

Supporting-B Topographical Survey

SUPPORTING-B TOPOGRAPHICAL SURVEY

1. GENERAL

For urgent water source development plan, it was required to get more accurate topographical information than that had been available. Therefore, topographical survey was conducted for Los Laureles II Dam site and Sabacuante Dam site. The selection process of the two sites is described in Supporting H.

After the formulation of the Master Plan and the selection of the priority project for feasibility study, reservoir survey was performed for the existing Los Laureles Reservoir.

2. ITEMS OF SURVEY

The items of survey is tabulated in *Table B.1.1* and *Table B.1.2*

Table B.1.1 Itmes of Topographical Survey

Item	Scale	Los Laureles II Dam	Sabacuante Dam
Plan survey for dam site	1 / 500	200m × 200m	200m × 200m
Plan survey for reservoir	1 / 5,000	60 ha	140 ha
Profile leveling	1 / 1,000	Total 3 km	Total 3 km
Cross sectional survey	1 / 200	Total: 7.5km, Total: 15 sections, Interval: 200m Length: 500m/section	Total: 7.5km, Total: 15 sections, Interval: 200m Length: 500m/section

Table B.1.2 Itmes of Reservoir Survey

Item	Scale	Location
Plan survey for reservoir	1 / 5,000	Existing Reservoir (5 ha)
Sediment Material Survey (sampling and laboratory test)		Existing Reservoir and Upper River Bed

3. PURPOSES OF SURVEY

The purposes of the survey items are as follows;

(1) Plan Survey for Reservoir Area (1/5,000)

The maps are used for preliminary design of reservoir and seeing the influence of the reservoir to the existing houses and facilities. They are also used to calculate the relationship between the reservoir water level and the reservoir volume.

(2) Plan Survey for Dam Site (1/500)

The survey results are used for preliminary design of dam structures.

(3) Profile Leveling and Cross Section Survey

The information is used to check the plan survey of the reservoir area. It is also used as a basic information when flood routing is made along the river to see the effect of dam structure on the upper reach of the river.

(4) Reservoir Survey

The topography of the reservoir is surveyed and the sediment volume in the reservoir is calculated in order to assess the actual capacity of the reservoir and the location of the sediment material.

(5) Sediment Material Test

Sediment samples are taken from various locations of the reservoir and the river upstream in order to assess the quality of the sediment for reutilization.

4. SURVEY RESULTS

4.1 TOPOGRAPHIC MAP

Figures B.3.1 and B.3.2 show the topographical maps of the Los Laureles II Reservoir and Sabacuamte Reservoir. Figures B.3.3 and B.3.4 show the topographic map of the Los Laureles II Dam and Sabacuante Dam.

4.2 RIVER SURVEY

Figure B.3.5 shows the river profile of Los Laureles II Reservoir. The river sections are shown in Figures B.3.6 to B.3.9. Figure B.3.10 shows the river profile of Sabacuante Reservoir and the river sections are shown in Figures B.3.11 and B.3.12.

4.3 RESERVOIR SURVEY

Figure B.3.13 shows the topographical map of Los Laureles Reservoir.

Figure B.3.14 shows the relationship between the water level and the reservoir storage volume of Los Laureles Reservoir together with the relationship when the reservoir was constructed in 1974.

4.4 SEDIMENT TEST

(1) Figure B.3.15 shows the location map of the sediment sampling. The result of the laboratory test is shown in Table B.3.1 and Figure B.3.16.

Table B.3.1 Physical Properties of Sediment

No.	d60	specific gravity				water absorption			
		Sand	G1	G2	G3	Sand	G1	G2	G3
	(mm)					(%)			
1	37.5	2.38	2.62	2.51	2.44	5.49	2.75	2.79	4.00
2	100.0	2.43	2.65	2.57	2.54	2.82	1.46	2.47	2.66
3	0.425	2.56							
4	0.075	2.47							
5	98.0	2.33	2.55	2.51	2.51	4.46	2.88	3.36	4.00
6	78.0	2.38	2.76	2.53	2.56	3.11	1.00	1.84	1.00
7	4.0	2.31	2.31	2.52	2.49	5.56	3.51	7.17	6.87
8	11.0	2.31							
9	0.275	2.28							
10	22.0	2.35							

G1; 37.5 mm – 25.0 mm, G2; 19.0 mm – 12.5 mm, G3; 9.5 mm – 4.75 mm

The result of laboratory test is summarized as follows;

According to the sieving analysis, the sediment material in the reservoir is mostly silt while the river bed material along the upper reach of the reservoir has suitable grain size distribution for concrete aggregate.

The specific gravity and water absorption rate of the river bed sediment show satisfactory value as concrete aggregate.



