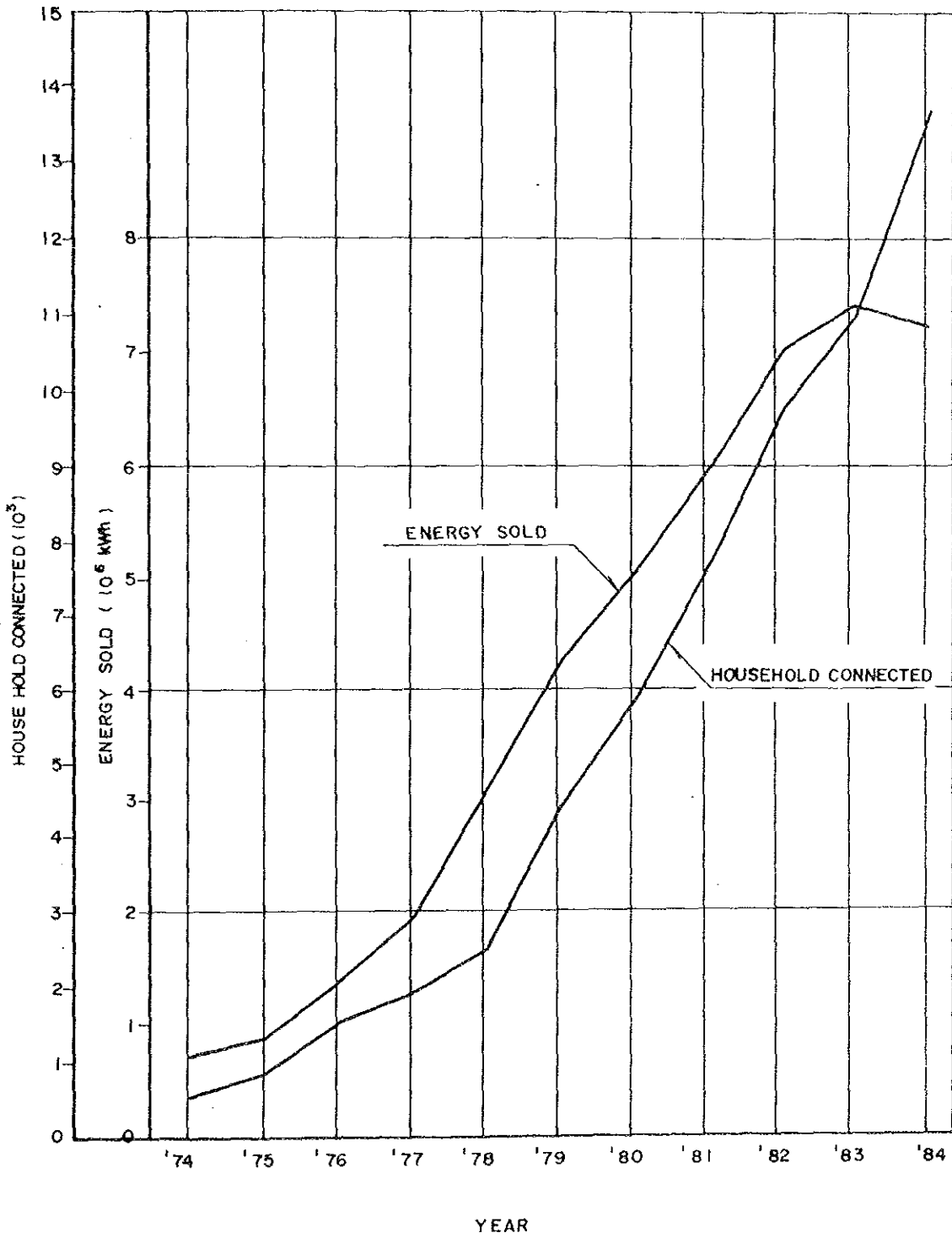


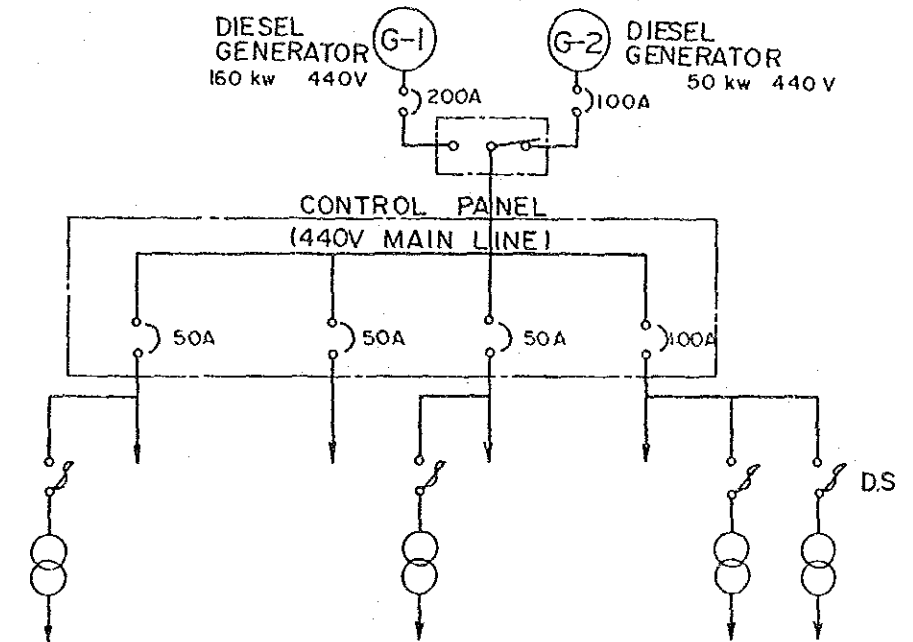
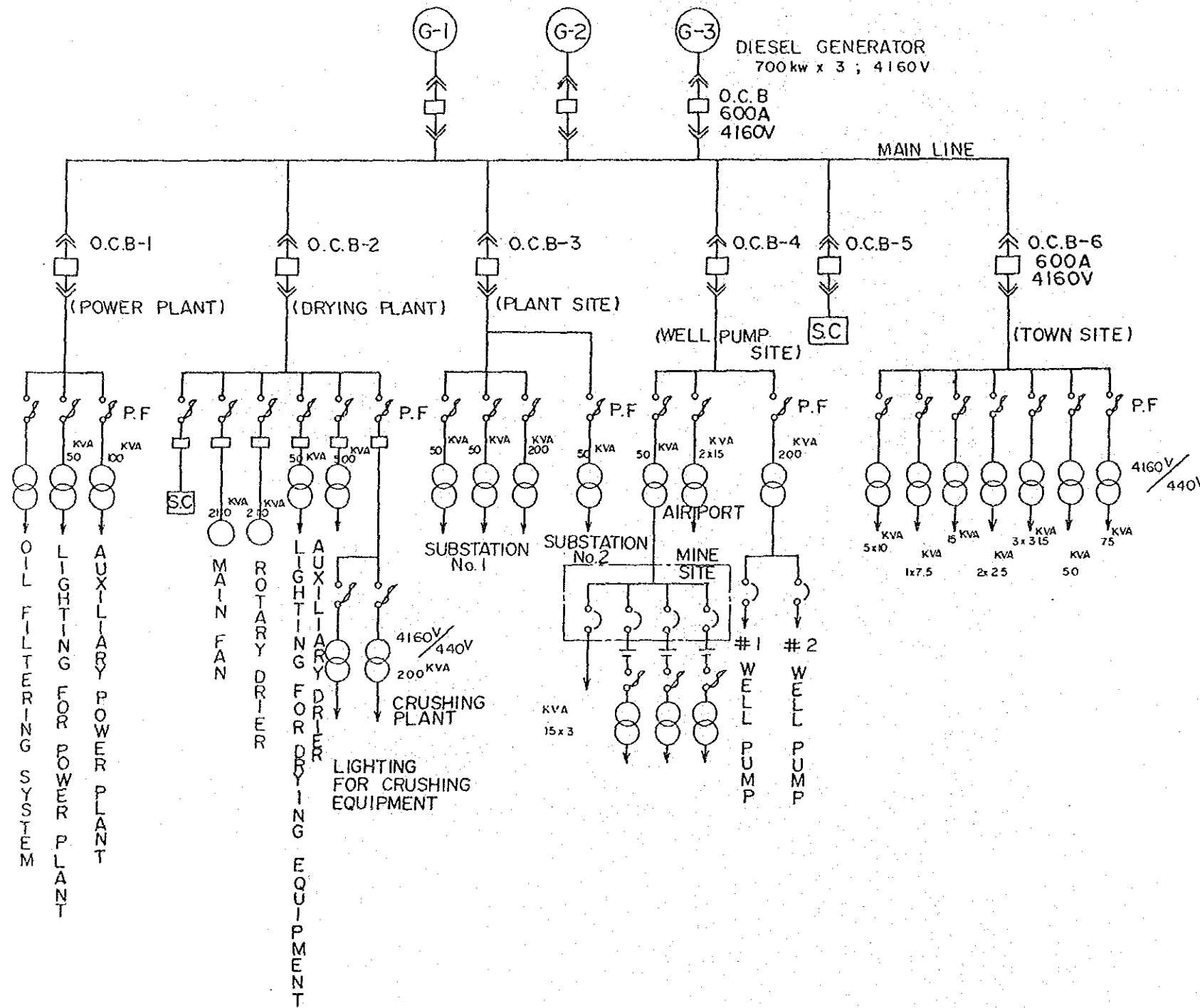
付 図

