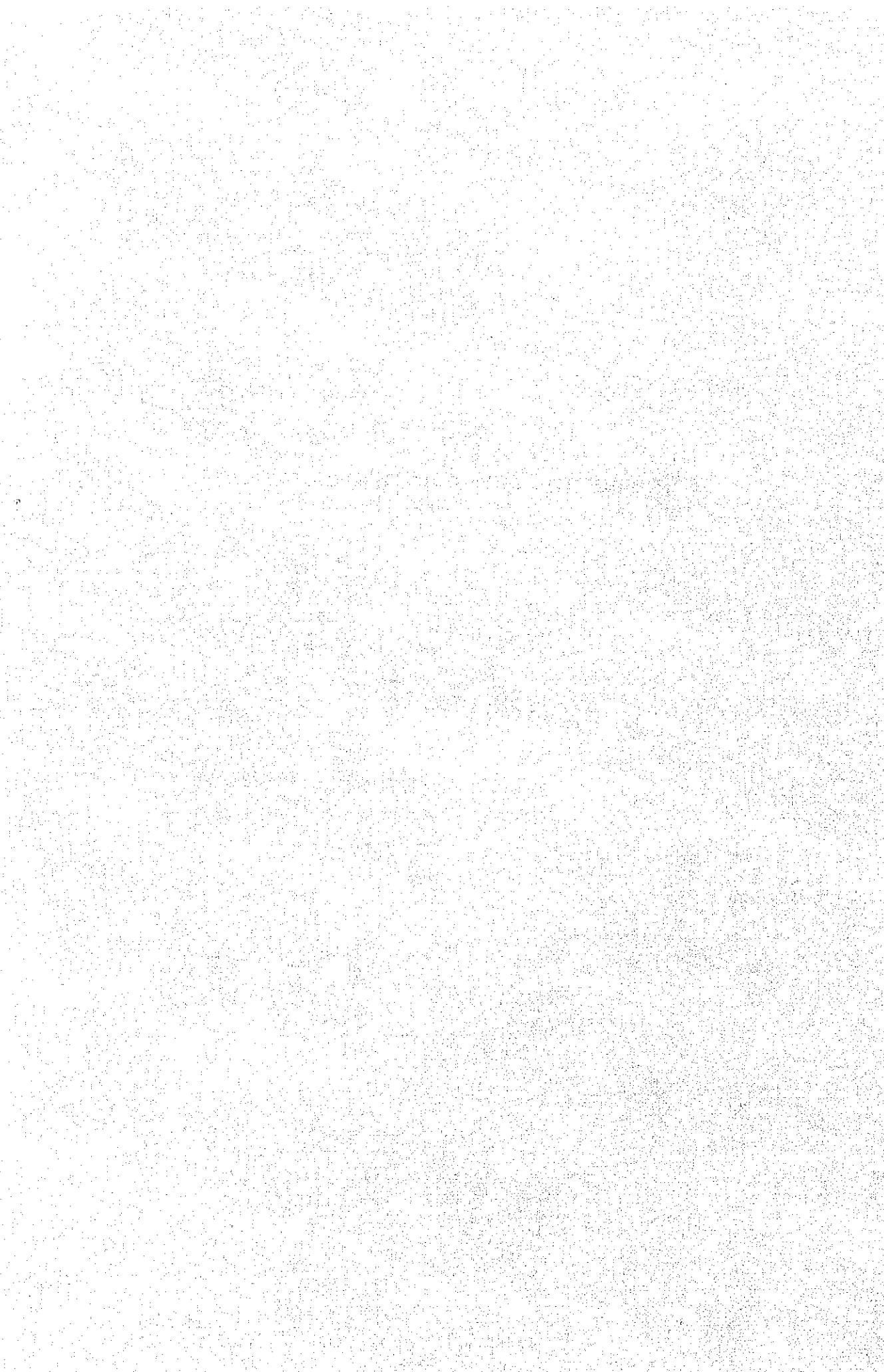


Chapter 16 Future Investigation Works



Chapter 16

FUTURE INVESTIGATION WORKS

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Chapter 16 FUTURE INVESTIGATION WORKS

16.1 Topographic Surveyings

- (a) Installation of triangulation stations
- (b) Leveling between dams and powerhouses
- (c) Supplemental 1:5,000 aerial photogrammetry for waterways

16.2 Geologic Investigations

(1) Olur Project

1) Dam Site

(a) Drilling

Quantities:

- Dam axis 100 m x 2 holes
(with permeability test in bed rock)
- Upstream Cofferdam 60 m x 1 hole
(with standard penetration test and permeability test in alluvial deposit)
- Downstream Cofferdam 60 m x 1 hole
(with standard penetration test and permeability test in alluvial deposit)

Purpose: To confirm thickness of alluvial deposit and characteristics of foundation rock at dam site and cofferdams sites

2) Surge Tank and Powerhouse Sites

(a) Drilling

Quantities:

- Surge Tank 100 m x 1 hole
(with permeability test)
- Powerhouse 50 m x 1 hole

Purpose: To grasp characteristics of foundation rock

(2) Ayvalı Project

1) Dam Site

(a) Drilling

Quantities:

- Dam Axis 100 m x 2 holes
(with permeability test in bed rock)
- Upstream Cofferdam 60 m x 1 hole
(with standard penetration test and permeability test in alluvial deposit)

- Downstream Cofferdam 60 m x 1 hole
(with standard penetration test and permeability test in alluvial deposit)

Purpose: To confirm thickness of alluvial deposit and characteristics of foundation rock at dam site and cofferdams sites

2) Underground Powerhouse and Penstock Sites

(a) Drilling

Quantities:

- Surge Chamber 250 m x 1 hole
(with permeability test, laboratory rock test; uniaxial compression test, triaxial compression test)

Purpose: To grasp characteristics of foundation rock

(b) Exploratory Adit and Drilling at Exploratory Adit

Exploratory adit should be excavated. In the adit, drilling and in-situ tests such as plate bearing test, block shear test and in-situ stress measurement should be carried out. However, the definite investigations program including locations and quantities will be formulated after studying the results of drilling investigations

(a).

16.3 Material Investigations

(1) Olur Project

Geologic surveys by drilling at quarry site.

Quantities of drilling : 2 ~ 3 holes

Items of surveys : Lithology, degree of weathering, specific gravity, compressive strength

(2) Ayvalı Project

Geologic surveys by drilling at quarry site.

Quantities of drilling : 2 ~ 3 holes

Items of surveys : Lithology, degree of weathering, specific gravity, compressive strength

16.4 Hydrologic Investigations

Site of Dam : Observation of gauging stations at Olur Dam site and Ayvalı Dam site.














Site of Powerhouse : Observation of water level of Olur powerhouse site during flood.

