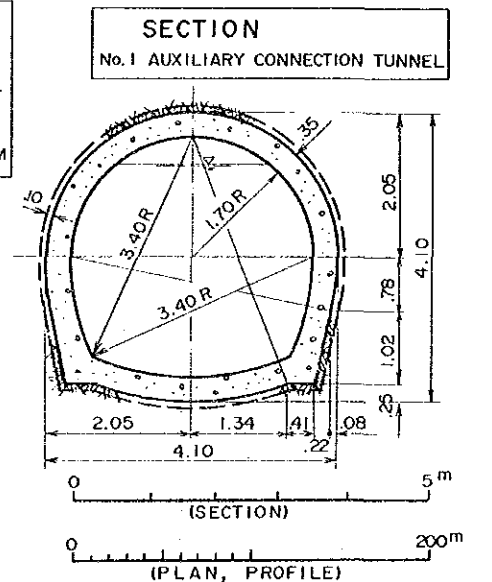
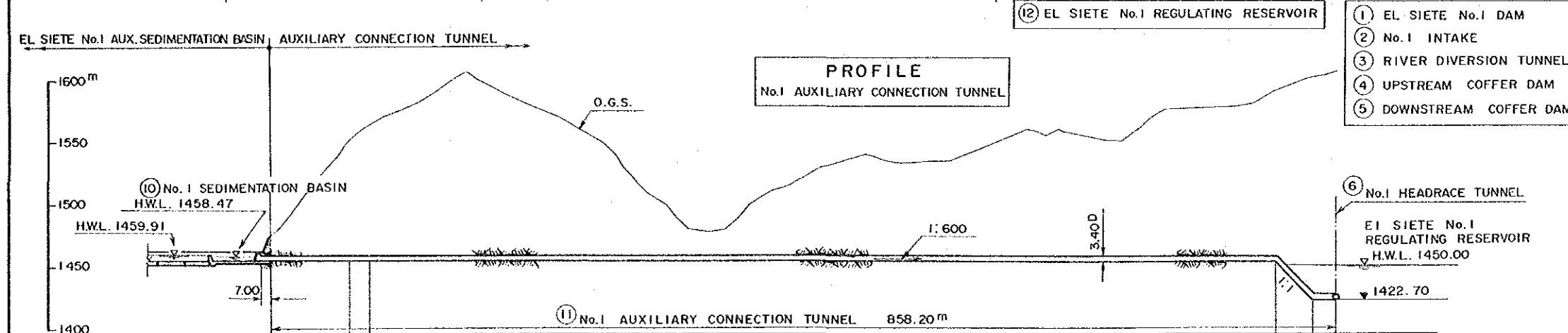
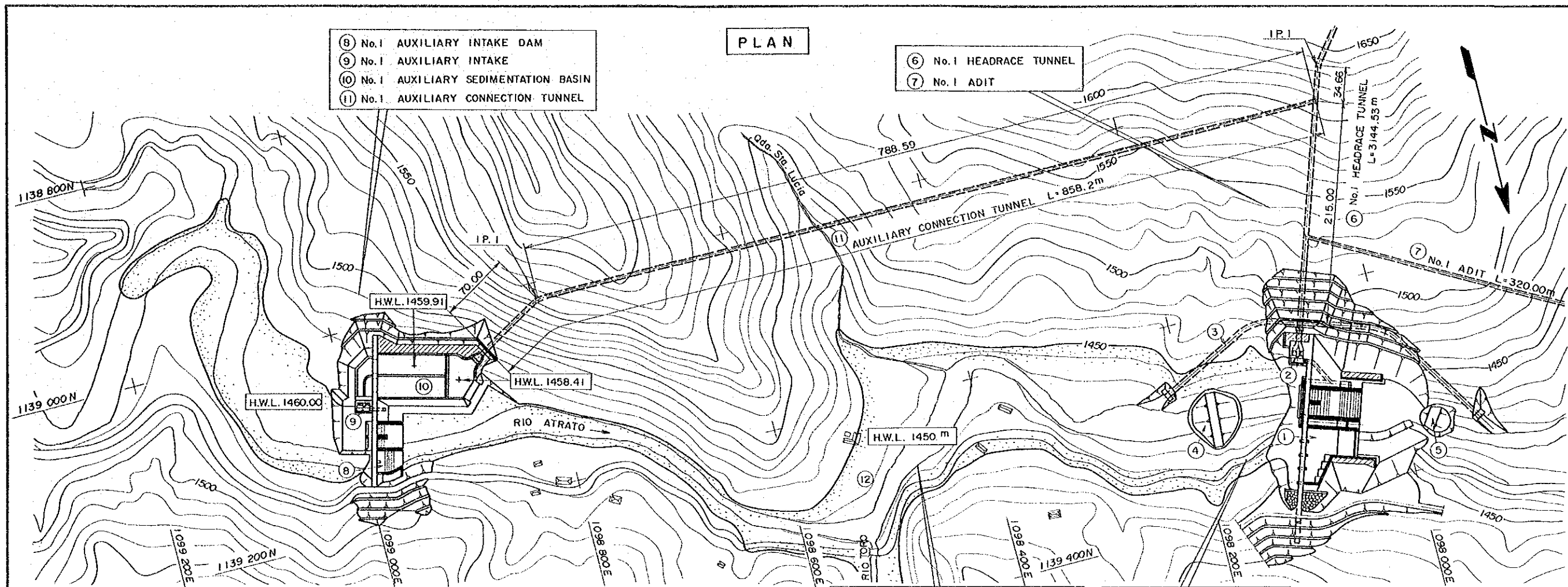


JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 NO. 1 AUXILIARY SEDIMENTATION BASIN
 PLAN

ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO, JAPAN

Dwg. - 22

LOCATION	DATE	DESCRIPTION	BY



STA	DISTANCE	TOTAL DISTANCE	GROUND HEIGHT	FORMATION HEIGHT
0	0.00	0.00	1476.00	1455.00
BC. 1	61.80	61.80	1551.00	1454.90
EC. 1	16.01	77.81	1564.00	1454.87
		810.00	1591.00	1453.65
		840.92	1601.00	1422.73
		858.20	1607.00	1422.70

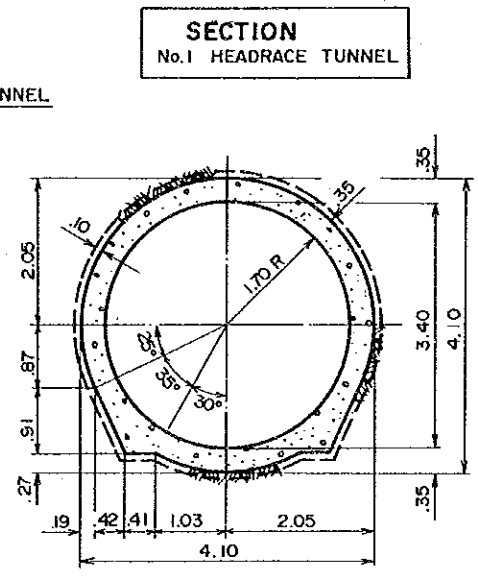
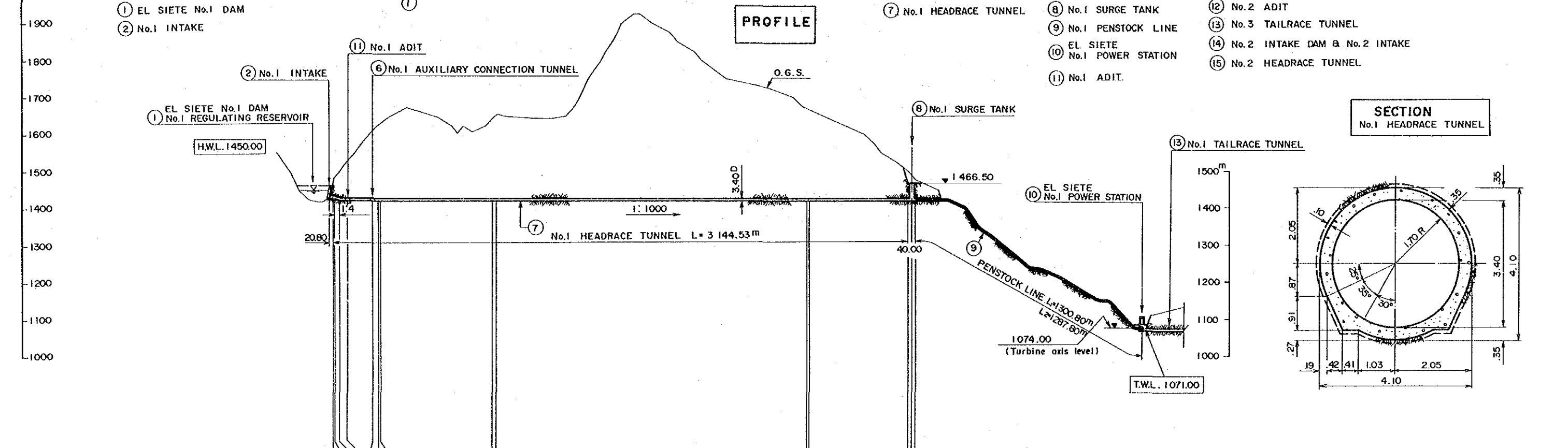
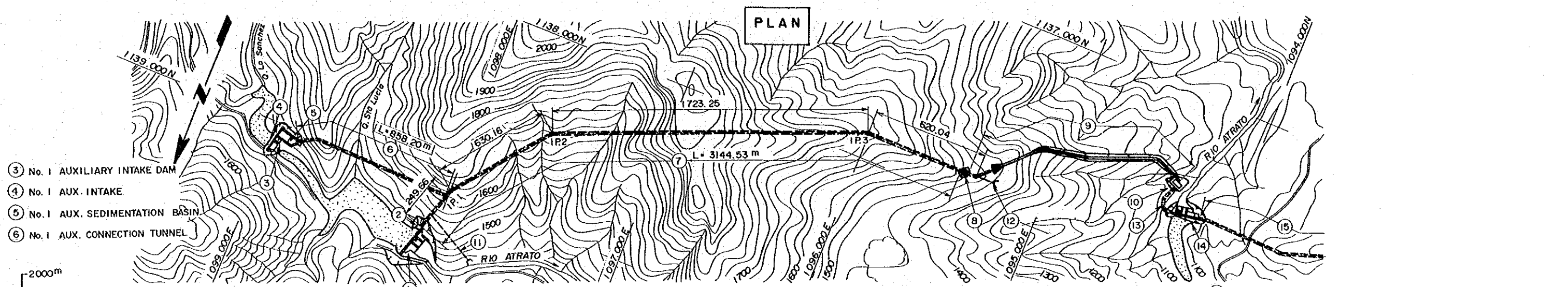
NOTE : O.G.S.; Original ground surface

LOCATION	DATE	DESCRIPTION	BY

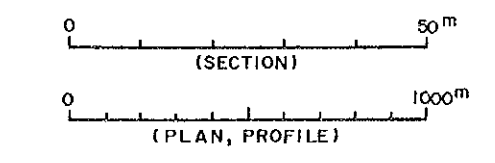
JAPAN INTERNATIONAL COOPERATION AGENCY
INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA

ATRATO HYDRO-ELECTRIC POWER PROJECT
AUXILIARY CONNECTION TUNNEL
PLAN, PROFILE AND SECTION

ELECTRIC POWER DEVELOPMENT CO., LTD.
TOKYO, JAPAN



STA	DIS TANCE	TOTAL DIS TANCE	GROUND HEIGHT	FORMAT ON HEIGHT
0	0.00	0.00	1485.00	1428.60
BC.1	5.00	5.00	1488.00	1428.60
EC.1	22.84	27.84	1505.00	1422.89
	52.16	80.00	1530.00	1422.84
	135.00	215.00	1607.00	1422.70
	294.40	244.40	1630.00	1422.67
	10.41	254.81	1634.00	1422.66
BC.2	617.00	871.81	1648.00	1422.04
EC.2	1547	887.28	1655.00	1422.03
BC.3	709.74	2597.02	1670.00	1420.32
EC.3	11.07	2608.09	1666.00	1420.31
ST	3364.4	3364.43	1496.00	1419.77
	20.00	3384.43	1478.00	1419.75



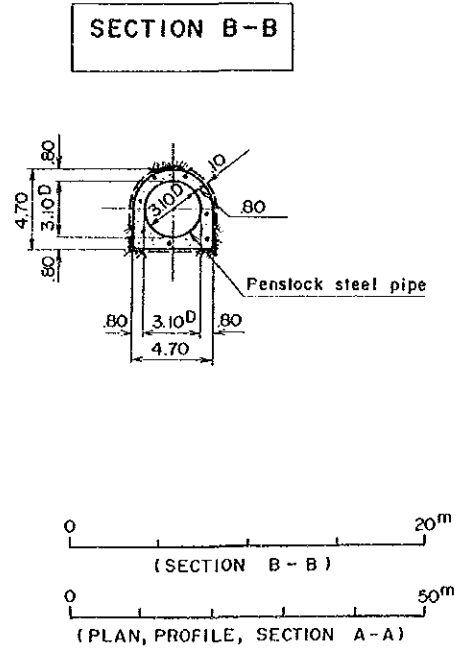
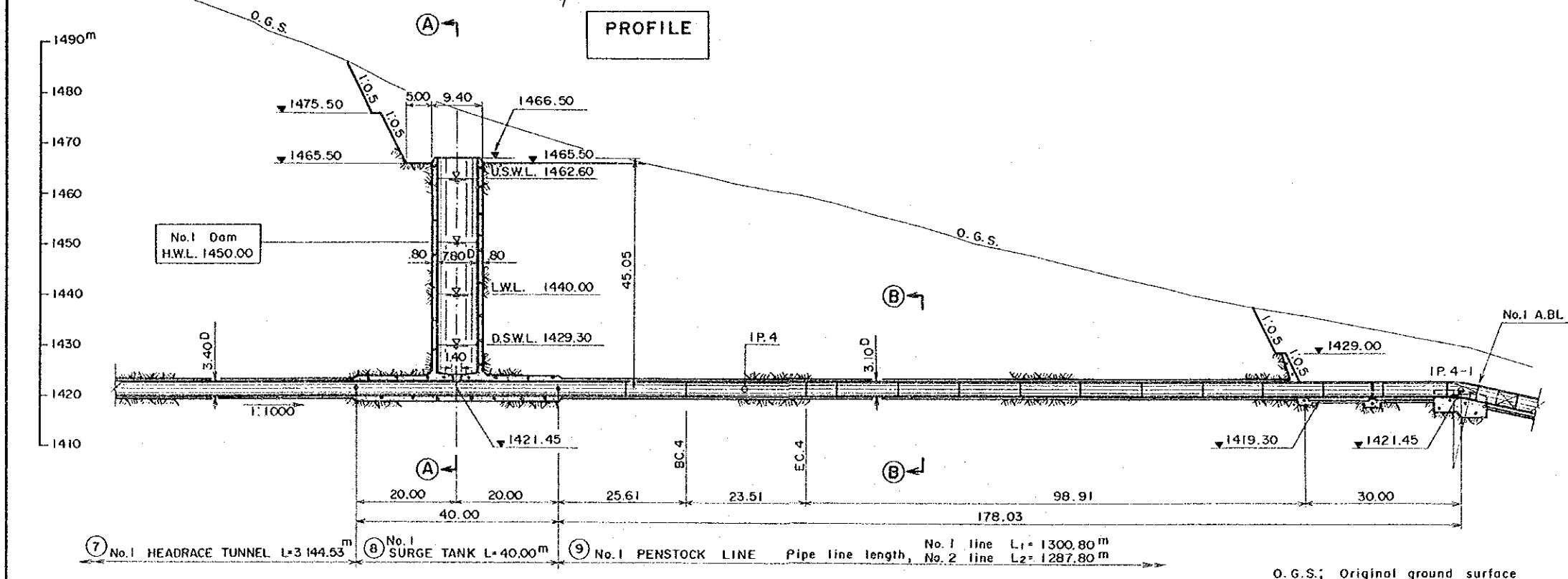
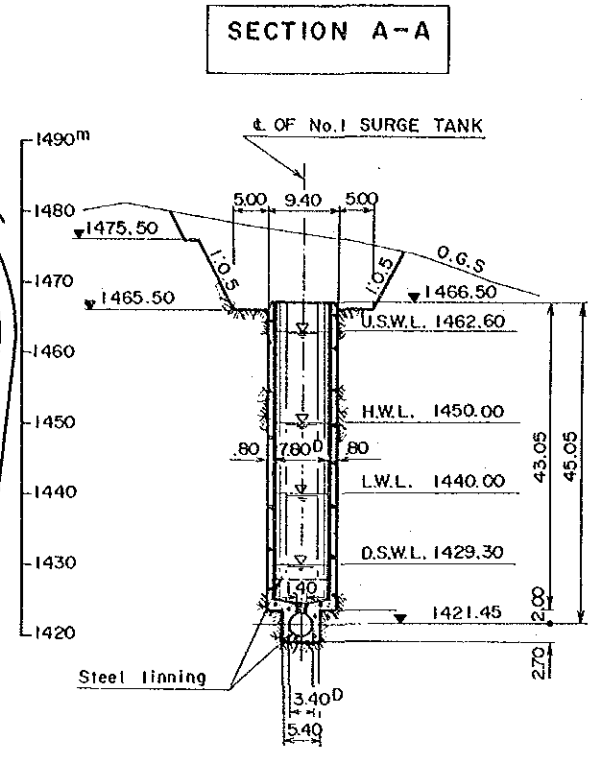
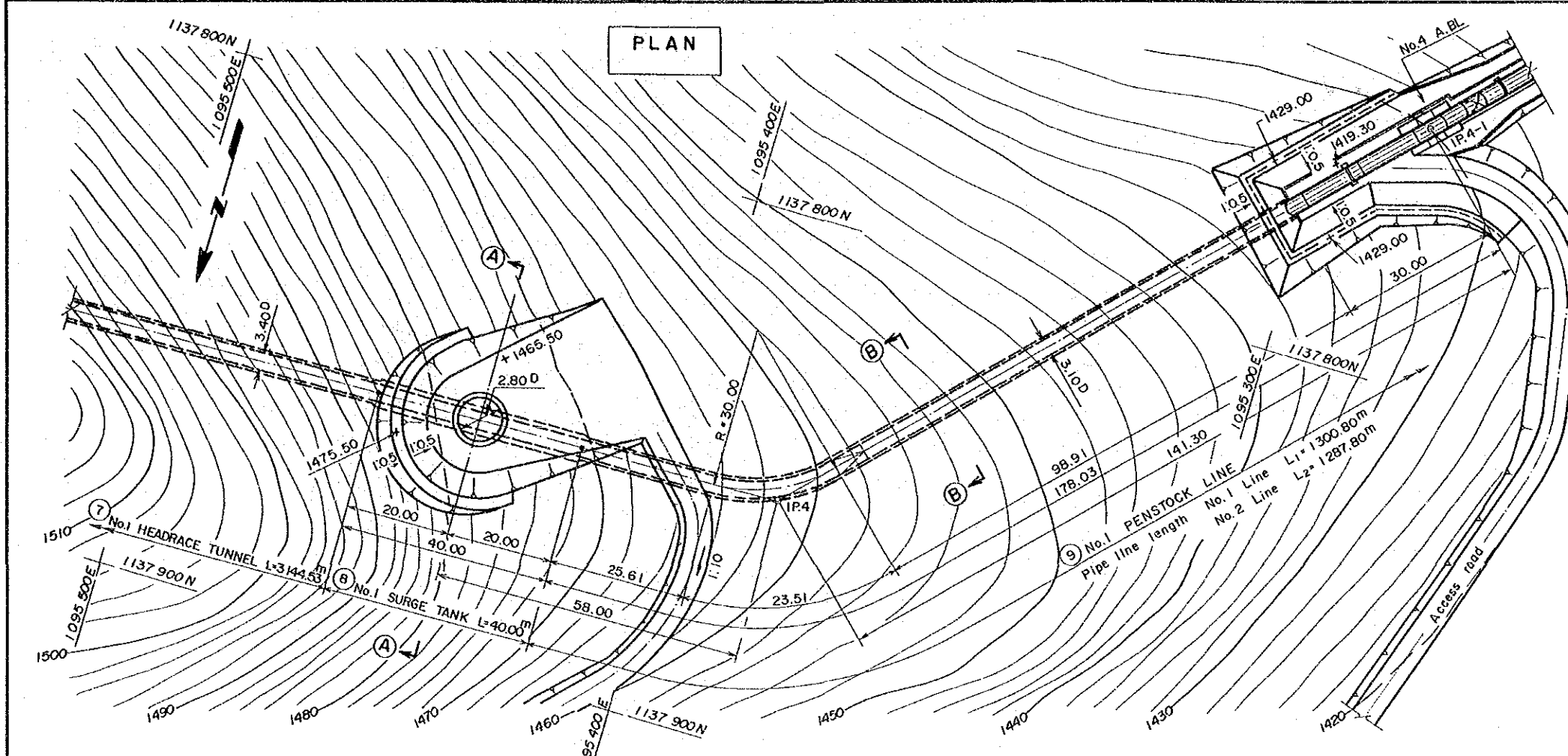
JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.1 HEADRACE TUNNEL
 PLAN, PROFILE AND SECTION

ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO, JAPAN

Dwg. - 25

O.G.S. ; Original ground surface

LOCATION	DATE	DESCRIPTION	BY
		REVISION	



(7) No. 1 HEADRACE TUNNEL L=3144.53m
 (8) No. 1 SURGE TANK L=40.00m
 (9) No. 1 PENSTOCK LINE Pipe line length, No. 1 line L₁=1300.80m, No. 2 line L₂=1287.80m

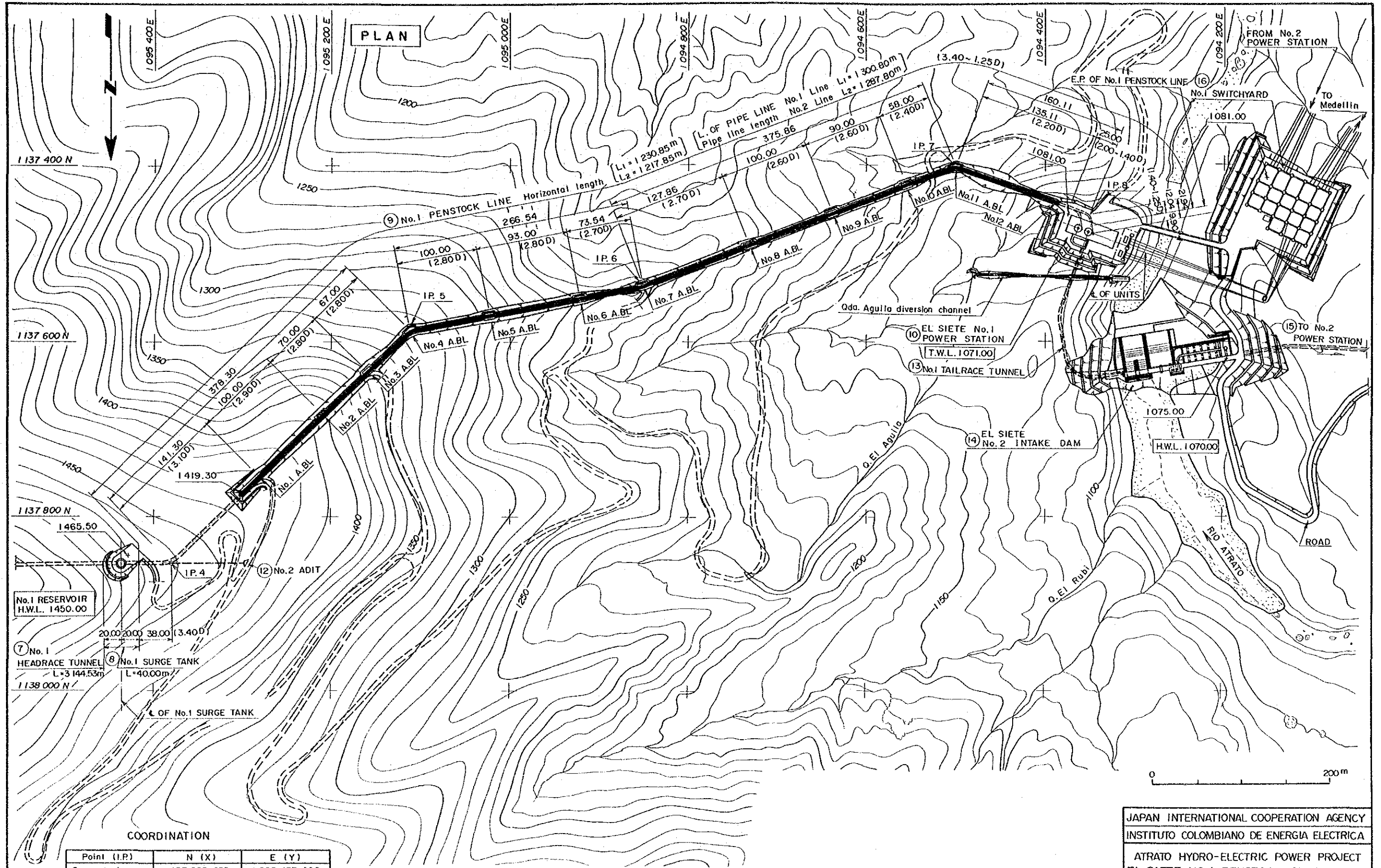
O.G.S.; Original ground surface

LOCATION	DATE	DESCRIPTION	BY
		REVISION	

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO. 1 SURGE TANK
 PLAN, PROFILE AND SECTIONS