PALECO 給電・売電の推移

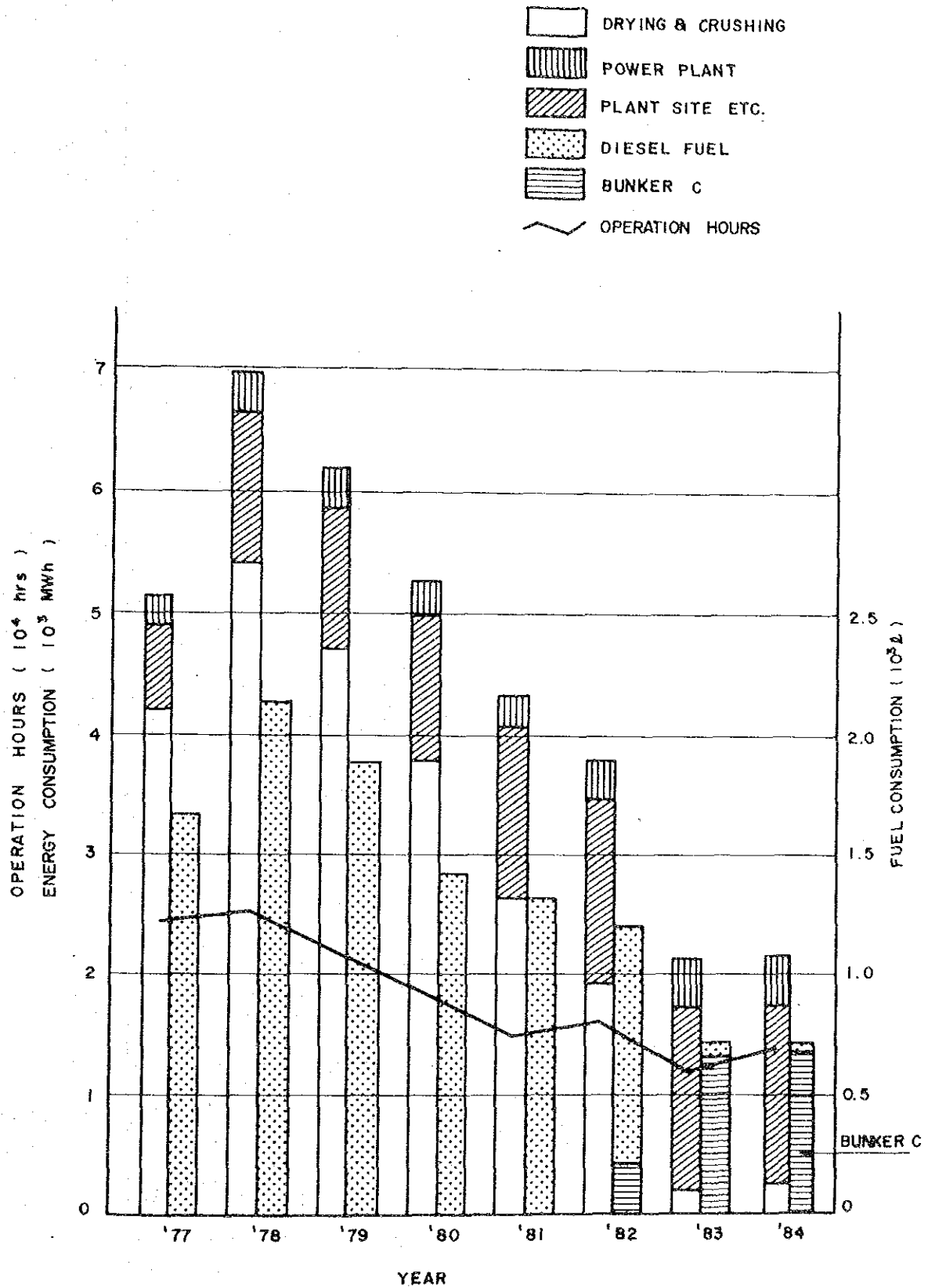


PLANT SITE SINGLE LINE DIAGRAM

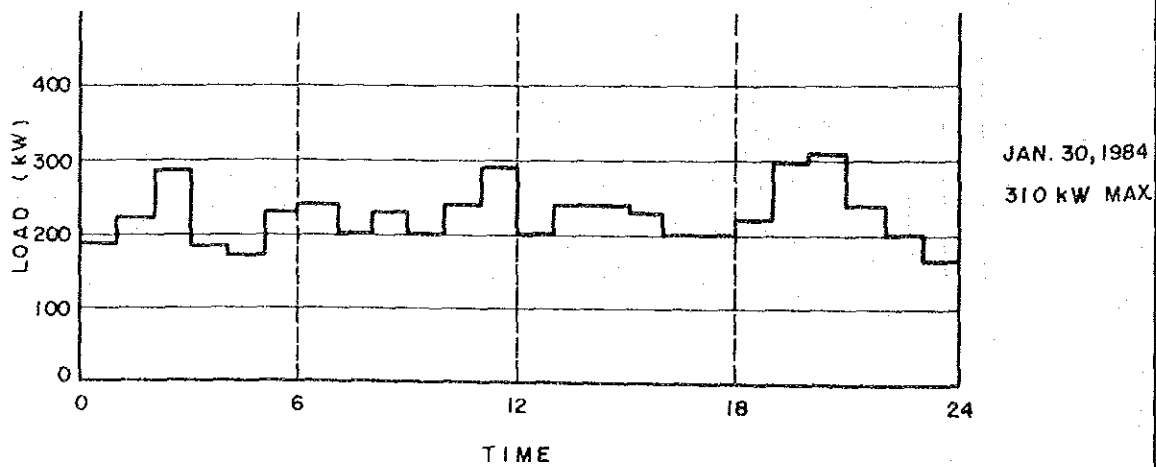
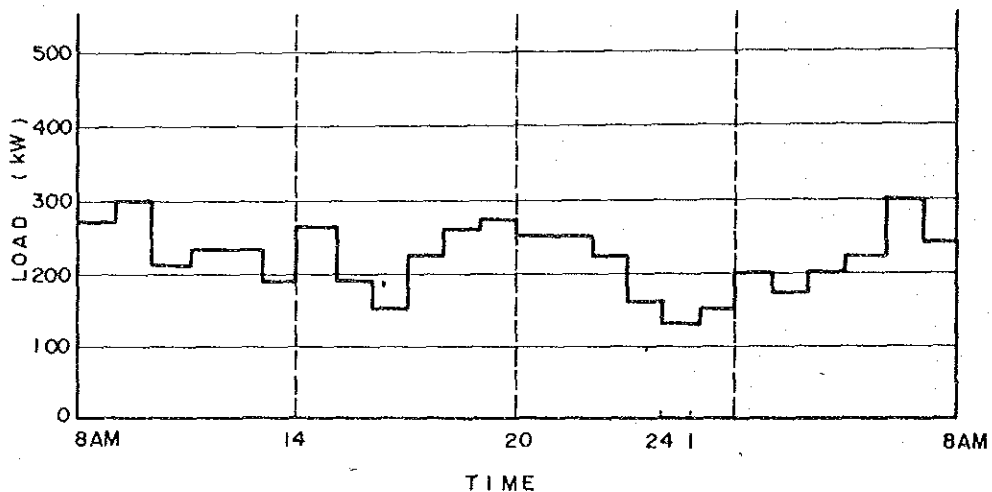
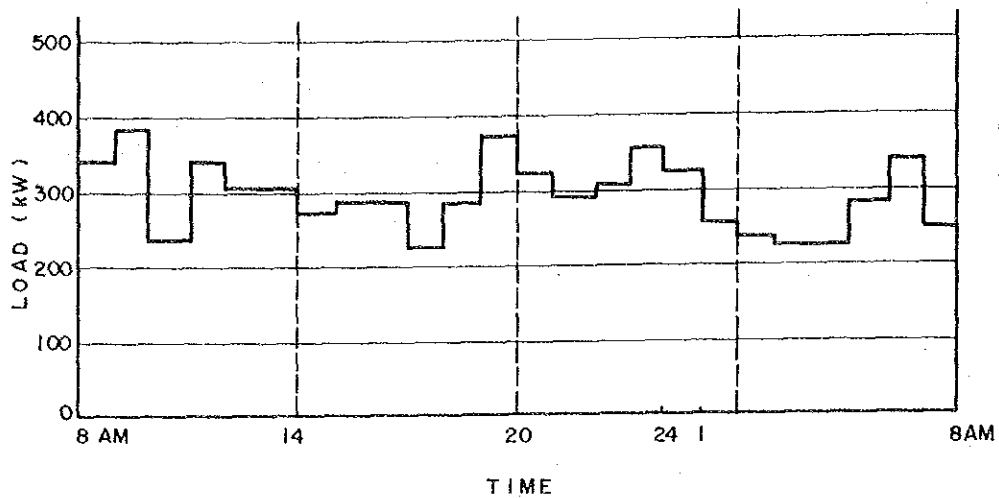
PIER SITE SINGLE LINE DIAGRAM



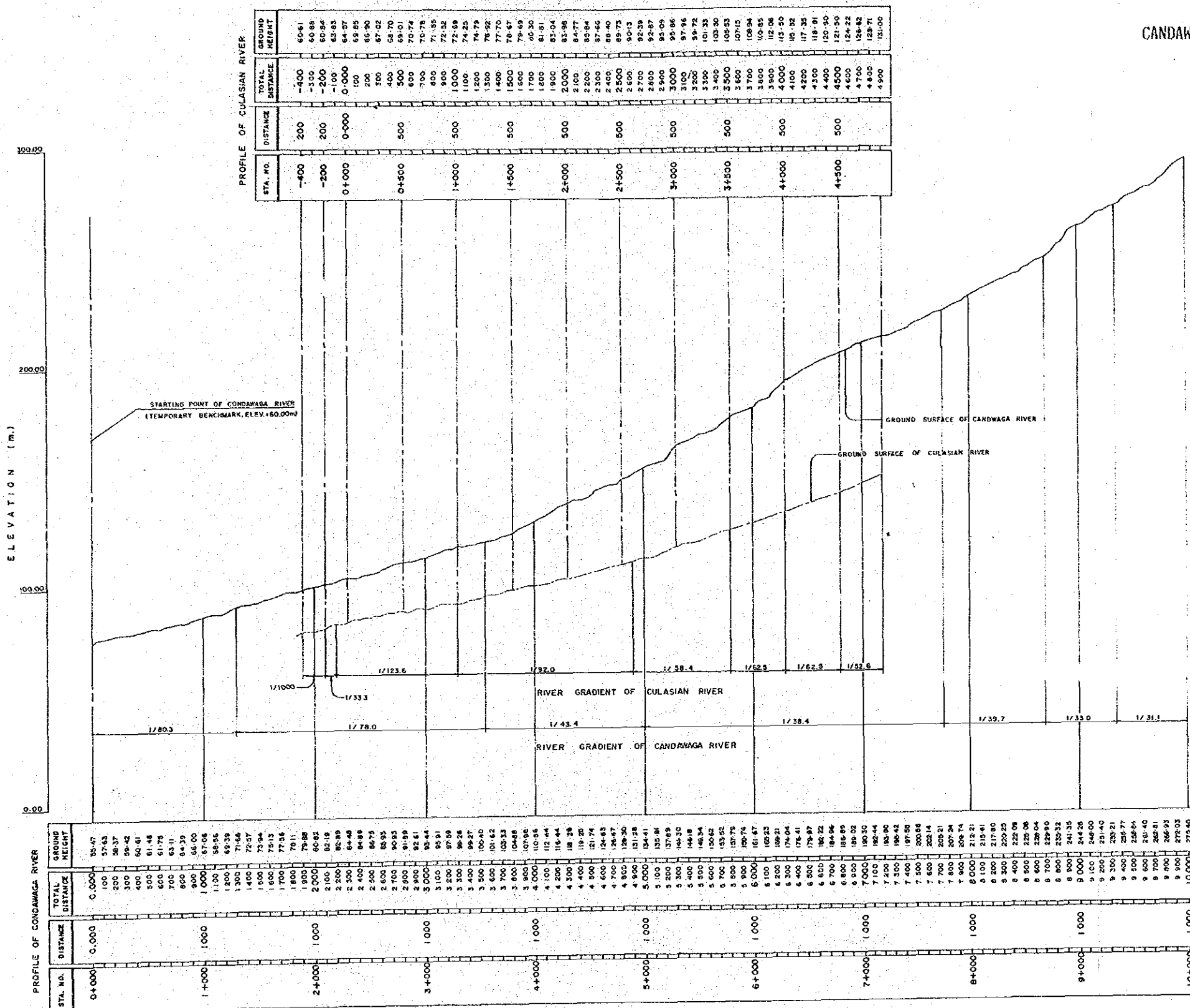
RIO TUBA 鉱山 電力状況



RIO TUBA 鉱山 日負荷曲線

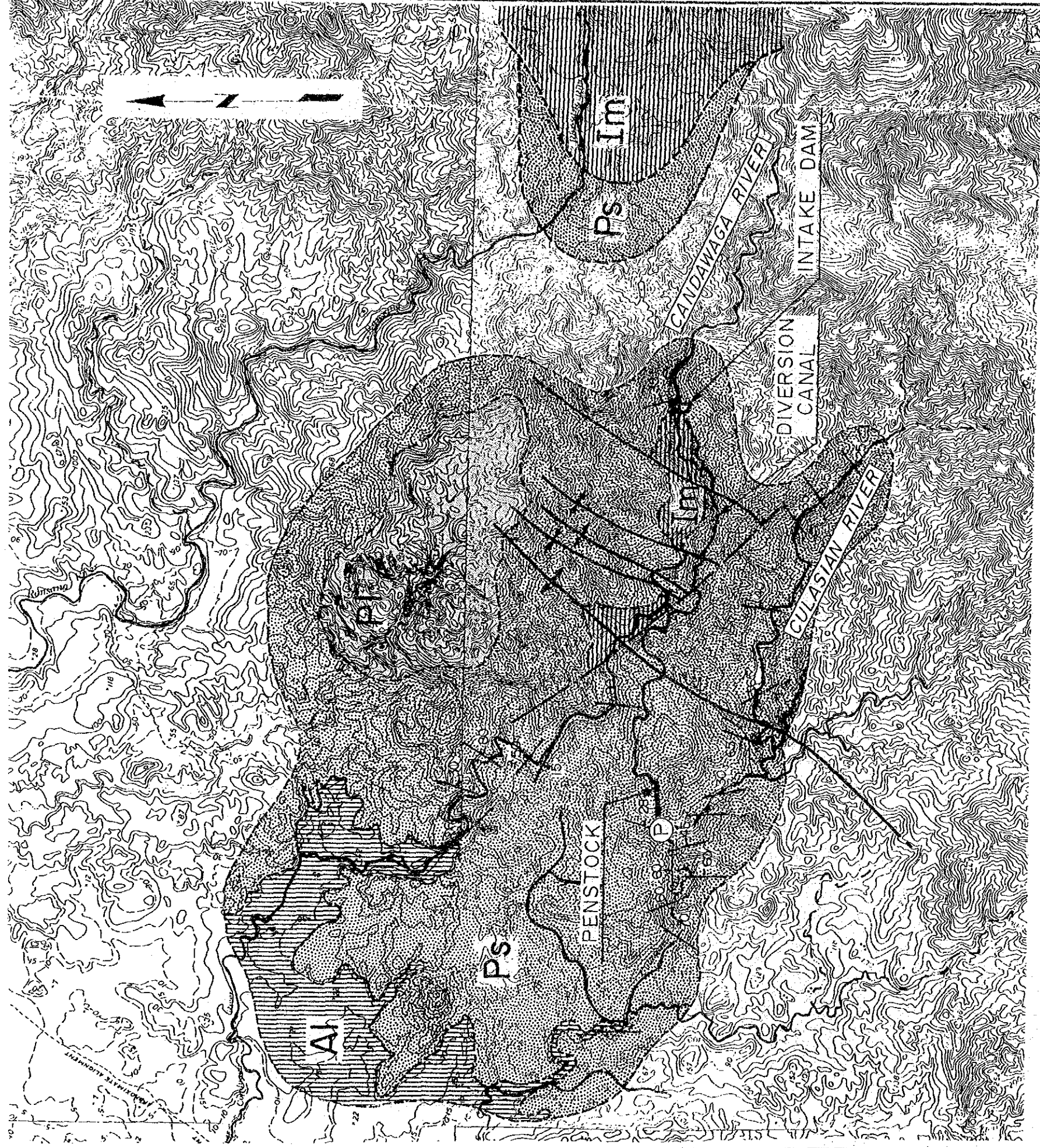


CANDAWAGA 川・CULASIAN 川 縦断面図



SCALE:
 HORIZONTAL 1: 40,000
 VERTICAL 1: 2,000

一般地質圖



Scale : 1 / 50,000

LEGEND

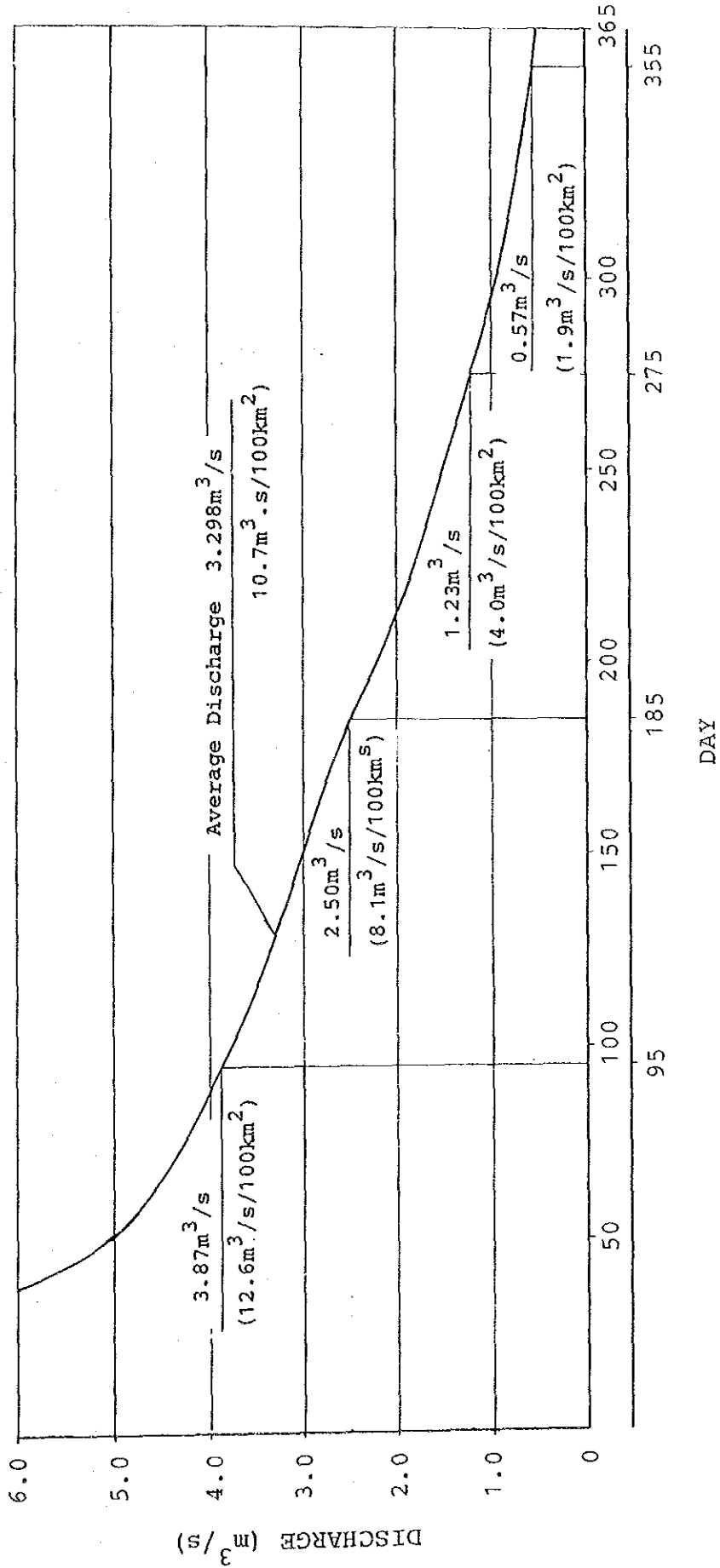
GEOLOGICAL AGE	FORMATION	LITHOLOGY
QUATERNARY	ALLUVIUM (Al)	CLAY, SAND, GRAVEL
EARLY MIOCENE OR LATE OLILOCENE	RANSANG LIMESTONE (Rl)	LIMESTONE
EARLY EOCENE	PANDIAN FORMATION (Pd)	MASSIVE SANDSTONE WITH INTERBEDDED MUDSTONE AND SHALE
PALEOCENE	FOVWATION (Ps)	INTERBEDDED SANDSTONE AND SHALE WITH LIMESTONE
PRE-TERTIARY	IRAHUAN - METAVOLCANICS (Im)	BASALTIC COMPLEX PYROCLASTICS AND LAVA (ALMOST PILLOW TYPE)

