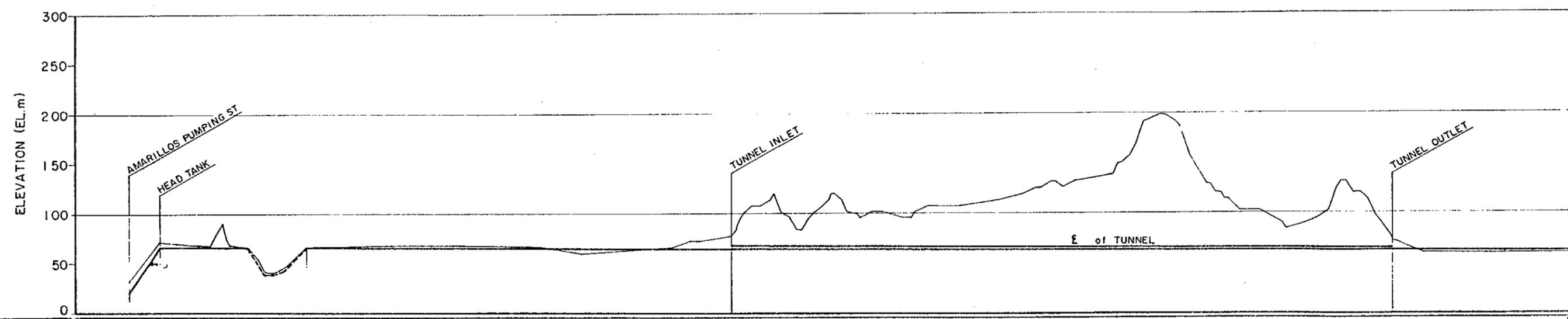
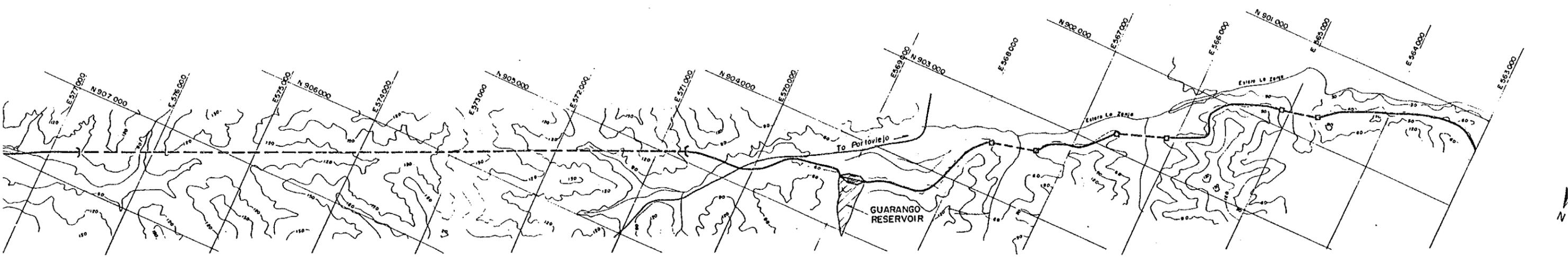


PLAN SCALE A

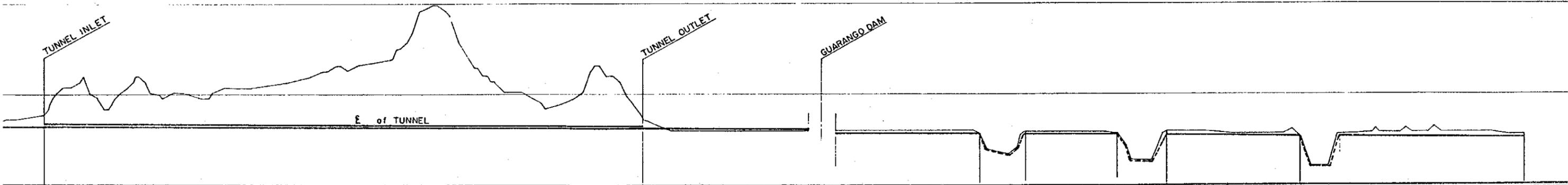


TYPE OF STRUCTURE	PIPELINE 2 ϕ 1,400		OPEN CHANNEL Q = 5.5 m ³ /s B = H = 2.0 m	SYPHON Q = 5.3 m ³ /s	OPEN CHANNEL Q = 5.3 m ³ /s B = H = 2.0 m I = 1/3,000										TUNNEL L = 6,600 m D = 2.5 m Q = 5.3 m ³ /s I = 1/3,000		OPEN CHANNEL L = 1,800 m I = 1/3,000 B = H = 2.0 m CONCRETE CLOSE PROFILU L = 60 m		
ELEVATION OF FORMATION (EL.m)	19.66	66.86	66.45	65.74	65.41	65.07	64.74	64.41	64.33	64.21	63.88	63.54	63.21	62.88	62.54	62.21	62.00	61.79	61.77
ELEVATION OF GROUND (EL.m)	32.00	72.00	66.00	66.00	66.00	66.00	66.00	70.00	72.00	120.00	108.00	126.00	170.00	110.00	114.00	72.00	59.00	59.00	59.00
ACCUMULATED DISTANCE (m)	0	300	1180	1730	2730	3730	4730	5730	5950	6950	7950	8950	9950	10950	11950	12550	13170	13230	13230
DISTANCE (m)	0	300	880	550	1000	1000	1000	1000	220	1000	1000	1000	1000	1000	1000	600	620	60	60
STATION	0+000	0+300	1+180	1+730	2+730	3+730	4+730	5+730	5+950	6+950	7+950	8+950	9+950	10+950	11+950	12+550	13+170	13+230	13+230

PROFILE H : SCALE A
V : SCALE B



PLAN SCALE A



TUNNEL			GUARANGO DAM			SYPHON		SYPHON		SYPHON		SYPHON		SYPHON															
L = 6,600m D = 2.5m Q = 5.3m ³ /s I = 1/3,000			L = 1,800m CONCRETE CLOSE PROFILU L = 60m I = 1/3,000 B * H = 20m			Q = 6.75m ³ /s B * H = 2.1m I = 1/3,000		Q = 6.5m ³ /s # 2,000		Q = 6.25m ³ /s B * H = 2.1m # 2,000		Q = 6.0m ³ /s B * H = 2.05m # 2,000		Q = 5.75m ³ /s B * H = 2.0m # 2,000		Q = 5.5m ³ /s B * H = 2.0m # 2,000		Q = 5.25m ³ /s B * H = 2.0m		Q = 5.0m ³ /s B * H = 1.95m									
5+730	1000	64.41	11+950	1000	62.21	16+200	1350	56.27	17+700	1000	54.75	18+240	540	53.69	19+200	960	53.37	20+130	430	52.53	21+140	1010	52.19	22+150	1010	51.85			
5+950	220	64.33	10+950	1000	62.54	14+350	1800	56.00	16+700	500	55.08	17+700	1700	56.50	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
6+950	1000	63.88	9+950	1700	62.88	12+350	7200	61.40	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
7+950	1000	63.54	8+950	12600	63.21	13+170	620	61.79	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
8+950	1000	63.21	7+950	10800	63.54	13+230	60	61.77	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
9+950	1000	62.88	6+950	12000	63.88	14+650	300	56.80	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
5+730	1000	64.41	5+730	7000	64.41	14+350	1800	61.40	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
5+950	220	64.33	5+950	7200	64.33	12+350	7200	61.40	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
6+950	1000	63.88	6+950	12000	63.88	13+170	620	61.79	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
7+950	1000	63.54	7+950	10800	63.54	13+230	60	61.77	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
8+950	1000	63.21	8+950	12600	63.21	14+650	300	56.80	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
9+950	1000	62.88	9+950	17000	62.88	14+350	1800	61.40	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
10+950	1000	62.54	10+950	11000	62.54	12+350	7200	61.40	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
11+950	1000	62.21	11+950	11400	62.21	13+170	620	61.79	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00
12+550	600	62.00	12+550	7200	62.00	13+230	60	61.77	16+200	5600	56.00	17+700	5600	56.00	18+240	5600	56.00	19+200	5600	56.00	20+130	5400	54.00	21+140	6000	60.00	22+150	5500	55.00

PROFILE H : SCALE A
V : SCALE B

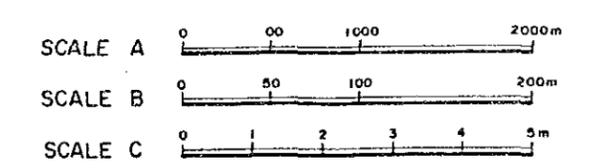
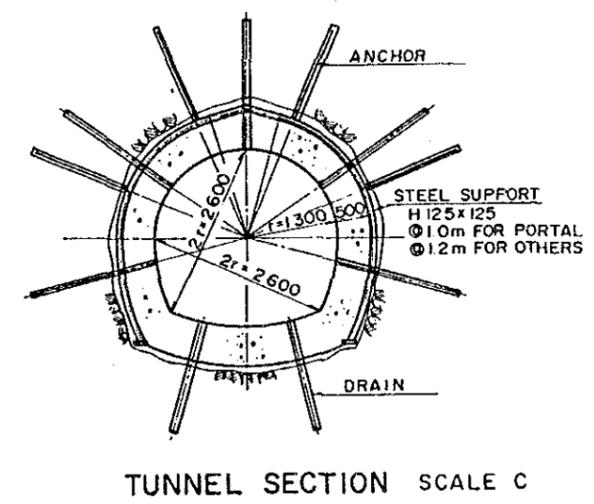
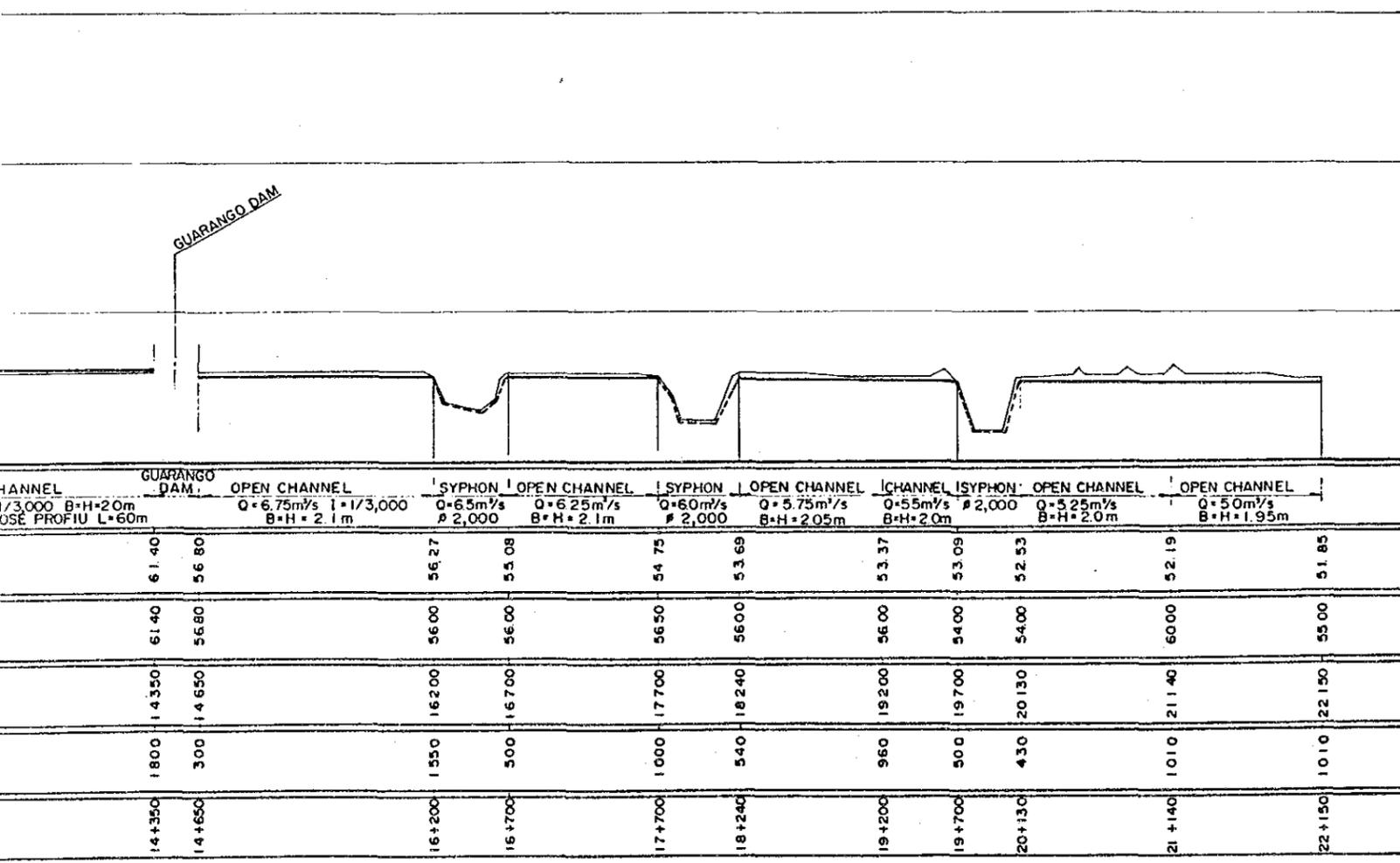
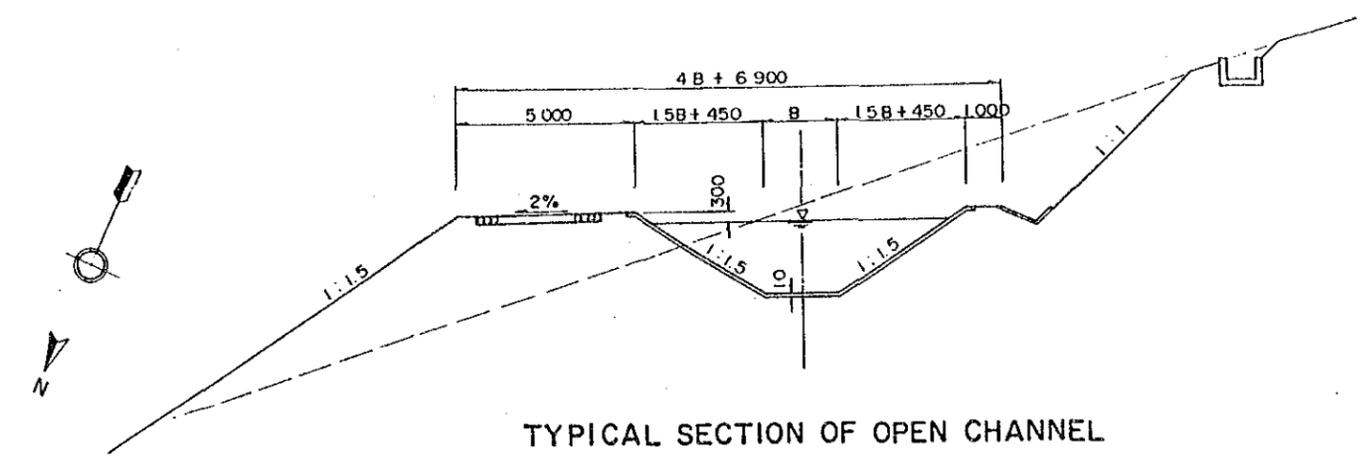
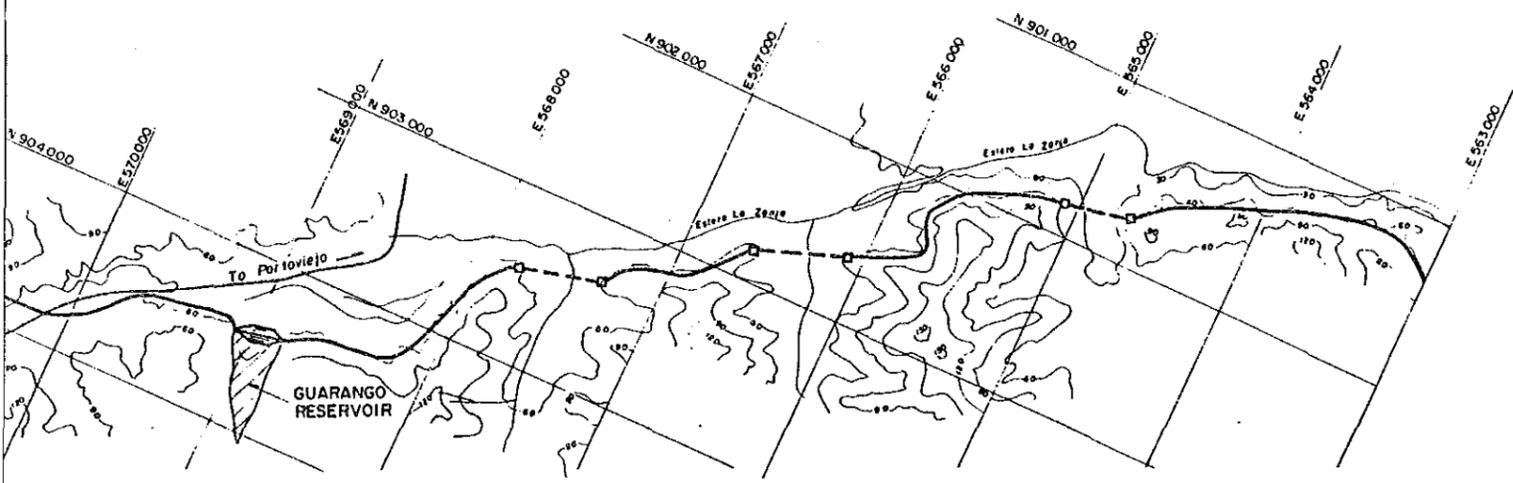
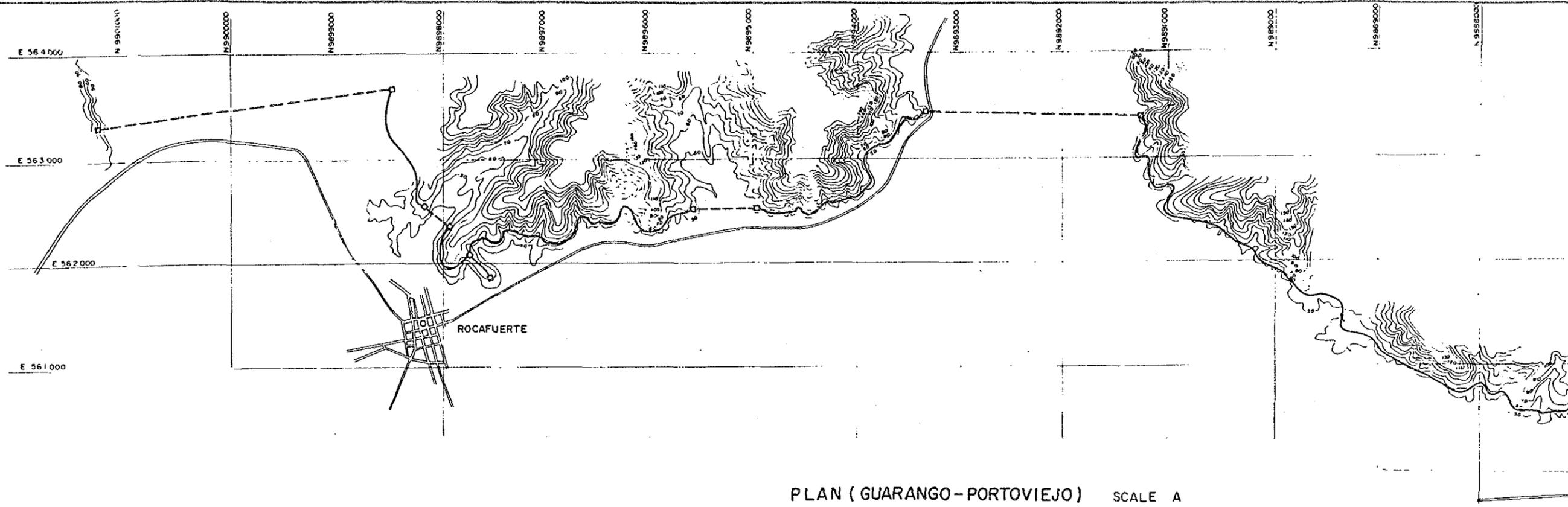
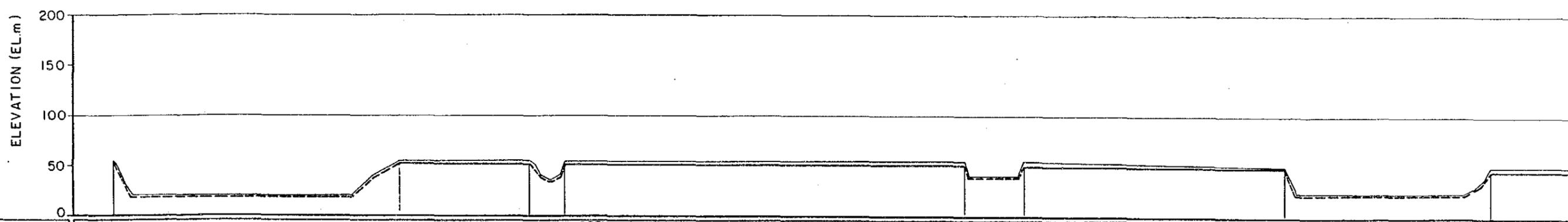


Fig. 1.14 Diseño Preliminar del Esquema de Traslase "Los Amarillos - Guarango"

GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
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 JAPAN INTERNATIONAL COOPERATION AGENCY

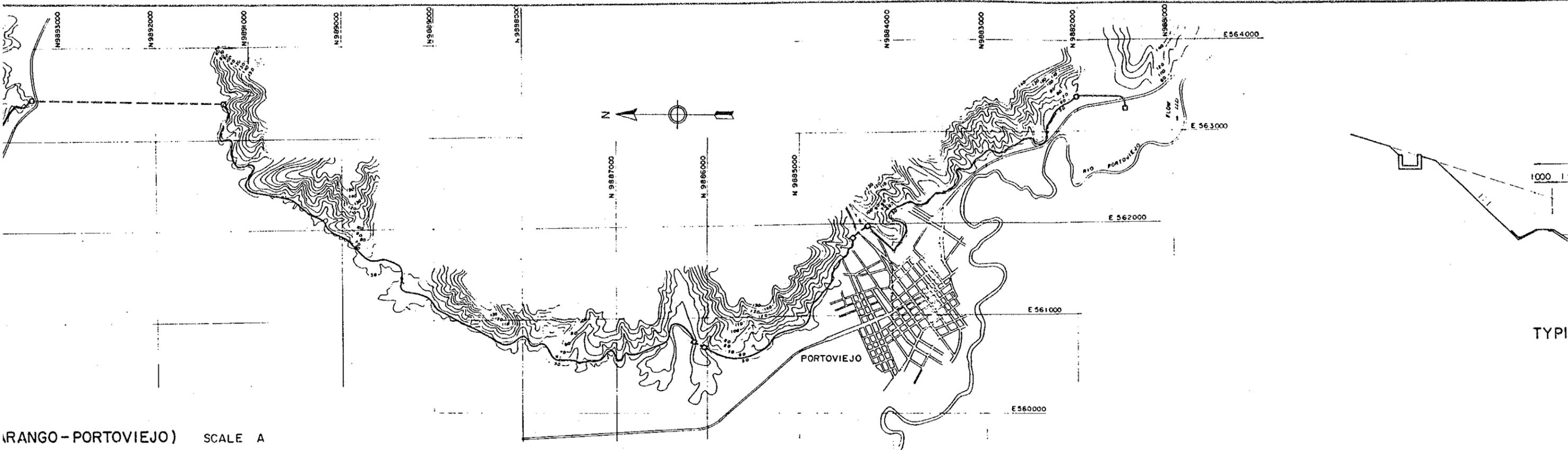


PLAN (GUARANGO-PORTOVIEJO) SCALE A

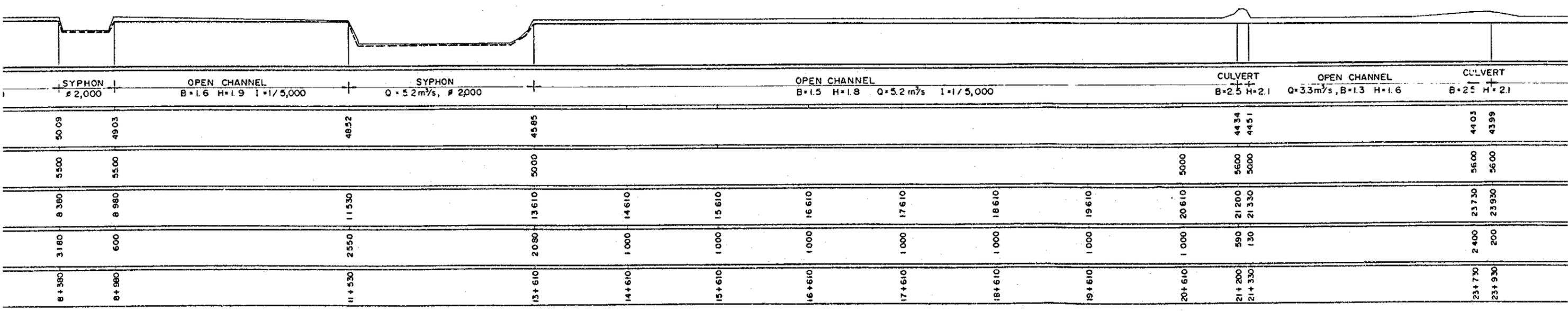


TYPE OF STRUCTURE	SYPHON $Q=9.9m^3/s$ ϕ 2,900		OPEN CHANNEL $B=2.0$ $I=1/5,000$ ϕ 2,900 $H=2.3$		SYPHON ϕ 2,900		OPEN CHANNEL $Q=5.6m^3/s$ $B=1.6$ $H=1.9$ $I=1/5,000$		SYPHON ϕ 2,000		OPEN CHANNEL $B=1.6$ $H=1.9$ $I=1/5,000$		SYPHON $Q=5.2m^3/s$ ϕ 2,000	
ELEVATION OF FORMATION (EL.m)	53.00	51.15	50.90	50.55	50.73	50.09	49.03	48.52	45.85					
ELEVATION OF GROUND (EL.m)	55.00	55.00	55.00	55.00	55.00	55.00	55.00	55.00	50.00					50.00
ACCUMULATED DISTANCE (m)	0	2,800	4,070	4,410	5,200	8,380	8,980	11,530	13,610					
DISTANCE (m)	0	2,800	1,270	340	790	3,180	600	2,550	2,080					
STATION	0+000	2+800	4+070	4+410	5+200	8+380	8+980	11+530	13+610					

