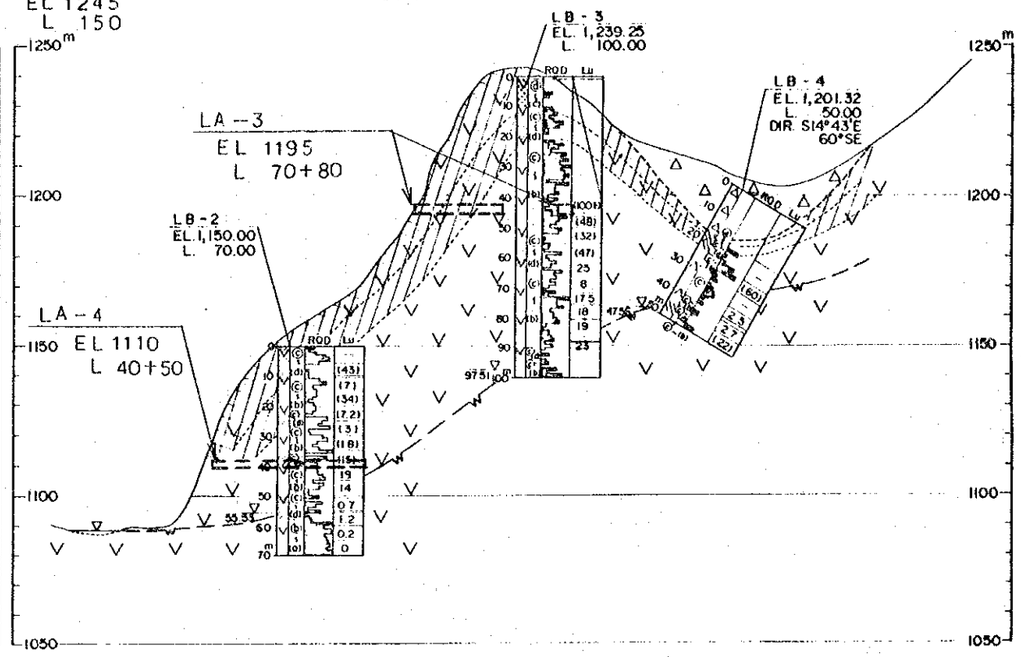

B.M 1,611
B.M 1,531
San Pablo
San Isidro
Queb San Rafael
1500
1000
Existing 1/2,000 scale map area
Existing 1/5,000 scale map area
Tranca T.S 1,646
1/1,000 scale topographical map area to be surveyed
B.M
Dam
Intake
B.M
Pera T.S 1,756
1/500 scale topographical map area to be surveyed
Adit-A
B.M
Rio Pirris
Existing 1/2,000 scale map area
1/1,000 scale topographical map area to be surveyed
Adit-B
Queb Seca
Power station
B.M
Adit-C
Headrace tunnel
B.M
Surge tank
Dota T.S 2,116
Penstock
Carmen
Queb Napoleon
0 1 2 3 Km
LEGEND
: 1/5,000 scale map area
: 1/2,000 scale map area
existing
: Triangulation stations
: Bench marks
: 1/500 scale map area
: 1/1,000 scale map area
Planning
: Triangulation stations
: Bench marks
Remarks ; Bench marks (B.M) and Triangulation stations (T.S) should be installed at each site such as Dam, Intake, Adits and Power plant.
These B.M and T.S should be connected with the existing stations which are provided by National Survey Department.
REPUBLIC OF COSTA RICA
PIRRIS HYDROELECTRIC POWER DEVELOPMENT PROJECT
ADDITIONAL SURVEY
TOPOGRAPHICAL MAP AREAS
LOCATION OF B.M & T.S
(PLANNING)
Fig.16-1


