

ATTACHMENT-4

SCOPE OF ADDITIONAL SURVEY AND
INVESTIGATION FOR UPPER MAE WONG PROJECT

1. Irrigation and Drainage

(1) Topographic survey for irrigable area

The available topographic maps on a scale of 1 to 10,000 with contour interval of 1.0 m cover only a part of irrigable area in the Mae Wong river basin to be developed under the project (see Fig. 1.1). The following topographic maps which cover the existing irrigation areas and potential areas to be improved and developed under the project, should be additionally prepared by the topographic survey for the feasibility study on the Upper Mae Wong Project.

<u>Scale</u>	<u>Contour Interval</u>	<u>Covering Area</u>
1 : 10,000	1 m	554 km ²

(2) Investigation on water use of existing irrigation area

Since no actual records on diversion water to the existing irrigation areas were available, the water amount used for the existing irrigation areas was estimated through the present water balance calculation. In order to confirm and check the results of above calculation in the feasibility stage, an investigation on water use of existing irrigation areas will be required. For such investigation, the staff gauges should be installed at the main diversion points of the Mae Wong river to observe the water level. The location of staff gauges to be installed is shown in Fig. 1.2. The water level should be recorded two times per day at each staff gauge. As for the Khun Lard Boriban and Wang Ma staff gauges, the opening of gates should also be recorded at the same time.

2. Dam and Reservoir Survey

(1) Topographic Survey

(a) Plane survey for reservoir area (Fig. 2.1)

scale : 1/10,000
 contour interval : 2 m
 area : 60 km²

(b) Plane survey for dam site area (Fig. 2.2)

scale : 1/1,000
 contour interval : 1 m
 area : 10 km²

(c) Longitudinal survey of dam axis (Fig. 2.3)

length : 1,400 m
 scale : 1/500

(d) Cross section survey

(i) Dam axis cross section (Fig. 2.3)

length : 400 m/line
 number of section : 13
 scale : 1/500

(ii) River cross section (Fig. 2.1)

length : 500 m/line
 number of section : 9, 1 km interval
 scale : 1/500

(2) Geological Survey

(a) Seismic sounding (Fig. 2.4, Fig. 2.5)

<u>Site</u>	<u>Line</u>	<u>Length (m)</u>
Damsite		
dam axis	A	1,400
cross section	B	1,000
	C	1,000
	D	1,000
Spillway	E	1,000
Borrow area	F	750
	G	500
Total		6,650

(b) Core boring (Fig. 2.4, Fig. 2.5)

<u>Site</u>	<u>No.</u>	<u>Diameter</u> (mm)	<u>Depth</u> (m)	<u>Core tube</u>	<u>Permeability test</u>
Dam site	B1	ø65	40	double	5 m interval
	B2	ø65	50	"	"
	B3	ø65	60	"	"
	B4	ø65	60	"	"
	B5	ø65	60	"	"
	B6	ø65	30	"	"
	B7	ø65	30	"	"
Spillway	B8	ø65	30	"	"
Borrow area	B9	ø65	20	"	"
	B10	ø65	20	"	"
	B11	ø86	10	single	"
	B12	ø86	10	"	"
	B13	ø86	10	"	"
	Total			430 m	

- Note:
1. Ground water level should be recorded on the geological log of boring hole.
 2. Location of boring hole should be shown on the 1/10,000 scale topographic map.
 3. Ground surface elevation of boring hole should be surveyed.
 4. Wooden pegs to show the location of boring holes and seismic sounding lines should be installed.
 5. Boring core should be kept in core box and color photo should be attached on the log.
 6. Boring at dam site (B1 to B7) can be terminated after drilling depth exceeded more than 30 m upon approval of Engineer of the Soil and Geology Division, but one drilling hole among B4, B5 and B6 should complete 60 m in depth.

(3) Material Test

(a) Rock materials

(i) Sampling from exposed rocks

Sampling place : Damsite left and right abutments, vicinity of B8, B9 and B10 boring holes.

Sampling number : 3 samples from granite rocks
3 samples from quartzite rocks

(ii) Test items

- absorption test
- specific gravity
(surface dry, inside satulate)
- durability test

(b) River Sand

(i) Distribution

- auger hole borings to confirm the depth of river sand deposit
- distribution width of river sand be measured by tape measurements

(ii) Sampling

upstream of dam	3 samples
dam axis	1 sample
downstream of dam	3 samples

(iii) Test items

- gradation test 7 samples
- specific gravity 7 samples
- compaction test 7 samples

(c) Core Material

(i) Core boring B11, B12, B13

(ii) Test pitting (Fig. 2.4)

- Location shown in Fig. 2.4
- Number of test pit 7 (TP1-TP7)
- Dimension of test pit

Width	2.0 x 2.0 m square
Depth	6 m max.

- Investigation

Log of test pit should be prepared.
Colour photo should be attached on the log.