Figure B.3.1

Topographic Map of Los Laureles II Reservoir

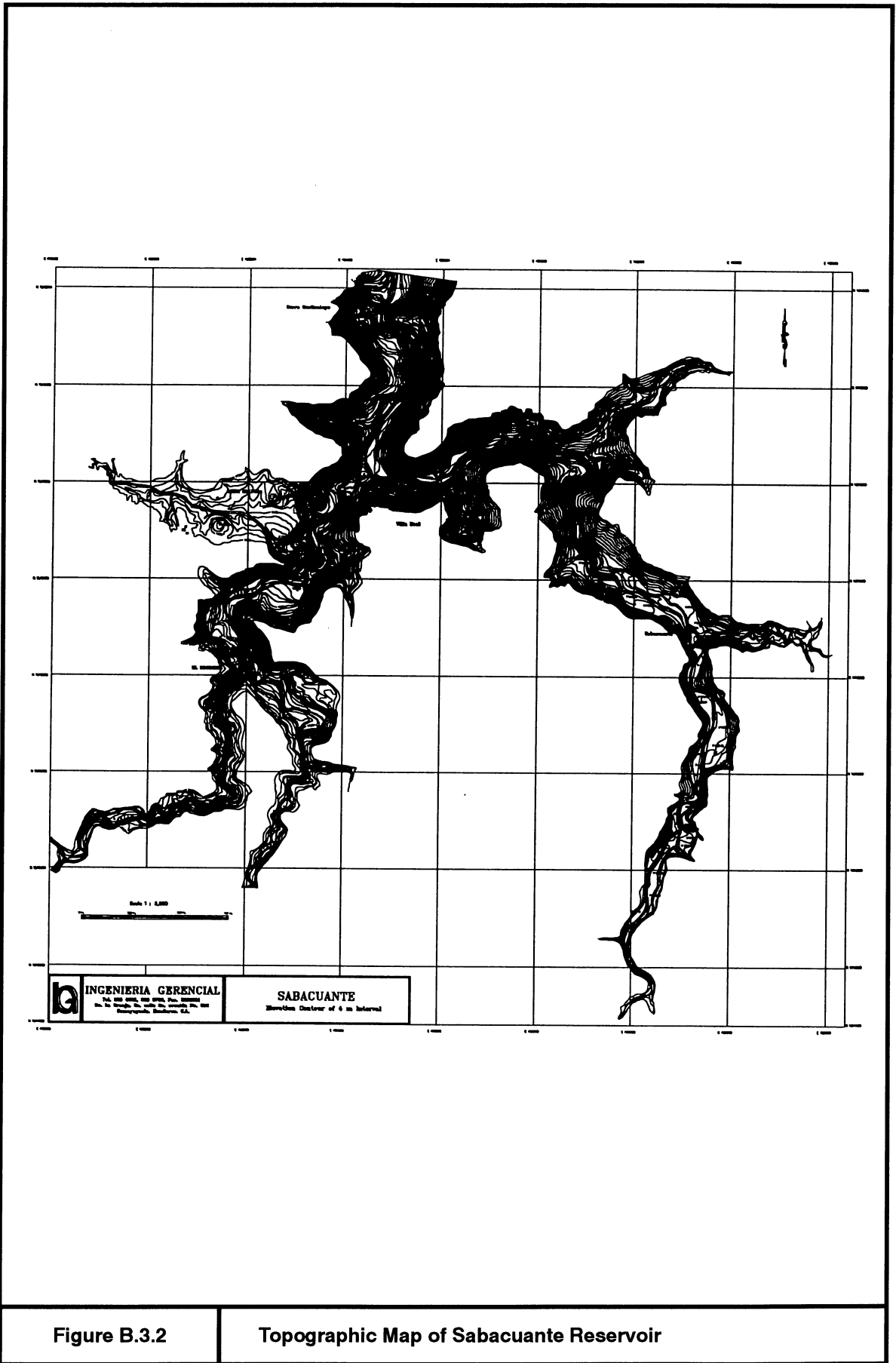


Figure B.3.2

Topographic Map of Sabacuante Reservoir

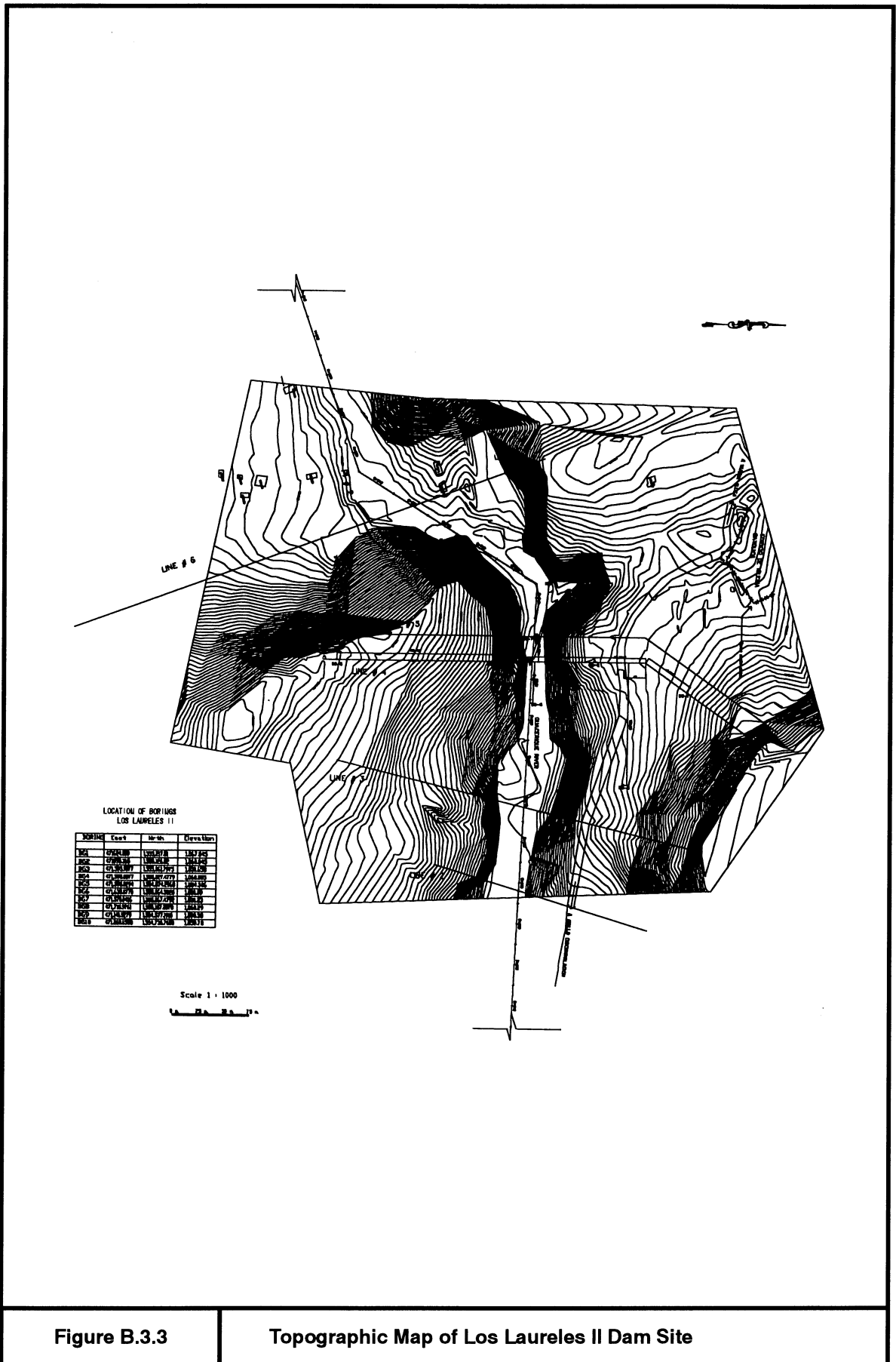


Figure B.3.3

Topographic Map of Los Laureles II Dam Site

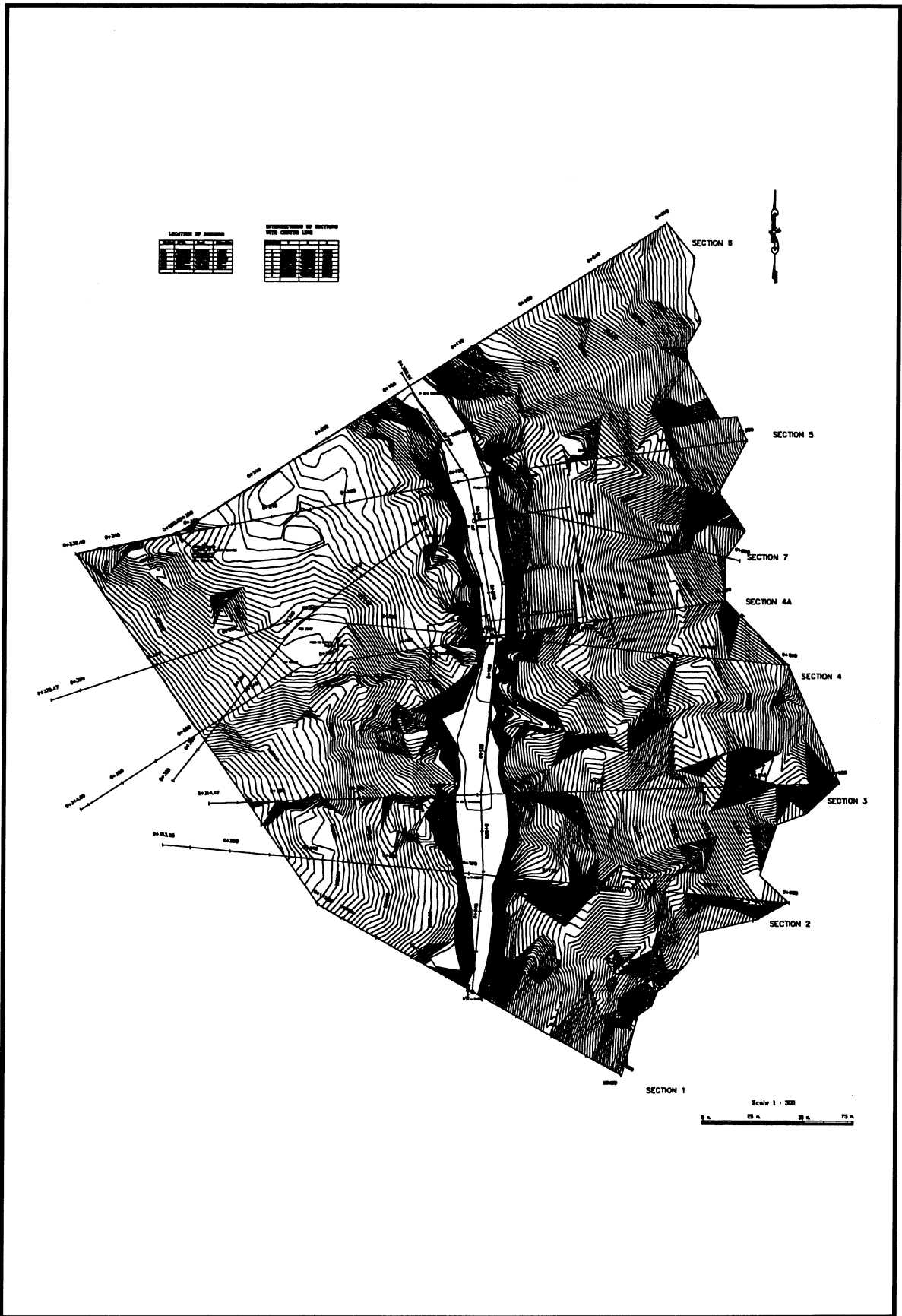


Figure B.3.4