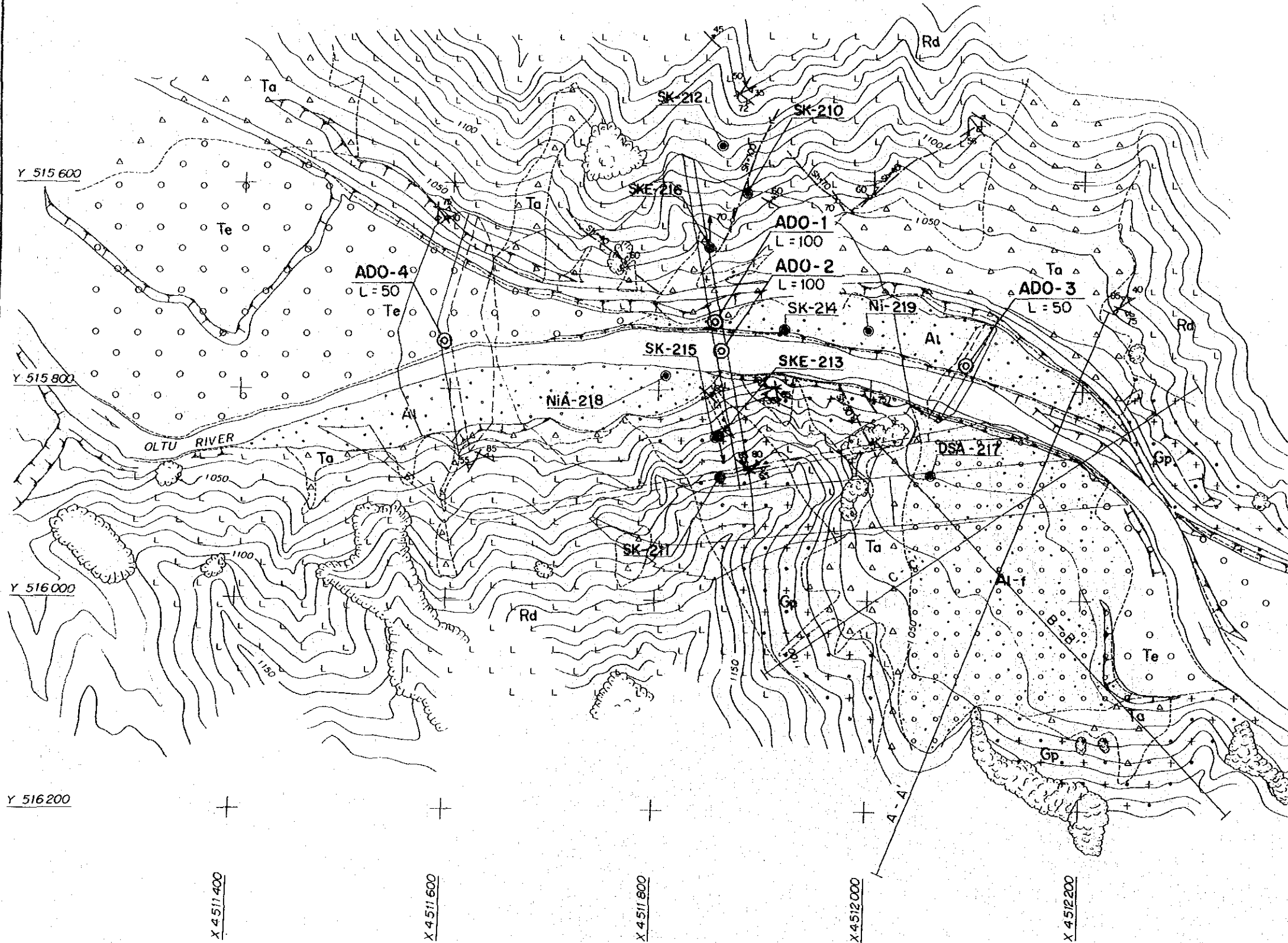
16.5 Formulation of Resettlement Program

A survey is to be made on resettlement in the area planned to be submerged with regard to residents' intentions in connection with the project implementation program, and alternative sites for resettlement are to be planned as necessary.

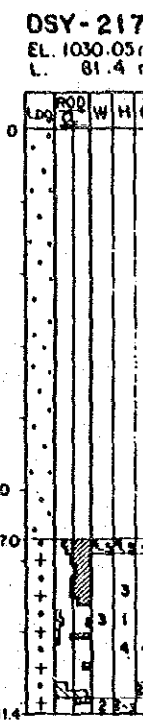
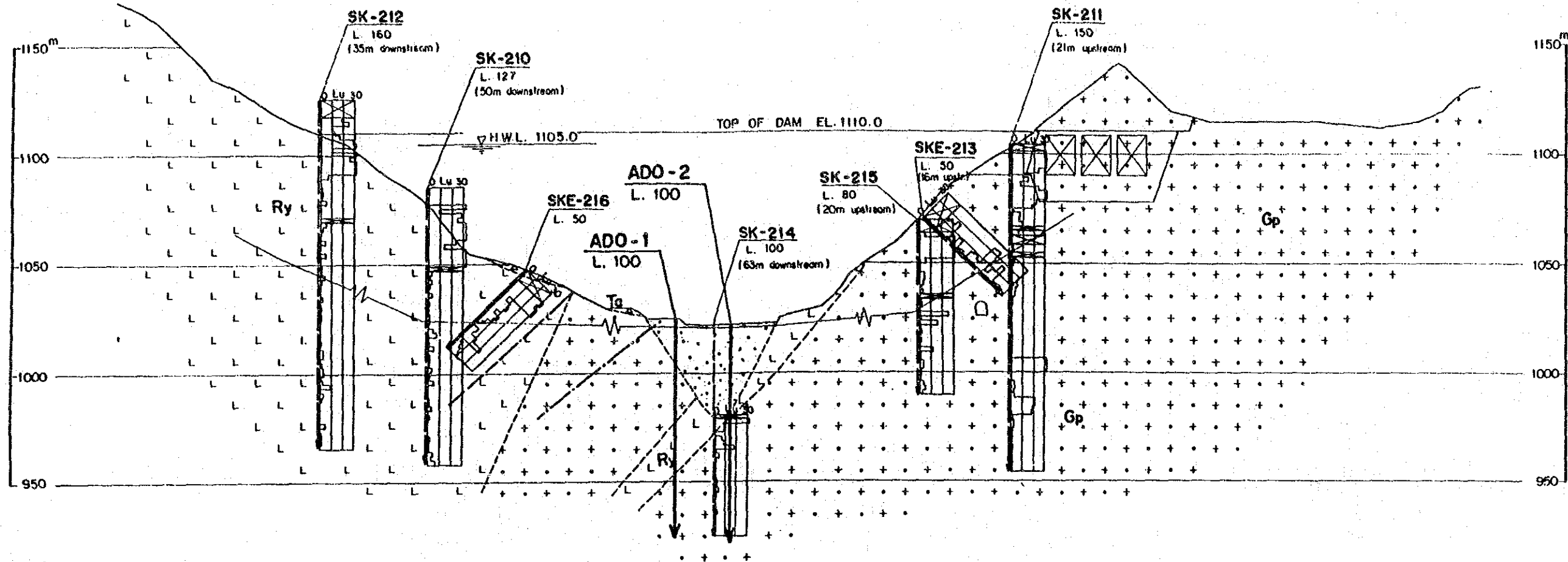


LEGEND

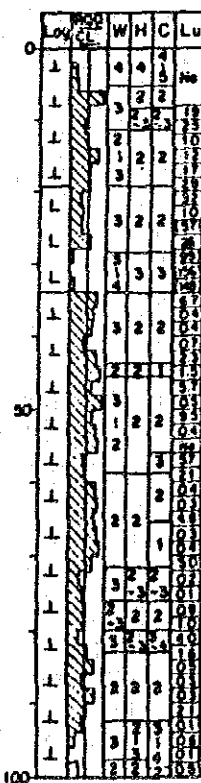
-  Talus deposit
-  Alluvial deposit
-  Alluvial fan deposit
-  Terrace deposit
-  Granite porphyry
-  Rhyolite and Diabase
-  Geologic boundary
-  Strike and dip of fault
(Sh: Width of shear zone, cm)
-  Strike and dip of joint
-  Strike and dip of igneous contact
-  Drill hole
-  Seismic prospecting line
-  Proposed additional drill hole



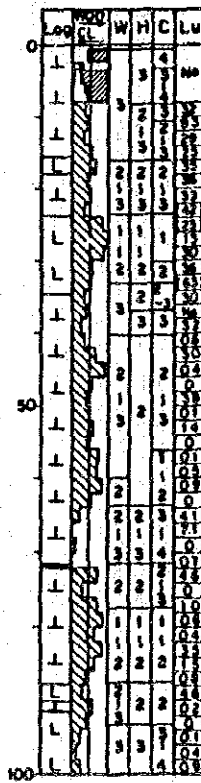
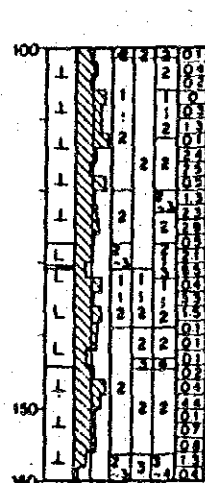
OLTU RIVER HYDROELECTRIC POWER DEVELOPMENT PROJECT	
OLUR PROJECT DAMSITE LOCATION OF ADDITIONAL DRILL HOLE	
Fig. 16-1	