LEGEND
Gl Riverbed deposits
Te Terrace deposits
Ta Talus deposits
Si Siltstone (Siliceous)
Ss Sandstone (Interbedded with siltstone and shale)
Do~Ba Dolerife ~ Basalt
Geologic boundary
Strike & dip of fault
sh = Width of sheared zone (cm)
Assumed fault
Sheared zone
Continuous joint and its strike & dip
Strike & dip of bedding
Adit
Drillhole
Inclined drillhole
Existing
Seismic prospecting traverse
Geologic section
Adit
Drillhole
Inclined drillhole
Planning
TERRABA Formation
PIRRIS River
LB-1 EL 1245~1250 L 50
LB-101 EL 1270 L 150
LB-102 EL 1149 L 70
LB-1 EL 1,148.73 L 70.00
LA-1 EL 1148.73 L 50+30
LB-103 EL 1150 L 70
LA-5 EL 1110 L 0+50
LB-203 EL 1085 L 50
LB-104 EL 1085 L 50
LB-202 EL 1085 L 30
LB-201 EL 1090 L 80
LA-2 EL 1160.66 L 50+30
LB-2 EL 1,150.00 L 70.00
LA-4 EL 1110 L 50+40
LB-3 EL 1,239.25 L 100.00
LA-3 EL 1195 L 70+80
LB-4 EL 1,201.32 L 50.00 DIR S14°43'E,60°SE
LB-204 EL 1250 L 150
LB-205 EL 1245 L 150
LB-206 EL 1255 L 150
451,600
451,400
451,200
399,600
0 100m
REPUBLIC OF COSTA RICA
PIRRIS HYDROELECTRIC POWER DEVELOPMENT PROJECT
ADDITIONAL GEOLOGICAL INVESTIGATION PLAN
(PLANNING)
Fig. 16-2