(iii) Material test (1)

Sampling

2 samples per test pit, Total 14 samples.
Sampling locations should be upon approval of Engineer and shown on the test pit log.

- Consolidation test

◦ load level

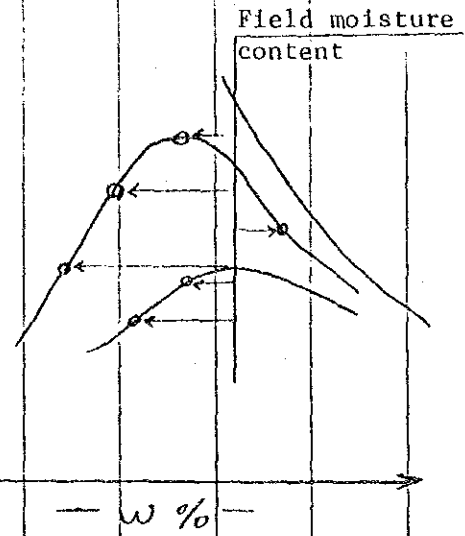
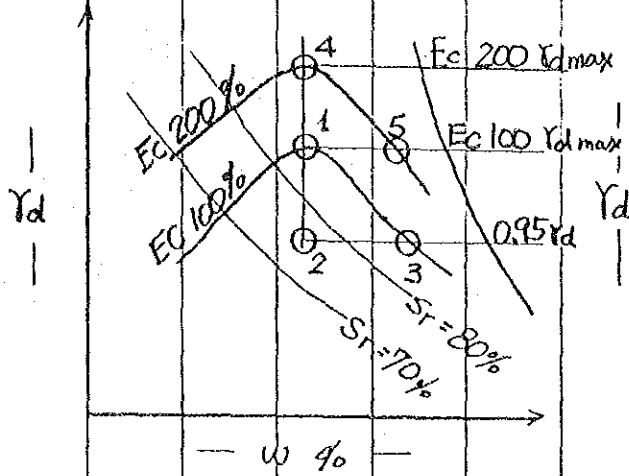
0.1, 0.2, 0.4, 0.8, 1.6, 3.2, 6.4
and 12.8 kg/cm²