ELECTRIC POWER DEVELOPMENT CO., LTD
TOKYO, JAPAN

Dwg. - 26



COORDINATION

Point (I.P.)	N (X)	E (Y)
Surge tank	1137 853.655	1095 437.996
Penstock I.P. 4	1137 853.000	1095 380.000
Tunnel end	1137 774.446	1095 301.152
Penstock I.P. 5	1137 586.000	1095 112.000
• I.P. 6	1137 537.000	1094 850.000
• I.P. 7	1137 400.000	1094 500.000
• I.P. 8	1137 456.000	1094 350.000
Powerhouse	1137 477.636	1094 346.369

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.1 PENSTOCK-SURGE TANK-
 POWER STATION PLAN

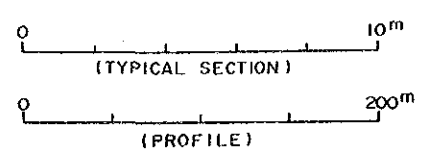
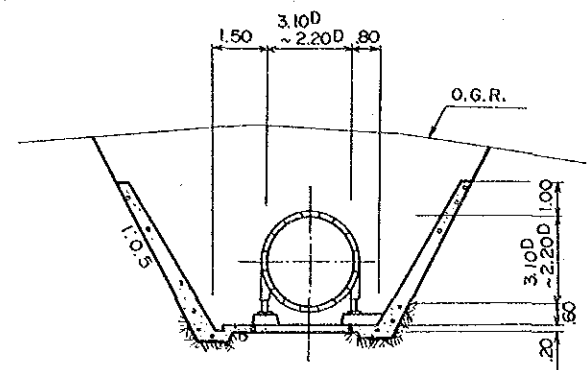
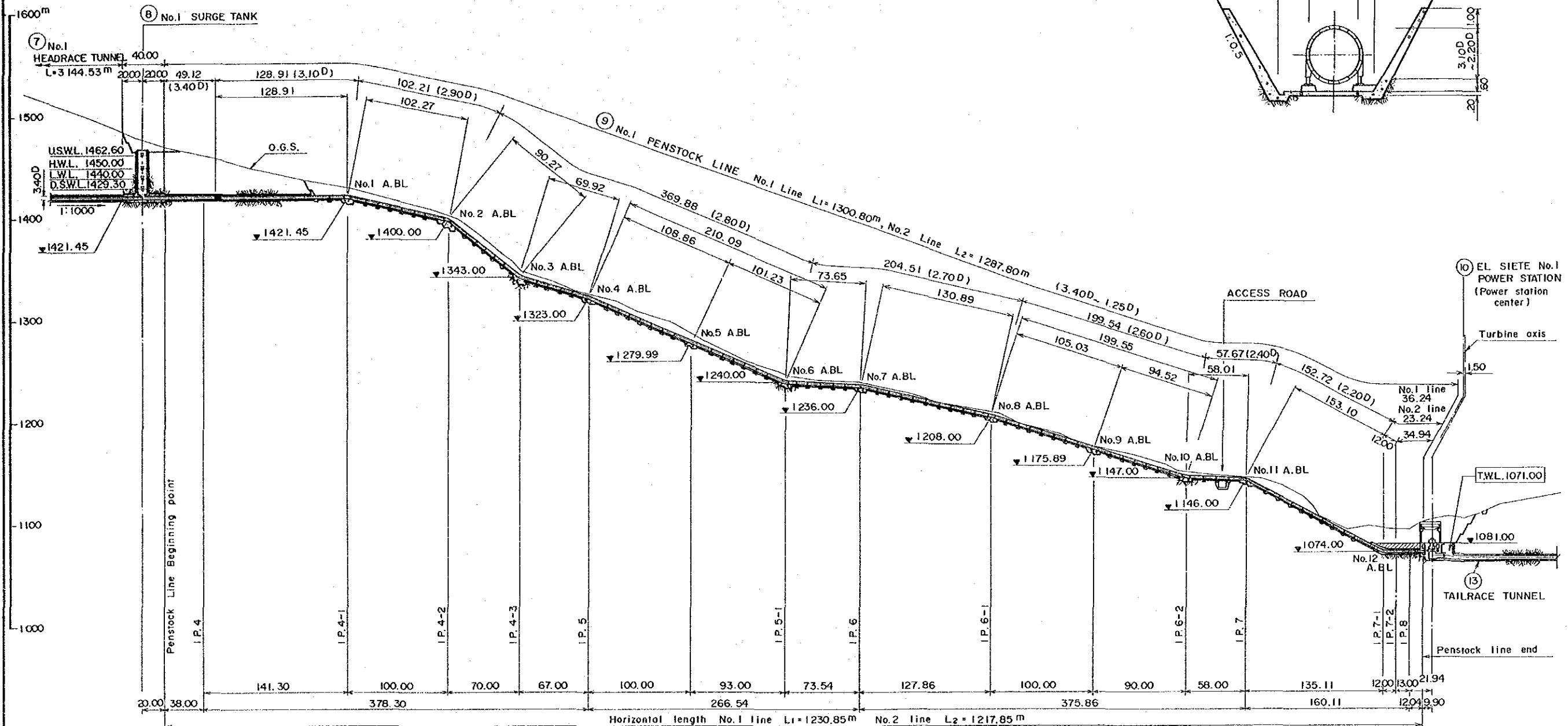
ELECTRIC POWER DEVELOPMENT CO., LTD.
 TOKYO, JAPAN

LOCATION	DATE	DESCRIPTION	BY
		REVISION	

Dwg.-27

PROFILE

TYPICAL SECTION OF NO.1 PENSTOCK LINE



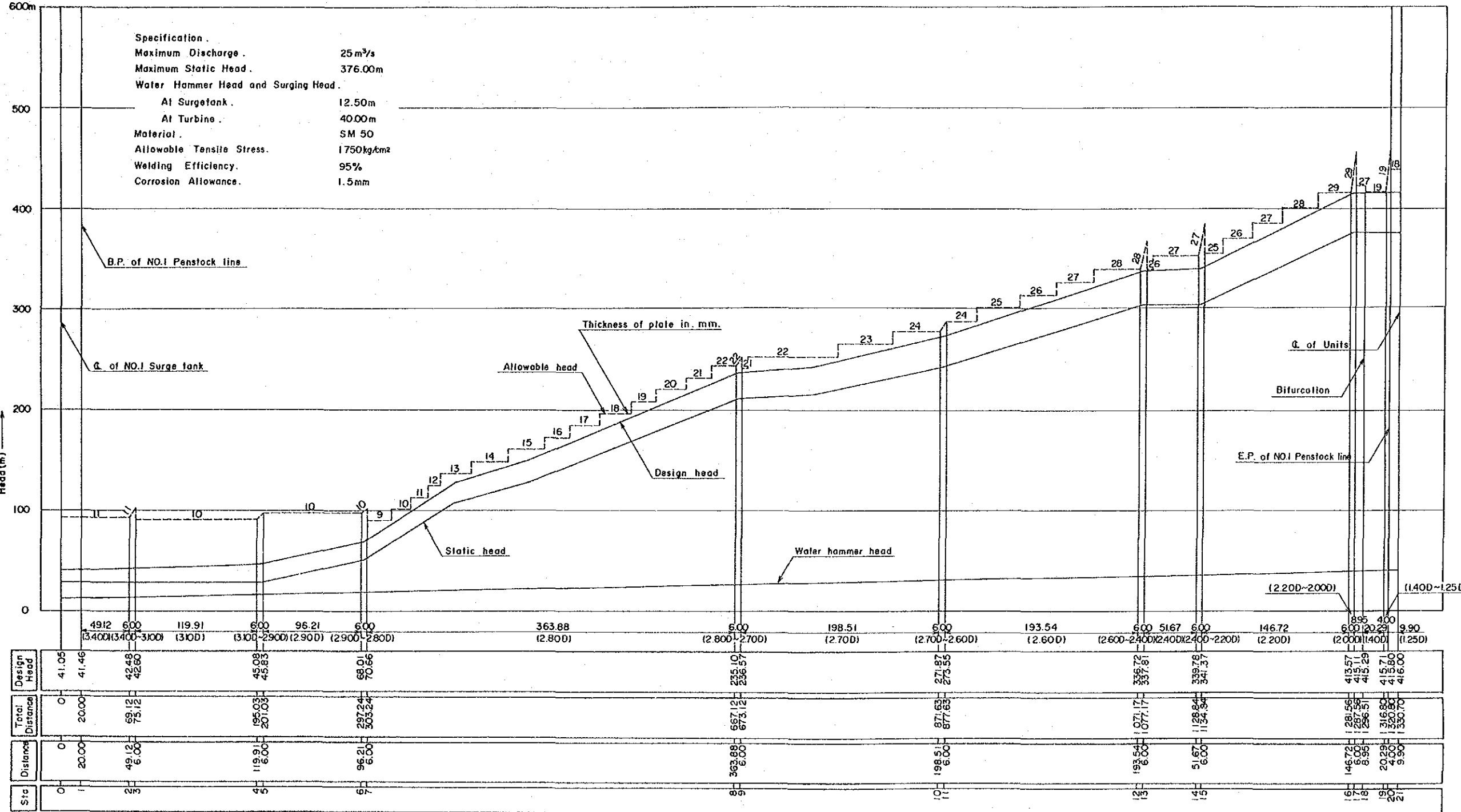
O.G.S.; Original ground surface

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.1 PENSTOCK LINE
 PROFILE AND SECTION

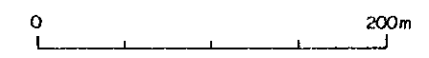
ELECTRIC POWER DEVELOPMENT CO., LTD.
 TOKYO, JAPAN

Dwg.-28

LOCATION	DATE	DESCRIPTION	BY
REVISION			



Pressure curve of El. siete NO.1 Penstock line



JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.1 PENSTOCK
 PRESSURE CURVE

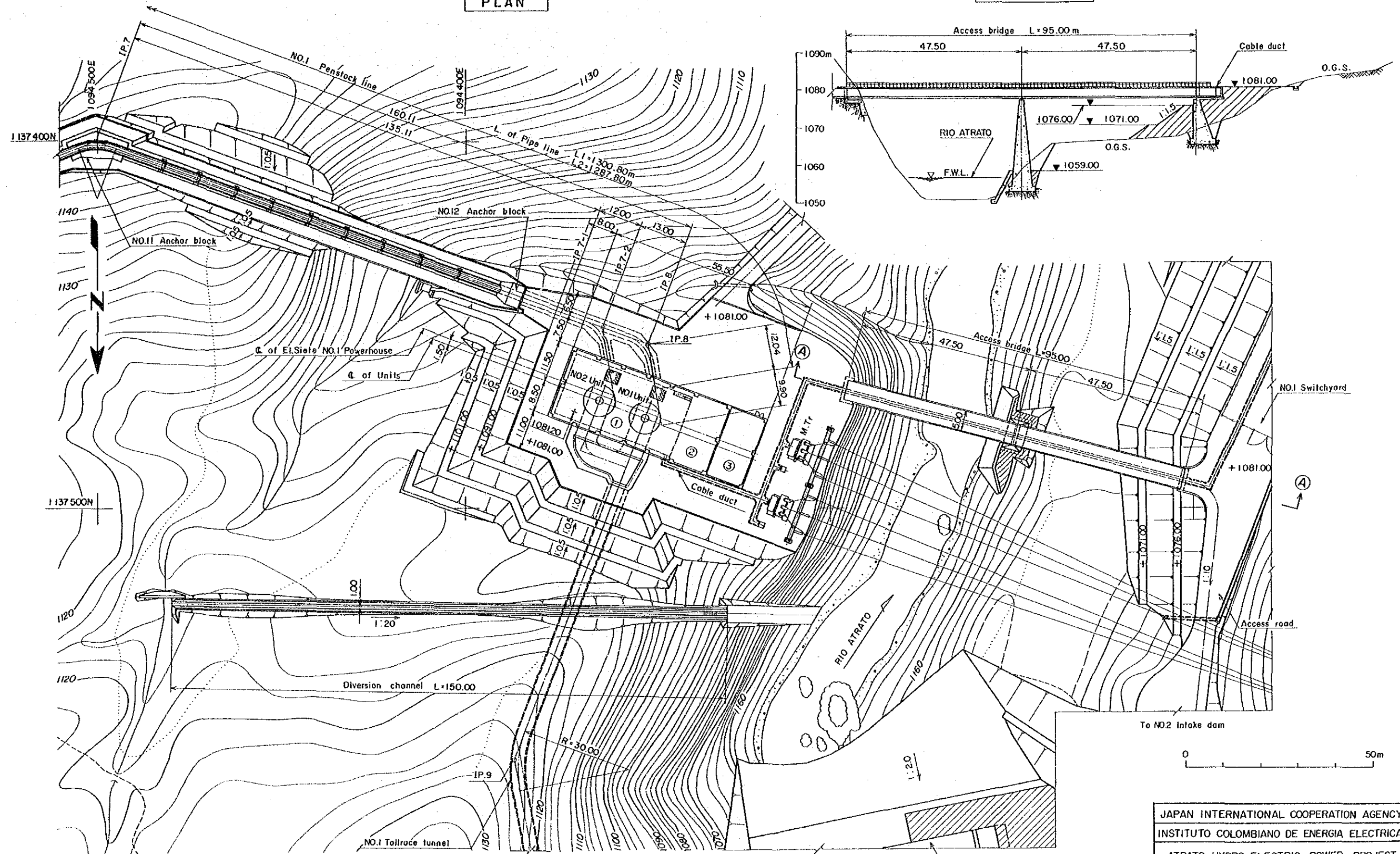
ELECTRIC POWER DEVELOPMENT CO.,LTD
 TOKYO, JAPAN

Dwg.-29

LOCATION	DATE	DESCRIPTION	BY
REVISION			

PLAN

SECTION A - A

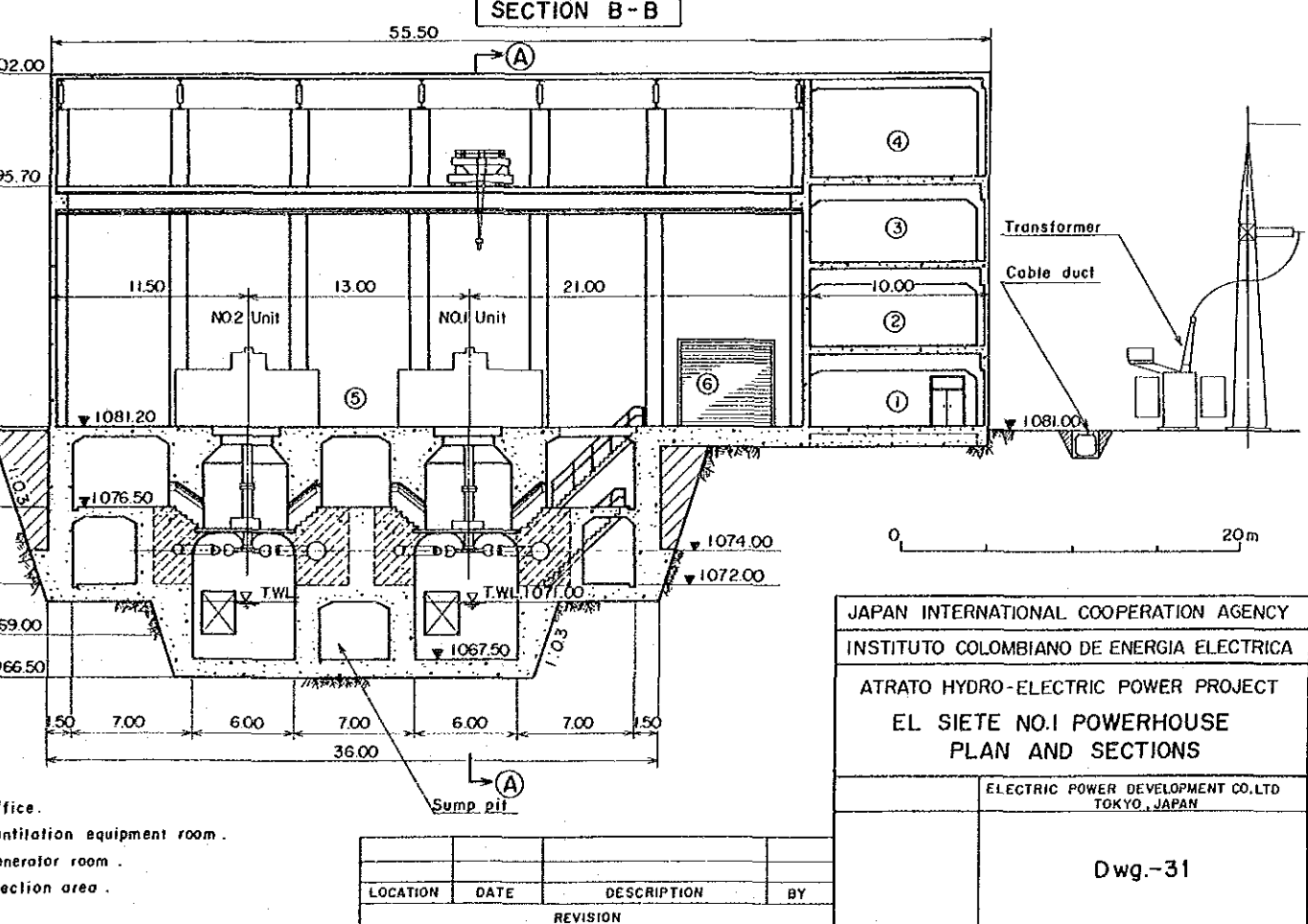
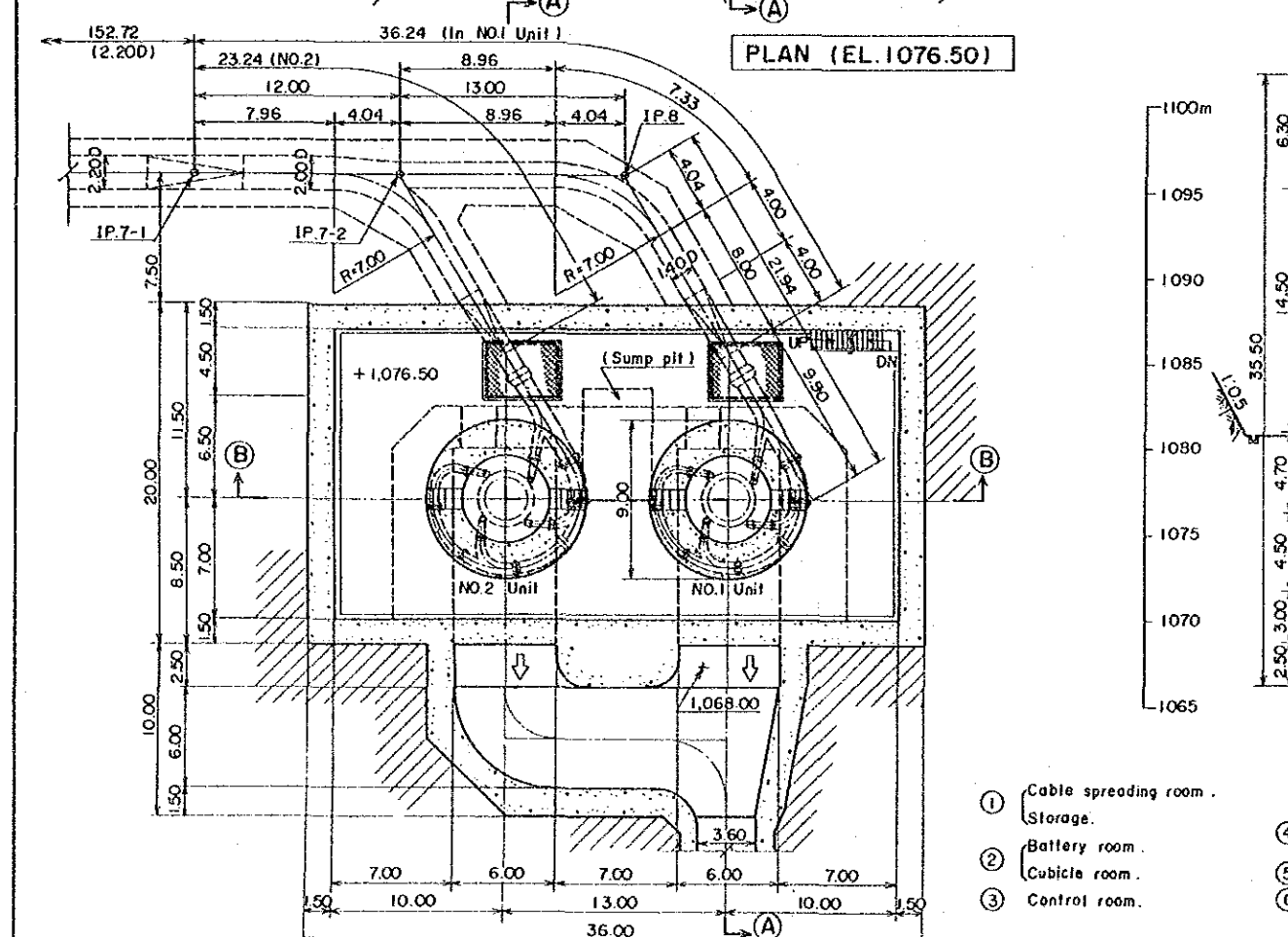
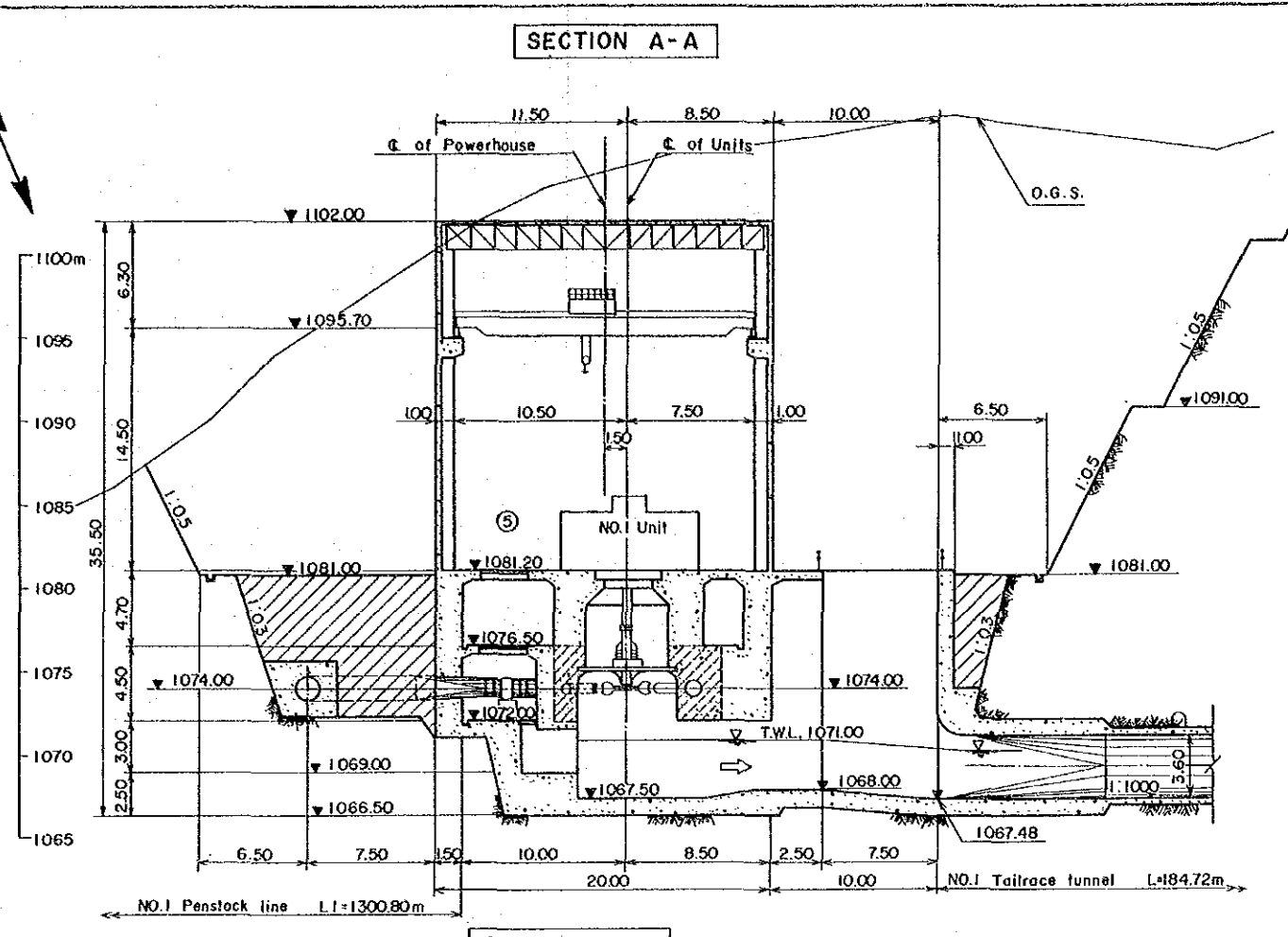
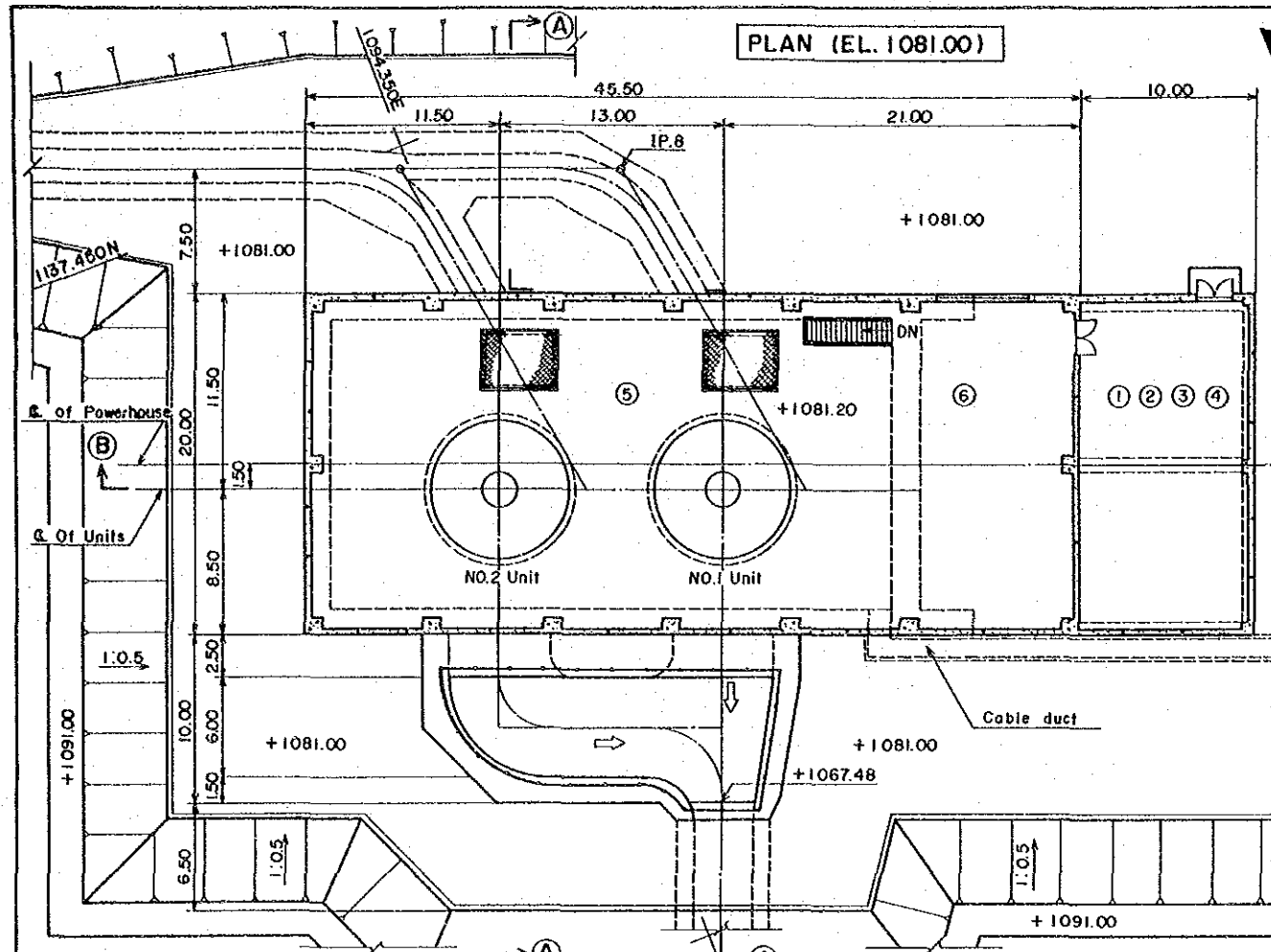