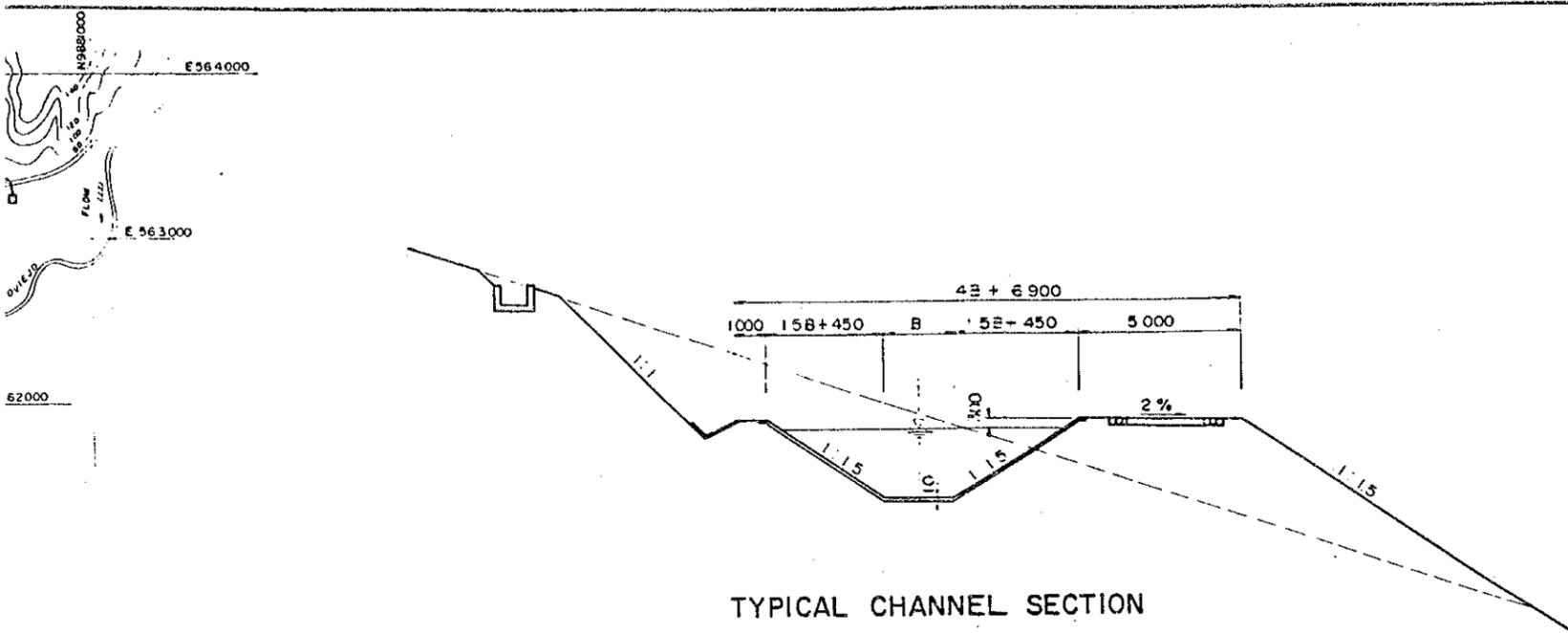
PROFILE H SCALE A
V SCALE B



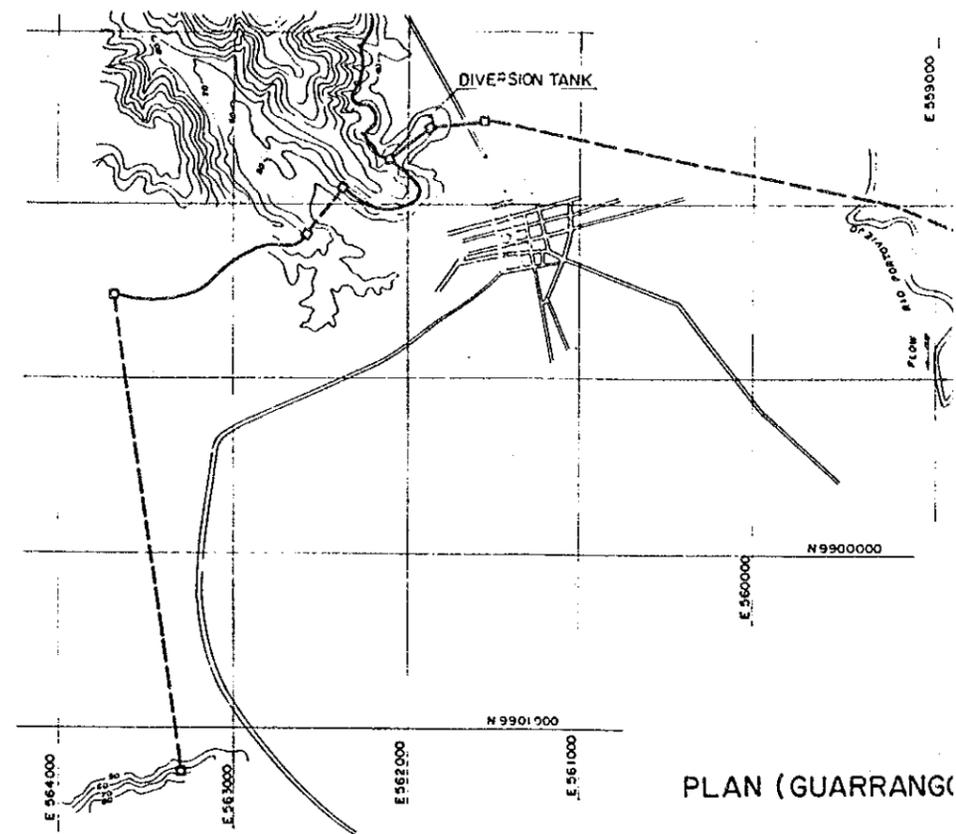
(RANGO - PORTOVIEJO) SCALE A



PROFILE H SCALE A
V SCALE B

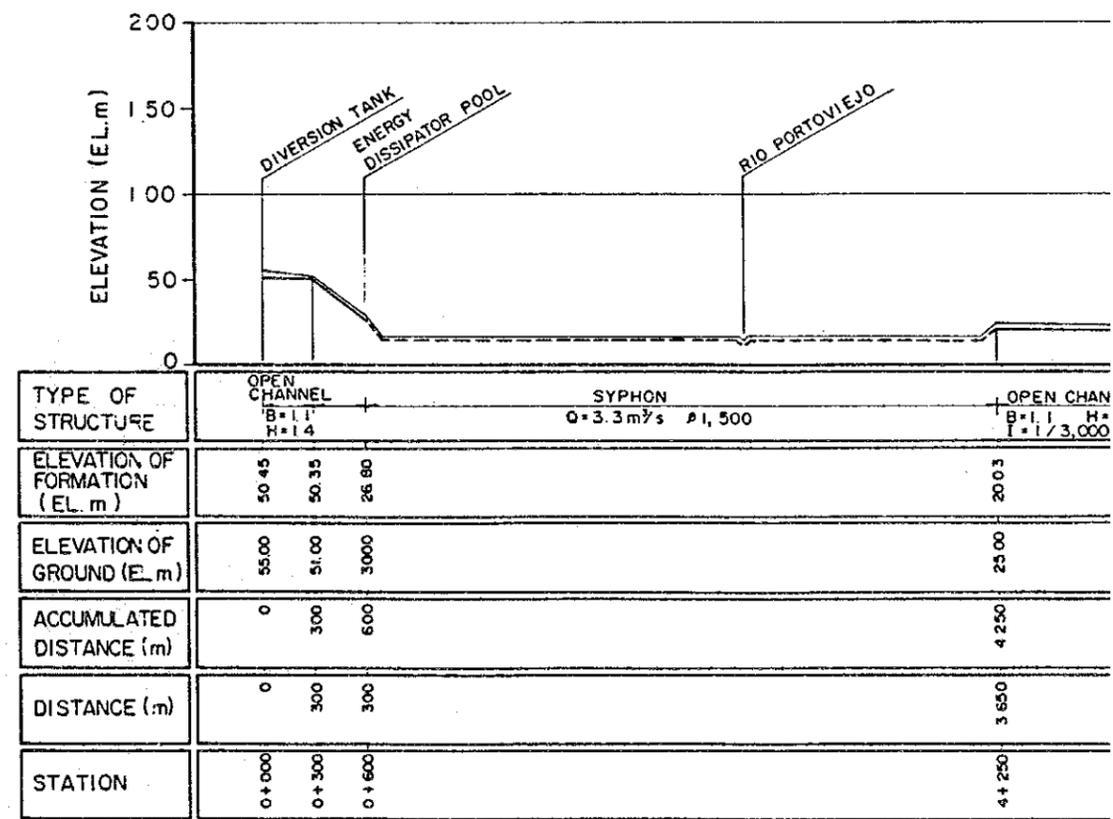


TYPICAL CHANNEL SECTION



PLAN (GUARRANG)

		4 ESQUINAS WATER TREATMENT PLANT			
		CULVERT	OPEN CHANNEL	CULVERT	OPEN CHANNEL
		B=2.5 H=2.1	Q=3.3m ³ /s, B=1.3 H=1.6	B=2.5 H=2.1	B=1.3 H=1.6 I=1/5,000
		44.34 44.51	44.03 43.99	43.13 42.30	
		5000	5600 5000	5000 4300	
		20 610	21 200 21 330	27 960 28 560	
		1 000	2 400 200	4 030 600	
		20+610	21+200 21+330	27+960 28+560	



PROFILE H : SCALE A
V : SCALE B

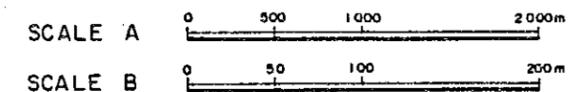
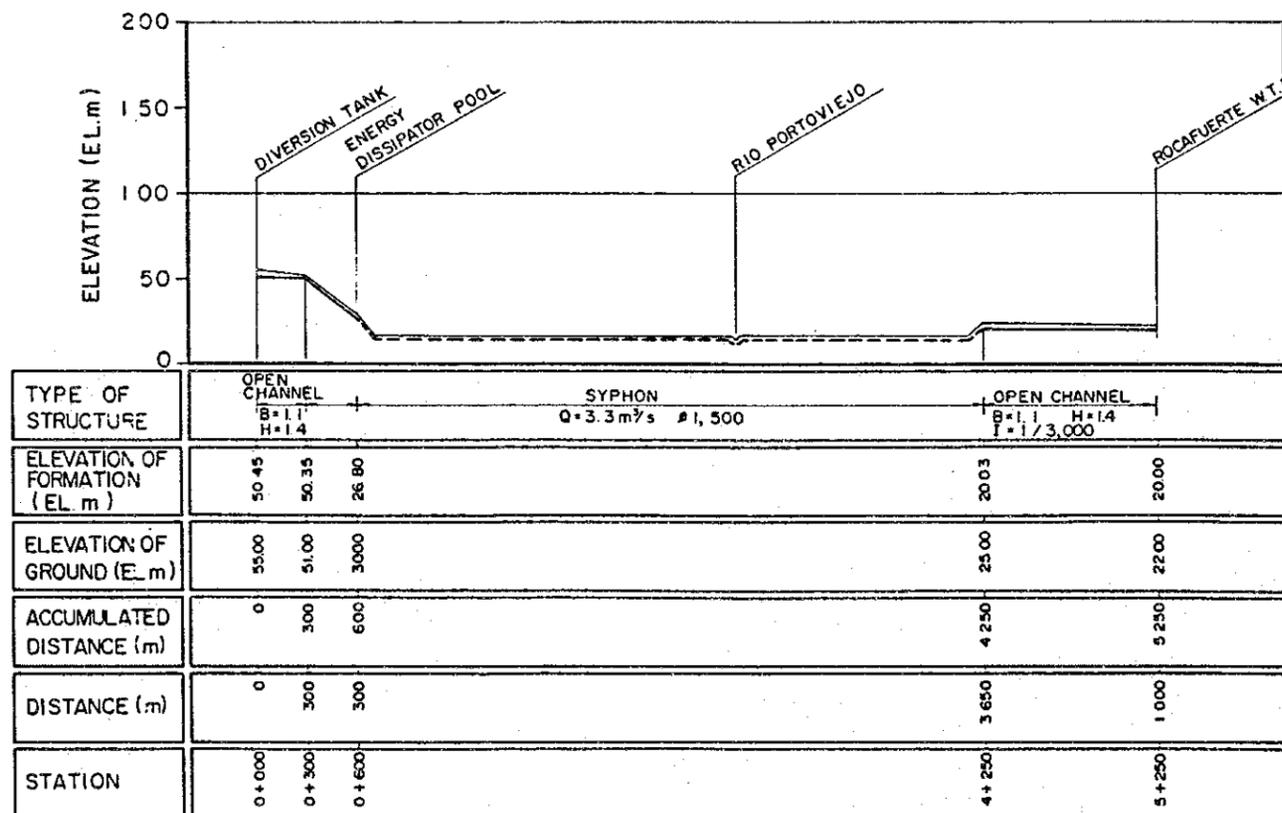
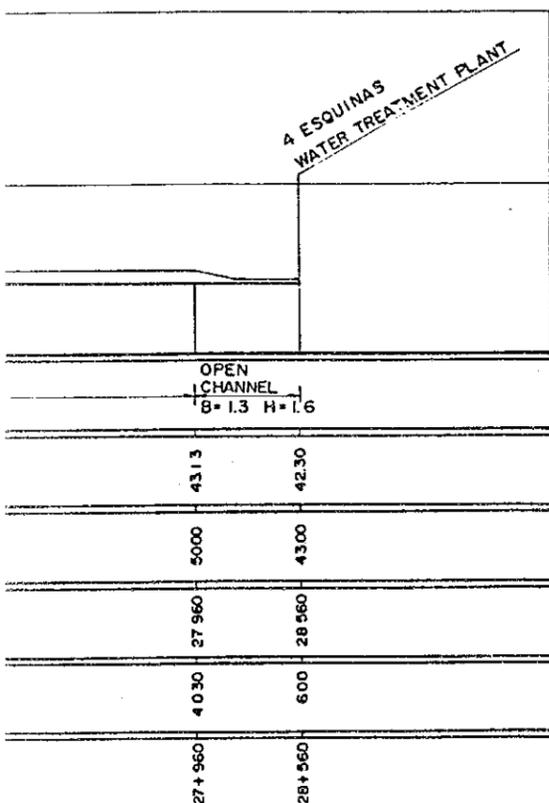
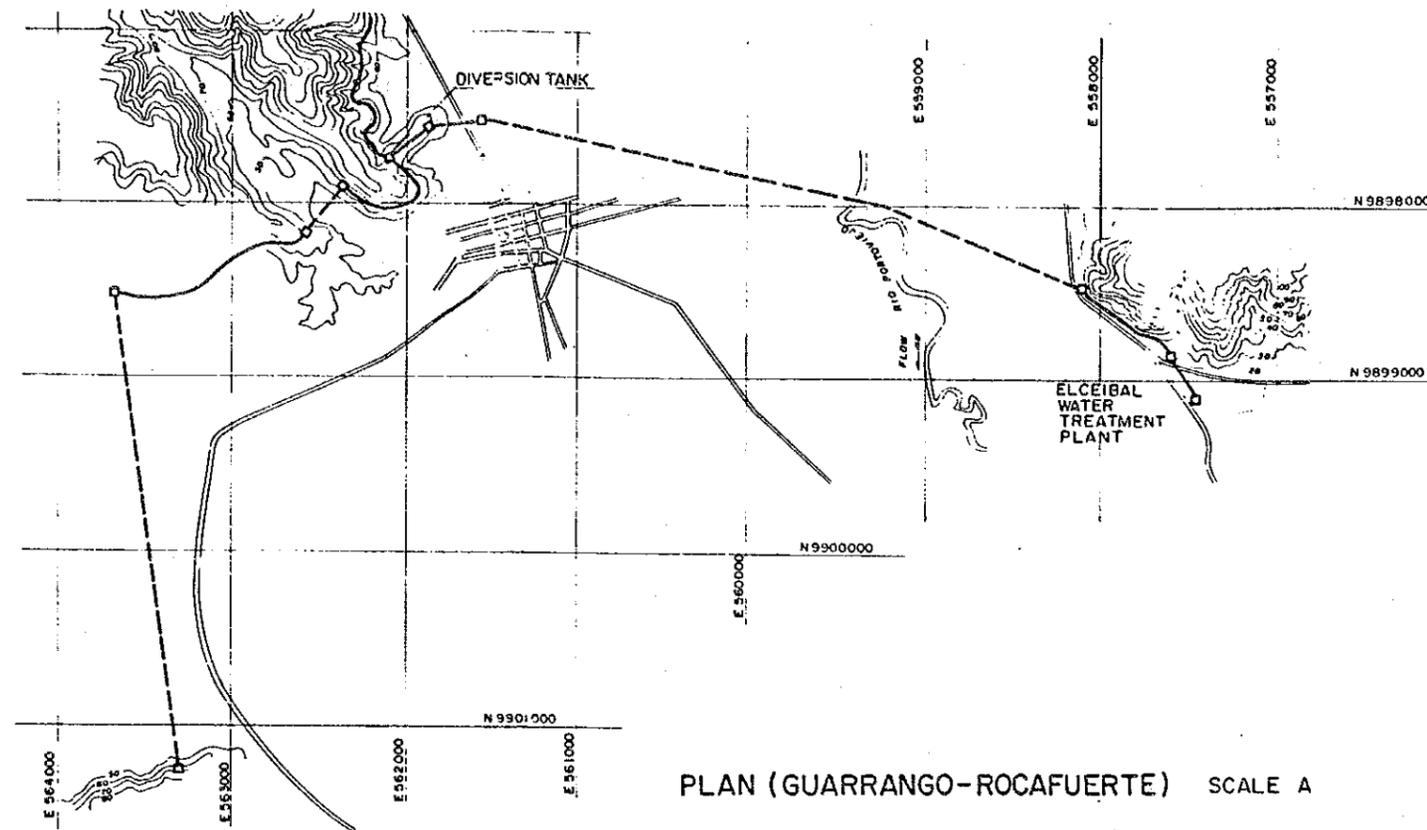
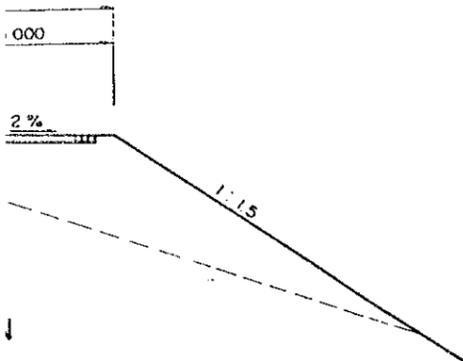


Fig. I.15 Diseño Preliminar del Esquema de Trasvase "Guarango - Rocafuerte - Portoviejo"

PROFILE H : SCALE A
V : SCALE B

GOVERNMENT OF THE REPUBLIC OF ECUADOR
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THE FEASIBILITY STUDY ON THE WATER
RESOURCES DEVELOPMENT FOR
CHONE-PORTOVIEJO RIVER BASINS
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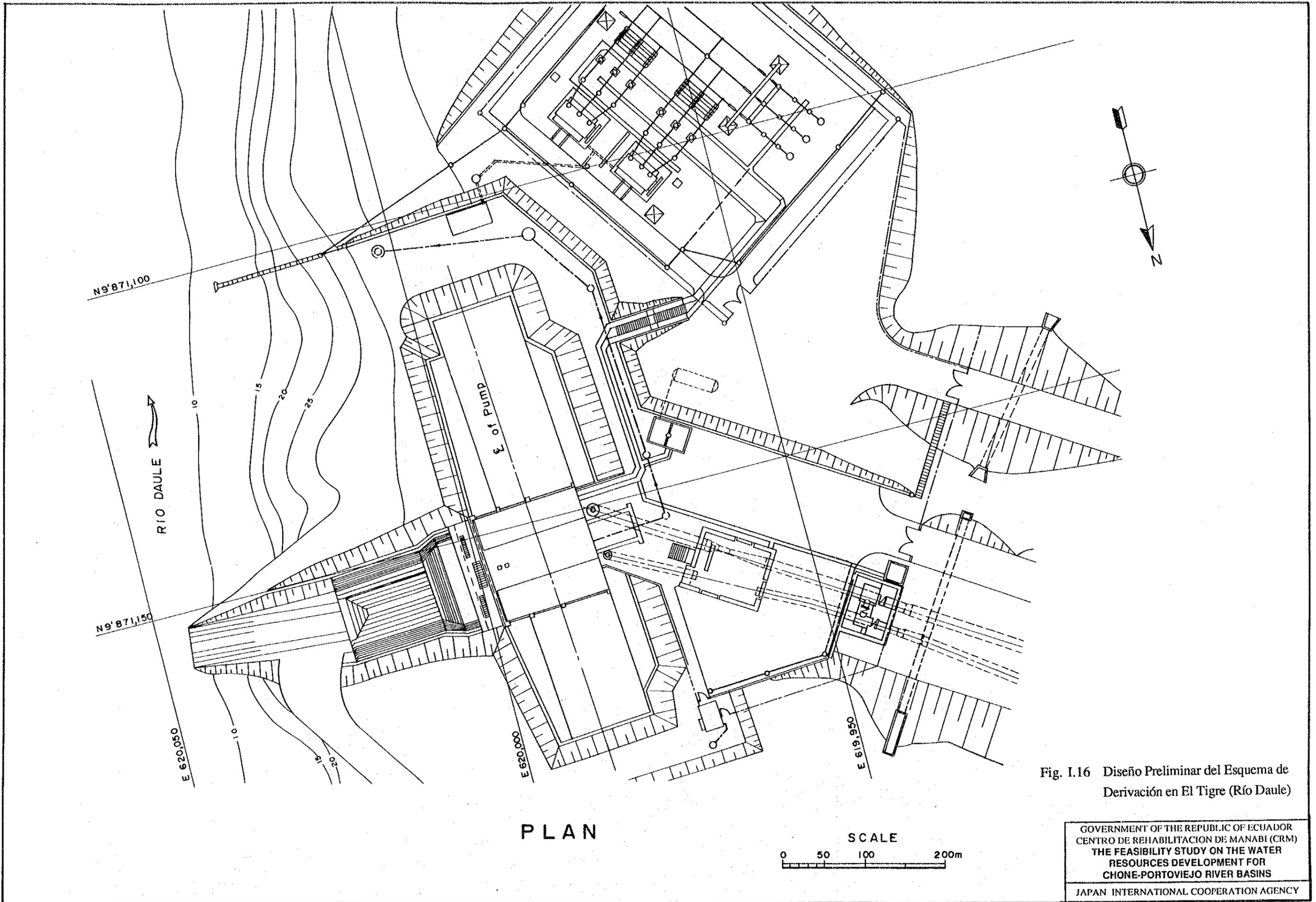
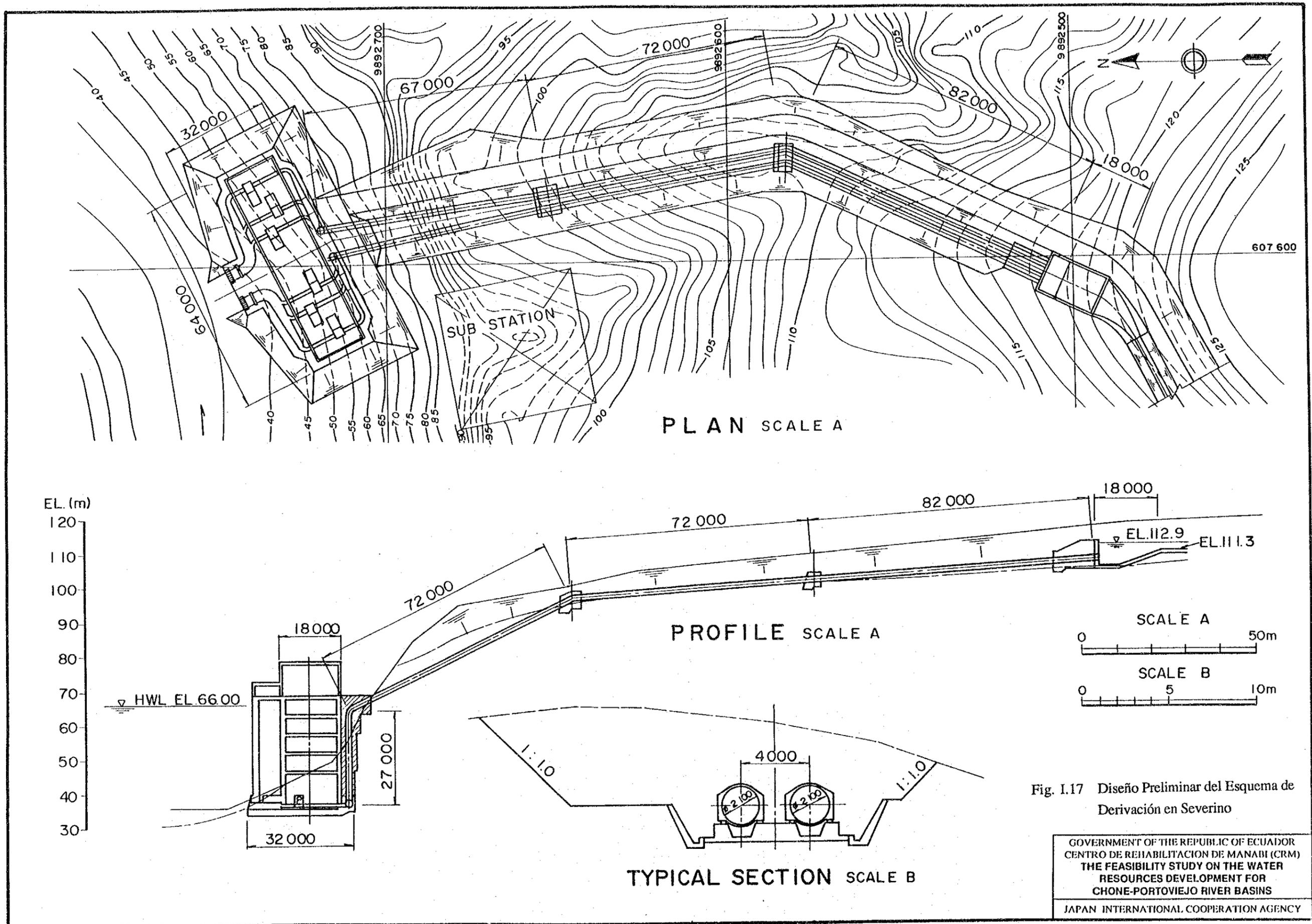
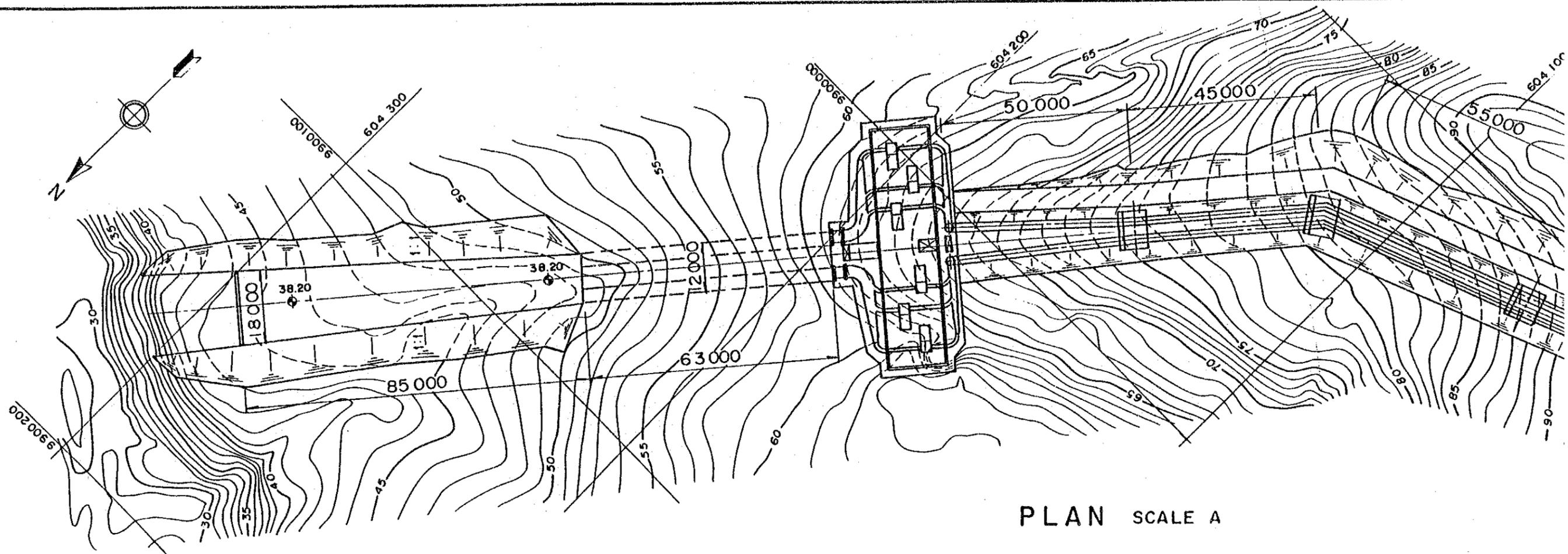


Fig. I.16 Diseño Preliminar del Esquema de Derivación en El Tigre (Río Daule)

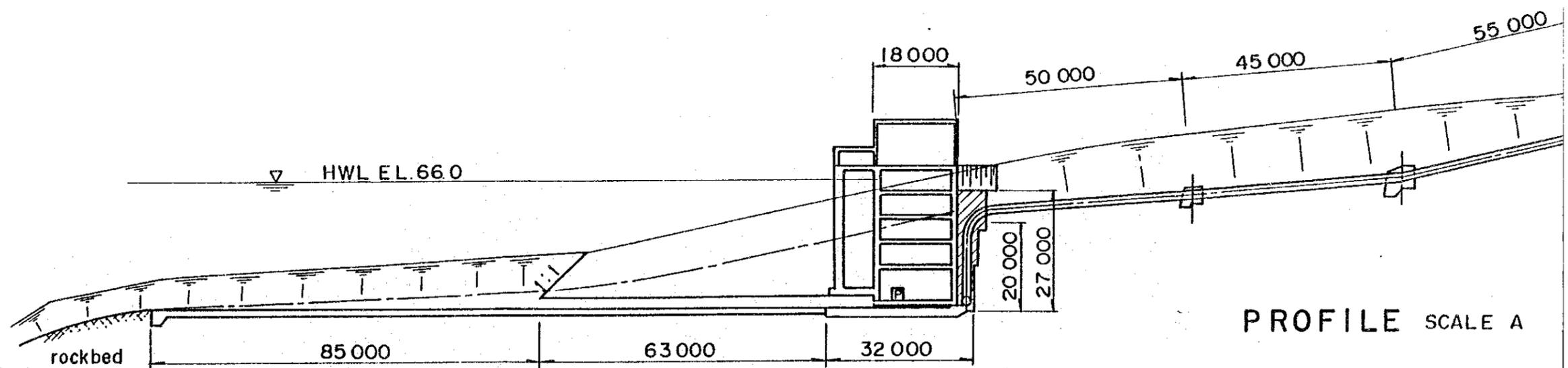
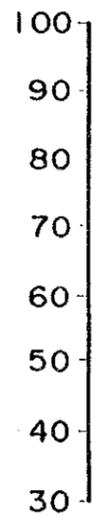
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE FEASIBILITY STUDY ON THE WATER
 RESOURCES DEVELOPMENT FOR
 CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY





PLAN SCALE A

EL. (m)