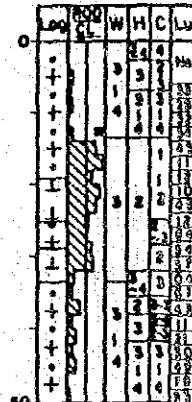
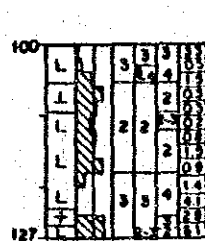
SK-212
EL. 1125.97 m
L. 160 m



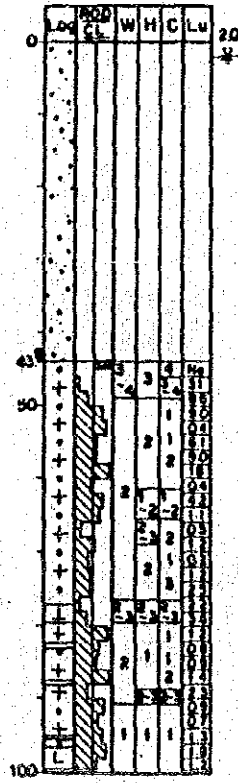
SK-210
EL. 1085.22 m
L. 127 m



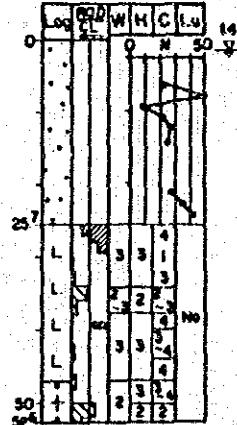
SKE-216
EL. 1048.3 m
L. 50 m



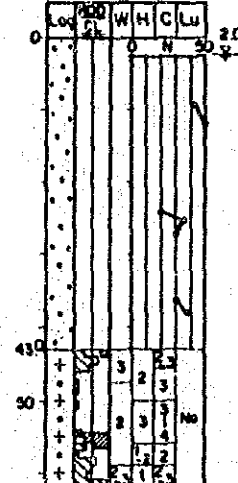
SK-214
EL. 1025.08 m
L. 99.5 m



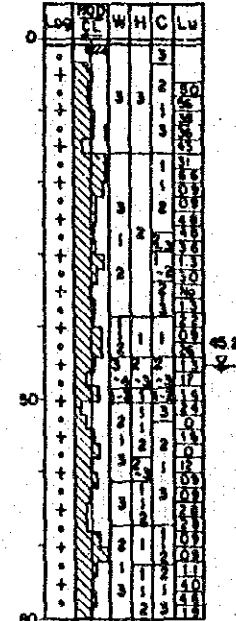
NIA-218
EL. 1026.10 m
L. 52.65 m



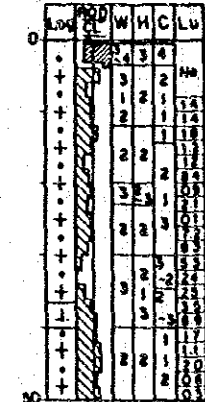
NI-219
EL. 1025.48 m
L. 62 m



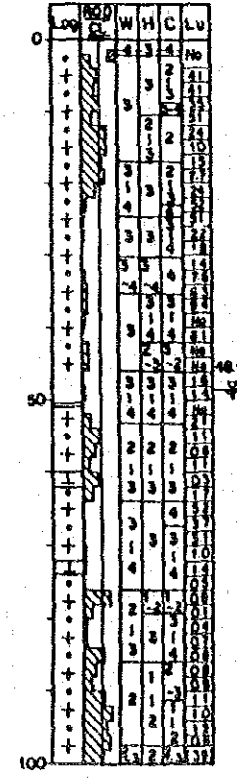
SK-215
EL. 1069.66 m
L. 80 m



SKE-213
EL. 1069.72 m
L. 50 m

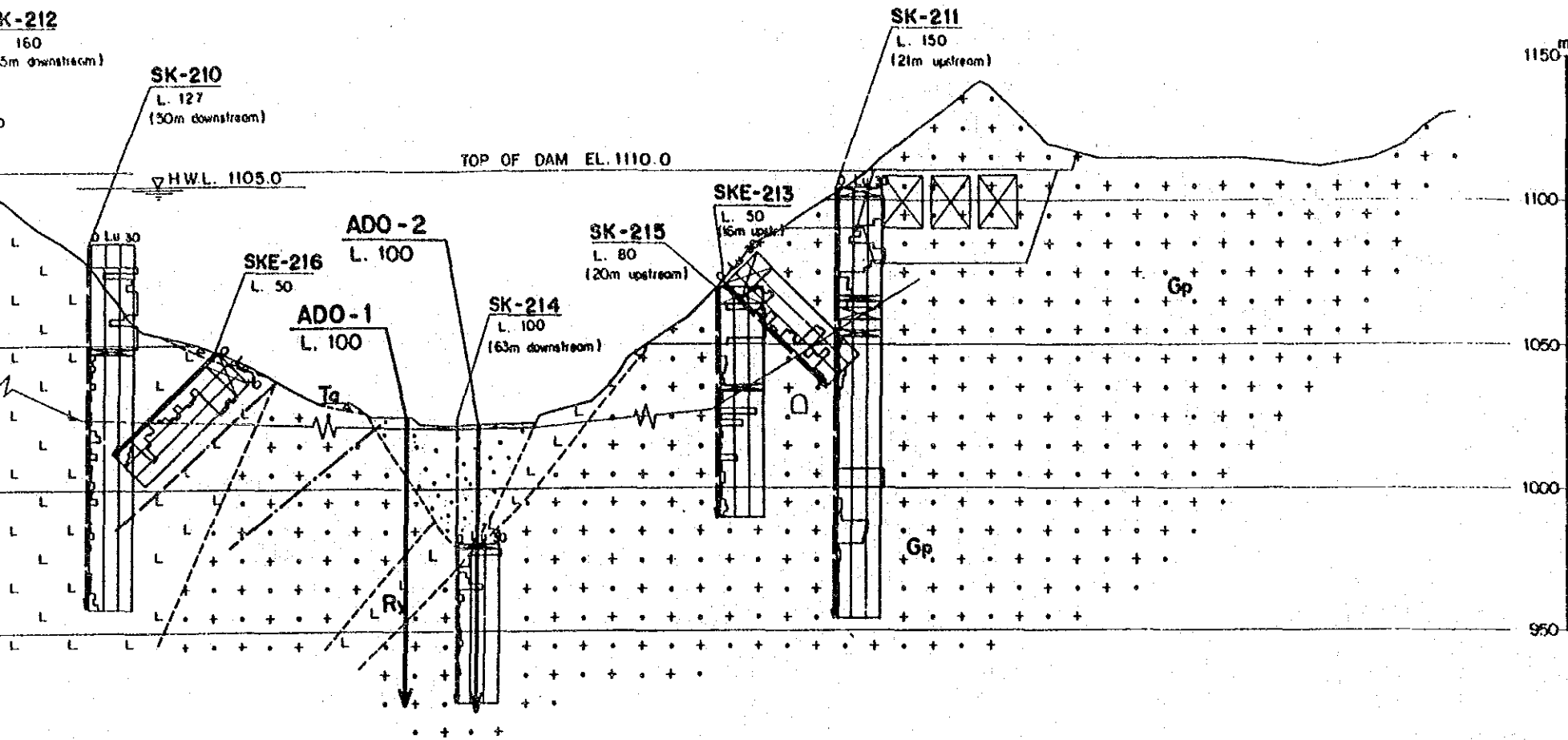


SK-211
EL. 1103.87 m
L. 150 m



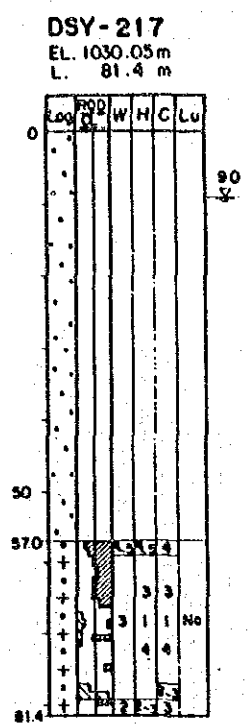
(4)

K-212
160
5m downstream)