- Permeability test

variable head permeability test

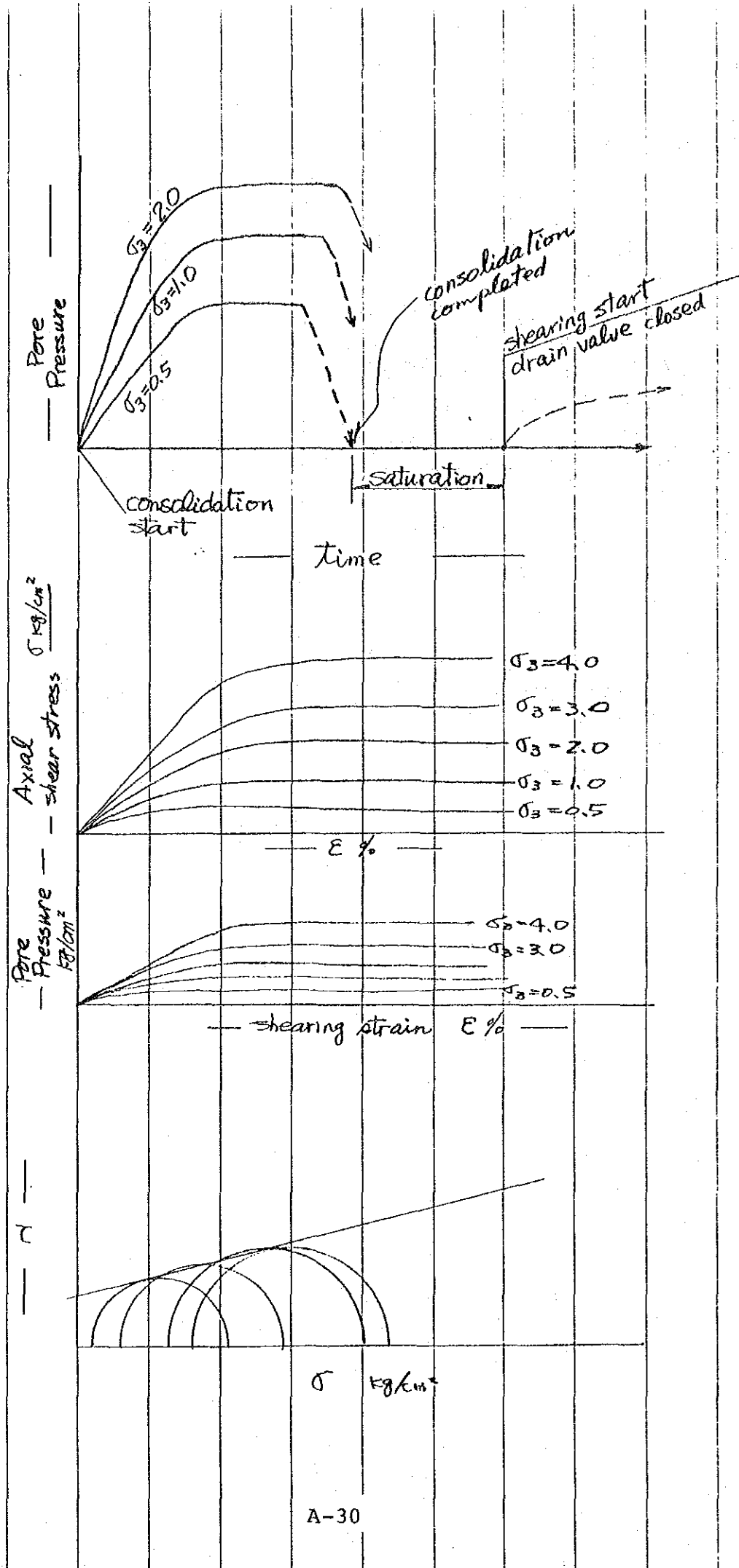
c. Test point

○ : Test Point



Adjustment of moisture content should be started from the field moisture content.

Adjustment of moisture content by means of, once dried and adding water should not be allowed.



3. Soil Survey

(1) Field Soil Survey

- (a) Soil profile survey over the first priority project area
- (b) Soil sampling; This will be required for laboratory test
- (c) Soil infiltration test on representative soils

(2) Soil Laboratory Tests

The following soil laboratory tests are required:

- pH (H₂O) & pH (KCl)
- electrical conductivity
- total carbon
- total nitrogen
- exchangeable bases (Ca, Mg, K, Na)
- cation exchangeable capacity
- available phosphorus
- total potassium
- calcium carbonate
- particle size distribution analysis