PROFILE SCALE A

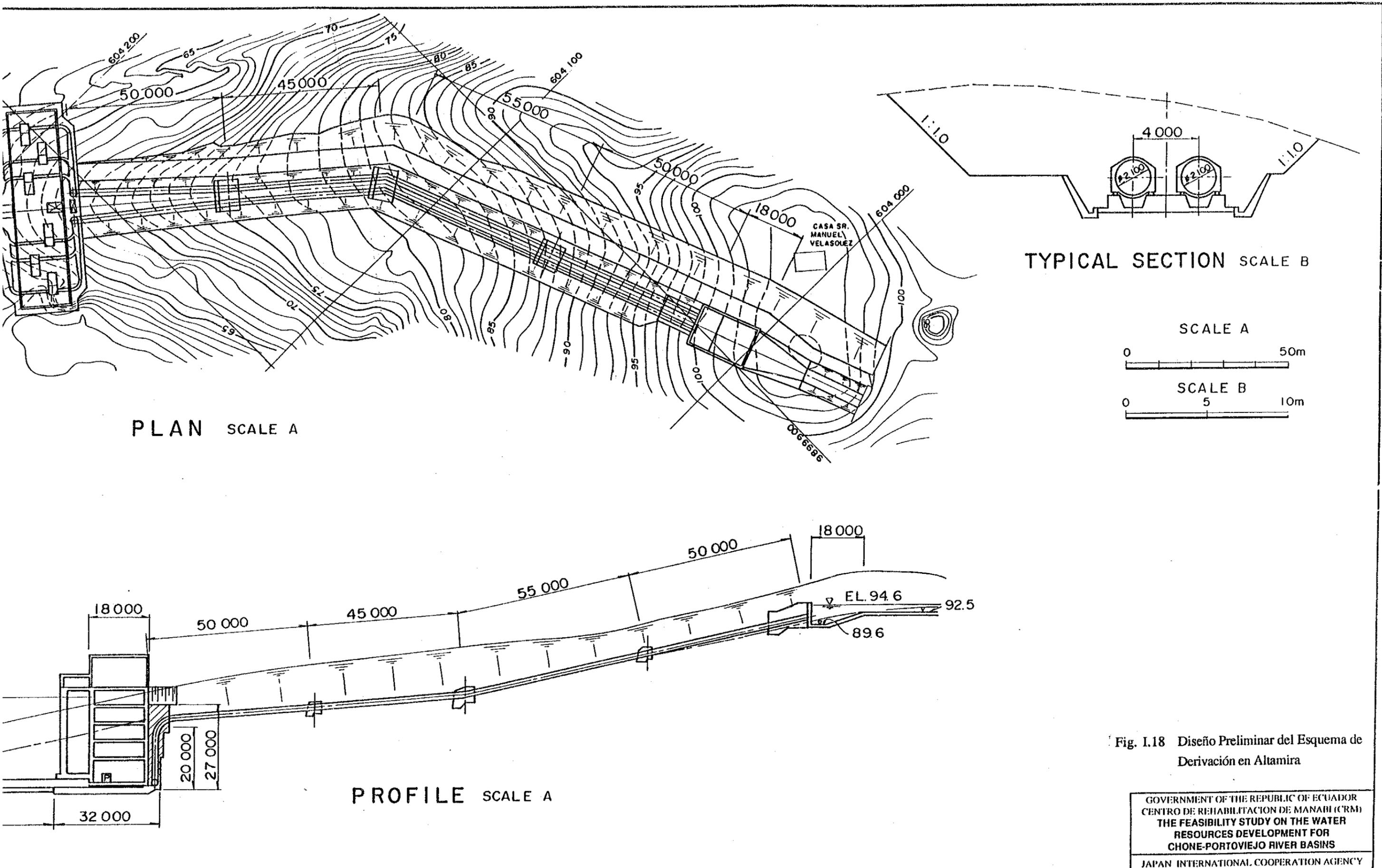
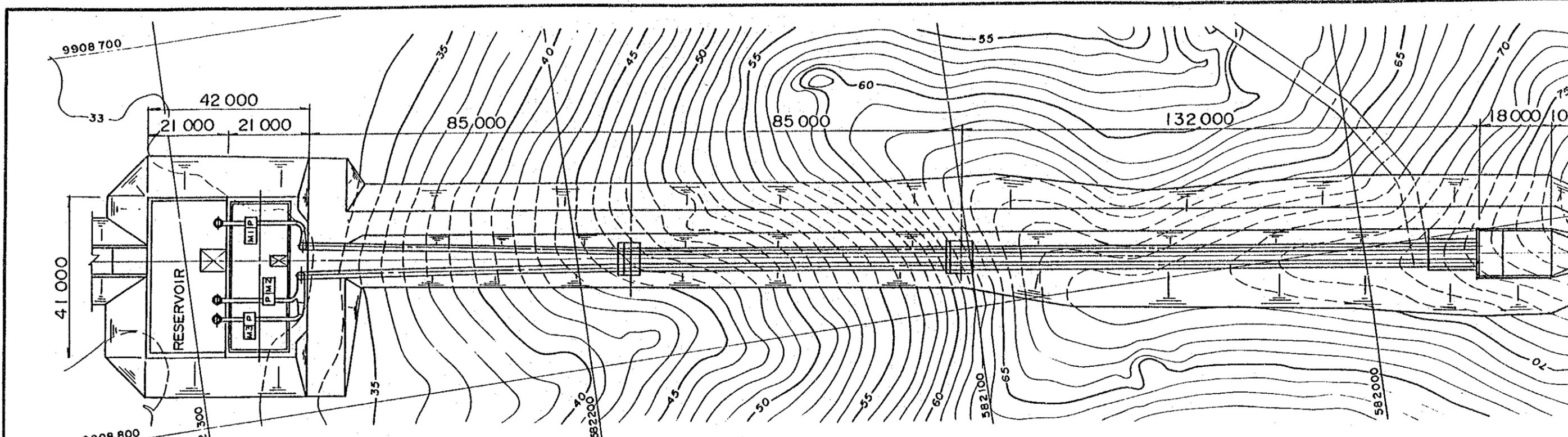
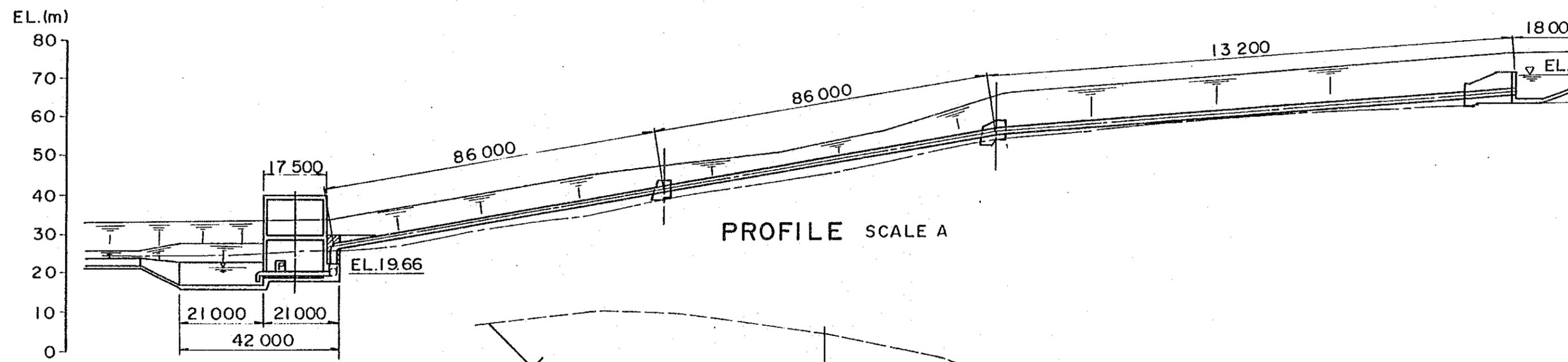


Fig. I.18 Diseño Preliminar del Esquema de Derivación en Altamira

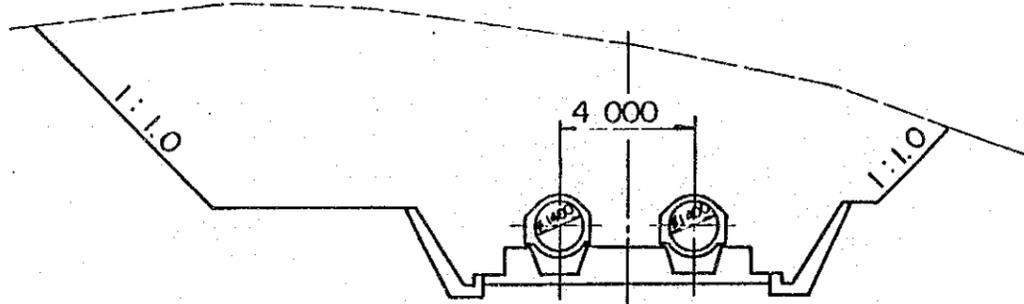
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE FEASIBILITY STUDY ON THE WATER
 RESOURCES DEVELOPMENT FOR
 CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY



PLAN SCALE A



PROFILE SCALE A



TYPICAL SECTION SCALE B

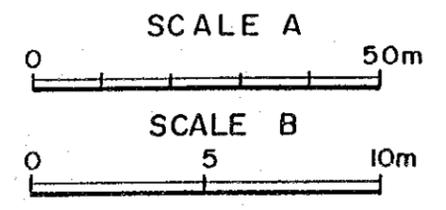
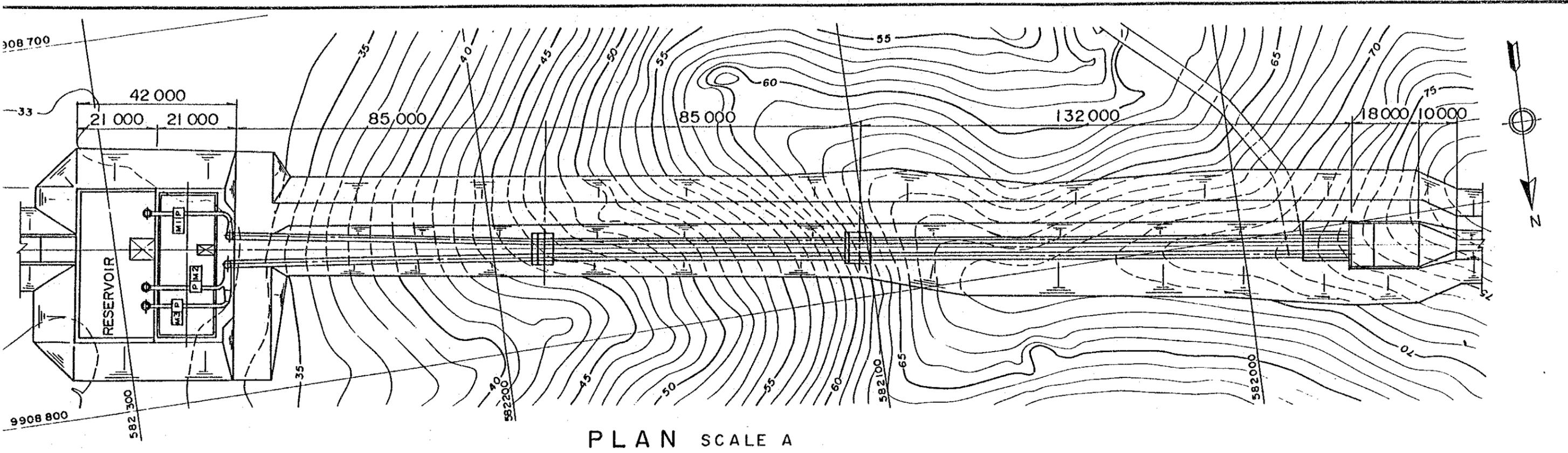
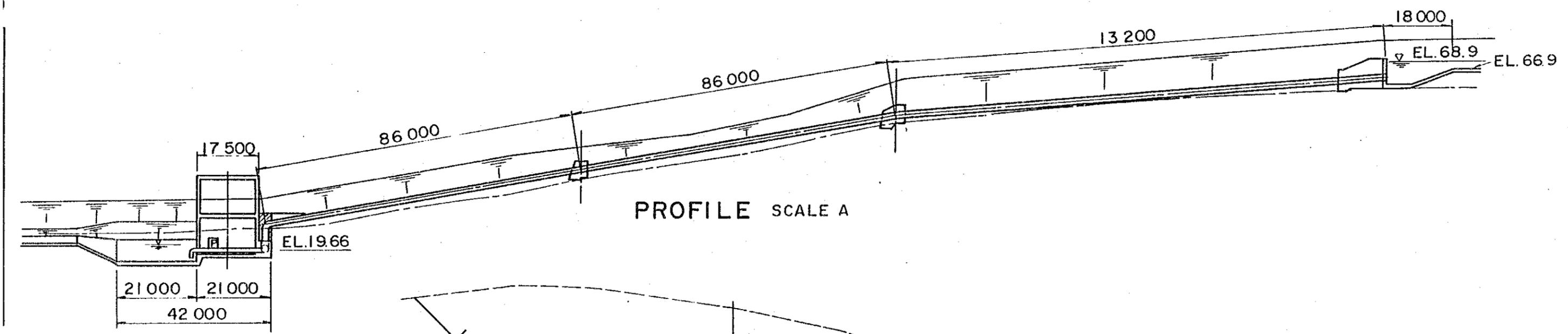


Fig. I.19 Diseño Prelim
Derivación en

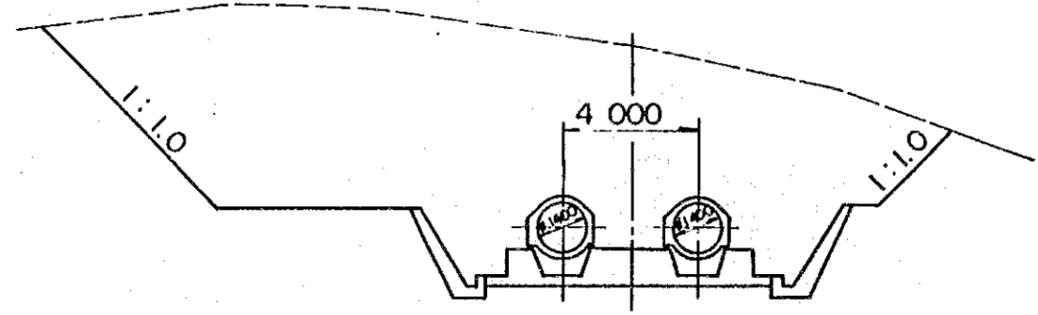
GOVERNMENT OF THE I
CENTRO DE REHABILITA
THE FEASIBILITY ST
RECURSOS DE V
CHONE-PORTOVIE
JAPAN INTERNATIONAL



PLAN SCALE A



PROFILE SCALE A



TYPICAL SECTION SCALE B

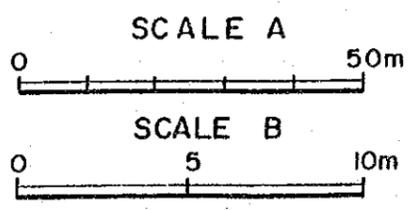
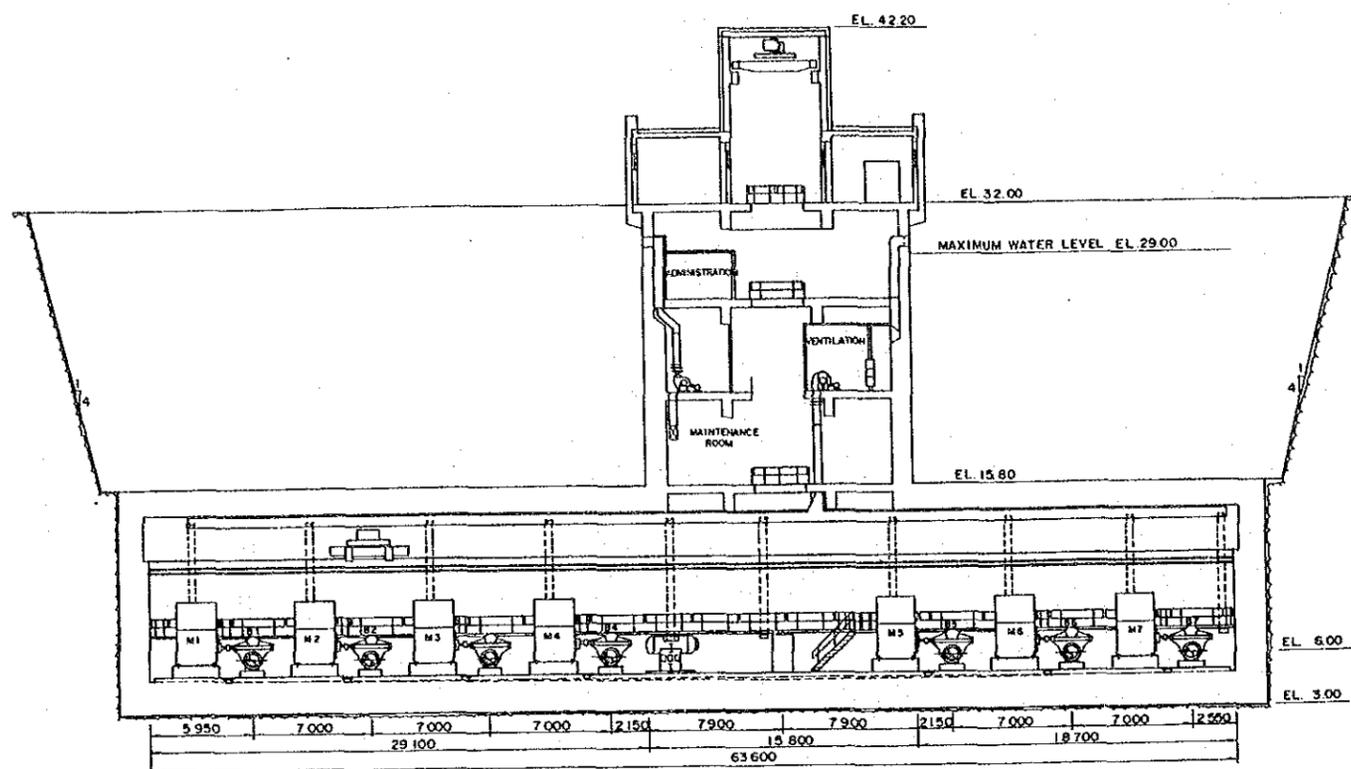
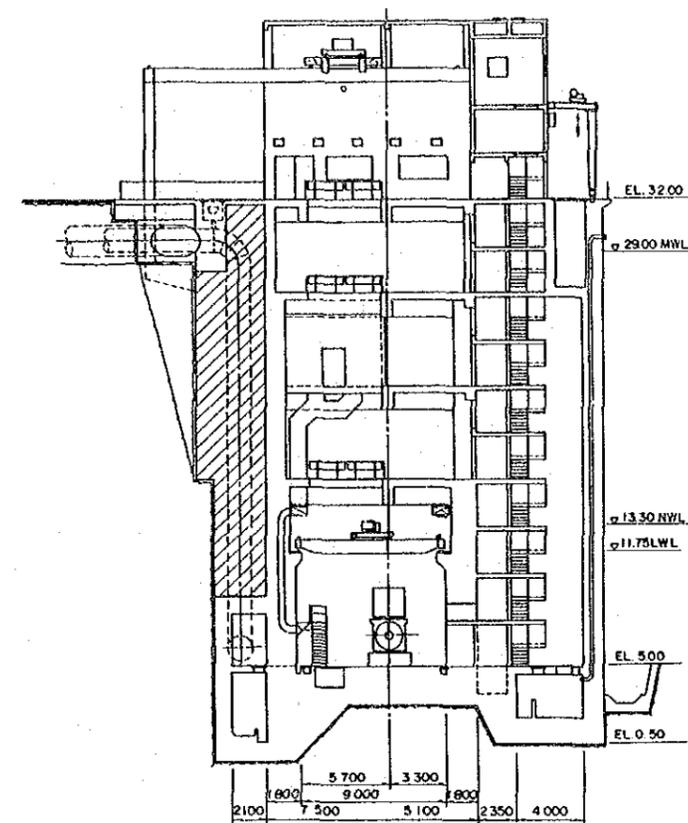


Fig. I.19 Diseño Preliminar del Esquema de Derivación en Los Amarillos

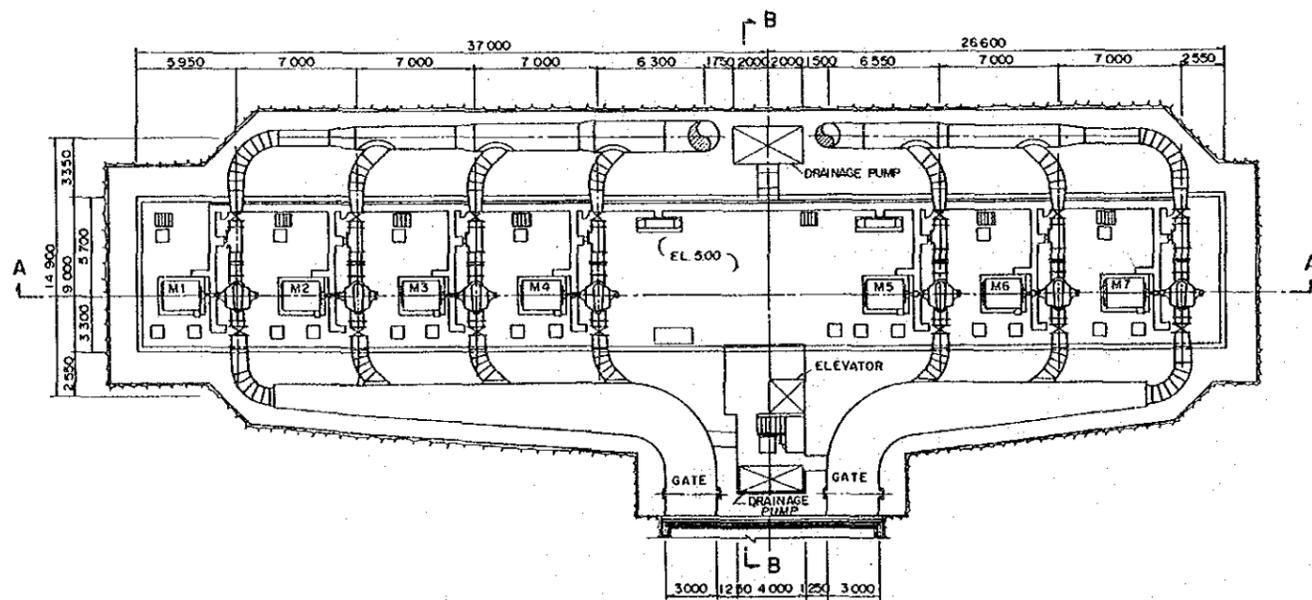
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE FEASIBILITY STUDY ON THE WATER
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SECTION A - A



SECTION B - B



PLAN

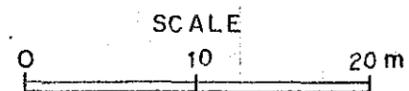
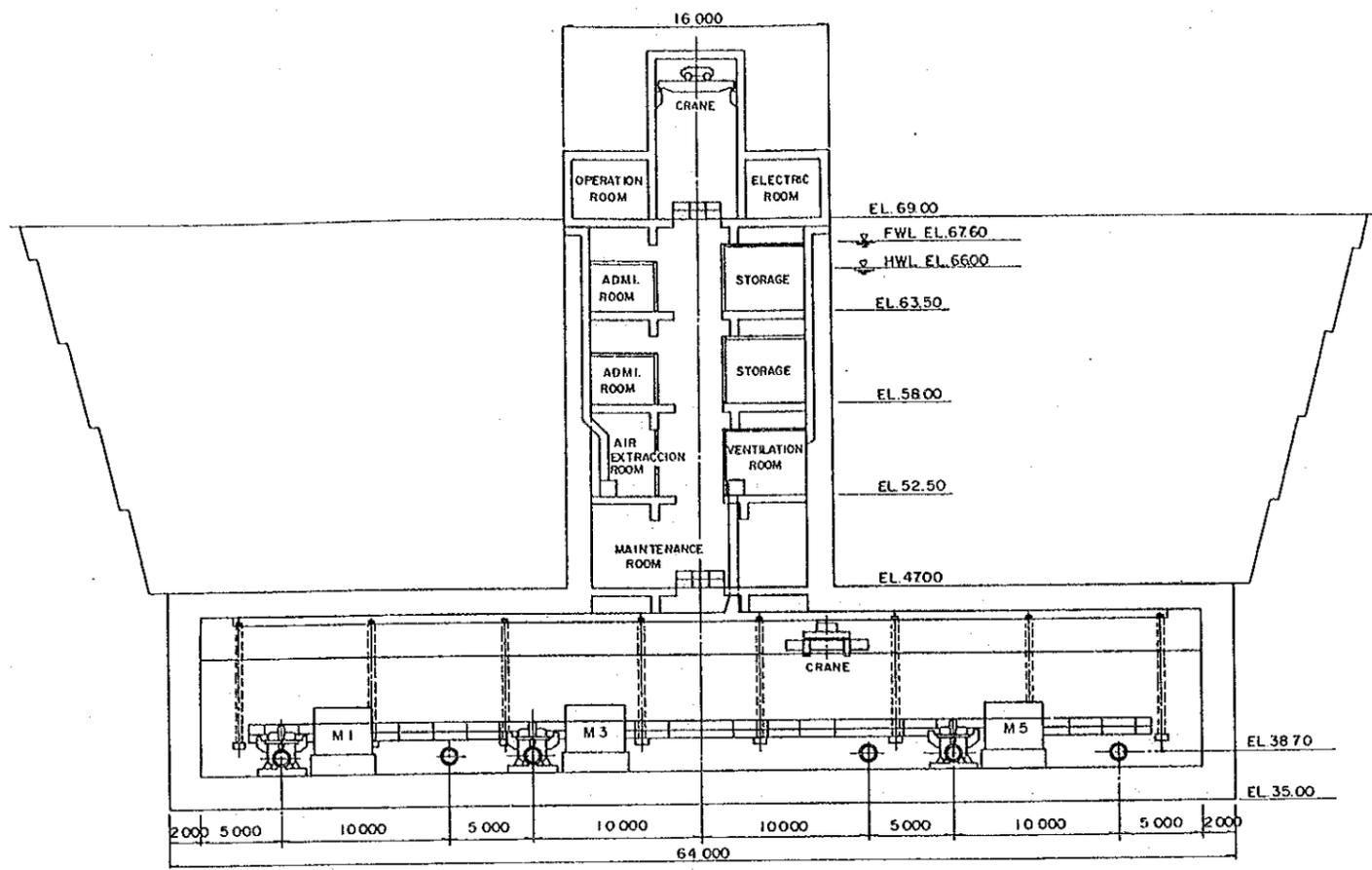
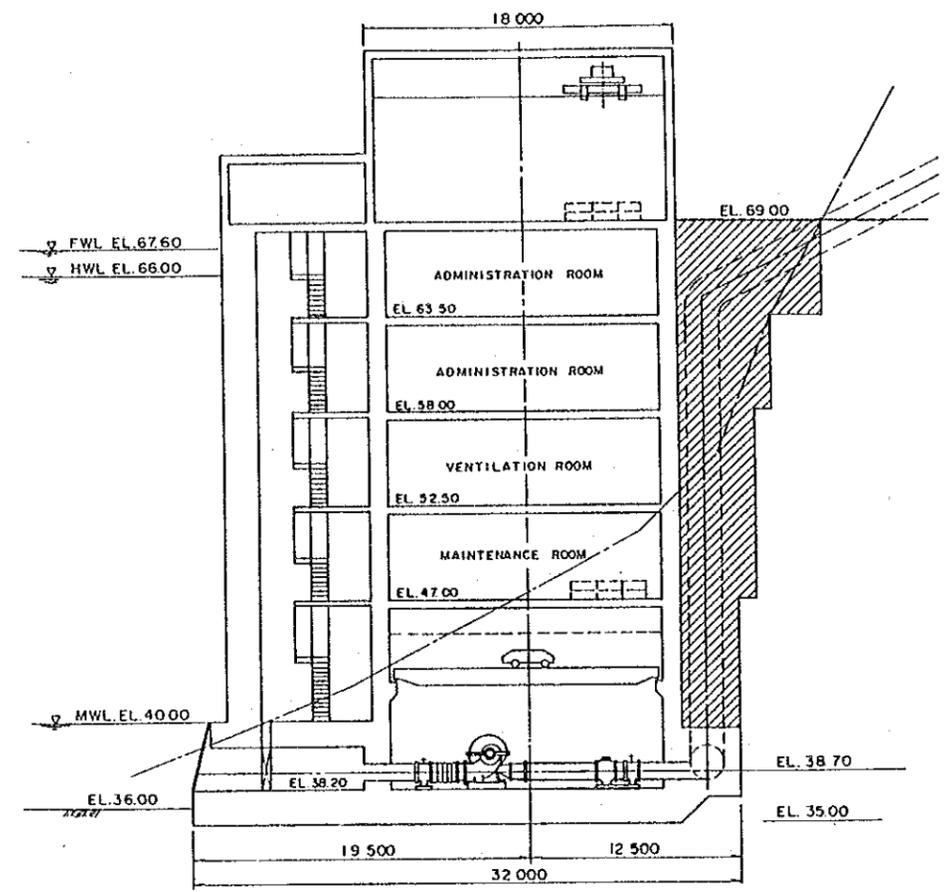


Fig. I.20 Diseño Preliminar de la Estación de Bombeo en El Tigre (Río Daule)

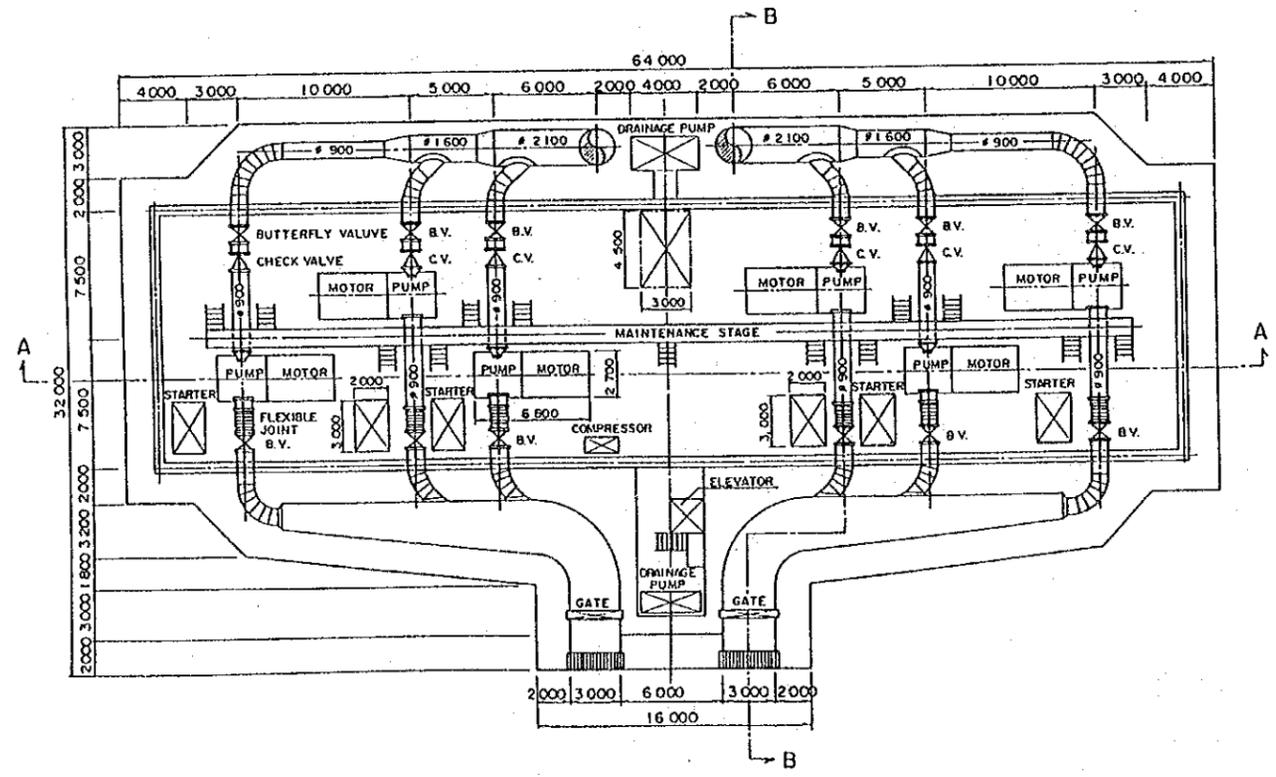
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE FEASIBILITY STUDY ON THE WATER
 RESOURCES DEVELOPMENT FOR
 CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY



SECTION A - A



SECTION B - B



PLAN

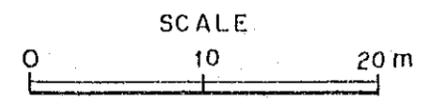
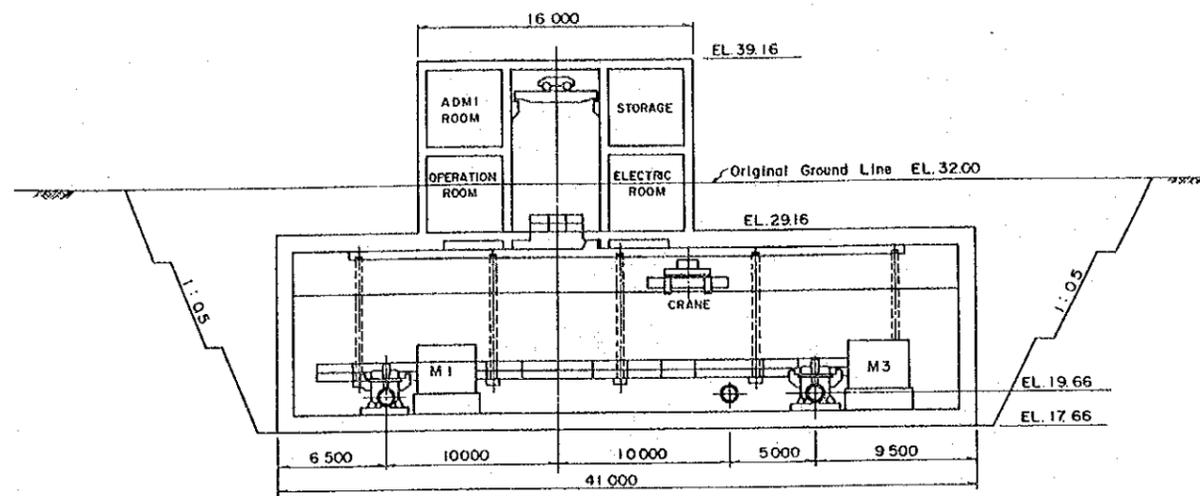
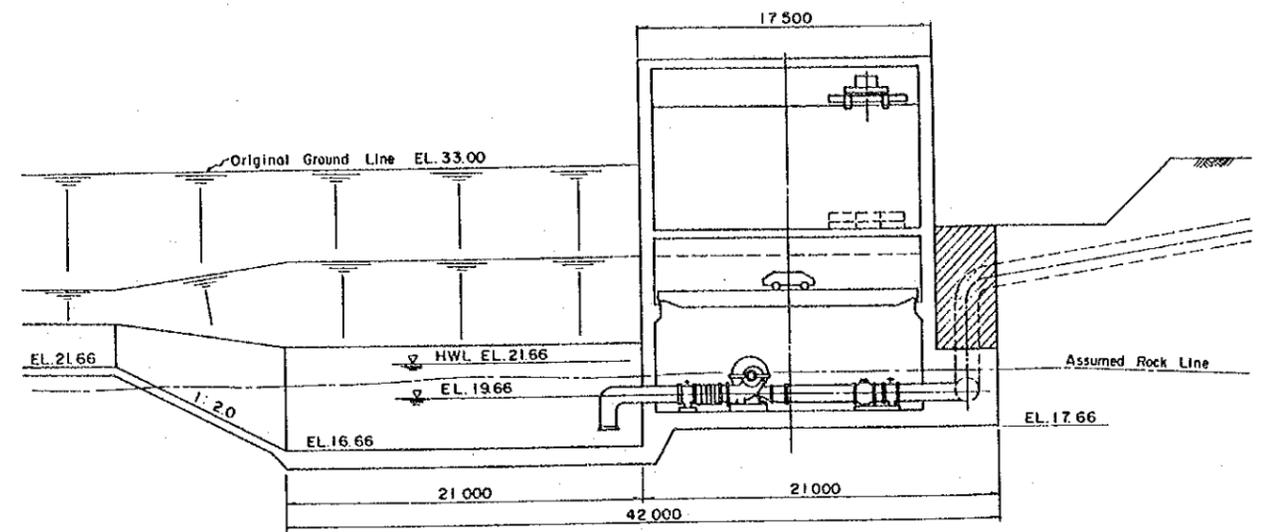


Fig. I.21 Diseño Preliminar de la Estación de Bombeo en Severino

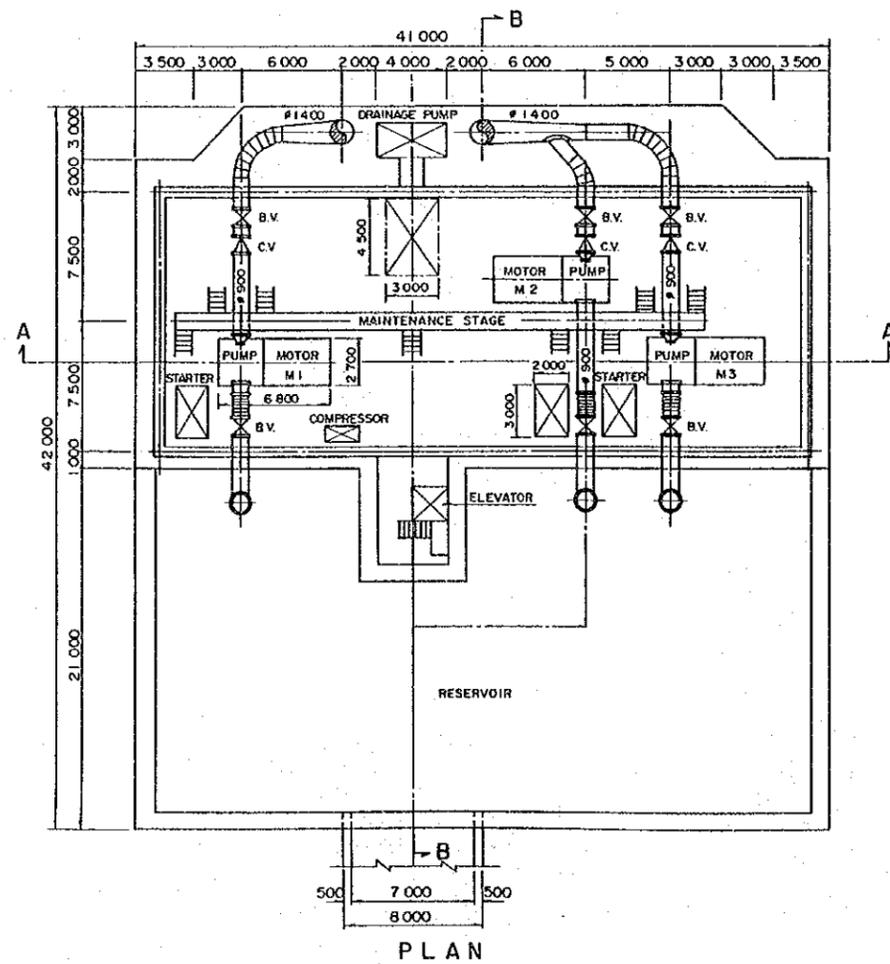
GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE FEASIBILITY STUDY ON THE WATER
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SECTION A-A



SECTION B-B



PLAN

Fig. I.23 Diseño Preliminar de la Estación de Bombeo en Los Amarillos

GOVERNMENT OF THE REPUBLIC OF ECUADOR
 CENTRO DE REHABILITACION DE MANABI (CRM)
 THE FEASIBILITY STUDY ON THE WATER
 RESOURCES DEVELOPMENT FOR
 CHONE-PORTOVIEJO RIVER BASINS
 JAPAN INTERNATIONAL COOPERATION AGENCY

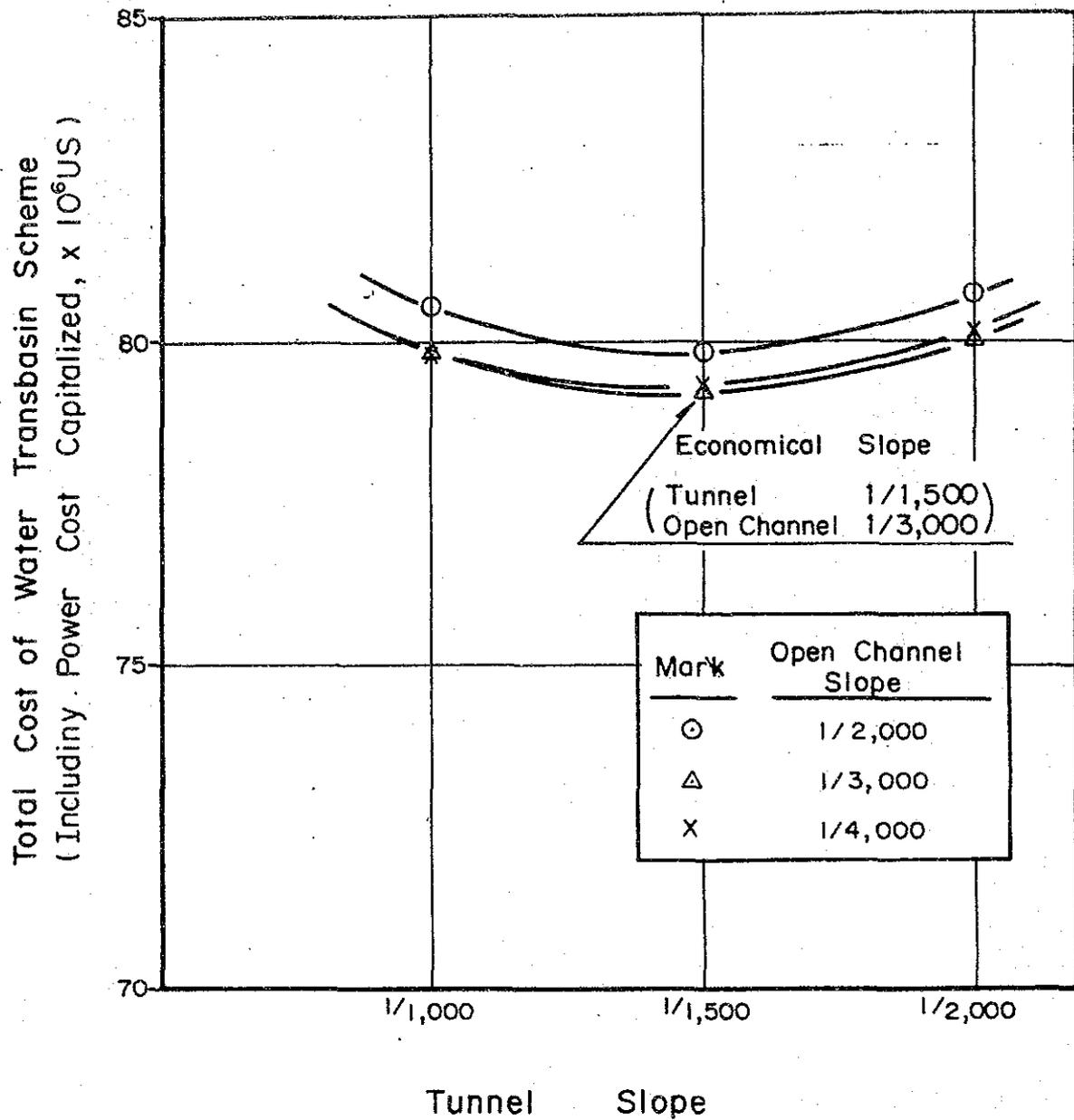
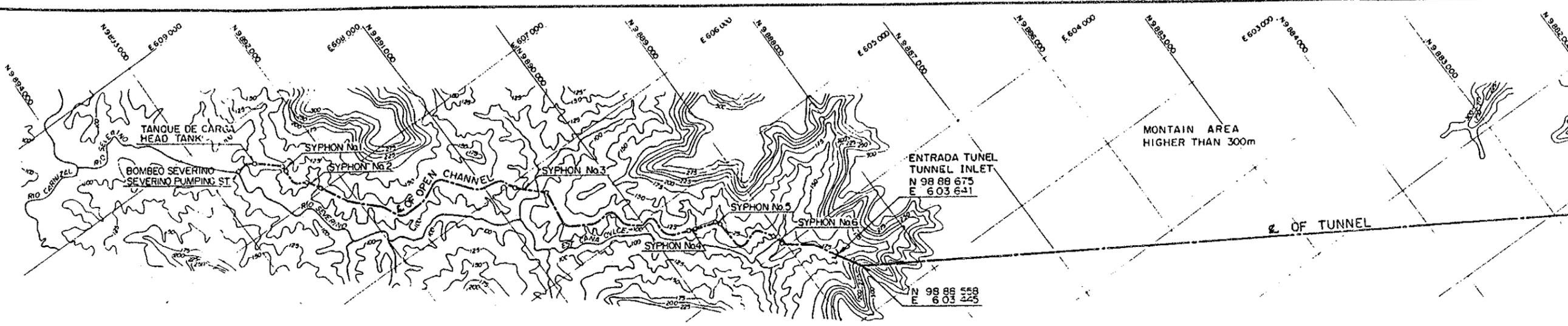


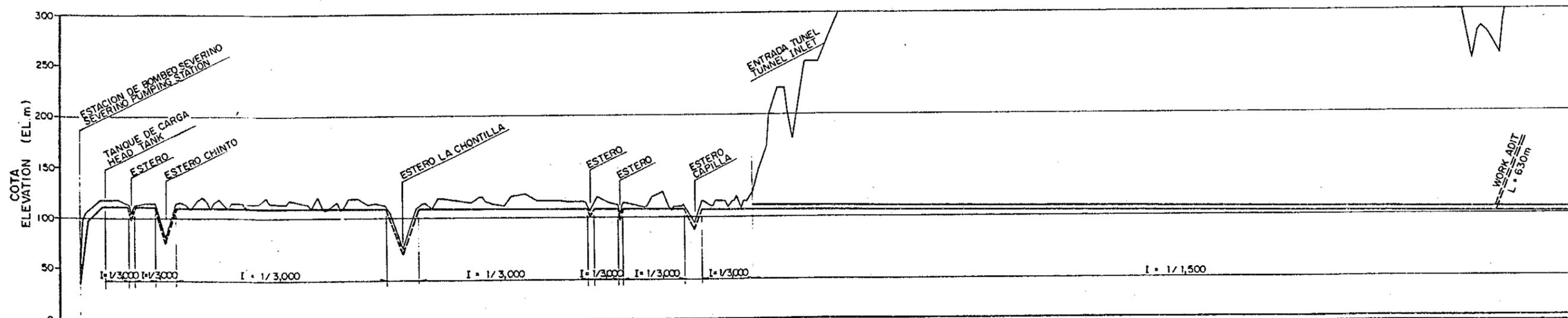
Fig. I.24 Pendientes Económicas del Túnel y del Canal Abierto
(Severino - Esquema Poza Honda)

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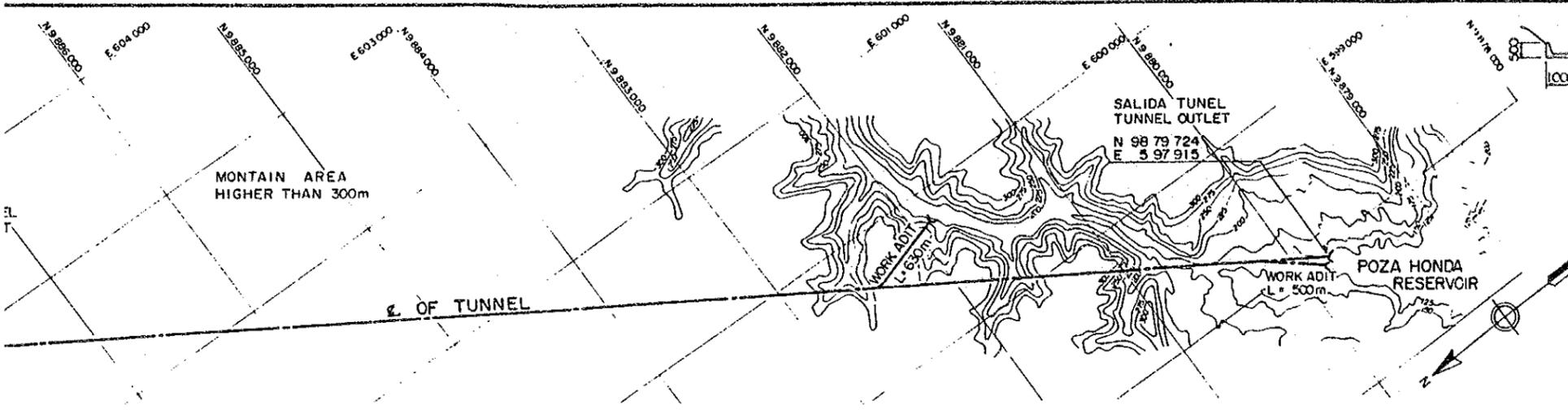


PLATA PLAN SCALE A

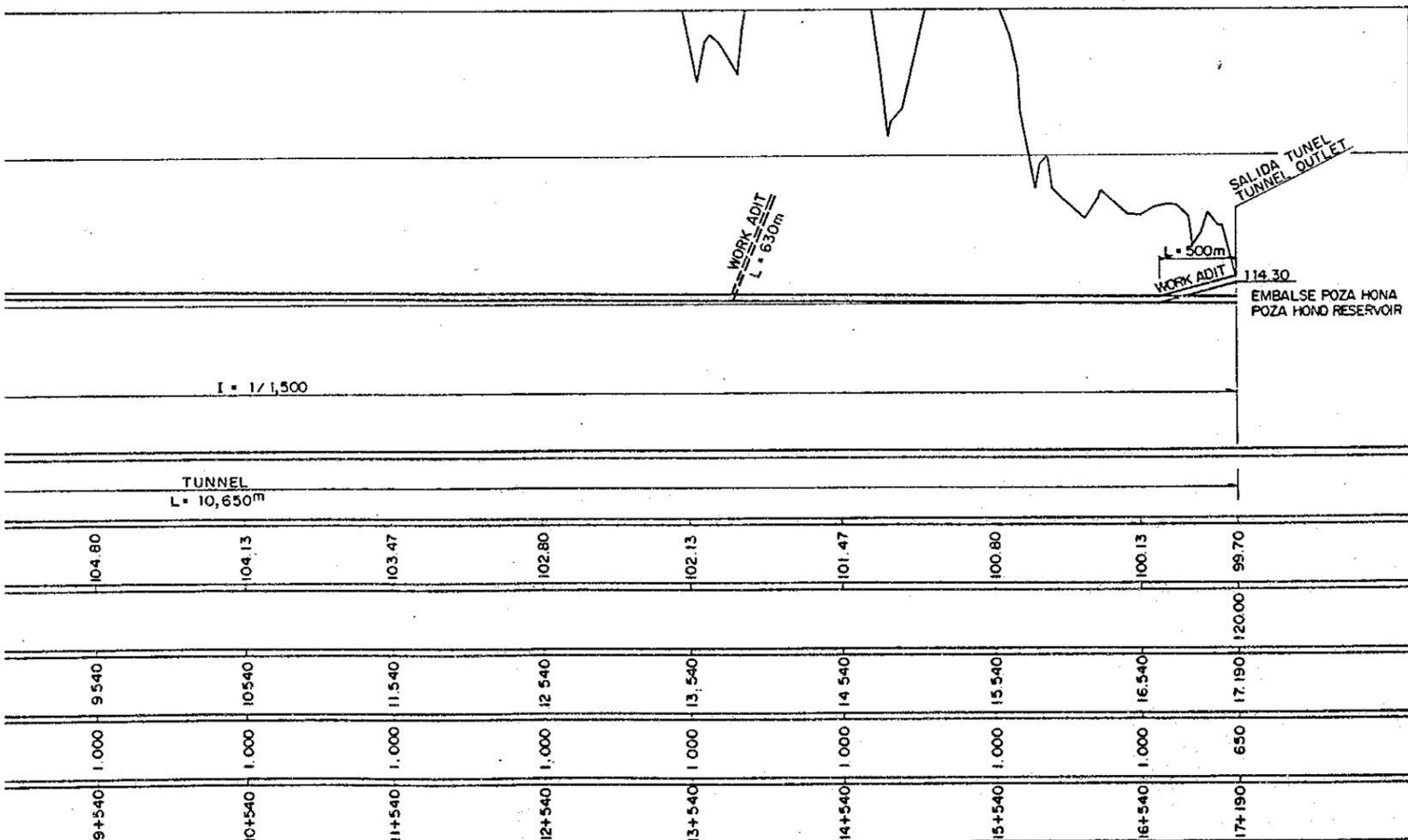


TIPOS DE ESTRUCTURAS TYPE OF STRUCTURE	PIPELINE CHANNEL	OPEN CHANNEL	OPEN CHANNEL	SYPHON	OPEN CHANNEL	OPEN CHANNEL	SYPHON	OPEN CHANNEL	TUNNEL L = 10,650m															
COTA DE ESTRUCTURAS ELEVATION OF STRUCTURE (EL. m)	38.20	111.199	111.199	109.760	109.282	108.734	108.502	108.422	107.998	107.673	107.503	106.800	106.13	105.47	104.80	104.13	103.47	102.80	102.13					
COTA DE TERRENO ELEVATION OF GROUND (EL. m)	36	119	113	113	114	113	114	113	112	117	125													
DISTANCIA ACUMULADA ACCUMULATE DISTANCE (m)	0	250	270	480	535	725	935	2965	3275	4920	4970	5210	5255	5845	6030	6540	7540	8540	9540	10540	11540	12540	13540	
DISTANCIA DISTANCE (m)	0	250	20	210	55	190	210	2030	310	1645	50	240	45	590	185	510	1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000
ESTACION STATION	0+000	0+250	0+270	0+480	0+535	0+725	0+935	2+965	3+275	4+920	4+970	5+210	5+255	5+845	6+030	6+540	7+540	8+540	9+540	10+540	11+540	12+540	13+540	

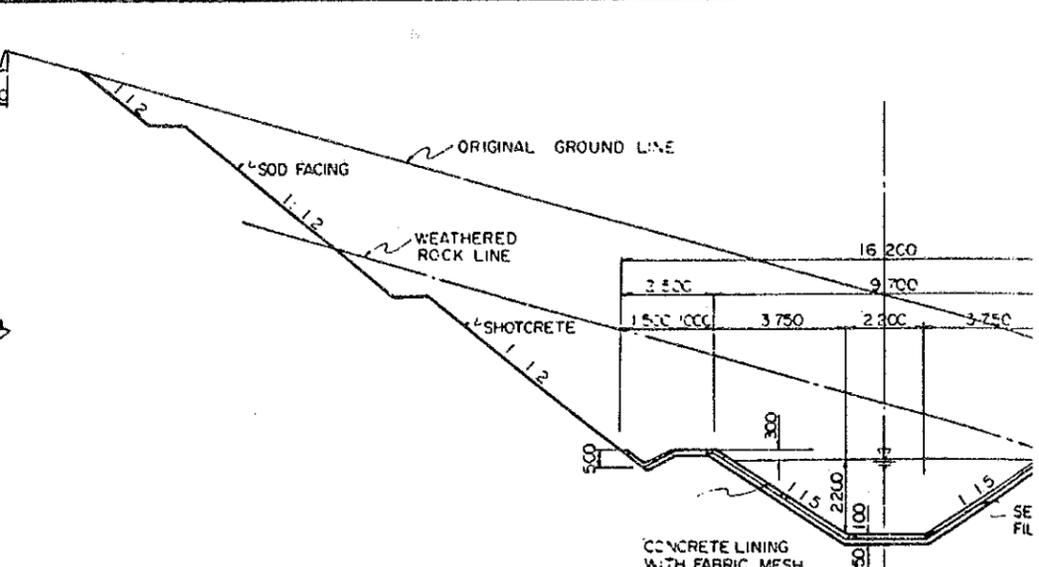
PERFIL PROFILE H; SCALE A V; SCALE B



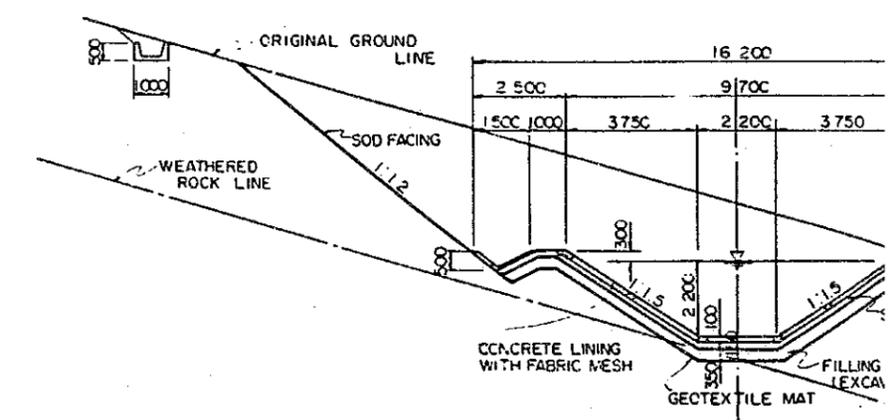
PLATA PLAN SCALE A



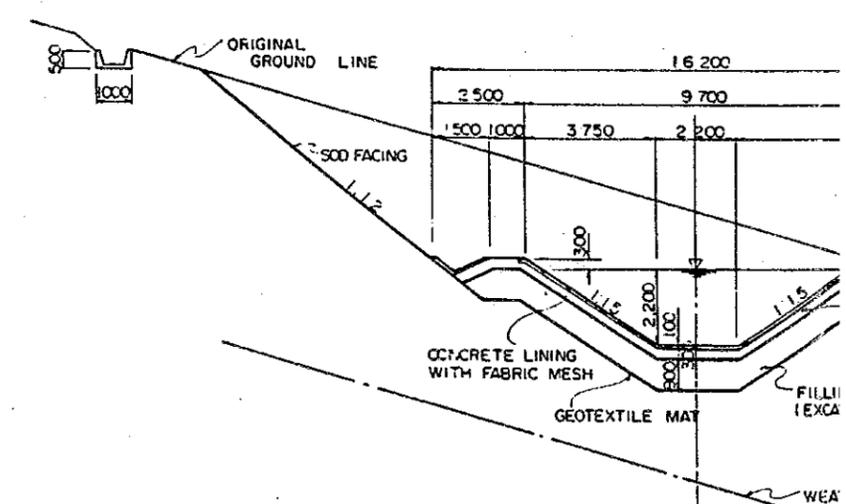
LE H : SCALE A
V : SCALE B



TYPE I

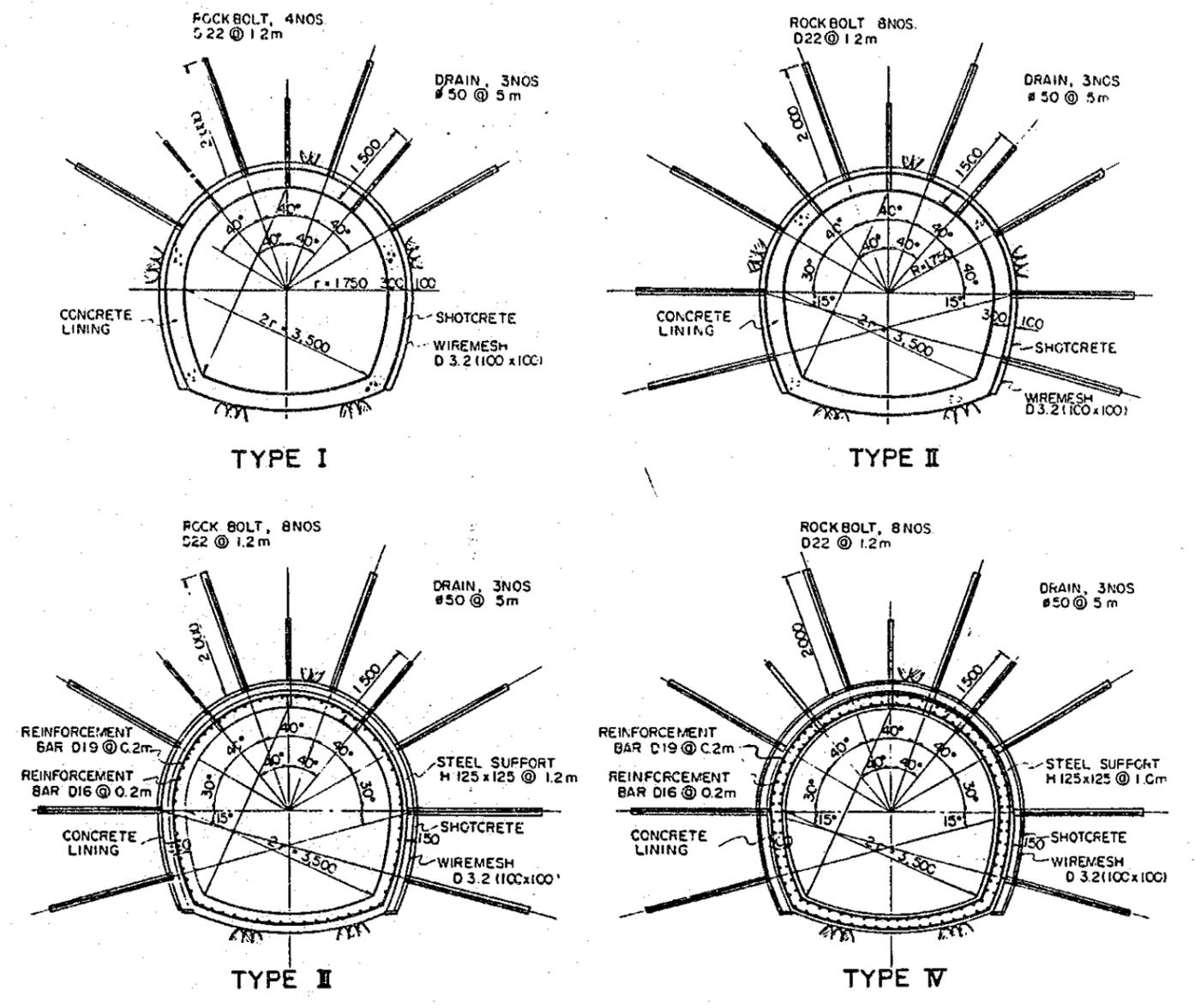
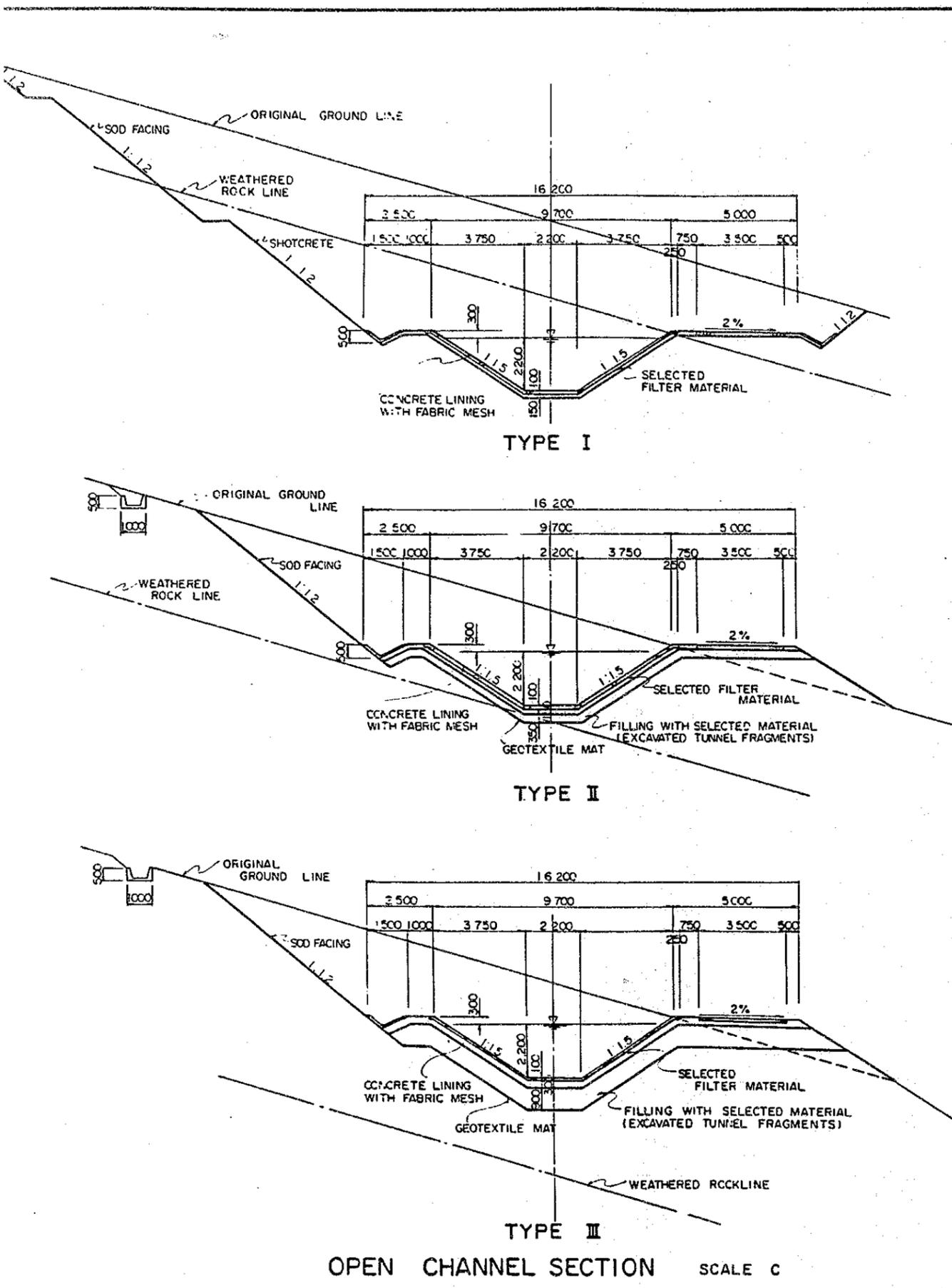


