

UNIVERSIDAD NACIONAL DE INGENIERIA
Facultad de Ingeniería Civil



**DISEÑO GEOMETRICO DE UN PROYECTO DE
CARRETERA USANDO EL PROGRAMA TOPO,
APLICADO EN EL TRAMO MATARANI - Ilo**

Tomo II

TESIS

**PARA OPTAR EL TITULO PROFESIONAL DE:
INGENIERO CIVIL**

PRESENTADO POR:

JOSE ARTURO LEYVA URPI

**LIMA - PERU
2001**

INDICE DE PLANOS

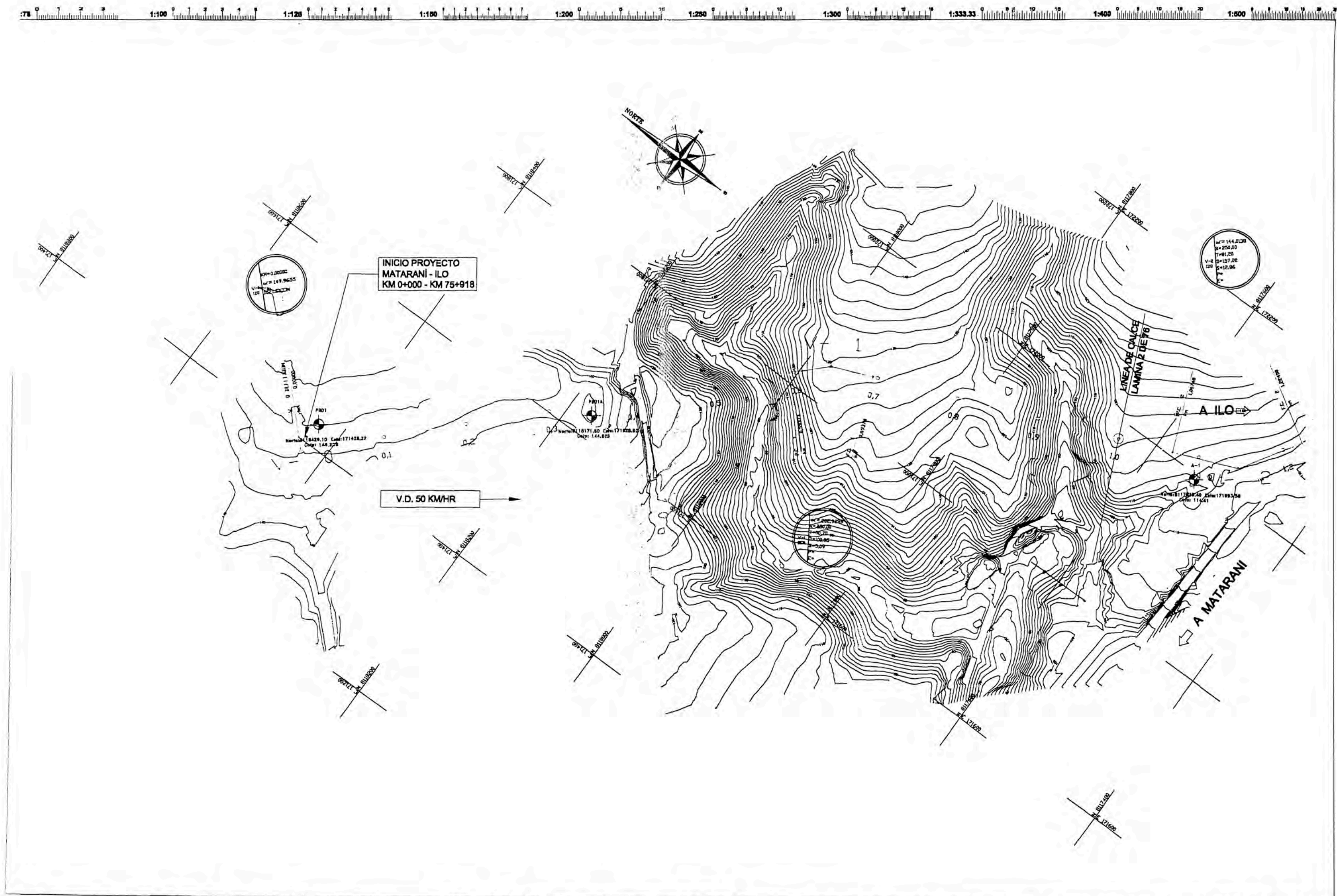
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VARIANTE AGUA LIMA Planta y Perfil Longitudinal	Km 3+600 – Km 5+600
MATARANI-MOLLENDO Planta y Perfil Longitudinal	Km 0+000 – Km 9+000
Secciones Transversales	Km 0+000 – Km 9+000

VARIANTE INICIO



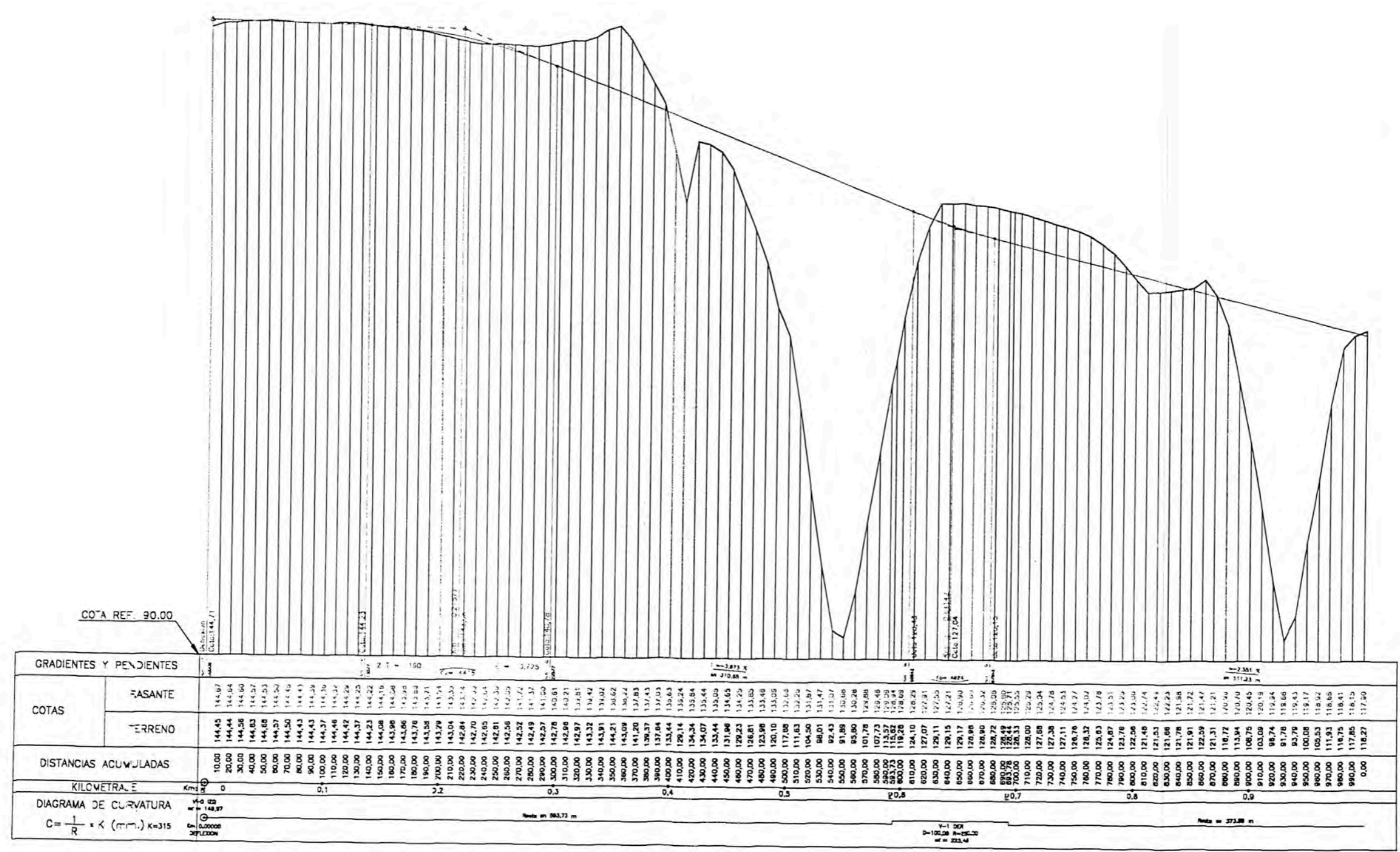
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MATARANI - ILO
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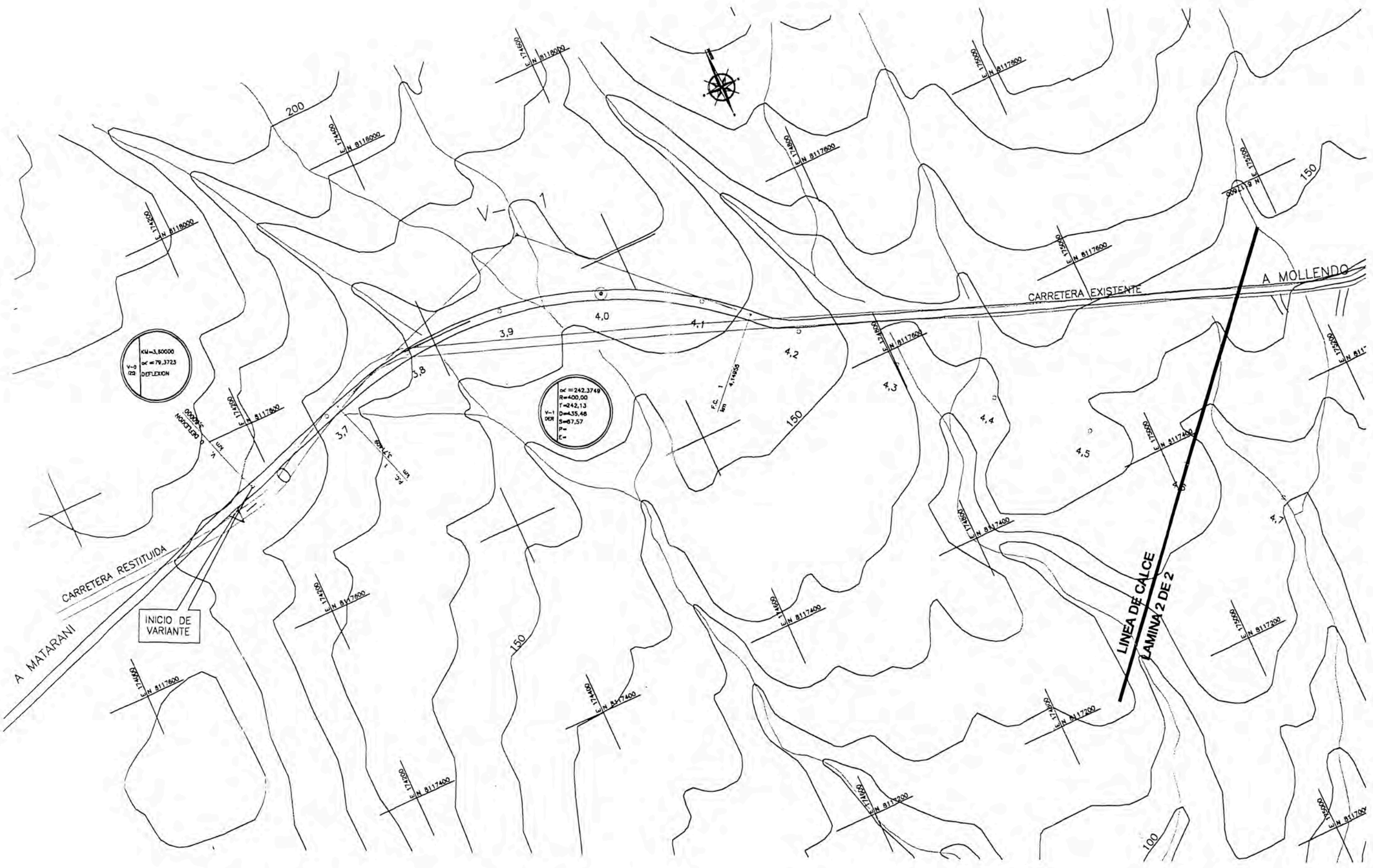
V.D. 50 KM/HR



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REVISIONES		
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UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA CIVIL
 DEPARTAMENTO ACADEMICO DE TOPOGRAFIA Y VIAS DE TRANSPORTE

Diseñó: Bach. A. Laya U
 Dibujó: A.L.U.
 Verificó: Ing. G. Rosales B
 CIP 28841
 Presentó: Bach. A. Laya U

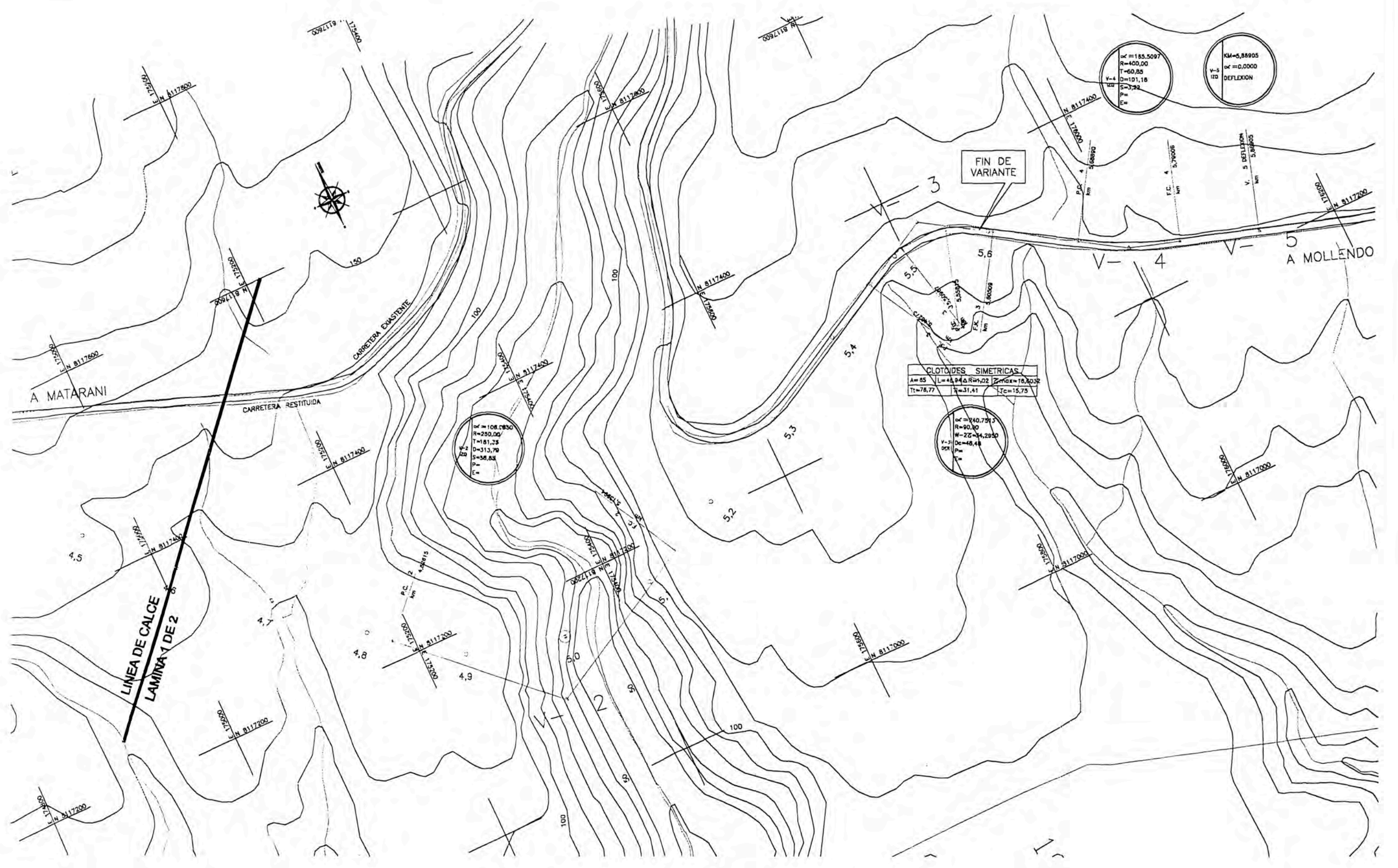
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REVISIONES	
N°	FECHA

ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

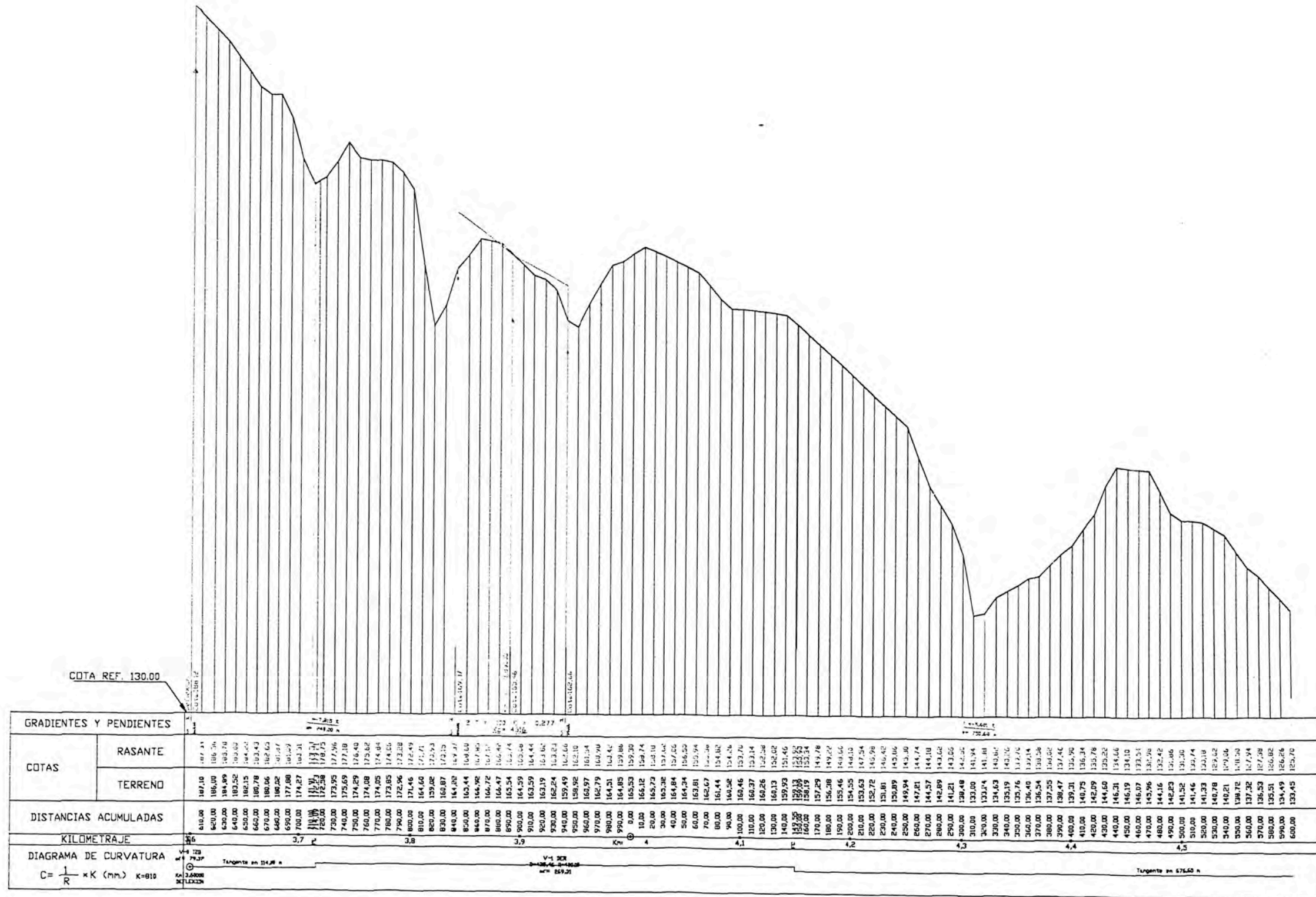
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 PLANO DE PLANTA
 KM 3+600 - KM 4+500

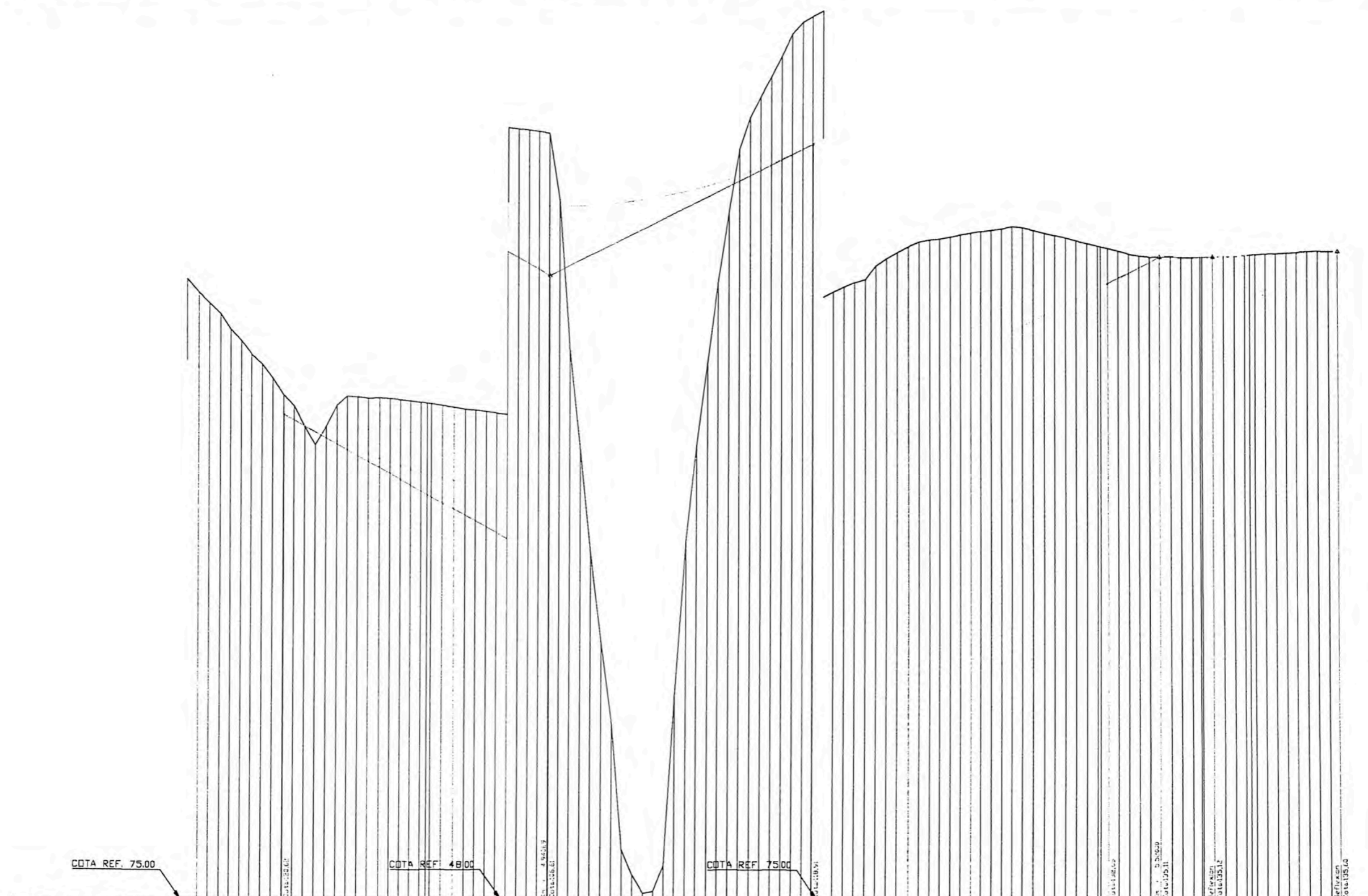
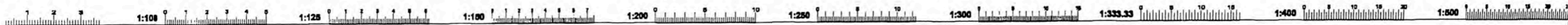
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 FECHA: DICIEMBRE 2000
 PPV - 001