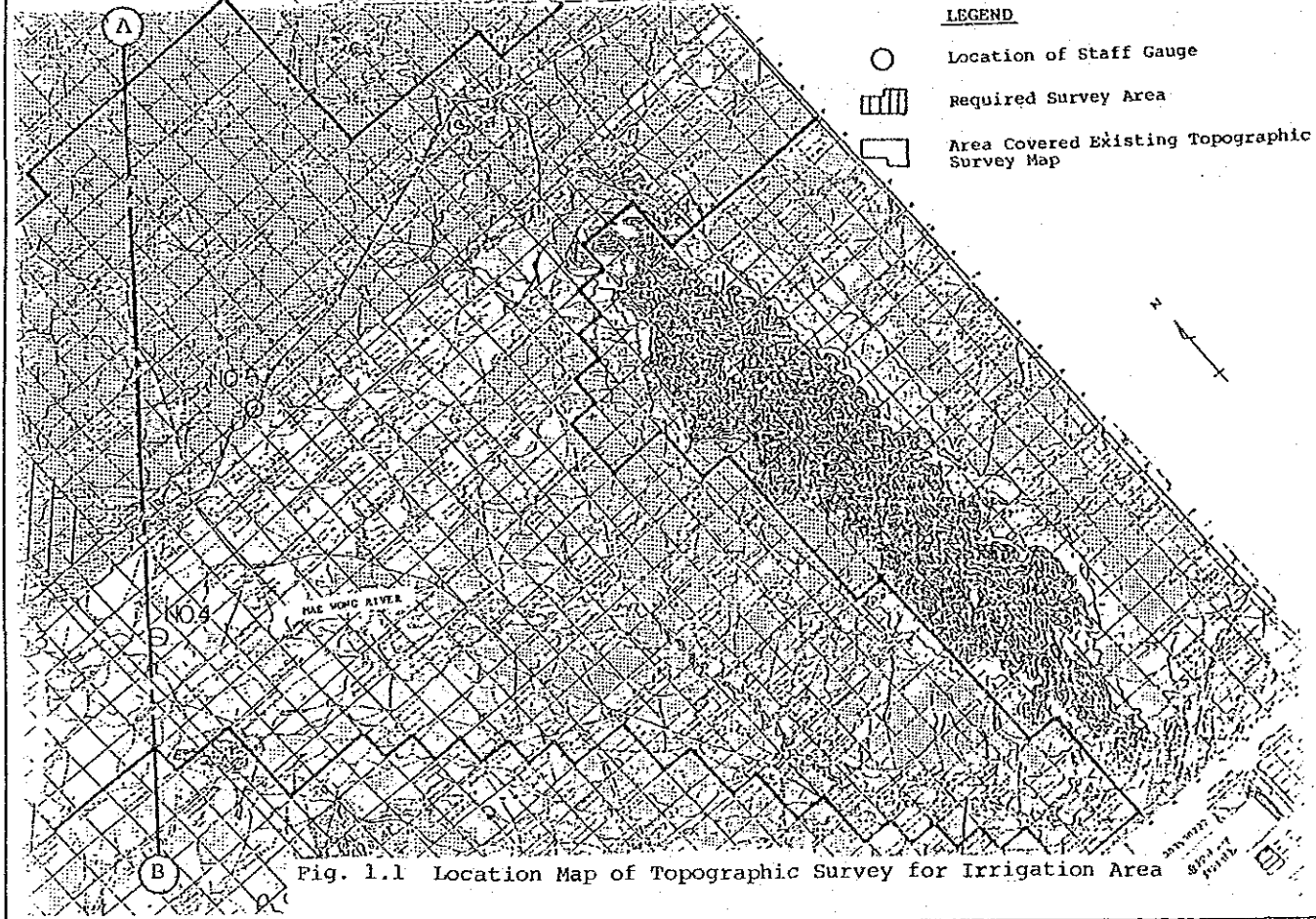
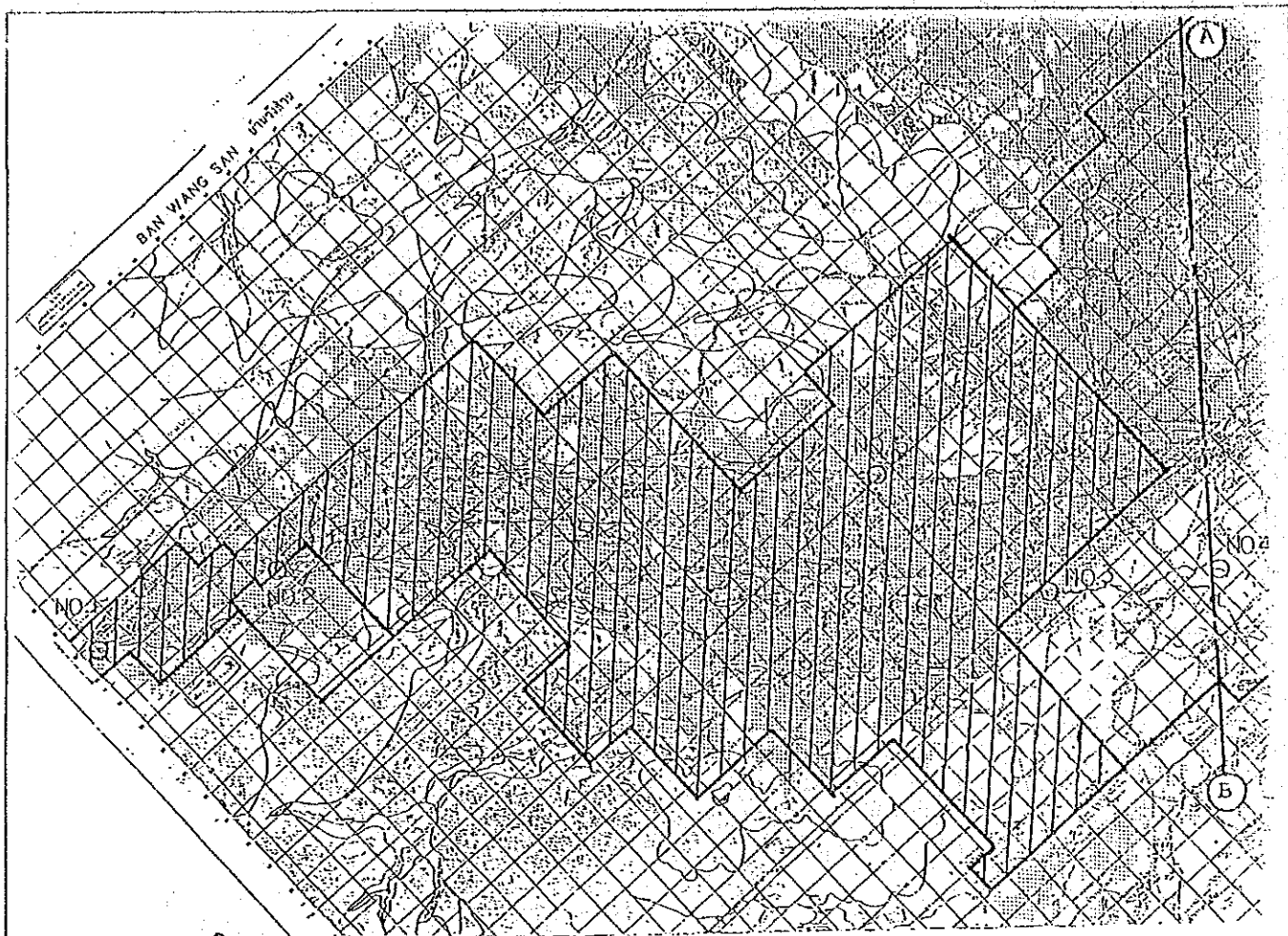