- STRIKE AND INCLINATION OF STRATUM.
- STRIKE AND INCLINATION OF FAULT
- INFERRERD GEOLOGICAL BORDER LINE
- ANTICLINE STRUCTURE
- SYNCLINE STRUCTURE

图 5-2

CANDAWAGA 川 1975-84年想定平均流況図

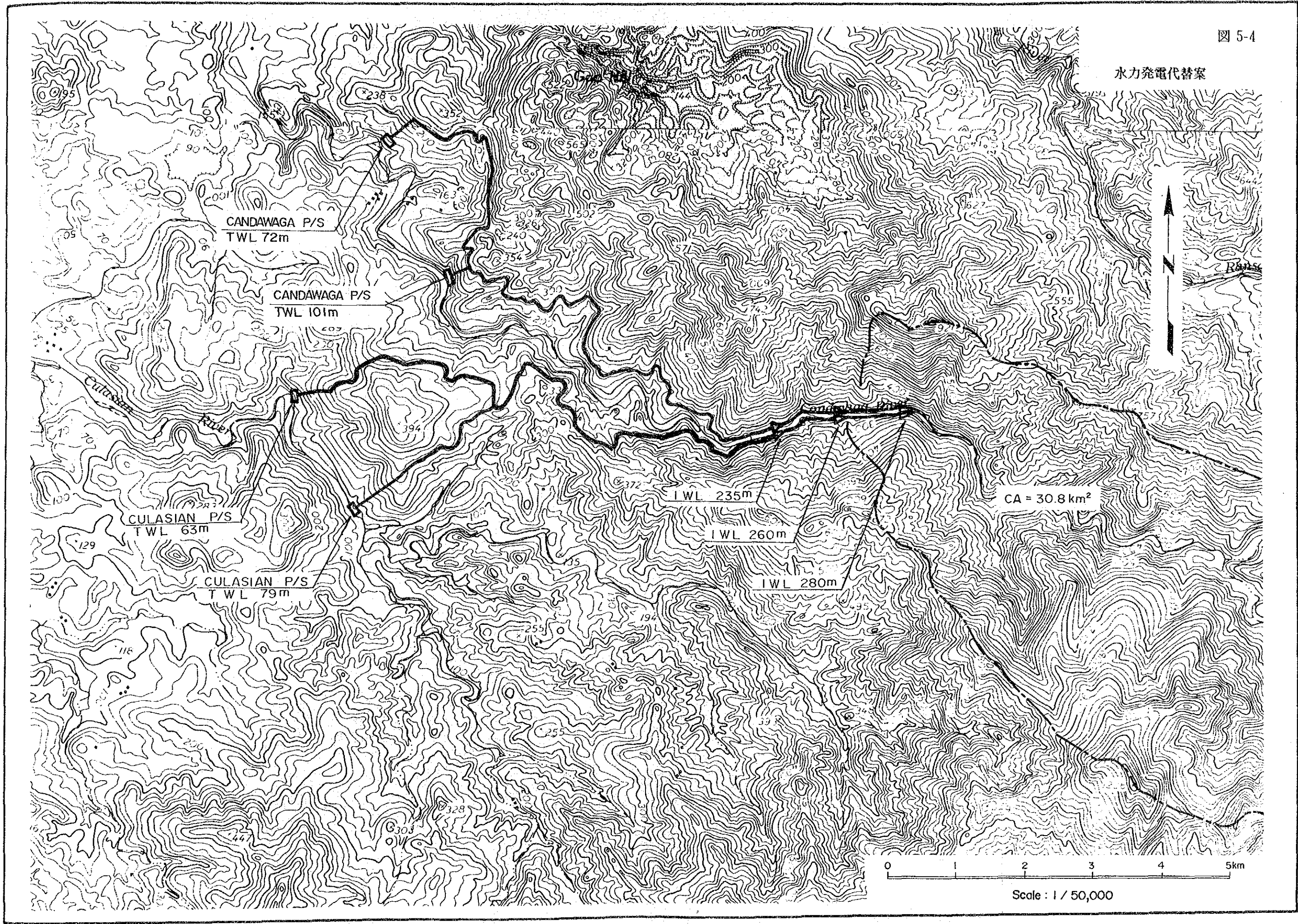
STATION : INTAKE DAM SITE (RIVER BED EL.255.0m)
 CATCHMENT AREA : 30.8km²



5-3

圖 5-4

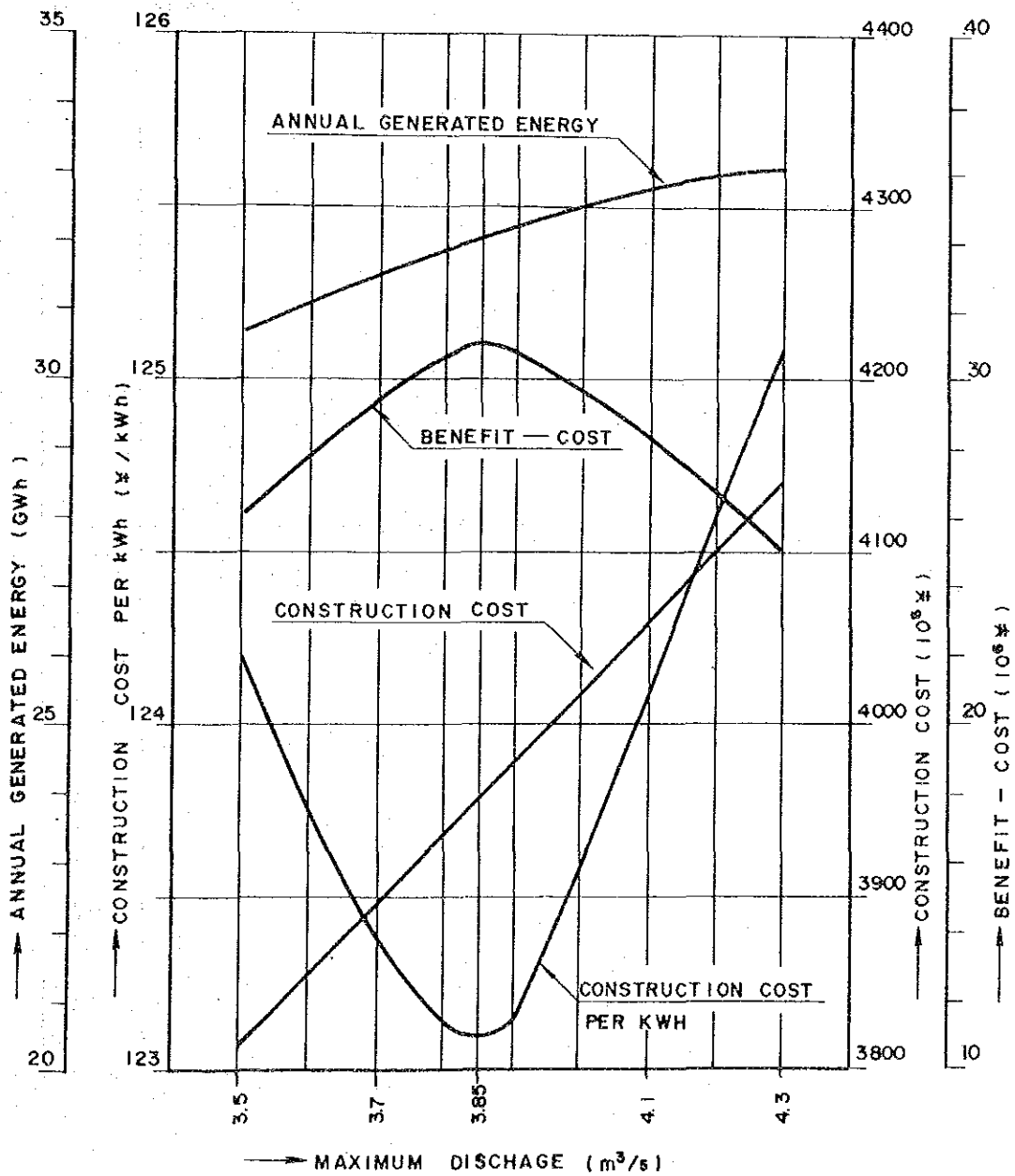
水力發電代替案



最大取流量最適案検討図

Intake water level : EL. 260m

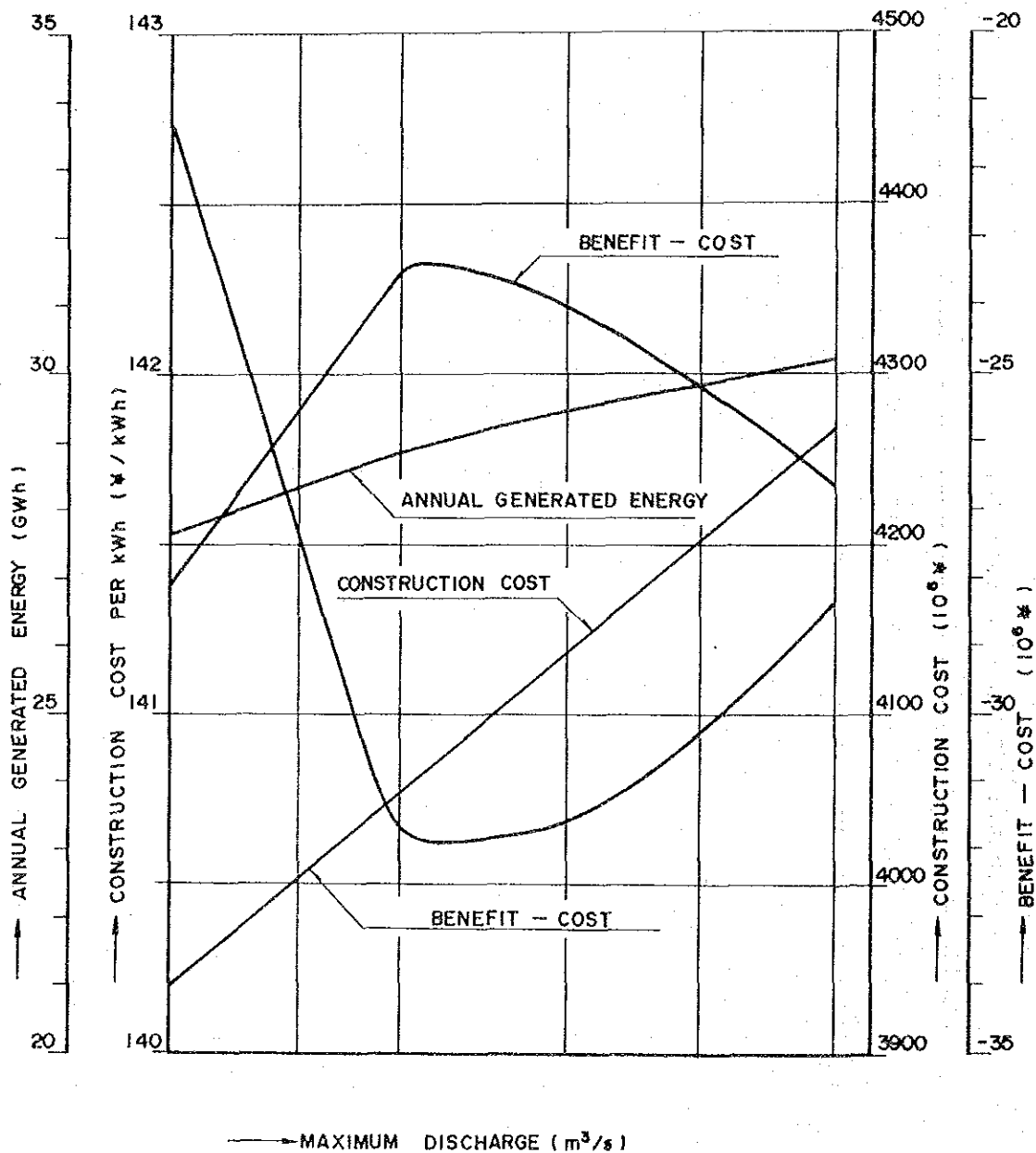
Tailrace water level : EL. 63 m



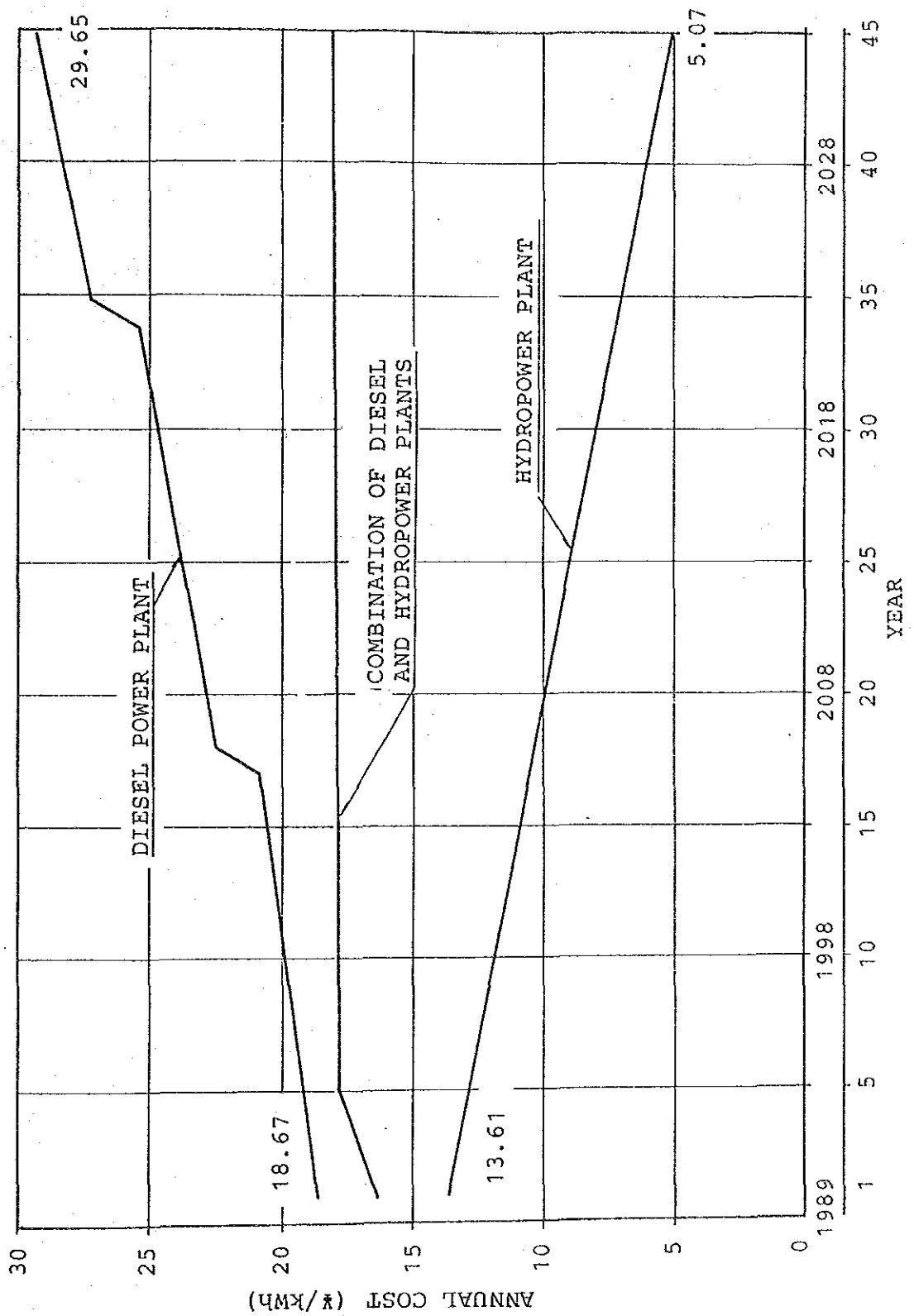
最大取流量最適案檢討圖 (CANDAWAGA P/S 代替案)