CLOTOS SIMETRICAS

A=85	L=48.94	R=90.00	Z=10.00	T=78.77	S=31.41	Tc=15.75
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GRADIENTES Y PENDIENTES		K = 4733		K = 5371	
COTAS	RASANTE	131.45	132.76	134.00	135.00
	TERRENO	131.45	132.76	134.00	135.00
DISTANCIAS ACUMULADAS		640.00	610.00	620.00	630.00
KILOMETRAJE		4.5	4.7	4.8	4.9
DIAGRAMA DE CURVATURA		$C = \frac{1}{R} \times K \text{ (mm.)} \quad K=810$			

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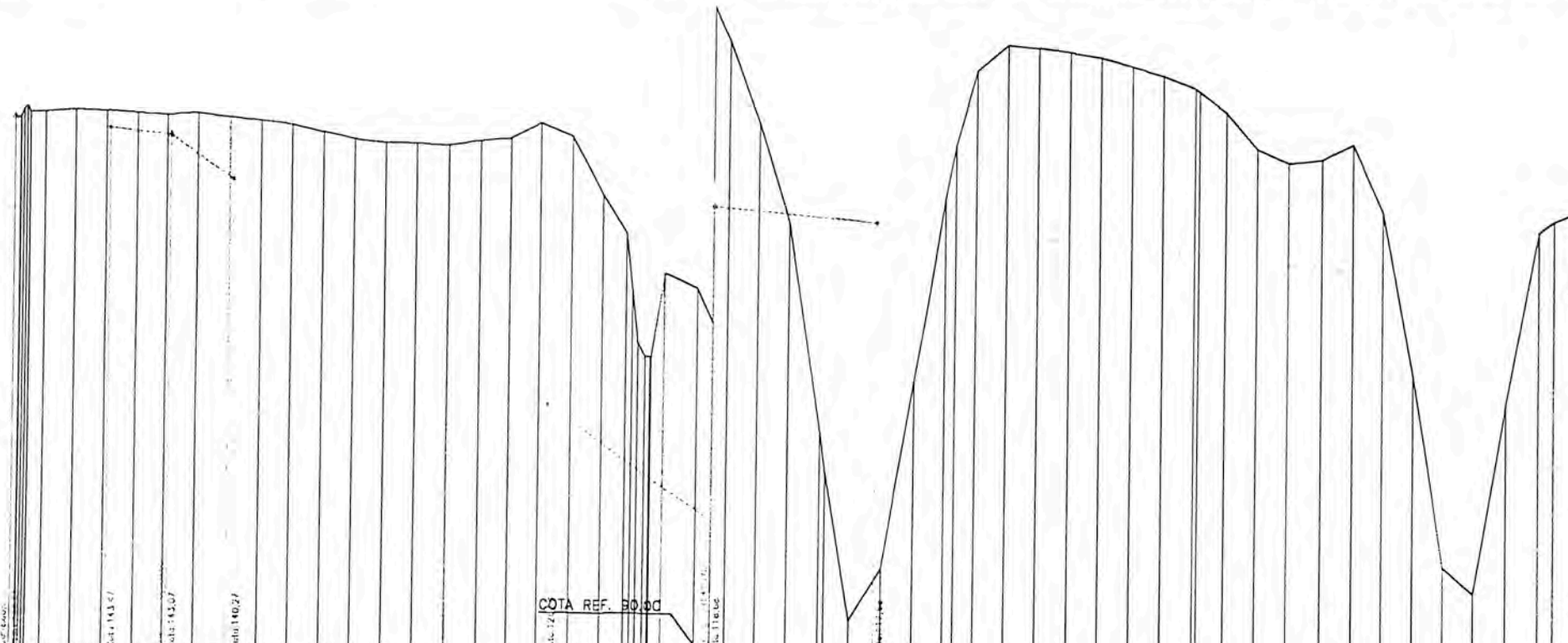
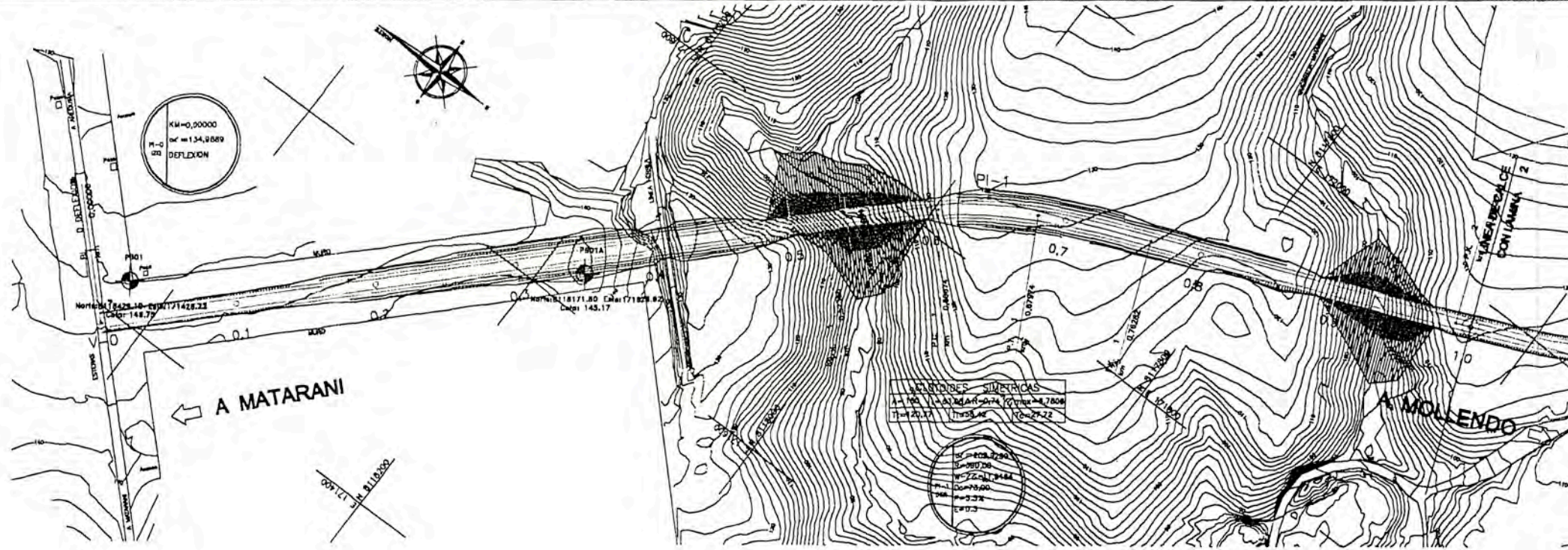
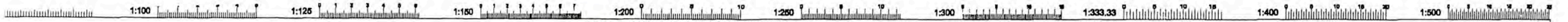
Diseñó: Smith, A. Lagos U
 Dibuja: A.L.U.
 Verificó: Ing. G. Bustos B
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REVISIONES	
Nº	FECHA

ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

SECTOR: MATARANI - MOLLEDO
 PERFIL LONGITUDINAL
 KM 4+600 - KM 5+600

ESCALA: H=1:400 V=1:400
 FECHA: DICIEMBRE 2000
 PLV - 002



GRADIENTES Y PENDIENTES		1.100	1.125	1.150	1.200	1.250	1.300	1.333.33	1.400	1.500
COTAS	RASANTE	144.83	144.97	145.14	145.37	145.62	145.88	146.15	146.42	146.69
	TERRENO	144.83	144.94	145.07	145.21	145.35	145.50	145.65	145.80	145.95
DISTANCIAS ACUMULADAS		0.00	40.00	80.00	120.00	160.00	200.00	240.00	280.00	320.00
KILOMETRAJE		0.00	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8

LEYENDA DRENAJE	
	ALCANTARILLA
	LOSA
	CUNETA
	BADÉN
	CUNETA DE CORONACIÓN
	ZANJA DE DRENAJE
	SUBDREN

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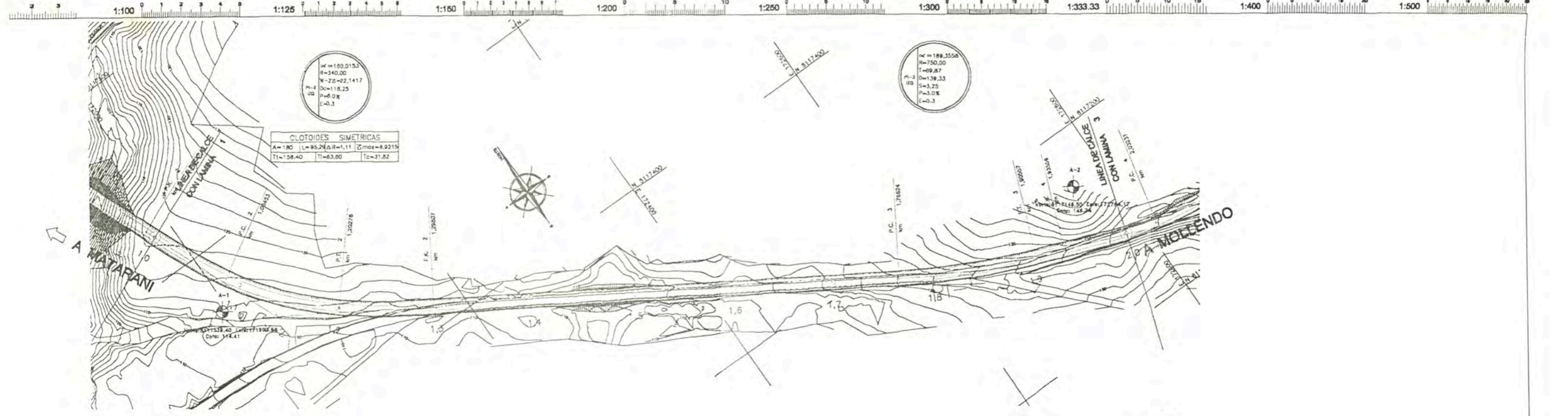
Diseño: Bach. A. Lopez U
 Dibujó: A.L.J
 Verificó: Ing. G. Bassani & CP 38891
 Presentó: Bach. A. Lopez U

REVISIONES	
Nº	FECHA

ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

SECTOR: MATARANI - MOLLEDO
 PLANTA Y PERFIL LONGITUDINAL
 KM 0+000 - KM 1+000

ESCALA: H=1:4000 V=1:400
 FECHA: DICIEMBRE 2000
 PP - 001



GRADIENTES Y PENDIENTES		COTAS		DISTANCIAS ACUMULADAS	KILOMETRAJE	DAGRAMA DE CURVATURA
	RASANTE	113.04	117.78	0.00	0	$C = \frac{1}{R} \times K$ (mm.) K=405 1=180.2 D=65.29 2=118.25 R=340.00 3=189.35 R=750.00 4=180.2 D=65.29
	TERRENO	118.30	117.78	20.00	1	
		117.32	116.86	40.00	2	
		115.98	115.38	60.00	3	
		113.45	112.44	80.00	4	
		111.93	111.04	100.00	5	
		114.51	111.38	120.00	6	
		114.18	111.46	140.00	7	
		114.00	111.46	160.00	8	
		113.26	111.46	180.00	9	
		113.31	111.46	200.00	10	
		112.44	111.46	220.00	11	
		111.04	111.46	240.00	12	
		111.38	111.46	260.00	13	
		111.46	111.46	280.00	14	
		110.84	111.46	300.00	15	
		110.54	111.46	320.00	16	
		110.80	111.46	340.00	17	
		110.76	111.46	360.00	18	
		110.71	111.46	380.00	19	
		110.63	111.46	400.00	20	
		110.71	111.46	420.00	21	
		110.72	111.46	440.00	22	
		110.87	111.46	460.00	23	
		111.03	111.46	480.00	24	
		111.30	111.46	500.00	25	
		111.57	111.46	520.00	26	
		111.76	111.46	540.00	27	
		112.14	111.46	560.00	28	
		112.44	111.46	580.00	29	
		112.72	111.46	600.00	30	
		113.04	111.46	620.00	31	
		113.45	111.46	640.00	32	
		114.06	111.46	660.00	33	
		114.81	111.46	680.00	34	
		115.04	111.46	700.00	35	
		115.01	111.46	720.00	36	
		116.57	111.46	740.00	37	
		117.60	111.46	760.00	38	
		118.70	111.46	780.00	39	
		119.77	111.46	800.00	40	
		120.19	111.46	820.00	41	
		120.53	111.46	840.00	42	
		120.85	111.46	860.00	43	
		121.20	111.46	880.00	44	
		121.90	111.46	900.00	45	
		122.97	111.46	920.00	46	
		123.83	111.46	940.00	47	
		124.73	111.46	960.00	48	
		125.61	111.46	980.00	49	
		126.49	111.46	1000.00	50	
		126.74	111.46	1020.00	51	
		127.34	111.46	1040.00	52	
		127.89	111.46	1060.00	53	
		128.37	111.46	1080.00	54	
		128.80	111.46	1100.00	55	
		129.30	111.46	1120.00	56	
		129.85	111.46	1140.00	57	
		130.65	111.46	1160.00	58	
		131.71	111.46	1180.00	59	
		133.05	111.46	1200.00	60	

LEYENDA DRENAJE

- ALCANTARILLA
- LOSA
- CUNETA
- BADÉN
- CUNETA DE CORONACIÓN
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- SUBDREN

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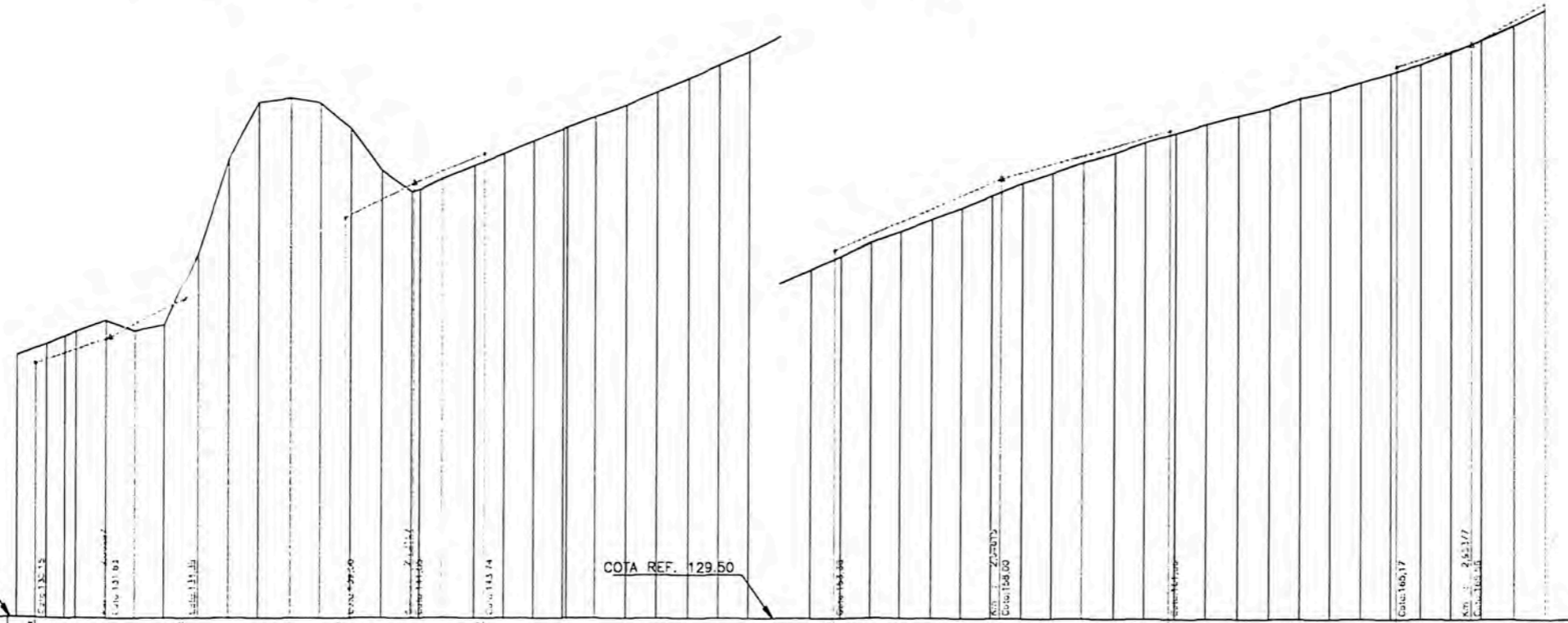
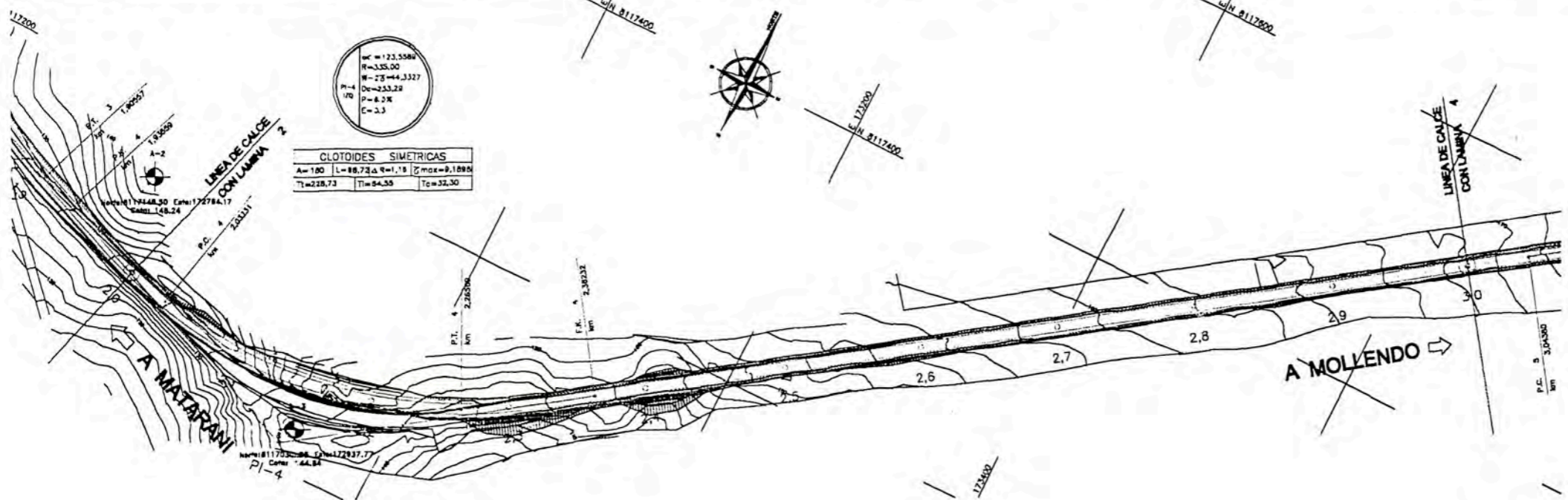
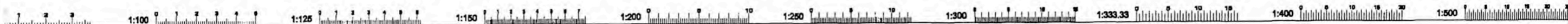
Diseño: Bach. A. Luján U
 Dibujo: A.L.U.
 Verificación: Ing. G. Benavente B
 CIP 388641
 Presentación: Bach. A. Luján U

REVISIONES	
Nº	FECHA

ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

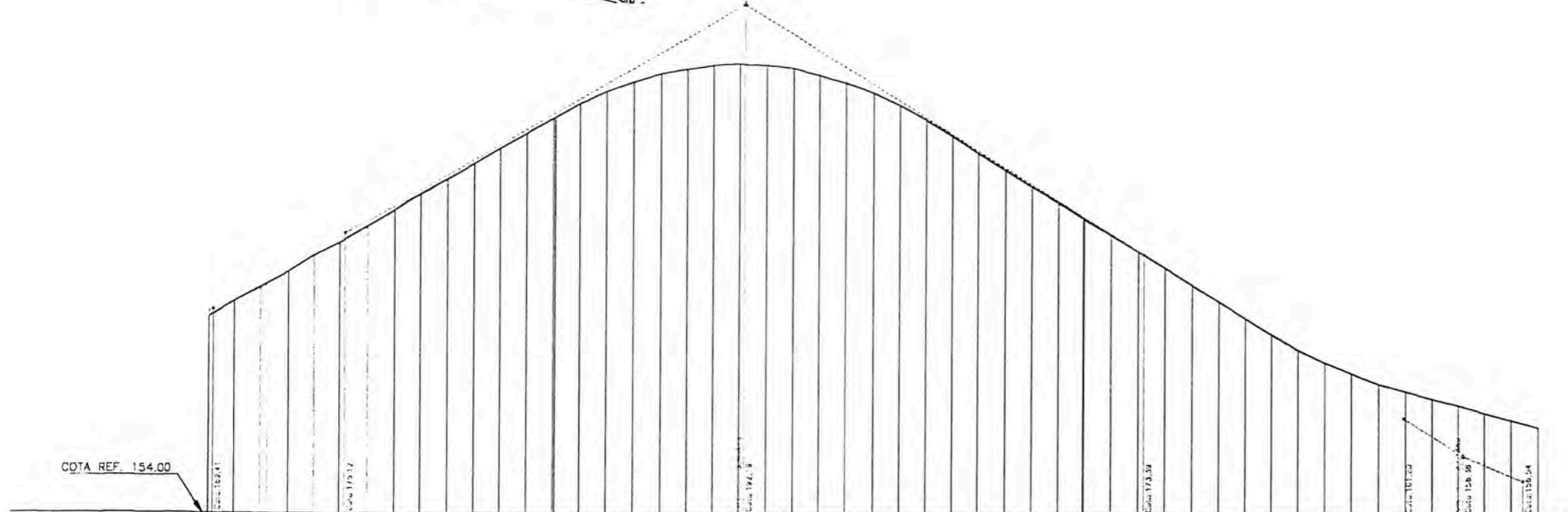
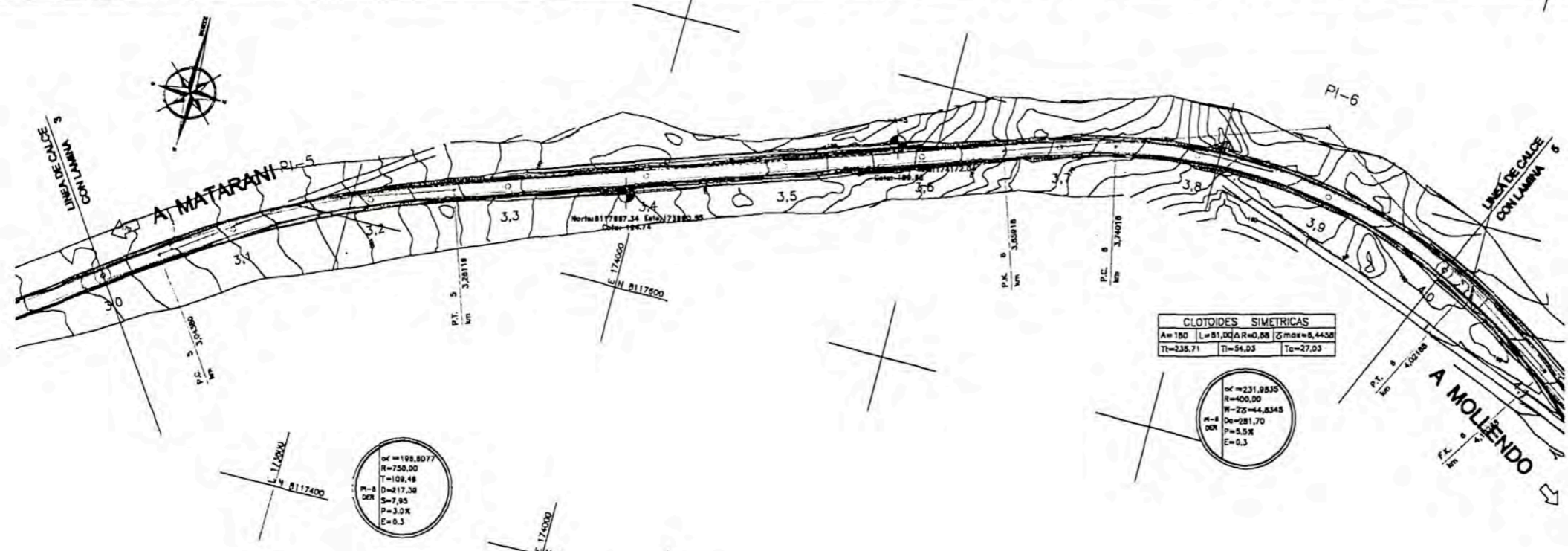
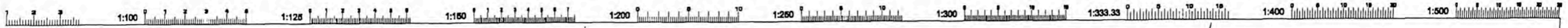
SECTOR: MATARANI - MOLLENDO
 PLANTA Y PERFIL LONGITUDINAL
 KM 1+000 - KM 2+000