- ① Generating room
- ② Erection bay
- ③ Office and control room

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETA NO.1 POWERHOUSE
 PLAN AND SECTION
 ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO, JAPAN

Dwg.-30

LOCATION	DATE	DESCRIPTION	BY
REVISION			



- ① Cable spreading room. Storage.
- ② Battery room.
- ③ Cubicle room.
- ④ Office.
- ⑤ Ventilation equipment room.
- ⑥ Erection area.

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.1 POWERHOUSE
 PLAN AND SECTIONS

ELECTRIC POWER DEVELOPMENT CO. LTD
 TOKYO, JAPAN

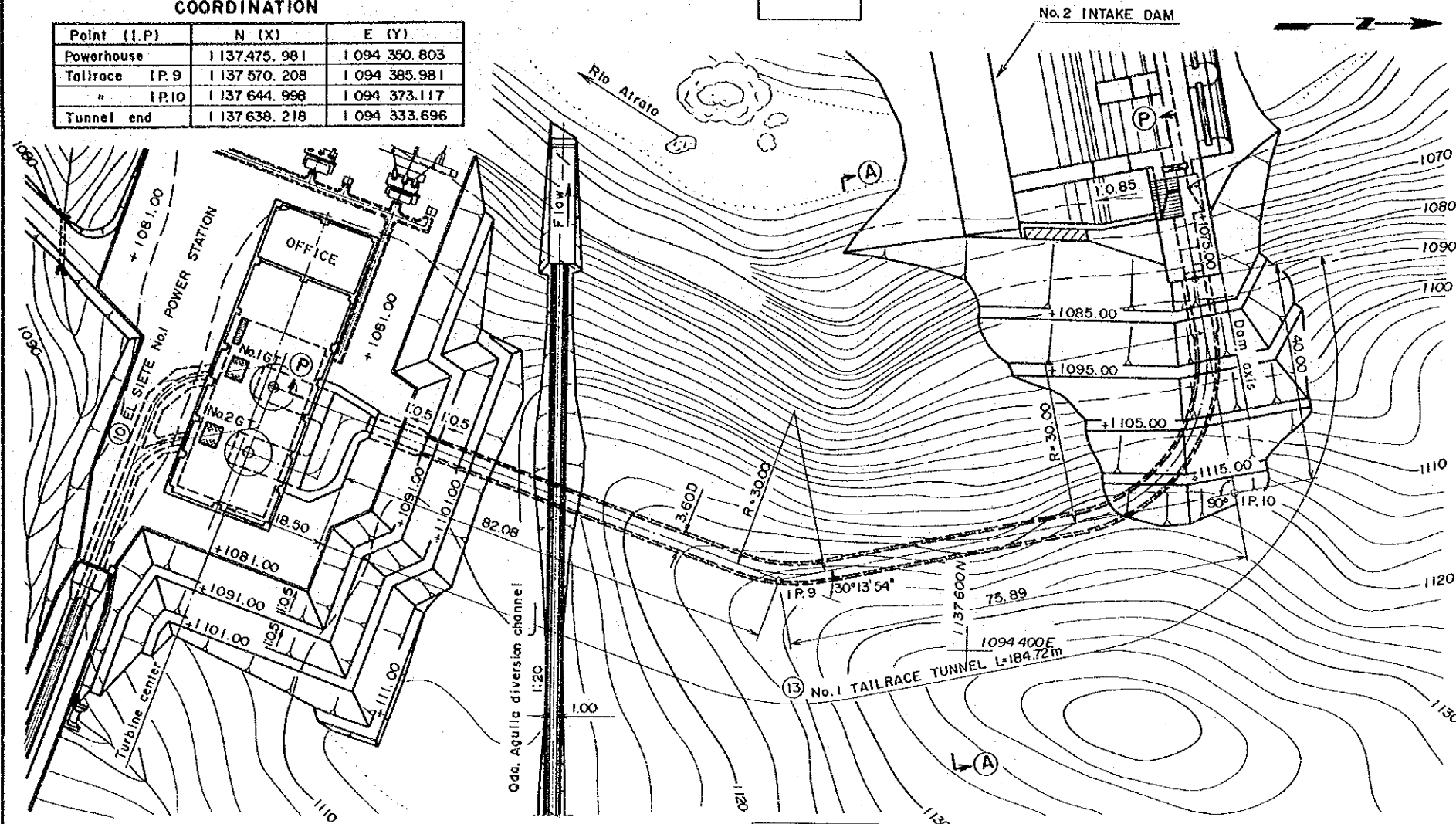
Dwg.-31

LOCATION	DATE	DESCRIPTION	BY

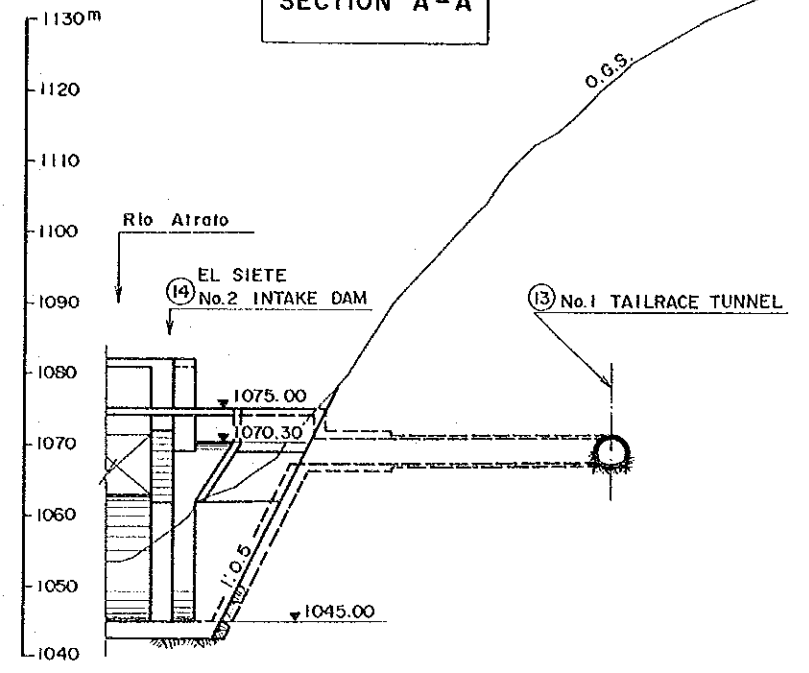
COORDINATION

Point (I.P)	N (X)	E (Y)
Powerhouse	1 137.475. 981	1 094 350. 803
Tailrace I.P. 9	1 137 570. 208	1 094 385. 981
" I.P.10	1 137 644. 998	1 094 373. 117
Tunnel end	1 137 638. 218	1 094 333. 696

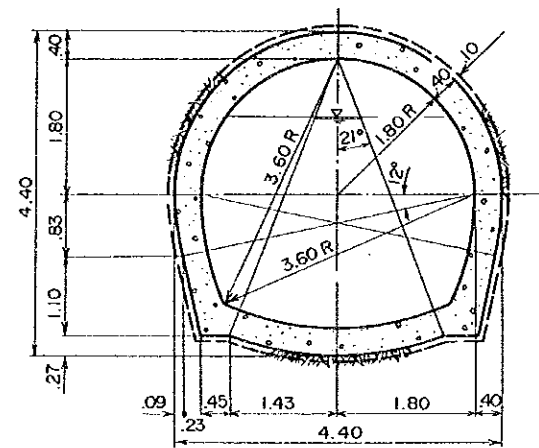
PLAN



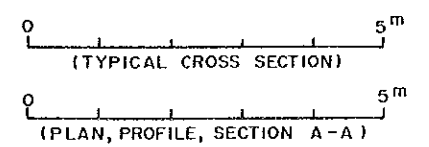
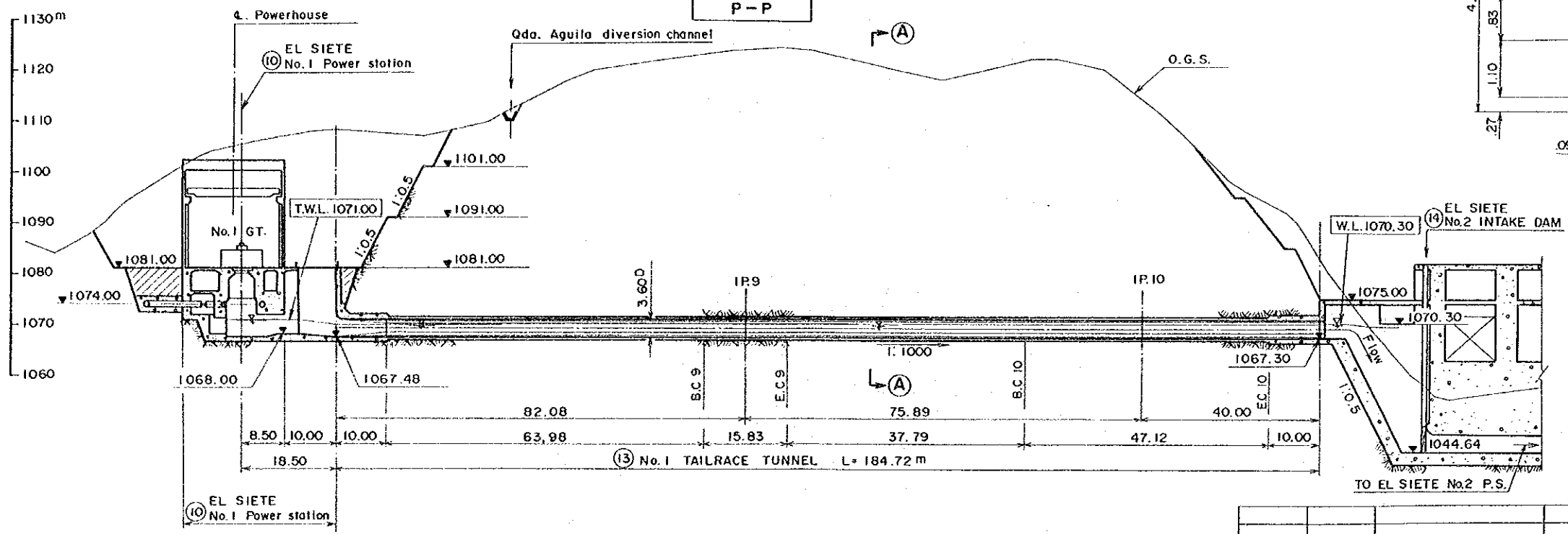
SECTION A-A



TYPICAL CROSS SECTION No.1 TAILRACE TUNNEL



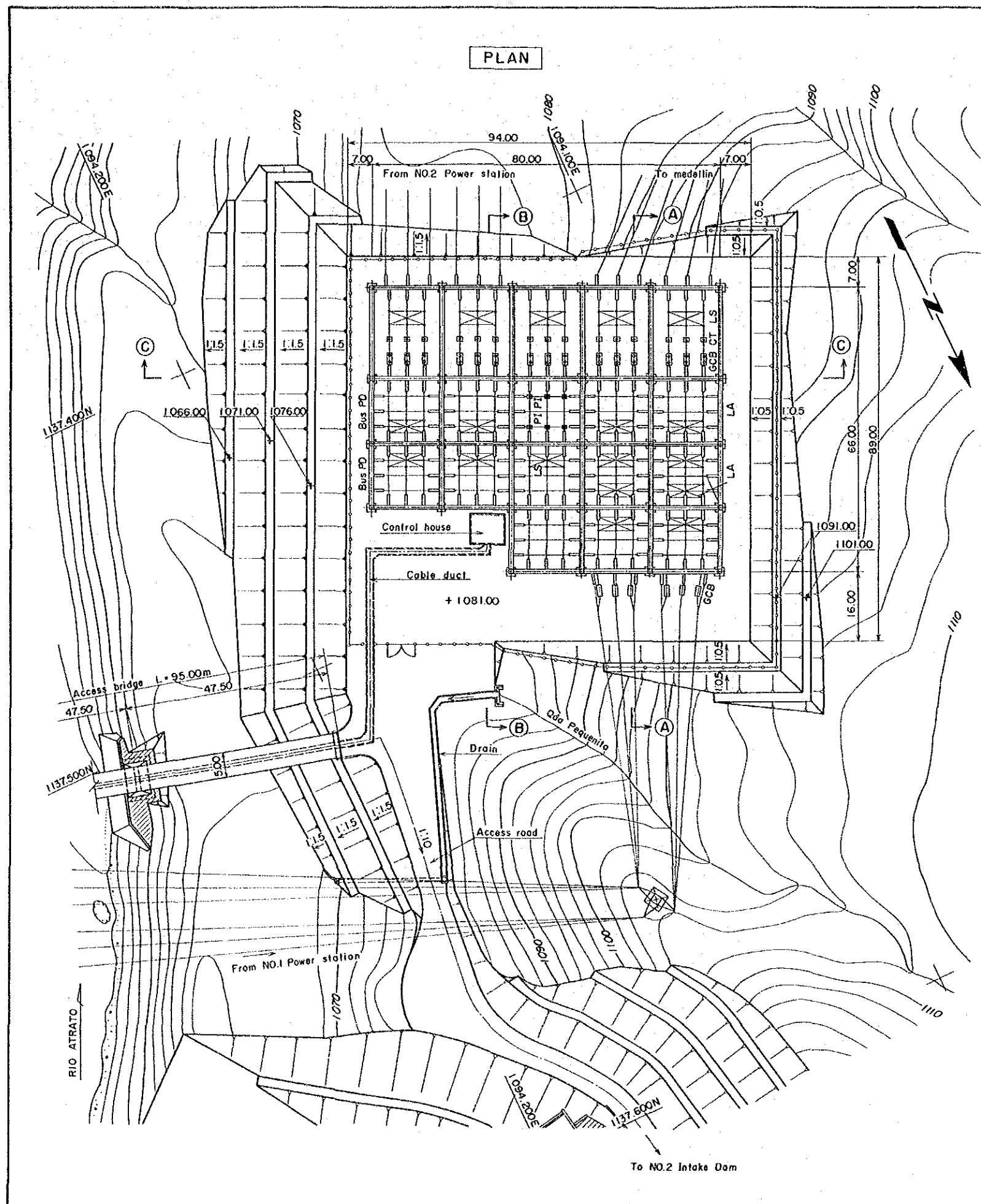
PROFILE P-P



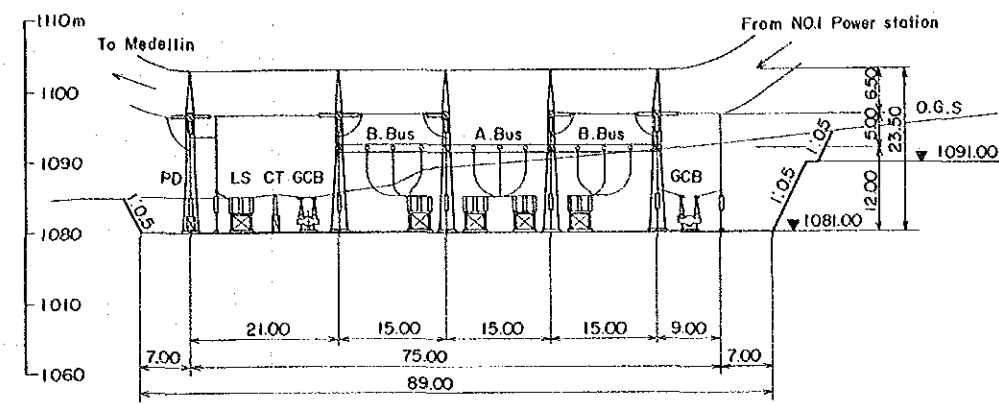
JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.1 TAILRACE TUNNEL
 PLAN, PROFILE AND SECTIONS
 ELECTRIC POWER DEVELOPMENT CO.,LTD
 TOKYO, JAPAN