Intake water level : EL. 260 m

Tailrace water level : EL. 101 m

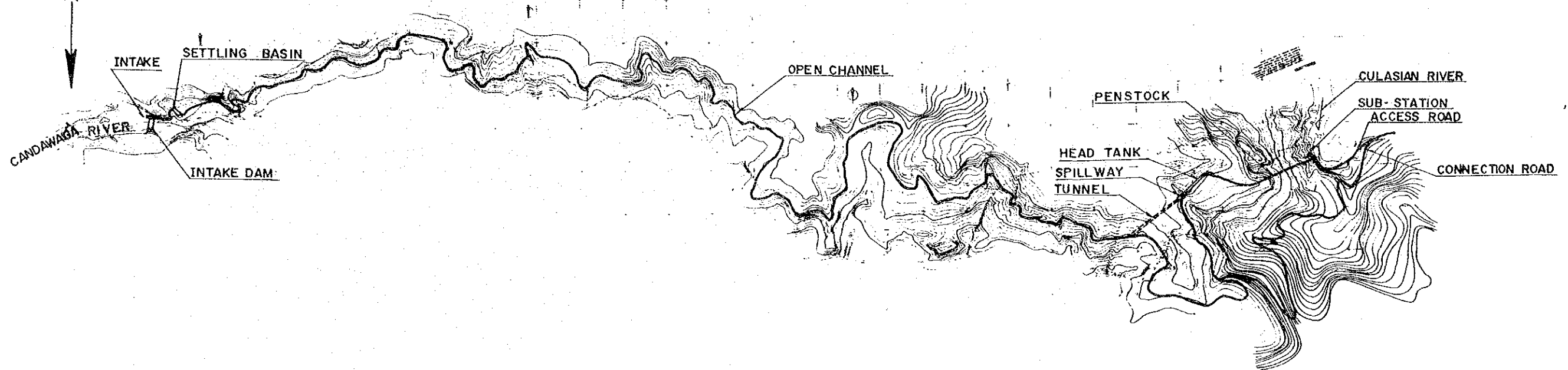


ディーゼル・水力発電コスト比較図

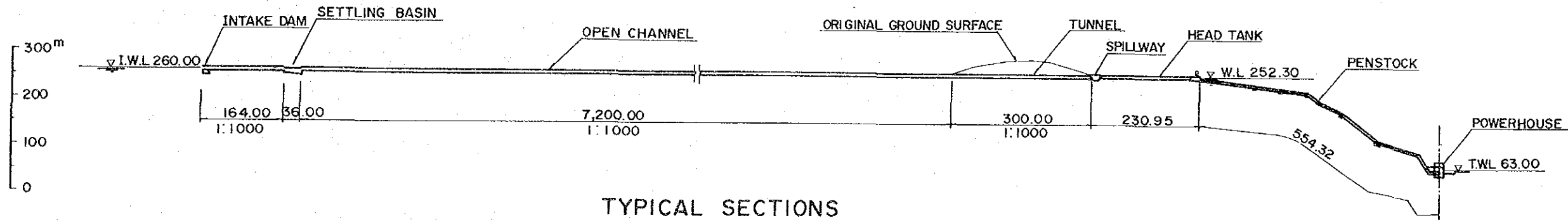


設計図面表

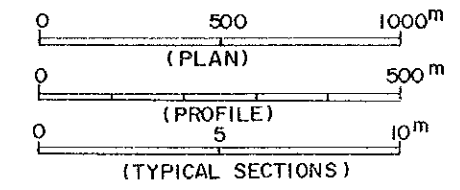
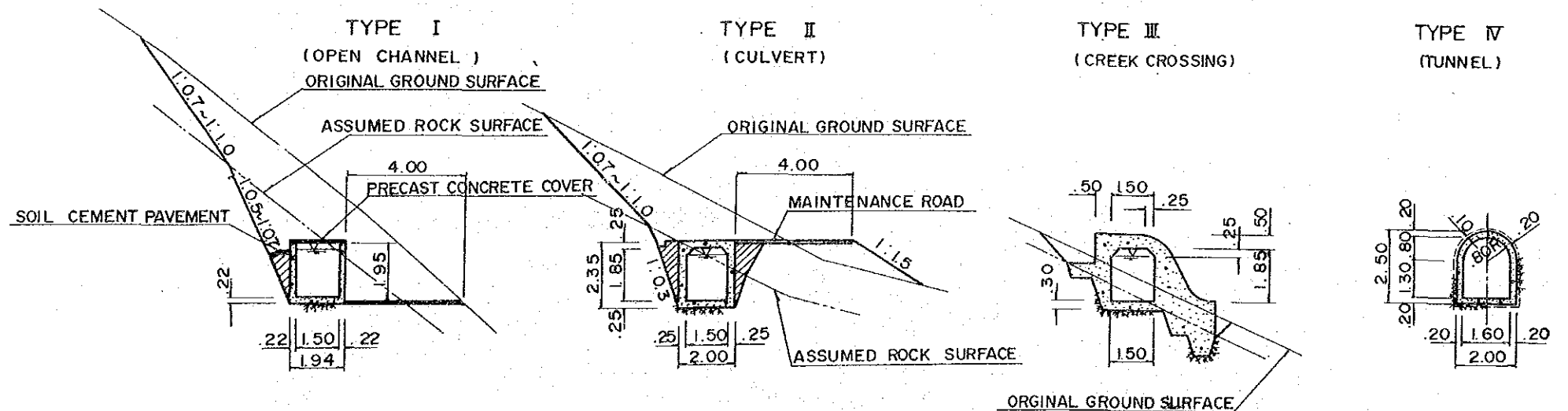
PLAN



PROFILE



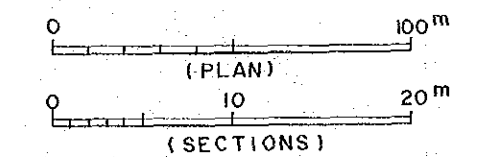
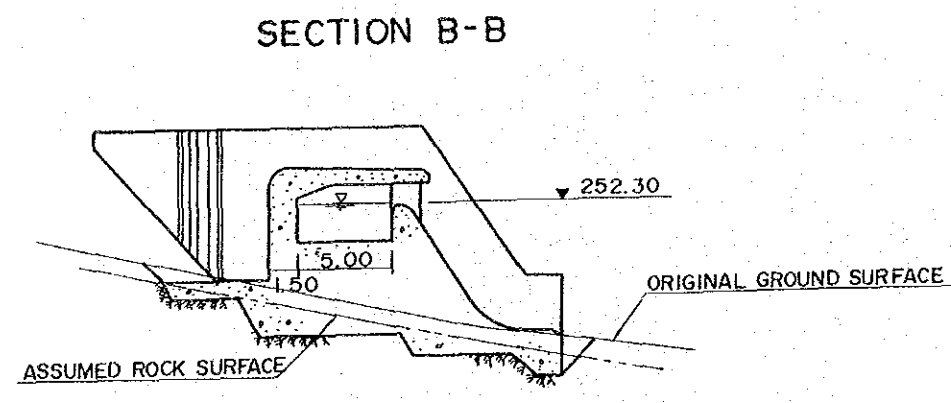
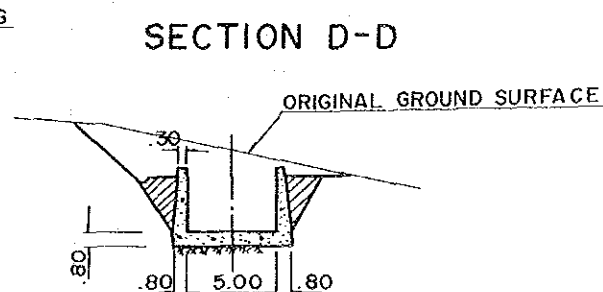
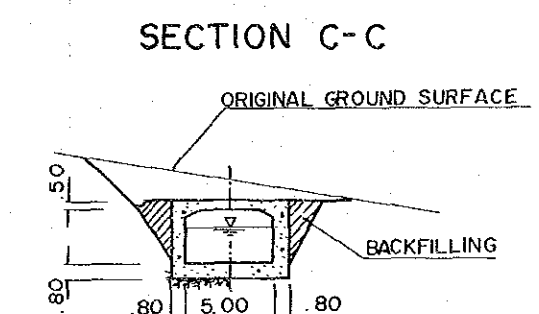
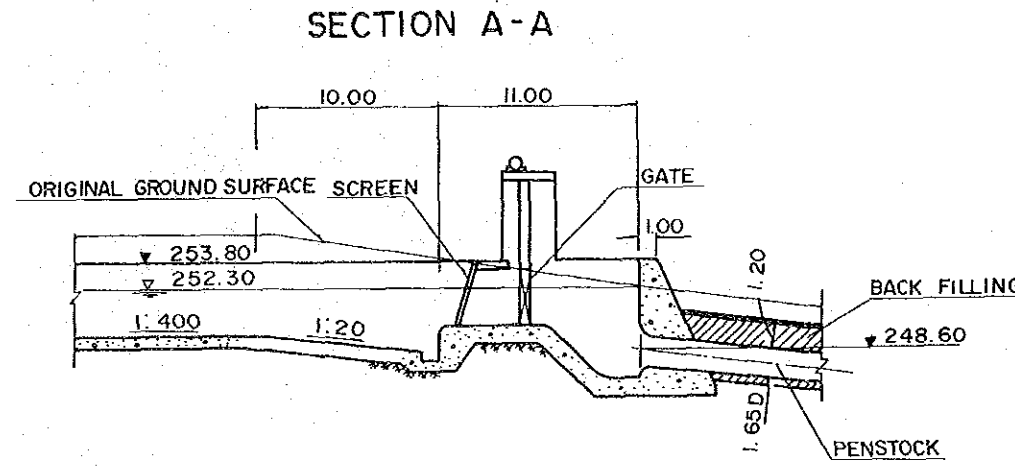
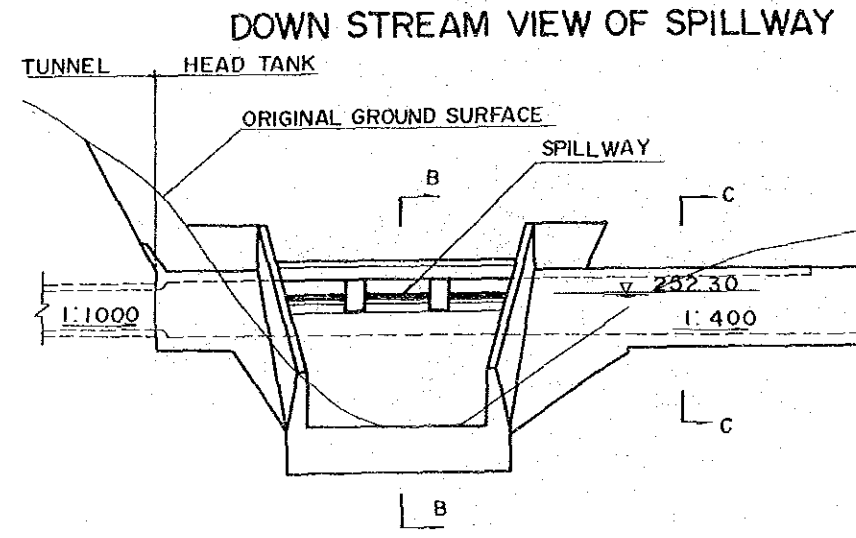
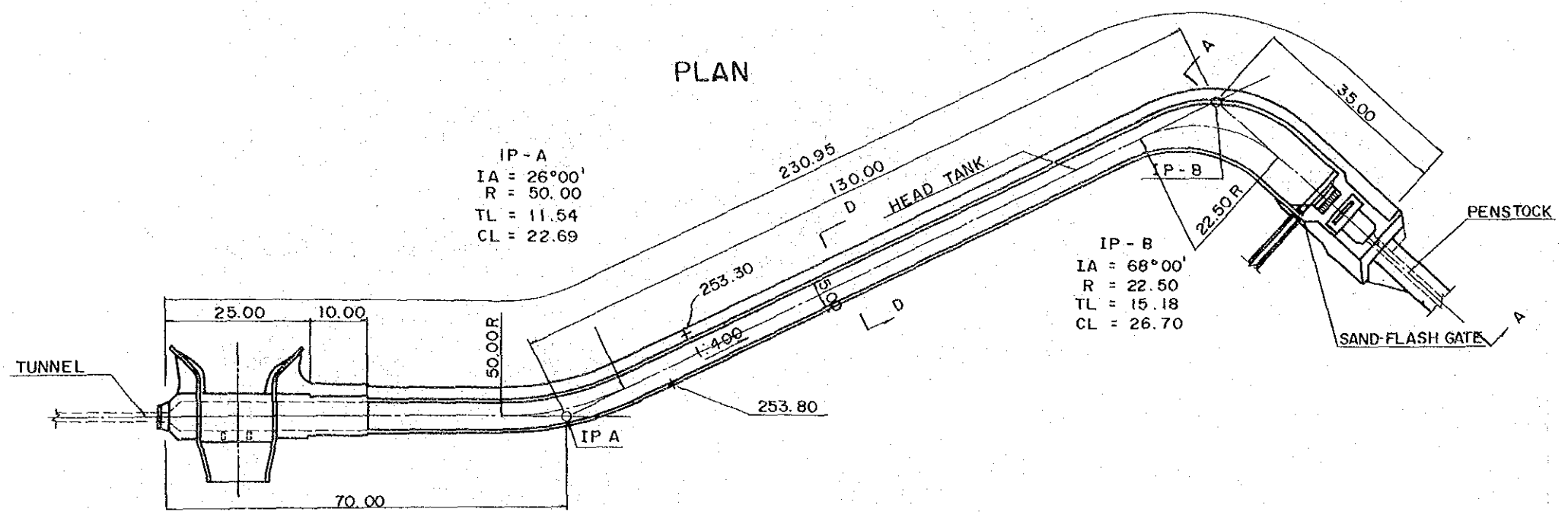
TYPICAL SECTIONS



INFRASTRUCTURE SURVEY FOR
 RIO TUBA NICKEL MINE
 (CANDAWAGA HYDROPOWER SCHEME)
 Republic of the Philippines