Topographic Map of Sabacuante Dam Site

→ FLOW DIRECTION

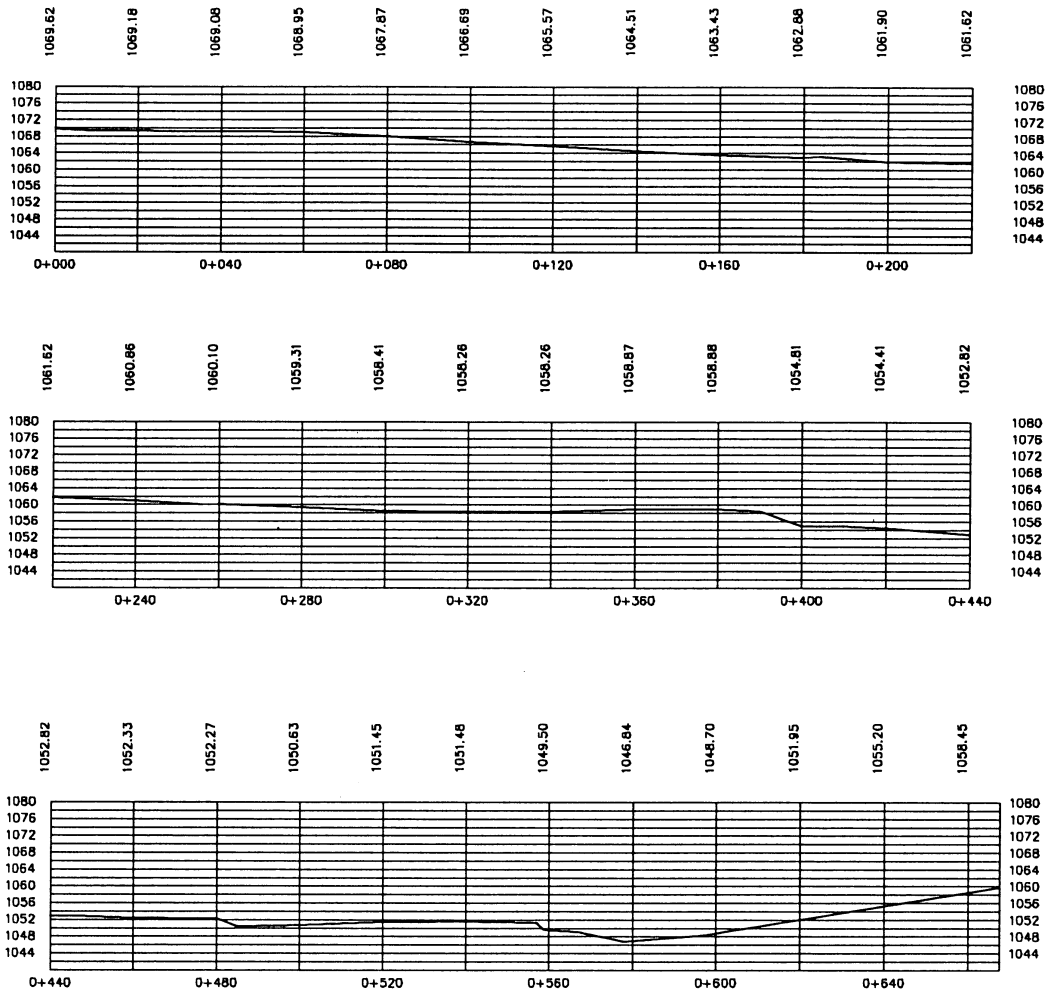


Figure B.3.5

River Profile of Los Laurels Reservoir



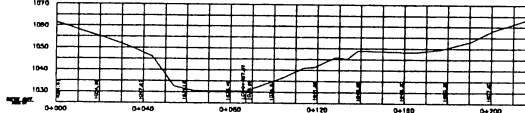
Figure B.3.6

Location Map of Sections (Los Laureles II Reservoir)

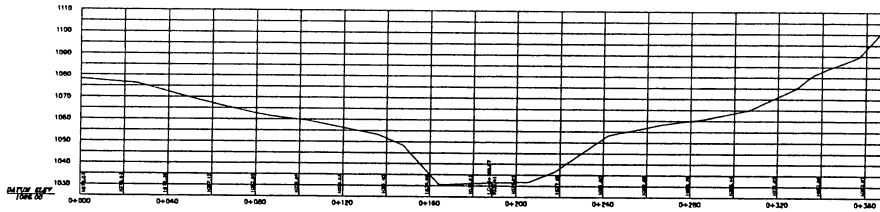
SECTION 0 LEFT → RIGHT