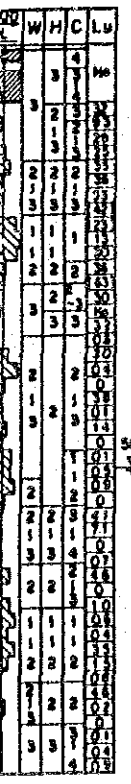
LEGEND (1) (For Profile)

- Talus deposit
- Alluvial deposit
- Terrace deposit
- Granite porphyry
- Rhyolite and Diabase
- Geologic boundary
- Assumed fault
- Ground water table
- Drill Hole
- Drill Hole (Projection)

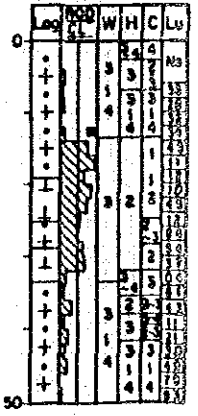


ADO-
Proposed additional
drill hole

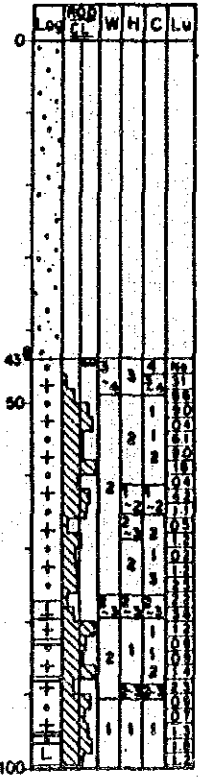
K-210
085.22 m
127 m



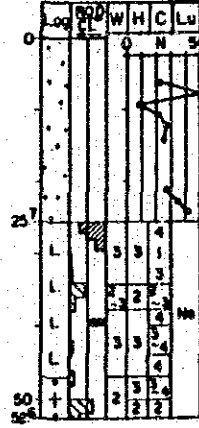
SKE-216
EL. 1048.3 m
L. 50 m



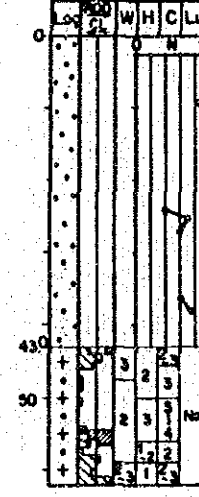
SK-214
EL. 1025.08 m
L. 99.5 m



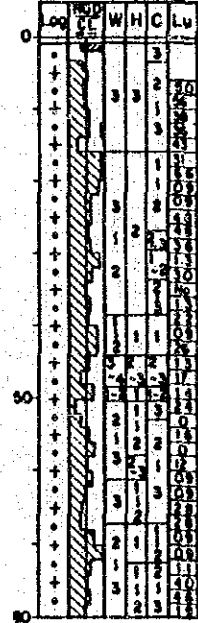
NIA-218
EL. 1026.10 m
L. 52.65 m



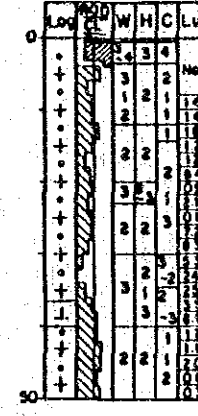
NI-219
EL. 1023.48 m
L. 62 m



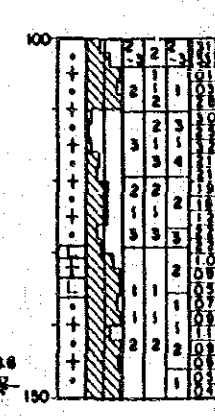
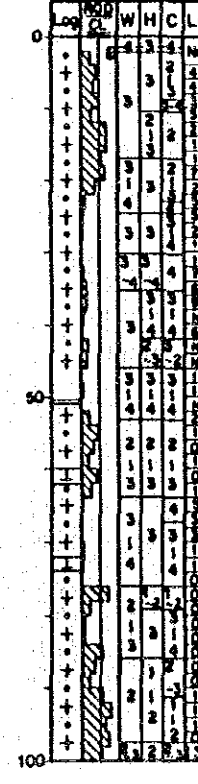
SK-215
EL. 1069.66 m
L. 80 m