Dwg.-32

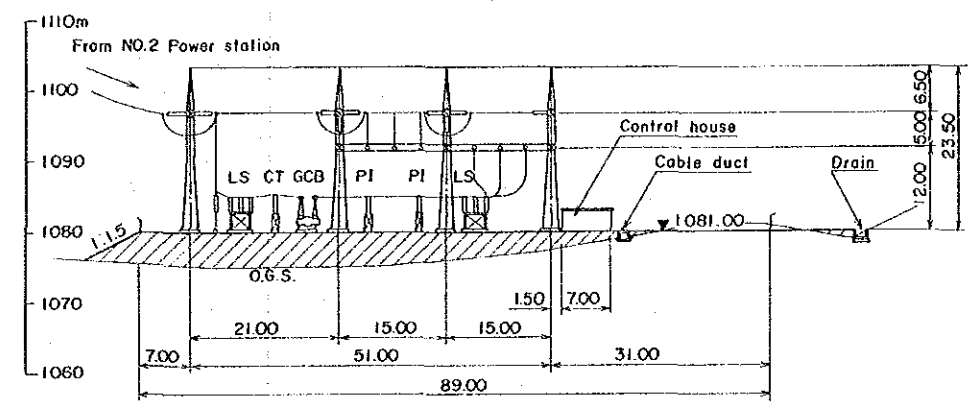
LOCATION	DATE	DESCRIPTION	BY
REVISION			



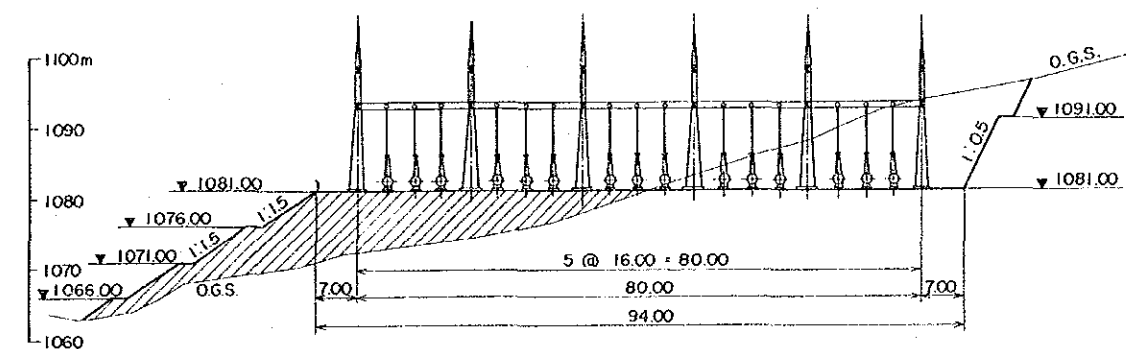
SECTION A - A



SECTION B - B



SECTION C - C

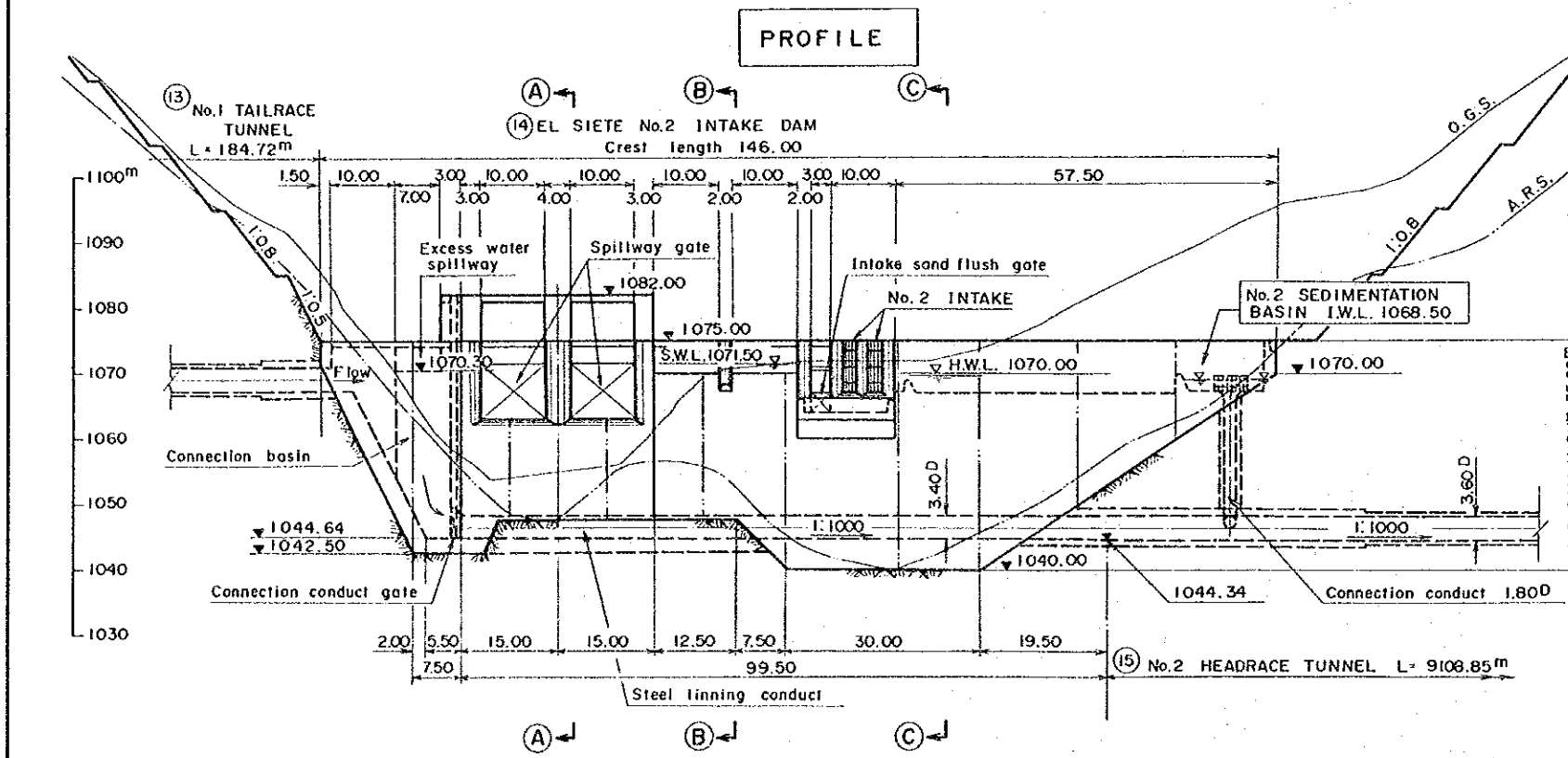
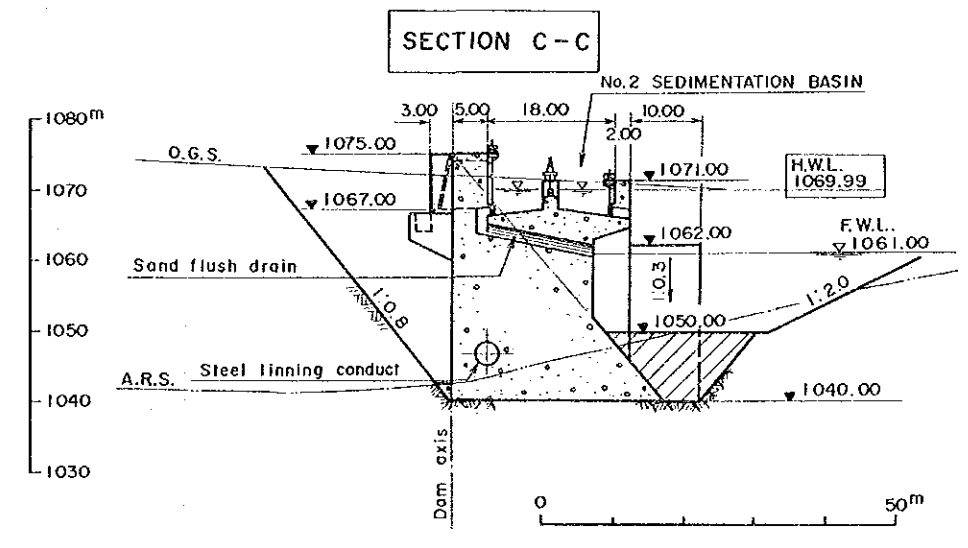
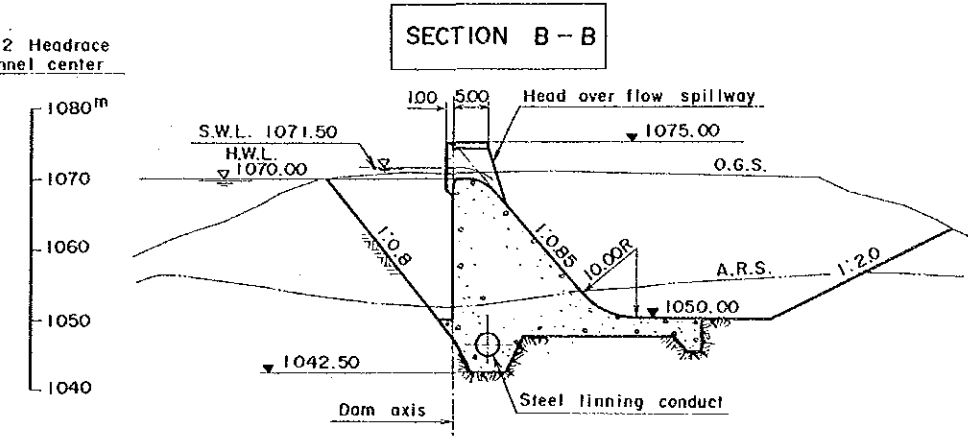
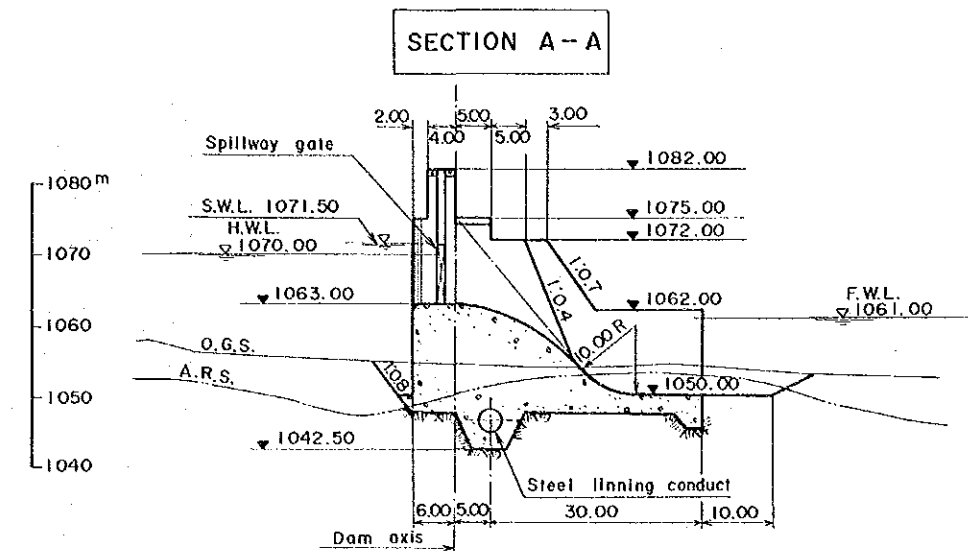
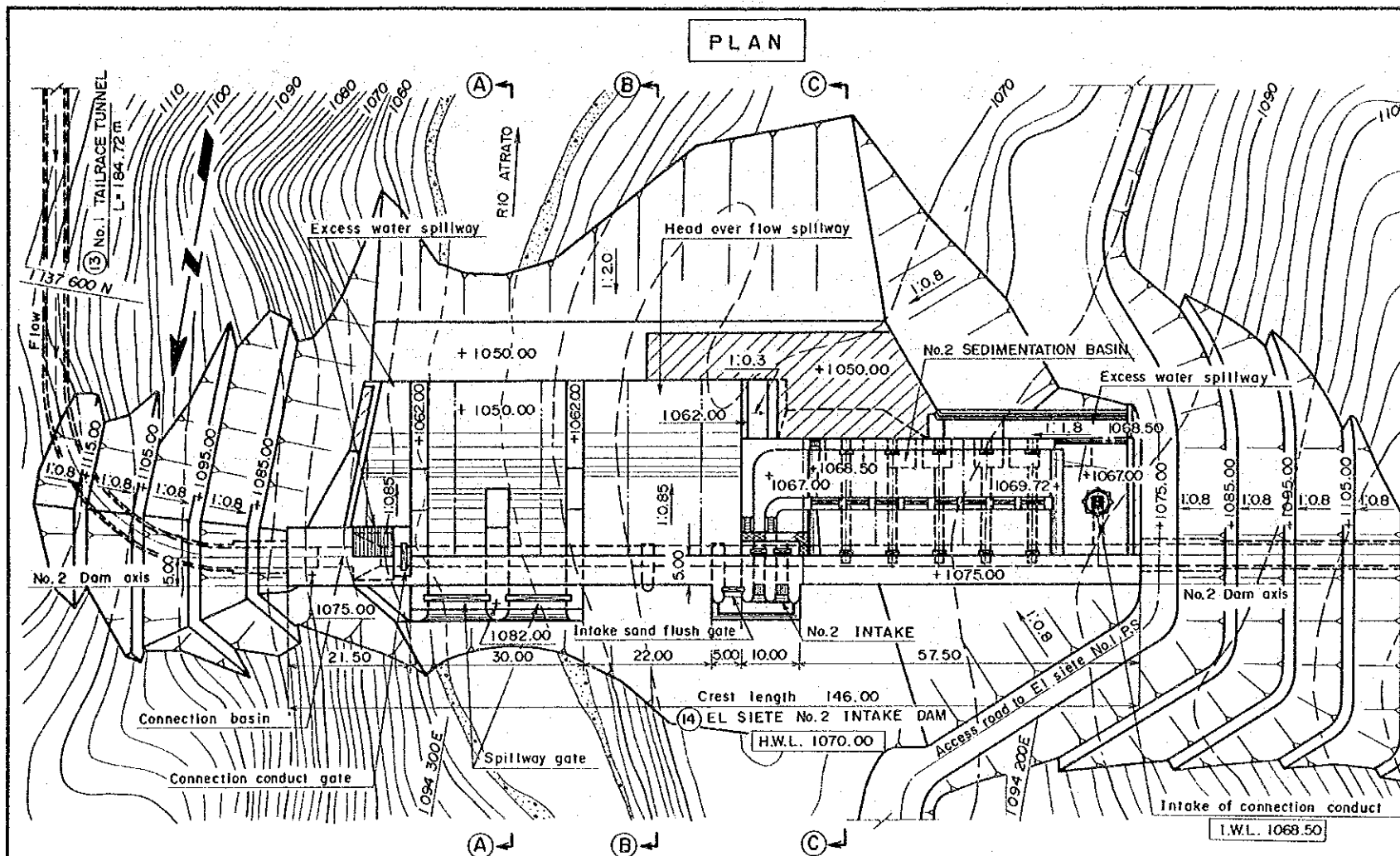


O.G.S.; Original ground surface

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.1 SWITCHYARD
 PLAN AND SECTIONS
 ELECTRIC POWER DEVELOPMENT CO.,LTD
 TOKYO, JAPAN

LOCATION	DATE	DESCRIPTION	BY
REVISION			

Dwg.-33



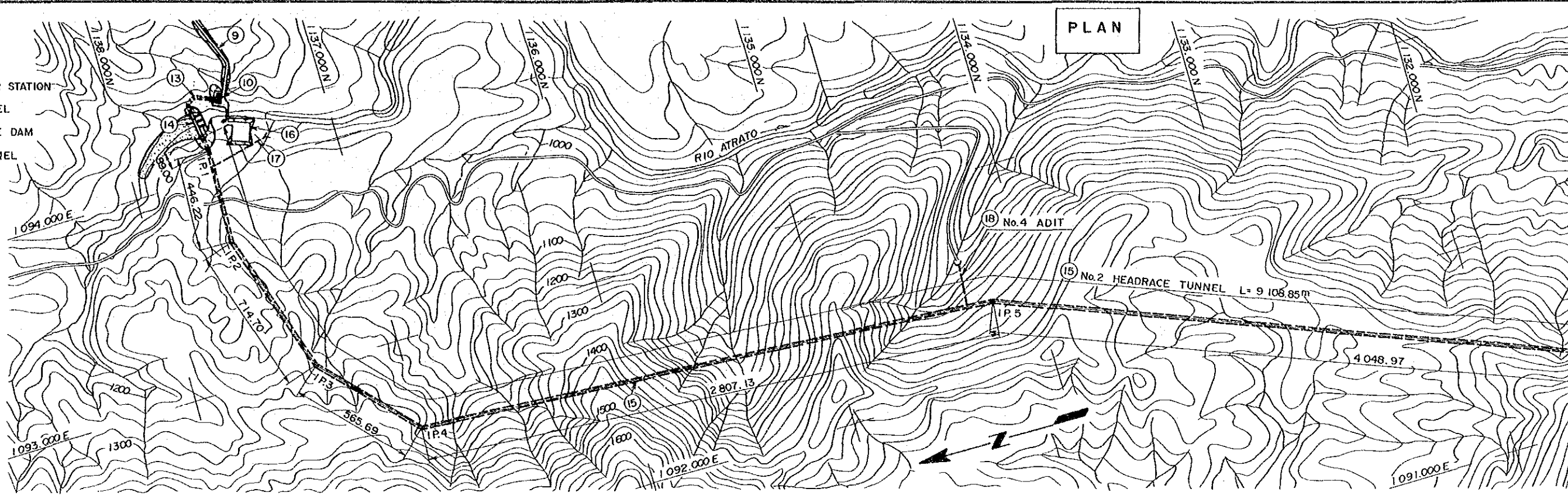
H.W.L.; High water level
 S.W.L.; Surcharge water level
 L.W.L.; Low water level
 O.G.S.; Original ground surface
 A.R.S.; Assumed rock surface

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 INTAKE DAM
 PLAN, PROFILE AND SECTION
 ELECTRIC POWER DEVELOPMENT CO., LTD.
 TOKYO, JAPAN

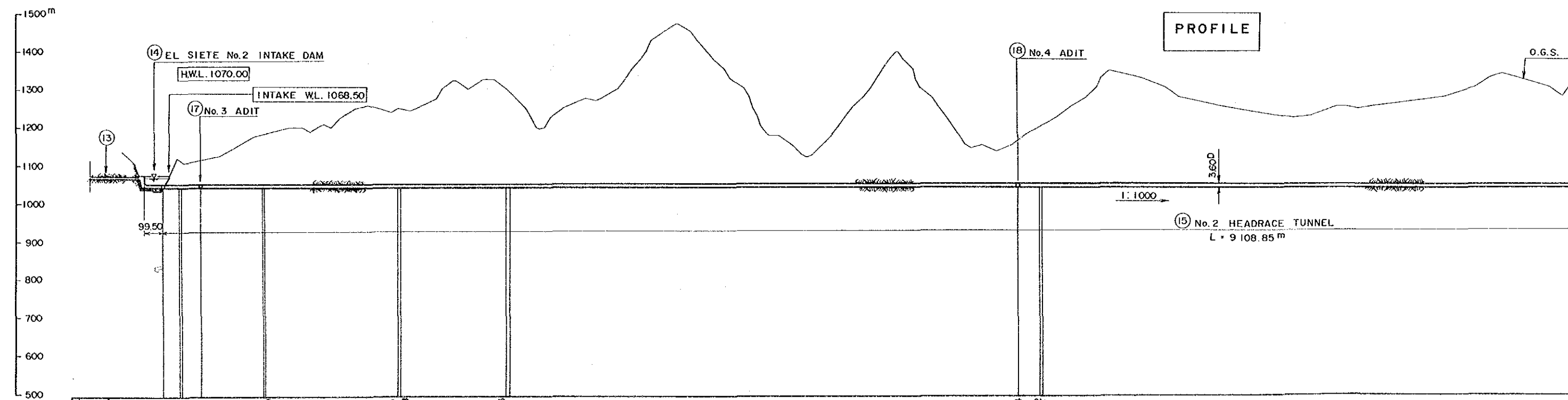
LOCATION	DATE	DESCRIPTION	BY
		REVISION	

Dwg.-34

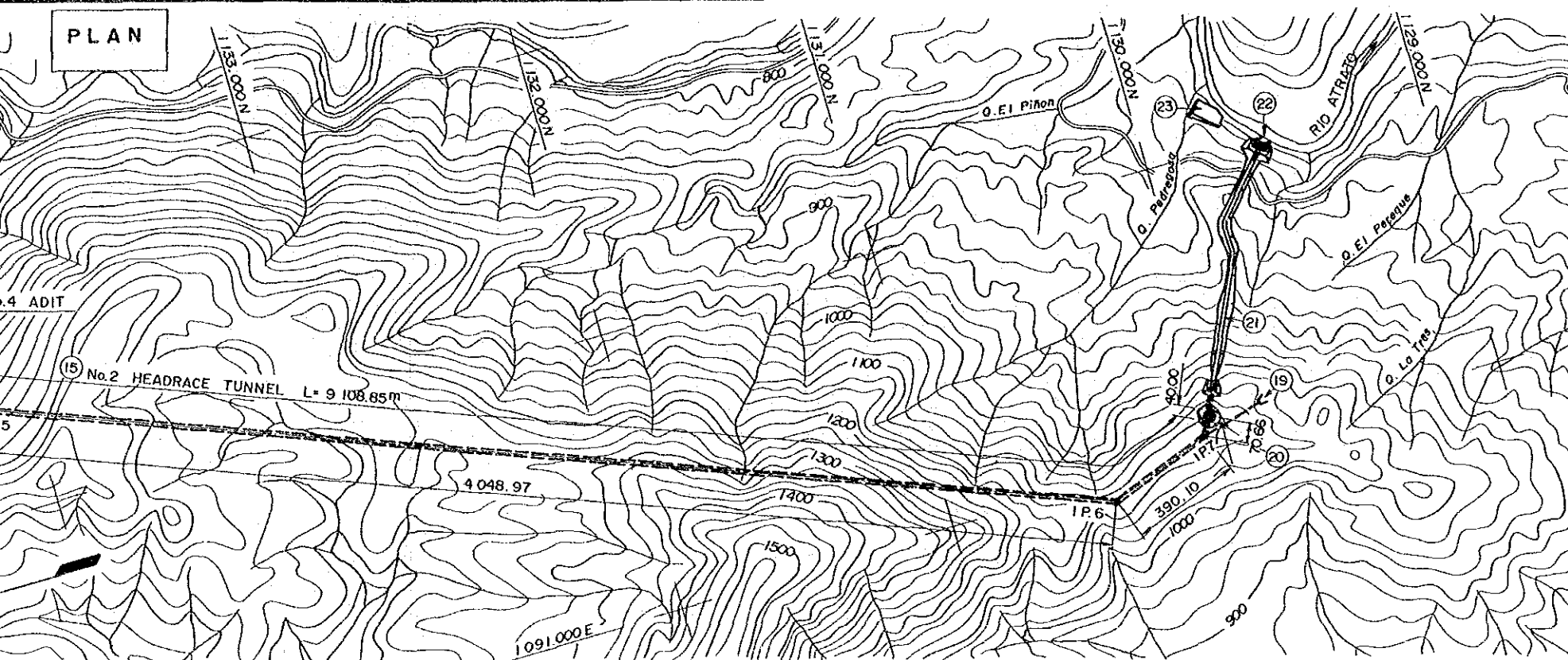
- ⑨ No.1 PENSTOCK LINE
- ⑩ EL SIETE No.1 POWER STATION
- ⑬ No.1 TAILRACE TUNNEL
- ⑭ EL SIETE No.1 INTAKE DAM
- ⑮ No.2 HEADRACE TUNNEL
- ⑯ No.1 SUB-STATION
- ⑰ No.3 ADIT



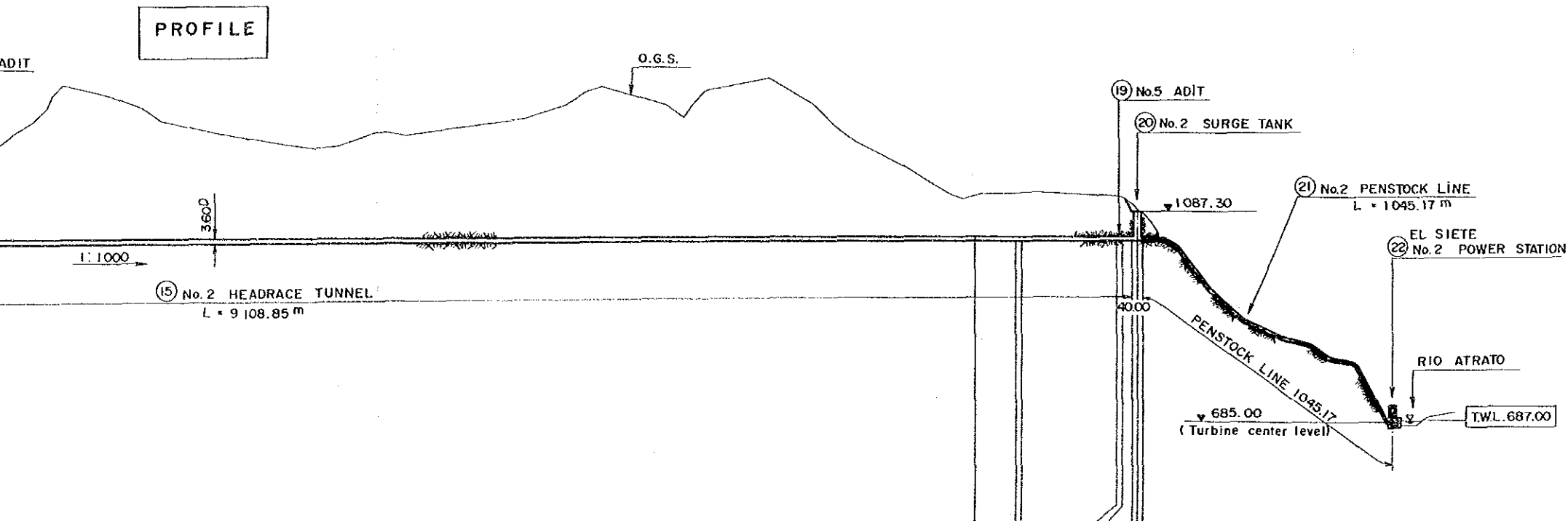
PROFILE



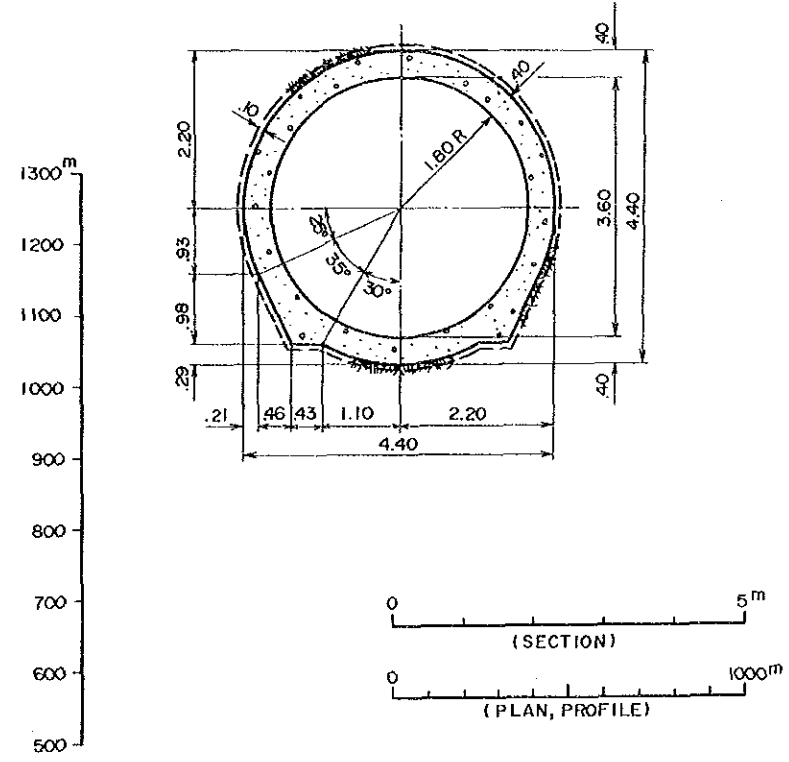
STA	DIS TANCE	TOTAL DIS TANCE	GROUND HIGHT	FORMAT ION HIGHT
0	0.00	0.00	1044.34	1044.34
BC.1	85.96	85.96	104.00	104.23
EC.1	6.26	92.12	105.00	104.23
	107.88	200.00	113.00	104.14
BC.2	329.87	529.87	182.00	043.81
EC.2	10.54	540.41	184.00	043.80
BC.3	702.15	242.56	248.00	043.10
EC.3	14.18	256.74	248.00	043.08
BC.4	547.27	804.01	300.00	042.53
EC.4	21.42	825.43	292.00	042.51
No.4 ADIT	2674.57	4 500.00	160.00	039.84
BC.5	116.79	4 616.79	095.00	039.72
EC.5	9.10	4 625.89	101.00	039.71