ESCALA: H=1:4000 V=1:400
 FECHA: DICIEMBRE 2000
 PP - 002



GRADIENTES Y PENDIENTES		2+000	2+100	2+200	2+300	2+400	2+500	2+600	2+700	2+800	2+900	3+000
COTAS	RASANTE	129.71	132.39	133.12	133.84	134.56	135.28	136.00	136.72	137.44	138.16	138.88
	TERRENO	130.65	131.41	132.17	132.93	133.69	134.45	135.21	135.97	136.73	137.49	138.25
DISTANCIAS ACUMULADAS		0.00	20.00	40.00	60.00	80.00	100.00	120.00	140.00	160.00	180.00	200.00
KILOMETRAJE		2.00	2.05	2.10	2.15	2.20	2.25	2.30	2.35	2.40	2.45	2.50
DIAGRAMA DE CURVATURA		$C = \frac{1}{R} \times K \text{ (mm.) } K=403$ $D=133.29 \quad R=334.32$ $A=100.0 \quad L=86.73$ $e=1.18 \quad Z_{max}=9.1899$										

LEYENDA DRENAJE	
	ALCANTARILLA
	LOSA
	CUNETA
	BADÉN
	CUNETA DE CORONACIÓN
	ZANJA DE DRENAJE
	SUBDREN

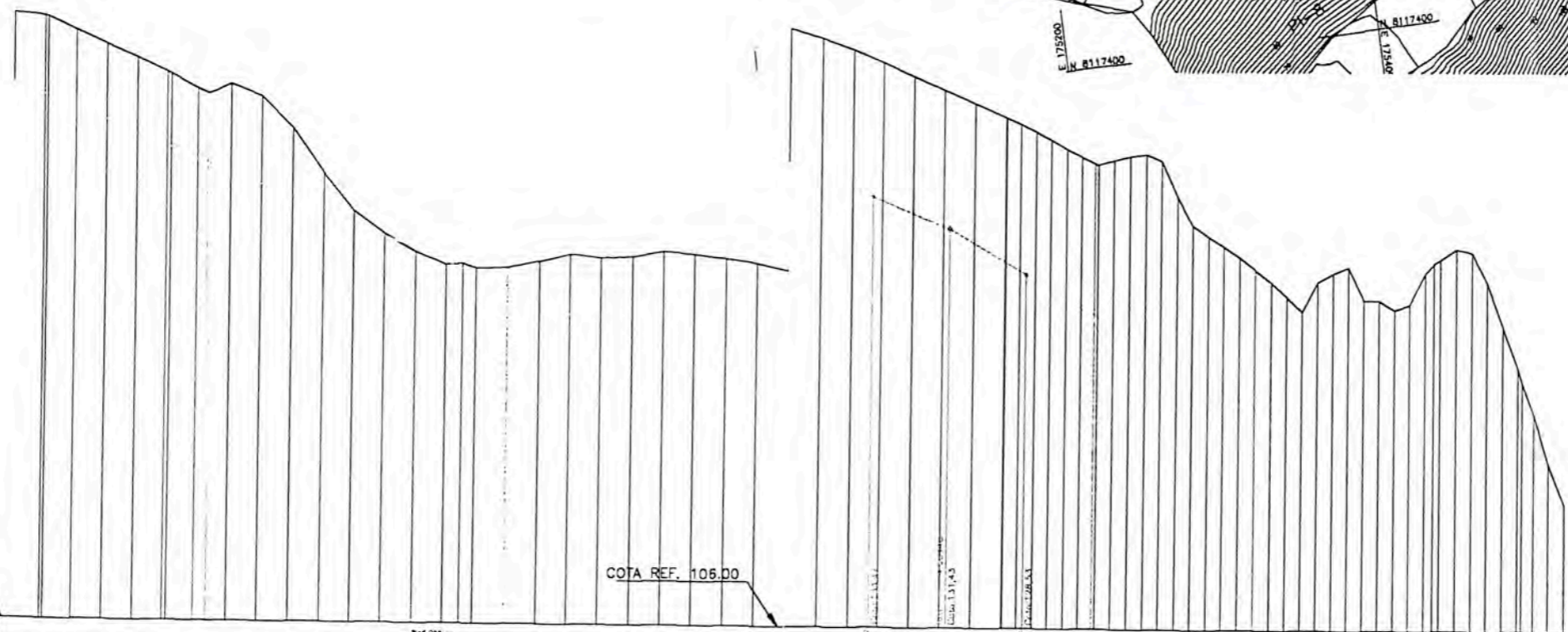
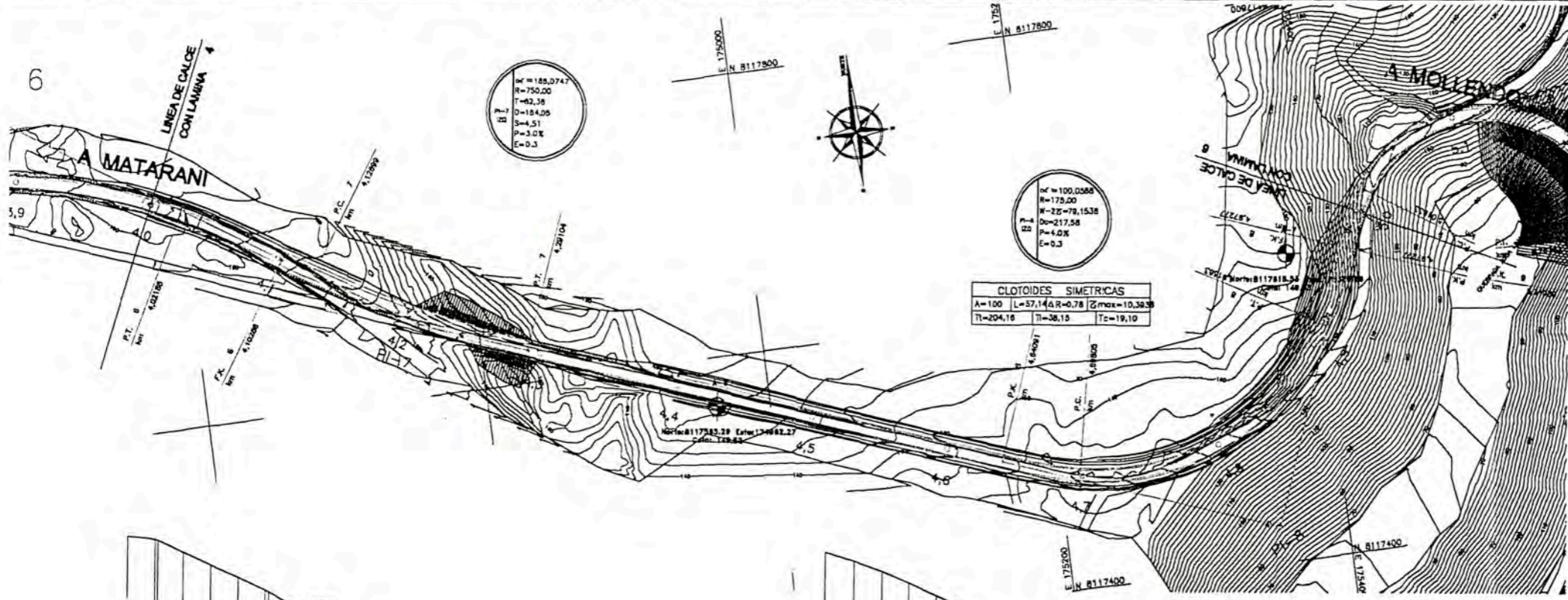
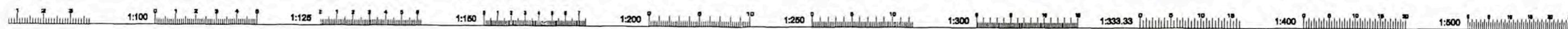


GRADIENTES Y PENDIENTES		0.36%
COTAS	RASANTE	154.00
	TERRENO	154.00
DISTANCIAS ACUMULADAS		0.00
KILOMETRAJE		3
DIAGRAMA DE CURVATURA		$C = \frac{1}{R} \times K$ (mm.) $K=405$

LEYENDA DRENAJE

- ALCANTARILLA
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- SUBDREN

REVISIONES	
Nº	FECHA



GRADIENTES Y PENDIENTES		COTAS		DISTANCIAS ACUMULADAS	KILÓMETRAJE	DIAGRAMA DE CURVATURA
	RASANTE	TERRENO				
	156.72	156.72	156.72	0.00	0.00	A=180.0 D=81.00
	155.27	155.27	155.27	20.00	20.00	D=194.28 R=750.00
	152.14	152.14	152.14	21.86	21.86	W=180.00
	151.16	151.16	151.16	40.00	40.00	
	153.04	153.04	153.04	60.00	60.00	
	152.52	152.52	152.52	80.00	80.00	
	154.74	154.74	154.74	100.00	100.00	
	151.58	151.58	151.58	102.88	102.88	
	151.91	151.91	151.91	120.00	120.00	
	151.91	151.91	151.91	128.89	128.89	
	152.28	152.28	152.28	140.00	140.00	
	149.23	149.23	149.23	160.00	160.00	
	148.74	148.74	148.74	180.00	180.00	
	147.73	147.73	147.73	200.00	200.00	
	147.11	147.11	147.11	220.00	220.00	
	146.82	146.82	146.82	240.00	240.00	
	145.16	145.16	145.16	260.00	260.00	
	144.65	144.65	144.65	280.00	280.00	
	144.21	144.21	144.21	291.04	291.04	
	143.25	143.25	143.25	300.00	300.00	
	141.11	141.11	141.11	310.00	310.00	
	138.77	138.77	138.77	340.00	340.00	
	138.25	138.25	138.25	360.00	360.00	
	140.58	140.58	140.58	380.00	380.00	
	137.32	137.32	137.32	400.00	400.00	
	135.91	135.91	135.91	420.00	420.00	
	133.54	133.54	133.54	440.00	440.00	
	131.97	131.97	131.97	460.00	460.00	
	131.43	131.43	131.43	480.00	480.00	
	131.15	131.15	131.15	500.00	500.00	
	130.42	130.42	130.42	520.00	520.00	
	128.79	128.79	128.79	540.00	540.00	
	127.05	127.05	127.05	560.00	560.00	
	127.05	127.05	127.05	580.00	580.00	
	126.47	126.47	126.47	600.00	600.00	
	125.89	125.89	125.89	620.00	620.00	
	125.31	125.31	125.31	640.00	640.00	
	124.73	124.73	124.73	660.00	660.00	
	124.15	124.15	124.15	680.00	680.00	
	123.57	123.57	123.57	700.00	700.00	
	122.99	122.99	122.99	720.00	720.00	
	122.41	122.41	122.41	740.00	740.00	
	121.83	121.83	121.83	760.00	760.00	
	121.25	121.25	121.25	780.00	780.00	
	120.67	120.67	120.67	800.00	800.00	
	119.09	119.09	119.09	820.00	820.00	
	118.51	118.51	118.51	840.00	840.00	
	117.93	117.93	117.93	860.00	860.00	
	117.35	117.35	117.35	880.00	880.00	
	116.77	116.77	116.77	900.00	900.00	
	116.19	116.19	116.19	920.00	920.00	
	115.61	115.61	115.61	940.00	940.00	
	115.03	115.03	115.03	960.00	960.00	
	114.45	114.45	114.45	980.00	980.00	
	113.87	113.87	113.87	1000.00	1000.00	
	113.29	113.29	113.29	1020.00	1020.00	
	112.71	112.71	112.71	1040.00	1040.00	
	112.13	112.13	112.13	1060.00	1060.00	
	111.55	111.55	111.55	1080.00	1080.00	
	110.97	110.97	110.97	1100.00	1100.00	
	110.39	110.39	110.39	1120.00	1120.00	
	109.81	109.81	109.81	1140.00	1140.00	
	109.23	109.23	109.23	1160.00	1160.00	
	108.65	108.65	108.65	1180.00	1180.00	
	108.07	108.07	108.07	1200.00	1200.00	

LEYENDA DRENAJE	
	ALCANTARILLA
	LOSA
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	SUBDREN

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 DEPARTAMENTO ACADÉMICO DE TOPOGRAFIA Y VIAS DE TRANSPORTE

Diseñó: Bach. A. Layva U
 Dibujó: A.L.U.
 Verificó: Ing. O. Bimazán B
 CIP 28841
 Presentó: Bach. A. Layva U

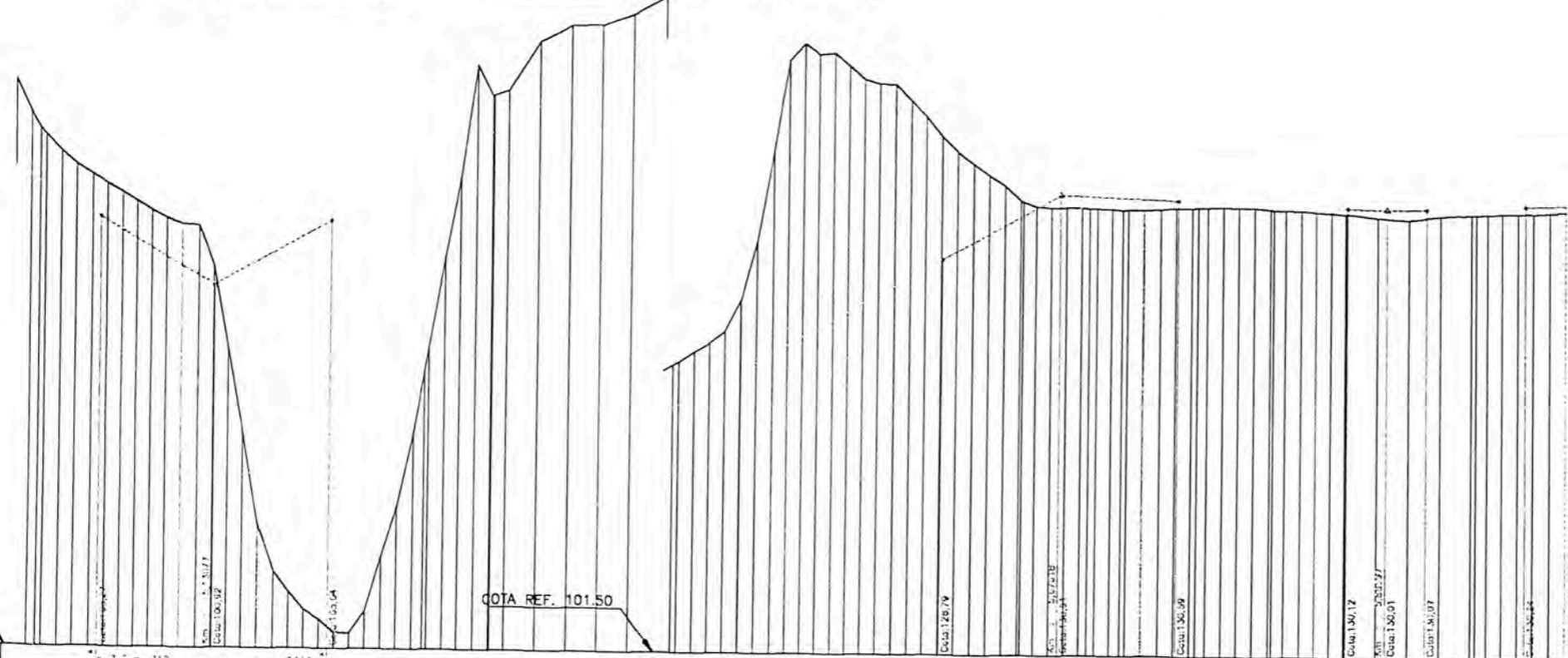
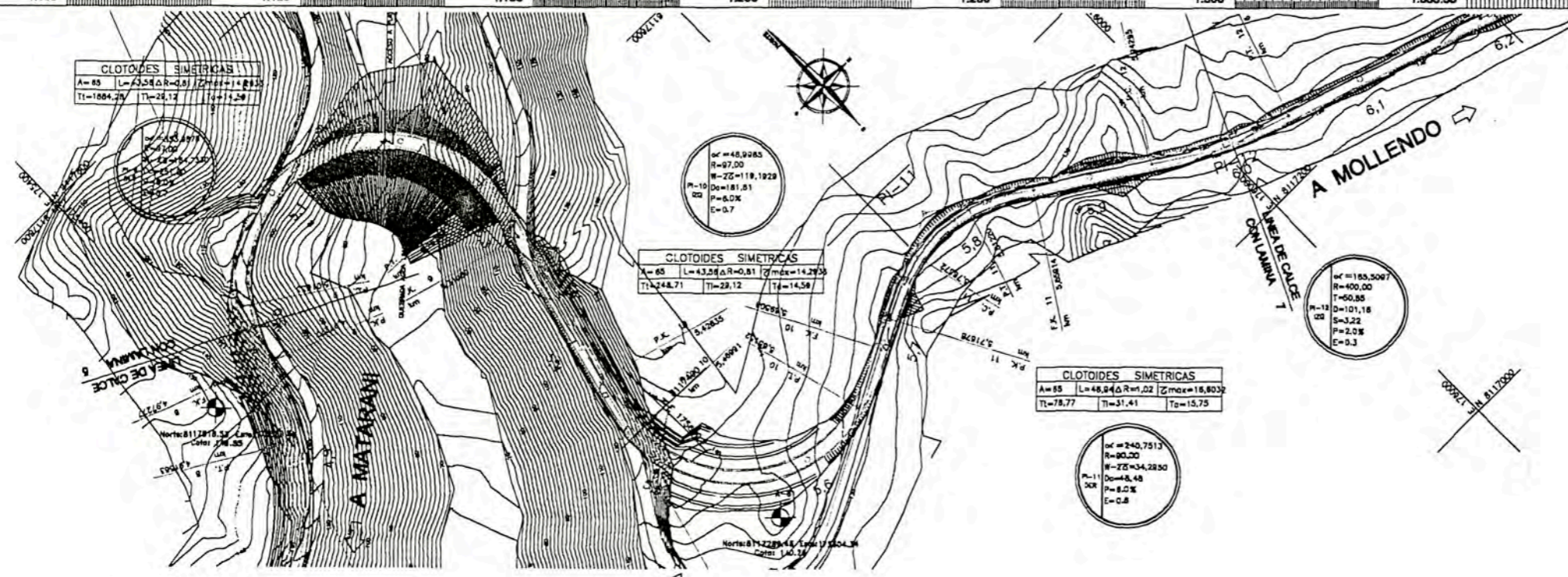
Aprobó:

REVISIONES		
Nº	FECHA	DESCRIPCIÓN

ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

SECTOR: MATARANI - MOLLEDO
 PLANTA Y PERFIL LONGITUDINAL
 KM 4+000 - KM 5+000

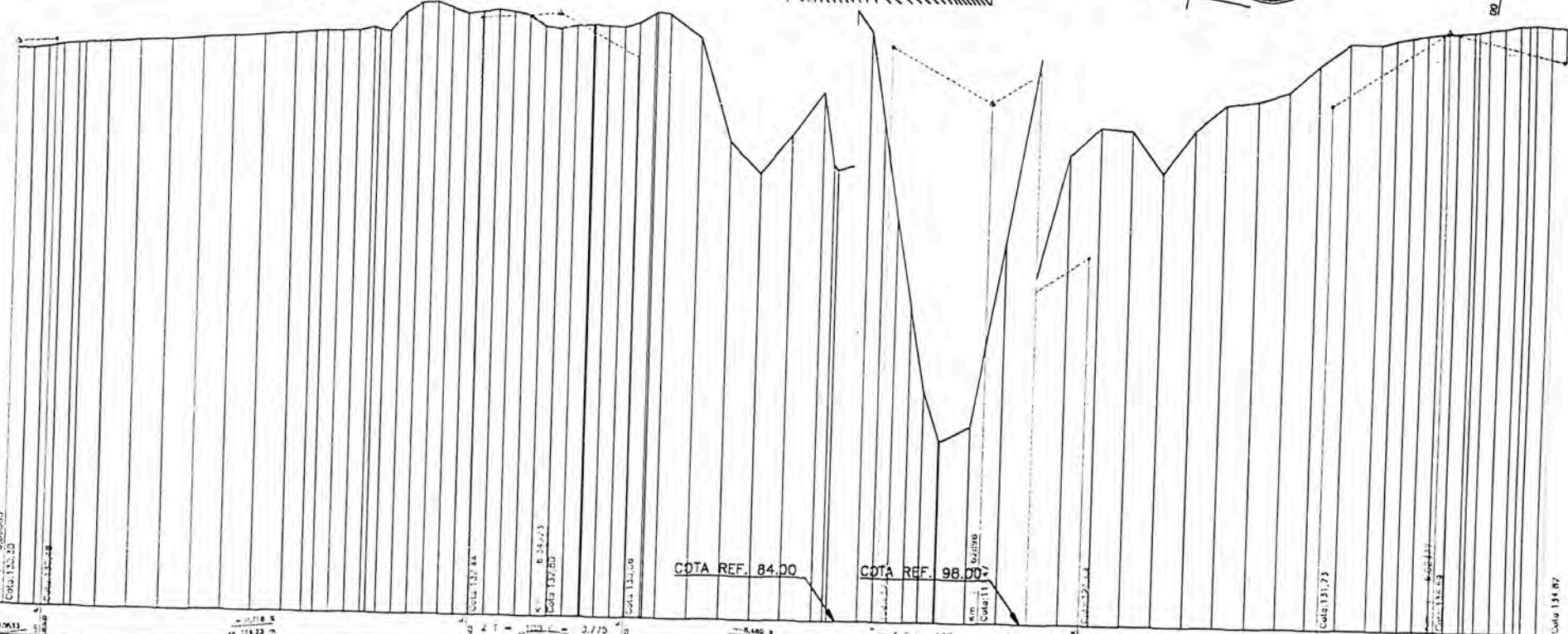
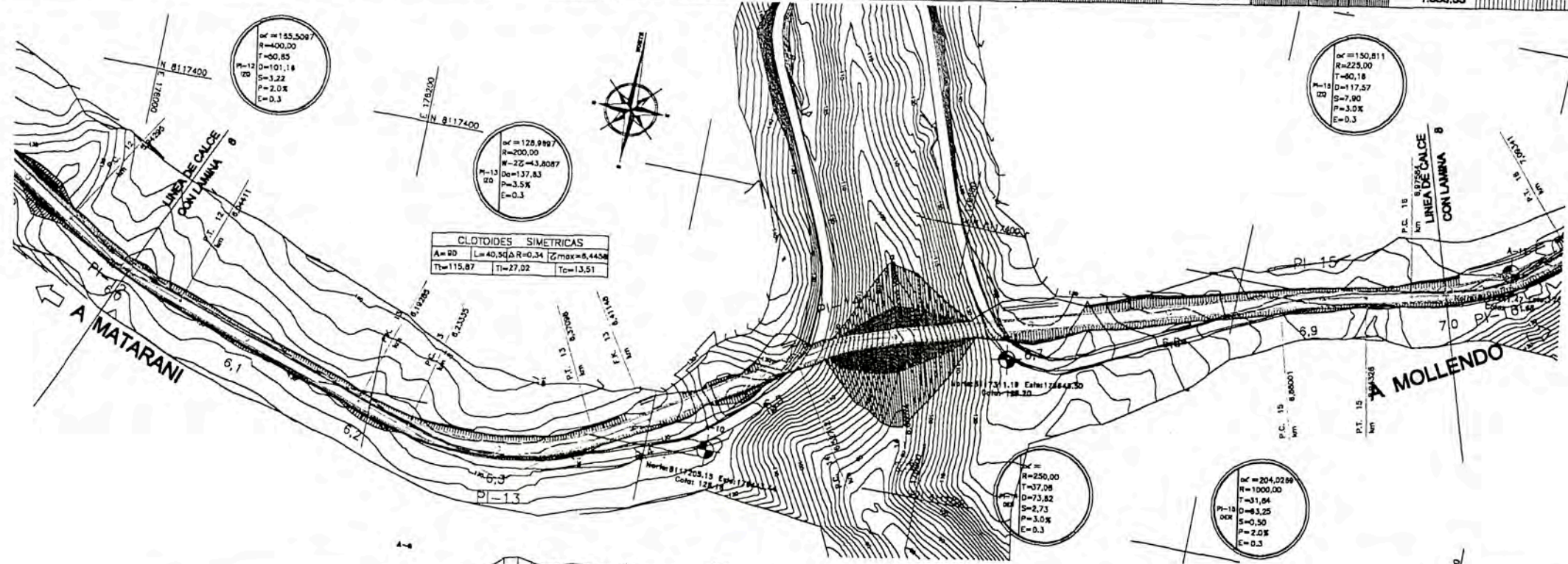
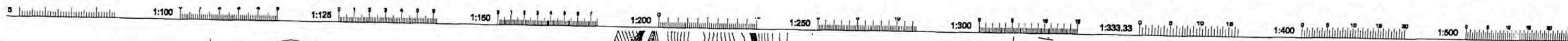
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 FECHA: DICIEMBRE 2000
 PP - 005



COTAS	GRADIENTES Y PENDIENTES	
	RASANTE	TERRENO
0.00	114.13	114.13
10.00	112.02	112.02
20.00	109.50	109.50
30.00	106.70	106.70
40.00	104.01	104.01
50.00	101.50	101.50
60.00	99.06	99.06
70.00	96.81	96.81
80.00	94.77	94.77
90.00	92.94	92.94
100.00	91.32	91.32
110.00	89.91	89.91
120.00	88.71	88.71
130.00	87.71	87.71
140.00	86.91	86.91
150.00	86.31	86.31
160.00	85.91	85.91
170.00	85.61	85.61
180.00	85.41	85.41
190.00	85.31	85.31
200.00	85.31	85.31
210.00	85.41	85.41
220.00	85.61	85.61
230.00	85.91	85.91
240.00	86.31	86.31
250.00	86.81	86.81
260.00	87.41	87.41
270.00	88.11	88.11
280.00	88.91	88.91
290.00	89.71	89.71
300.00	90.61	90.61
310.00	91.61	91.61
320.00	92.71	92.71
330.00	93.91	93.91
340.00	95.21	95.21
350.00	96.61	96.61
360.00	98.11	98.11
370.00	99.71	99.71
380.00	101.41	101.41
390.00	103.21	103.21
400.00	105.11	105.11
410.00	107.11	107.11
420.00	109.21	109.21
430.00	111.41	111.41
440.00	113.71	113.71
450.00	116.11	116.11
460.00	118.61	118.61
470.00	121.21	121.21
480.00	123.91	123.91
490.00	126.71	126.71
500.00	129.61	129.61
510.00	132.61	132.61
520.00	135.71	135.71
530.00	138.91	138.91
540.00	142.21	142.21
550.00	145.61	145.61
560.00	149.11	149.11
570.00	152.71	152.71
580.00	156.41	156.41
590.00	160.21	160.21
600.00	164.11	164.11
610.00	168.11	168.11
620.00	172.21	172.21
630.00	176.41	176.41
640.00	180.71	180.71
650.00	185.11	185.11
660.00	189.61	189.61
670.00	194.21	194.21
680.00	198.91	198.91
690.00	203.71	203.71
700.00	208.61	208.61
710.00	213.61	213.61
720.00	218.71	218.71
730.00	223.91	223.91
740.00	229.21	229.21
750.00	234.61	234.61
760.00	240.11	240.11
770.00	245.71	245.71
780.00	251.41	251.41
790.00	257.21	257.21
800.00	263.11	263.11
810.00	269.11	269.11
820.00	275.21	275.21
830.00	281.41	281.41
840.00	287.71	287.71
850.00	294.11	294.11
860.00	300.61	300.61
870.00	307.21	307.21
880.00	313.91	313.91
890.00	320.71	320.71
900.00	327.61	327.61
910.00	334.61	334.61
920.00	341.71	341.71
930.00	348.91	348.91
940.00	356.21	356.21
950.00	363.61	363.61
960.00	371.11	371.11
970.00	378.71	378.71
980.00	386.41	386.41
990.00	394.21	394.21
1000.00	402.11	402.11

LEYENDA DRENAJE

- ALCANTARILLA
- LOSA
- CUNETA
- BADÉN
- CUNETA DE CORONACIÓN
- ZANJA DE DRENAJE
- SUBDREN



GRADIENTES Y PENDIENTES		Kilómetros	
COTAS	RASANTE	130.33	130.33
	TERRENO	129.85	130.33
D'ISTANCIAS ACUMULADAS		0.00	129.85
		10.00	129.82
KILOMETRAJE		0	0
		0.1	0.1
D'AGRAMA DE CURVATURA		0	0
		0.1	0.1

- LEYENDA DRENAJE**
- ALCANTARILLA
 - LOSA
 - CUNETA
 - BADÉN
 - CUNETA DE CORONACIÓN
 - ZANJA DE DRENAJE
 - SUBDREN

UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA CIVIL
 DEPARTAMENTO ACADEMICO DE TOPOGRAFIA Y VIAS DE TRANSPORTE

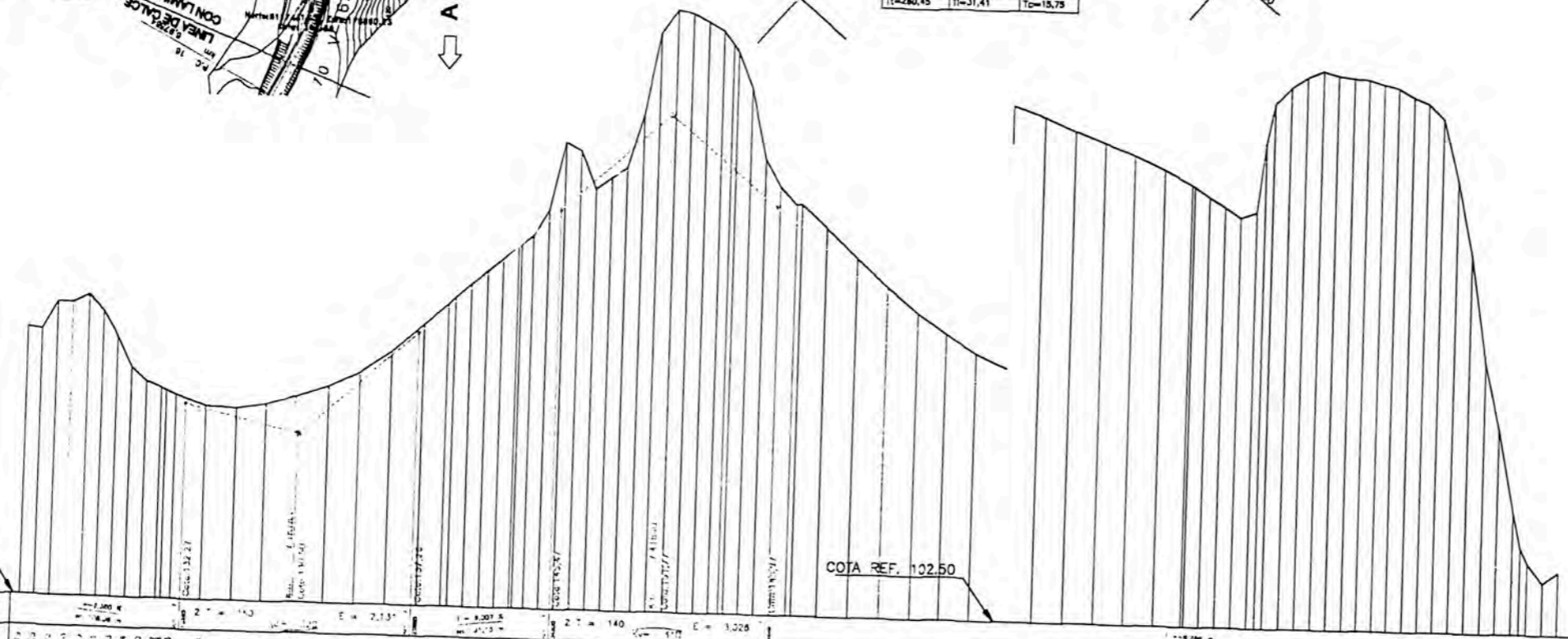
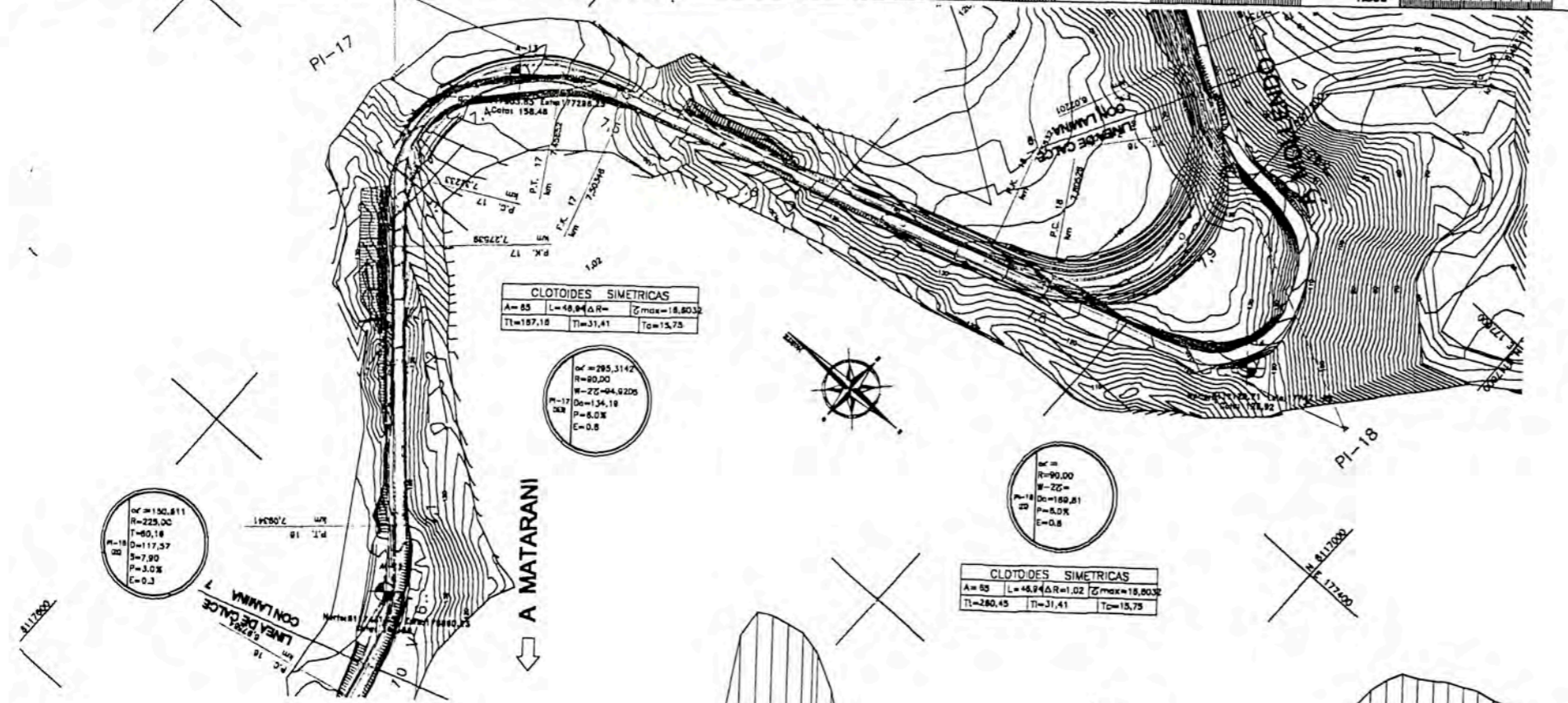
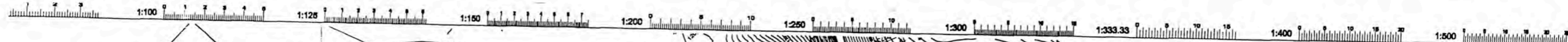
Diseño: **Rech. A Layre U**
 Dibujo: **A. L. U**
 Verificado: **Ing. O. Bernaldi B**
 CP 38841
 Presentado: **Rech. A Layre U**

REVISIONES	
Nº	FECHA

ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

SECTOR: MATARANI - MOLLENDO
 PLANTA Y PERFIL LONGITUDINAL
 KM 6+000 - KM 7+000

ESCALA: H=1:4000 V=1:400
 FECHA: DICIEMBRE 2000
 PP - 007



Kilometraje	GRADIENTES Y PENDIENTES	
	RASANTE	TERRENO
0.00	137.00	137.00
10.00	136.72	134.55
20.00	136.72	134.22
30.00	136.72	133.95
40.00	136.72	133.70
50.00	136.72	133.51
60.00	136.72	133.34
70.00	136.72	133.23
80.00	136.72	133.14
90.00	136.72	133.08
100.00	136.72	133.03
110.00	136.72	132.99
120.00	136.72	132.93
130.00	136.72	132.85
140.00	136.72	132.75
150.00	136.72	132.63
160.00	136.72	132.49
170.00	136.72	132.33
180.00	136.72	132.15
190.00	136.72	131.95
200.00	136.72	131.72
210.00	136.72	131.47
220.00	136.72	131.20
230.00	136.72	130.91
240.00	136.72	130.60
250.00	136.72	130.27
260.00	136.72	129.92
270.00	136.72	129.55
280.00	136.72	129.17
290.00	136.72	128.77
300.00	136.72	128.36
310.00	136.72	127.93
320.00	136.72	127.49
330.00	136.72	127.03
340.00	136.72	126.56
350.00	136.72	126.07
360.00	136.72	125.57
370.00	136.72	125.05
380.00	136.72	124.52
390.00	136.72	123.98
400.00	136.72	123.43
410.00	136.72	122.87
420.00	136.72	122.30
430.00	136.72	121.72
440.00	136.72	121.13
450.00	136.72	120.53
460.00	136.72	119.92
470.00	136.72	119.30
480.00	136.72	118.67
490.00	136.72	118.03
500.00	136.72	117.38
510.00	136.72	116.72
520.00	136.72	116.05
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540.00	136.72	114.68
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570.00	136.72	112.55
580.00	136.72	111.82
590.00	136.72	111.08
600.00	136.72	110.33
610.00	136.72	109.57
620.00	136.72	108.80
630.00	136.72	108.02
640.00	136.72	107.23
650.00	136.72	106.43
660.00	136.72	105.62
670.00	136.72	104.80
680.00	136.72	103.97
690.00	136.72	103.13
700.00	136.72	102.28
710.00	136.72	101.43
720.00	136.72	100.57
730.00	136.72	99.70
740.00	136.72	98.82
750.00	136.72	97.93
760.00	136.72	97.03
770.00	136.72	96.12
780.00	136.72	95.20
790.00	136.72	94.27
800.00	136.72	93.33
810.00	136.72	92.38
820.00	136.72	91.43
830.00	136.72	90.47
840.00	136.72	89.50
850.00	136.72	88.52
860.00	136.72	87.53
870.00	136.72	86.54
880.00	136.72	85.54
890.00	136.72	84.53
900.00	136.72	83.51
910.00	136.72	82.48
920.00	136.72	81.44
930.00	136.72	80.39
940.00	136.72	79.33
950.00	136.72	78.26
960.00	136.72	77.18
970.00	136.72	76.09
980.00	136.72	75.00
990.00	136.72	73.90
1000.00	136.72	72.79

	ALCANTARILLA
	LOSA
	CUNETA
	BADÉN
	CUNETA DE CORONACIÓN
	ZANJA DE DRENAJE
	SUBDREN

UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA CIVIL
 DEPARTAMENTO ACADEMICO DE TOPOGRAFIA Y VIAS DE TRANSPORTE

Clasific: Bach. A Layre U
 Dibujó: A. L. U
 Verificó: Ing. D. Sánchez & CIP 39841
 Presentó: Bach. A Layre U

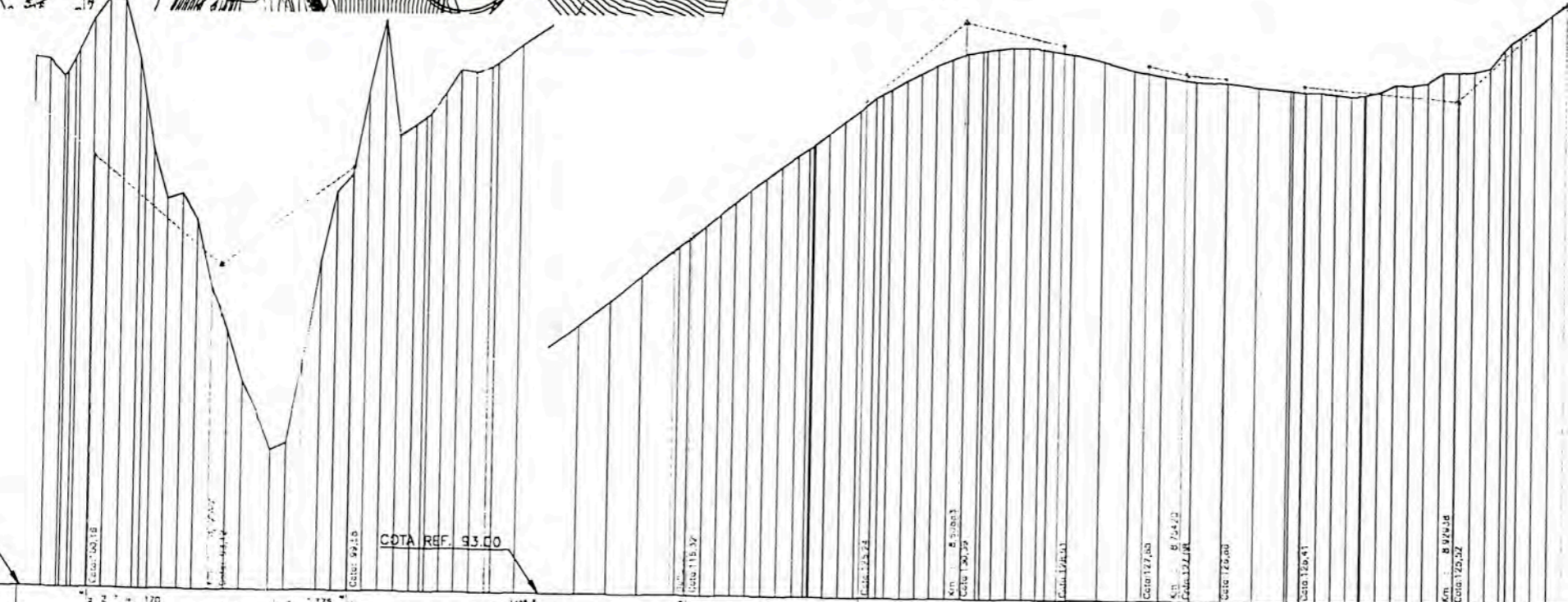
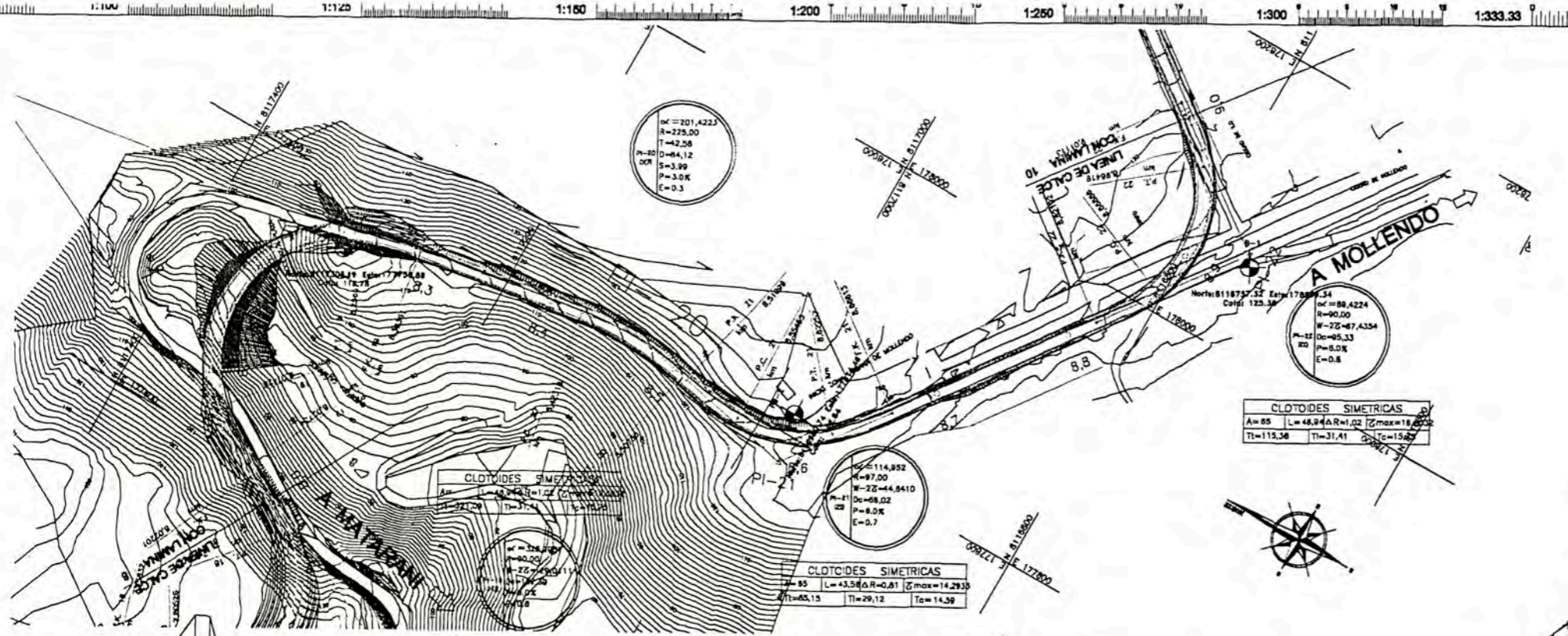
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REVISIONES	
Nº	FECHA

ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

SECTOR: MATARANI - MOLLEDO
 PLANTA Y PERFIL LONGITUDINAL
 KM 7+000 - KM 8+000

ESCALA: H=1:4000 V=1:400
 FECHA: DICIEMBRE 2000
 PP - 008



RADIANTES Y PENDIENTES		Kilómetros	
STAS	RASANTE	0.00	9.00
	TERRENO	0.00	9.00
DISTANCIAS ACUMULADAS		0.00	9.00
KILOMETRAJE		0.00	9.00
DIAGRAMA DE CURVATURA		$C = \frac{1}{R} \times K \text{ (mm.) } K=405$	

LEYENDA DRENAJE

- ALCANTARILLA
- LOSA
- CUNETA
- BADÉN
- CUNETA DE CORONACIÓN
- ZANJA DE DRENAJE
- SUBDREN

UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA CIVIL
 DEPARTAMENTO ACADEMICO DE TOPOGRAFIA Y VIAS DE TRANSPORTE

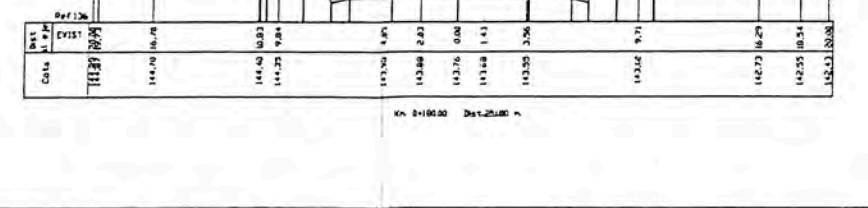
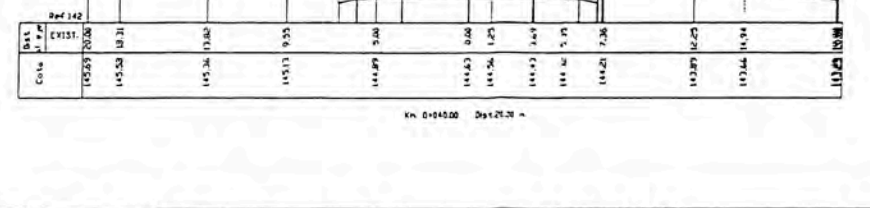
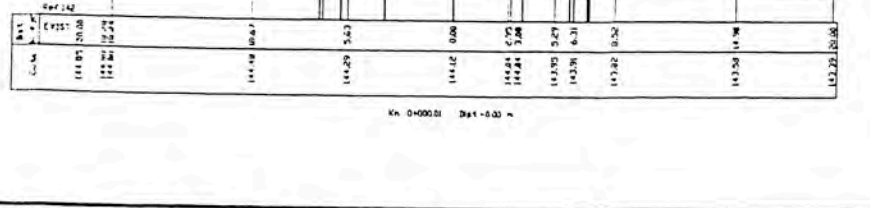
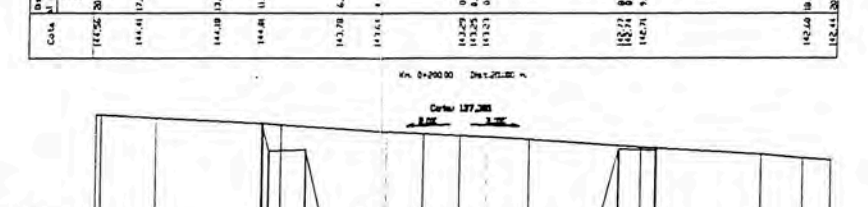
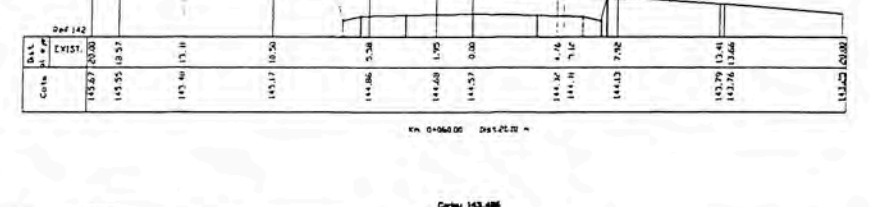
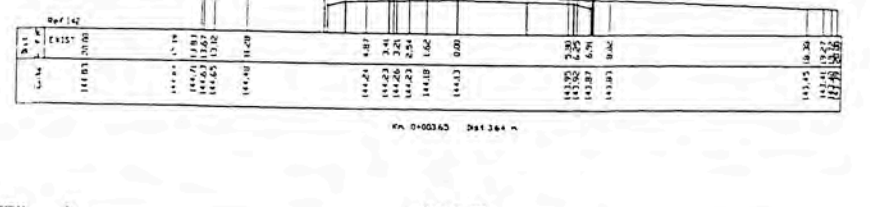
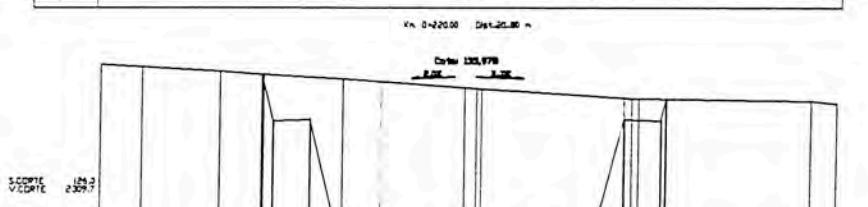
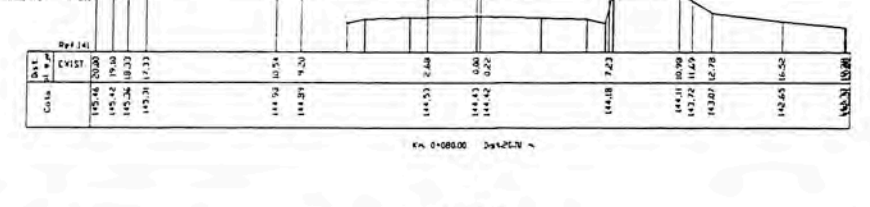
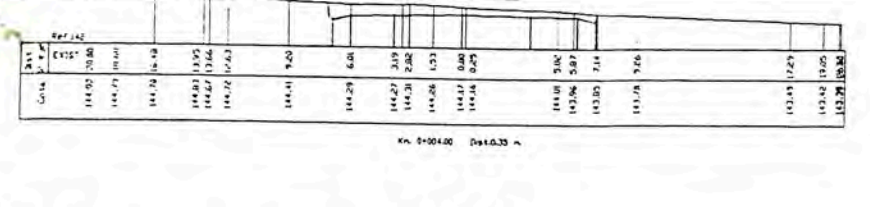
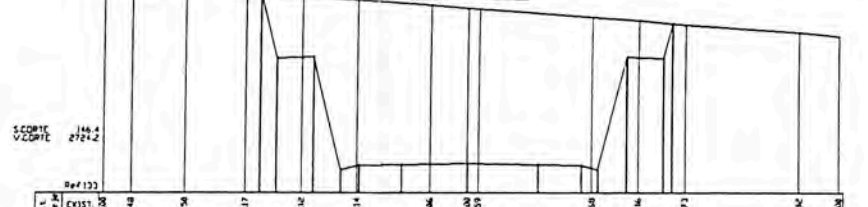
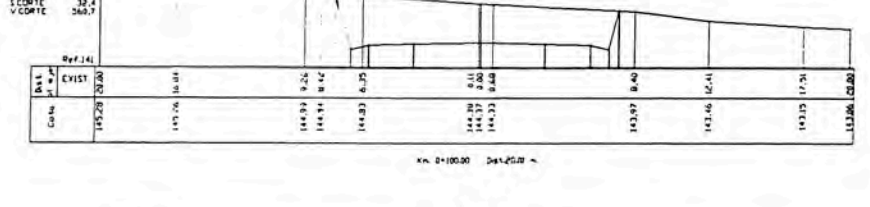
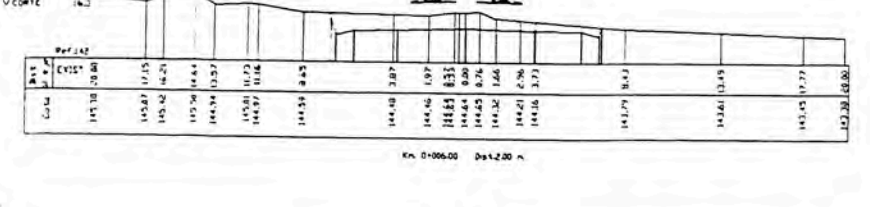
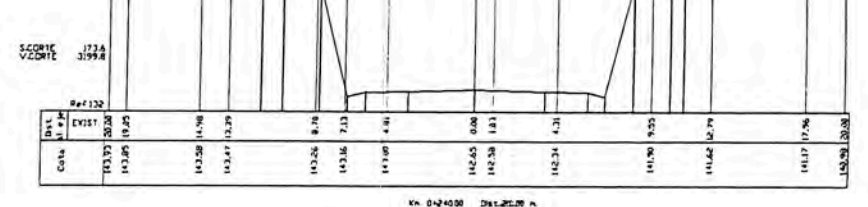
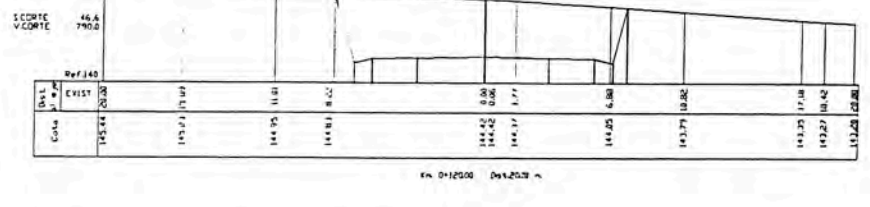
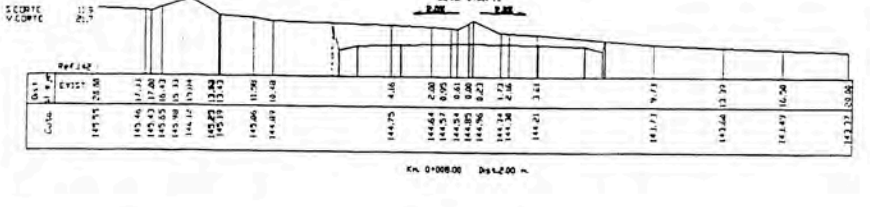
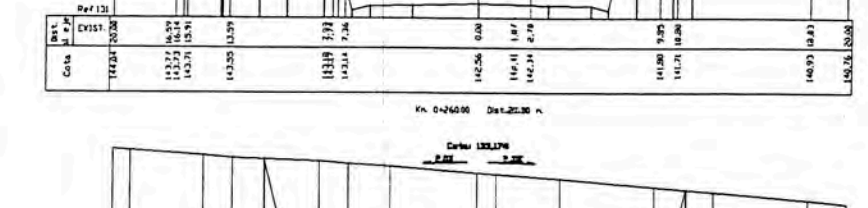
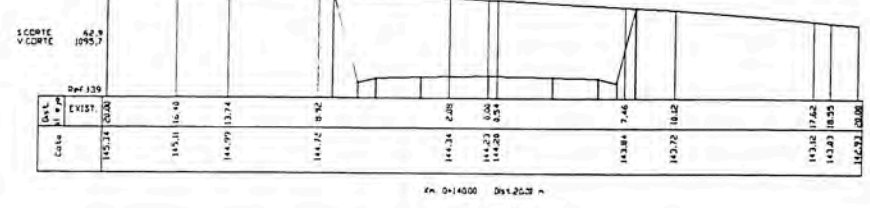
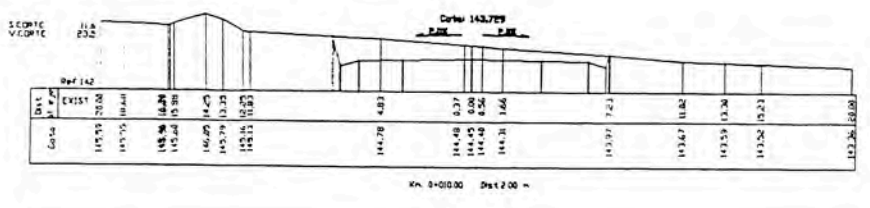
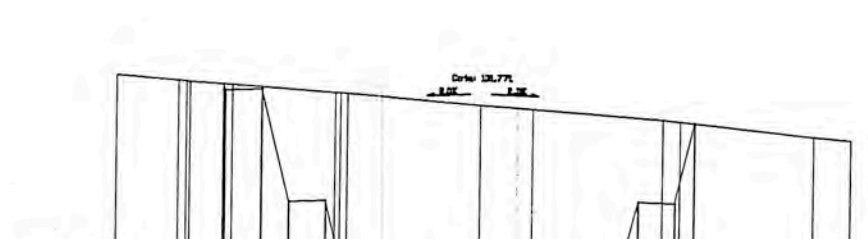
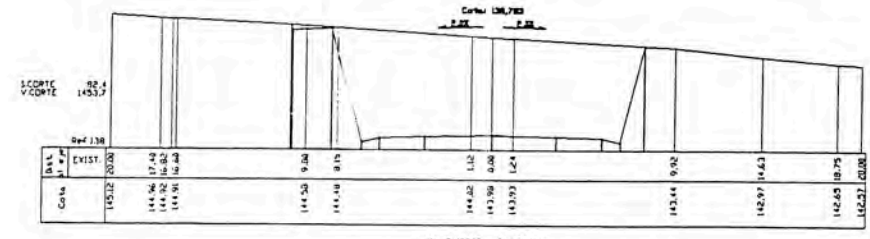
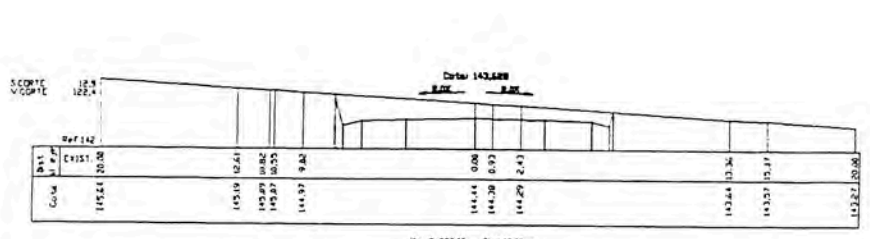
Elaboró: Bach. A. Layre U
 Dibujo: A. L. U
 Verificó: Ing. G. Rosales S
 CIP 20891
 Presentó: Bach. A. Layre U