SKE-213
EL. 1069.72 m
L. 50 m



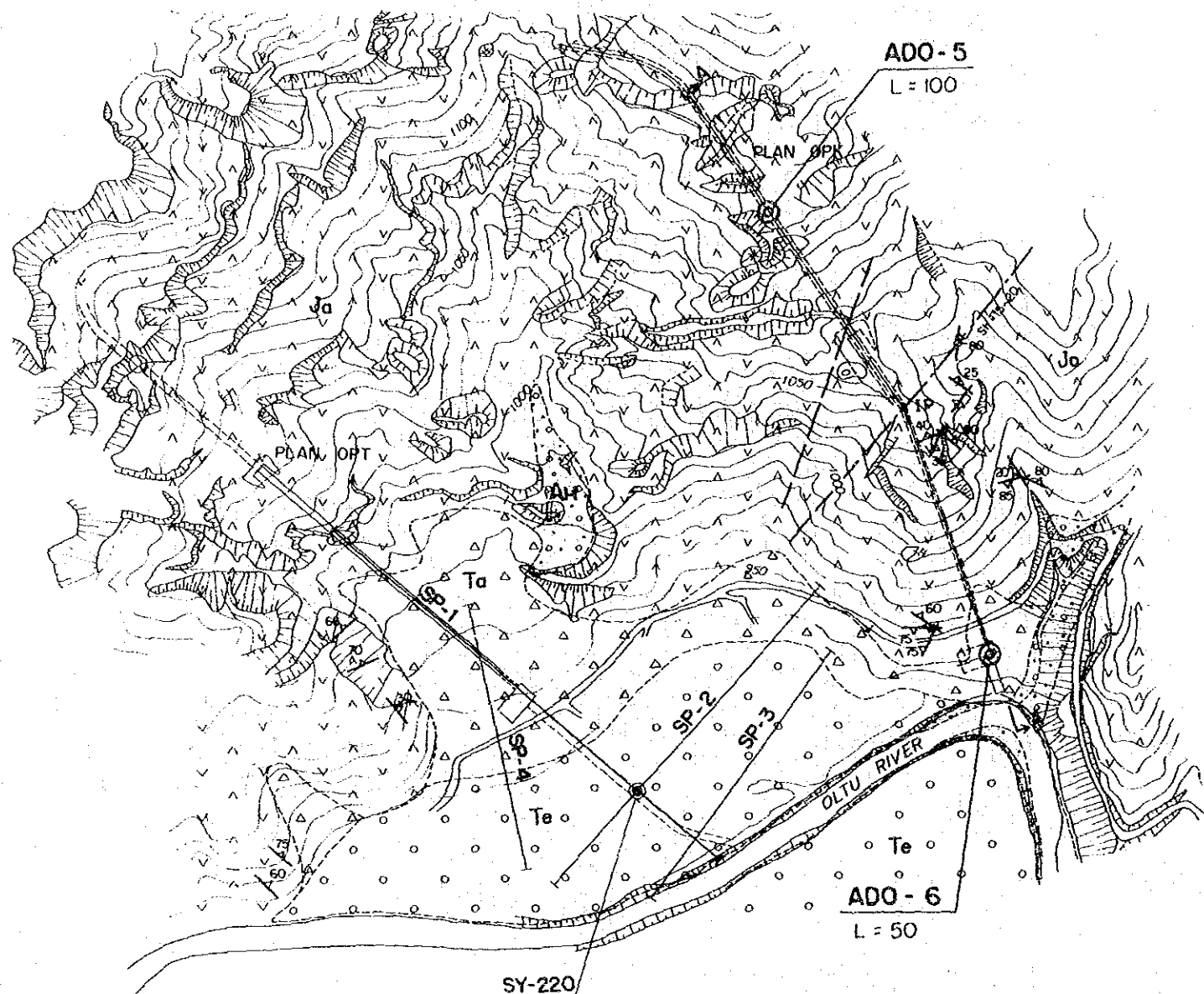
SK-211
EL. 1103.87 m
L. 150 m



OLTU RIVER HYDROELECTRIC
POWER DEVELOPMENT PROJECT

OLUR PROJECT
DAM SITE
LOCATION OF ADDITIONAL
DRILL HOLE

Fig. 16 - 2

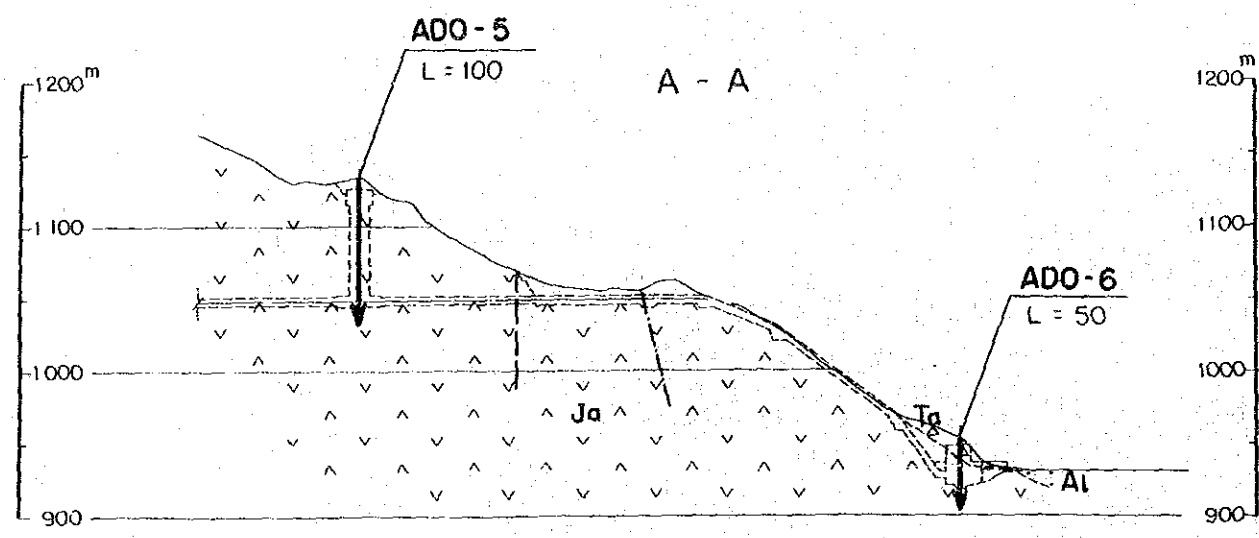


LEGEND (1) (For Plan and Profile)

- Talus deposit
- Alluvial deposit
- Alluvial fan deposit
- Terrace deposit
- Ayvali volcanic rocks (Acidic and basic lava, rhyolite, tuff and Volcanic breccia)
- Geologic boundary
- Strike and dip of fault
- Assumed fault
- Strike and dip of strata
- Drill hole
- Seismic prospecting line

ADO-
 Proposed additional drill hole

ADO-
 Proposed additional drill hole



SY - 220

EL. 934.69 m
 L. 72 m

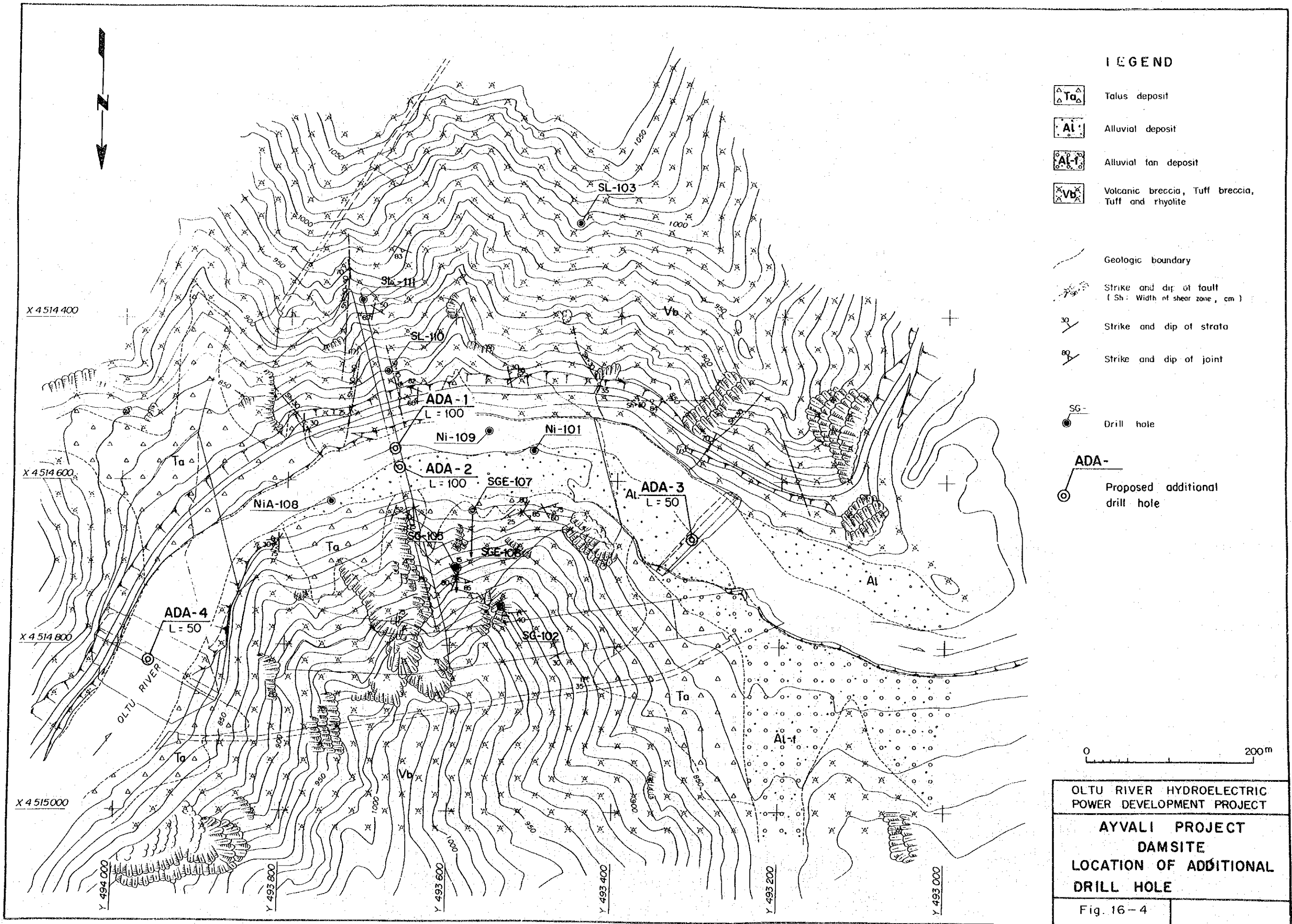
Log	PROD	WH	C
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50			
60	3	2	2
	1	1	1
	4	3	3
72			