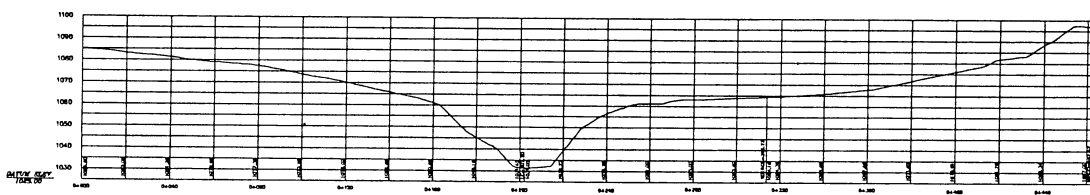
SECTION 2 LEFT → RIGHT



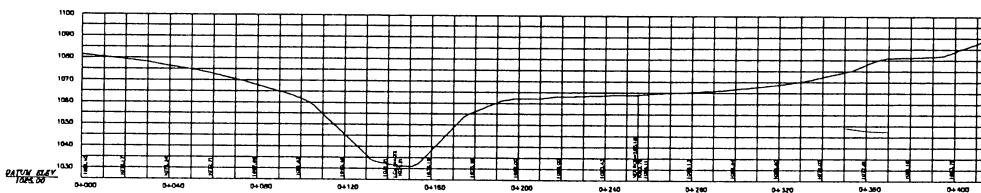
SECTION 3 LEFT → RIGHT



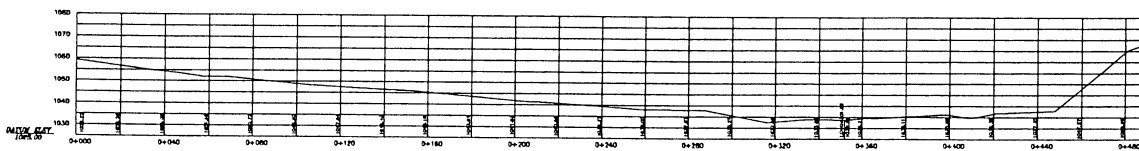
SECTION 4 LEFT → RIGHT



SECTION 5 LEFT → RIGHT



SECTION 6 LEFT → RIGHT



Graphic Scale: 1" = 300' V
 1" = 300' H

Figure B.3.7

Sections of Los Laureles II Reservoir (1/3)