- (15) No.2 HEADRACE TUNNEL
- (18) No.4 ADIT
- (19) No.5 ADIT
- (20) No.2 SURGE TANK
- (21) No.2 PENSTOCK LINE
- (22) EL SIETE No.2 POWER STATION
- (23) No.2 SUB-STATION



SECTION
No.2 Headrace tunnel



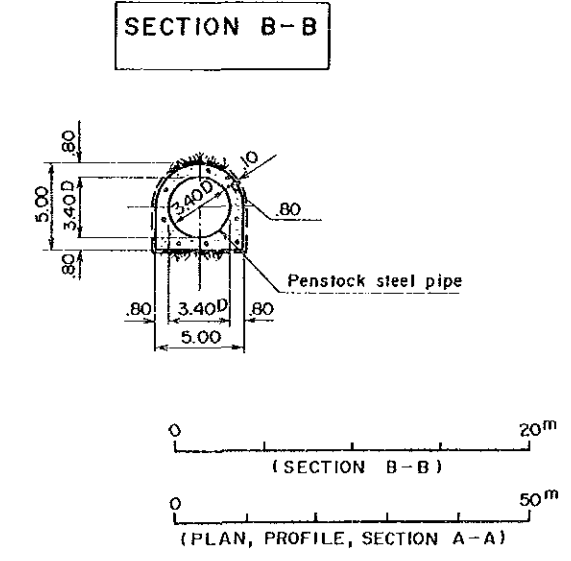
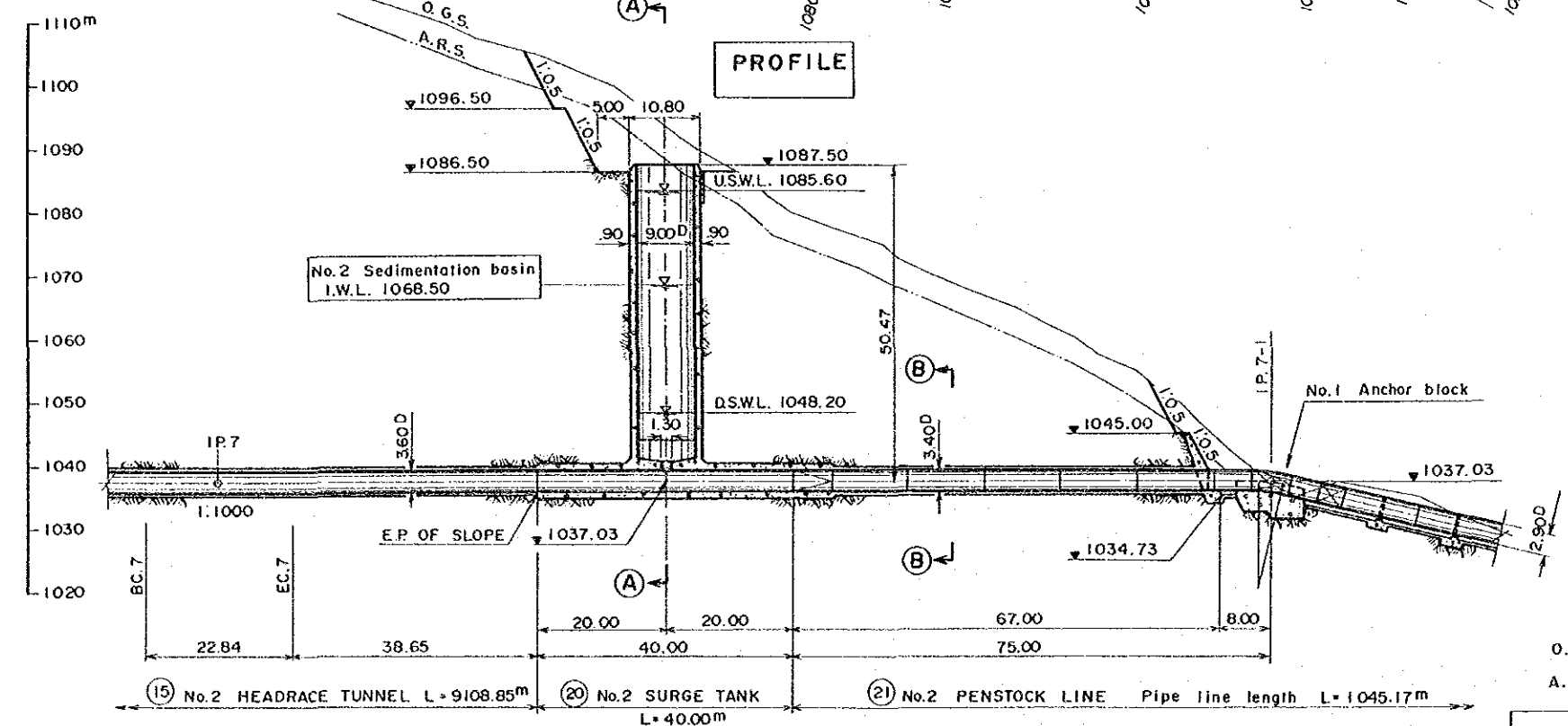
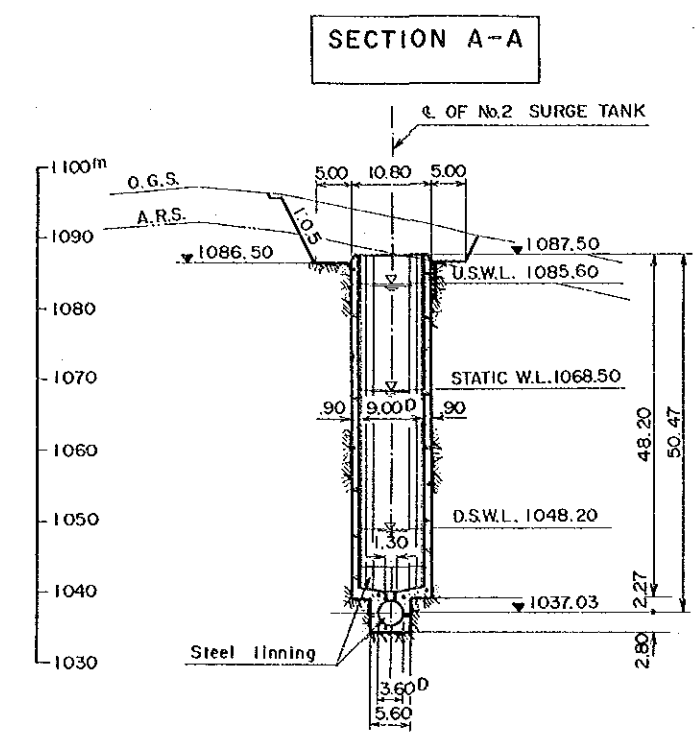
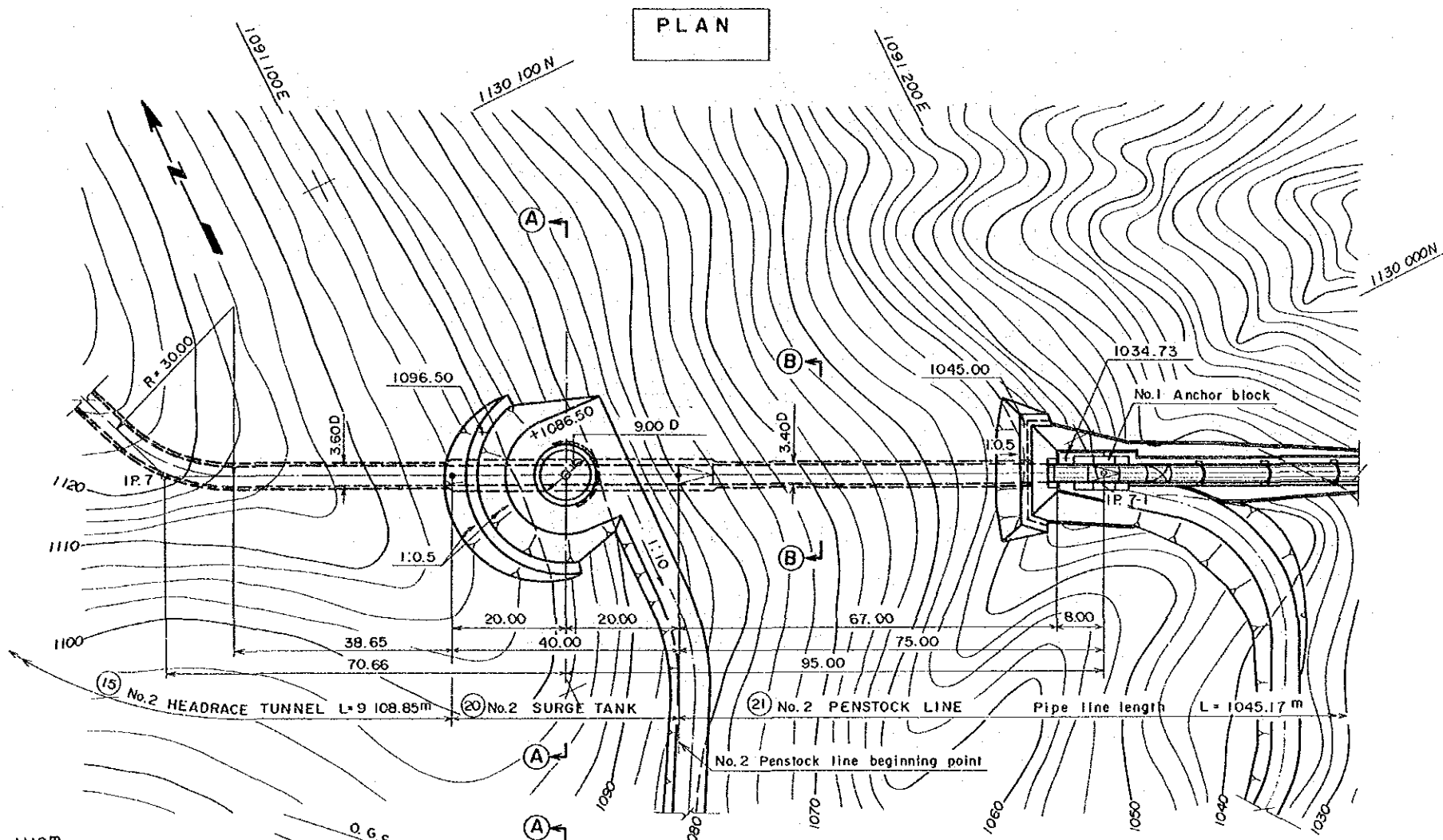
387.11	18500.00	121.00	035.84
156.84	18659.84	125.00	035.86
21.85	18680.69	128.00	035.66
366.66	19047.35	123.00	035.28
22.85	19070.20	117.00	035.27
30.65	19108.85	105.00	035.23
20.00	19128.85	094.00	035.23
20.00	19148.85	083.00	035.23
ST			
BC 6			
EC 6			

O.G.S. ; Original ground surface

LOCATION	DATE	DESCRIPTION	BY
		REVISION	

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 HEADRACE TUNNEL
 PLAN, PROFILE AND SECTION
 ELECTRIC POWER DEVELOPMENT CO.,LTD
 TOKYO, JAPAN

Dwg.-36

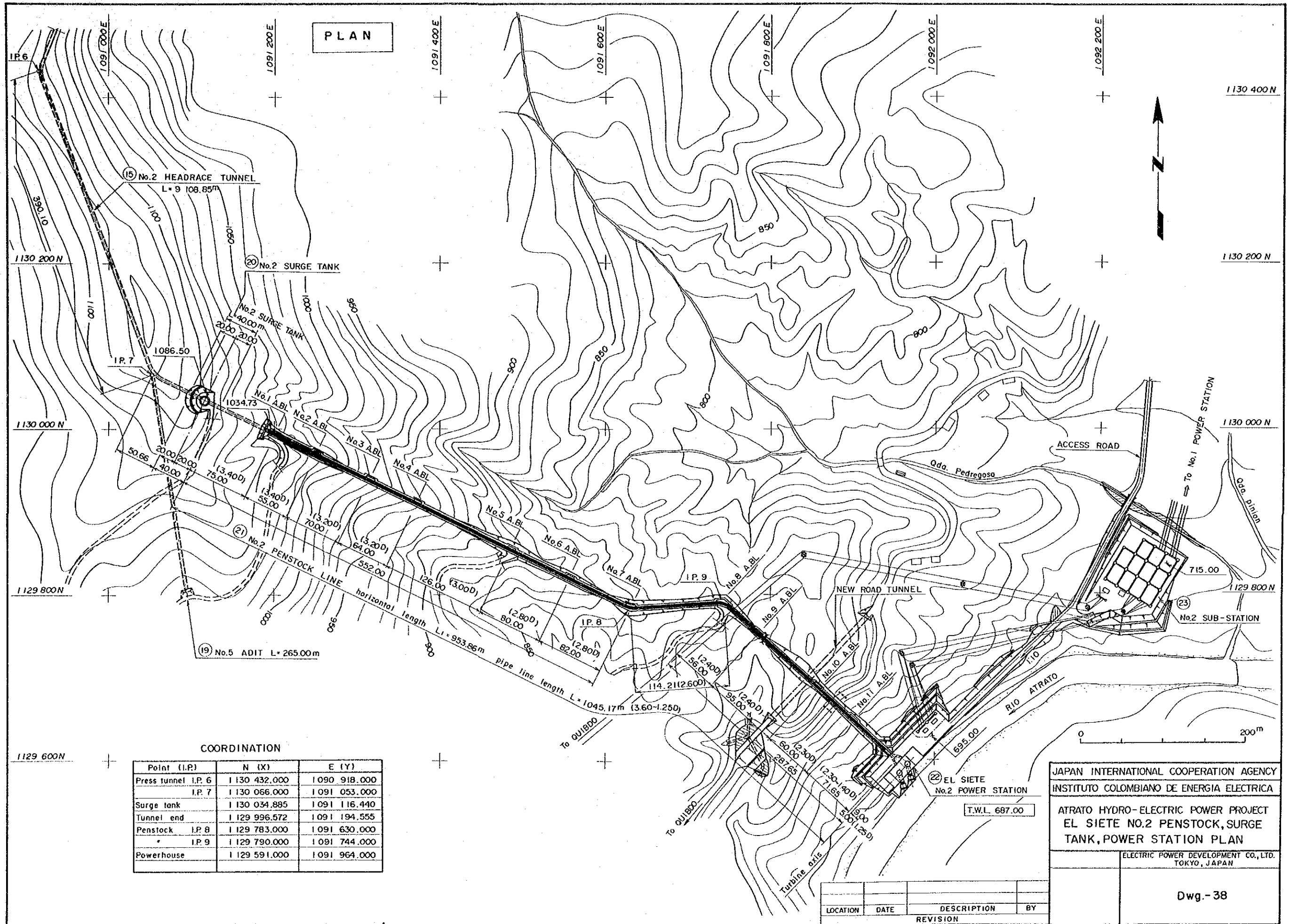


O.G.S.; Original ground surface
A.R.S.; Assumed rock surface

LOCATION	DATE	DESCRIPTION	BY
REVISION			

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 SURGE TANK
 PLAN, PROFILE AND SECTIONS
 ELECTRIC POWER DEVELOPMENT CO., LTD.
 TOKYO, JAPAN

Dwg.-37



PLAN

COORDINATION

Point (I.P.)	N (X)	E (Y)
Press tunnel I.P. 6	1 130 432.000	1 090 918.000
I.P. 7	1 130 066.000	1 091 053.000
Surge tank	1 130 034.885	1 091 116.440
Tunnel end	1 129 996.572	1 091 194.555
Penstock I.P. 8	1 129 783.000	1 091 630.000
I.P. 9	1 129 790.000	1 091 744.000
Powerhouse	1 129 591.000	1 091 964.000

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 PENSTOCK, SURGE
 TANK, POWER STATION PLAN
 ELECTRIC POWER DEVELOPMENT CO., LTD.
 TOKYO, JAPAN

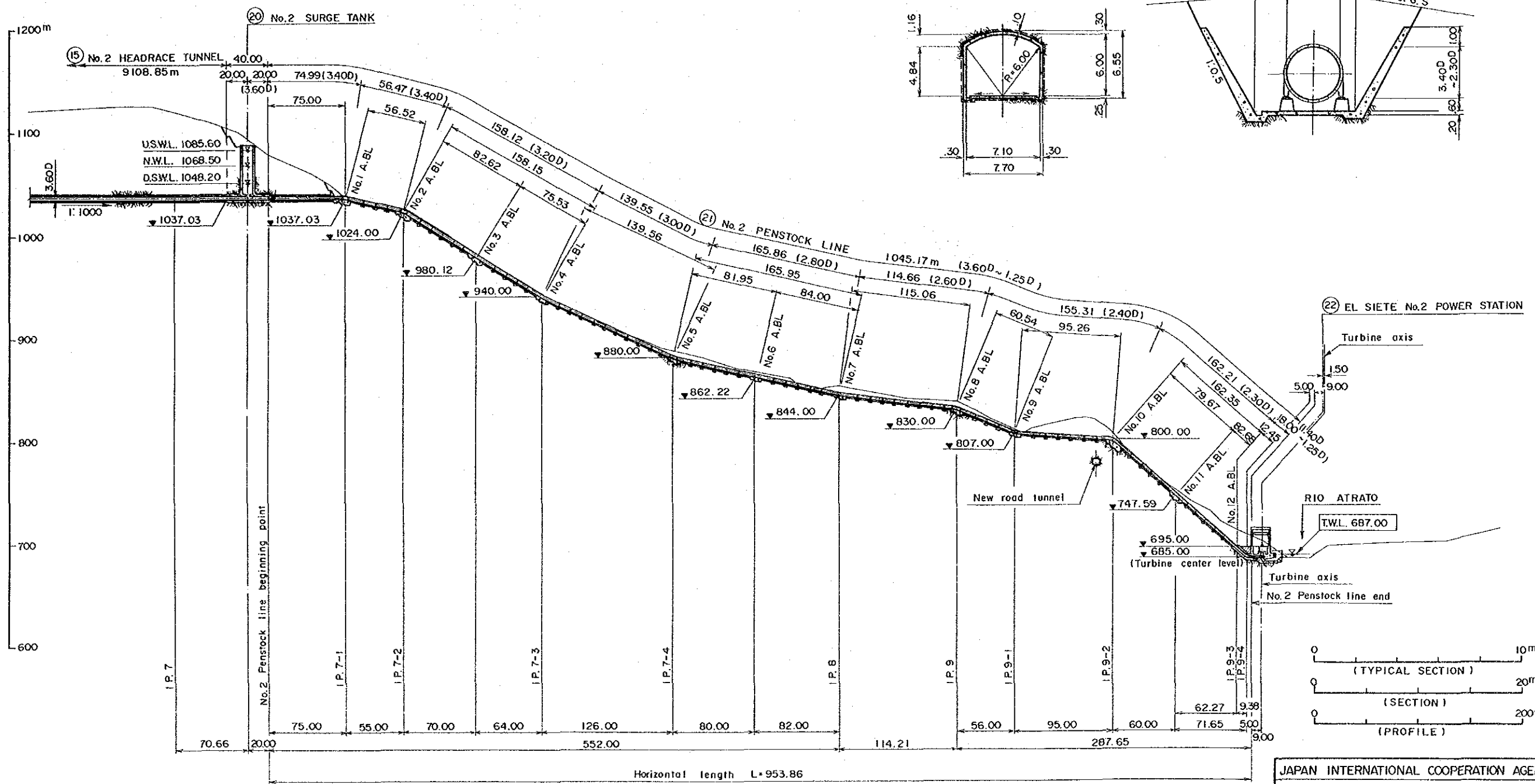
LOCATION	DATE	DESCRIPTION	BY
		REVISION	

Dwg.-38

PROFILE

SECTION
New road tunnel

TYPICAL SECTION
No.2 Penstock line



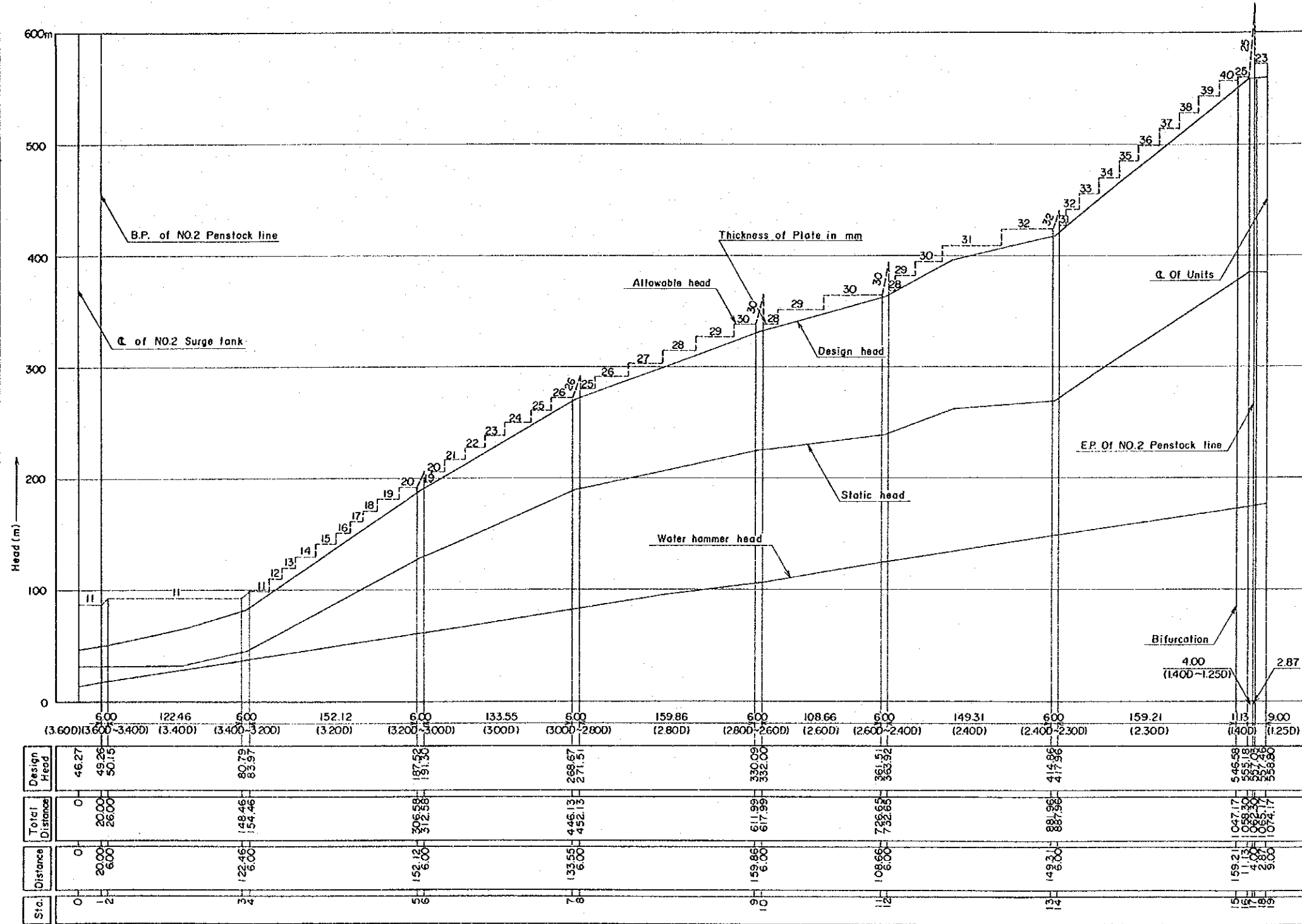
JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 PENSTOCK
 PROFILE AND SECTIONS
 ELECTRIC POWER DEVELOPMENT CO.,LTD.
 TOKYO, JAPAN