TYPE II



TYPE III

OPEN CHANNEL SECTION



TUNNEL SECTION SCALE D

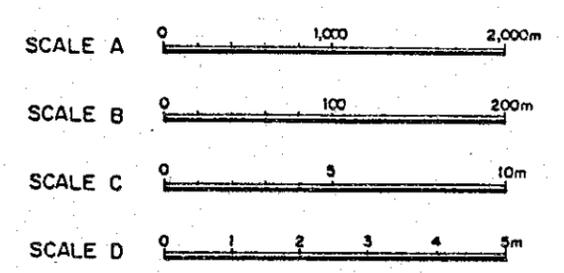
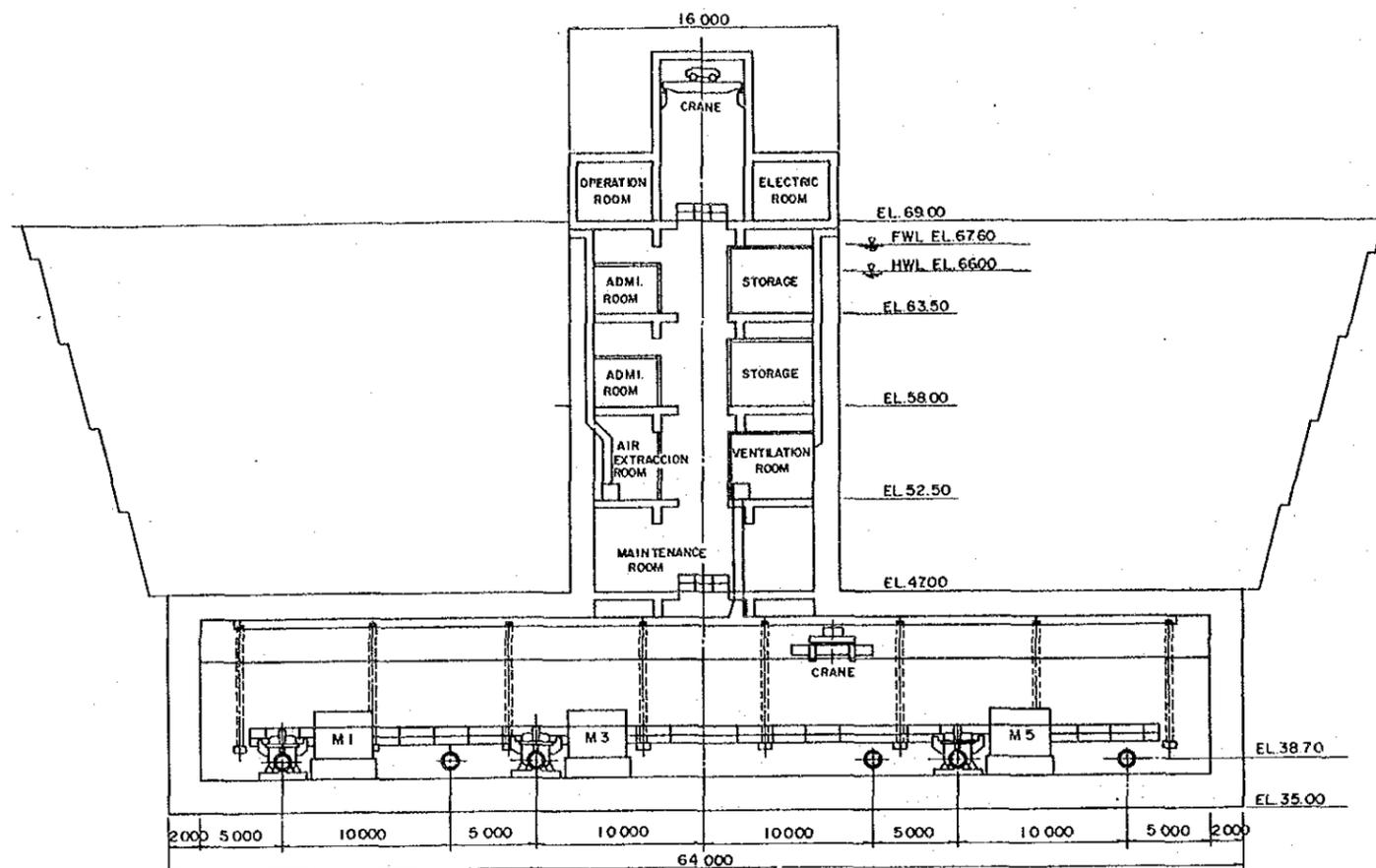
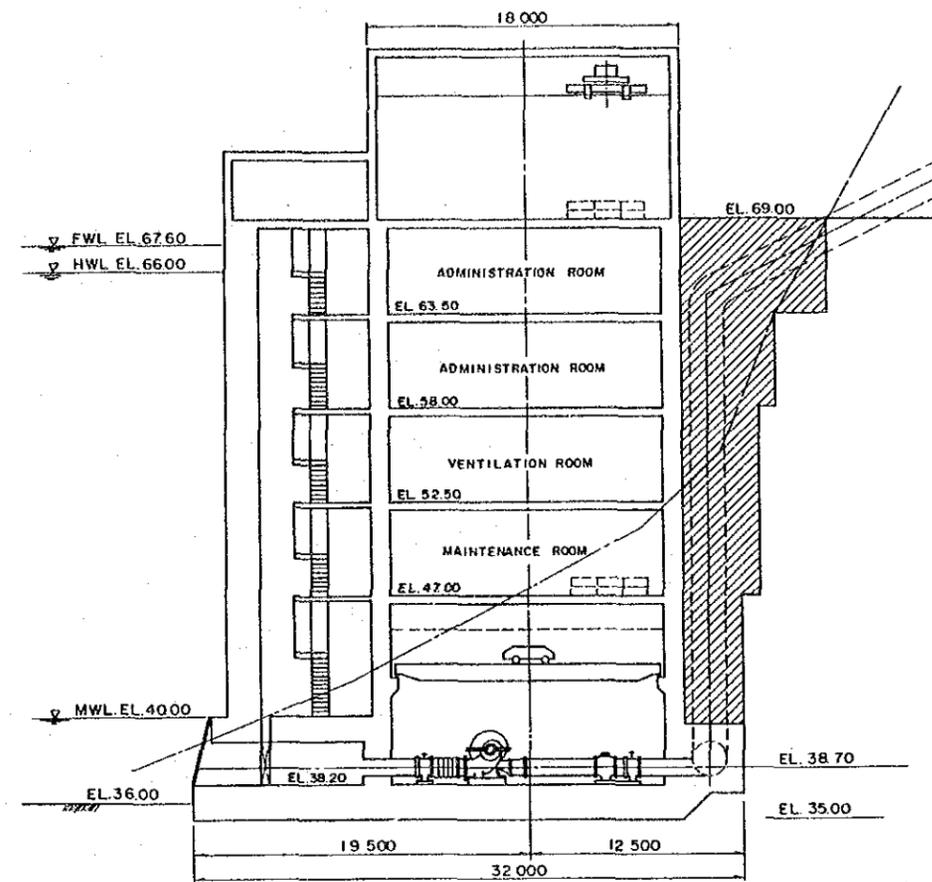


Fig. I.25 Diseño Básico del Esquema de Traslase "Presas La Esperanza (Severino) - Presa Poza Honda"

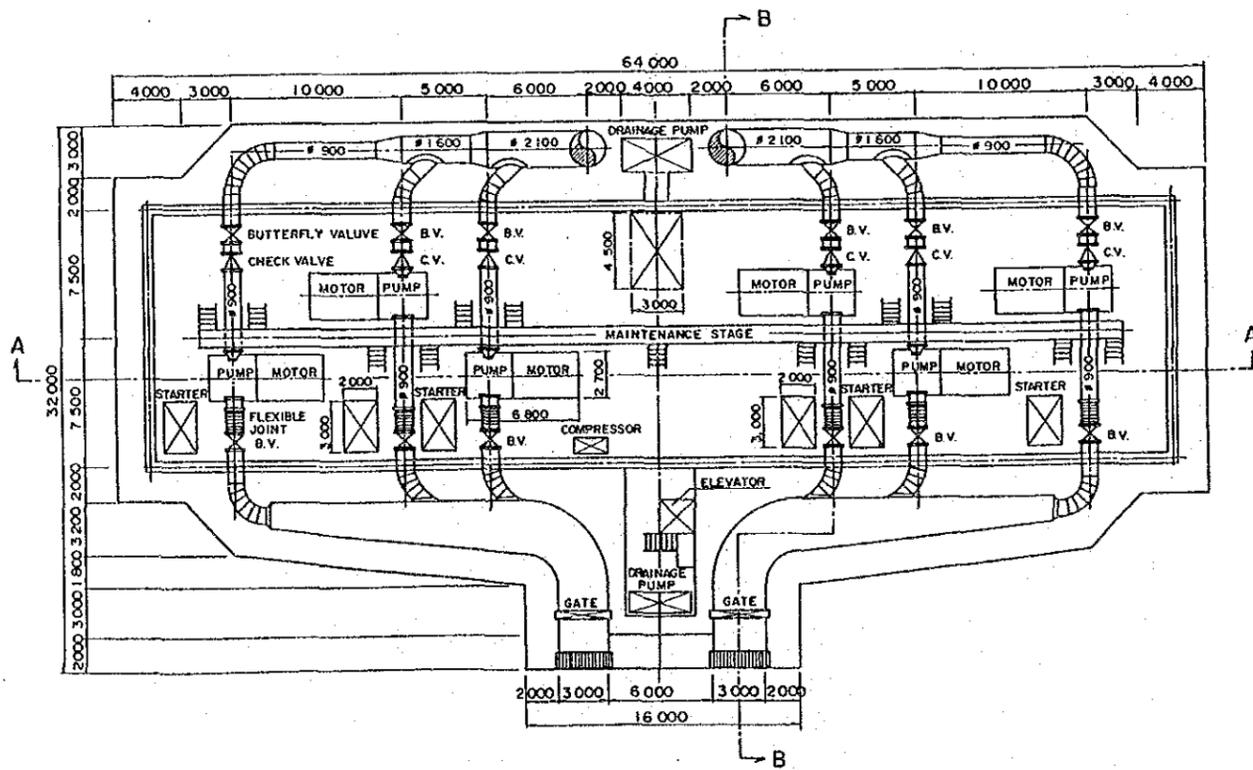
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SECTION A-A



SECTION B-B



PLAN

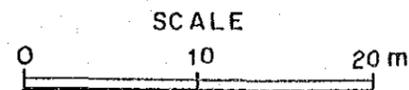


Fig. I.26 Diseño Básico de la Estación de Bombeo en Severino

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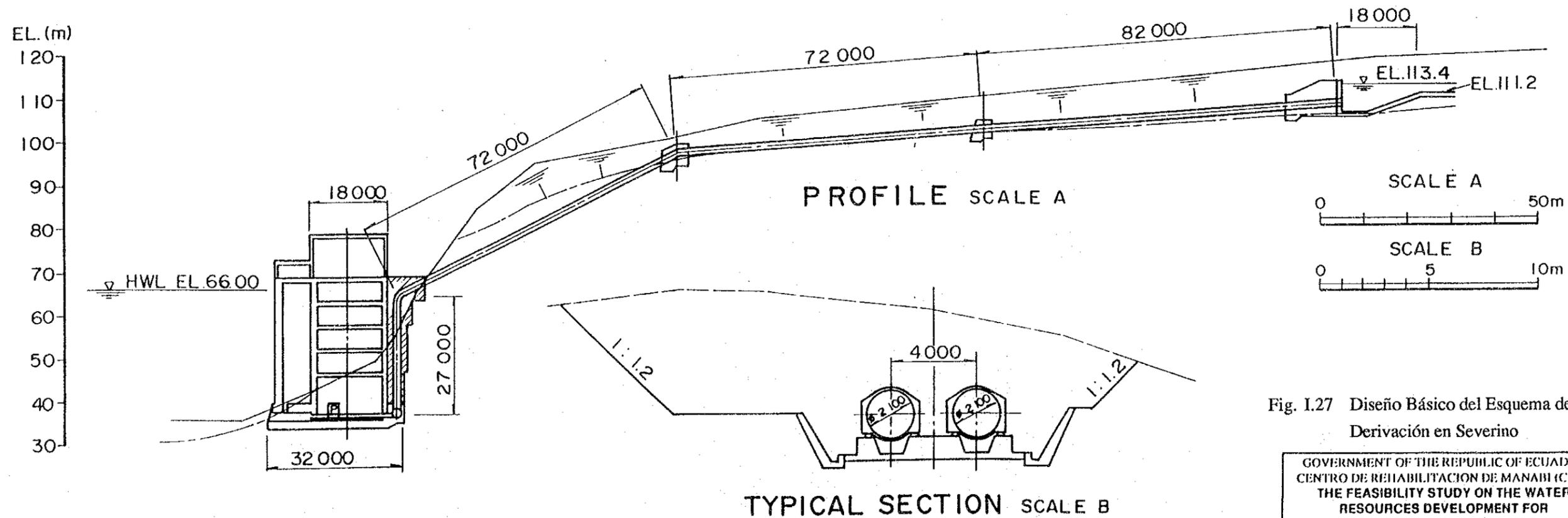
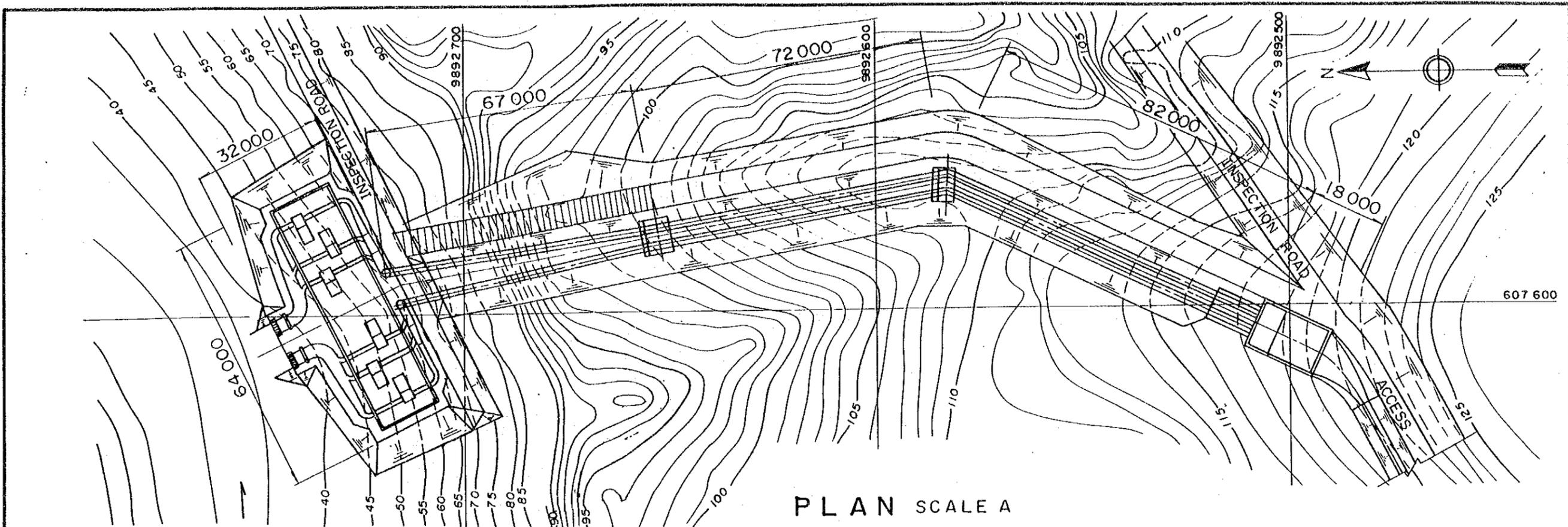


Fig. I.27 Diseño Básico del Esquema de Derivación en Severino

GOVERNMENT OF THE REPUBLIC OF ECUADOR
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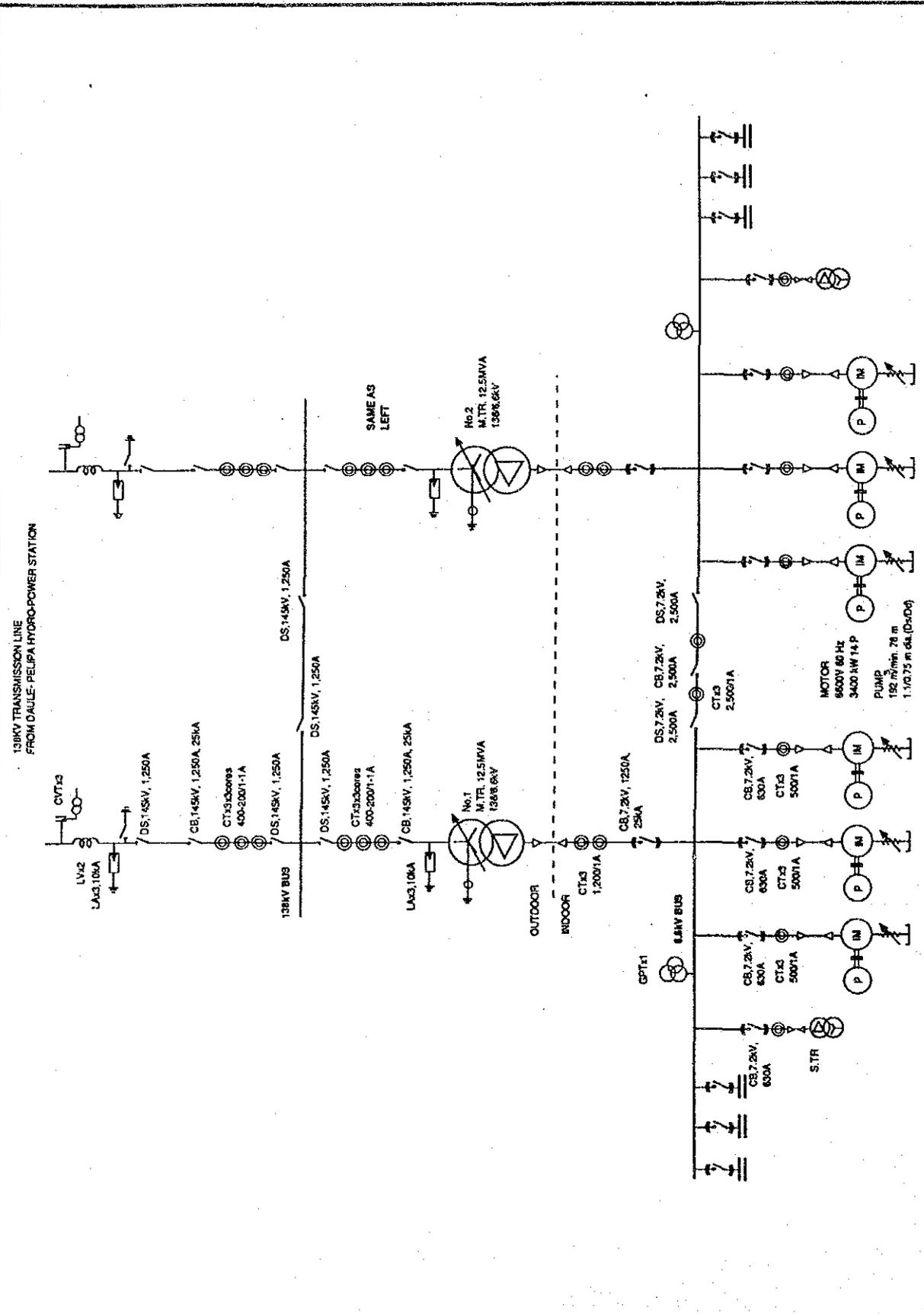
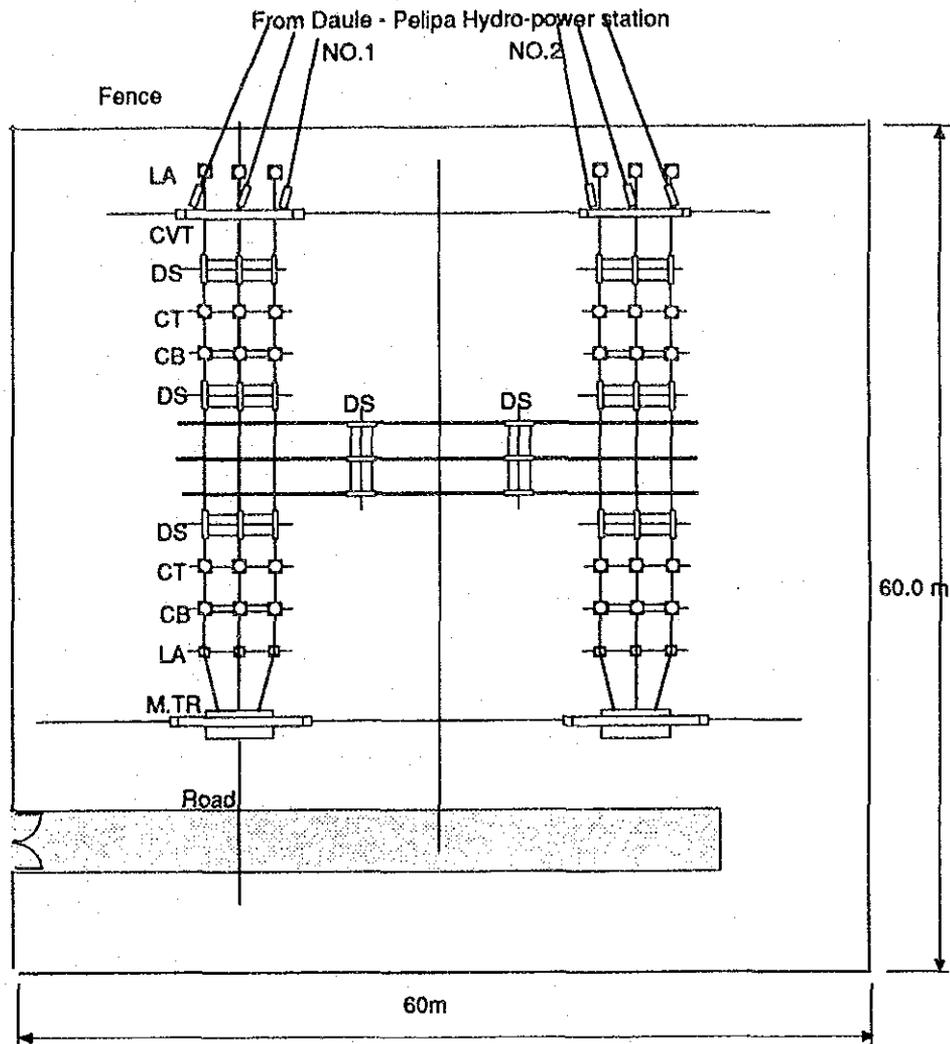


Fig. I.28 Diagrama de una sola Línea para la Estación de Bombeo Severino

GOVERNMENT OF THE REPUBLIC OF ECUADOR
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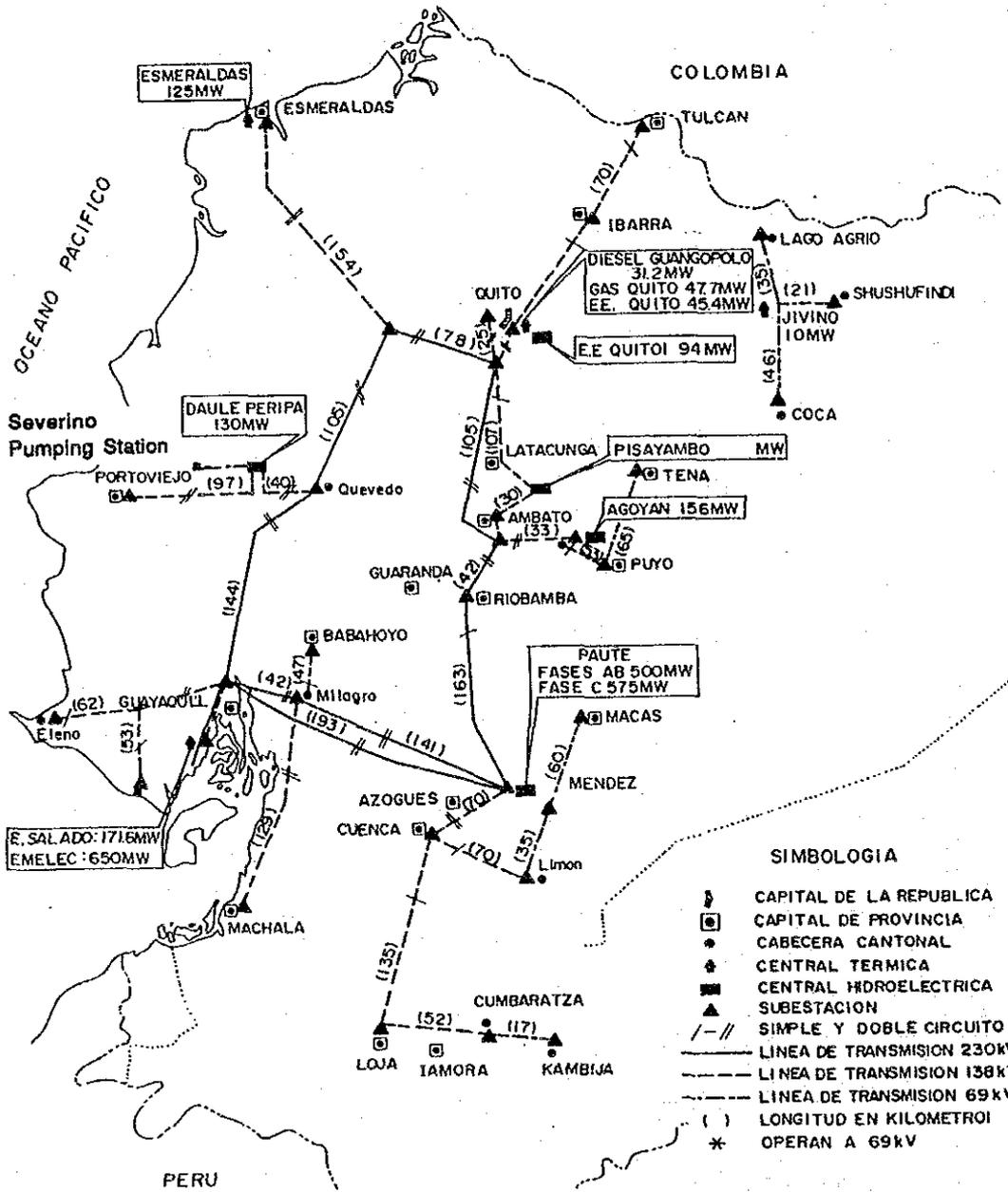
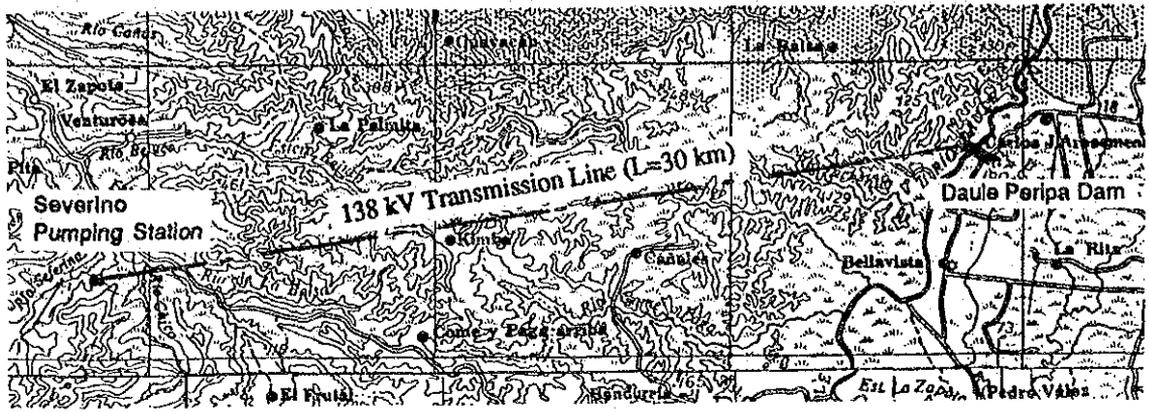


- LA: Lightning Arrester
- CVT: Capacitance Voltage Transformer
- DS: Disconnecting Switch
- CT: Current Transformer
- CB: Circuit Breaker
- M.TR Main Transformer