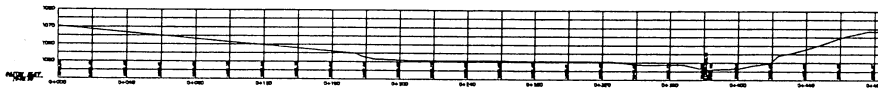
SECTION 14

LEFT → RIGHT



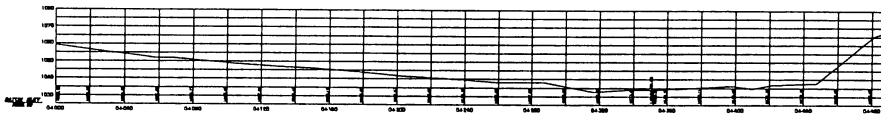
SECTION 15

LEFT → RIGHT



SECTION 16

LEFT → RIGHT



SECTION 17

LEFT → RIGHT



SECTION 18

LEFT → RIGHT



SECTION 19A

LEFT → RIGHT



SECTION 19

LEFT → RIGHT



SECTION 20

LEFT → RIGHT

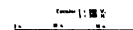
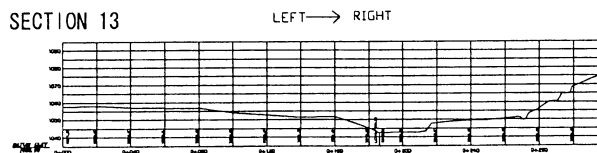
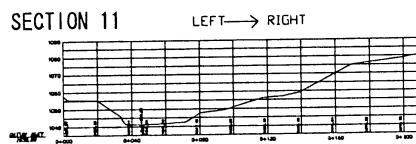
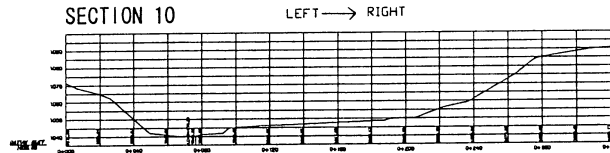
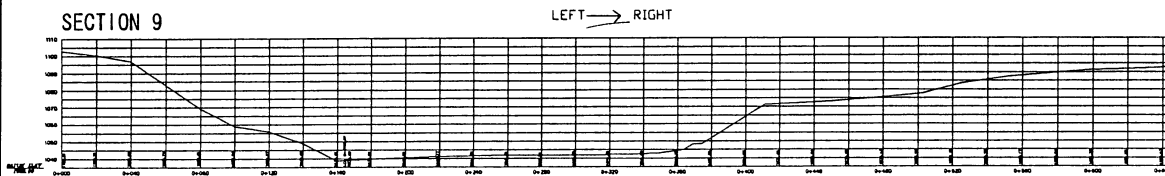
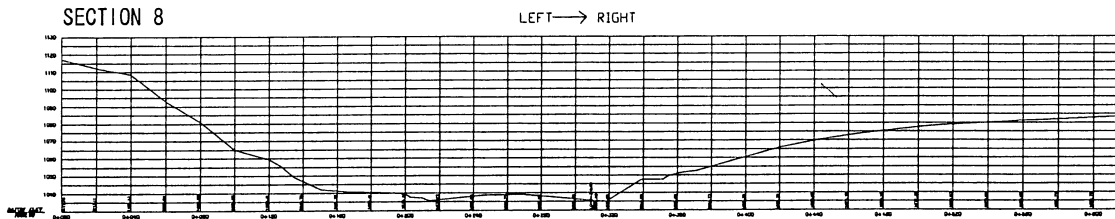
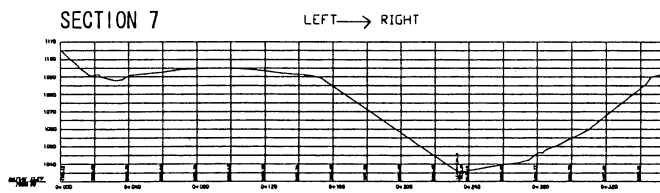


Figure B.3.8

Sections of Los Laureles II Reservoir (2/3)



Scale 1: 2000

Figure B.3.9

Sections of Los Laureles II Reservoir (3/3)

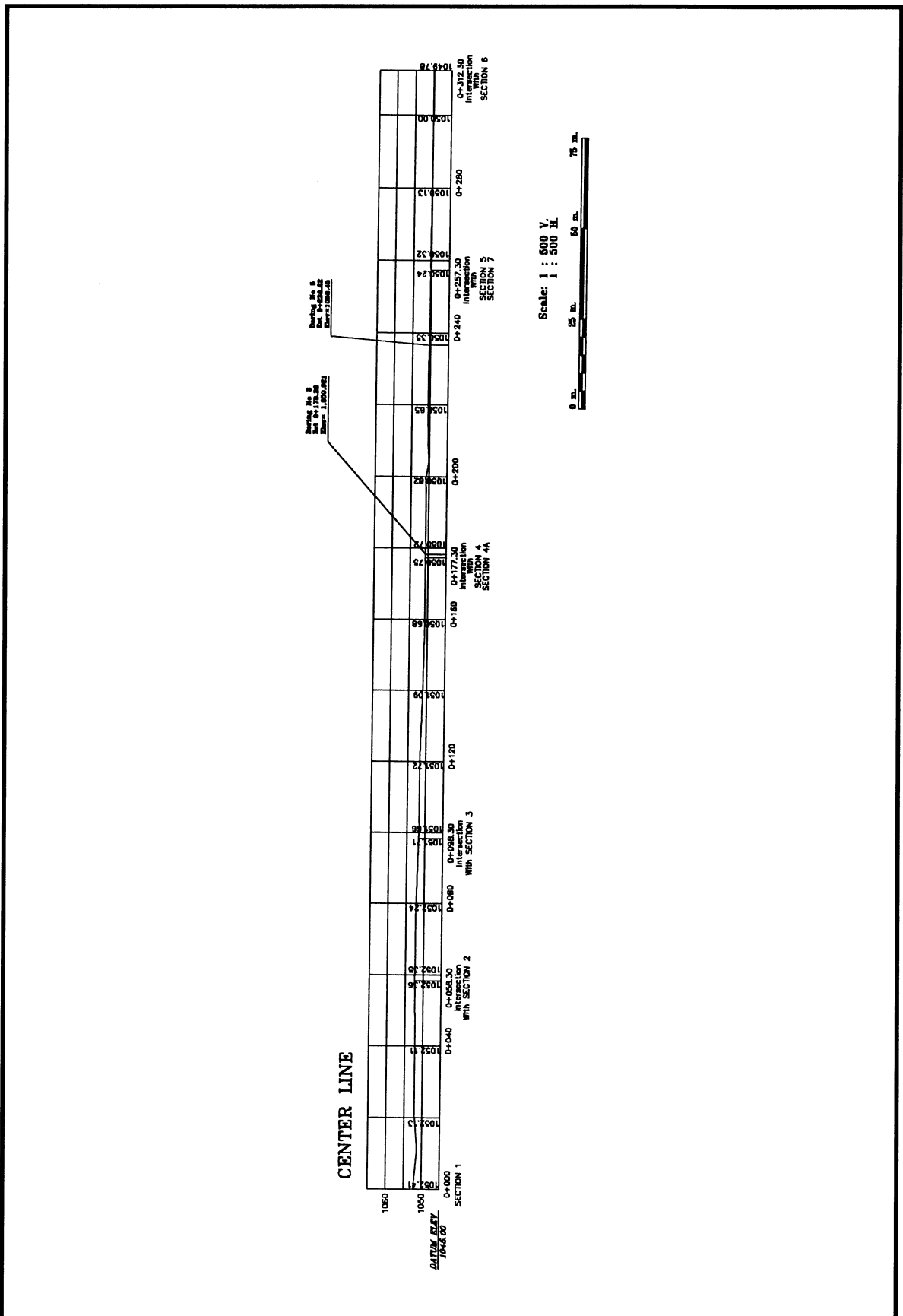
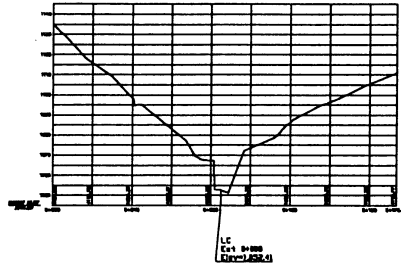