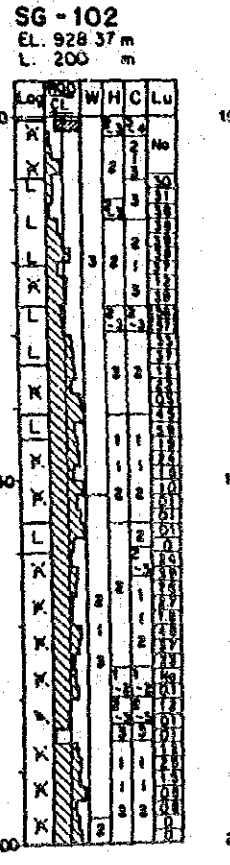
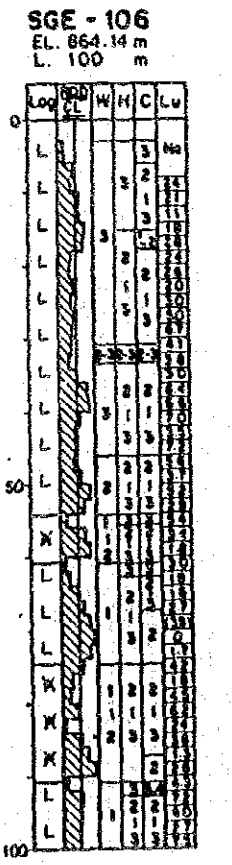
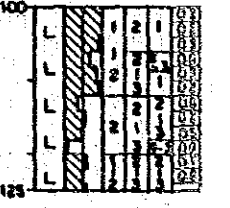
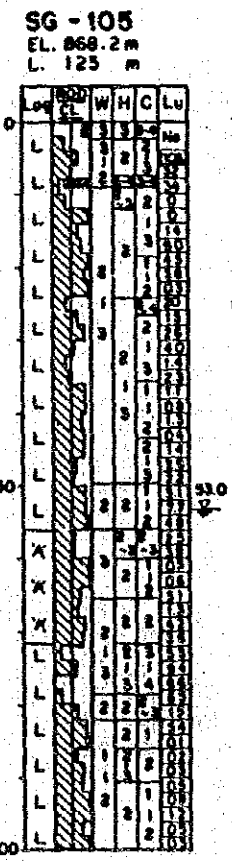
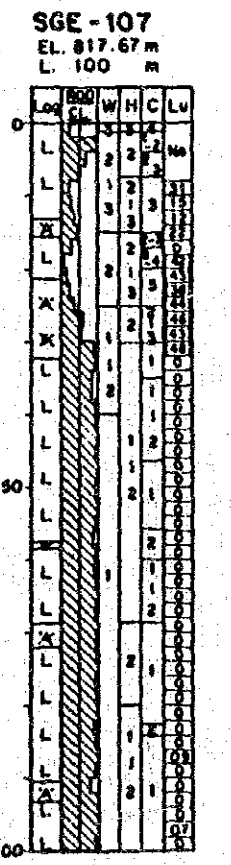
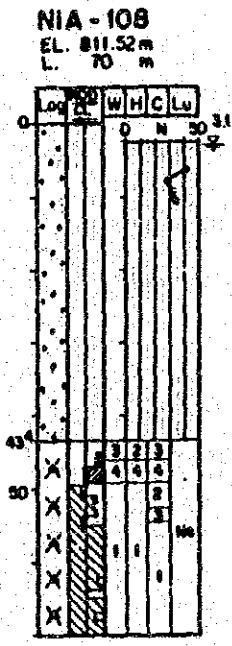
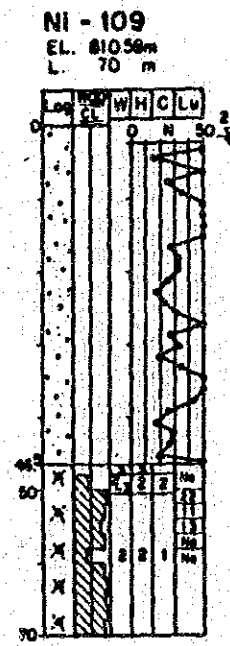
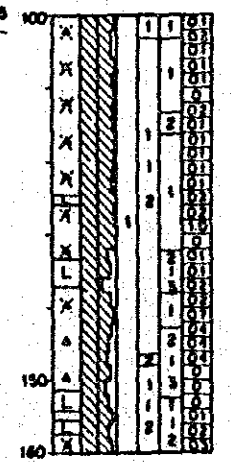
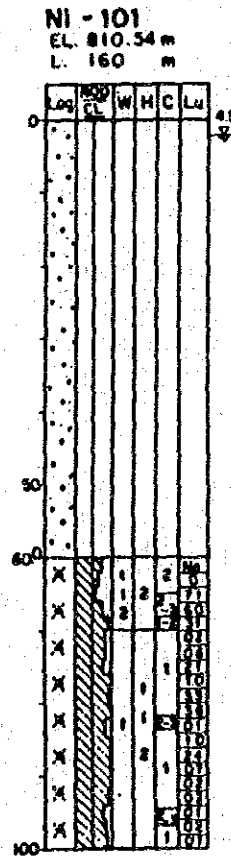
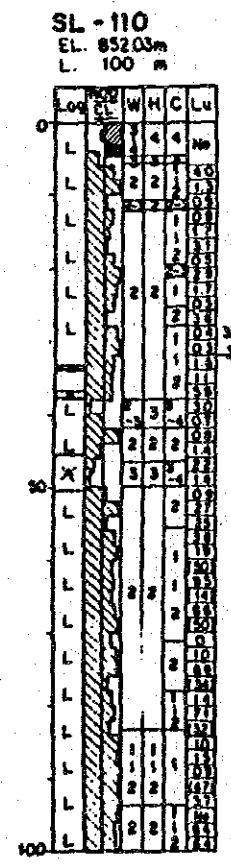
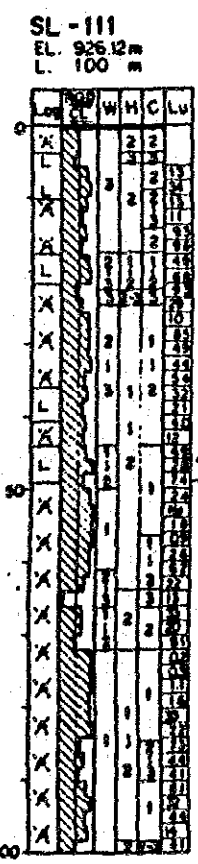
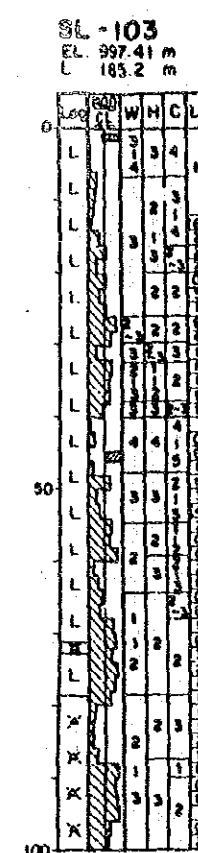
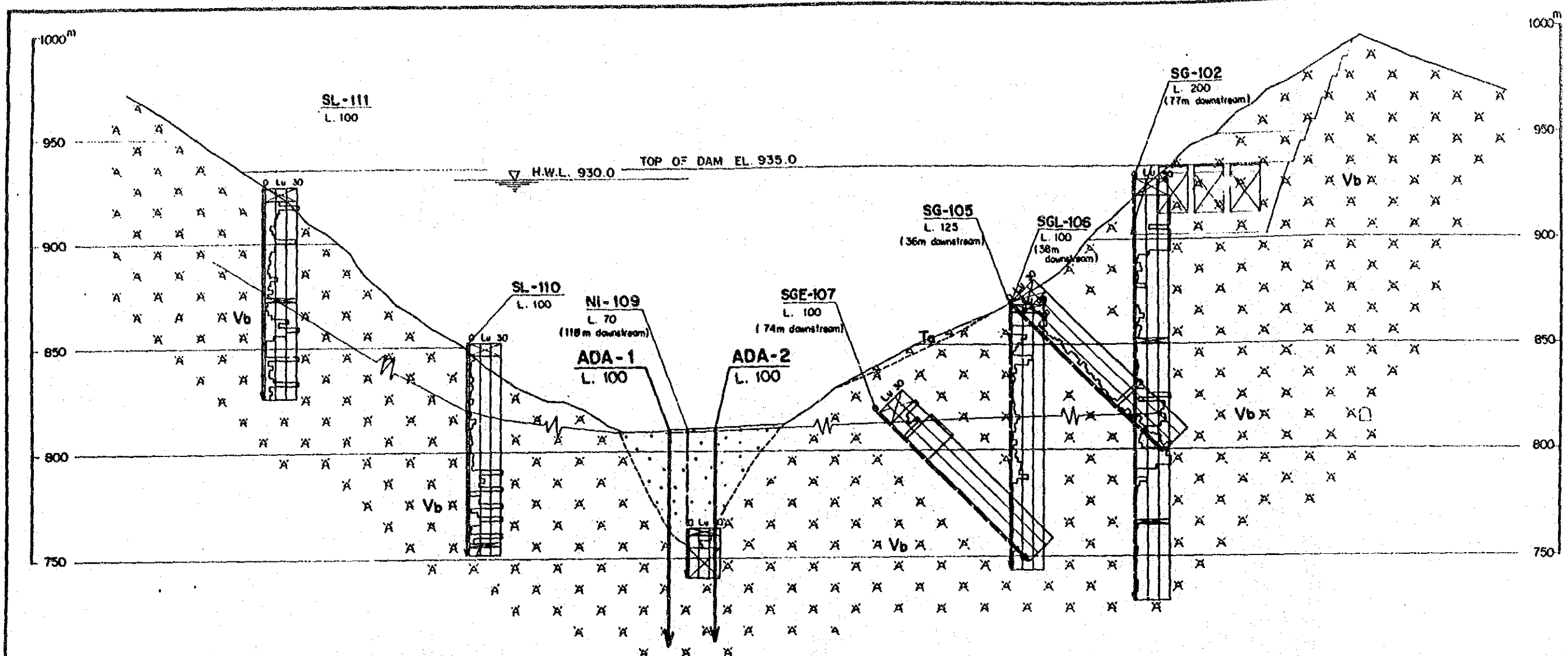