Fig. I.29 Distribución de los Equipos Exteriores

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- SIMBOLOGIA**
- Ⓜ CAPITAL DE LA REPUBLICA
 - Ⓜ CAPITAL DE PROVINCIA
 - CABECERA CANTONAL
 - ⬆ CENTRAL TERMICA
 - ⬆ CENTRAL HDROELECTRICA
 - ▲ SUBSTACION
 - /- SIMPLE Y DOBLE CIRCUITO
 - LINEA DE TRANSMISION 230KV
 - - - LINEA DE TRANSMISION 138KV
 - - - LINEA DE TRANSMISION 69KV
 - () LONGITUD EN KILOMETRO
 - * OPERAN A 69KV

Fig. I.30 Mapa de Ruta de la Línea de Transmisión de 138 kV

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THE FEASIBILITY STUDY ON THE WATER RESOURCES DEVELOPMENT FOR CHONE-PORTOVIEJO RIVER BASINS
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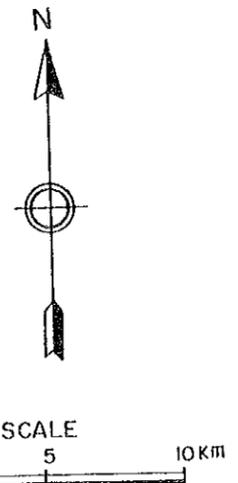
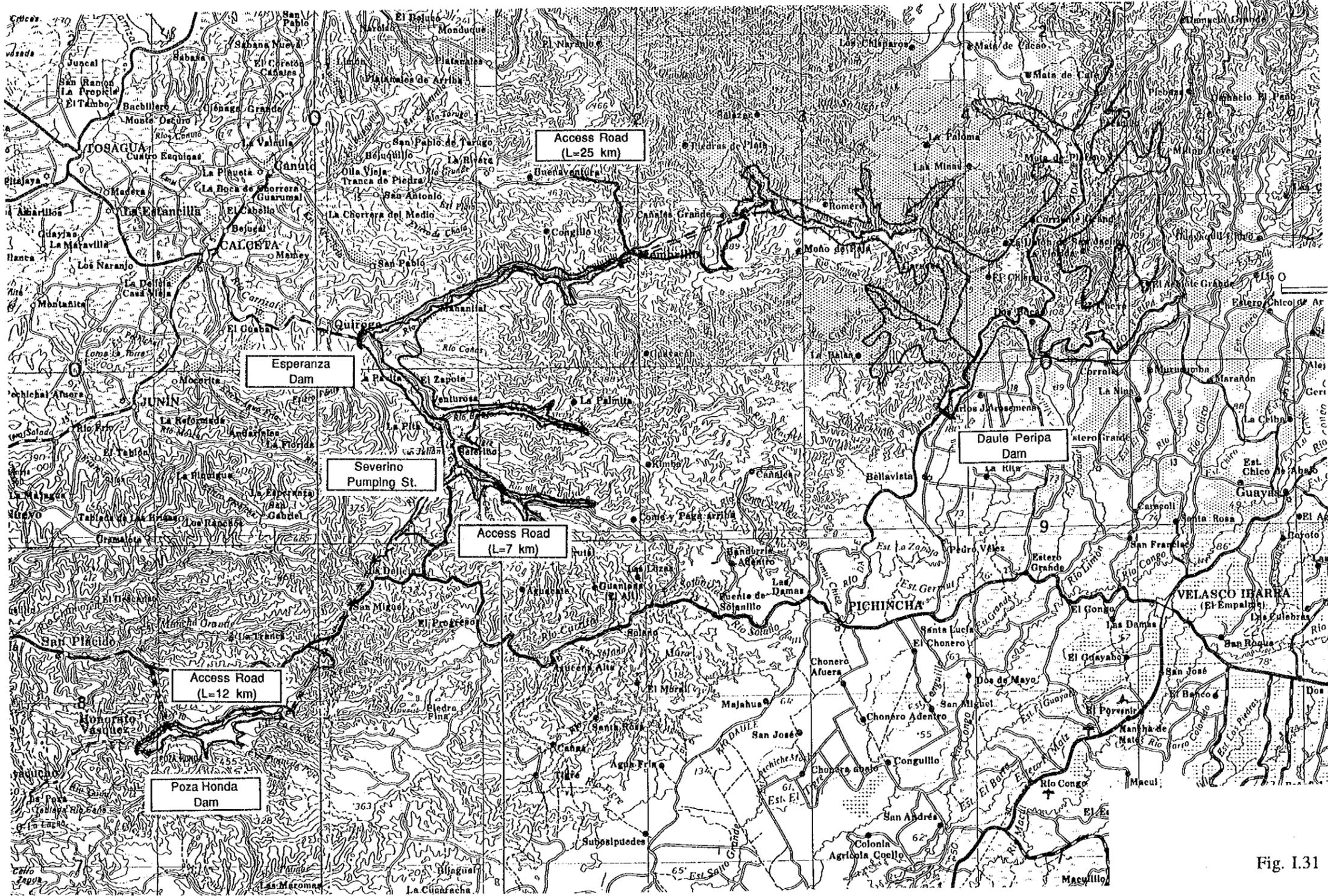
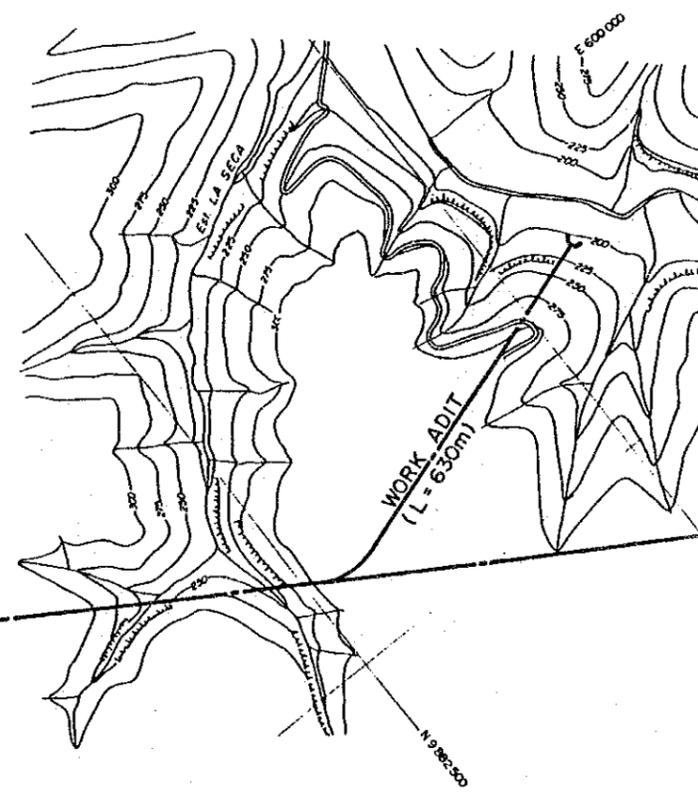
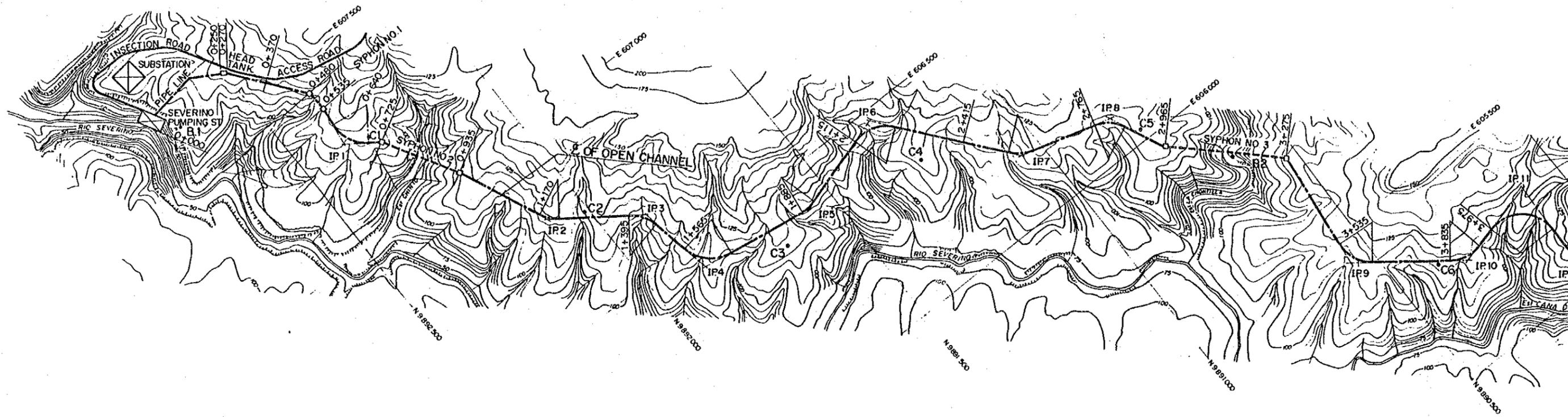
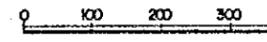
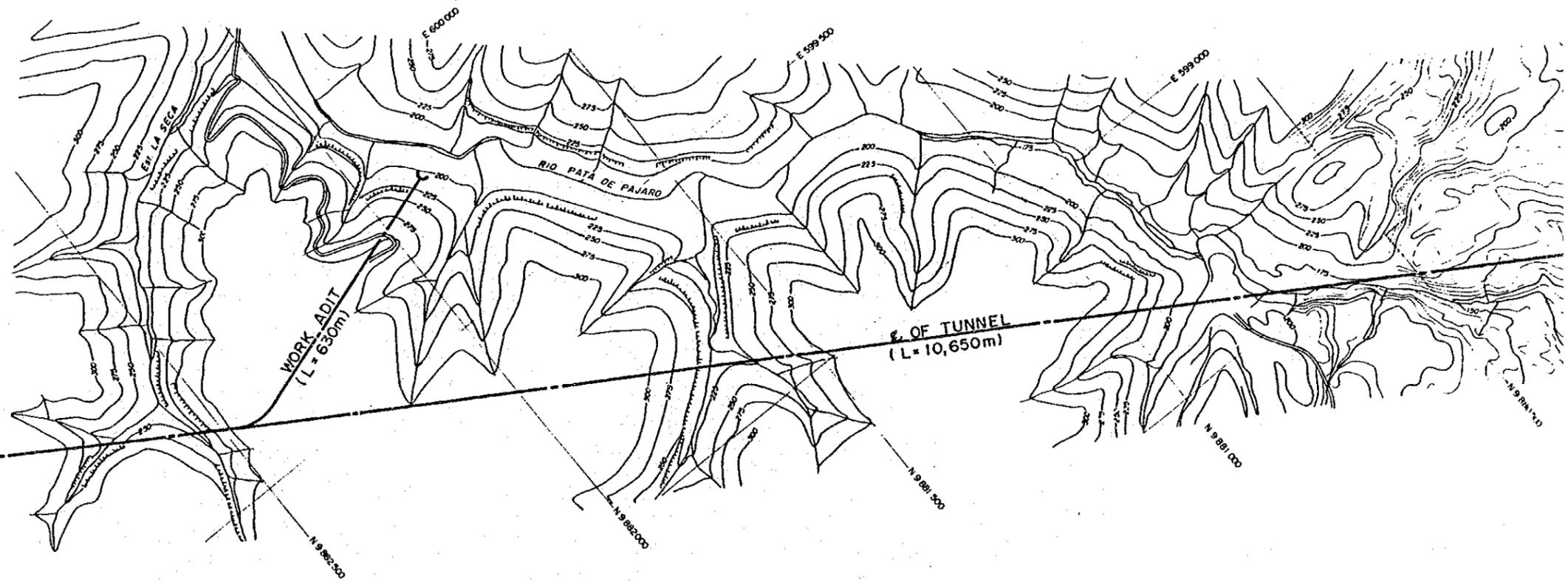
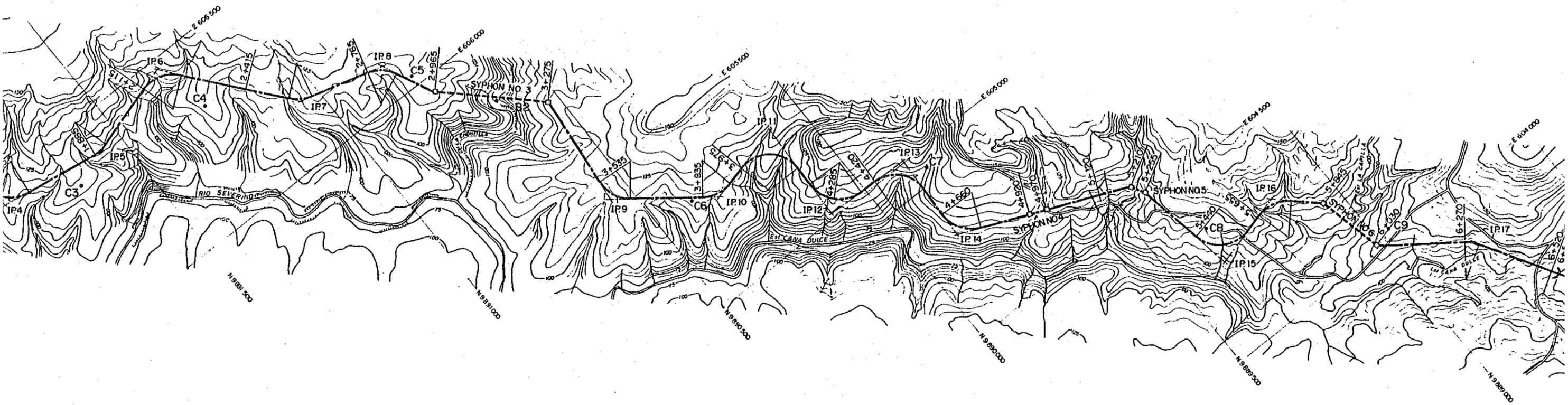


Fig. I.31 Vía de Acceso

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98 87 790
6 02 965



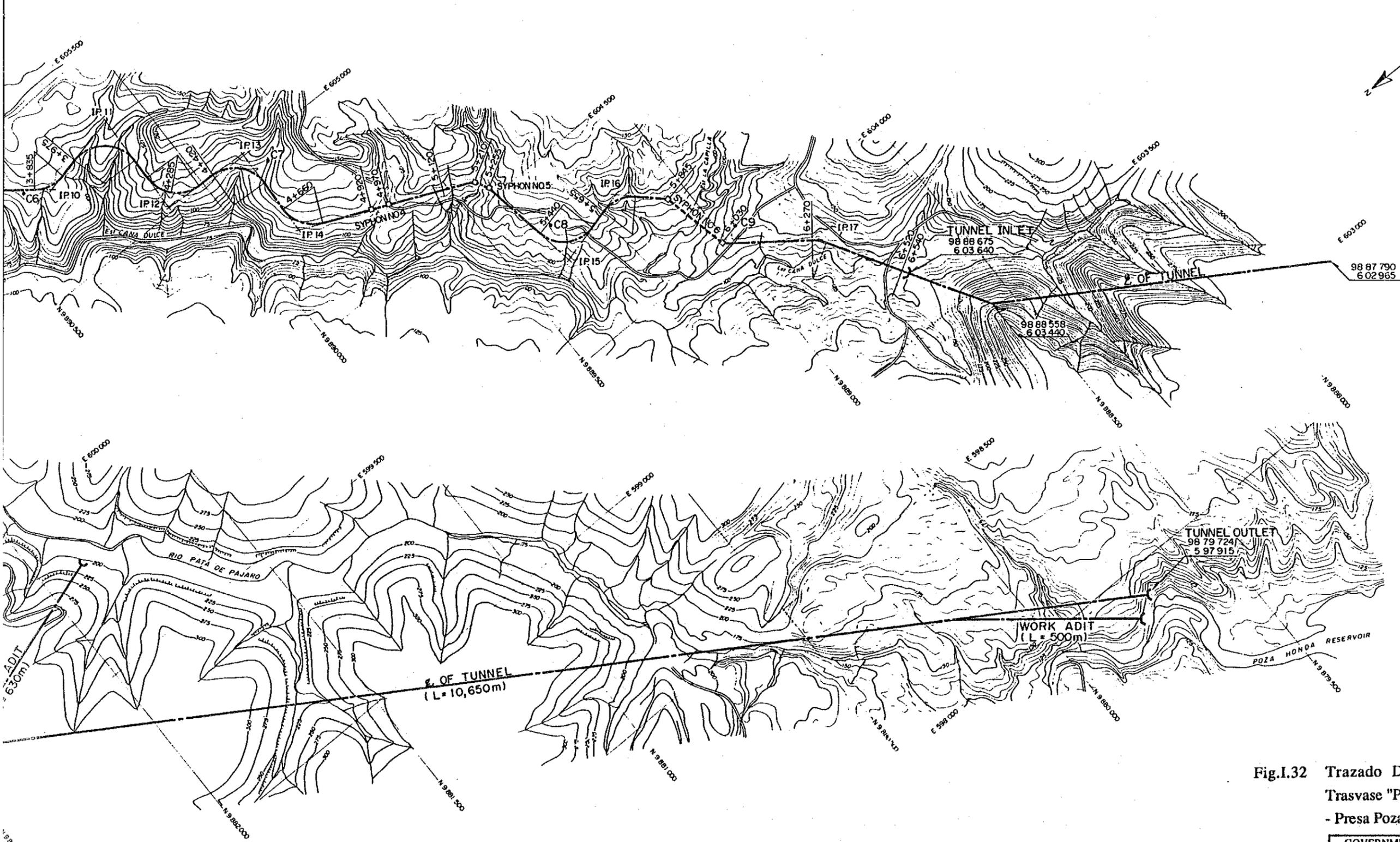
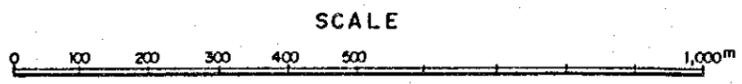


Fig.I.32 Trazado Detallado del Esquema de Traslase "Presa La Esperanza (Severino) - Presa Poza Honda"



GOVERNMENT OF THE REPUBLIC OF ECUADOR
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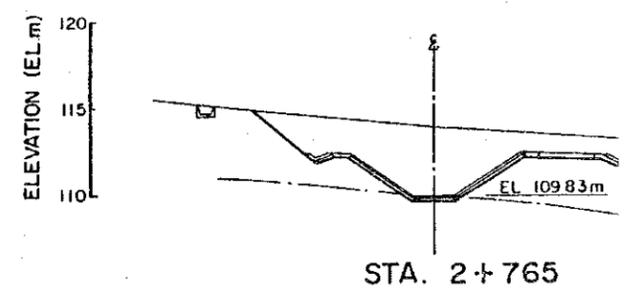
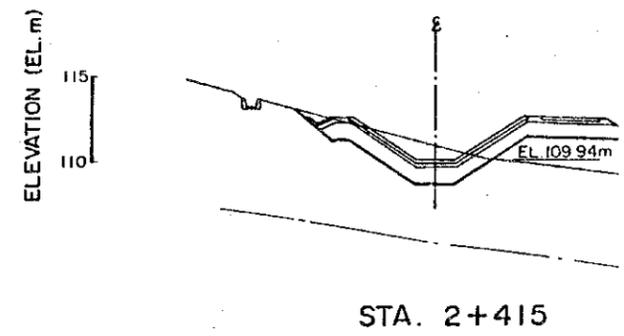
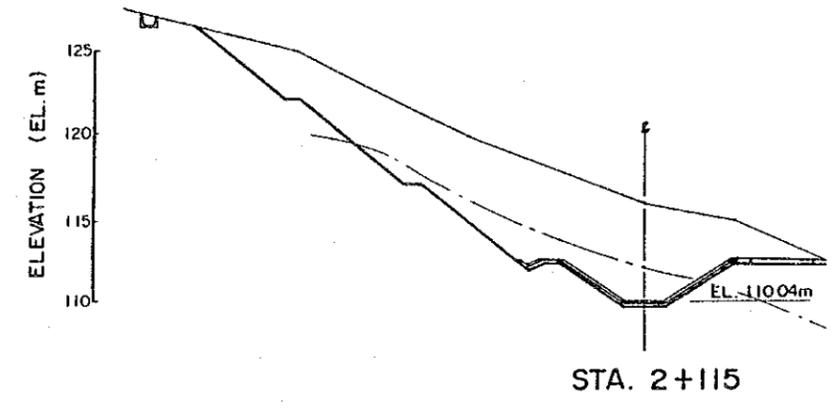
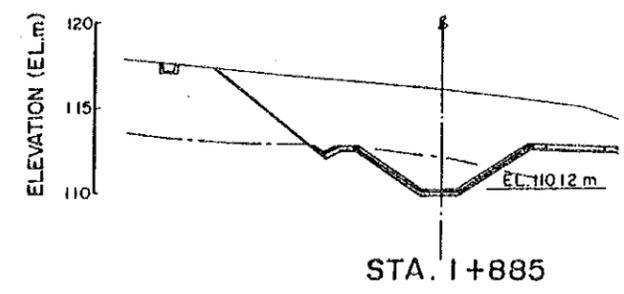
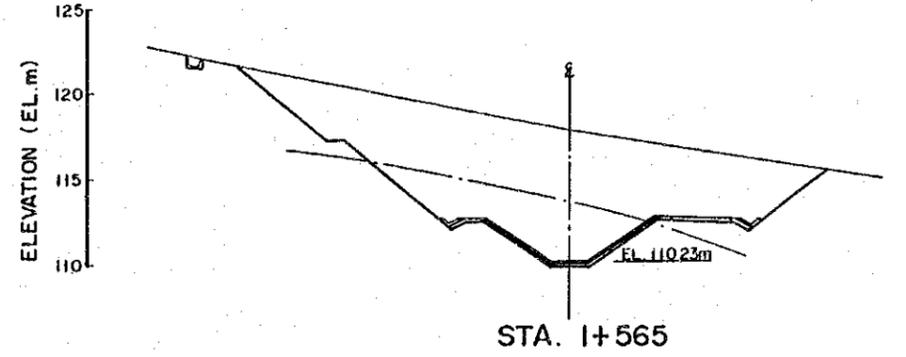
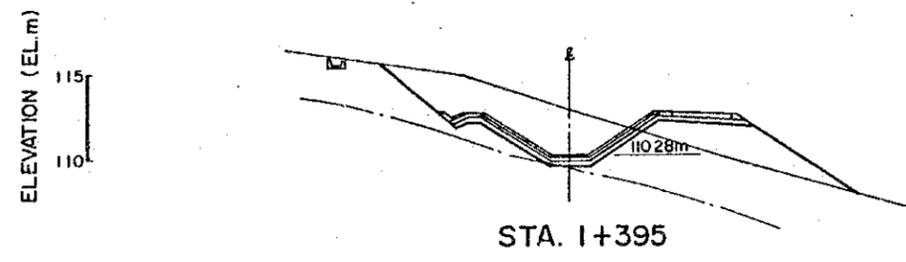
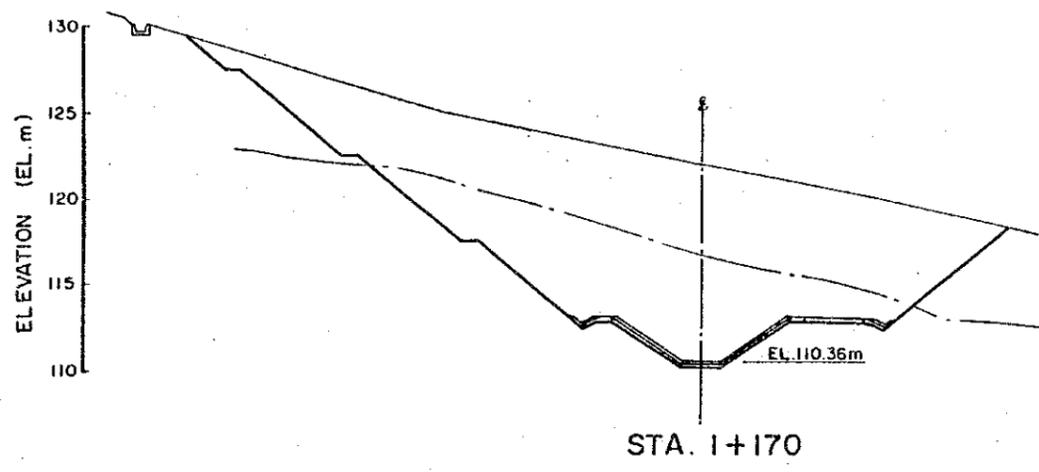
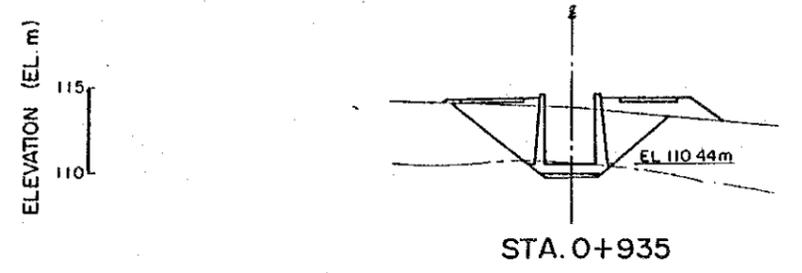
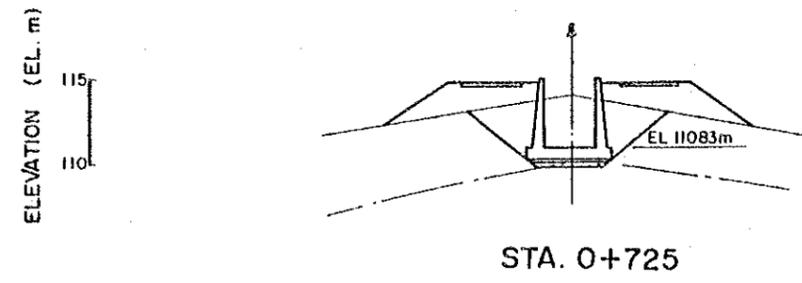
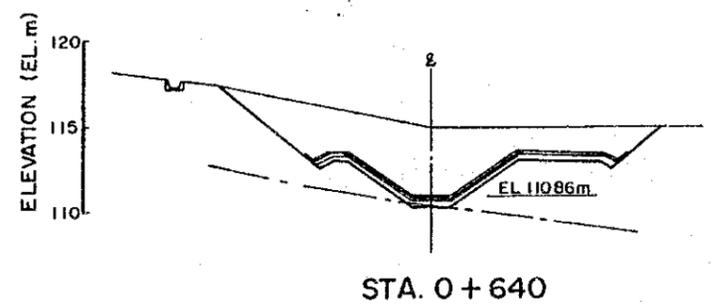
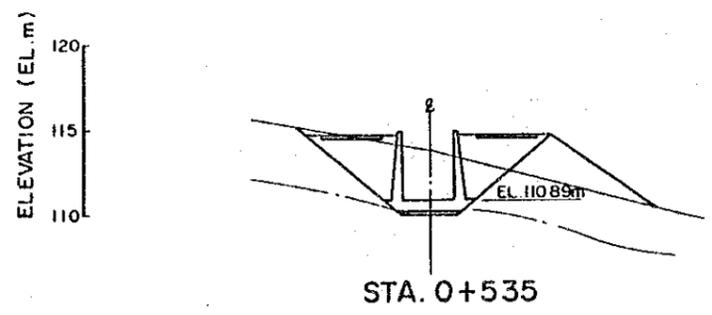
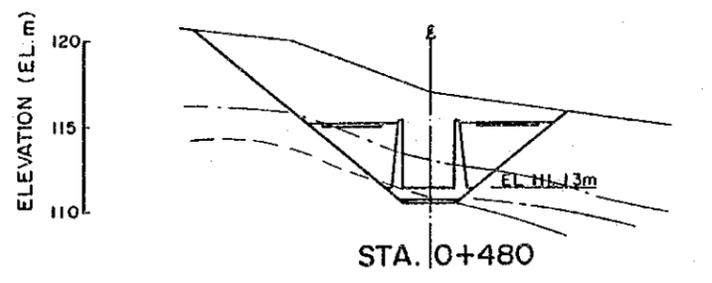
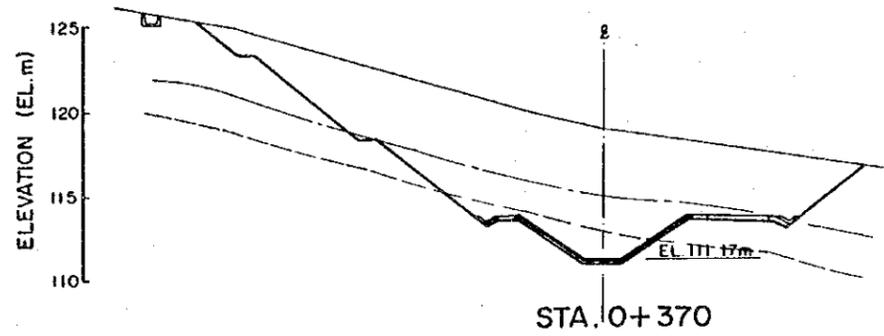
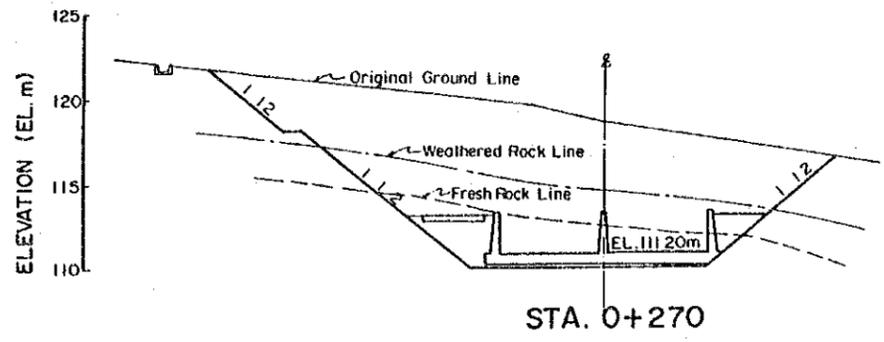
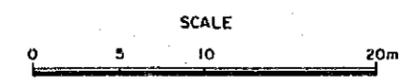