REVISIONES	
Nº	FECHA

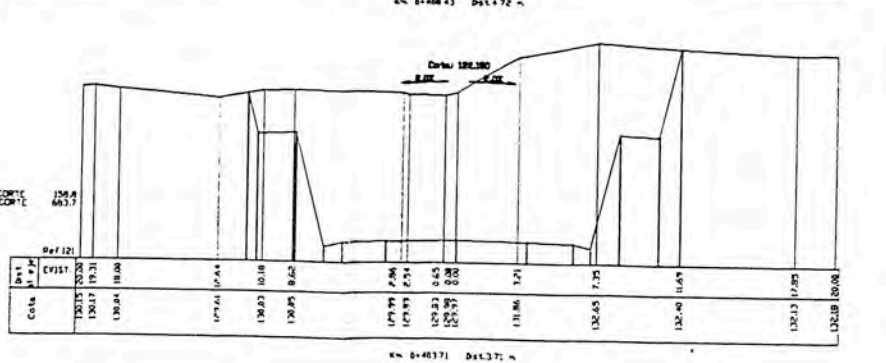
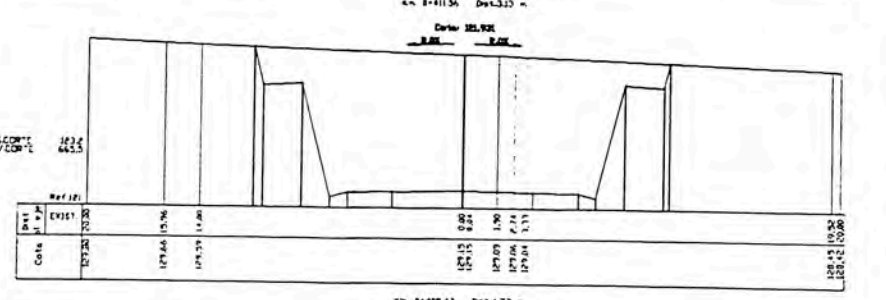
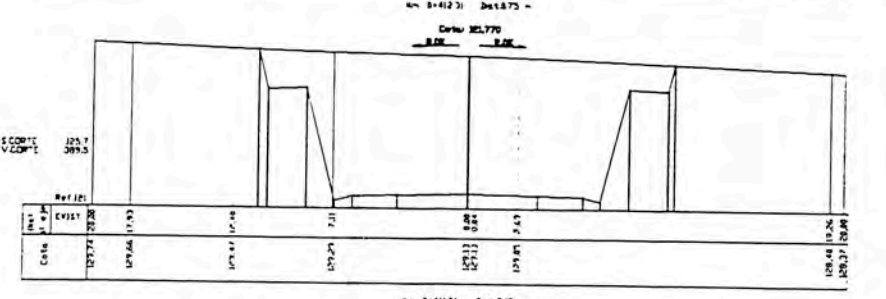
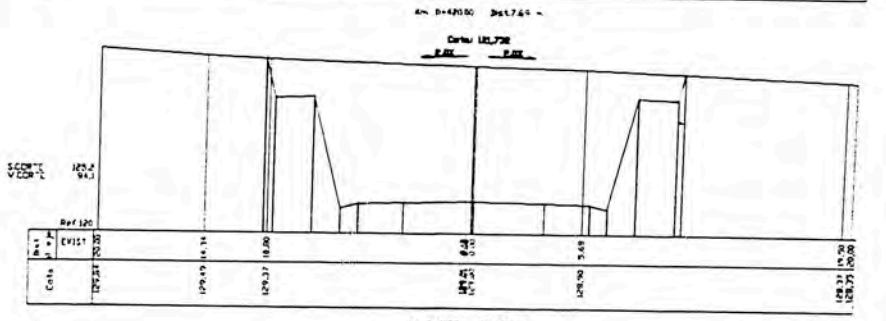
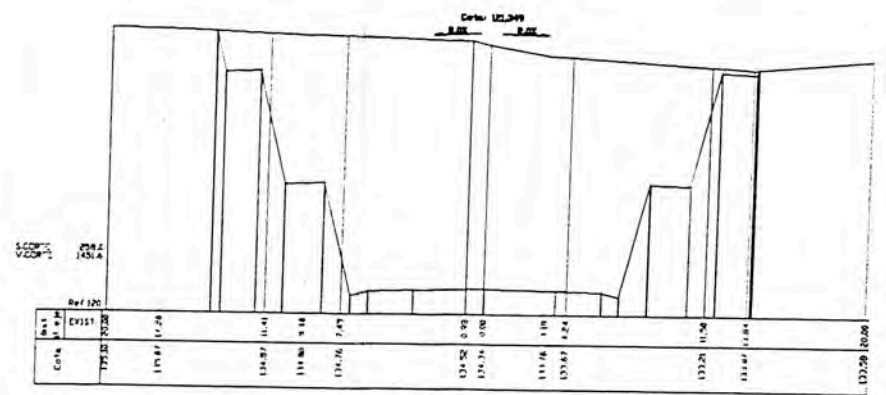
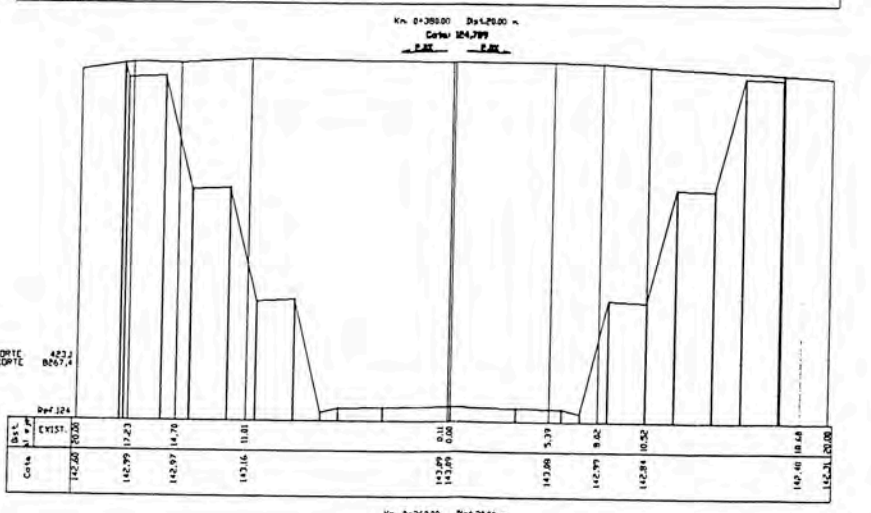
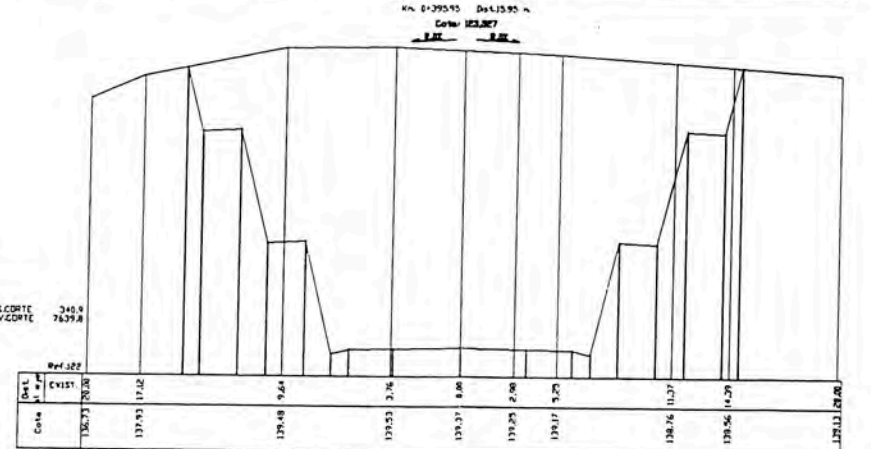
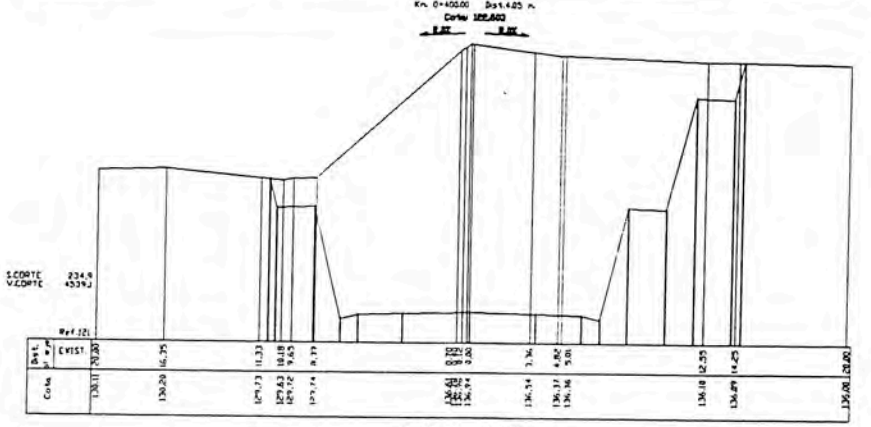
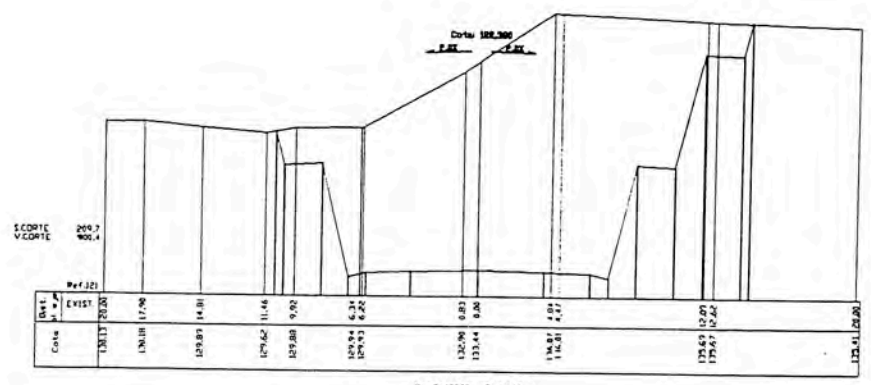
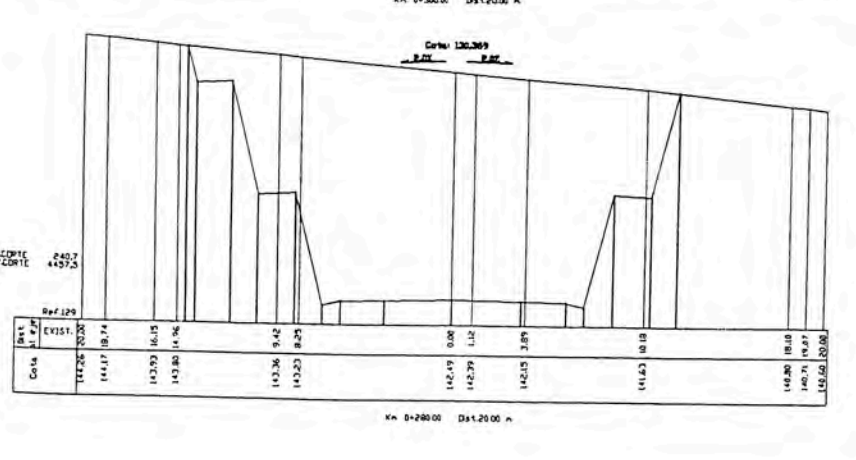
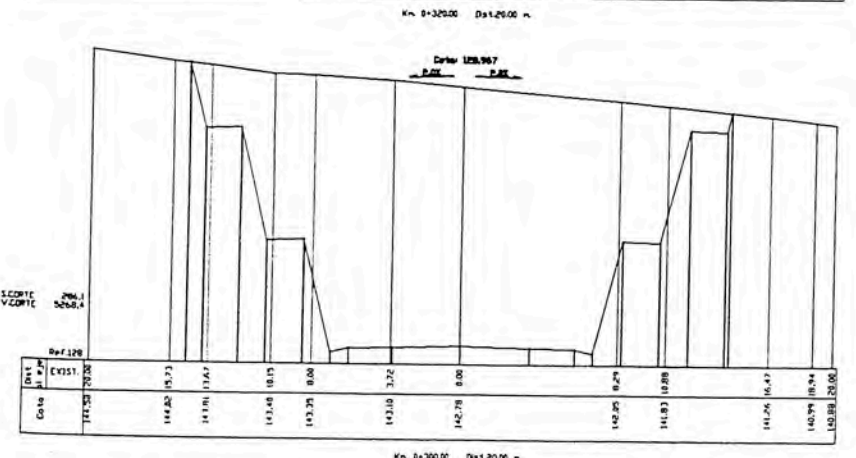
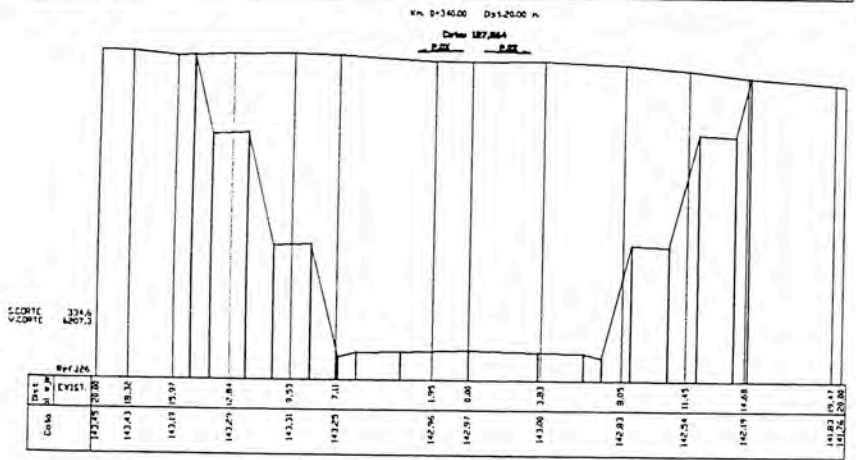
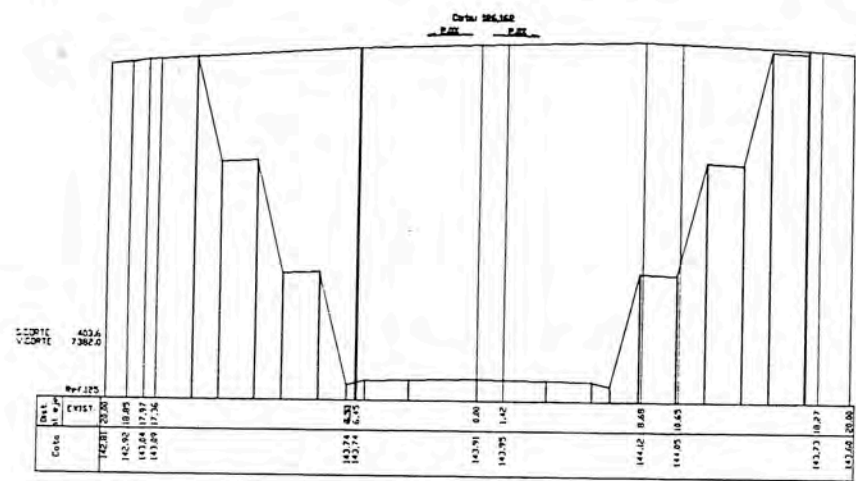
ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

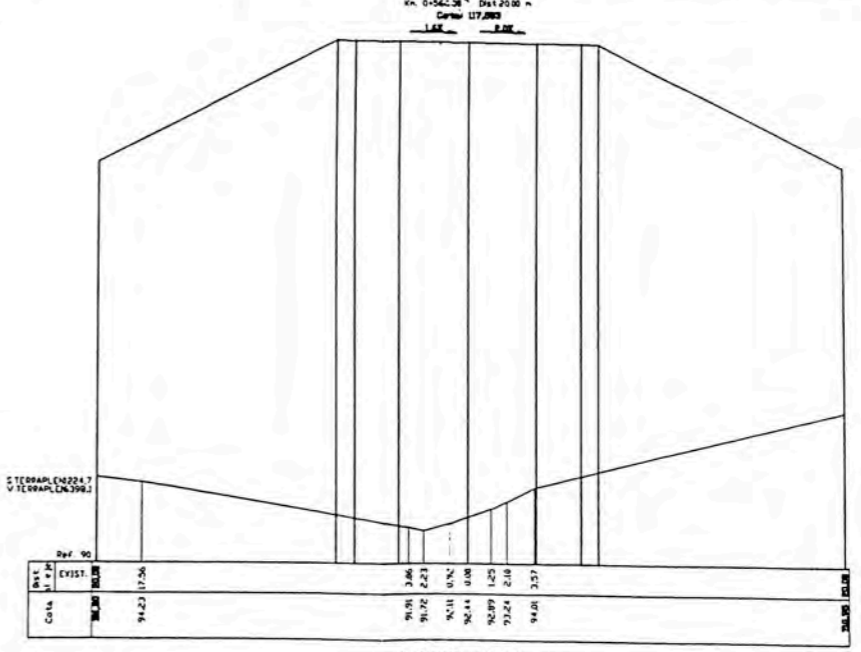
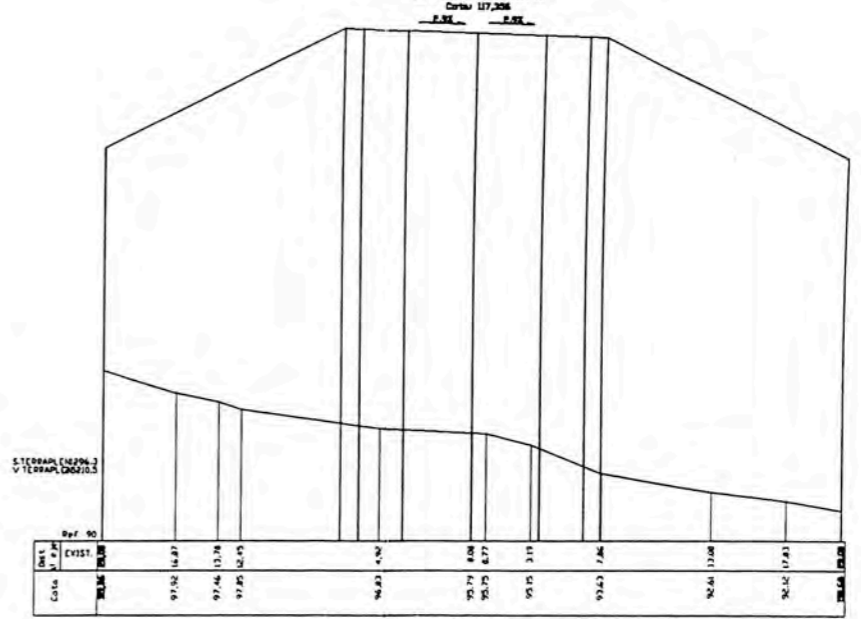
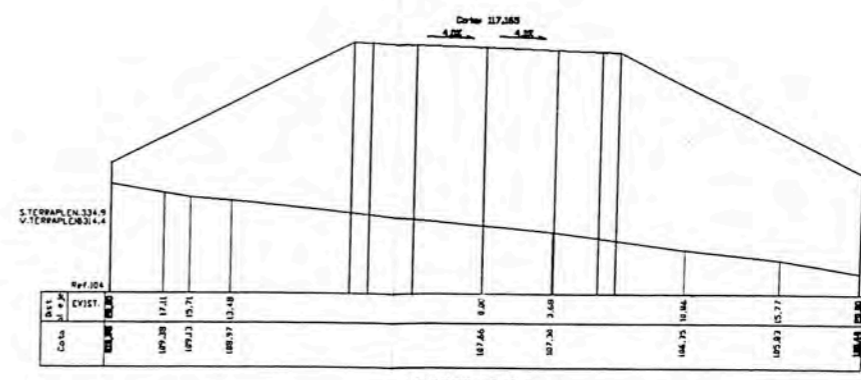
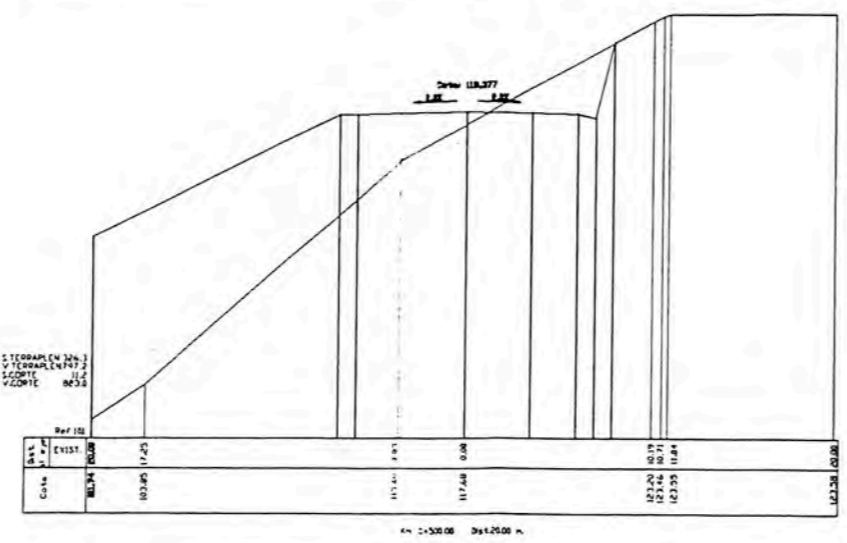
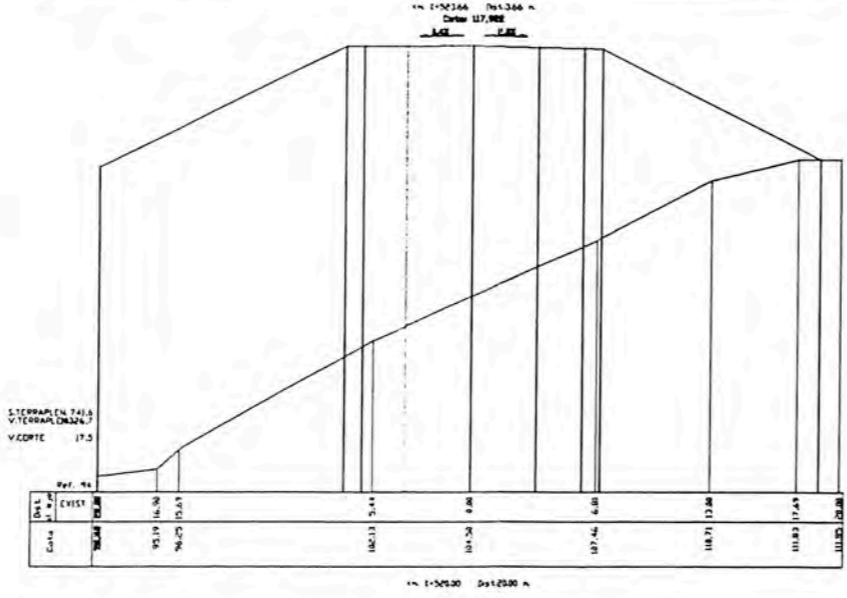
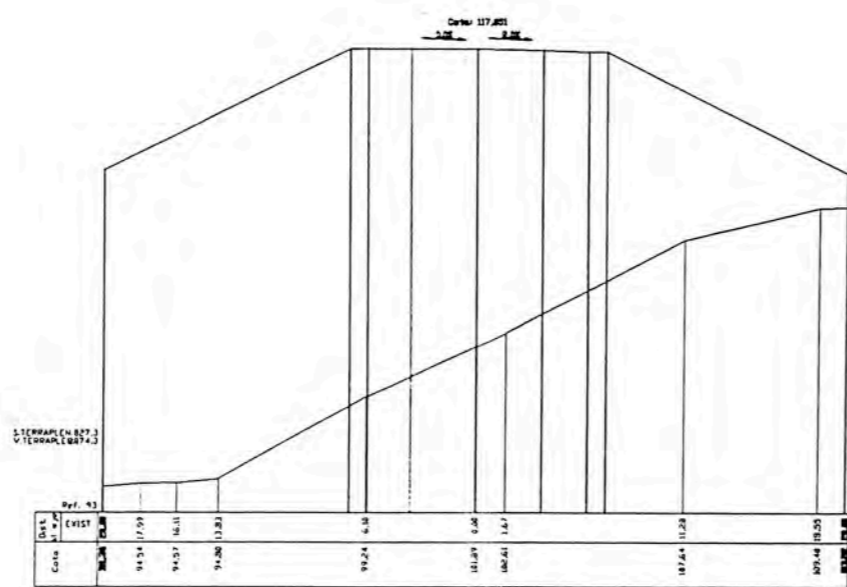
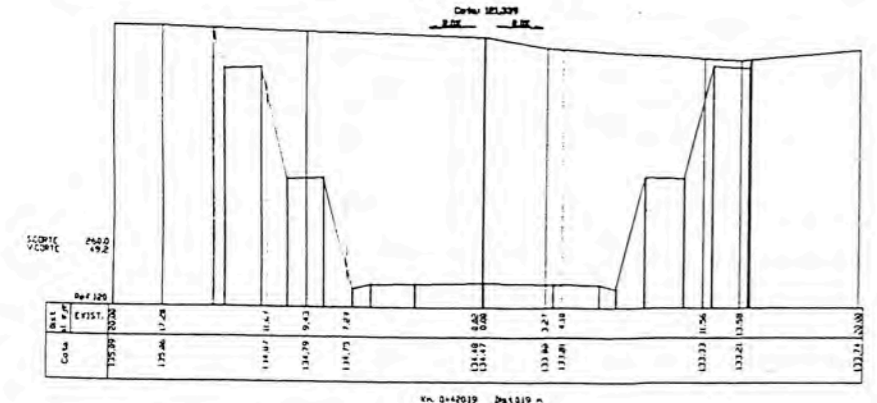
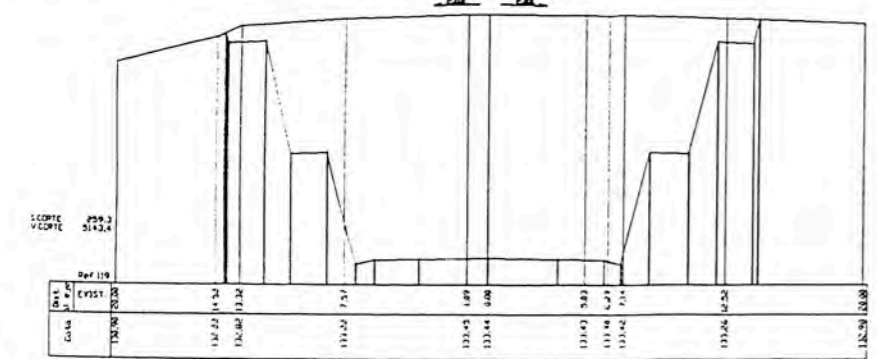
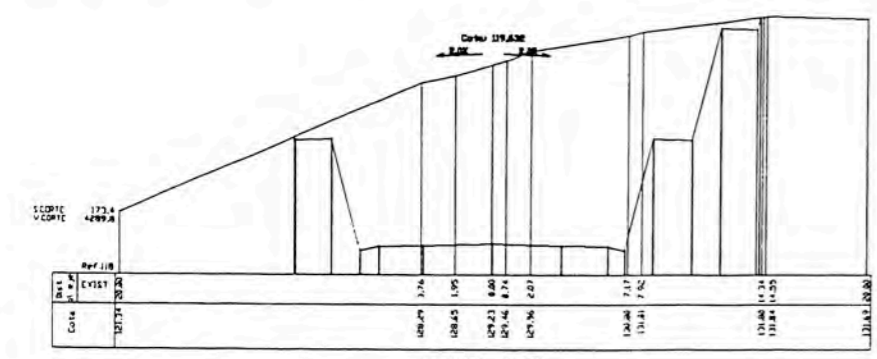
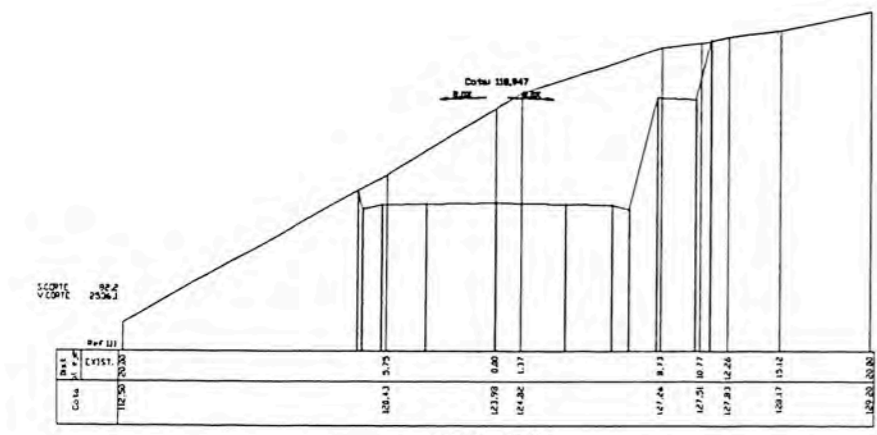
SECTOR: MATARANI - MOLLENDO
 PLANTA Y PERFIL LONGITUDINAL
 KM 8+000 - KM 9+000