**WATERWAY PLAN
 PROFILE & SECTIONS**

JAPAN INTERNATIONAL COOPERATION AGENCY
 DRWG. No. 101 SHEET OF

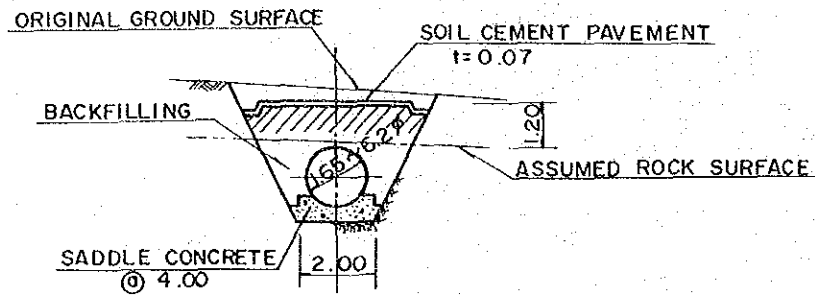


INFRASTRUCTURE SURVEY FOR
 RIO TUBA NICKEL MINE
 (CANDAWAGA HYDROPOWER SCHEME)
 Republic of the Philippines

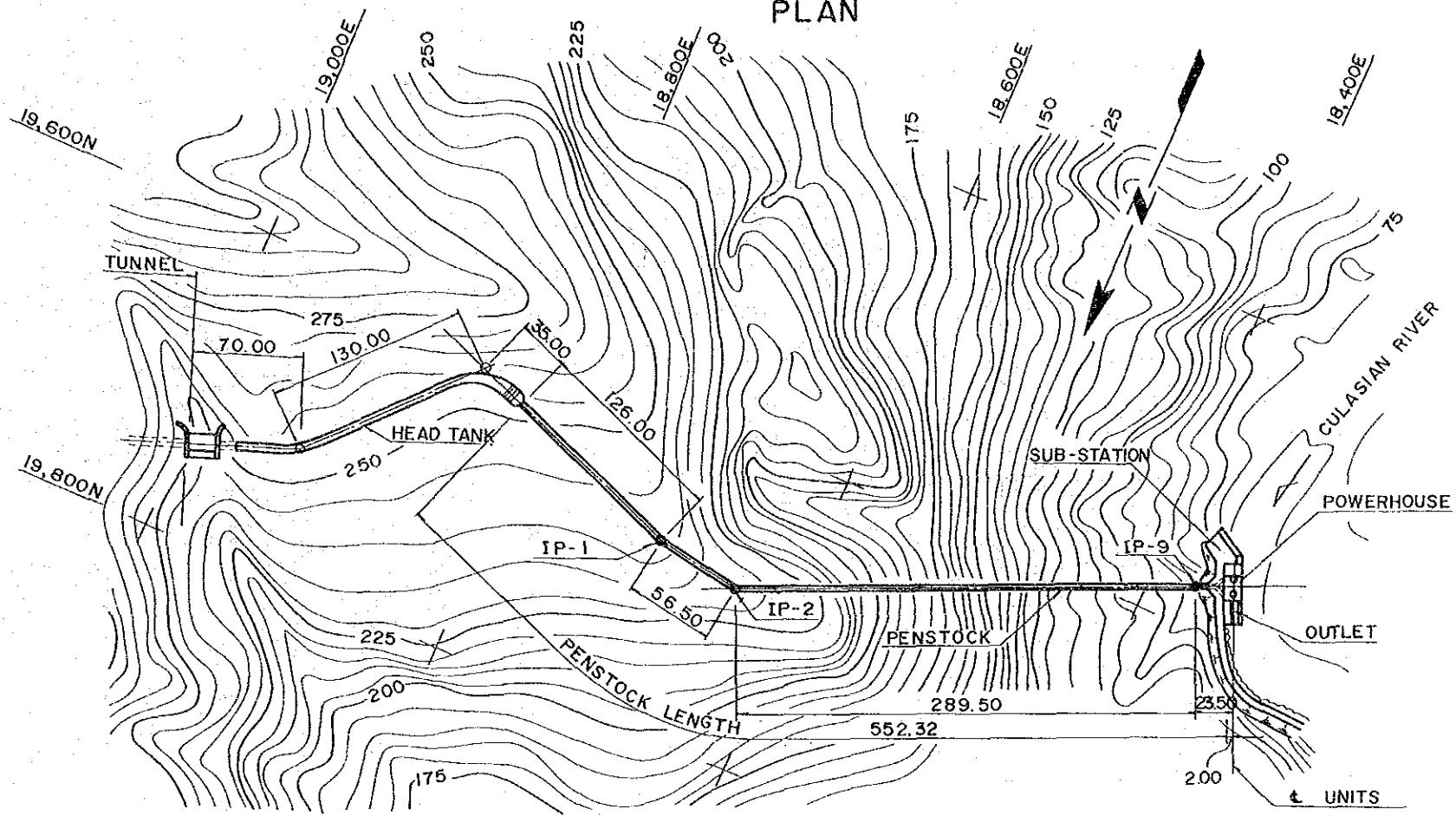
**HEAD TANK
 PLAN, SECTIONS & DETAIL**

JAPAN INTERNATIONAL COOPERATION AGENCY
 DRWG. No. 103 SHEET OF

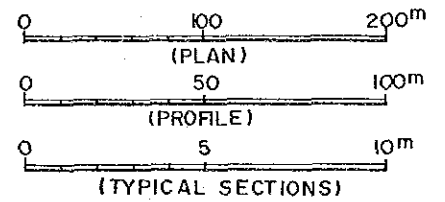
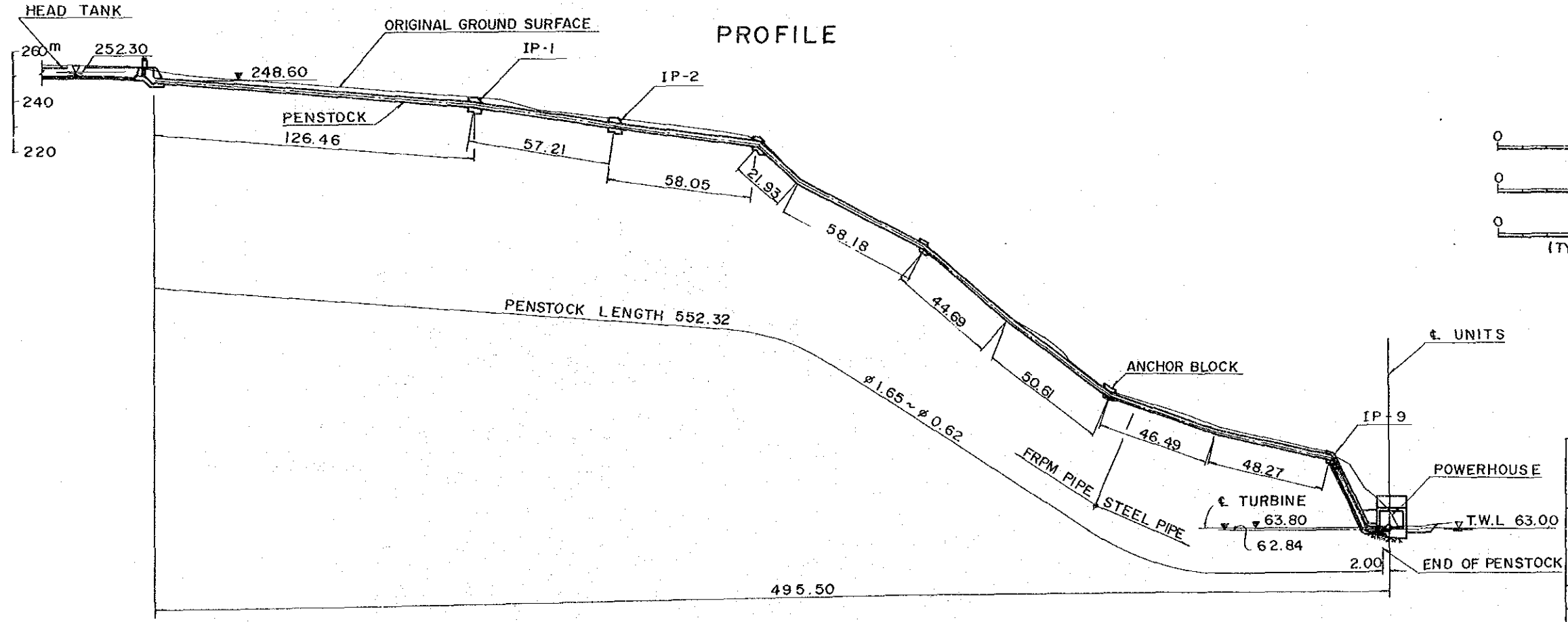
TYPICAL CROSS SECTION



PLAN



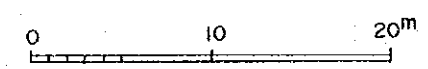
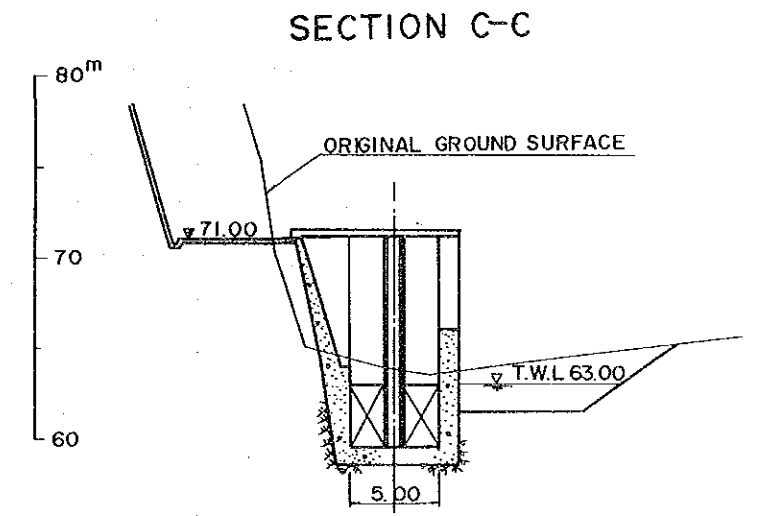
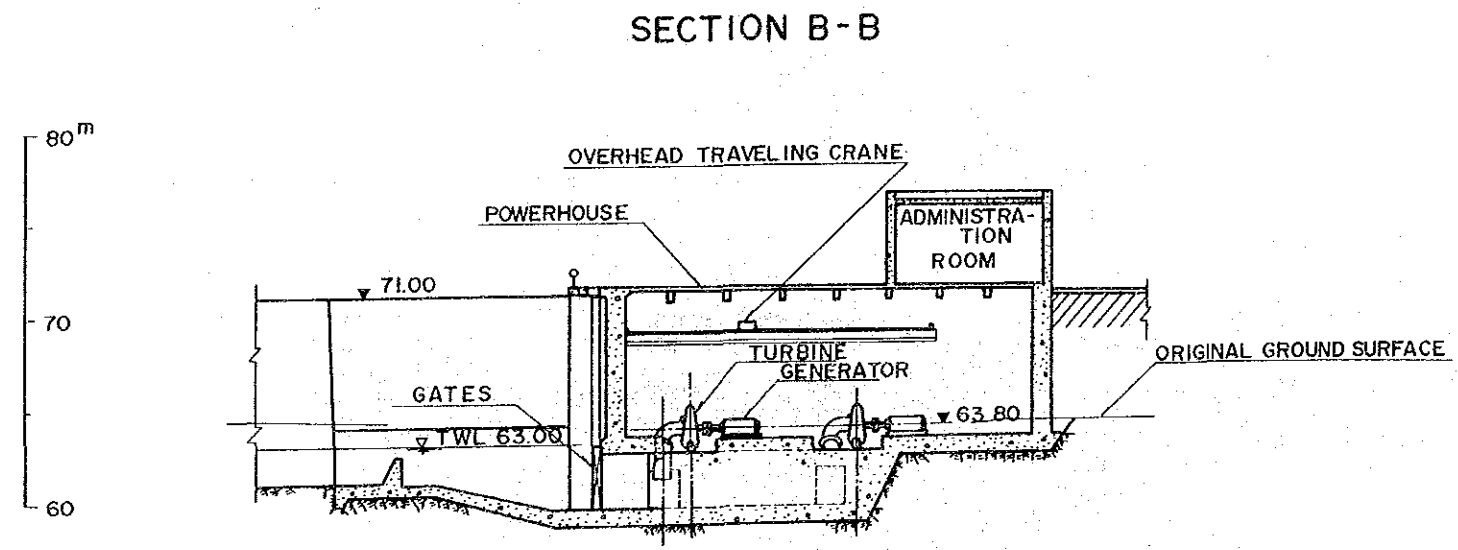
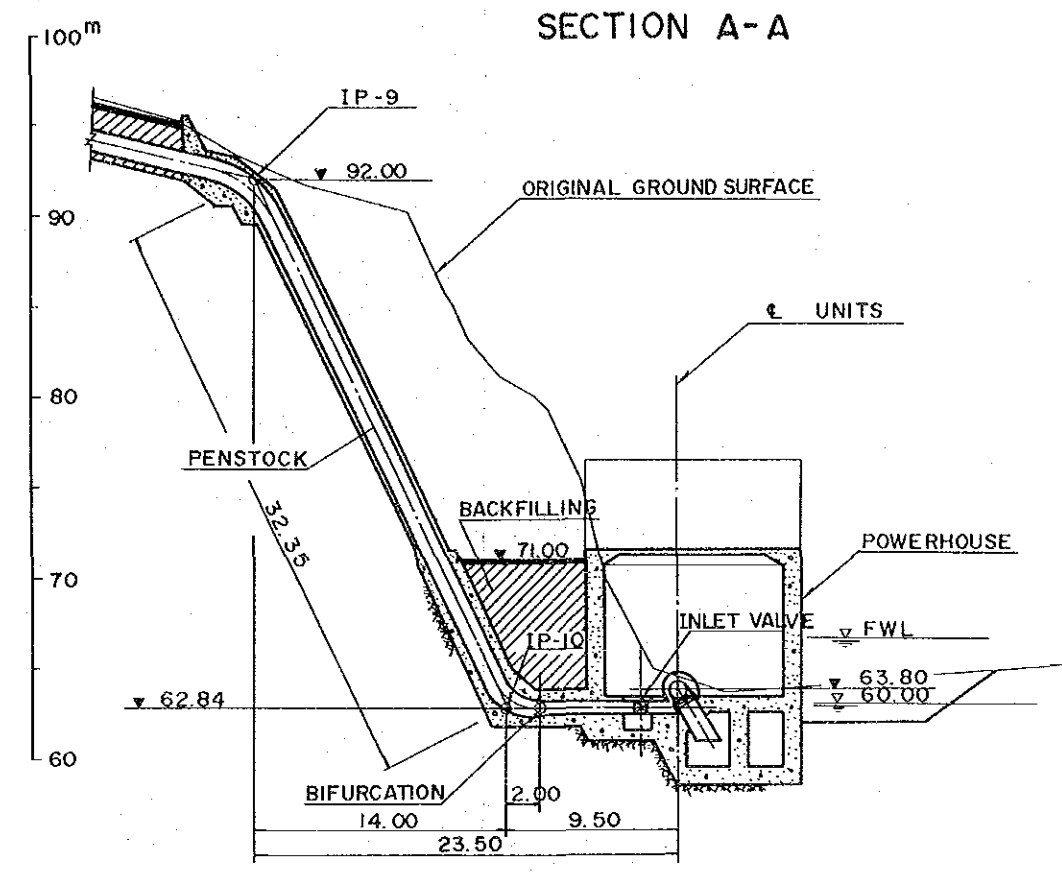
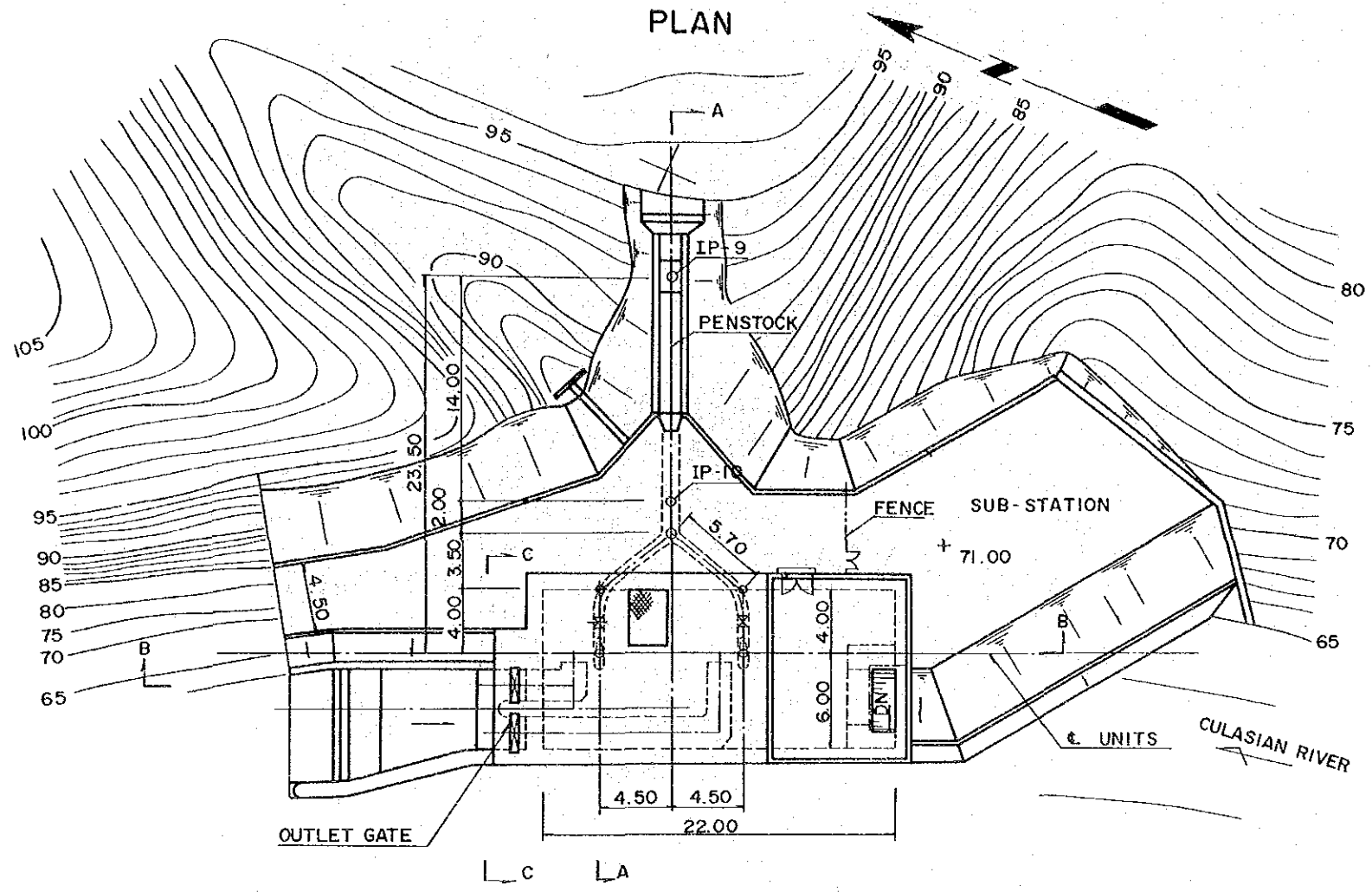
PROFILE