Fig. 1.1 Location Map of Topographic Survey for Irrigation Area

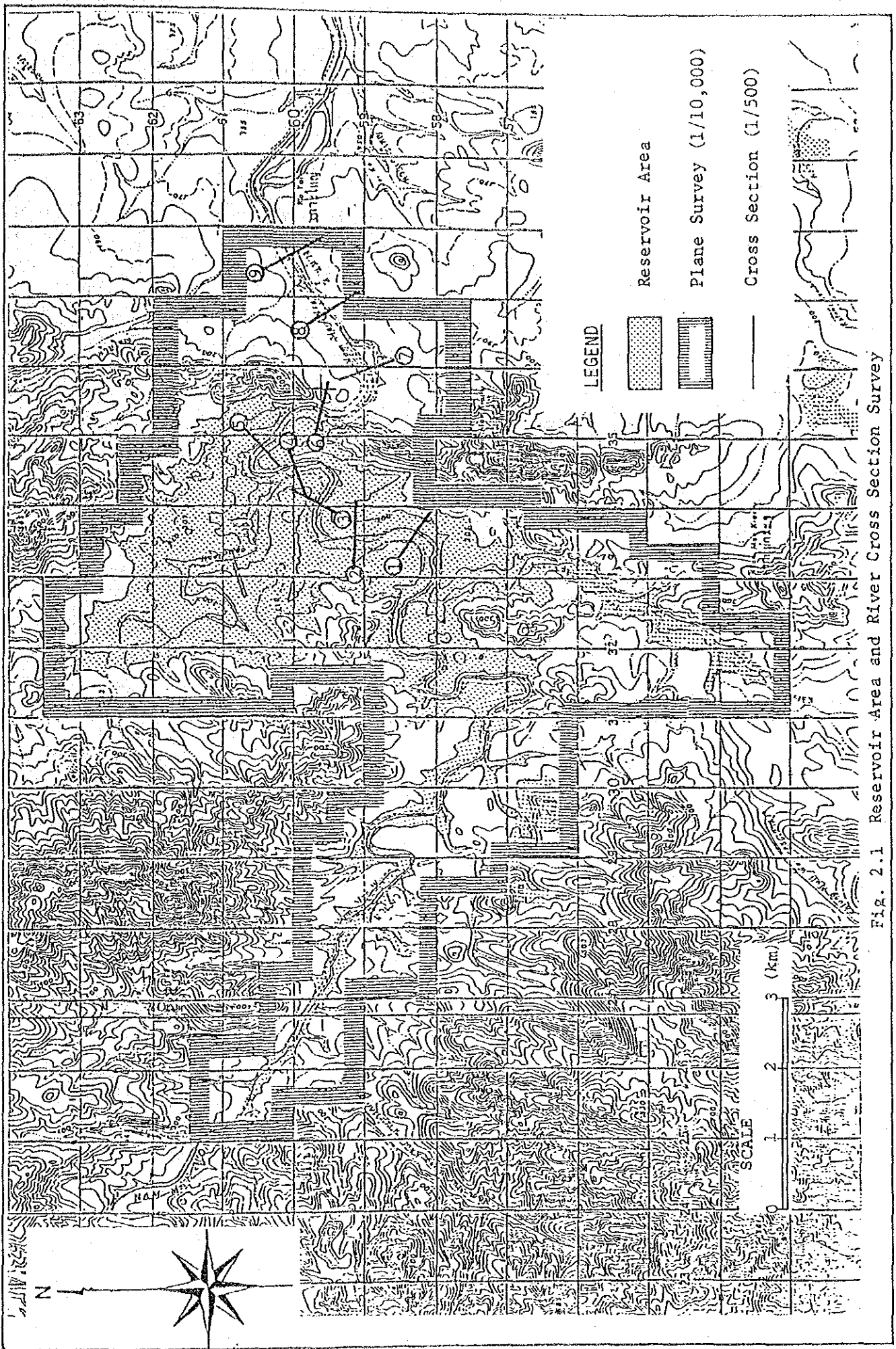


Fig. 2.1 Reservoir