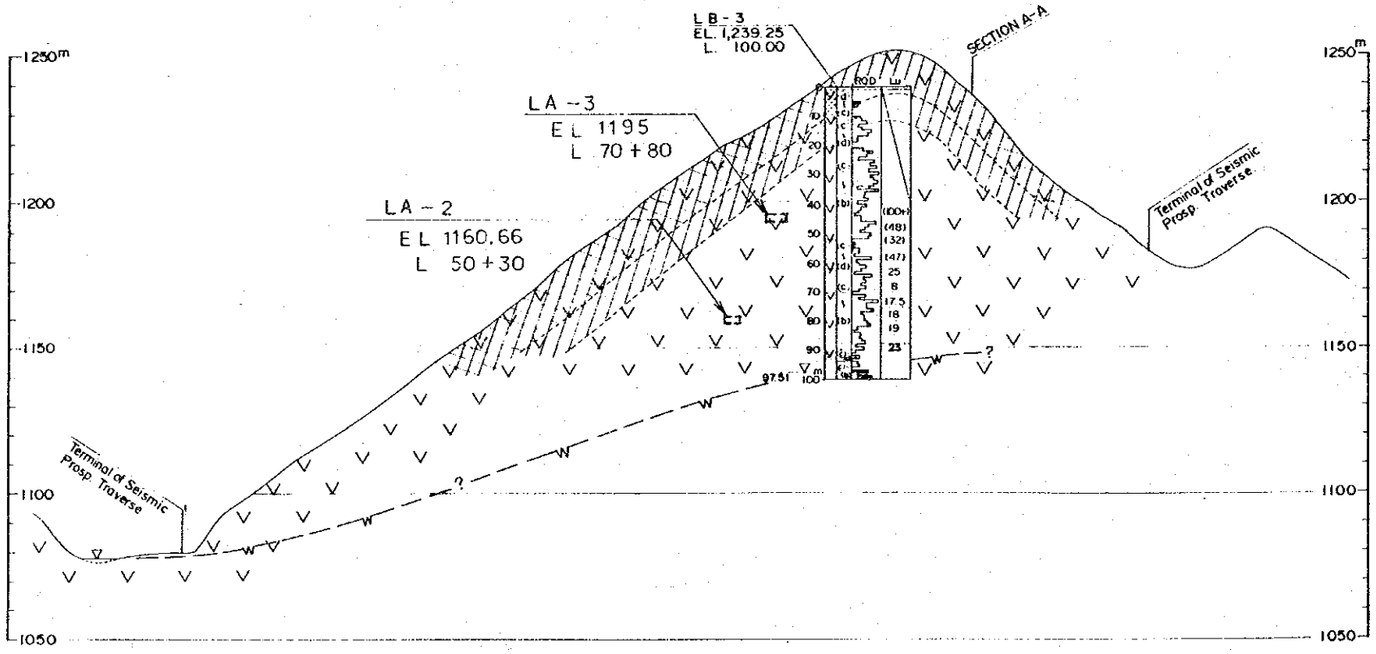
SECTION A - A



SECTION B-B



SECTION C-C



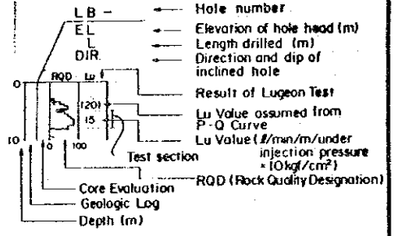
L E G E N D

- Talus deposits
- Dolerite ~ Basalt
- Fault
- Geologic boundary
- Boundary of rock condition
- Ground water level

(Rock Condition)

- Somewhat cracky and slightly loosened part
- Cracky and loosened part due to weathering and/or creeping
- Softened and/or brittle part due to shearing
- Adit (Existing)
- Adit
- Drillhole (Planning)

(Drillhole Log)



- Dolerite
- Softened or gravelish cores
- Cracky cores
- Core Evaluation (See Core Classification and Evaluation)