INFRASTRUCTURE SURVEY FOR
RIO TUBA NICKEL MINE
(CANDAWAGA HYDROPOWER SCHEME)
Republic of the Philippines

**PENSTOCK PLAN,
PROFILE & SECTION**

JAPAN INTERNATIONAL COOPERATION AGENCY
DRWG. No. 104 SHEET OF

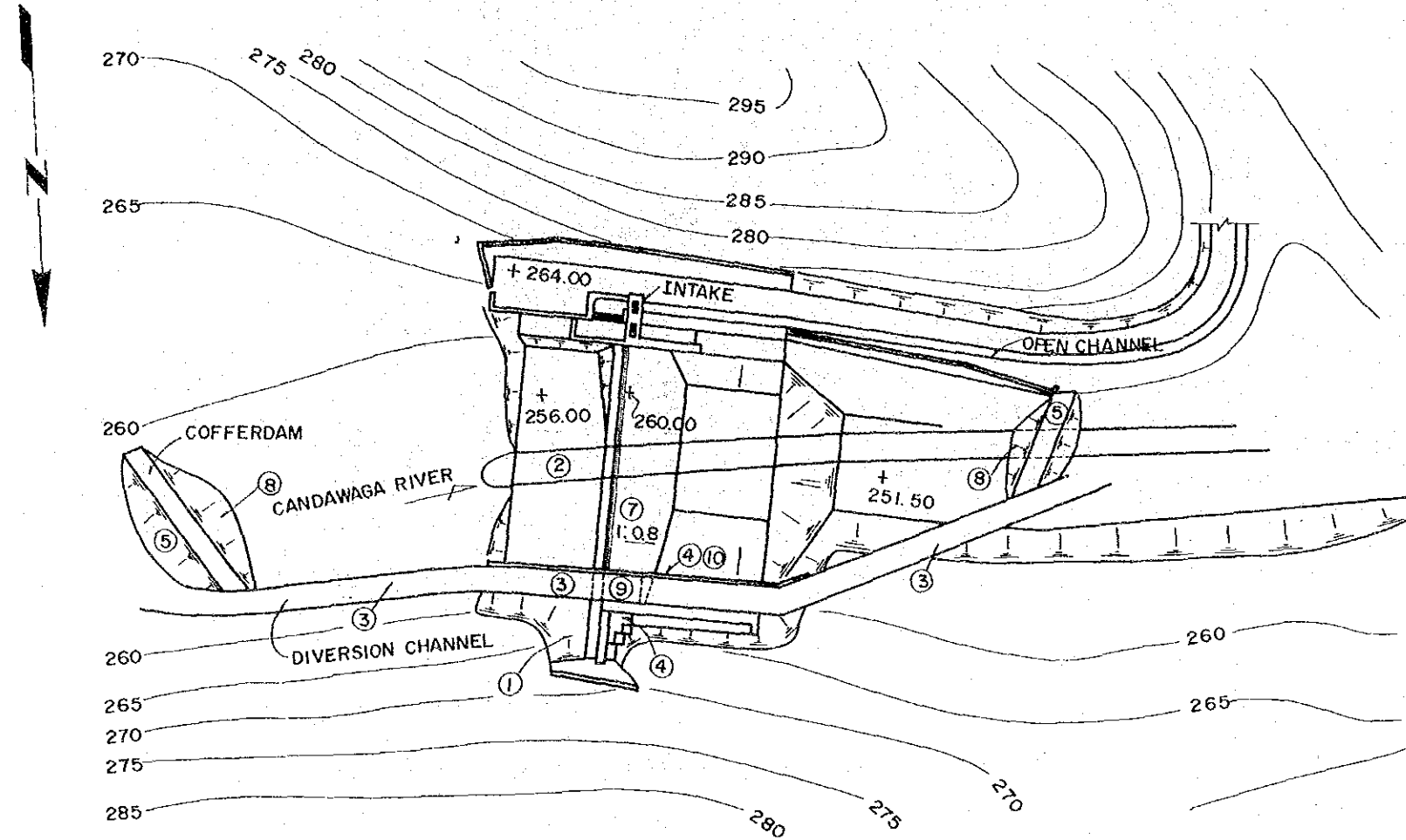


INFRASTRUCTURE SURVEY FOR
 RIO TUBA NICKEL MINE
 (CANDAWAGA HYDROPOWER SCHEME)
 Republic of the Philippines

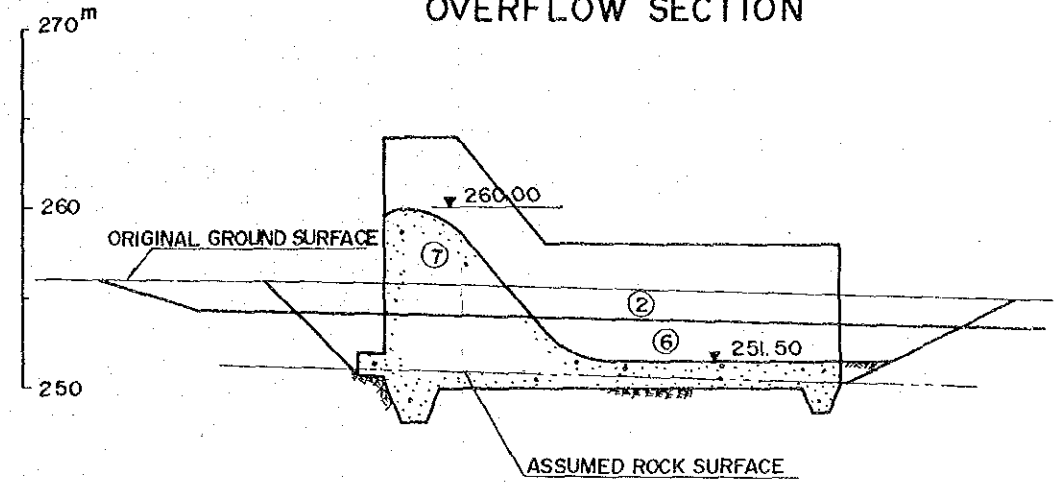
POWERHOUSE PLAN & SECTIONS

JAPAN INTERNATIONAL COOPERATION AGENCY
 DRWG. No. 105 SHEET OF

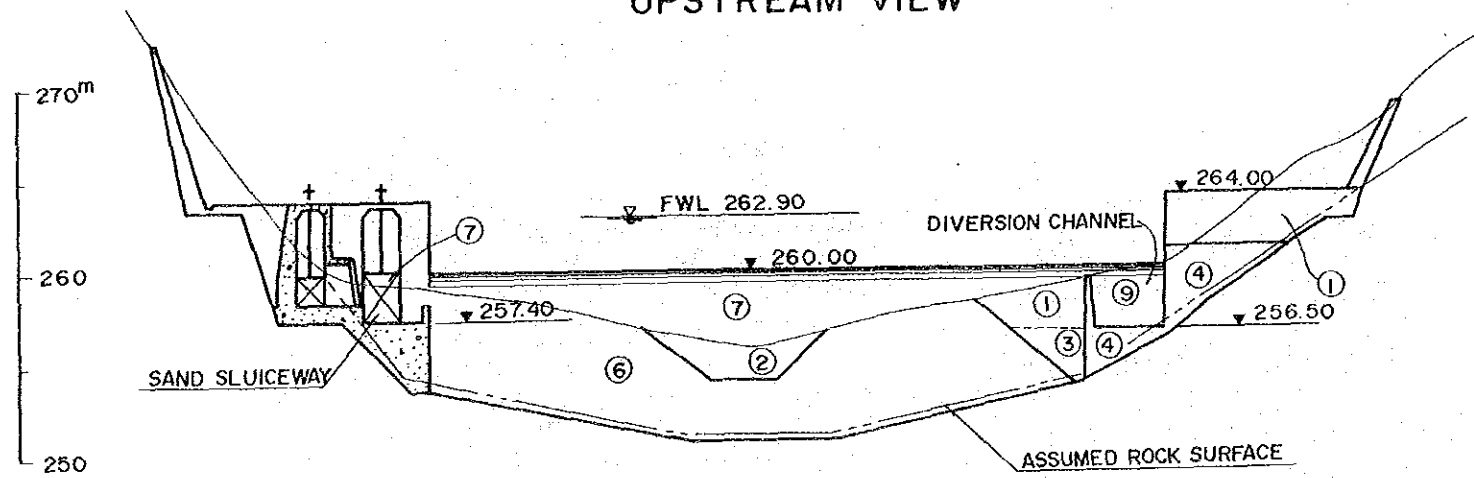
PLAN



OVERFLOW SECTION

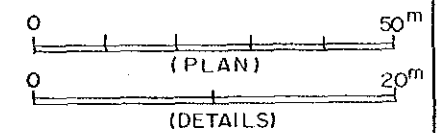


UPSTREAM VIEW



WORK PROCEDURE

- ① EXCAVATION OF DAM FOUNDATION (RIGHT BANK, ABOVE EL.256.50)
- ② EXCAVATION OF RIVER BED
- ③ EXCAVATION FOR DIVERSION CHANNEL AND DAM FOUNDATION
- ④ PLACING OF CONCRETE FOR DAM AND DIVERSION CHANNEL
- ⑤ COFFERDAM CONSTRUCTION AND DIVERSION OF THE RIVER
- ⑥ EXCAVATION OF DAM FOUNDATION.
- ⑦ PLACING OF DAM CONCRETE ETC. AND INSTALLATION OF SAND FLUSH GATE
- ⑧ ROMOVAL OF COFFERDAM, DEWATERING THROUGH SAND FLUSHING CHANNEL
- ⑨ PLACING OF DAM CONCRETE ON THE DIVERSION CHANNEL
- ⑩ DEMOLISHING OF DIVERSION CHANNEL CONCRETE



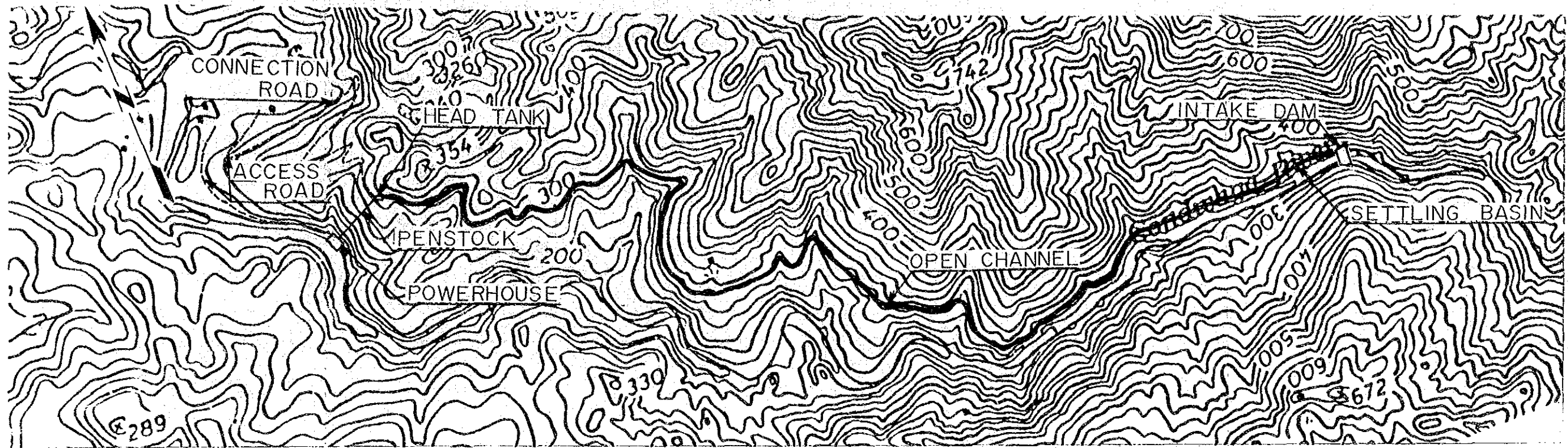
INFRASTRUCTURE SURVEY FOR
RIO TUBA NICKEL MINE
(CANDAWAGA HYDROPOWER SCHEME)
Republic of the Philippines