O.G.S ; Original ground surface

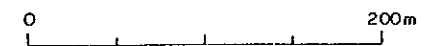
LOCATION	DATE	DESCRIPTION	BY
REVISION			

Dwg.-39

Specification .	
Maximum Discharge .	28m ³ /s
Maximum Static Head .	383.50m
Water Hammer Head and Surging Head .	
At Surgetank .	14.80m
At Turbine .	175.30m
Material .	SM 50
Allowable Tensile Stress .	1750kg/cm ²
Welding Efficiency .	95 %
Corrosion Allowance .	1.5 mm



Pressure curve of El. siete NO2 Penstock line

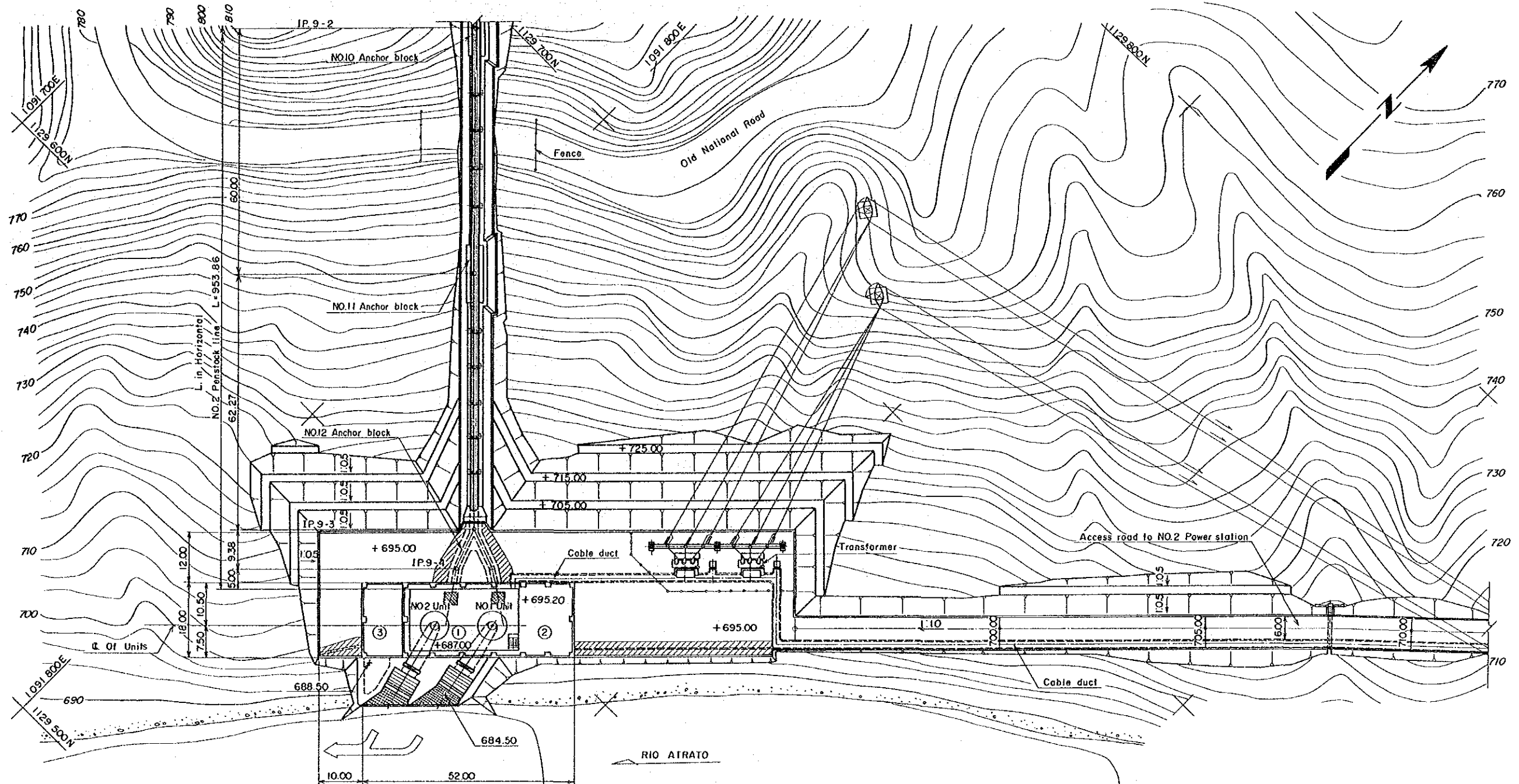


JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL. SIETE NO.2 PENSTOCK
 PRESSURE CURVE
 ELECTRIC POWER DEVELOPMENT CO.,LTD
 TOKYO, JAPAN

Dwg.-40

LOCATION	DATE	DESCRIPTION	BY
REVISION			

PLAN

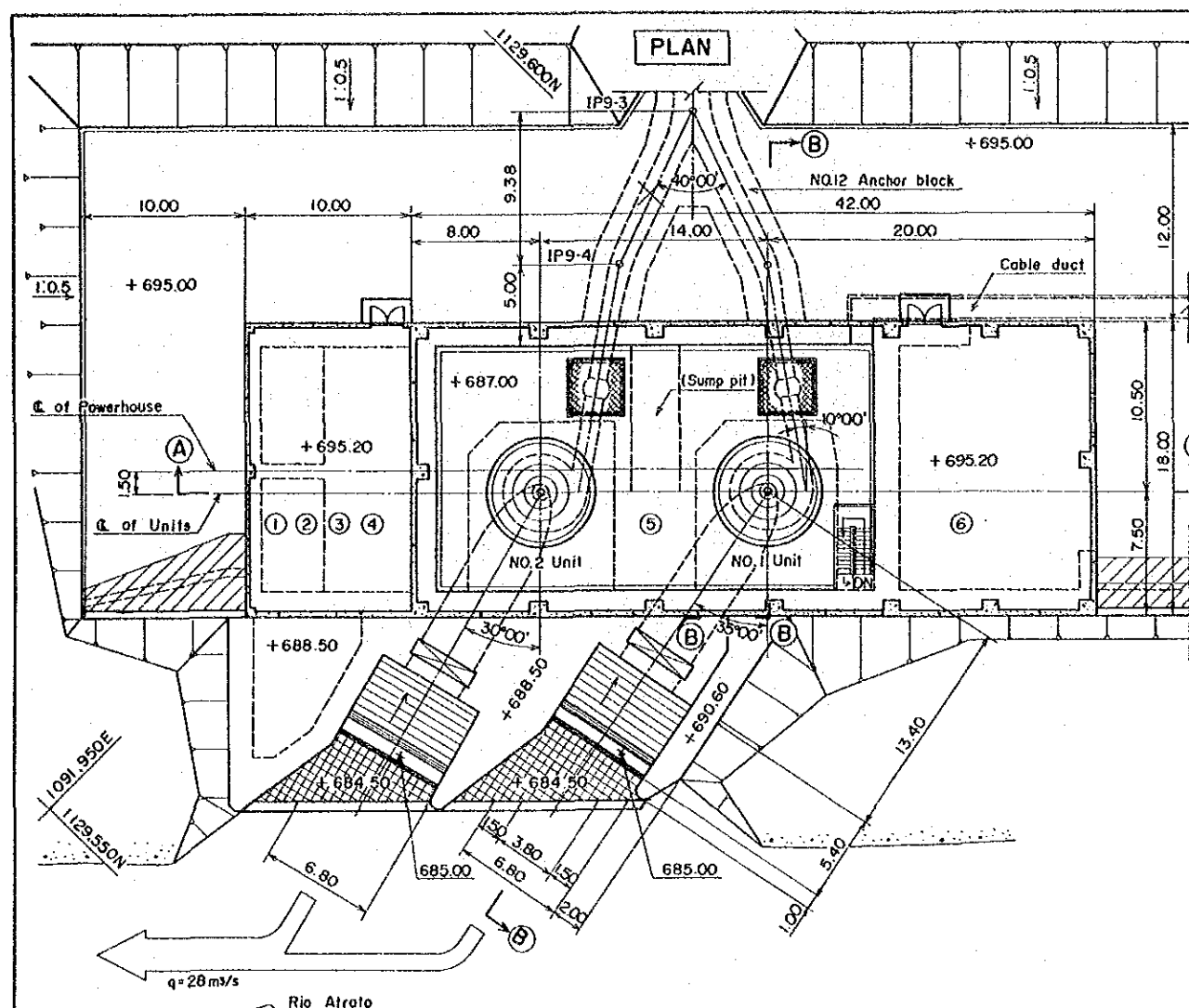


- ① Generating room .
- ② Erection bay .
- ③ Office and control room .

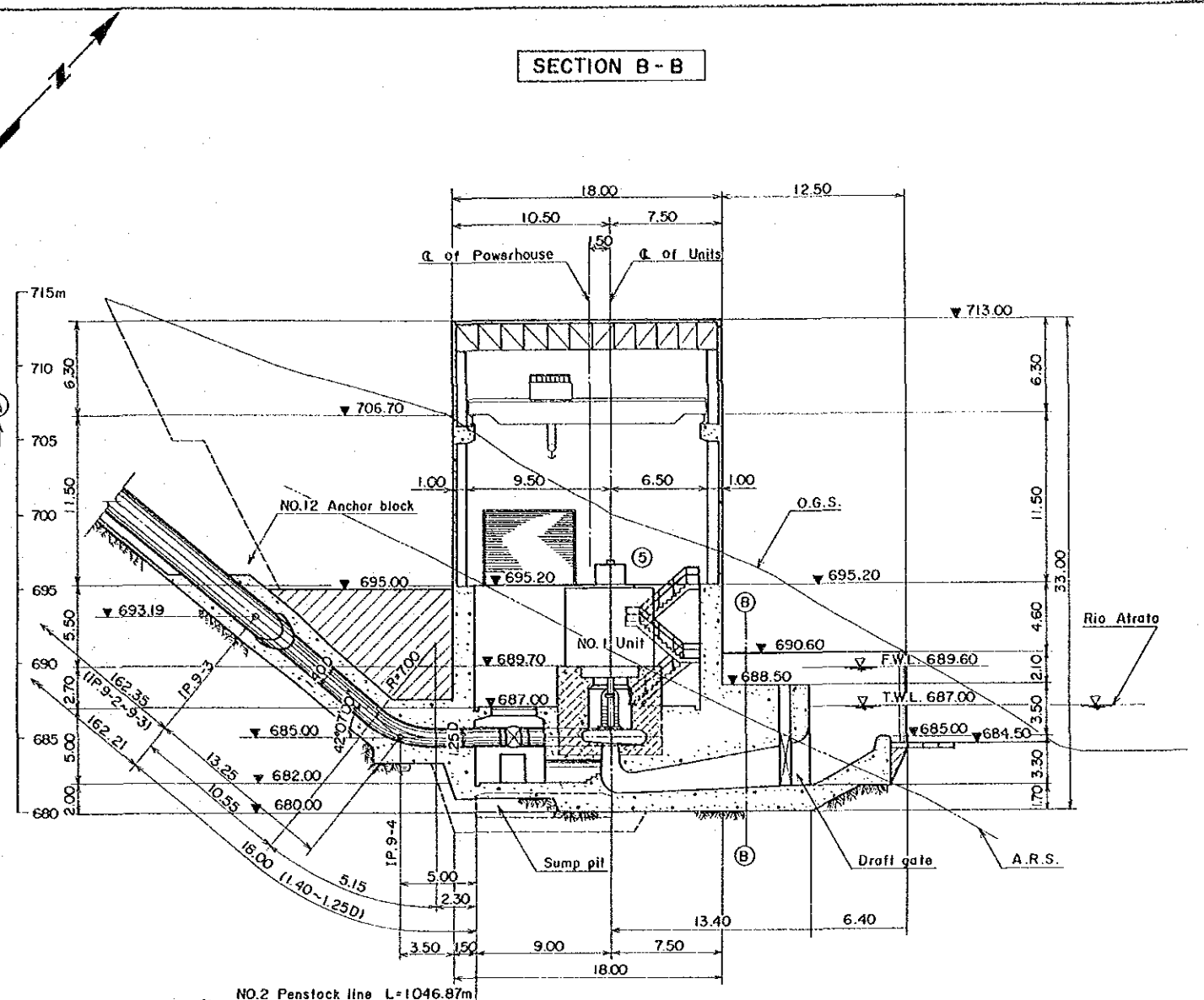
JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 POWERHOUSE
 PLAN
 ELECTRIC POWER DEVELOPMENT CO.,LTD
 TOKYO, JAPAN

Dwg.-41

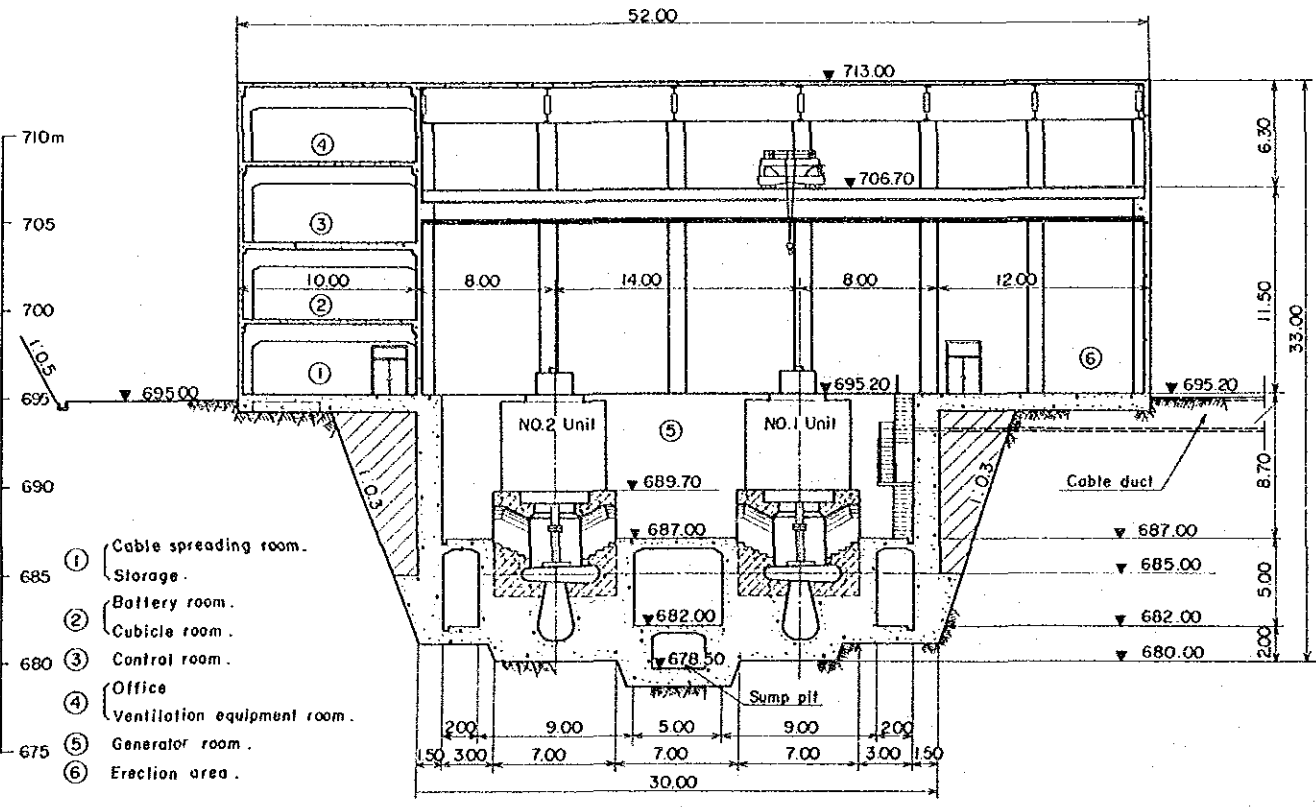
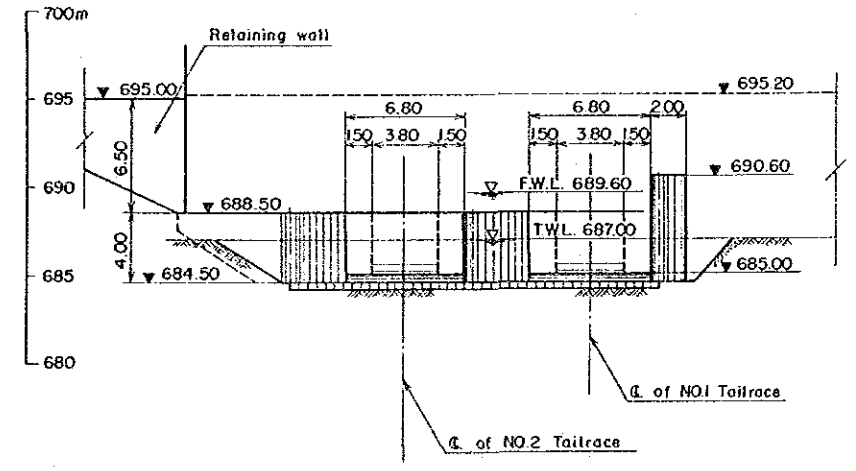
LOCATION	DATE	DESCRIPTION	BY
REVISION			



SECTION A - A



FRONT VIEW OF TAILRACE



- ① Cable spreading room.
- ② Storage.
- ③ Battery room.
- ④ Cubicle room.
- ⑤ Control room.
- ⑥ Office.
- ⑦ Ventilation equipment room.
- ⑧ Generator room.
- ⑨ Erection area.

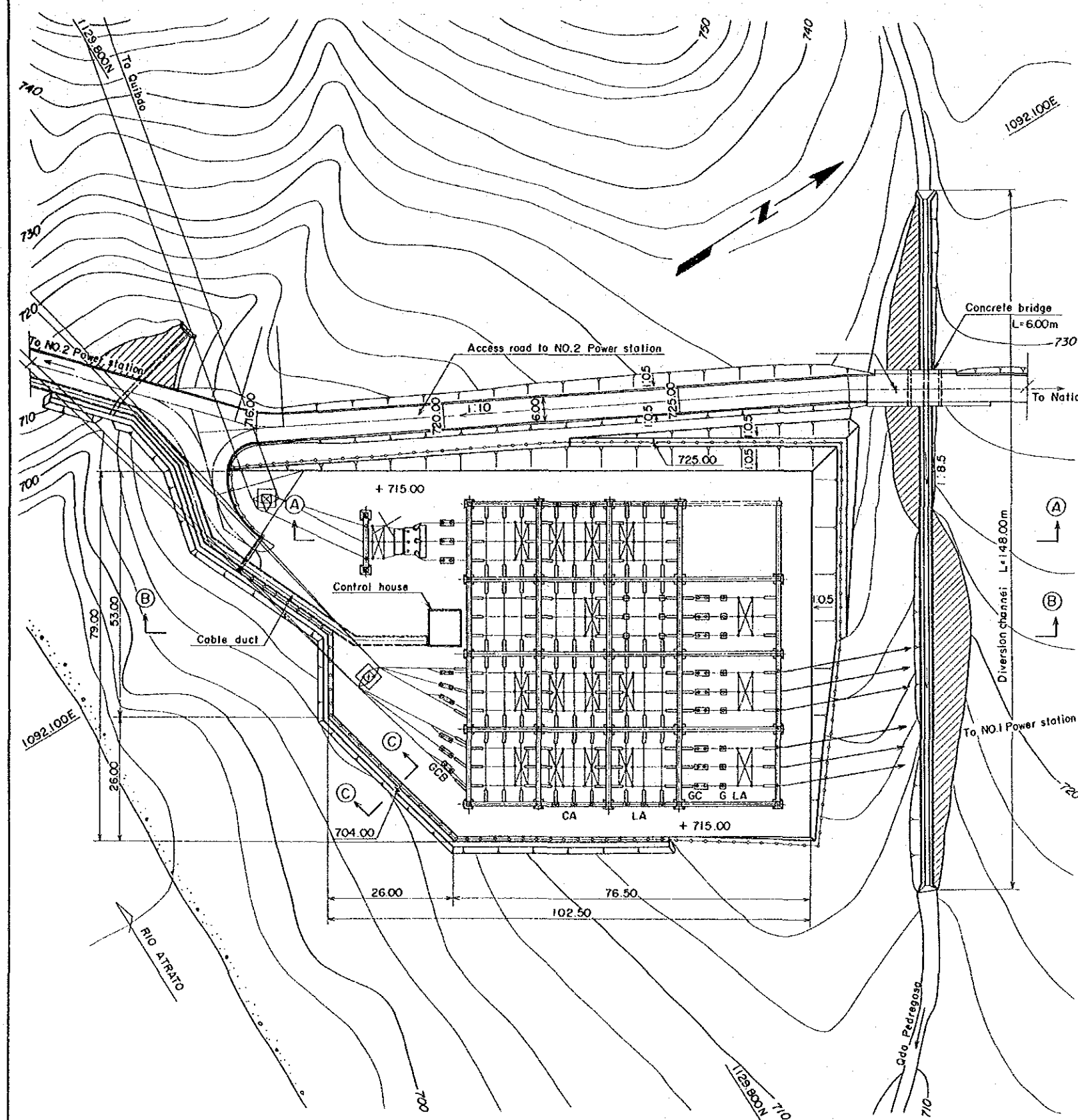
O.G.S. ; Original ground surface
A.R.S. ; Assumed rock surface

LOCATION	DATE	DESCRIPTION	BY
REVISION			

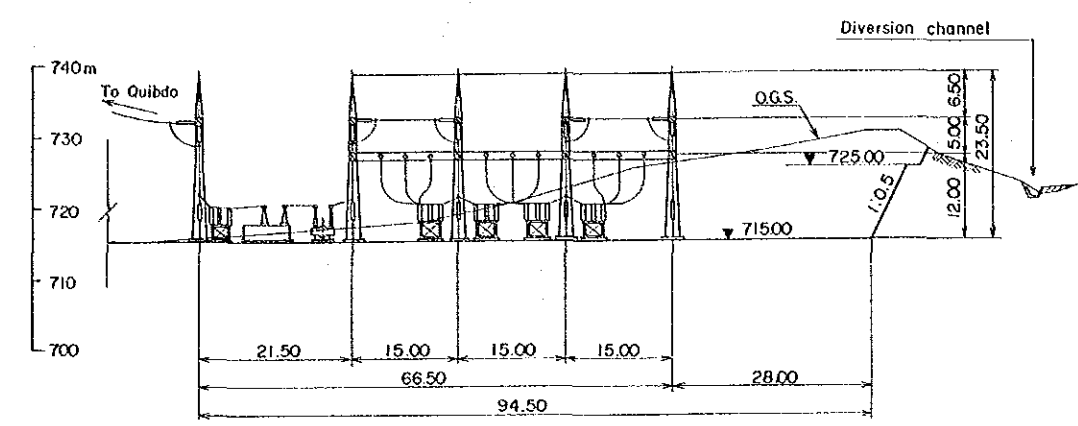
JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 POWERHOUSE
 PLAN AND SECTIONS
 ELECTRIC POWER DEVELOPMENT CO.,LTD
 TOKYO, JAPAN