0 100m

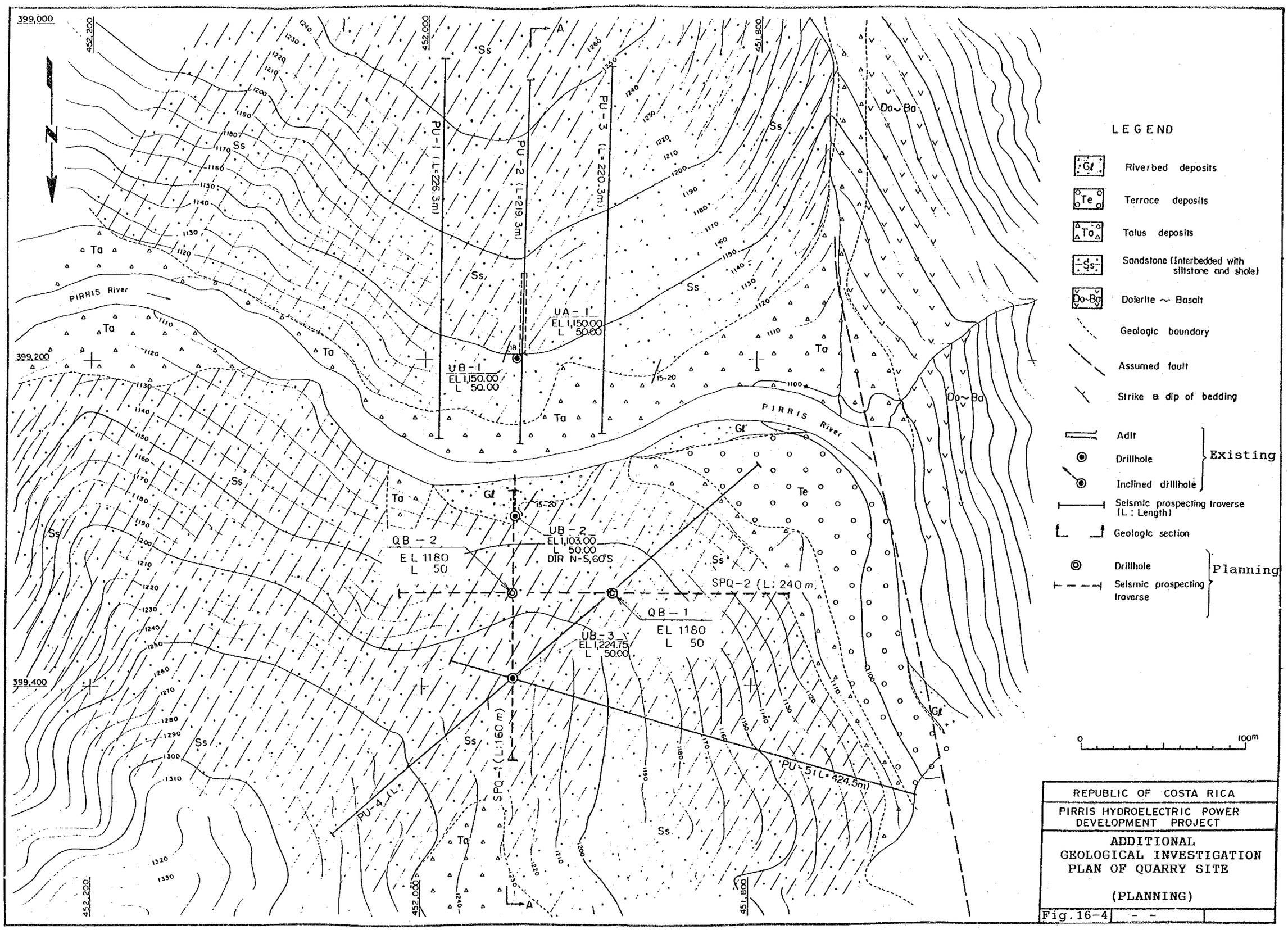
REPUBLIC OF COSTA RICA

PIRRIS HYDROELECTRIC POWER DEVELOPMENT PROJECT

ADDITIONAL GEOLOGICAL INVESTIGATION SECTIONS

(PLANNING)