INTAKE DAM DIVERSION WORKS

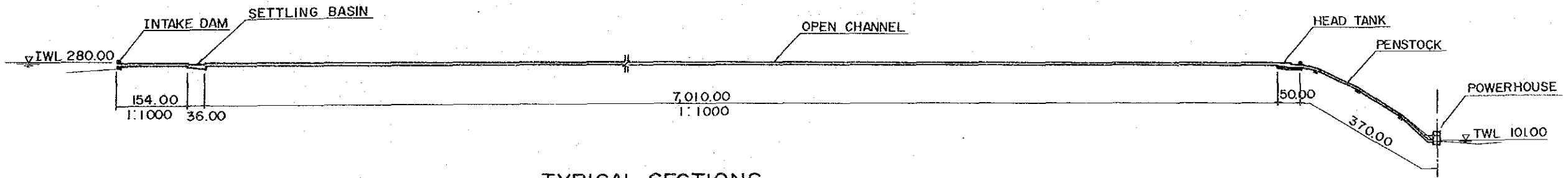
JAPAN INTERNATIONAL COOPERATION AGENCY

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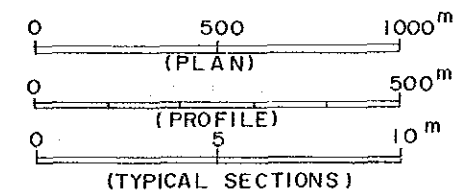
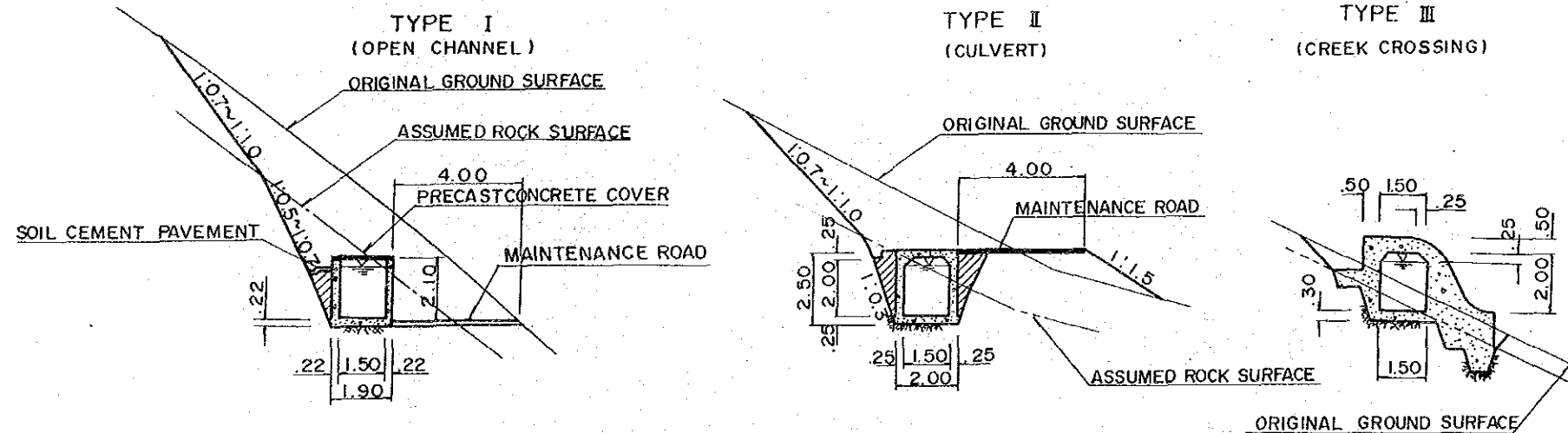
PLAN



PROFILE



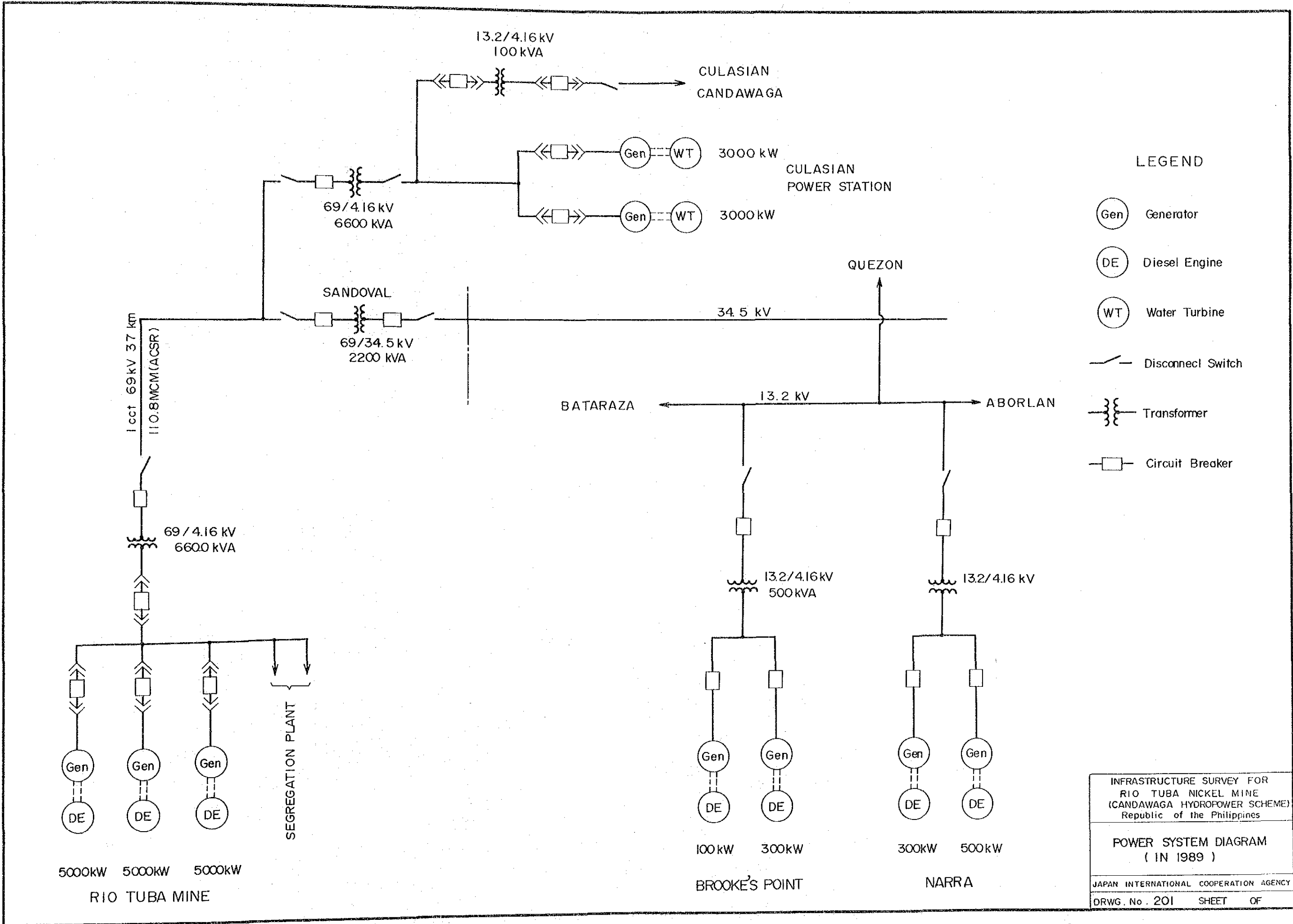
TYPICAL SECTIONS



INFRASTRUCTURE SURVEY FOR
 RIO TUBA NICKEL MINE
 (CANDAWAGA HYDROPOWER SCHEME)
 Republic of the Philippines

GENERAL PLAN FOR ALTERNATIVE
 CANDAWAGA P/S SCHEME

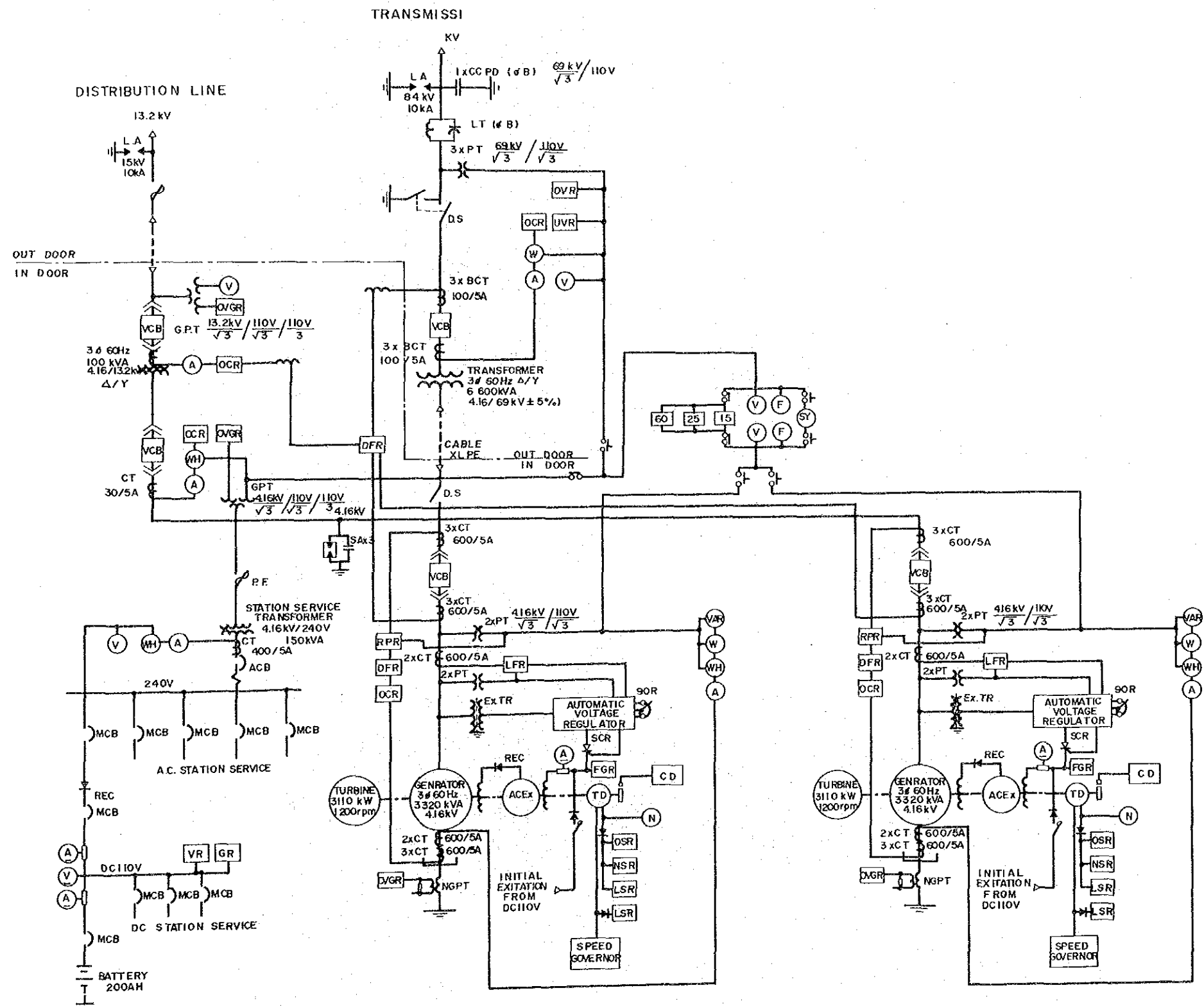
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INFRASTRUCTURE SURVEY FOR
 RIO TUBA NICKEL MINE
 (CANDAWAGA HYDROPOWER SCHEME)
 Republic of the Philippines

POWER SYSTEM DIAGRAM
 (IN 1989)

JAPAN INTERNATIONAL COOPERATION AGENCY
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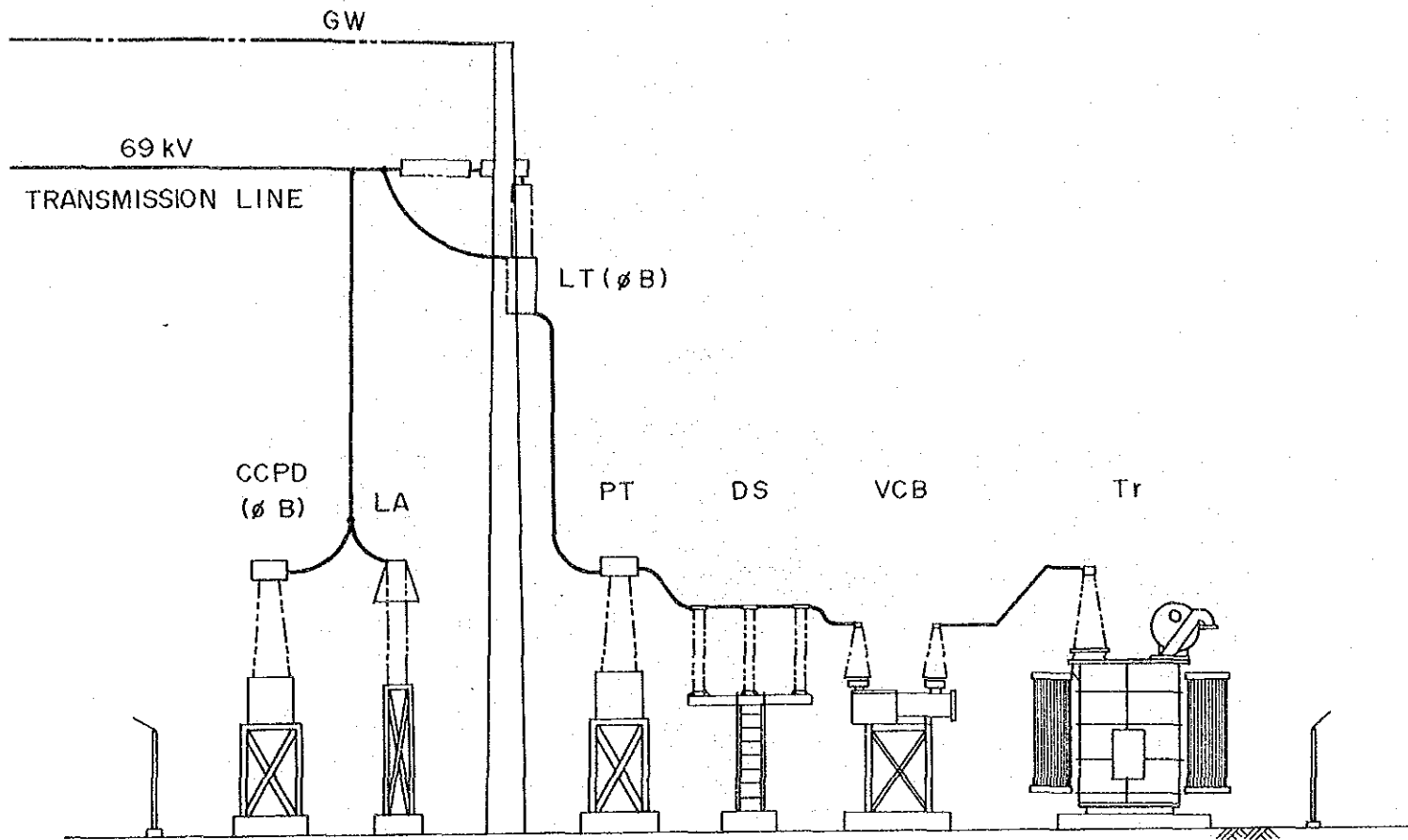
LEGEND