OLTU RIVER HYDROELECTRIC
 POWER DEVELOPMENT PROJECT

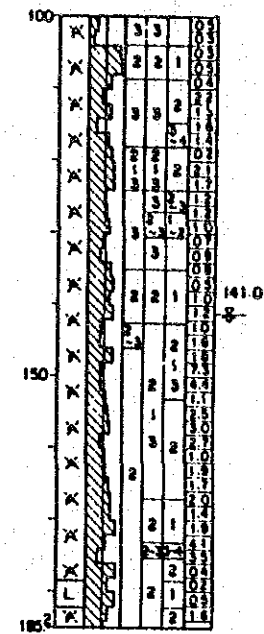
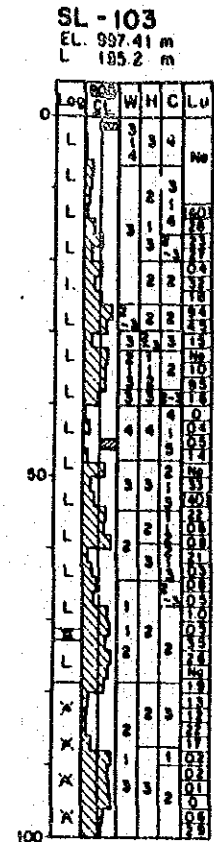
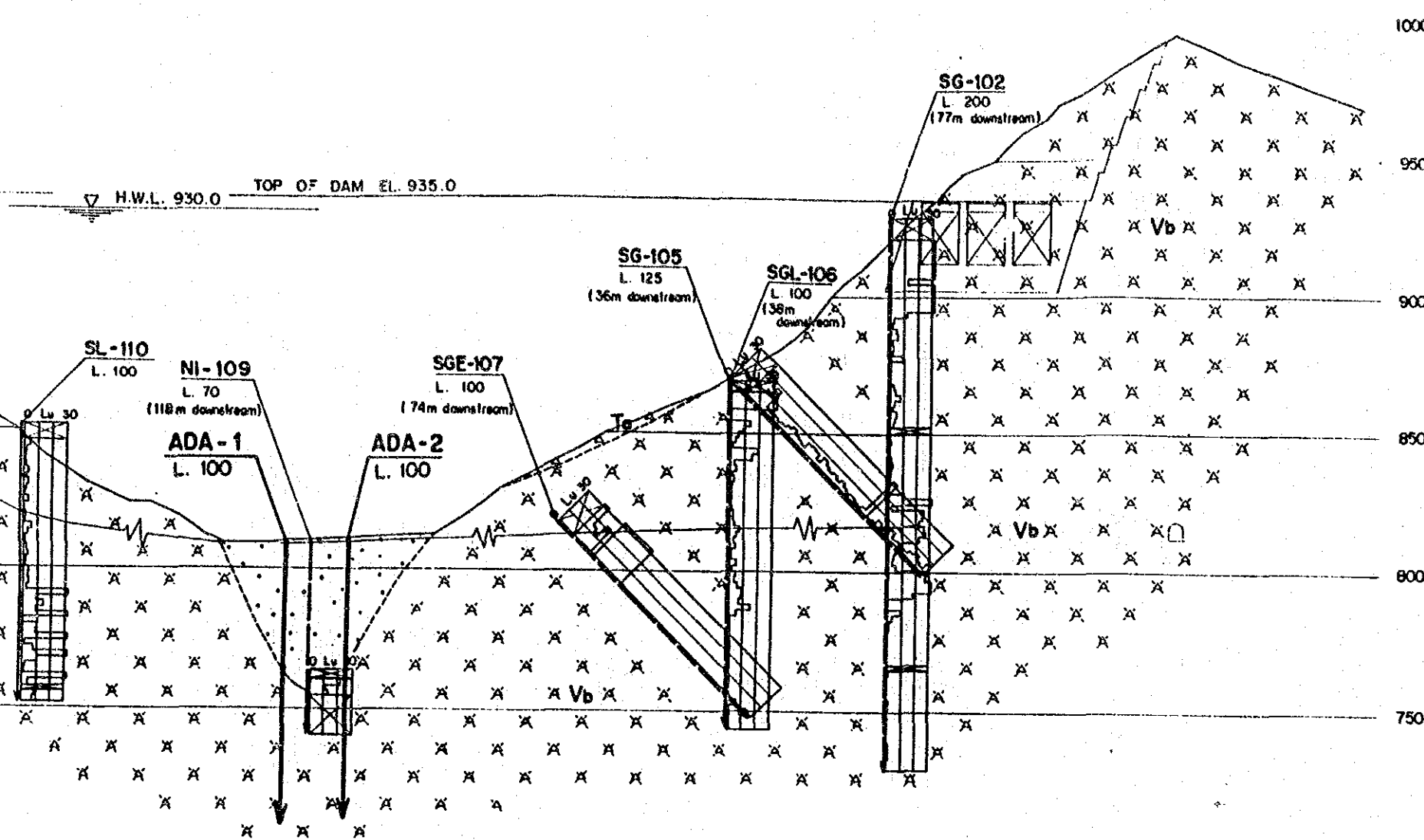
OLUR PROJECT
 PENSTOCK AND POWERHOUSE
 LOCATION OF ADDITIONAL
 DRILL HOLE