Fig. 16-3



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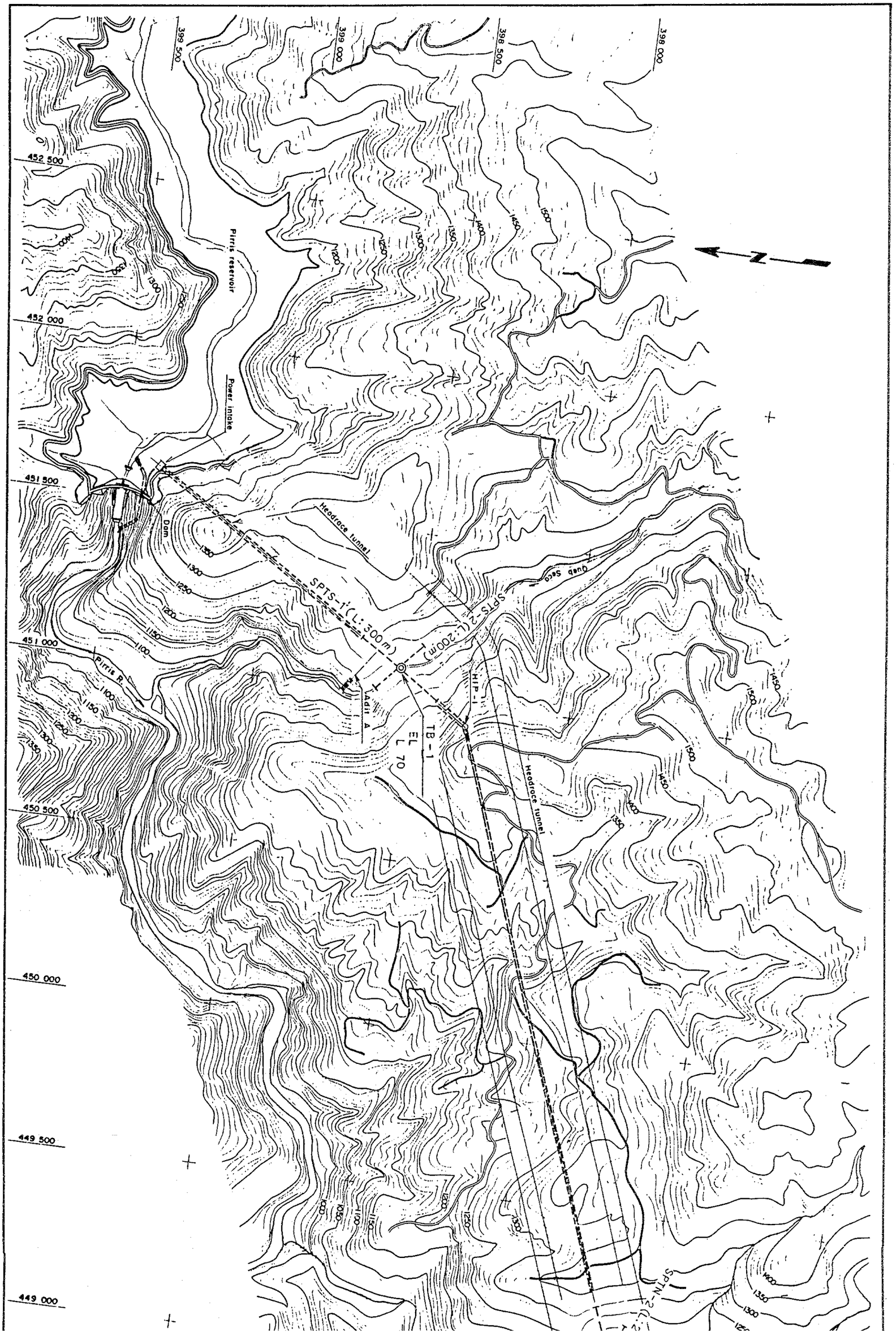
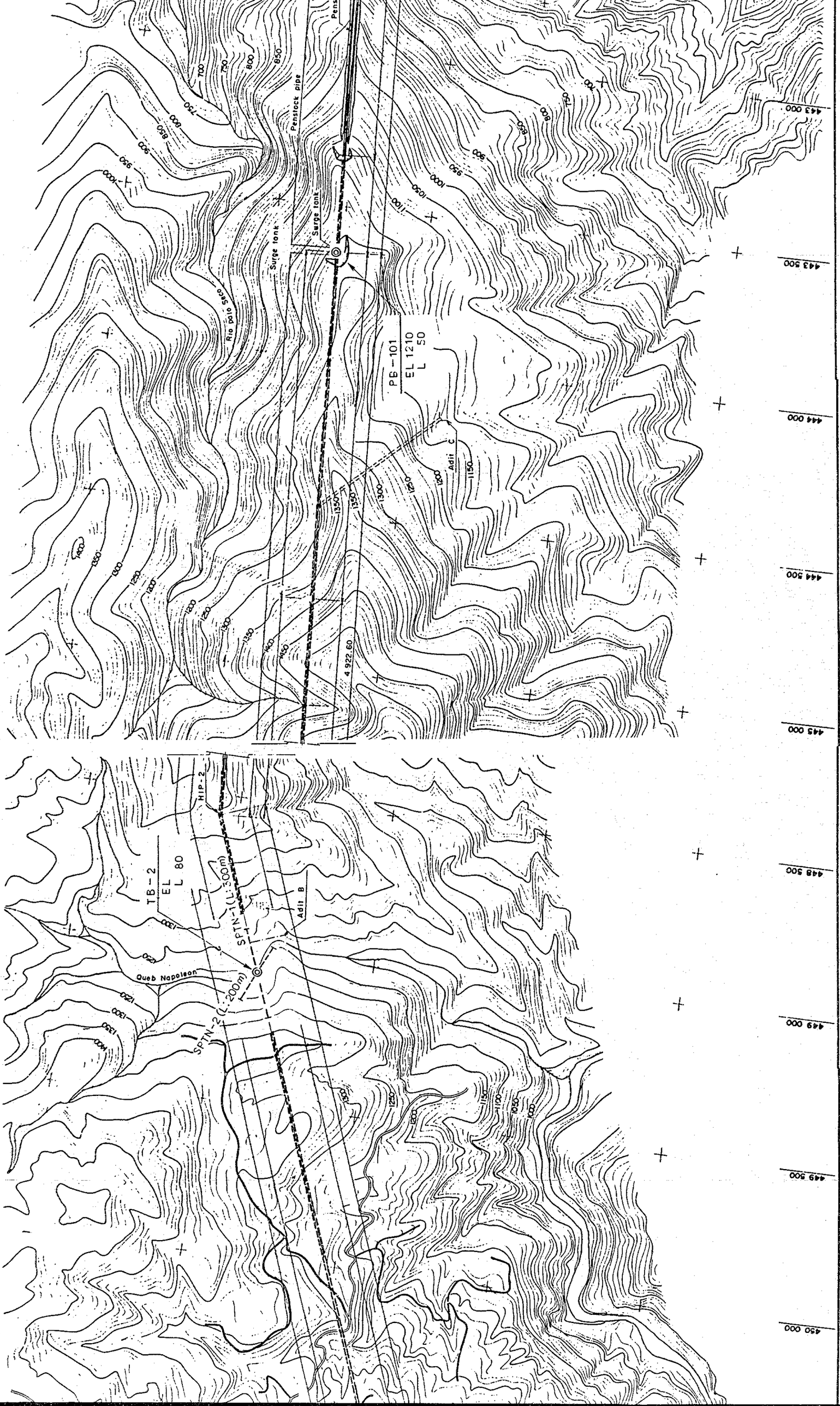
PIRRIS HYDROELECTRIC POWER DEVELOPMENT PROJECT