- | | | |
|-------------------------------|----------------------------|--|
| OCR Over Current Relay | 60 Voltage Matcher | SA Surge Absorber |
| OVR Overvoltage Relay | 15 Speed Matcher | Ex. TR: Existing Transformer |
| UVR Undervoltage Relay | 25 Synchronizer | TD Tachometer Dynamo |
| DGR Directional Ground Relay | CD Crowding Detector | NGPT Neutral Grounding Potential Transformer |
| DFR Differential Relay | W Wattmeter | AC.Ex: AC Exciter |
| LFR Loss-of-field Relay | WH Watt-hourmeter | |
| RFR Reverse Power Relay | VAR Volt-meter | |
| FGR Field Ground Relay | N Speed Meter | |
| OVR Over Voltage Ground Relay | Rectifier | |
| VR Voltage Relay | Styristor | |
| GR Ground Relay | Current Transformer | |
| OSR Over Speed Relay | Potential Transformer | |
| NSR Nominal Speed Relay | VCB Vacuum Circuit Breaker | |
| LSR Low Speed Relay | CB Circuit Breaker | |
| V Voltmeter | MCB Molded Circuit Breaker | |
| Vg Grounding Voltmeter | DS Disconnecting Switch | |
| A Ammeter | PF Power Fuse | |
| A D.C. Ammeter | LA Lightning Arrester | |
| V D.C. Voltmeter | PT Potential Transformer | |
| F Frequency meter | CT Current Transformer | |
| SY Synchroscope | BCT Bushing Type C.T. | |

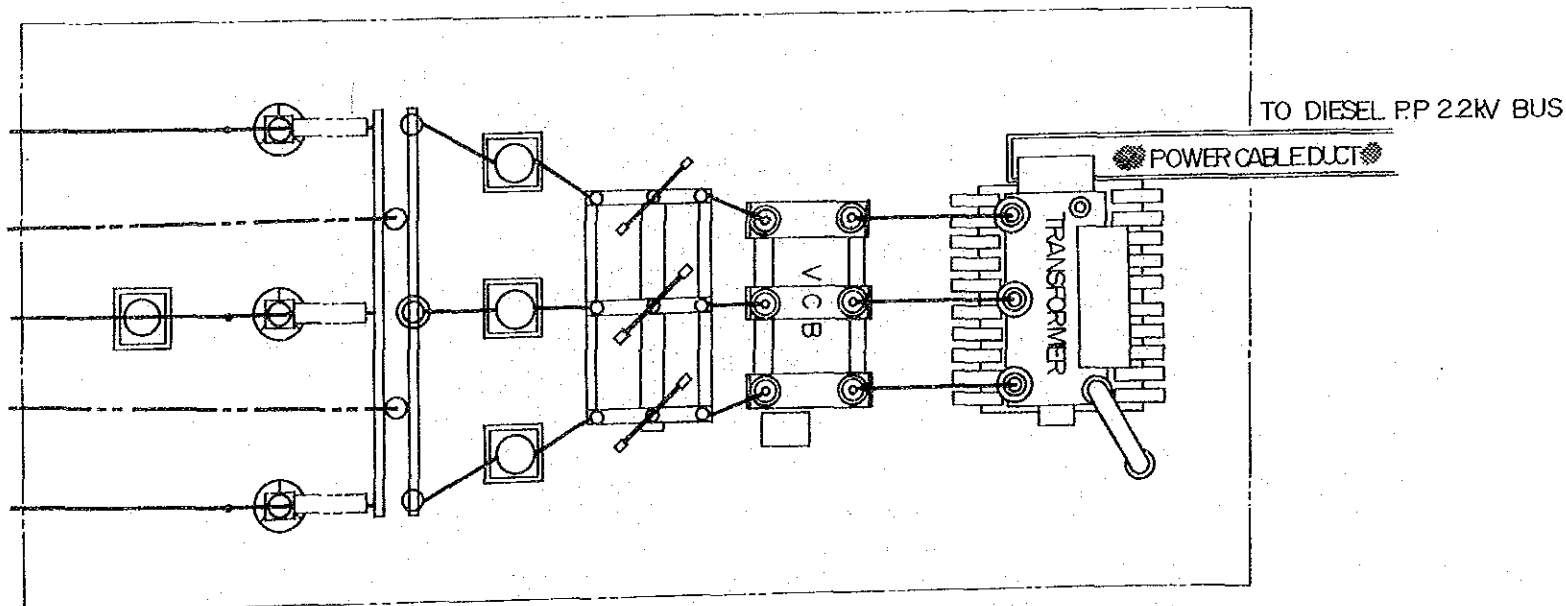
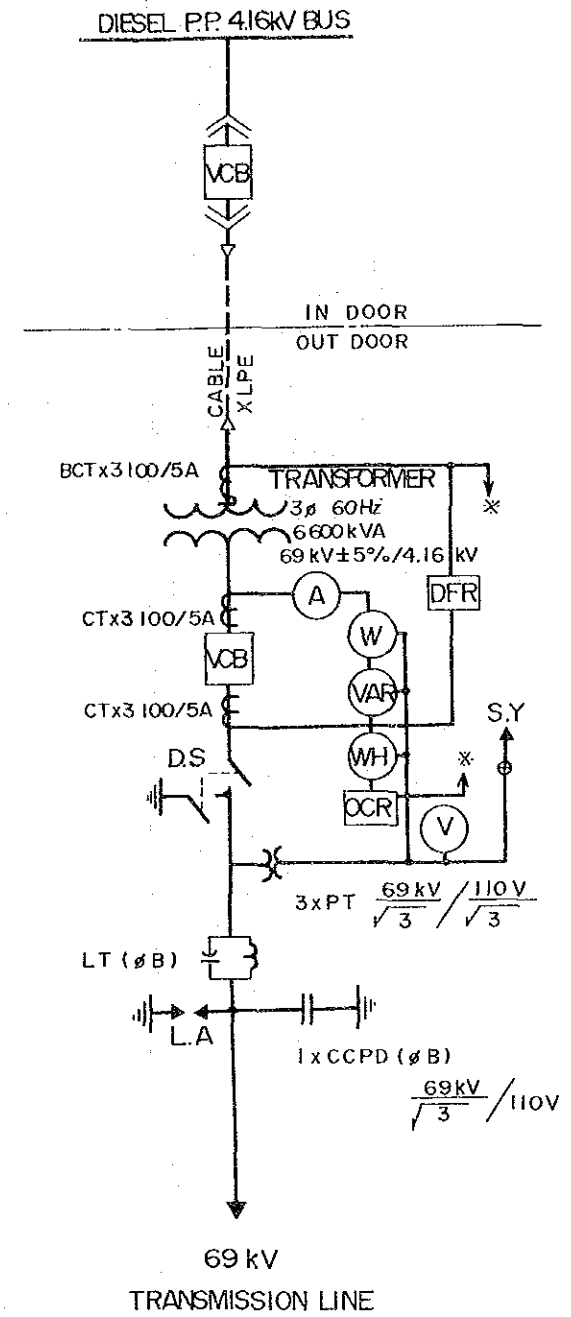
INFRASTRUCTURE SURVEY FOR
 RIO TUBA NICKEL MINE
 (CANDAWAGA HYDROPOWER SCHEME)
 Republic of the Philippines

SINGLE LINE DIAGRAM

JAPAN INTERNATIONAL COOPERATION AGENCY
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SINGLE LINE DIAGRAM
(RIO TUB MINE SIDE)



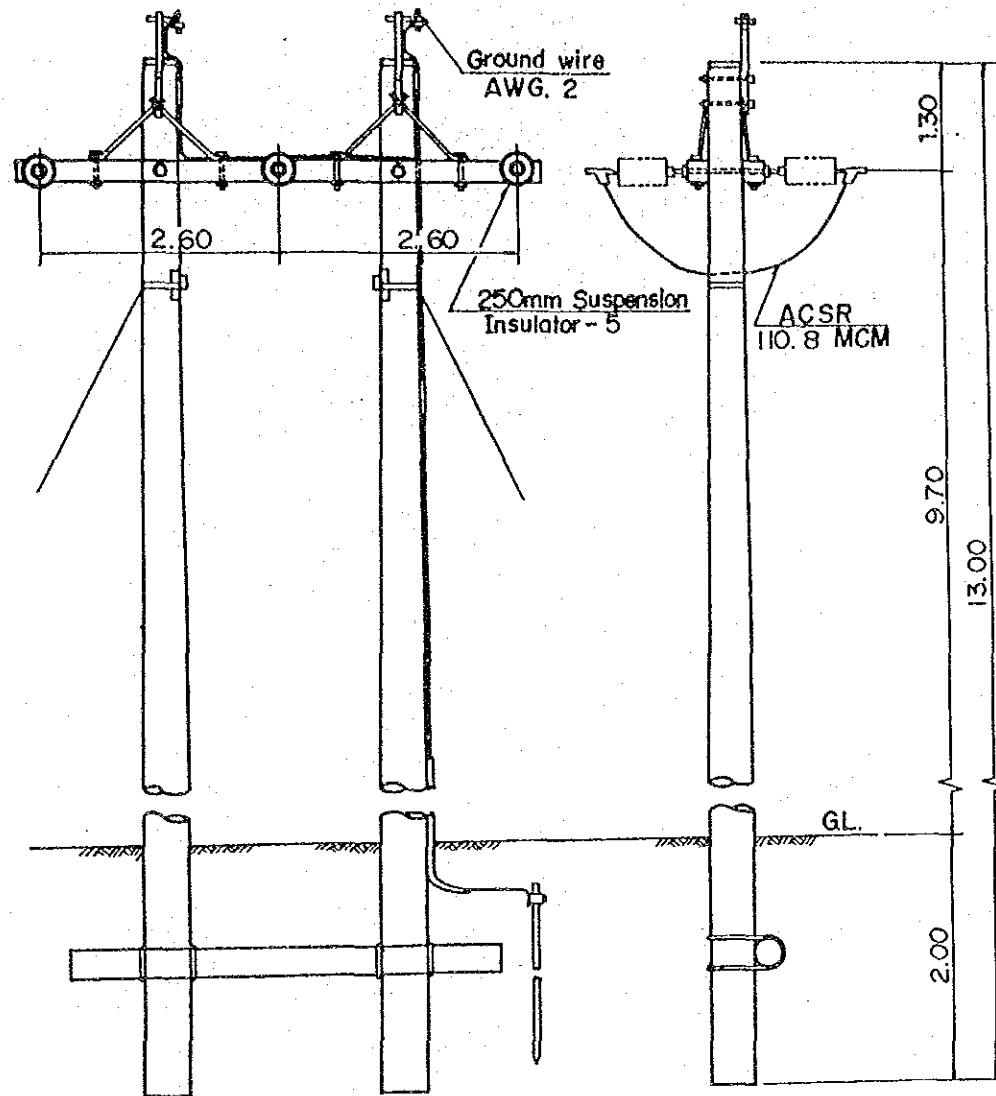
INFRASTRUCTURE SURVEY FOR
RIO TUBA NICKEL MINE
(CANDAWAGA HYDROPOWER SCHEME)
Republic of the Philippines

SUBSTATION

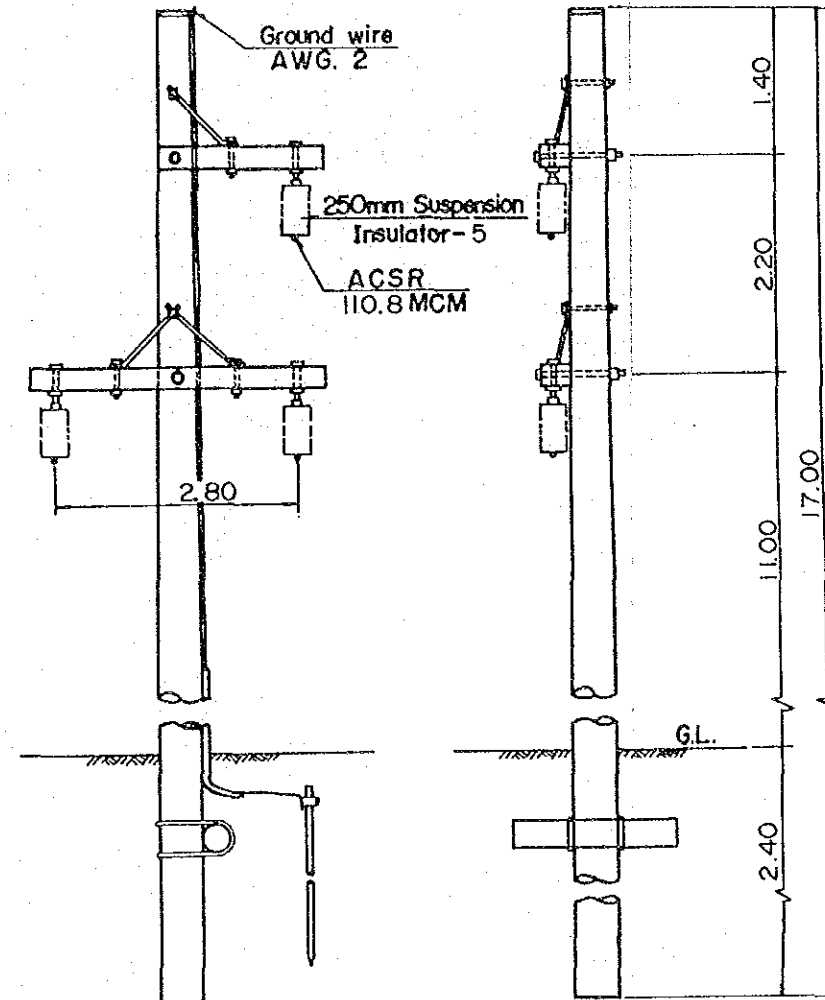
JAPAN INTERNATIONAL COOPERATION AGENCY

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TENSION



SUSPENSION



INFRASTRUCTURE SURVEY FOR RIO TUBA NICKEL MINE (CANDAWAGA HYDROPOWER SCHEME) Republic of the Philippines
STANDARD WOODEN POLE FOR 69KV TRANSMISSION LINE
JAPAN INTERNATIONAL COOPERATION AGENCY DRWG. No : 204 SHEET OF

JICA