ESCALA: H=1:4000 V=1:400
 FECHA: DICIEMBRE 2000
 PP - 009

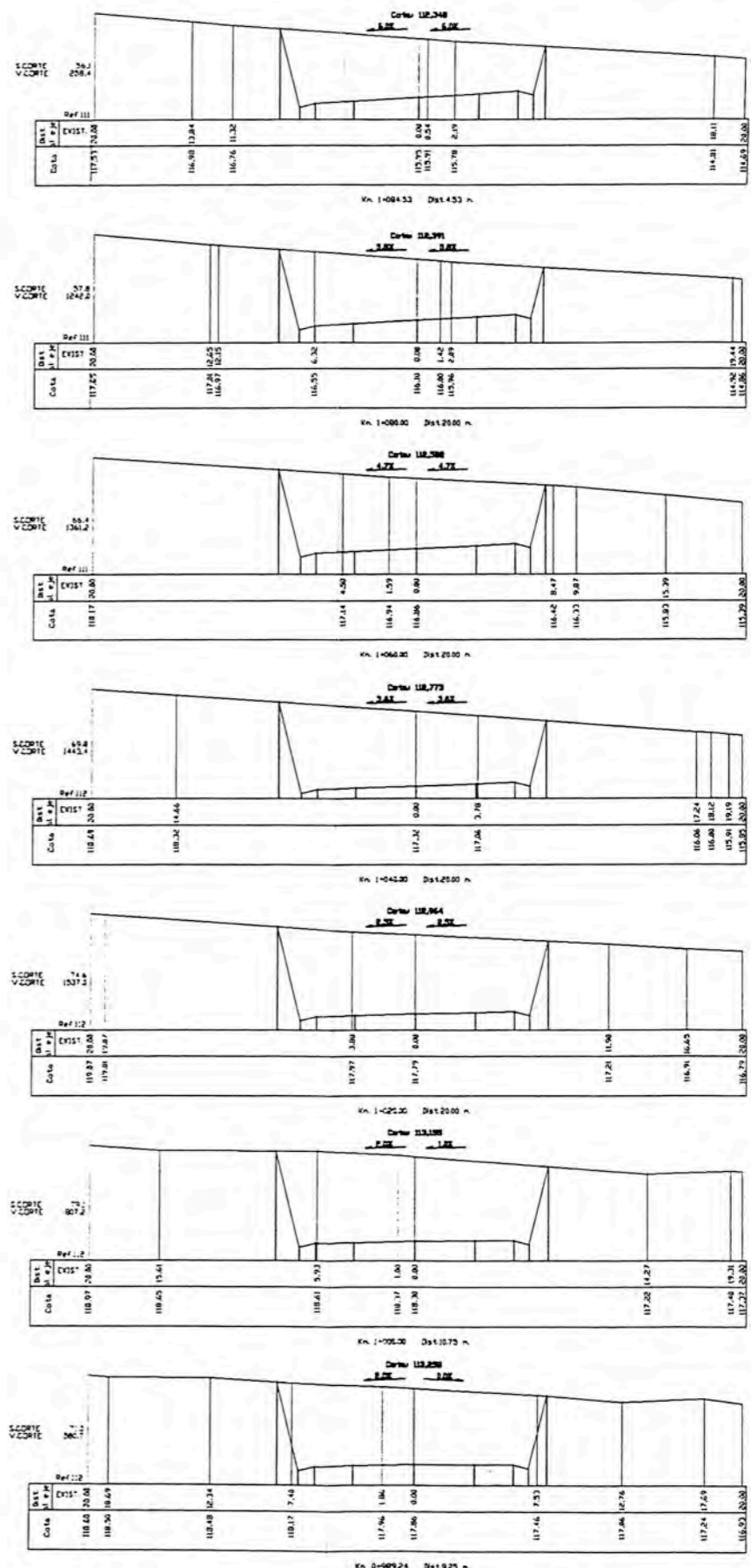
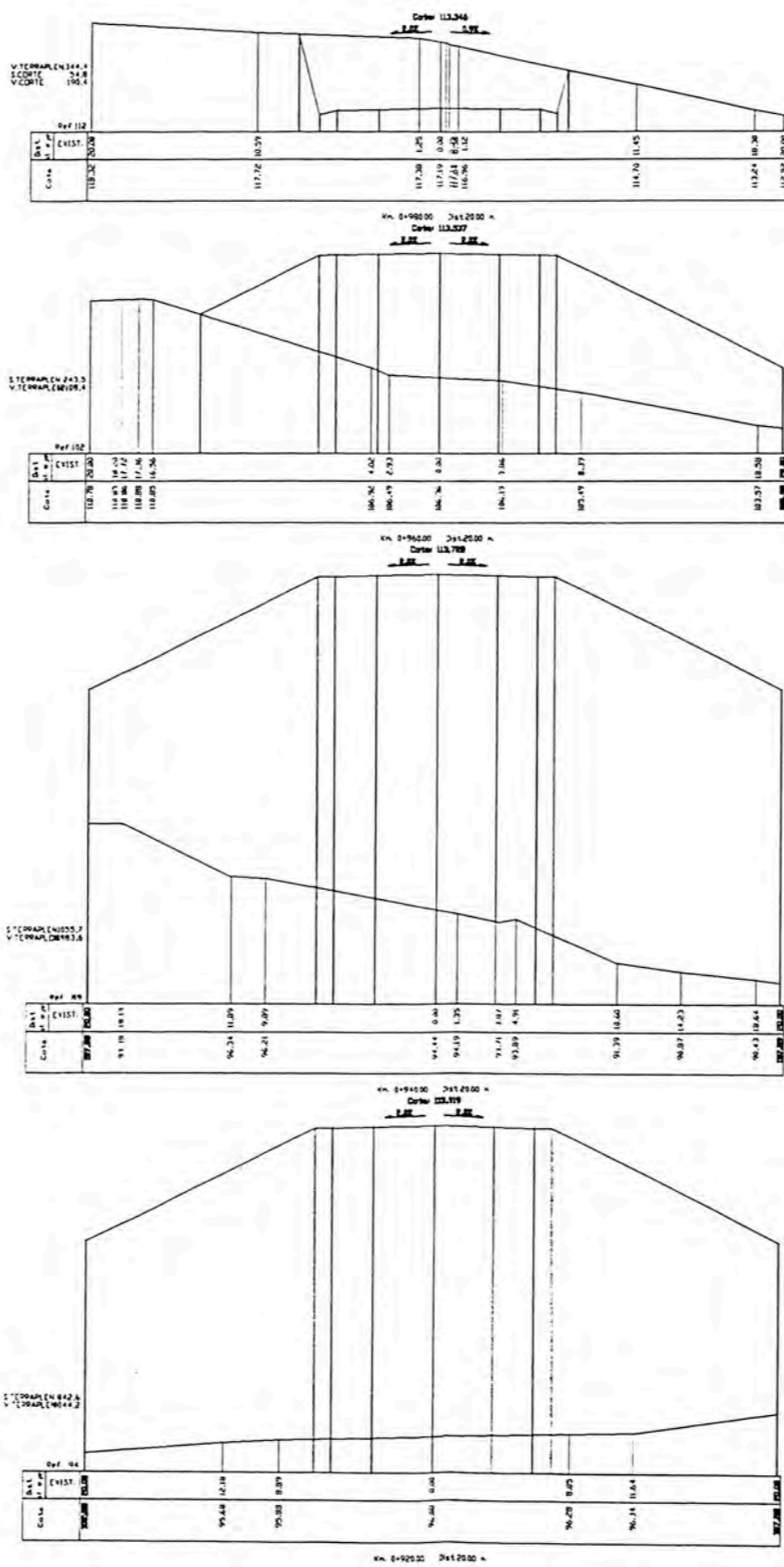
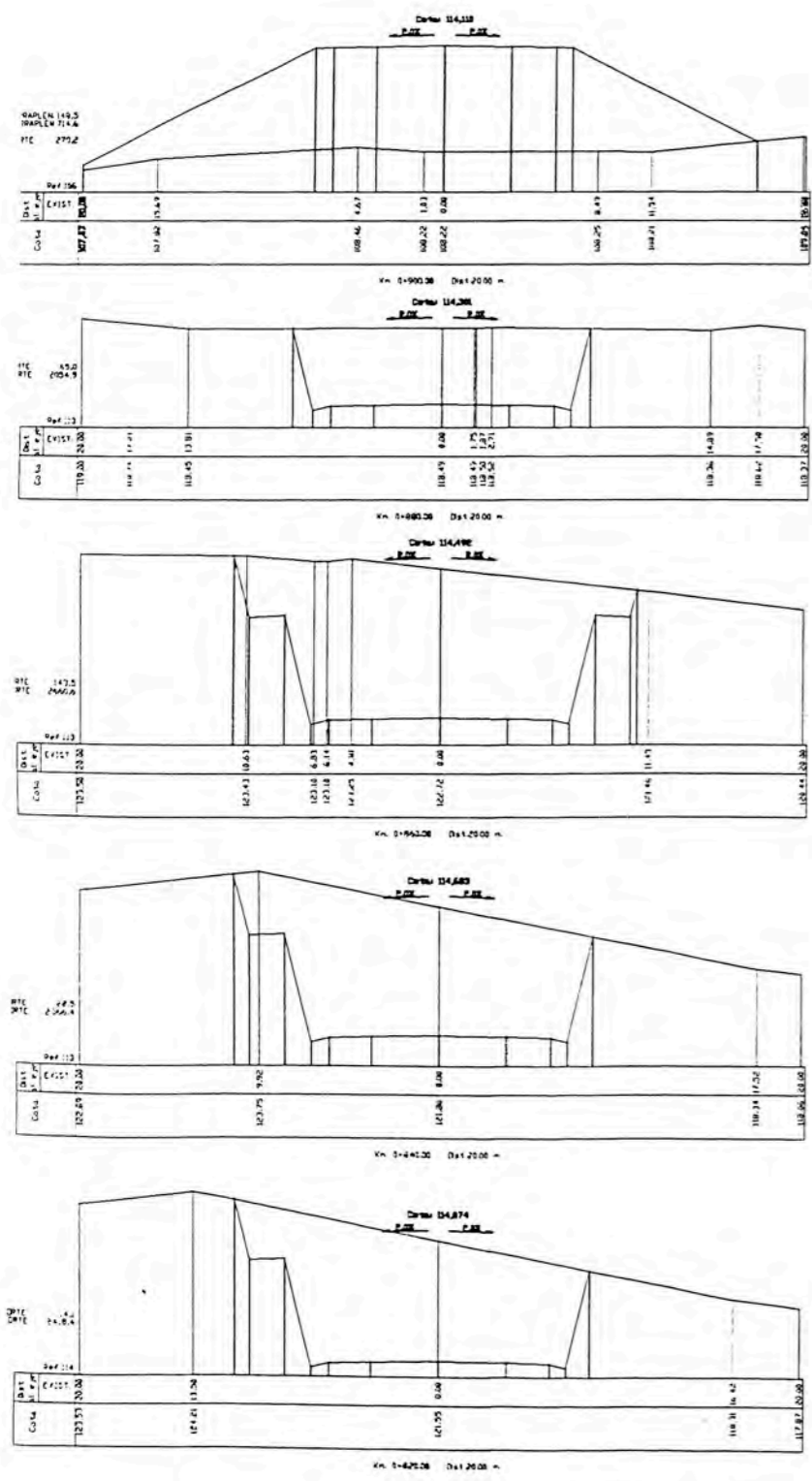


REVISIONES	
Nº	FECHA

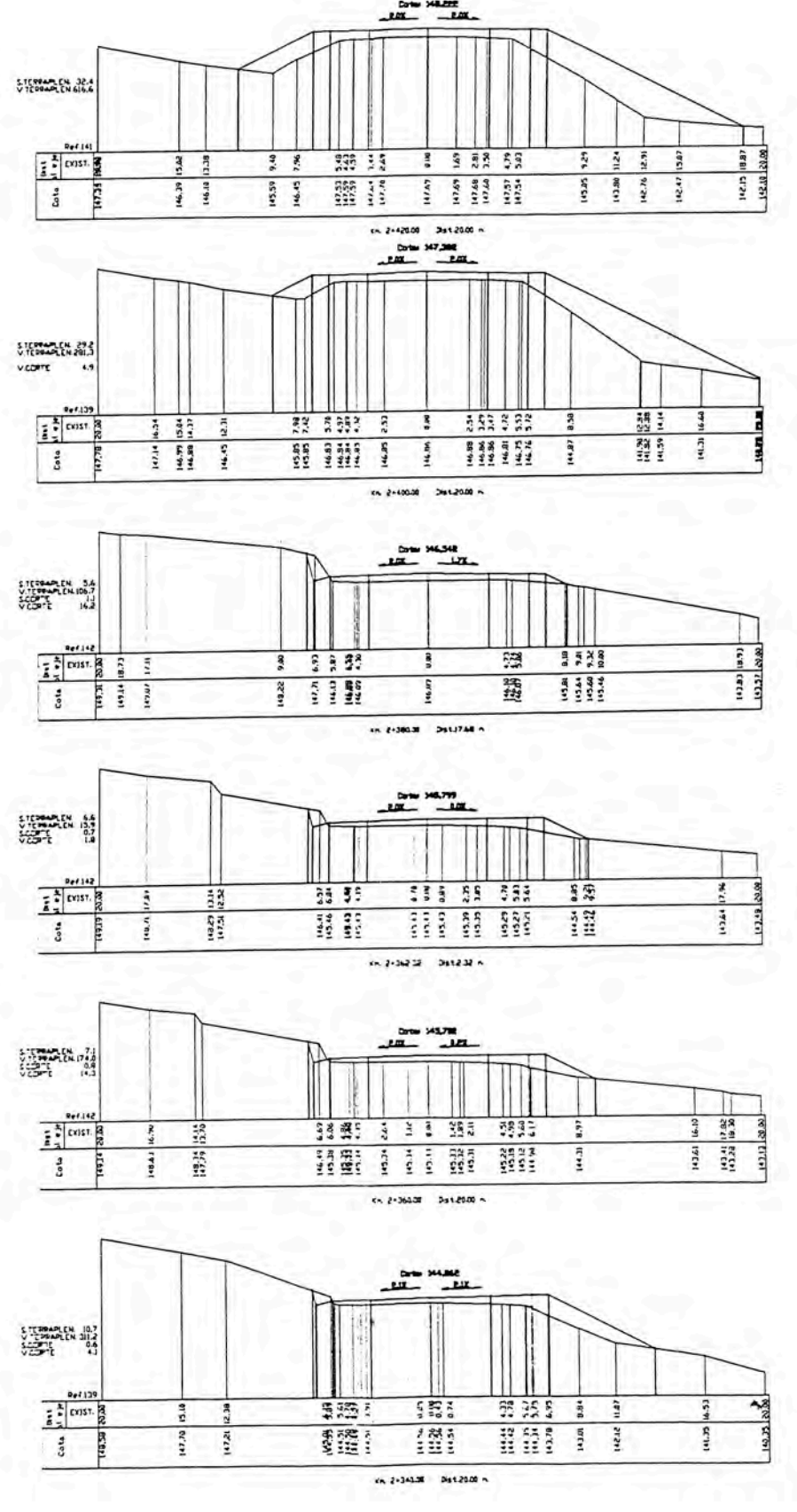
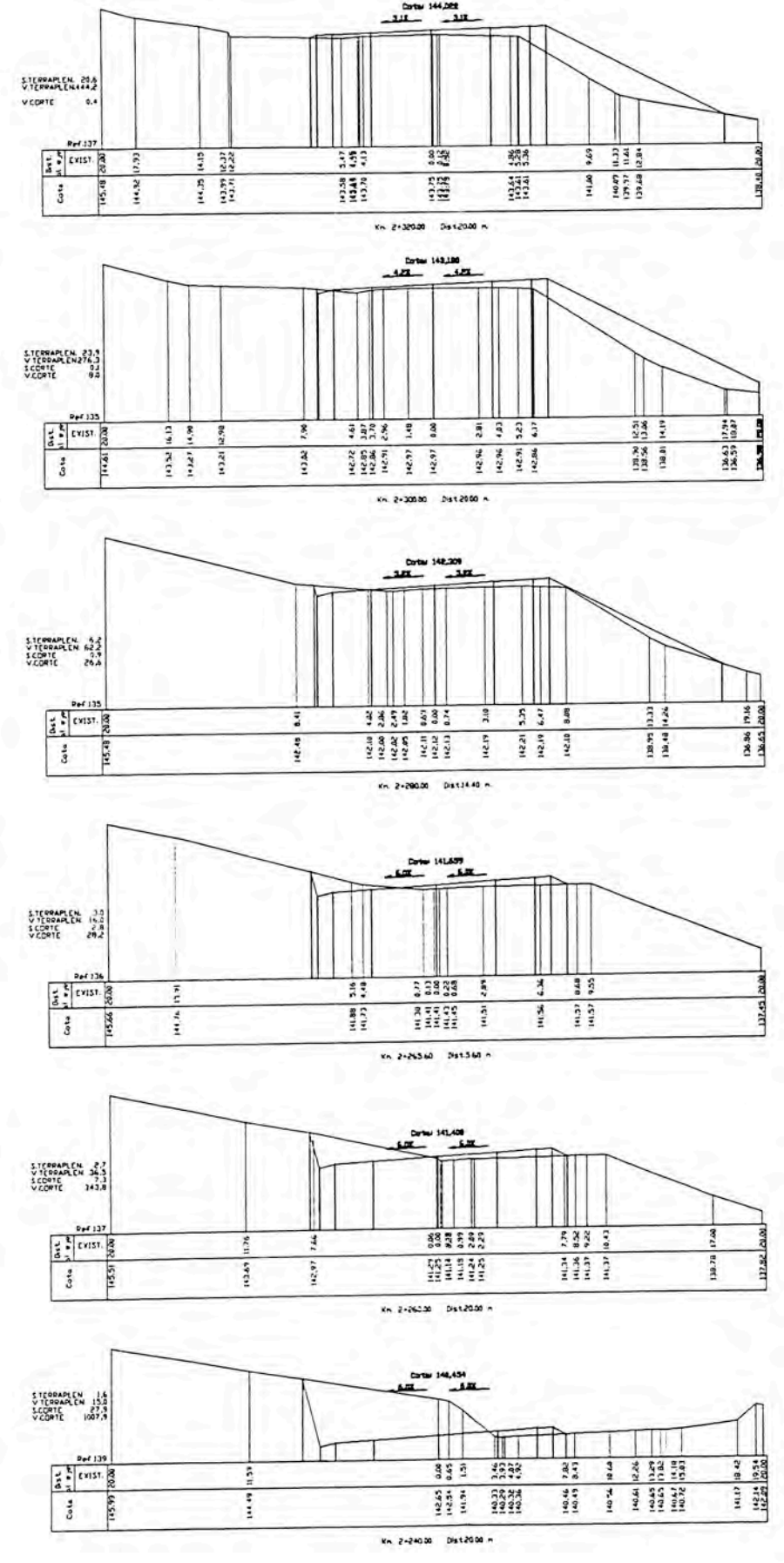
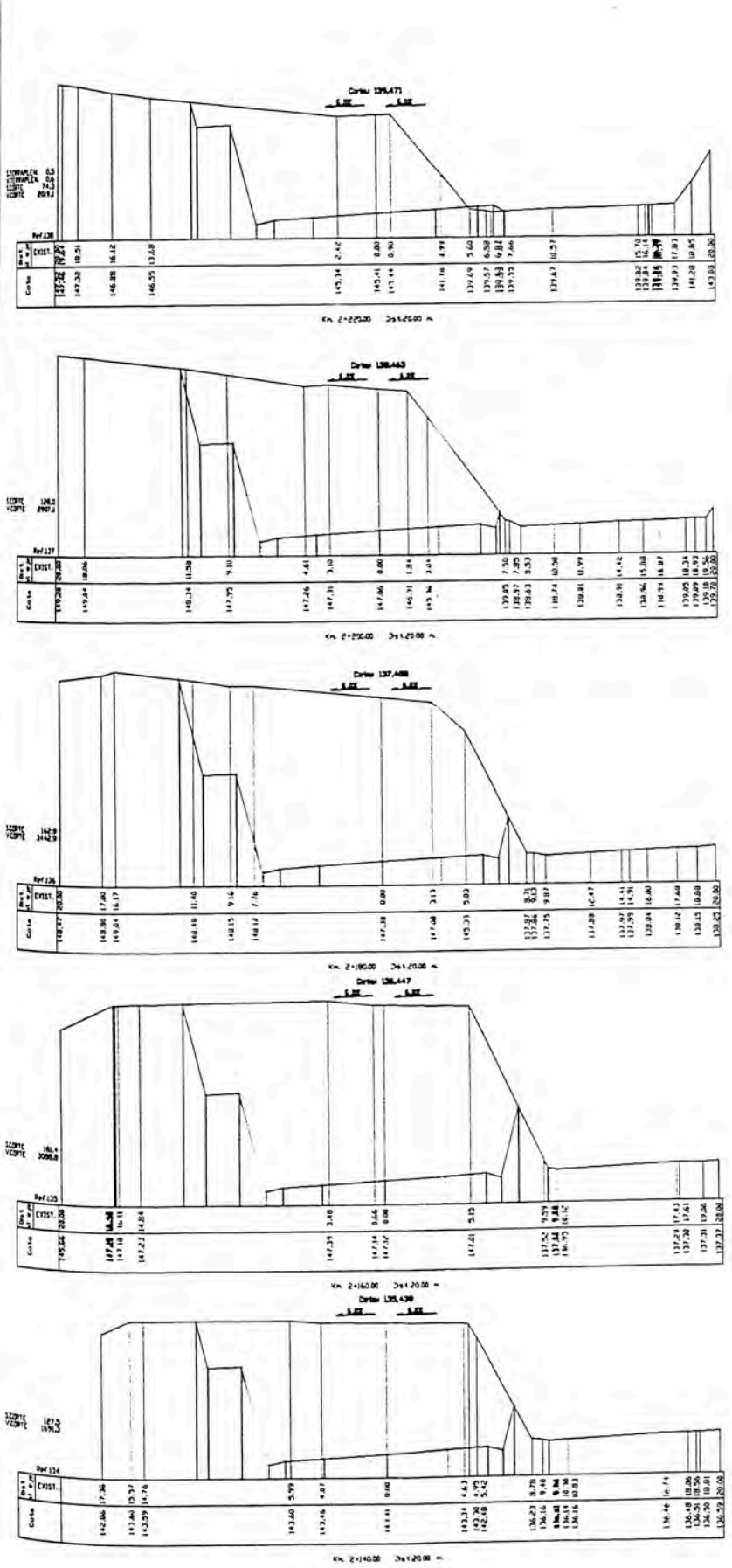