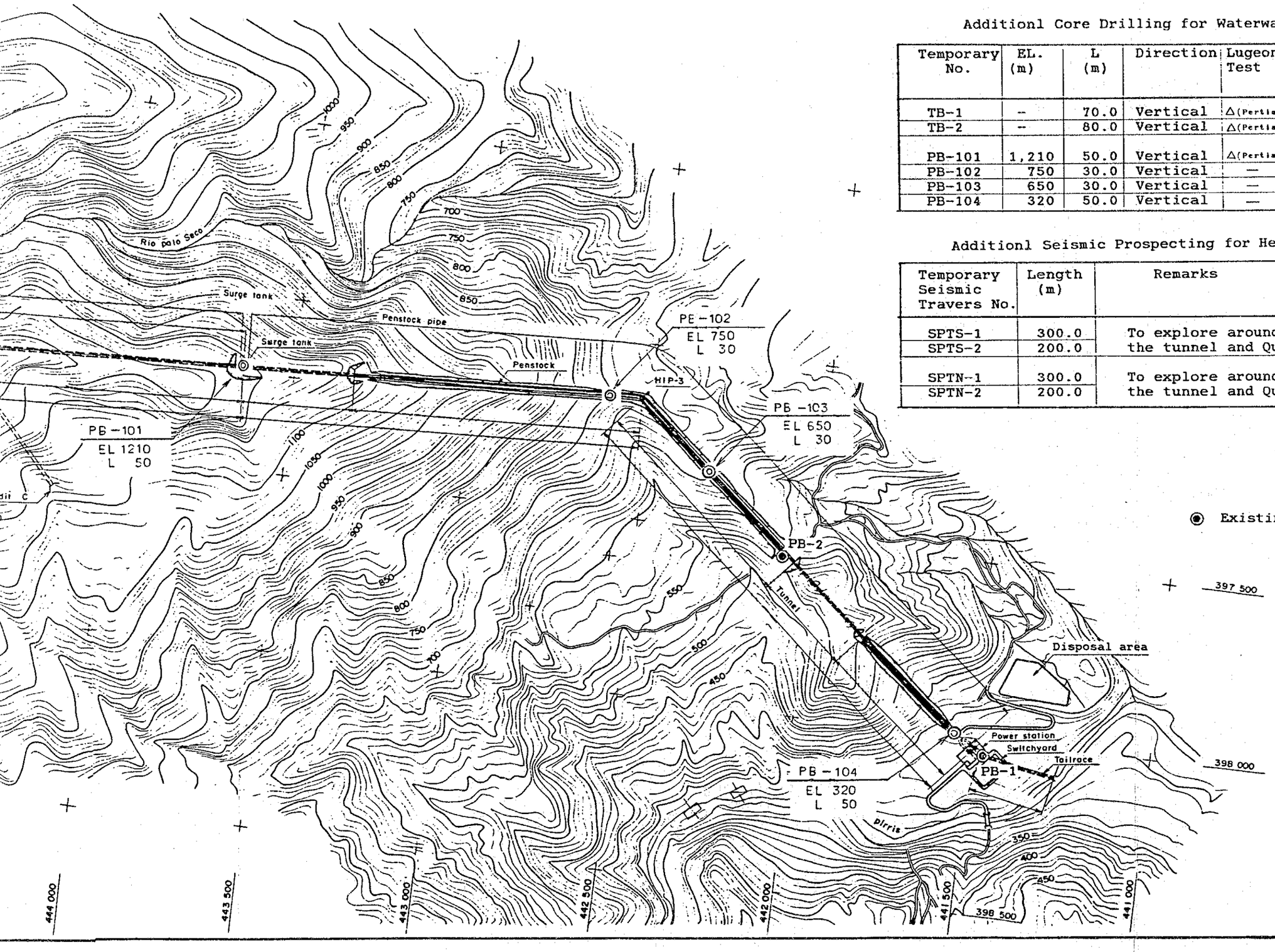
ADDITIONAL GEOLOGICAL INVESTIGATION PLAN OF QUARRY SITE