Area and River Cross Section Survey

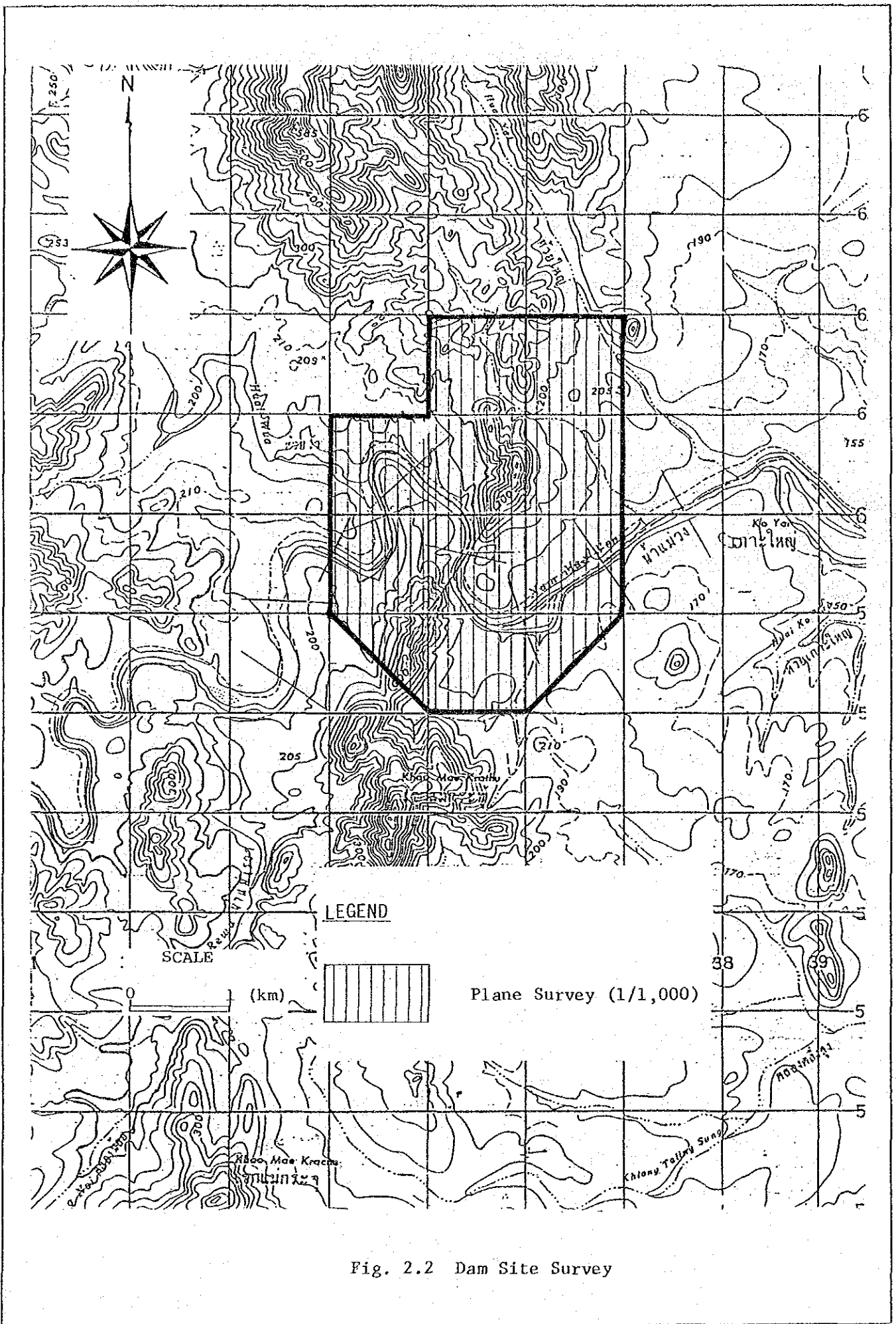


Fig. 2.2 Dam Site Survey

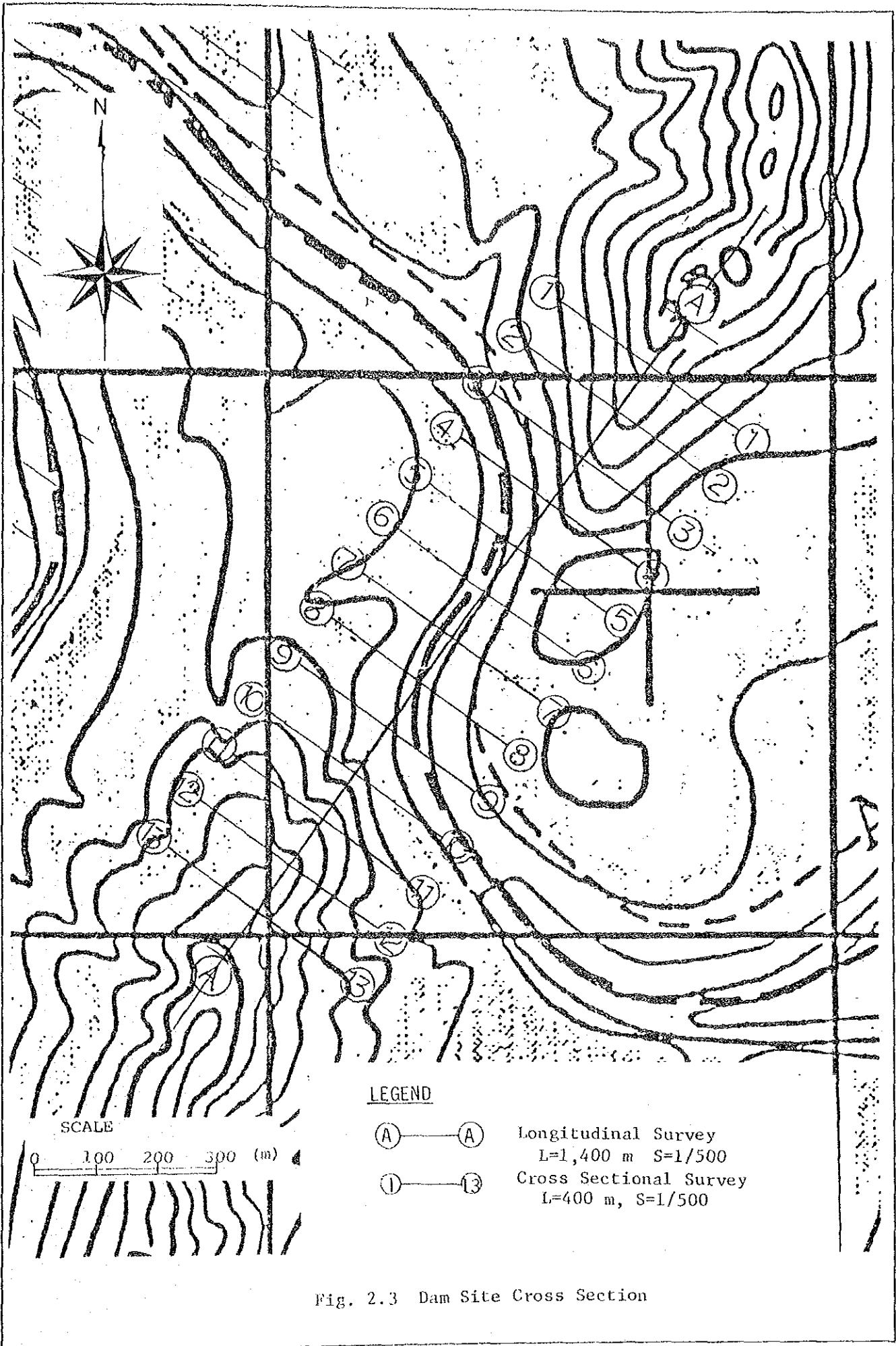