Fig. I.33 Sección Transversal del



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JAPAN INTERNATIONAL

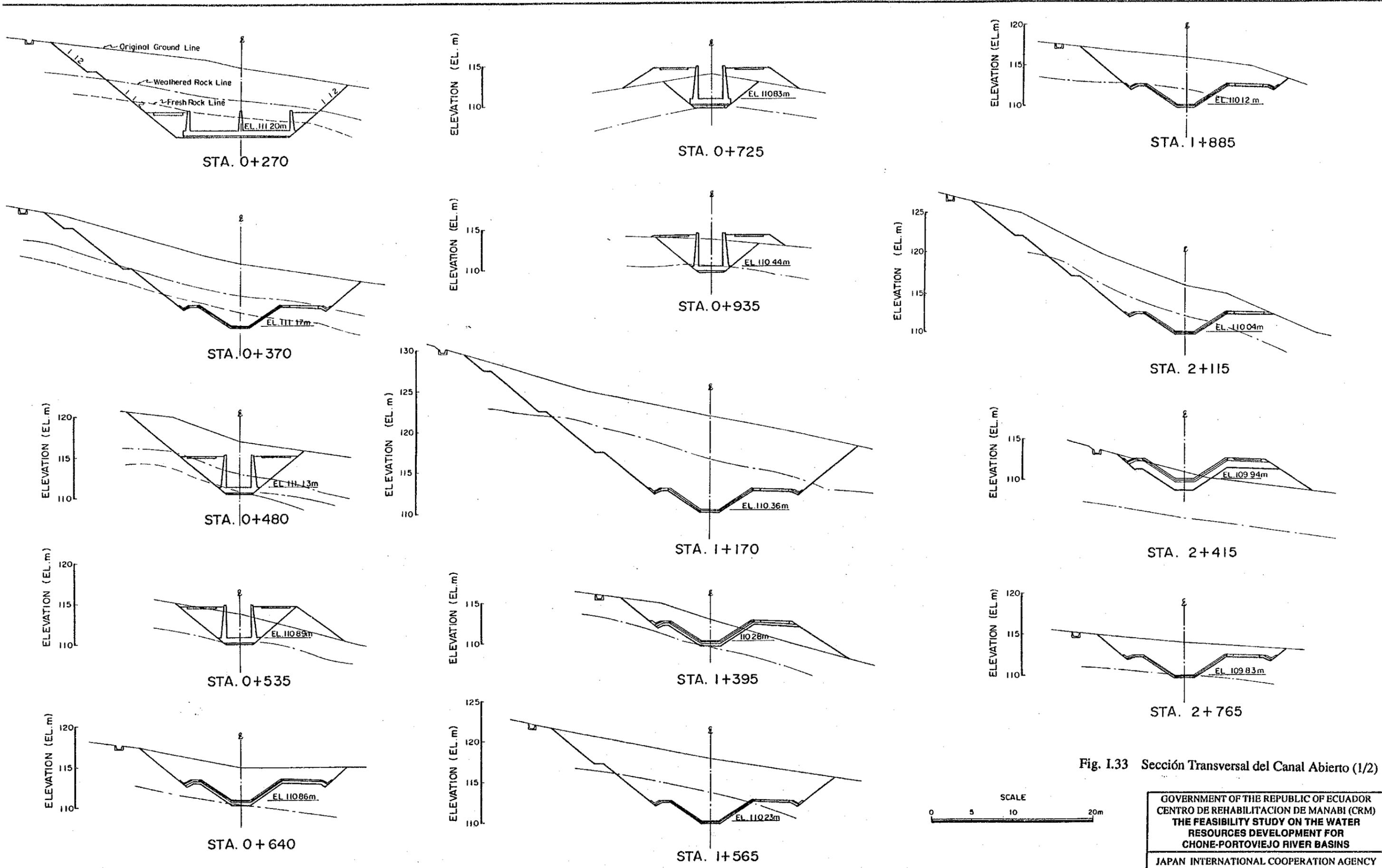
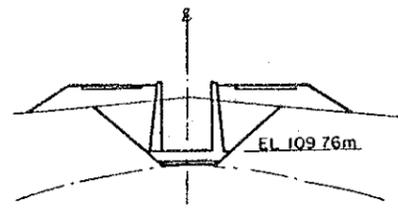


Fig. I.33 Sección Transversal del Canal Abierto (1/2)

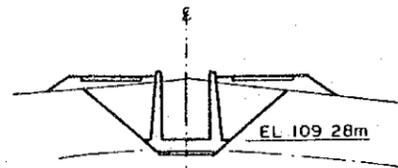
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ELEVATION (EL.m)



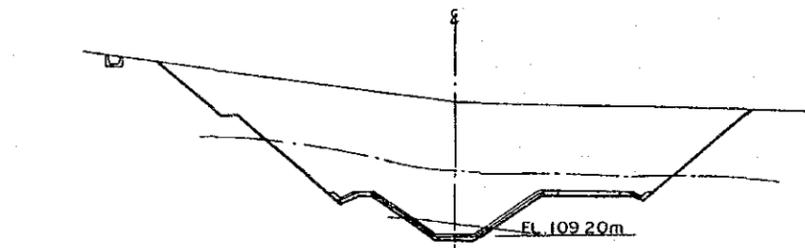
STA. 2+965

ELEVATION (EL.m)



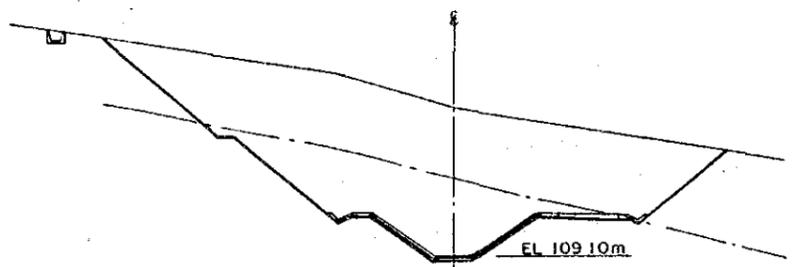
STA. 3+275

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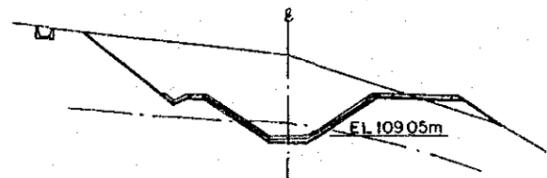
STA. 3+535

ELEVATION (EL.m)



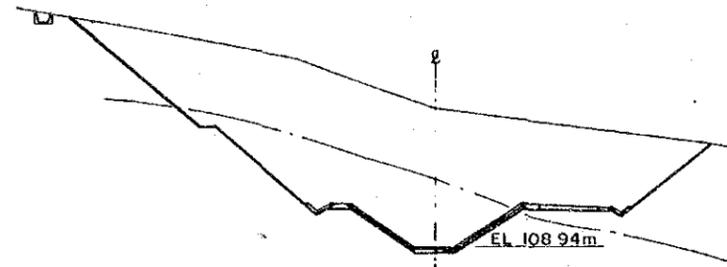
STA. 3+835

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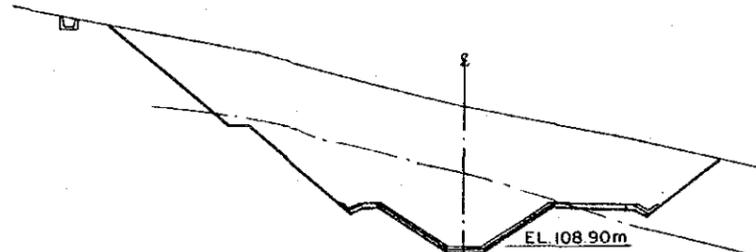
STA. 3+975

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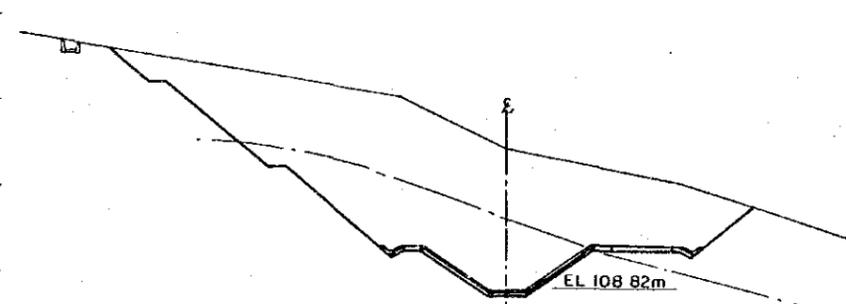
STA. 4+295

ELEVATION (EL.m)



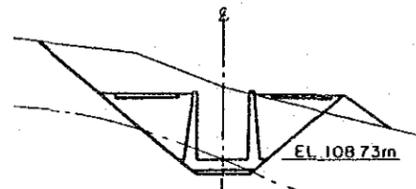
STA. 4+420

ELEVATION (EL.m)



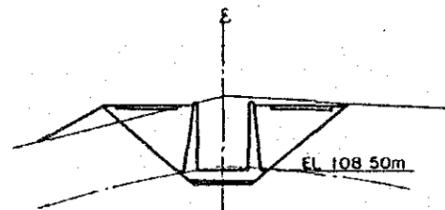
STA. 4+660

ELEVATION (EL.m)



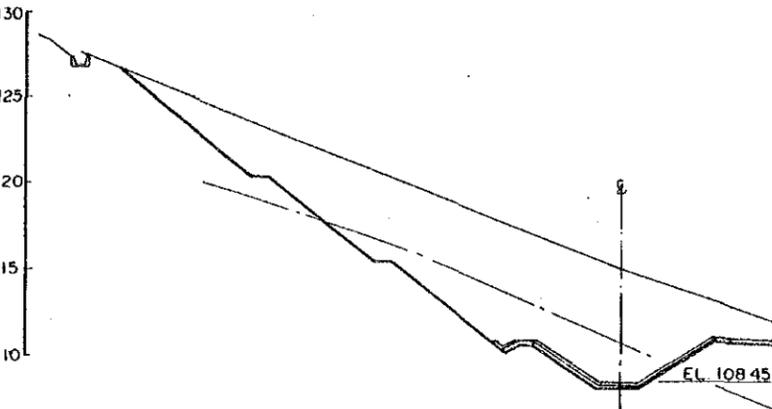
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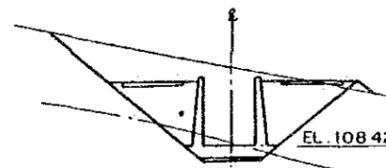
STA. 4+970

ELEVATION (EL.m)



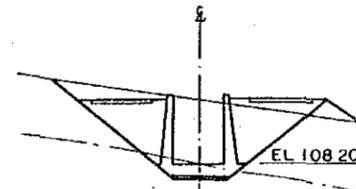
STA. 5+120

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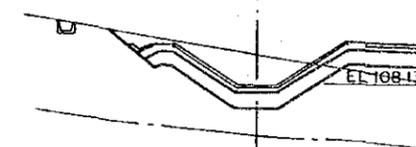
STA. 5+210

ELEVATION (EL.m)



STA. 5+255

ELEVATION (EL.m)



STA. 5+440

ELEVATION (EL.m)



STA. 5+655

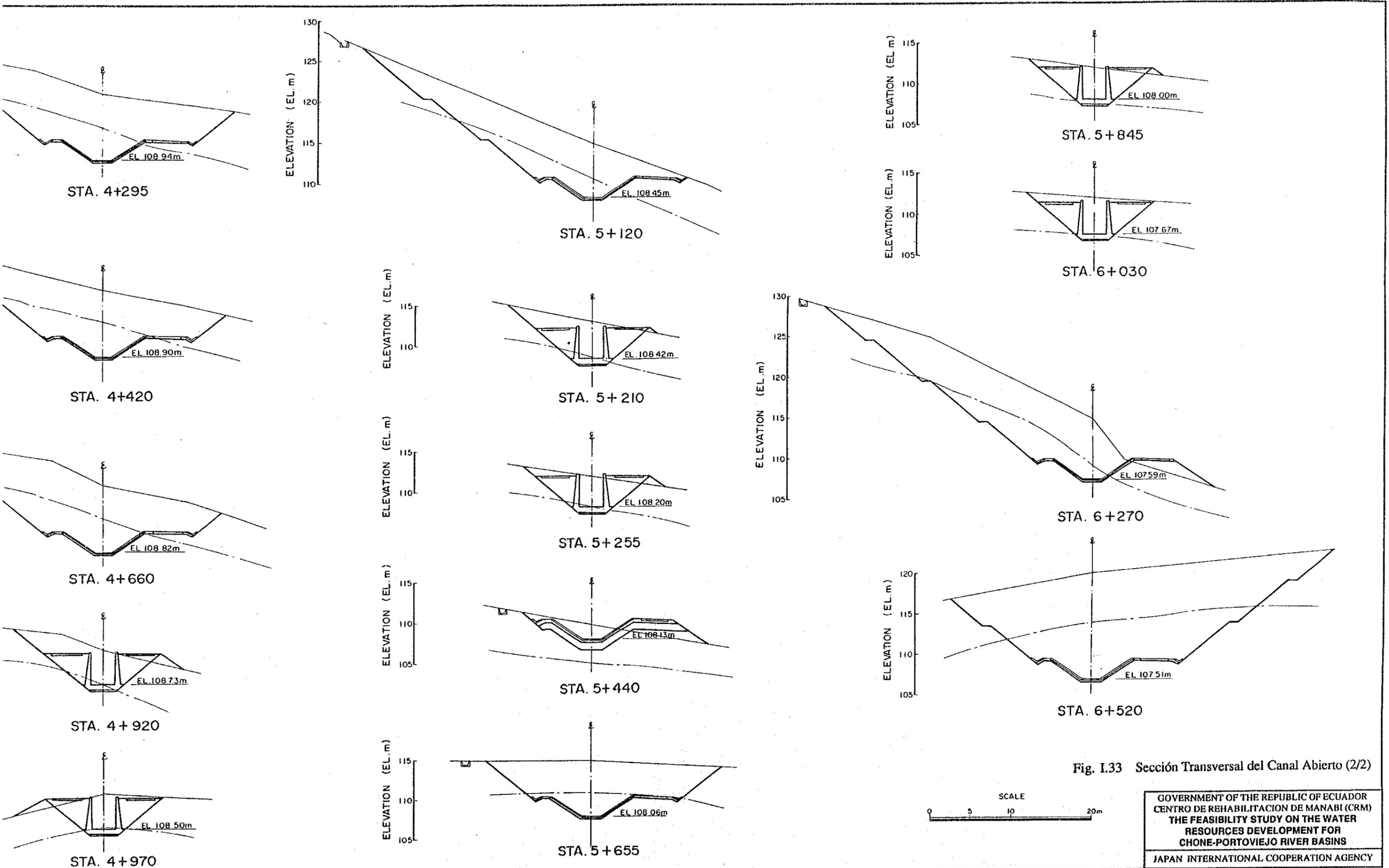
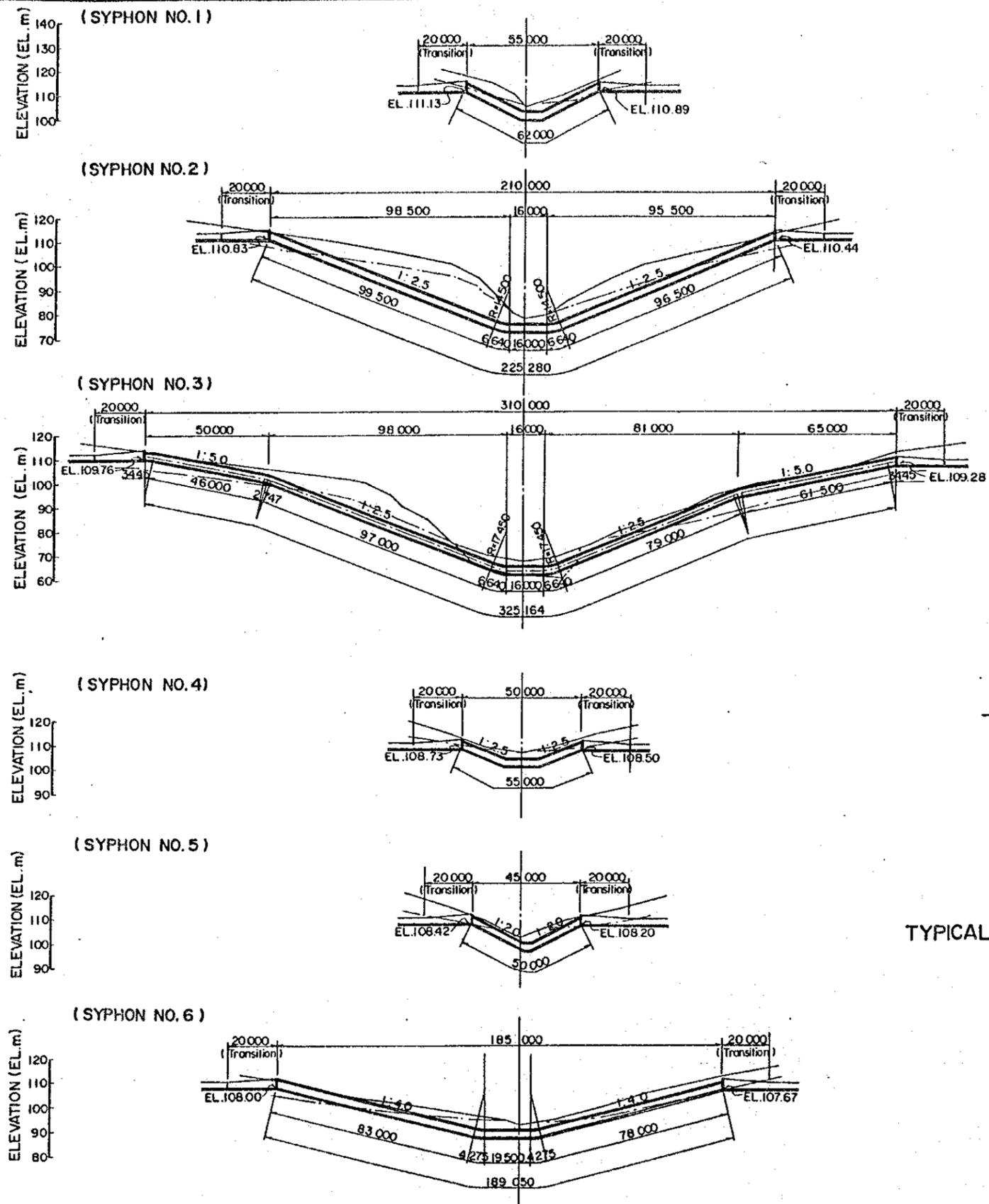
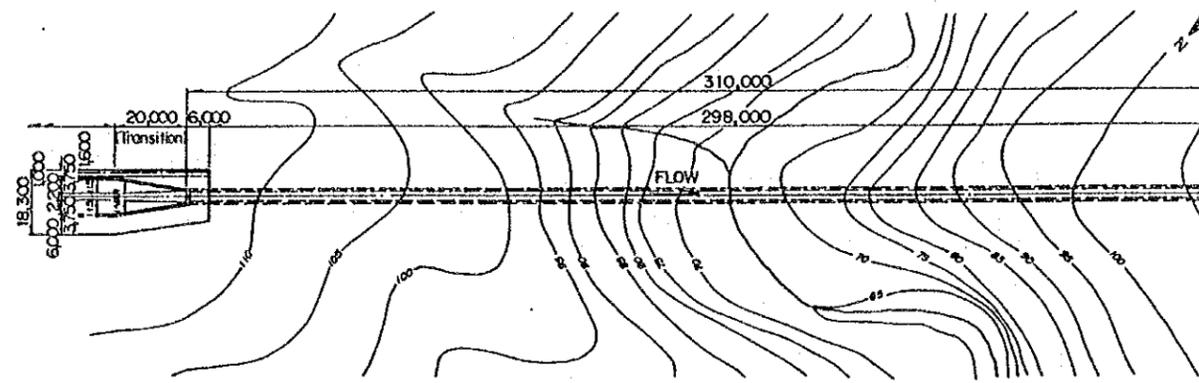


Fig. I.33 Sección Transversal del Canal Abierto (2/2)

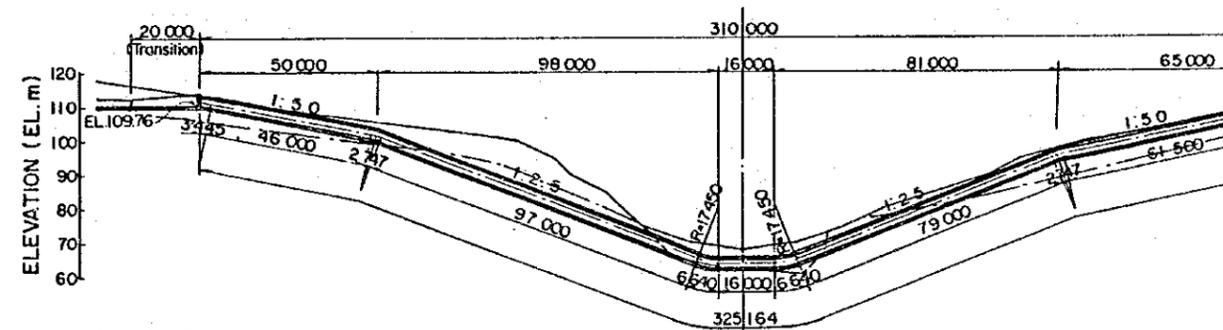
GOVERNMENT OF THE REPUBLIC OF ECUADOR
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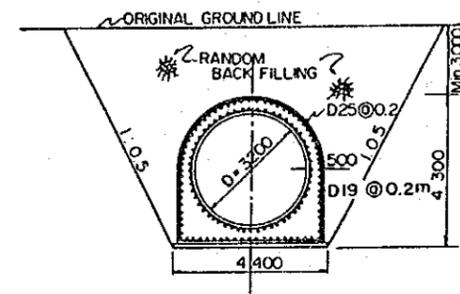
PROFILE OF SYPHON (No.1-No.6) SCALE A



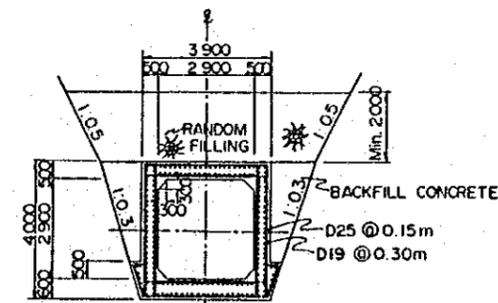
PLAN OF SYPHON No.3 SCALE A



PROFILE OF SYPHON No.3 SCALE A



TYPICAL SECTION OF SYPHON NO.2 AND NO.3 SCALE B

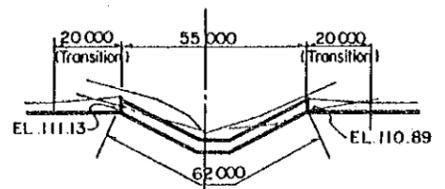


TYPICAL SECTION OF SYPHON NO.1, NO.4-NO.6 SCALE B

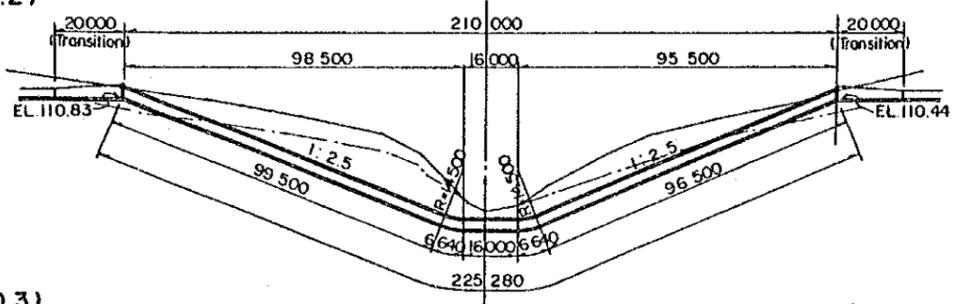


Fig. I.34 Dis

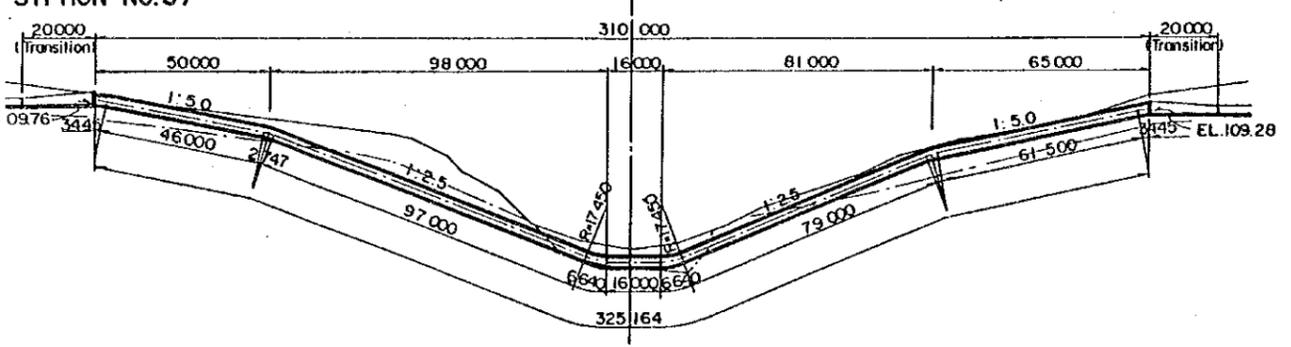
(SYPHON NO.1)



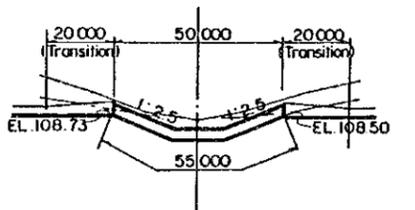
(SYPHON NO.2)



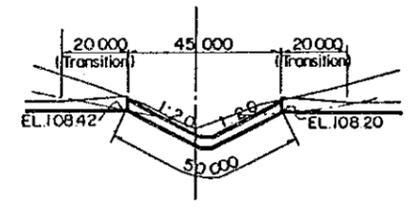
(SYPHON NO.3)



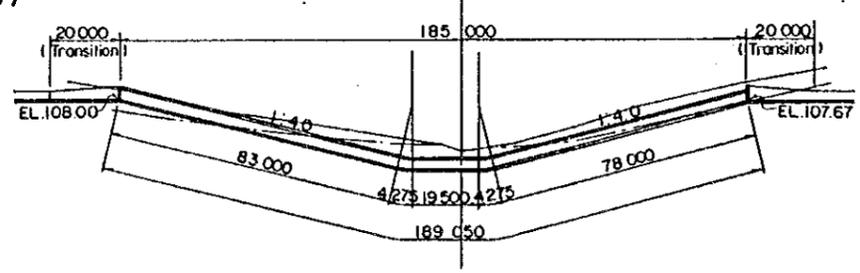
(SYPHON NO.4)



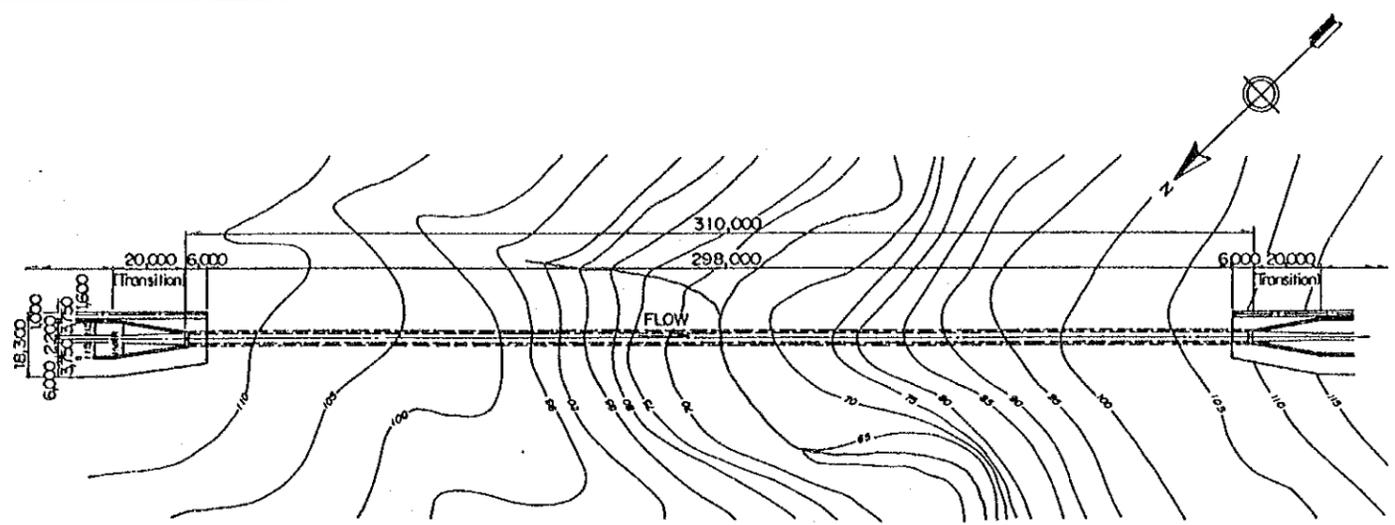
(SYPHON NO.5)



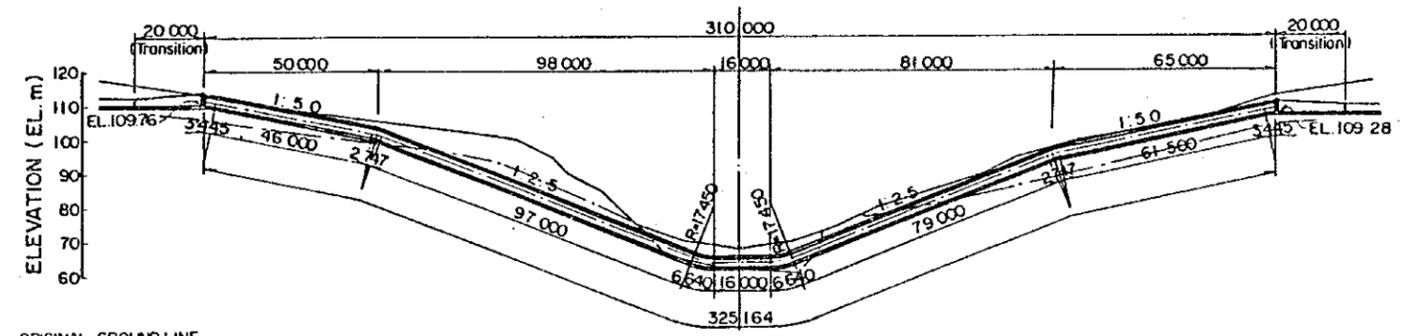
(SYPHON NO.6)



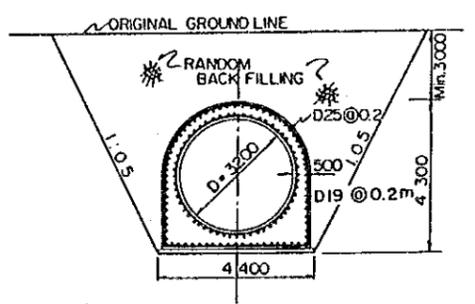
PROFILE OF SYPHON (No.1-No.6) SCALE A



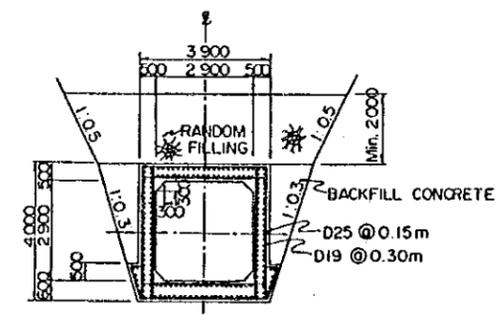
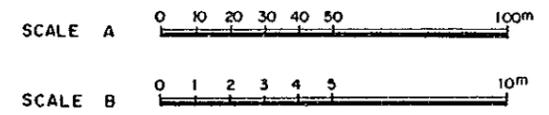
PLAN OF SYPHON No.3 SCALE A