Fig. 16 - 3



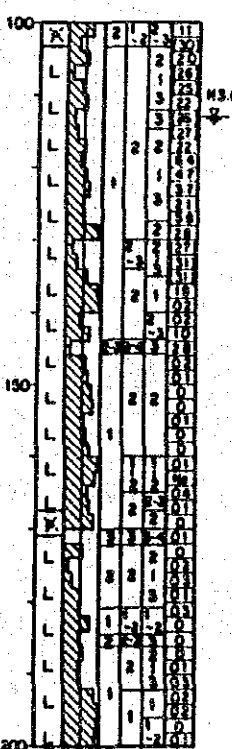
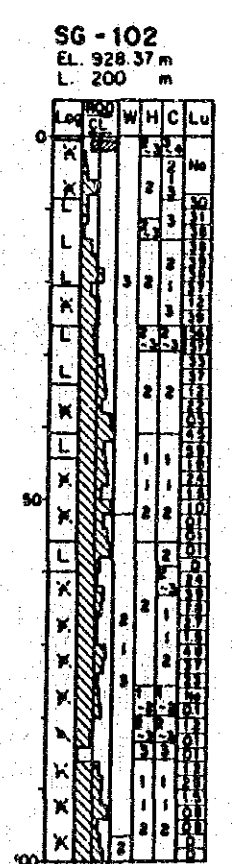
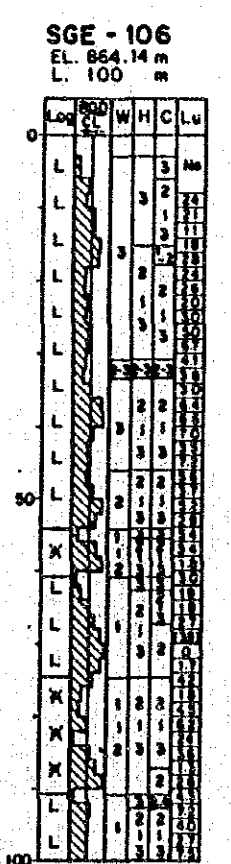
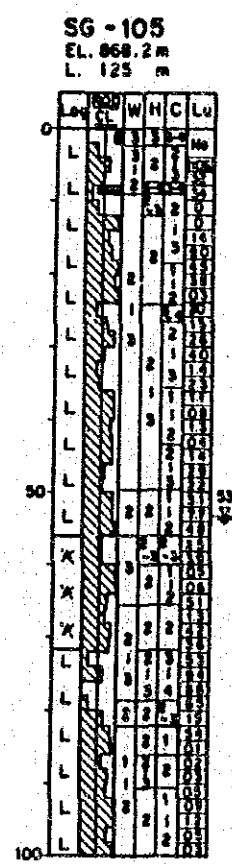
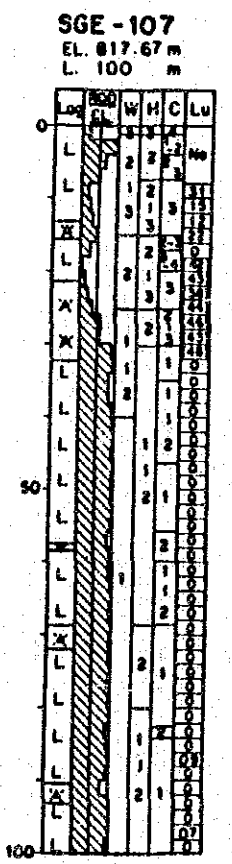
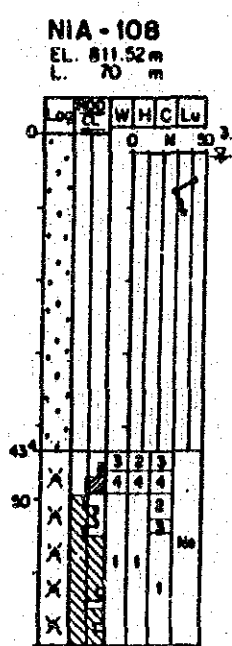
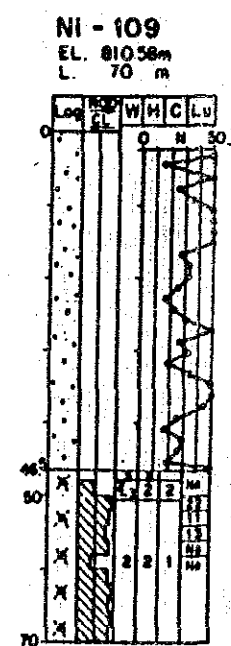
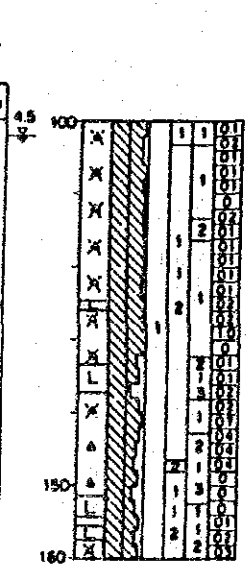


(4)



- LEGEND (1) (For Profile)**
- Talus deposit
 - Alluvial deposit
 - Volcanic breccia, Tuff breccia, Tuff and Rhyolite
 - Geologic boundary
 - Ground water table
 - Drill hole
 - Drill hole (Projection)
 - Lugeon value

ADA-
Proposed additional drill hole



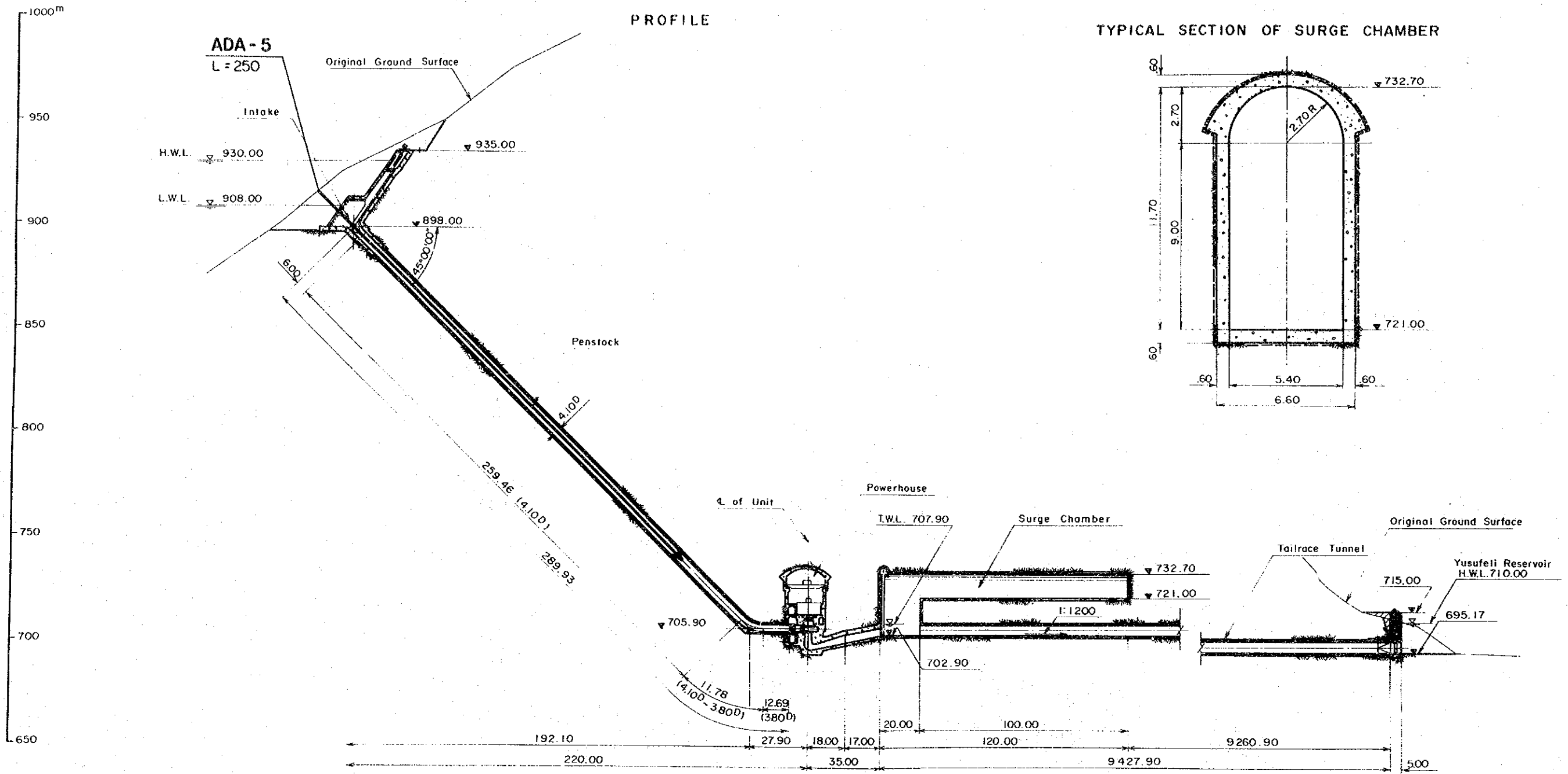
0 100m

OLTU RIVER HYDROELECTRIC
POWER DEVELOPMENT PROJECT

AYVALI PROJECT

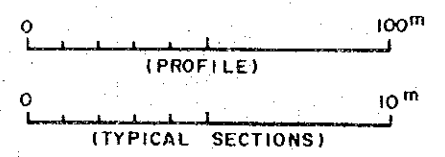
DAM SITE
LOCATION OF ADDITIONAL
DRILL HOLE

Fig. 16-5



LEGEND

ADA -
Proposed additional drill hole



OLTU RIVER HYDROELECTRIC
POWER DEVELOPMENT PROJECT

AYVALI PROJECT
PENSTOCK AND POWERHOUSE
LOCATION OF ADDITIONAL
DRILL HOLE

Fig. 16 - 6

JICA