Fig. 2.3 Dam Site Cross Section

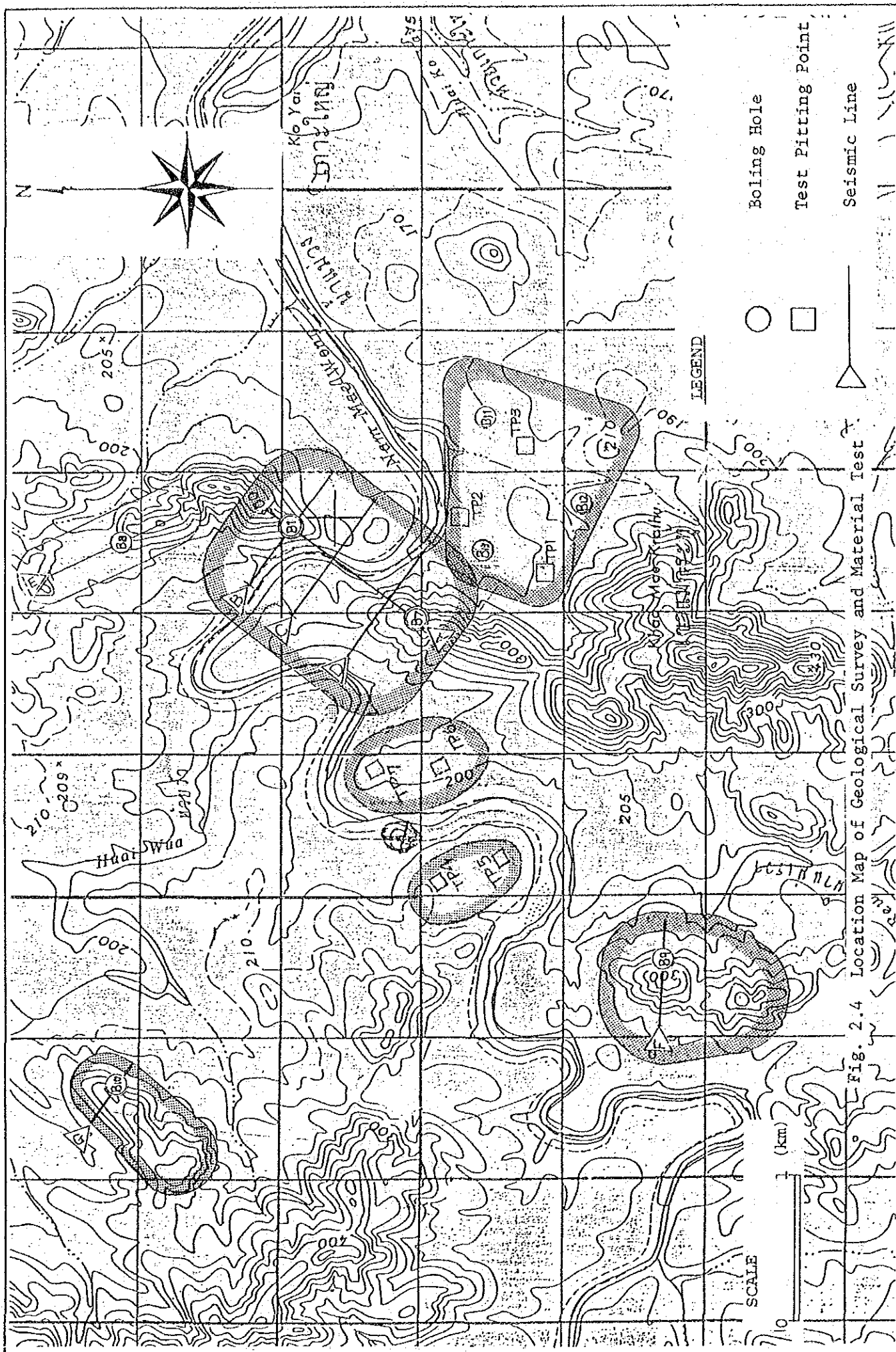


Fig. 2.4 Location Map of