PROFILE OF SYPHON No.3 SCALE A



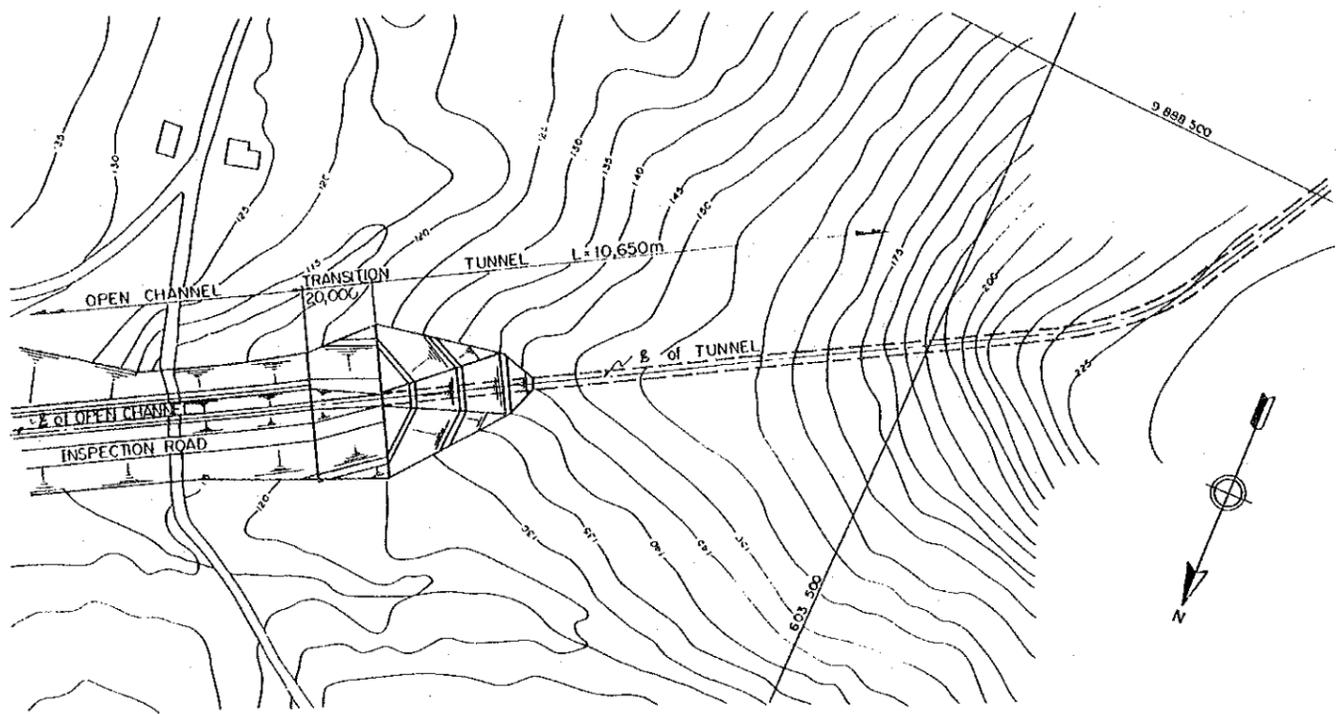
TYPICAL SECTION OF SYPHON NO.2 AND NO.3 SCALE B



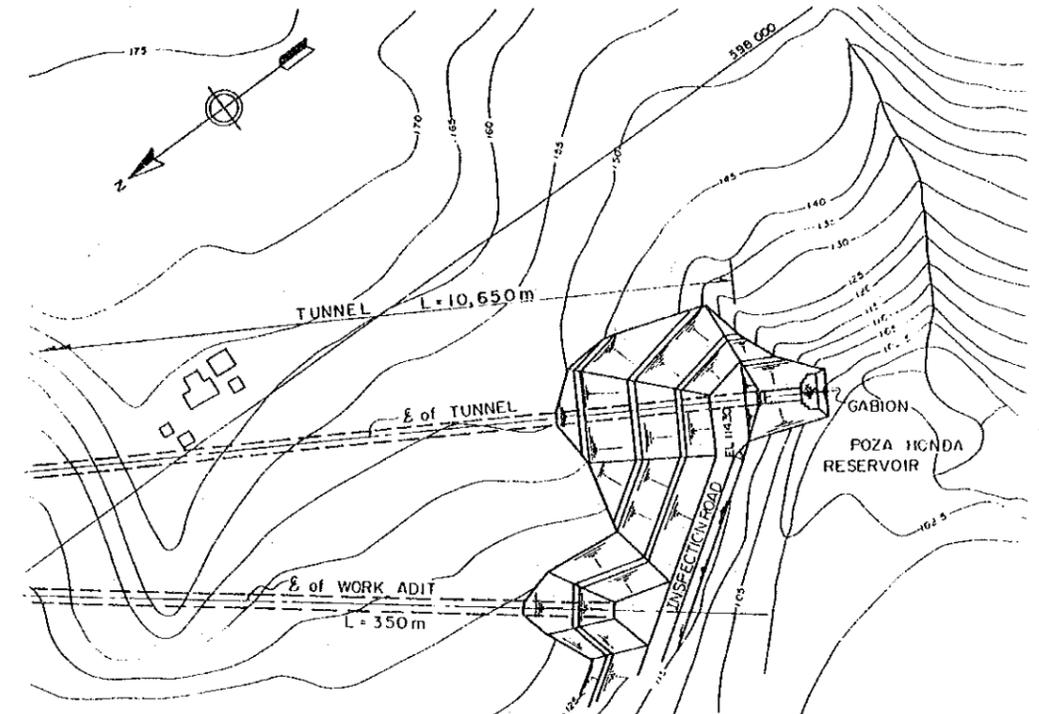
TYPICAL SECTION OF SYPHON NO.1, NO.4-NO.6 SCALE B

Fig. I.34 Diseño Básico de los Sifones

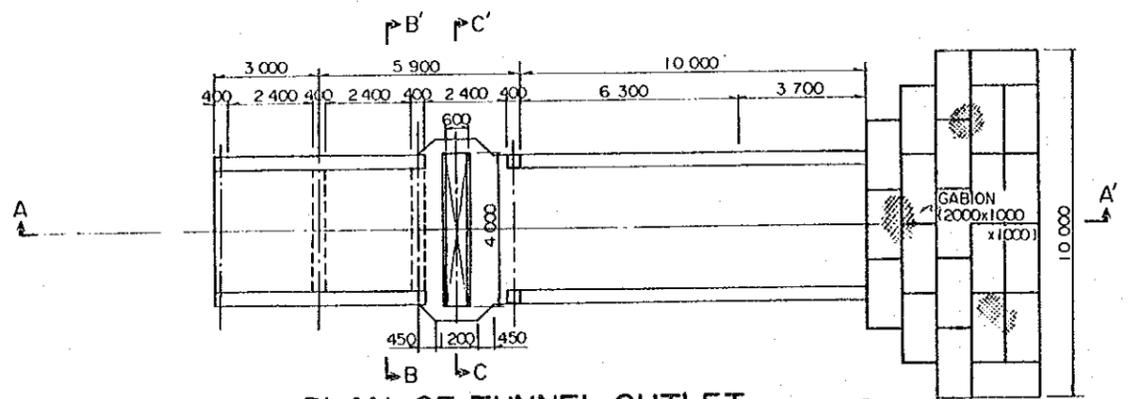
GOVERNMENT OF THE REPUBLIC OF ECUADOR
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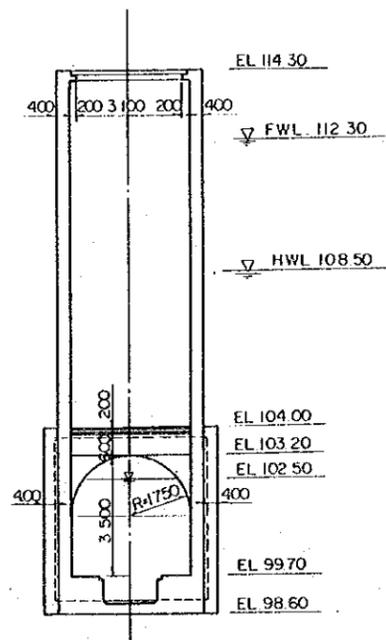
LAYOUT PLAN OF TUNNEL INLET SCALE A



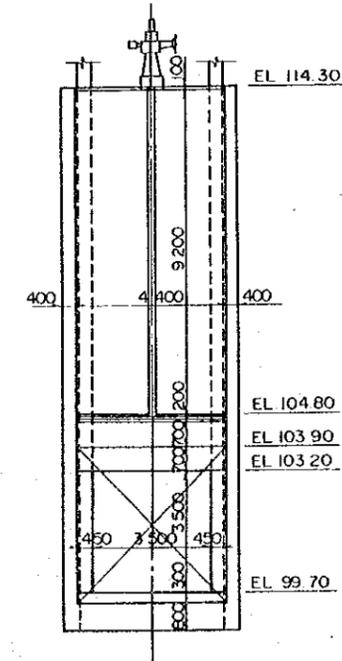
LAYOUT PLAN OF TUNNEL OUTLET SCALE A



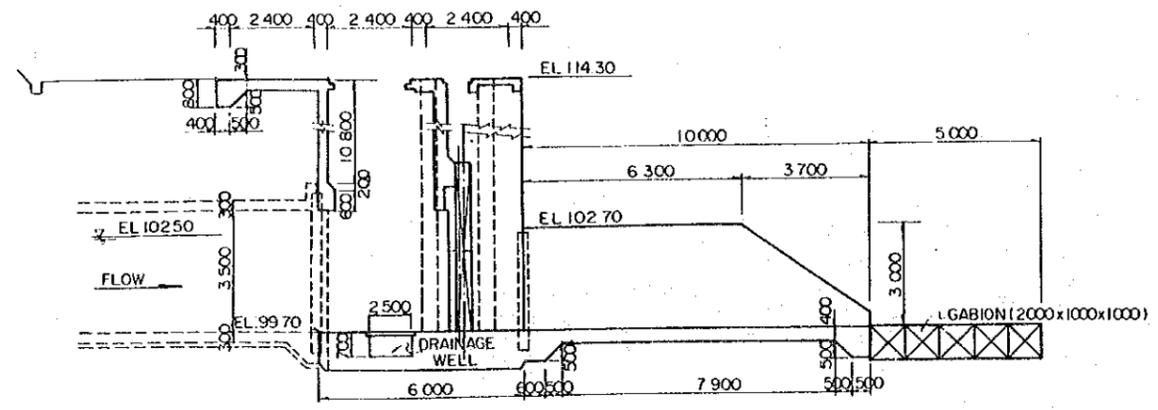
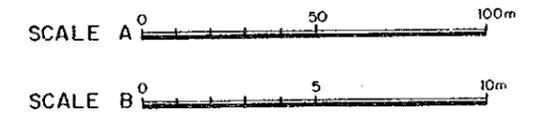
PLAN OF TUNNEL OUTLET SCALE B



SECTION OF OUTLET B - B' SCALE B

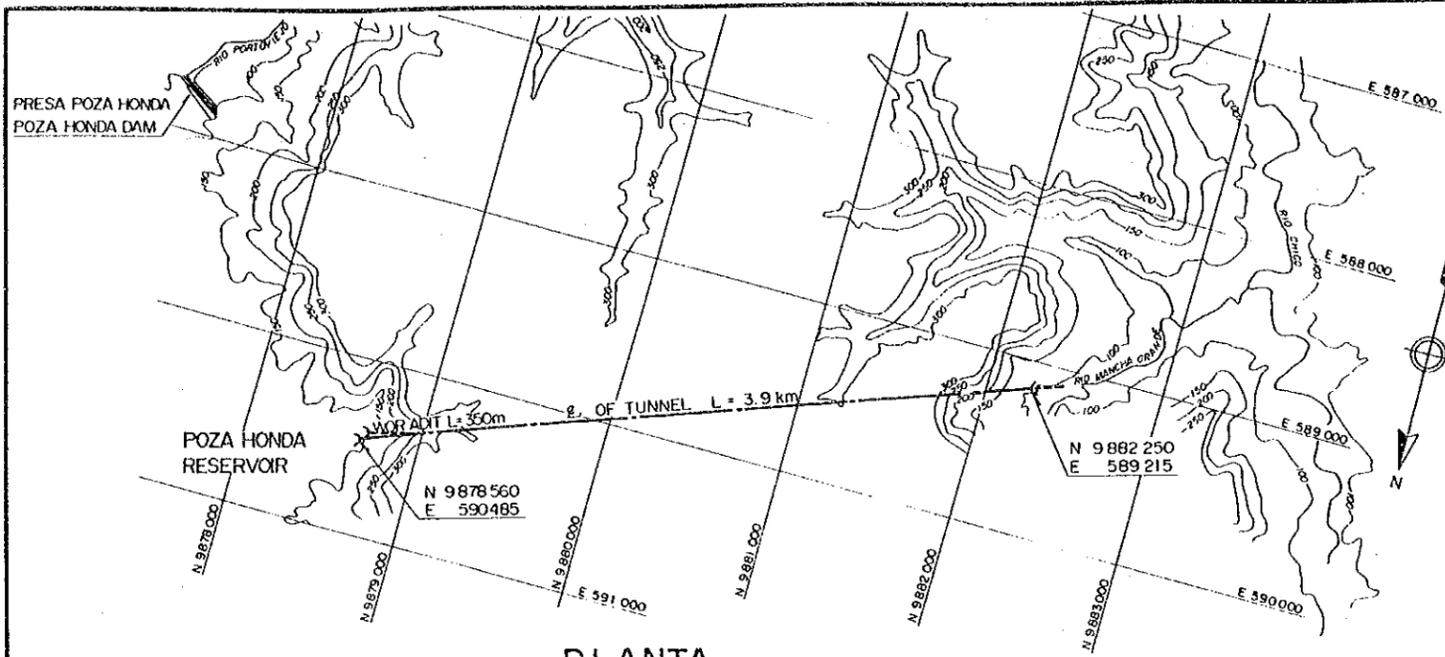


SECTION OF OUTLET C - C' SCALE B

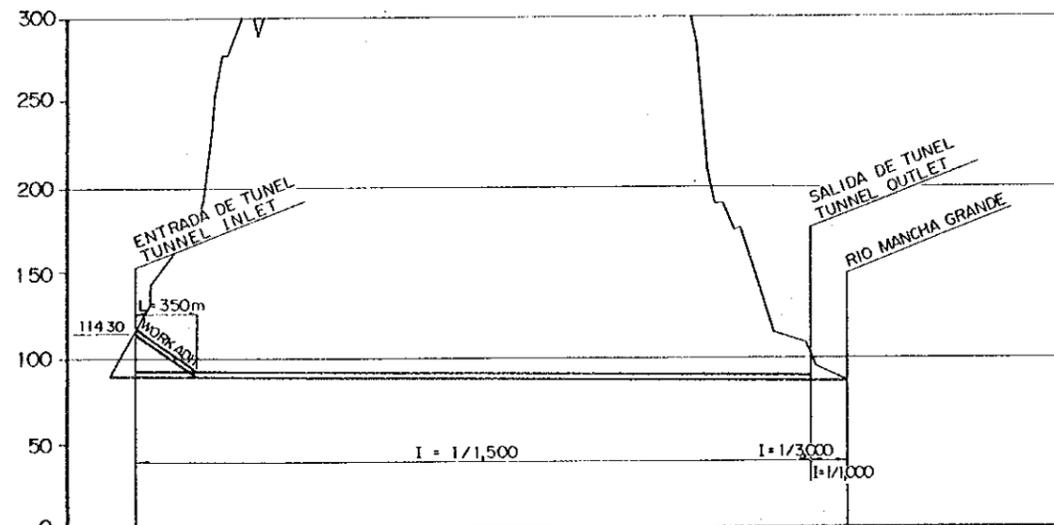


SECTION A - A' SCALE B

Fig. I.35
Diseño Básico de los Portales de Entrada y Salida para el Esquema de Trasvase "Presa La Esperanza (Severino) - Presa Poza Honda"

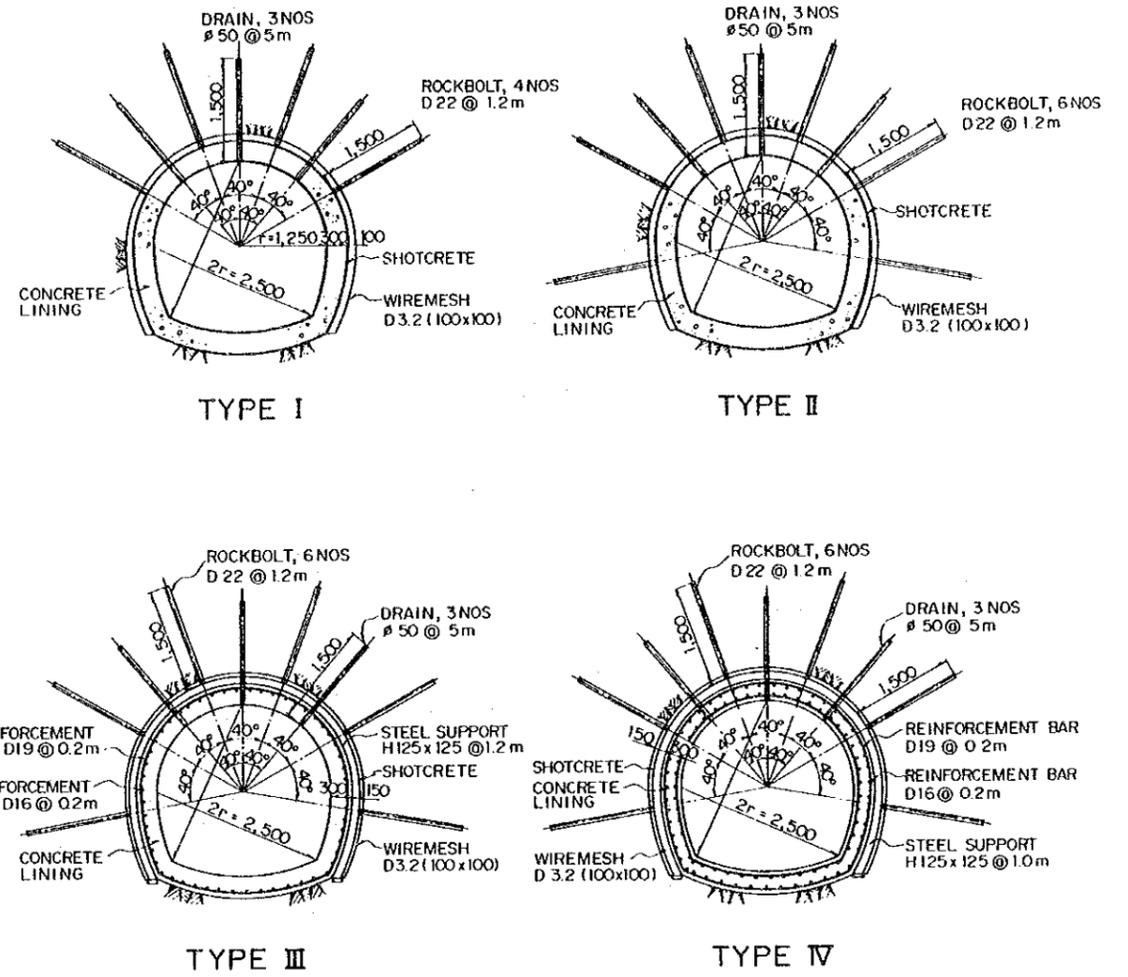


PLANTA PLAN SCALE A



PERFIL PROFILE H; SCALE A V; SCALE B

TIPOS DE ESTRUCTURAS TYPE OF STRUCTURE	TUNNEL L = 3,902m				OPEN CHANNEL L = 205m	
COTA DE ESTRUCTURA ELEVATION OF STRUCTURE (EL. m)	89.90	89.23	88.57	87.90	87.30	87.29
COTA DEL TERRENO ELEVATION OF GROUND (EL. m)	120				103	89
DISTANCIA ACUMULADA ACCUMULATE DISTANCE (m)	0	1.000	2.000	3.000	3.902	4.107
DISTANCIA DISTANCE (m)	0	1.000	1.000	1.000	3.902	205
ESTACION STATION	0+000	1+000	2+000	3+000	3+902	4+107



TUNNEL SECTION SCALE C

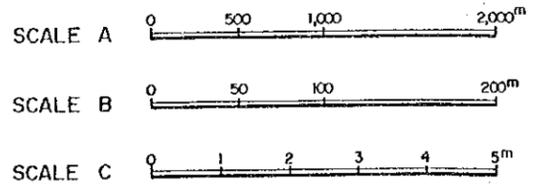
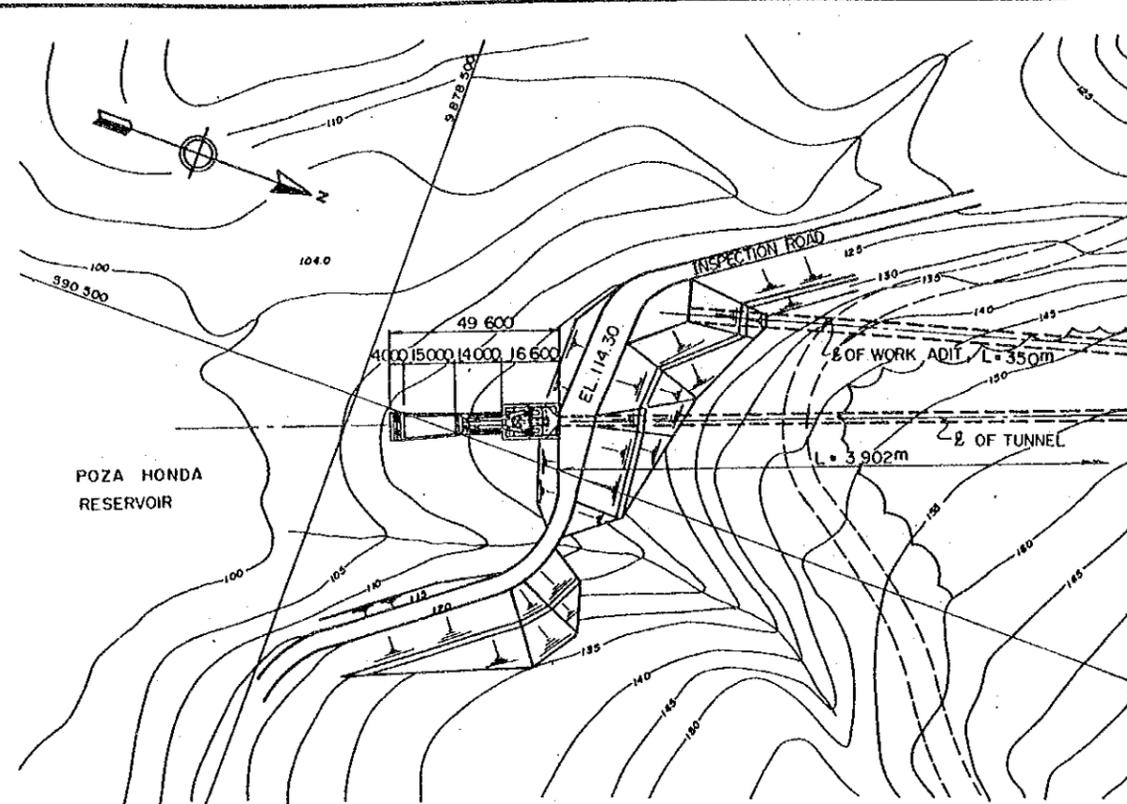
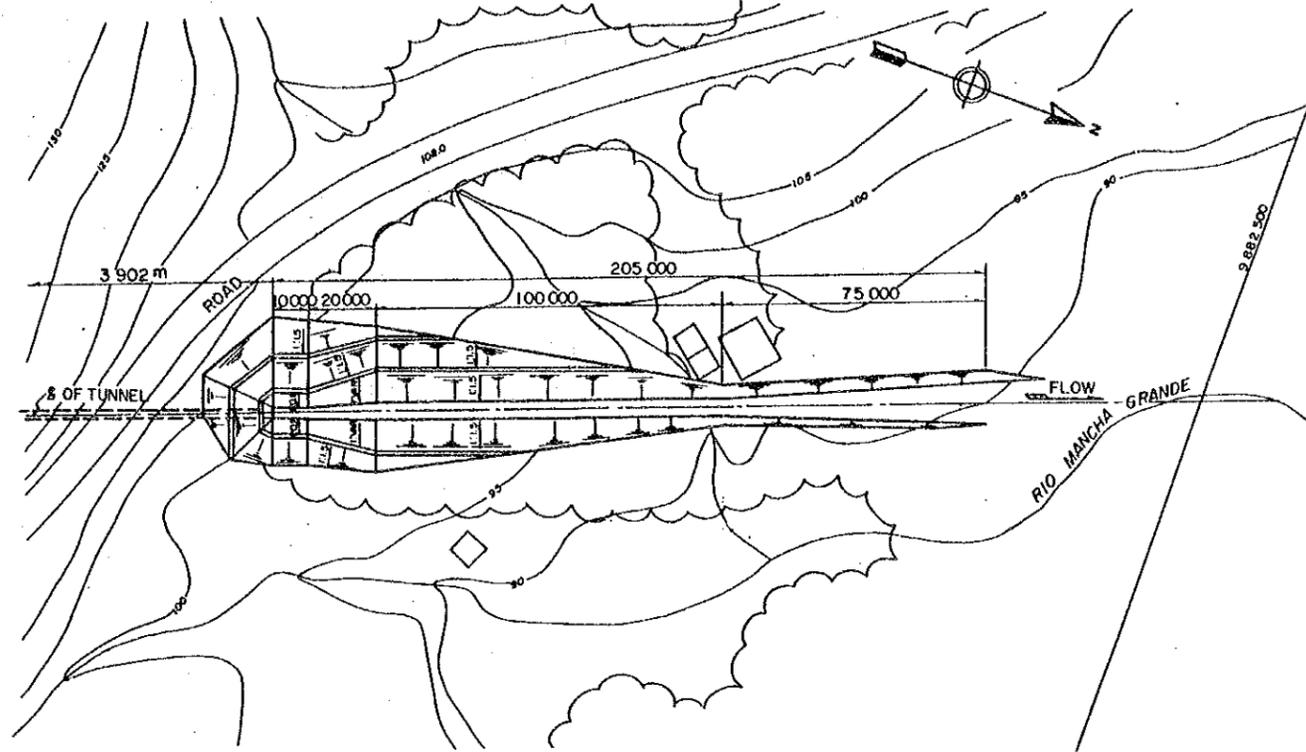


Fig. I.36 Diseño Básico del Esquema de Traspase "Presas Poza Honda - Río Mancha Grande"

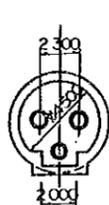
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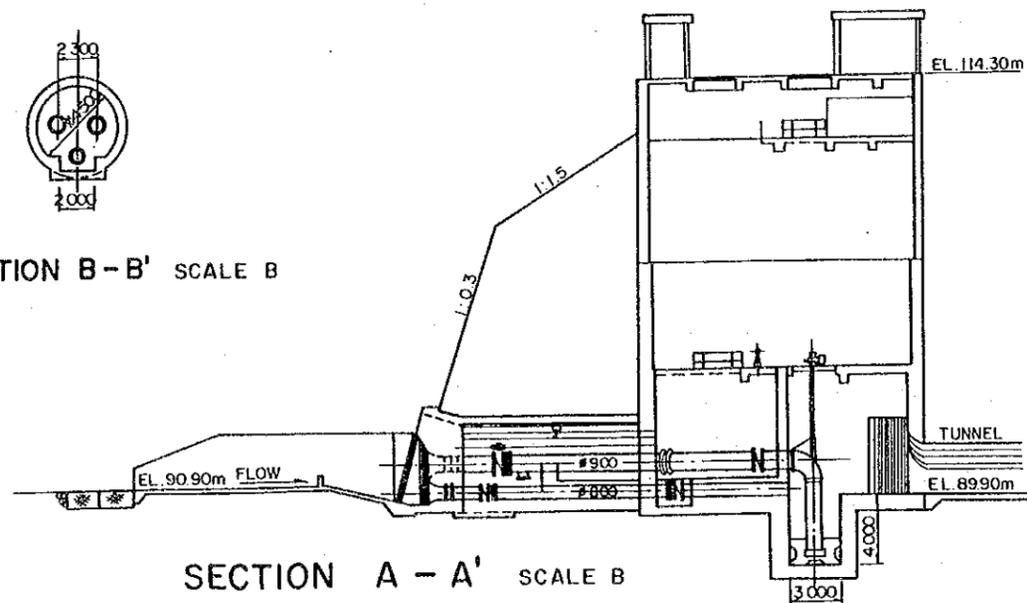
LAYOUT PLAN OF TUNNEL INLET SCALE A



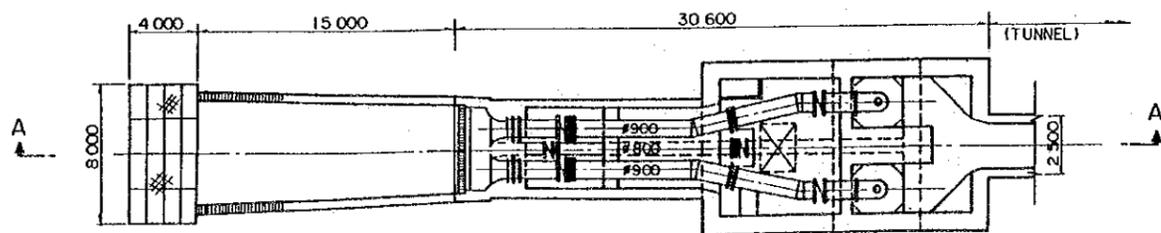
LAYOUT PLAN OF TUNNEL OUTLET SCALE A



SECTION B - B' SCALE B



SECTION A - A' SCALE B



PLAN OF TUNNEL INLET SCALE B

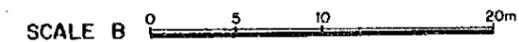
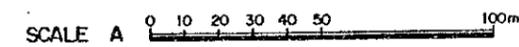


Fig. I.37 Diseño Básico de los Portales de Entrada y Salida para el Esquema de Trasvase "Presas Poza Honda - Río Mancha Grande"

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