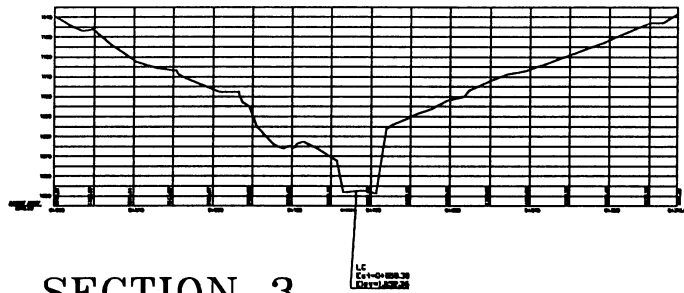
Figure B.3.10

River Profile of Sabacuante Reservoir

SECTION 1



SECTION 2



SECTION 3



SECTION 4A

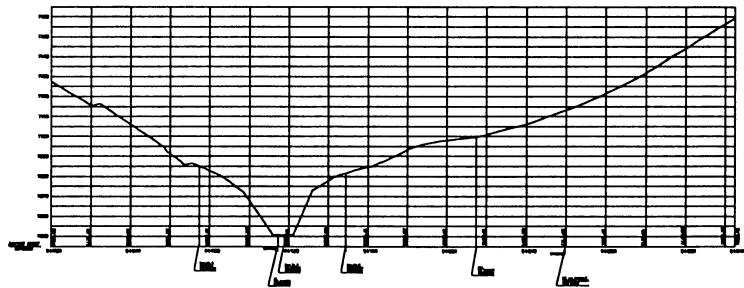


Figure B.3.11

Sections of Sabacuante Reservoir (1/2)

SECTION 5



SECTION 6



SECTION 7

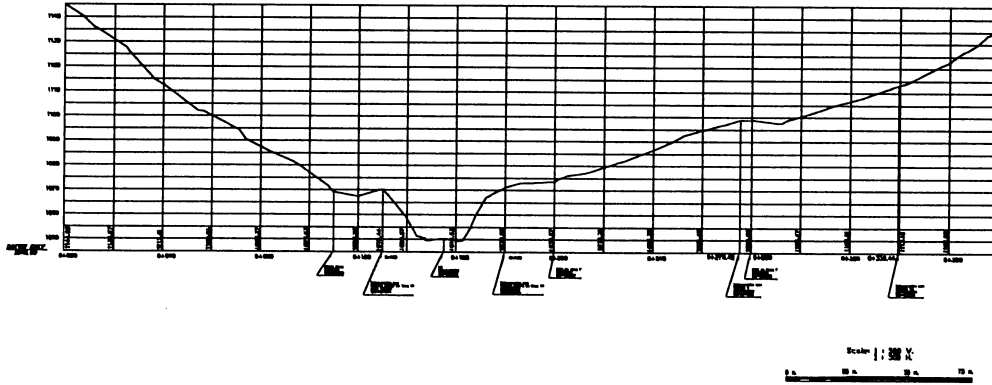


Figure B.3.12

Sections of Sabacuante Reservoir (2/2)