Dwg.-42

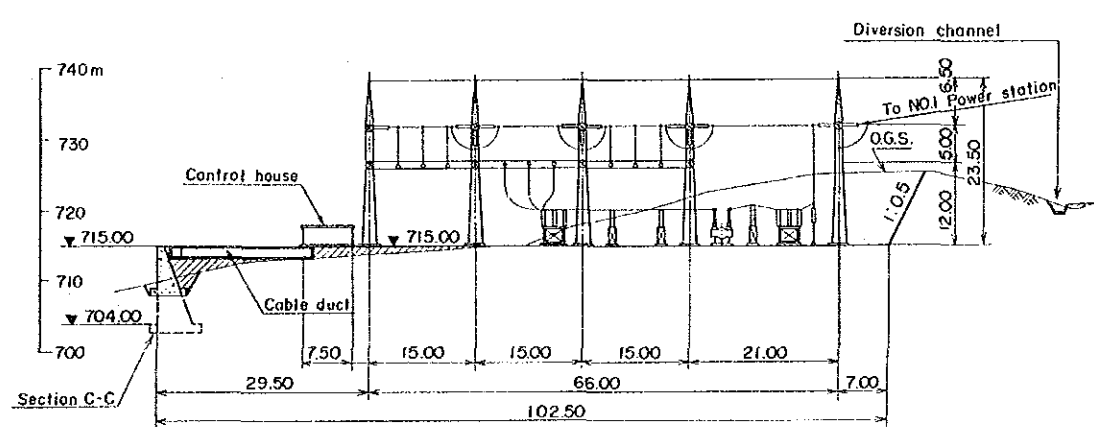
PLAN



SECTION A - A



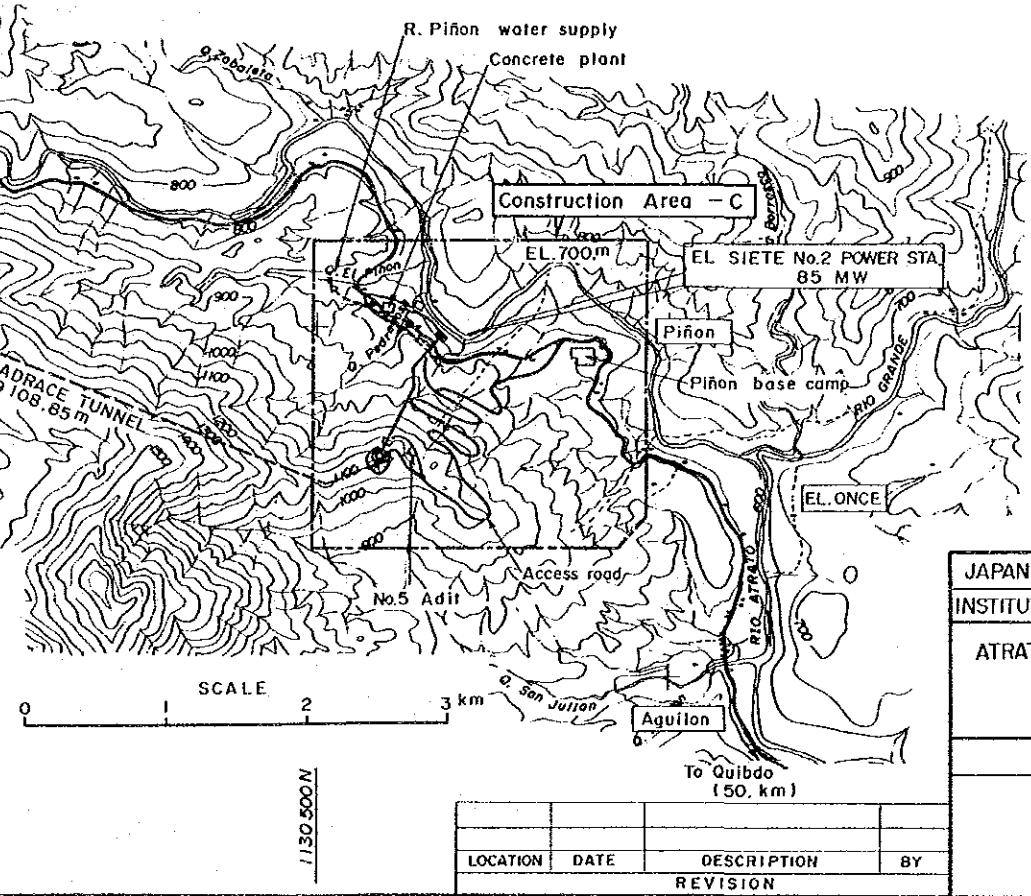
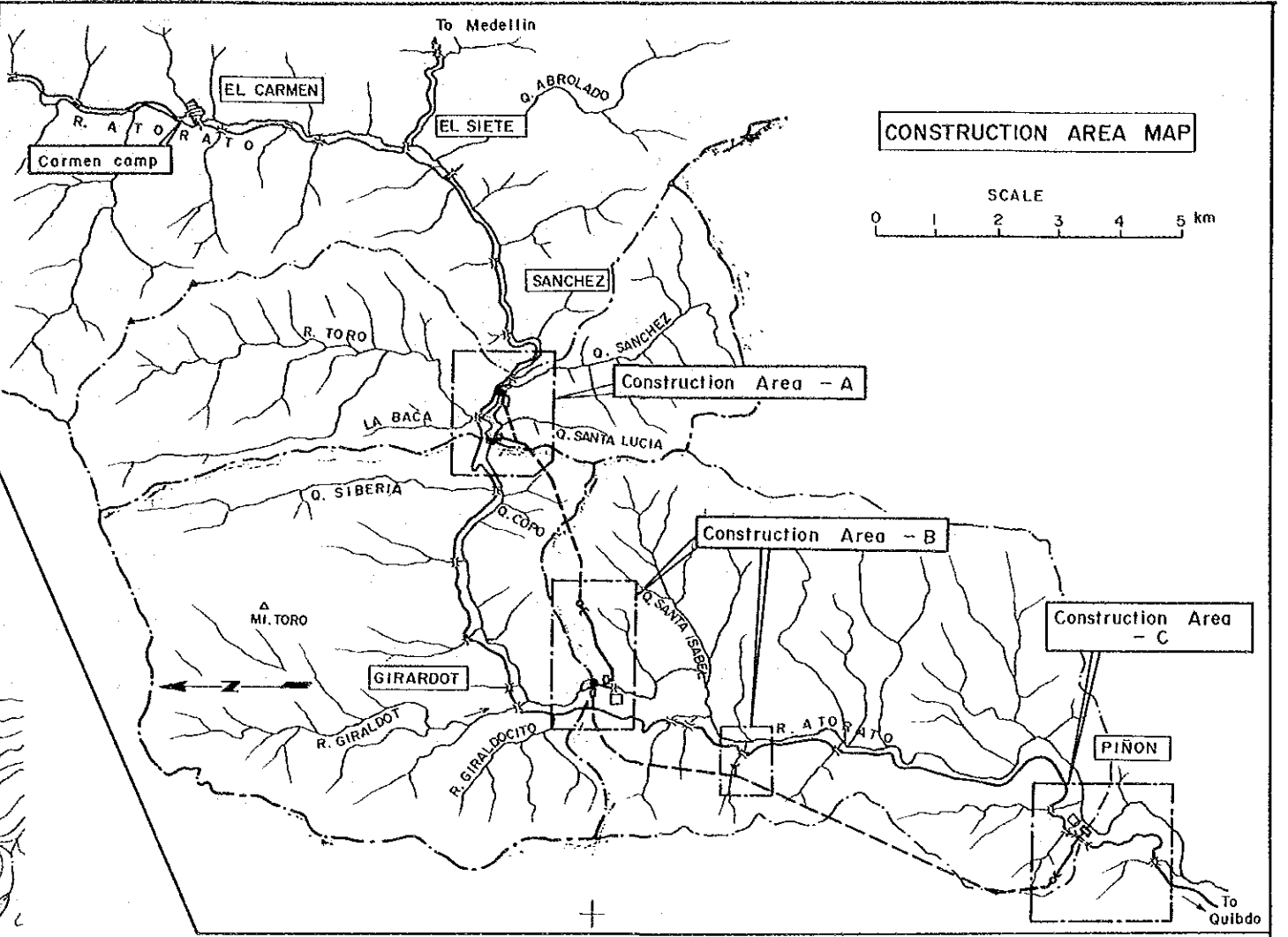
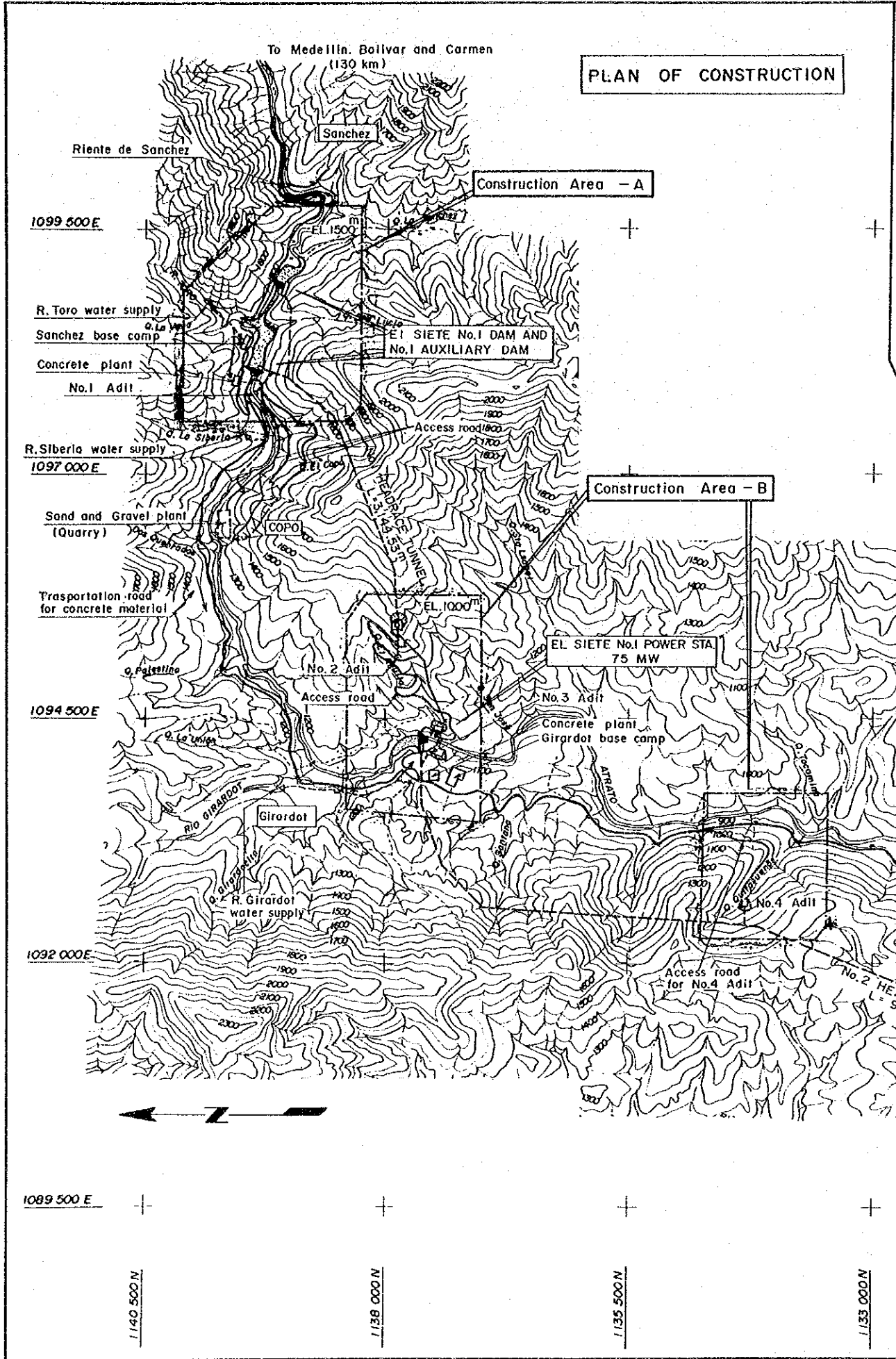
SECTION B - B



JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 SWITCHYARD
 PLAN AND SECTIONS
 ELECTRIC POWER DEVELOPMENT CO. LTD
 TOKYO, JAPAN

LOCATION	DATE	DESCRIPTION	BY
		REVISION	

Dwg. - 43



JAPAN INTERNATIONAL COOPERATION AGENCY			
INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA			
ATRATO HYDRO ELECTRIC POWER PROJECT			
CONSTRUCCION PLAN			
ELECTRIC POWER DEVELOPMENT CO., LTD. TOKYO, JAPAN			
Dwg.-44			
LOCATION	DATE	DESCRIPTION	BY
		REVISION	

El. Siete NO.1 Hydro Electric Power Station's Construction Schedule

Item	Quantity	1985												1986												1987												1988												1989												1990												1991												1992												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Study, Preparation of tender & Contract		Feasibility study (in Tokyo, by JICA) [1985] → Definite design & tender document [1986] → Bidding open & Negotiation [1988] → Contract of civil works [1989]																																																																																																
I-1 Preparation works		Land acquisition [1985] → Relocation road (open) [1985] → Bridge & Access road [1985] → Electric power supply system [1985] → Camp [1985] → Communication system [1985]																																																																																																
A- El. Siete NO.1 Power station		II-1. NO.1 dam core of river, Diversion Tunnel 357 m [1988] → II-2. NO.1 dam H=55m [1988] → II-3 NO.1 Aux. Intake dam H=25m [1988] → III-1 NO.1 Intake [1988] → III-2 Auxiliary Sedimentation Basin [1988] → III-3 Auxiliary Connection tunnel L=859m [1988] → III-4 NO.1 Headrace tunnel [1988] → III-5 NO.1 Surge tank H=45.05m [1988] → III-6 NO.1 Penstock tunnel L=178m [1988] → III-8 Tailrace tunnel L=185m [1988] → III-9 NO.1 Sub-station [1988] → III-7 NO.1 Power station [1988] → Architecture [1988] → Turbine [1988] → Generator [1988] → Other Equipment [1988] → Bridge L=95m, B=5m [1988] → Test [1992] → Commercial operation [1992]																																																																																																

- Symbols**
- Preparation works by Contractor.
 - ▽ Fab Machine & Equipment fabrication.
 - ⇄ Transportation in sea & inland.
 - ⇄ Installation of machine & Equip.
 - ⇄ Civil works
 - Access Access road's construction by contractor.
 - ▽ Contract
 - ⊙ Commercial operation.

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO - ELECTRIC POWER PROJECT
 EL SIETE NO.1 POWER STATION
 CONSTRUCTION SCHEDULE

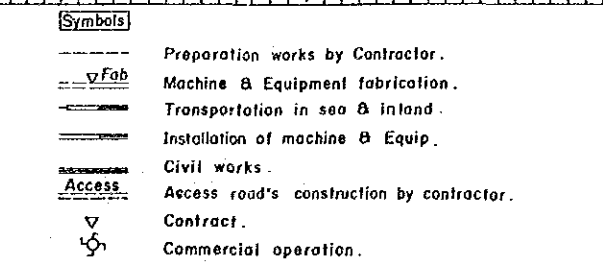
ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO, JAPAN

Dwg. - 45

LOCATION	DATE	DESCRIPTION	BY
REVISION			

EI. Siete NO.2 Hydro Electric Power Station's Construction Schedule

Item	Quantity	1985												1986												1987												1988												1989												1990												1991												1992												Remarks
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	
Study, Preparation of tender & contract		Feasibility study (in Tokyo, by JICA) [1985.1-1986.12] Government approve [1986.1-1986.12] ICCEL ISA approve [1986.1-1986.12] Definite design & tender document (include the field survey) [1986.1-1987.12] Procurement of const fund [1987.1-1987.12] Preparation of tender [1987.1-1988.12] Bidding opening Negotiation [1988.1-1988.12] Proposal [1988.1-1988.12] Contract of Civil works [1988.1-1989.12] Preparation works [1989.1-1989.12]																																																Commercial operation																																																
I-1 Preparation works		Land acquisition [1988.1-1988.12] Relocation road (open) 0.1 km [1988.1-1988.12] Relocation road (tunnel) 0.17 km [1988.1-1988.12] Bridge & Access road 8.10 km [1988.1-1988.12] Electric power supply system LS [1988.1-1988.12] Camp LS [1988.1-1988.12] Communication system LS [1988.1-1988.12]																																																																																																
B - EI. Siete NO.2 Power station		II-1 NO.2 Intake dam and NO.2 Intake H=35m Excavation 226,590 m ³ Concrete 60,070 m ³ II-2 NO.2 Sedimentation Basin Excavation 9,950 m ³ Concrete 9,950 m ³ III-2 NO.2 Headrace tunnel NO.3 Adit LA=280m, LI=2,250m Excavation 38,070 m ³ Concrete 15,180 m ³ NO.4 Adit LA=200m, LI=Up=2,250m, Down=2,300m Excavation 76,990 m ³ Concrete 30,700 m ³ NO.5 Adit LA=265m, LI=2,309m Excavation 39,060 m ³ Concrete 15,580 m ³ II-3 NO.2 Surge tank H=50.27m Excavation 15,650 m ³ Concrete 2,430 m ³ II-4 NO.2 Penslock tunnel L=67m, Steel pipe Line L=1,301m Excavation 74,150 m ³ Concrete 9,610 m ³ Steel pipe Line 2,150 ton III-6 NO.2 Substation Banking 28,200 m ³ Excavation 49,600 m ³ Concrete 3,340 m ³ Equipment III-5 NO.2 Power station Excavation 71,800 m ³ Concrete 9,420 m ³ Architecture Turbine Generator Other Equipment Test																																																																																																



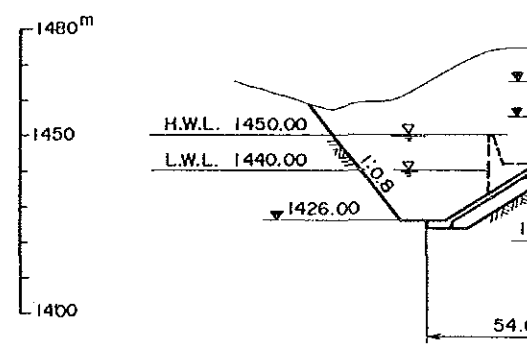
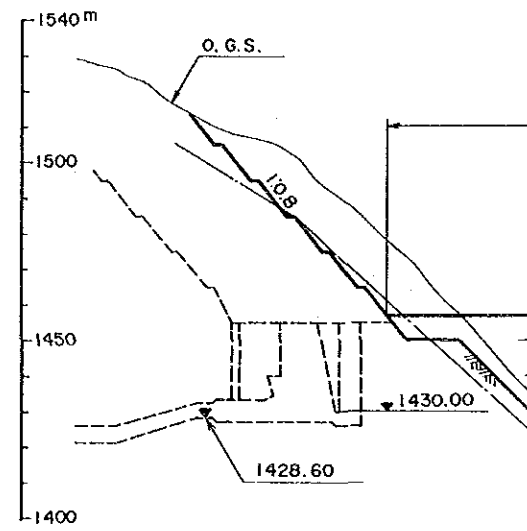
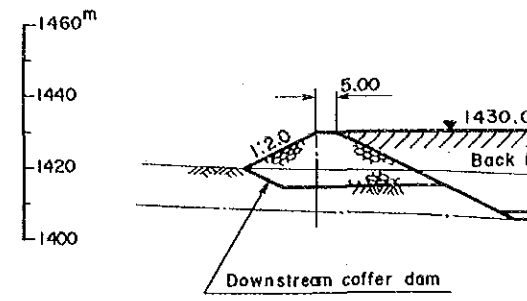
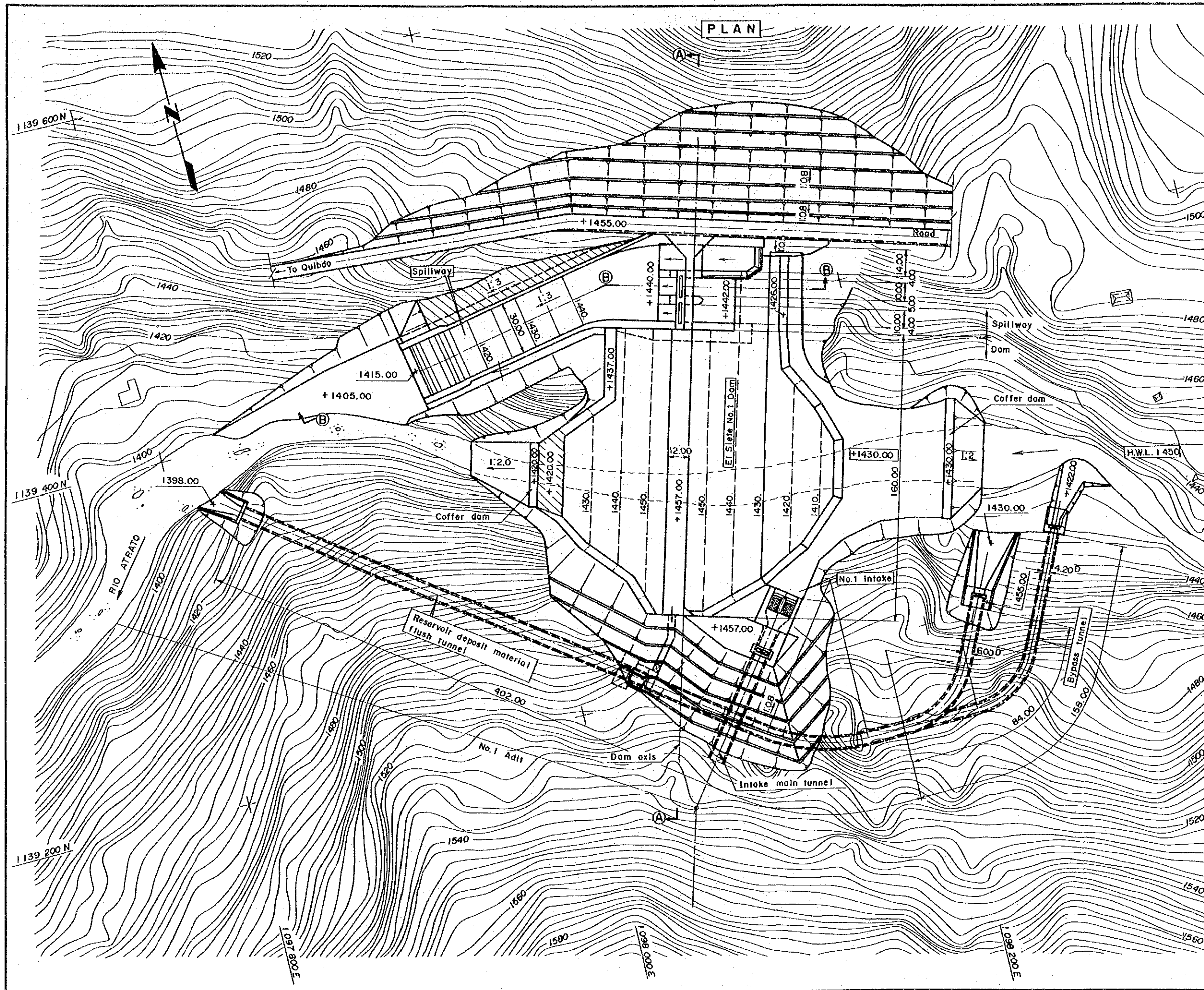
- Symbols**
- Preparation works by Contractor.
 - Fab Machine & Equipment fabrication.
 - Transportation in sea & inland.
 - Installation of machine & Equip.
 - Civil works.
 - Access road's construction by contractor.
 - ▽ Contract.
 - ⊙ Commercial operation.

JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO-ELECTRIC POWER PROJECT
 EL SIETE NO.2 POWER STATION
 CONSTRUCTION SCHEDULE

ELECTRIC POWER DEVELOPMENT CO., LTD
 TOKYO, JAPAN

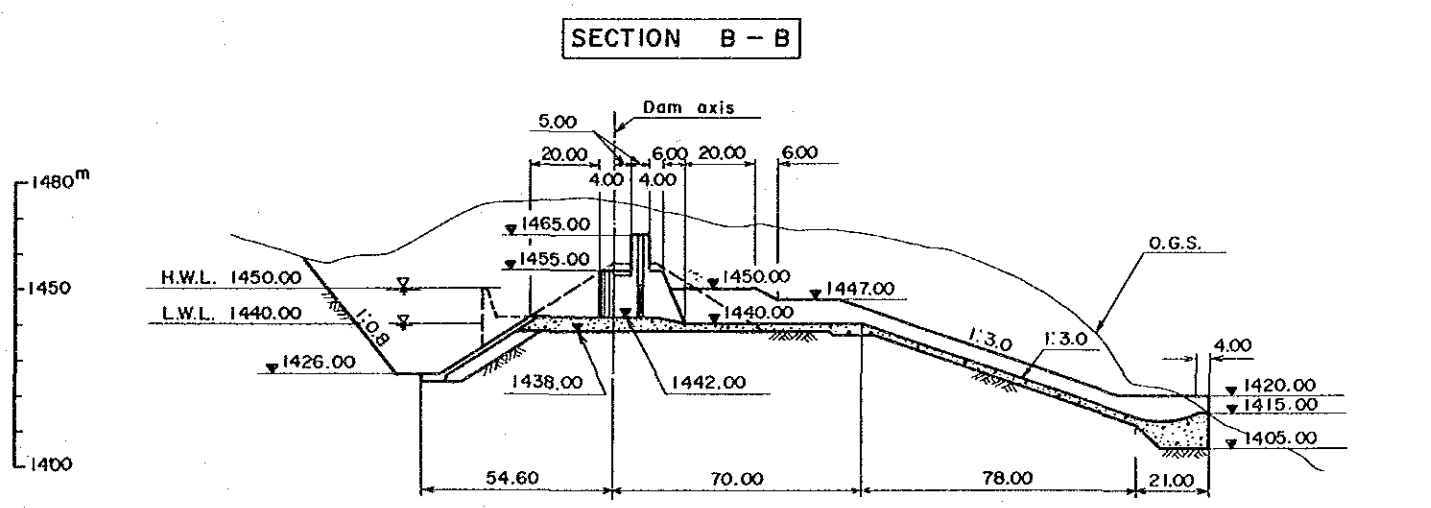
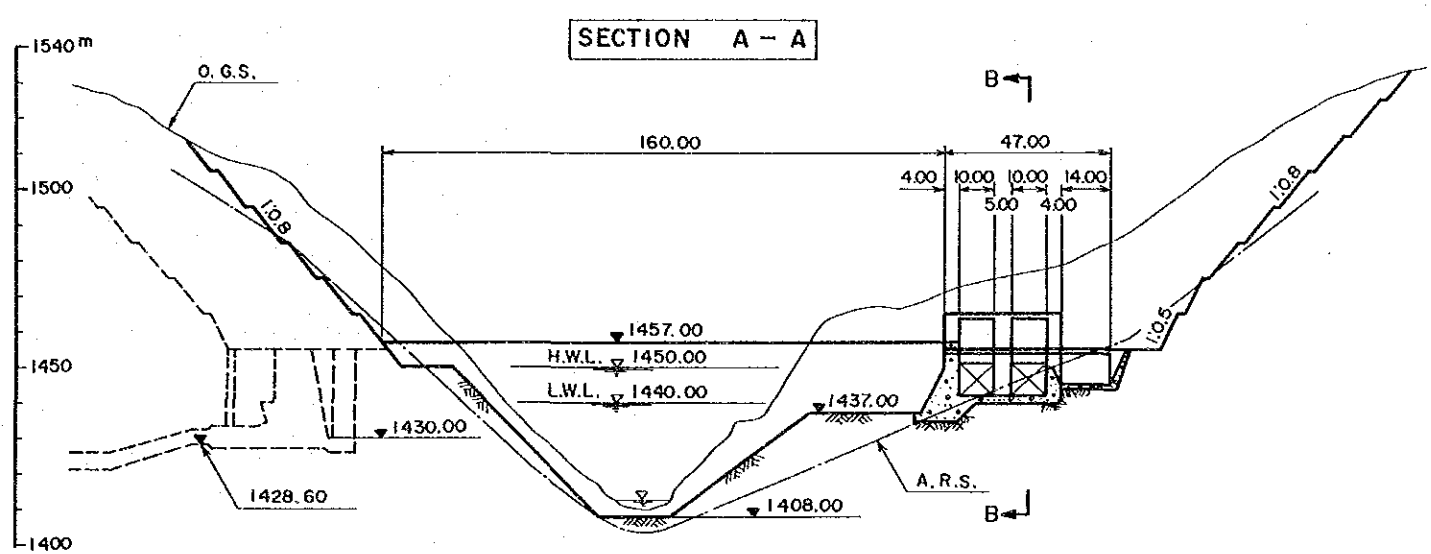
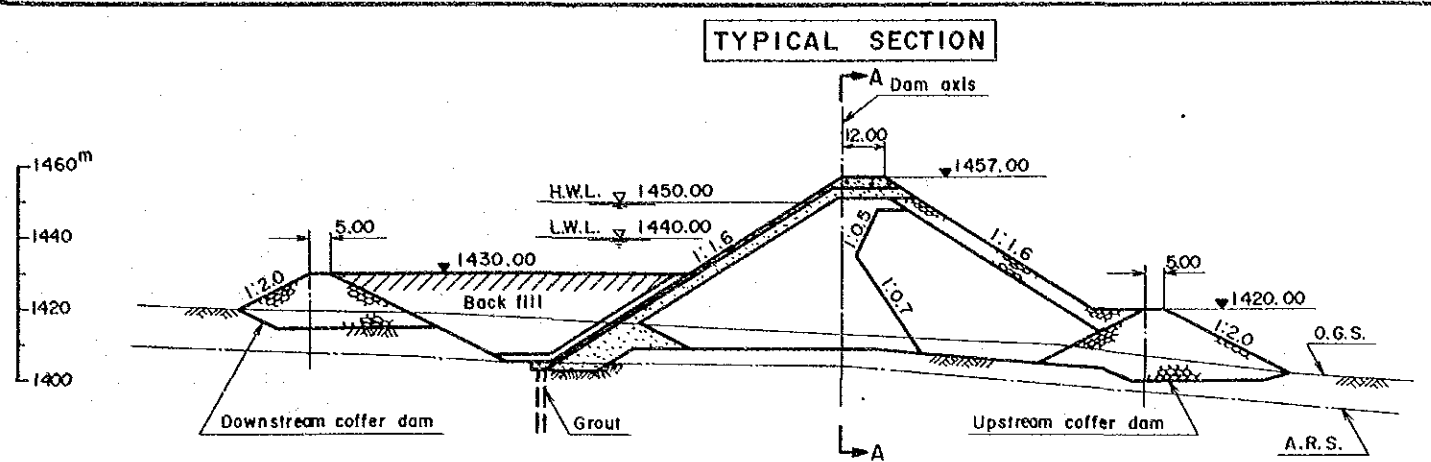
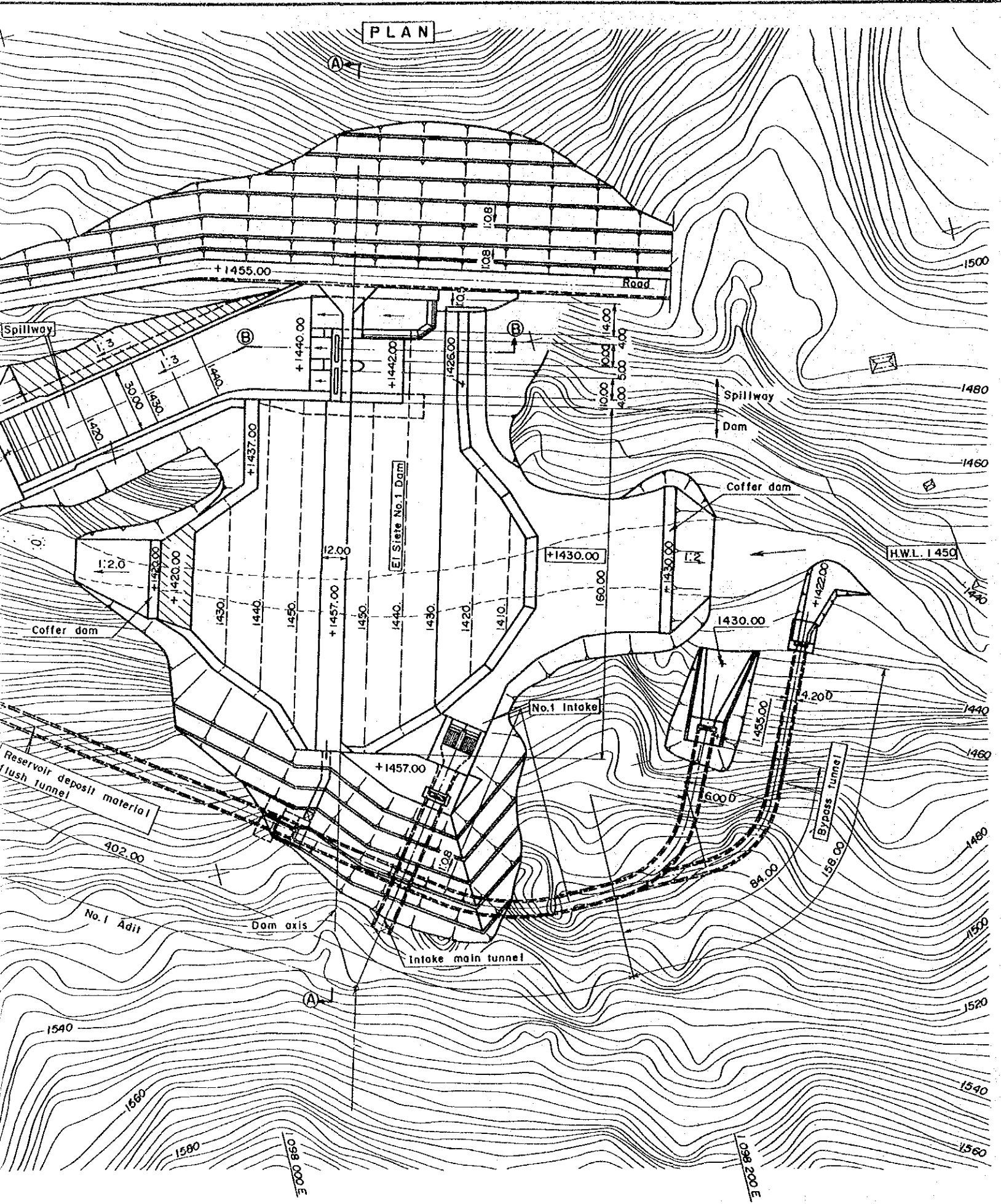
Dwg.-46

LOCATION	DATE	DESCRIPTION	BY
REVISION			



O.G.S. ; Original ground surface
A.R.S. ; Assumed rock surface

LOCATE



O.G.S. ; Original ground surface
 A.R.S. ; Assumed rock surface



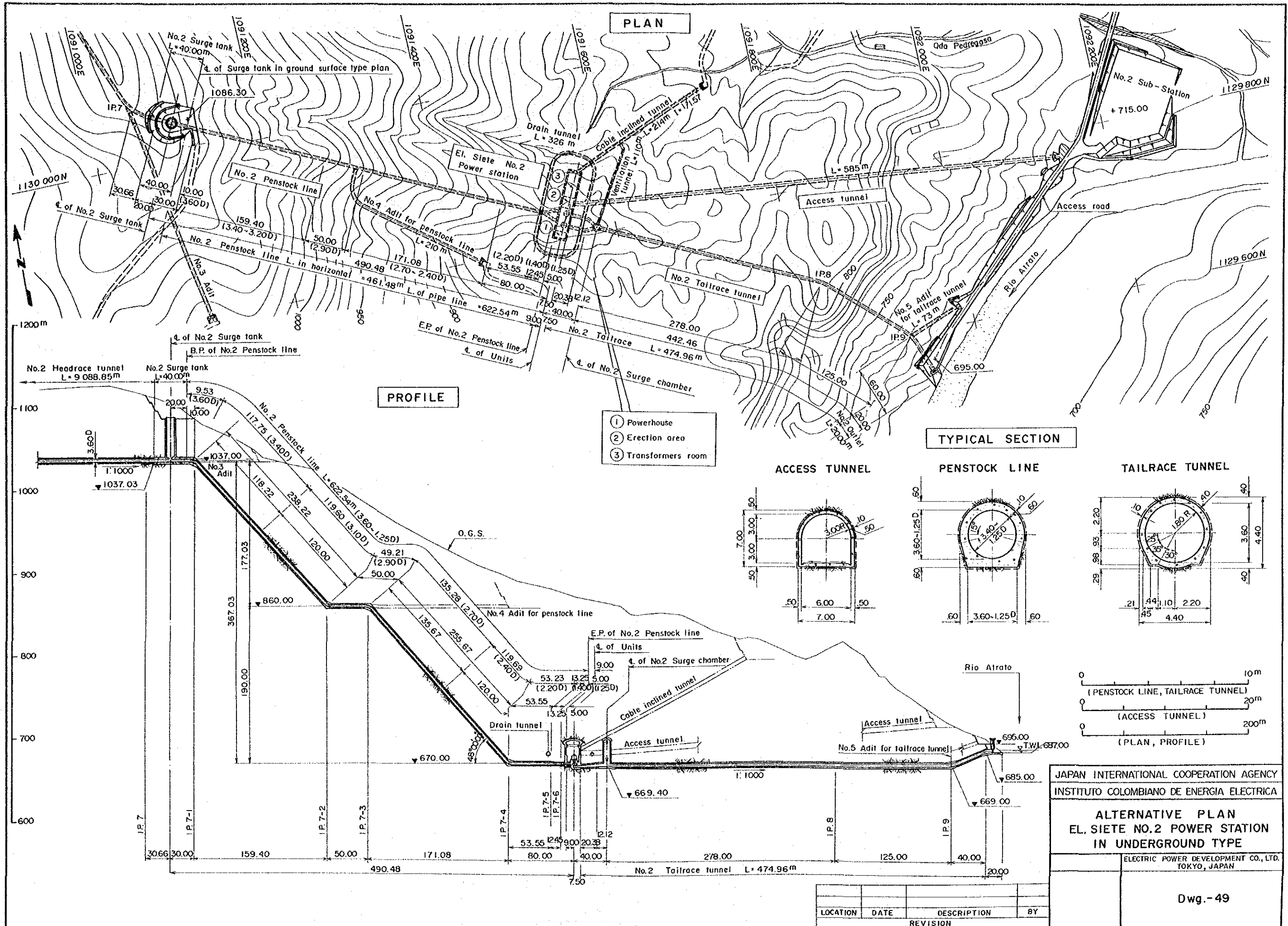
JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA

ATRATO HYDRO-ELECTRIC POWER PROJECT
 ALTERNATIVE PLAN
 EL SIETE NO.1 CONCRETE FACING DAM

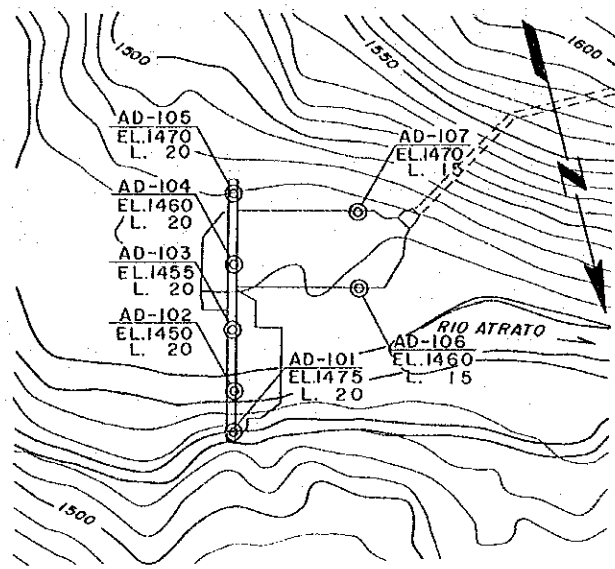
ELECTRIC POWER DEVELOPMENT CO., LTD.
 TOKYO, JAPAN

Dwg.-47

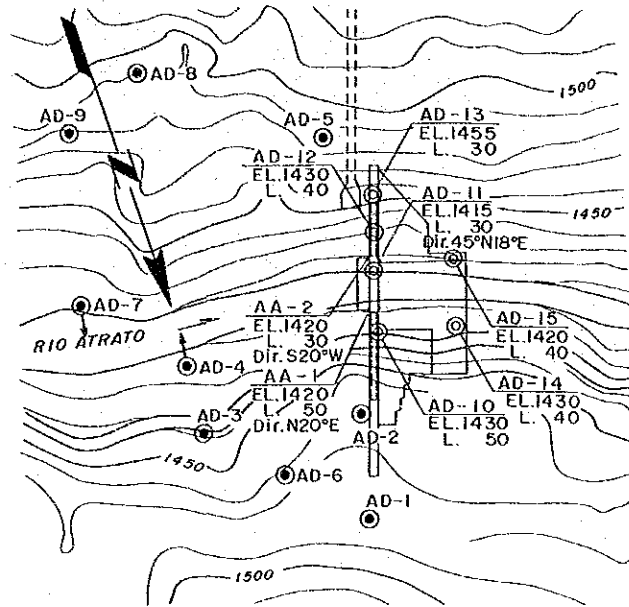
NO.	LOCATION	DATE	DESCRIPTION	BY



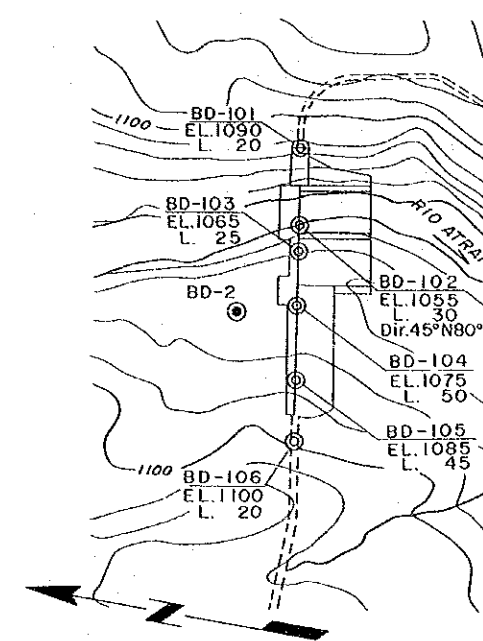
EL SIETE NO.1 AUXILIARY DAM



EL SIETE NO.1 DAM



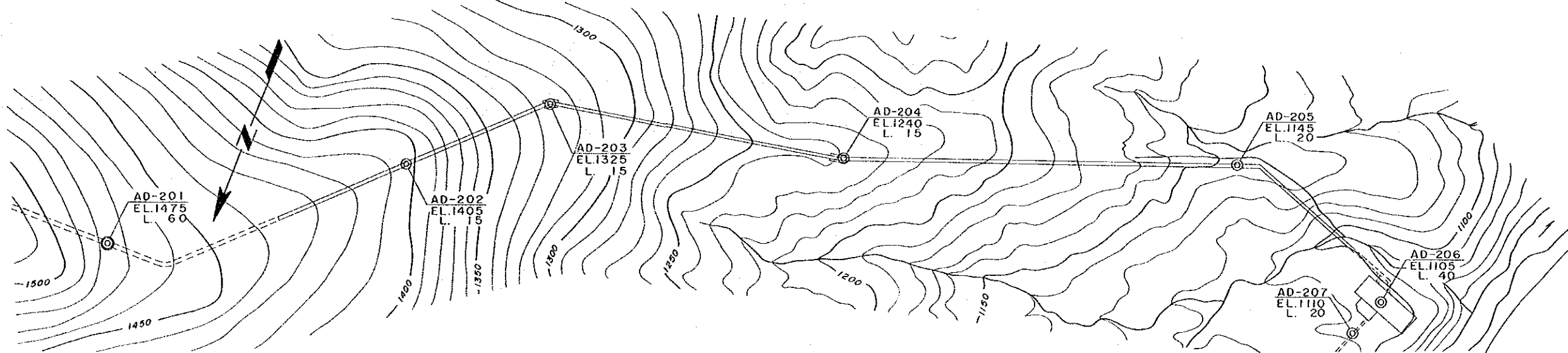
EL SIETE NO.2 INTAKE DAM



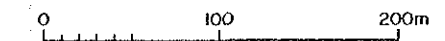
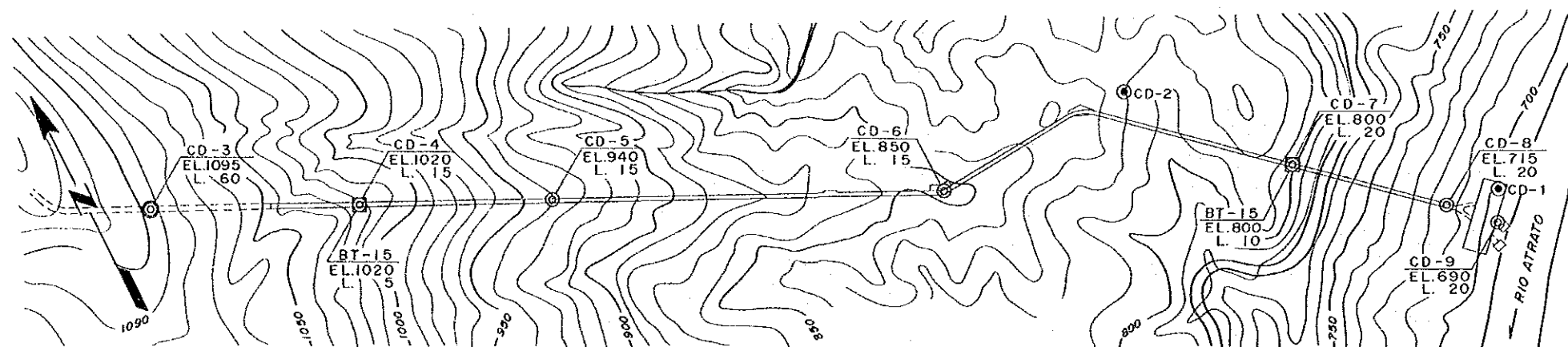
LEGEND

- Drill hole (Proposed for definite design)
 - AD- : Name of Hole
 - EL. : Elevation (m)
 - L. : Length of Hole (m)
 - Dir. : Direction
- AD- : Drillhole (Completed)
- Adit (Proposed for definite design)
 - AA- : Name of Adit
 - EL. : Elevation (m)
 - L. : Length of Adit (m)
 - Dir. : Direction
- Pit (Proposed for definite design)
 - BT- : Name of Pit
 - EL. : Elevation (m)
 - L. : Depth of Pit

EL SIETE NO.1 SURGE TANK, PENSTOCK AND POWERHOUSE



EL SIETE NO.2 SURGE TANK, PENSTOCK AND POWERHOUSE



JAPAN INTERNATIONAL COOPERATION AGENCY
 INSTITUTO COLOMBIANO DE ENERGIA ELECTRICA
 ATRATO HYDRO ELECTRIC POWER PROJECT
 LOCATION OF PROPOSED SUBSURFACE
 INVESTIGATION WORKS
 OF EL SIETE NO.1 AND NO.2 PROJECT

ELECTRIC POWER DEVELOPMENT Co., LTD
 TOKYO JAPAN

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