Geological Survey and Material Test

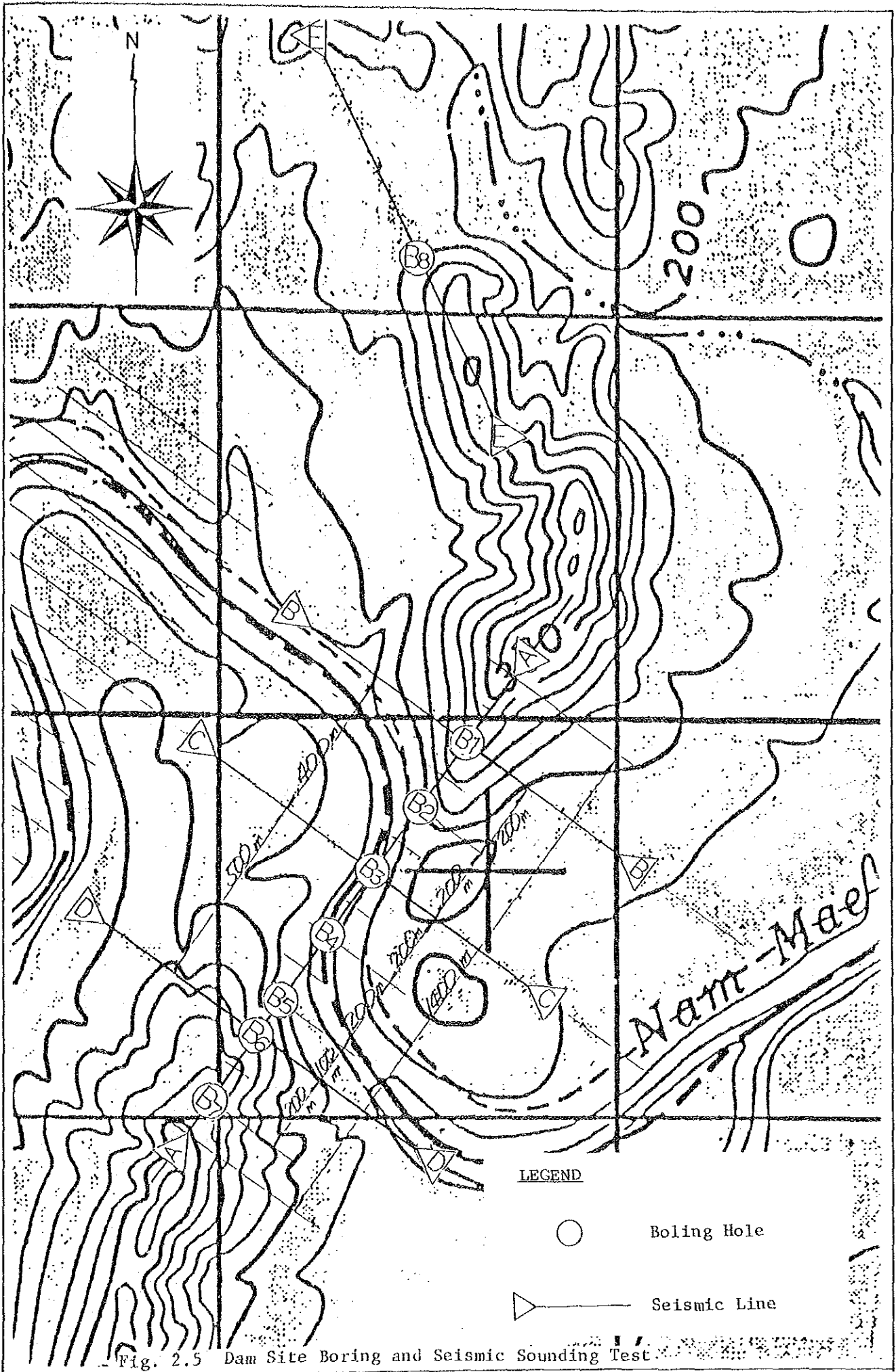


Fig. 2.5 Dam Site Boring and Seismic Sounding Test