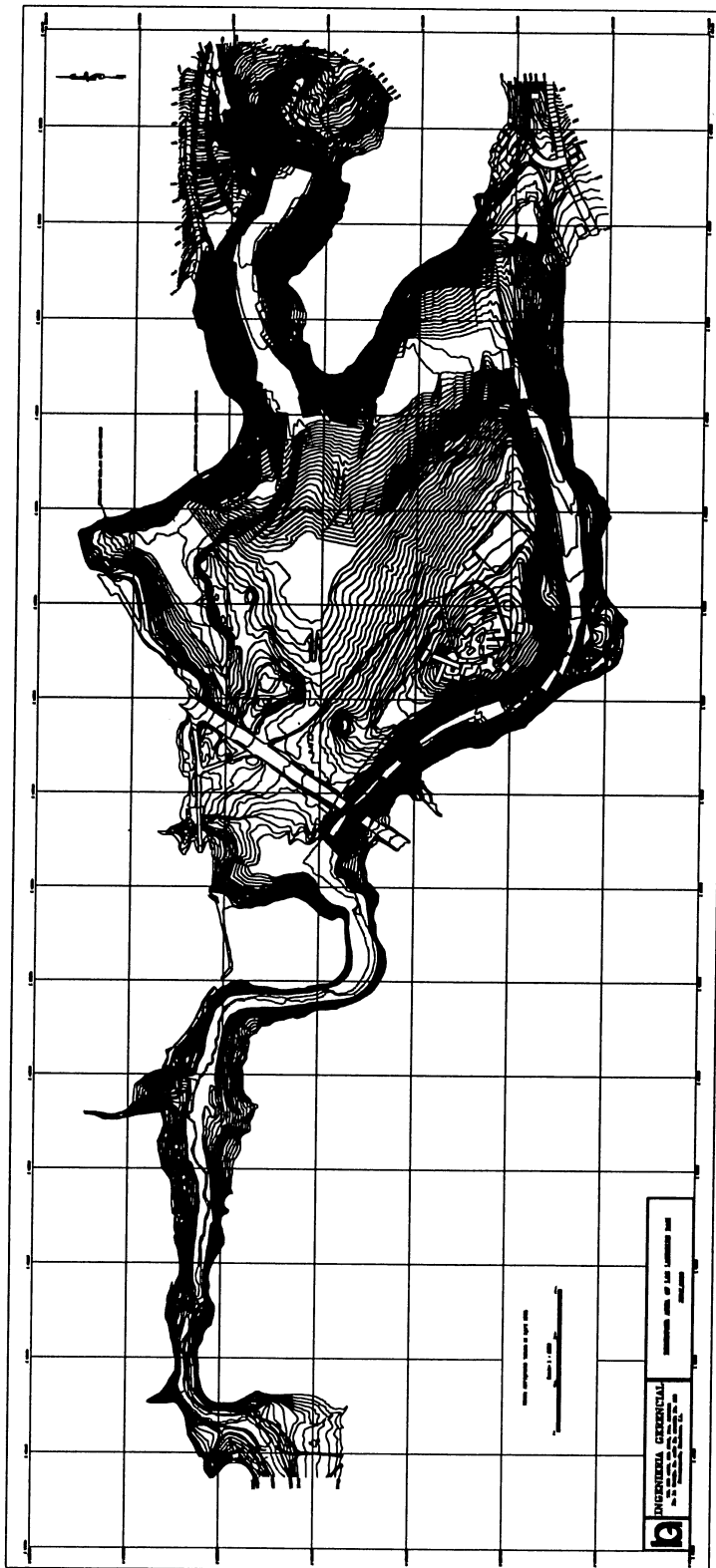


Figure B.3.13

Topographic Map of Los Laureles Reservoir

Change of Reservoir Capacity of Los Laureles Dam

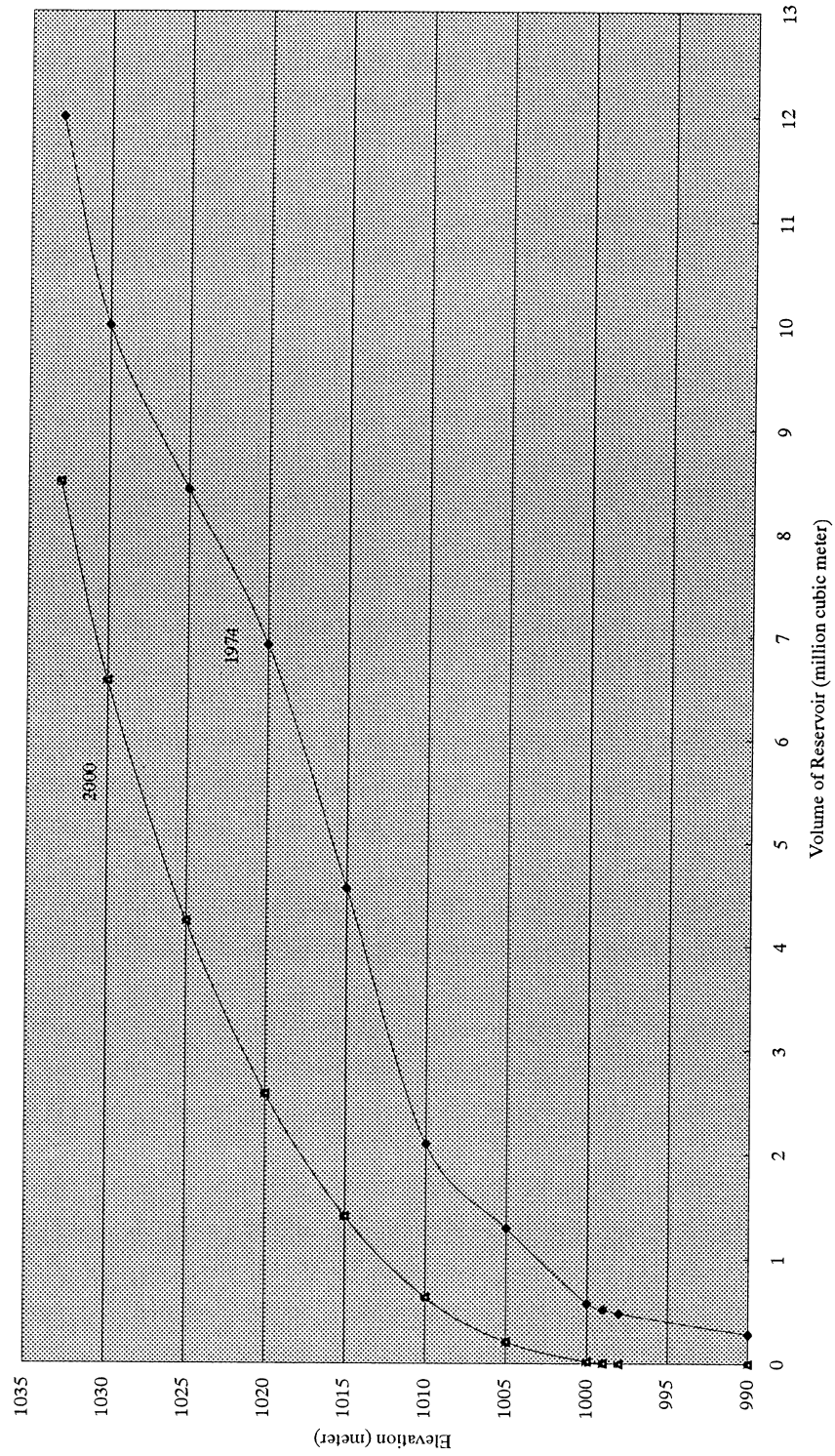


Figure B.3.14

H-V Relationship of Los Laureles Reservoir