(PLANNING)

Fig. 16-4


399 500
399 000
398 500
398 000
452 500
452 000
451 500
451 000
450 500
450 000
449 500
449 000
Pirris reservoir
Power intake
Dam
Headrace tunnel
SPTS-1 (L: 300 m)
SPTS-2 (L: 200 m)
Quebrada Seca
Pirris R.
Adit A
TB-1
EL 70
HIP-1
Headrace tunnel
SPTN-2
1400
1450
1500
1350
1300
1250
1200
1150
1100
1050
1000
950
900


Penstock pipe
Surge tank
Surge tank
Rio polio sas
PB-101
EL 1210
L 50
Adit C
4 922.60
HIP-2
TB-2
EL
L 80
SPTN-1 (L: 300m)
Adit B
Queb Napoleon
SPTN-2 (L: 200m)
443 000
443 500
444 000
444 500
448 500
449 000
449 500
450 000



Existing drill hole

Additionl Core Drilling for Waterway Alignment

Temporary No.	EL. (m)	L (m)	Direction	Lugeon Test	Ground Water Monitering	Remarks
TB-1	--	70.0	Vertical	△(Pertial)	○	Queb Seca
TB-2	--	80.0	Vertical	△(Pertial)	○	Queb Napo.
PB-101	1,210	50.0	Vertical	△(Pertial)	○	Sure tank
PB-102	750	30.0	Vertical	—	—	
PB-103	650	30.0	Vertical	—	—	
PB-104	320	50.0	Vertical	—	○	Powerhouse

Additionl Seismic Prospecting for Headrace Tunnel Route

Temporary Seismic Travers No.	Length (m)	Remarks
SPTS-1	300.0	To explore around the crossing point of the tunnel and Queb Seca.
SPTS-2	200.0	
SPTN-1	300.0	To explore around the crossing point of the tunnel and Queb Napoleon.
SPTN-2	200.0	

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PIRRIS HYDROELECTRIC POWER DEVELOPMENT PROJECT

ADDITIONAL GEOLOGICAL INVESTIGATION PLAN OF WATERWAY

(PLANNING)

Fig.16-5 | - - -