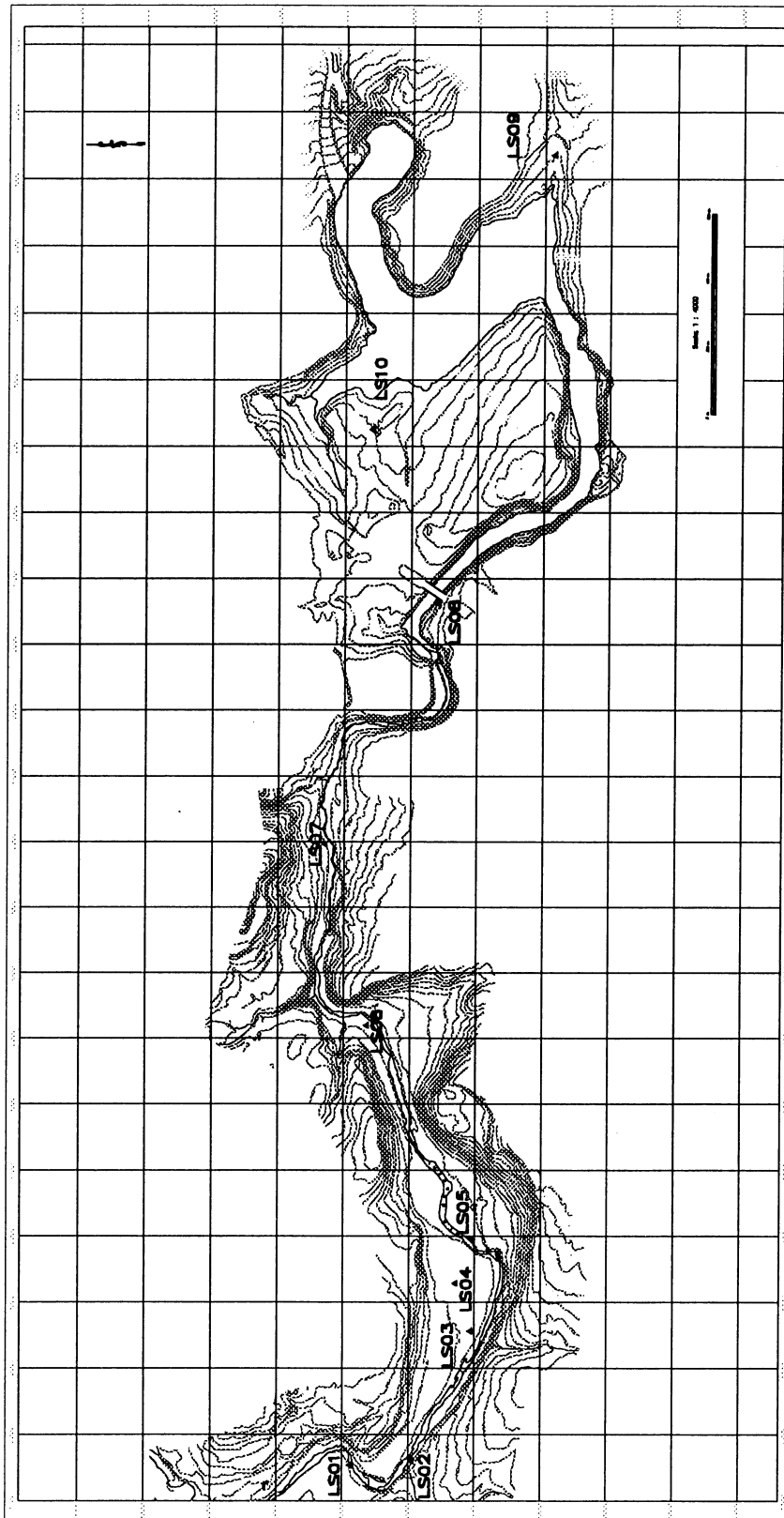


Figure B.3.15

Location Map of Sediment Sampling

Grain Size Distribution of Sediment

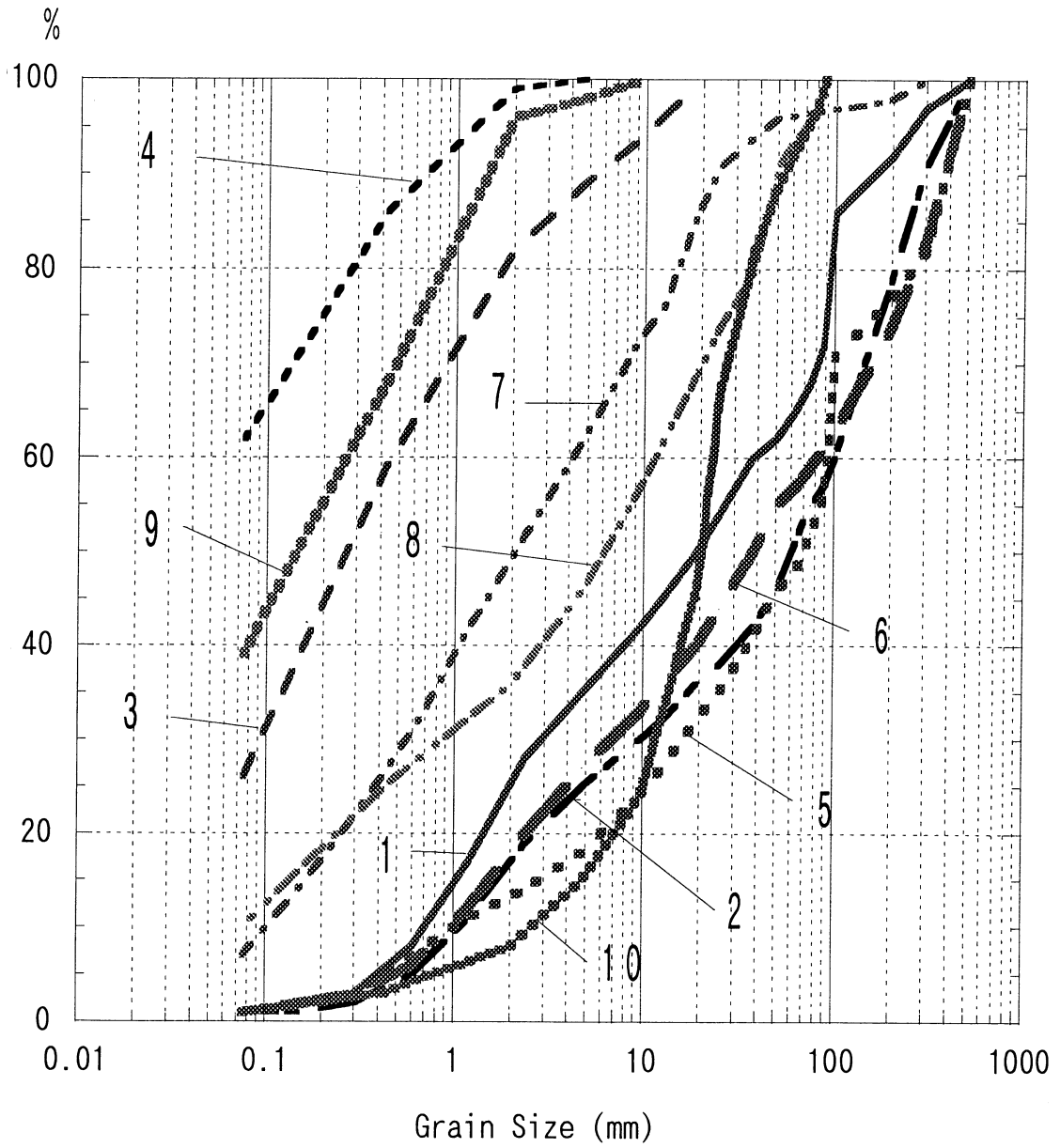


Figure B.3.16

Grain Size Distribution of Sediment