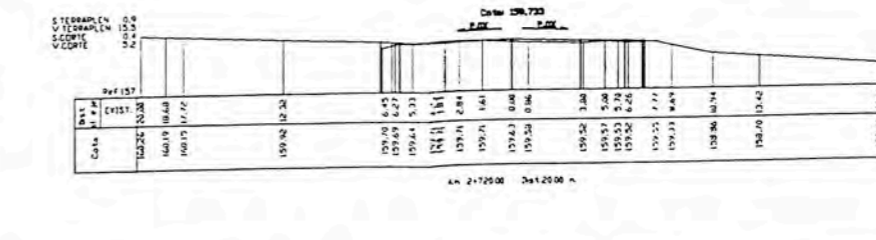
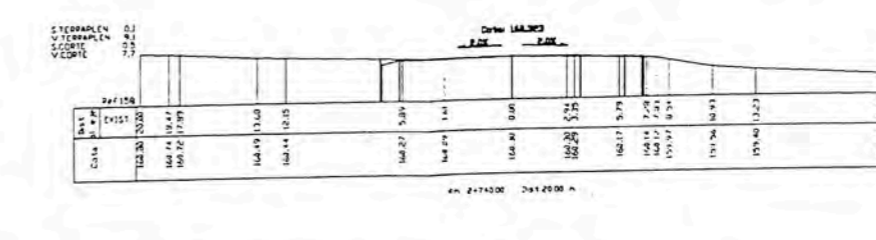
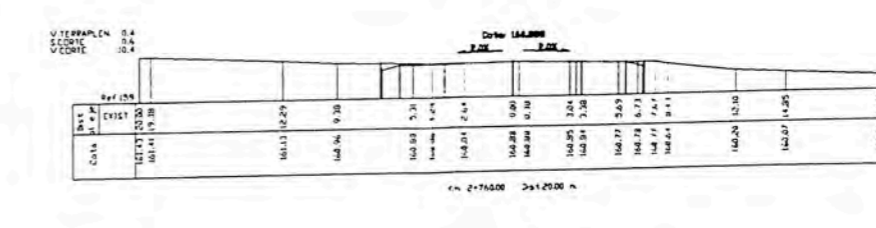
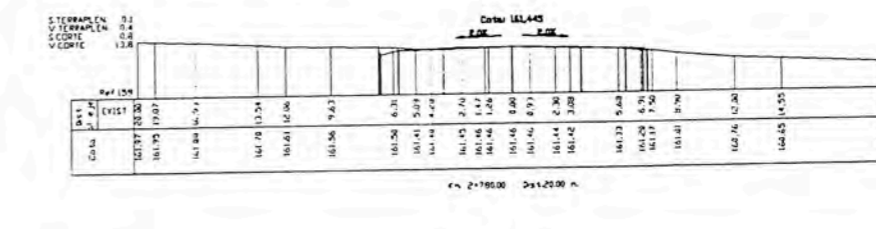
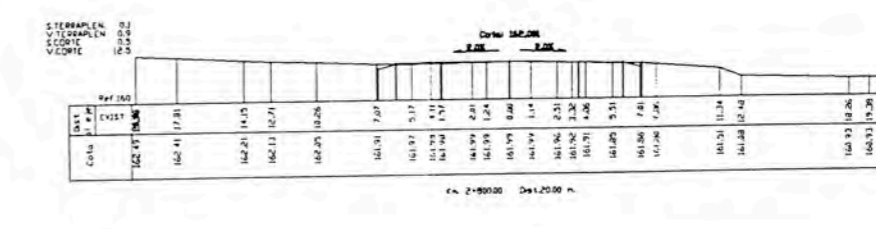
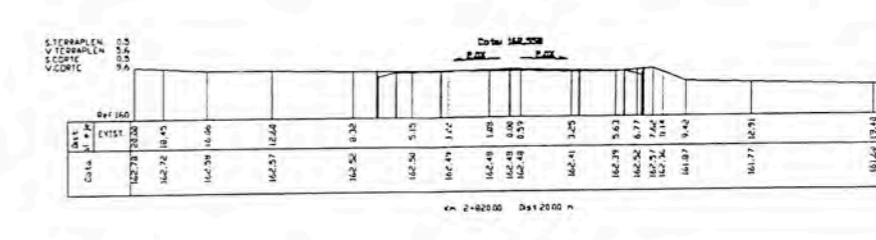
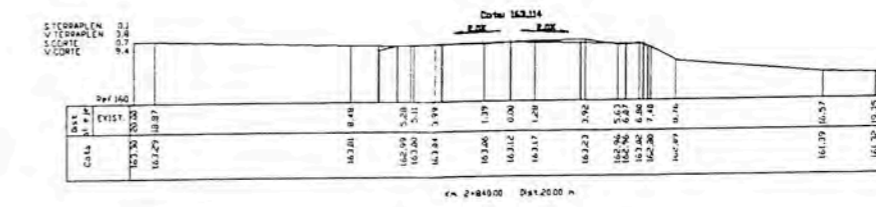
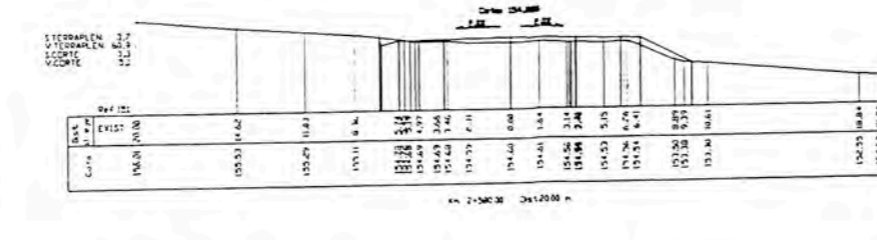
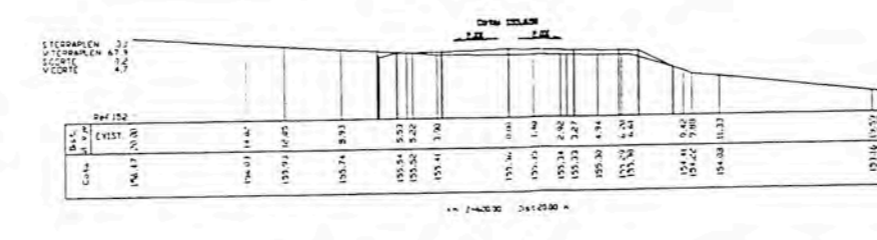
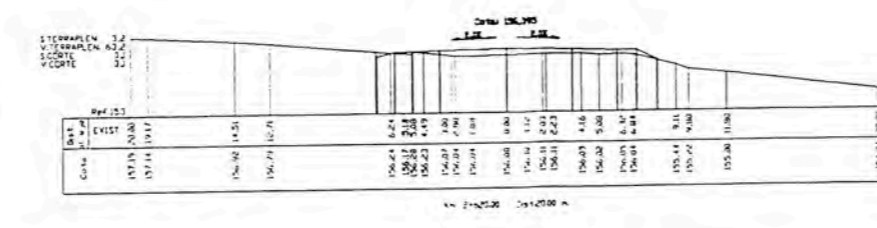
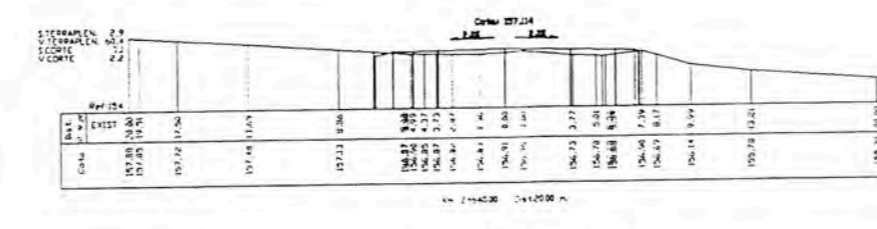
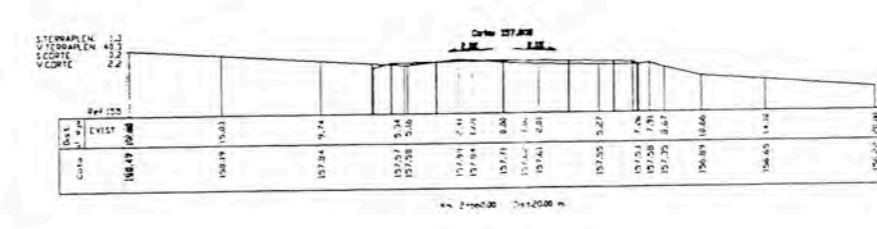
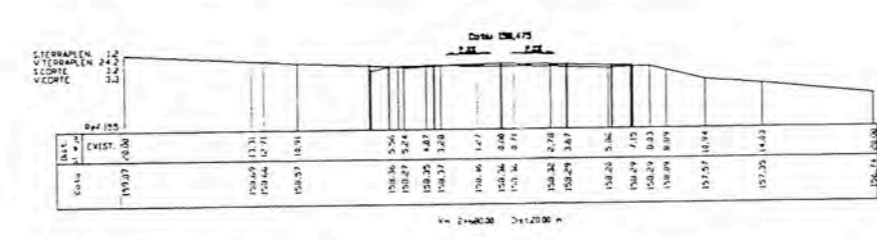
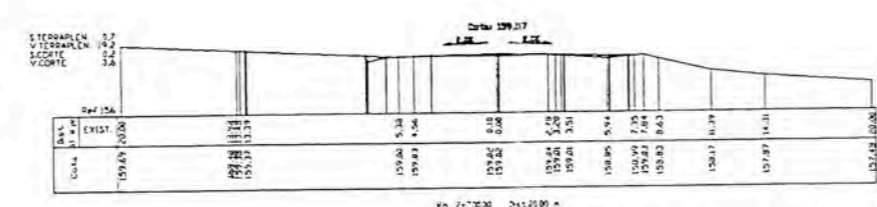
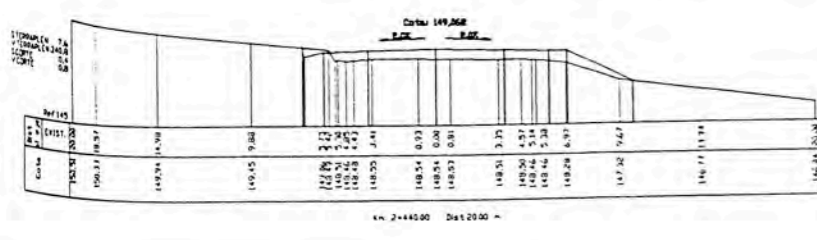
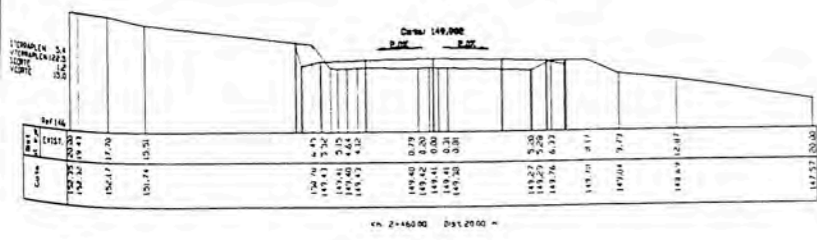
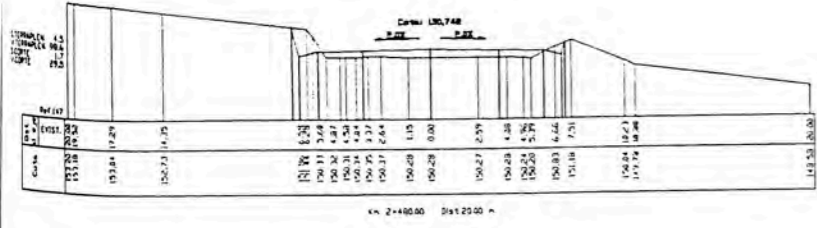
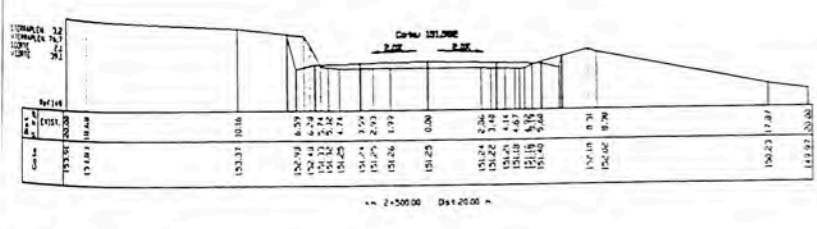
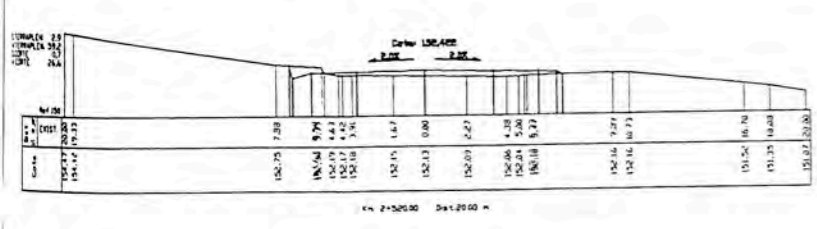
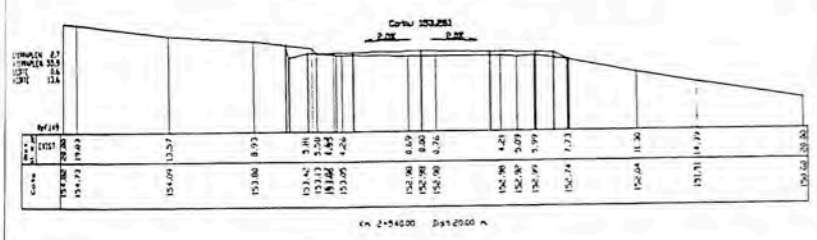
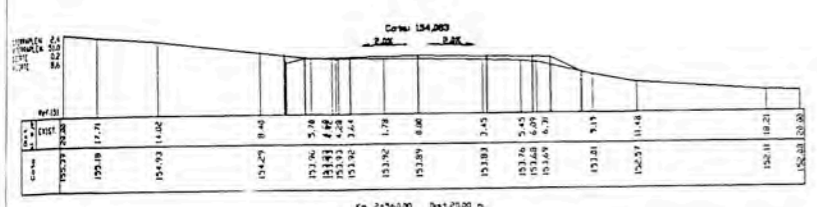


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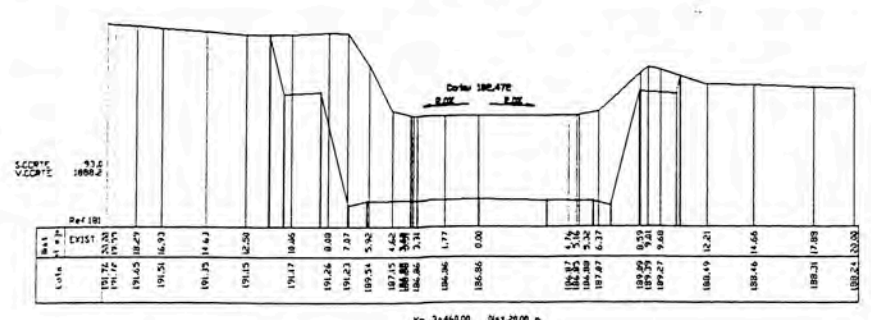
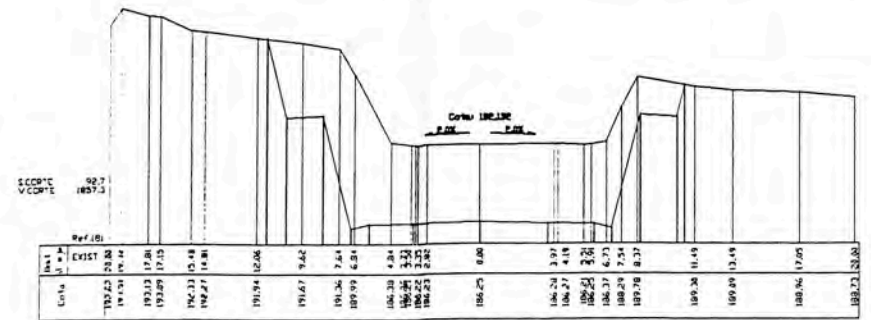
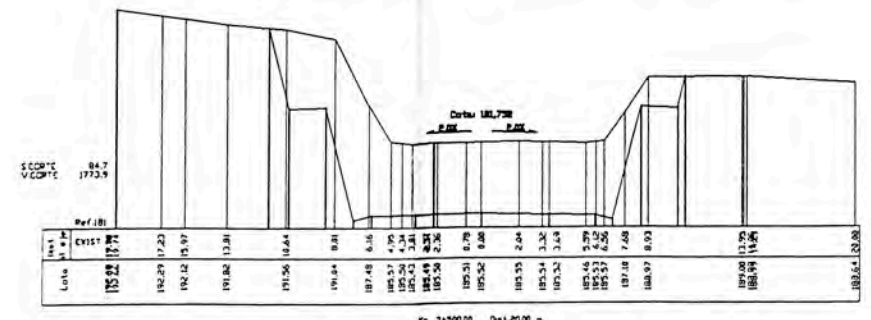
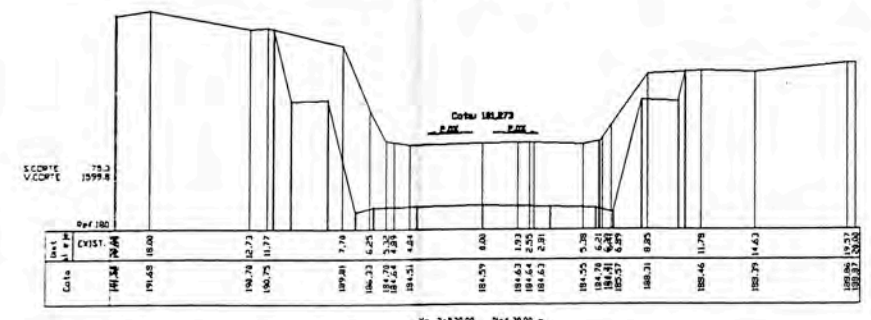
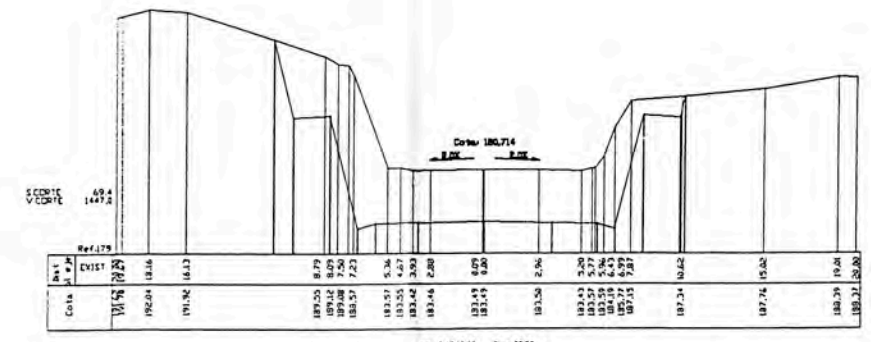
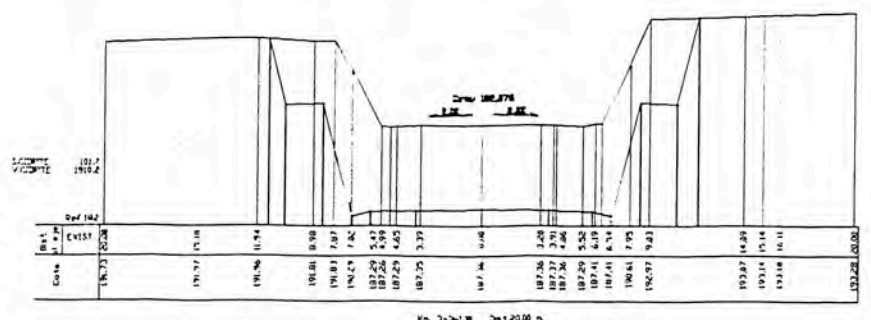
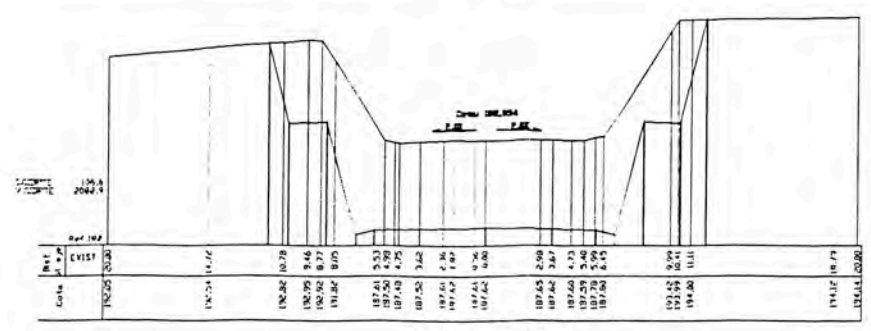
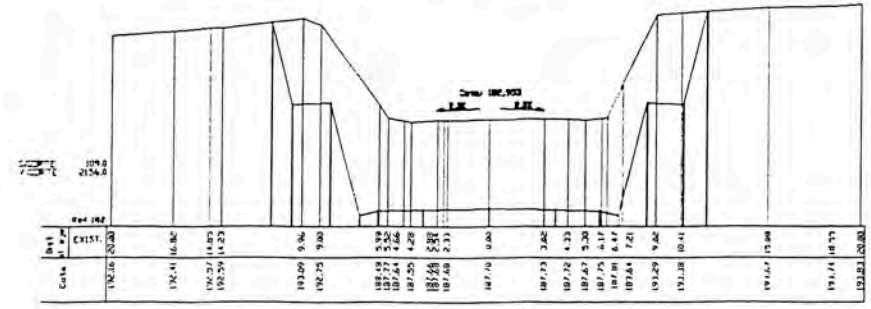
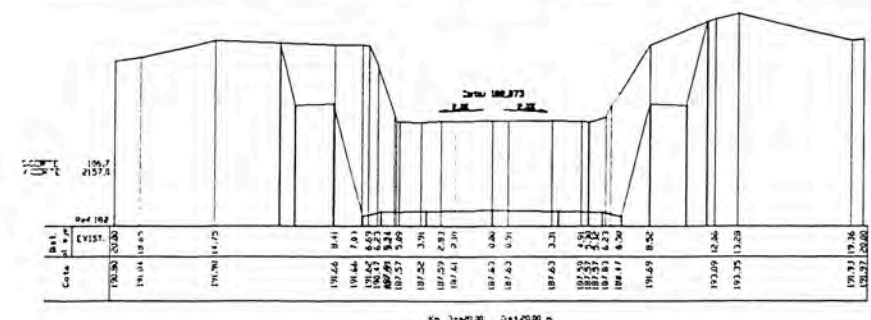
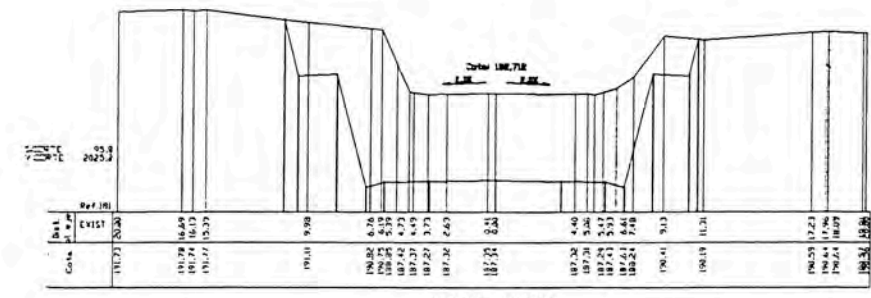
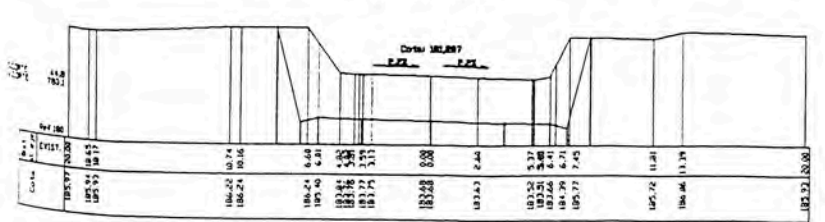
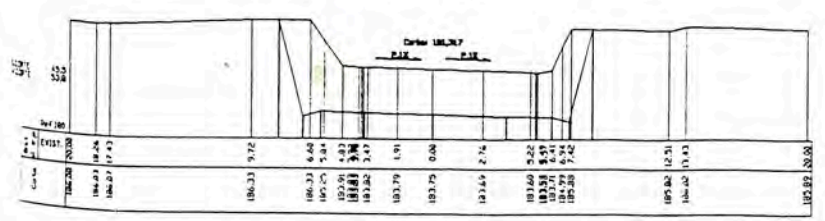
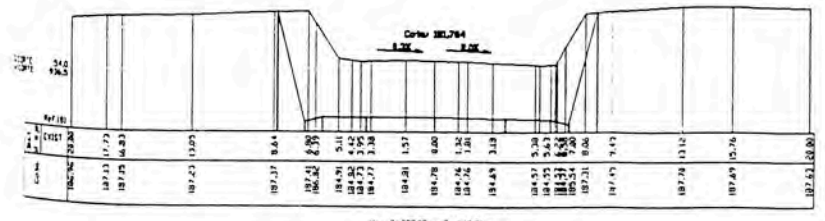
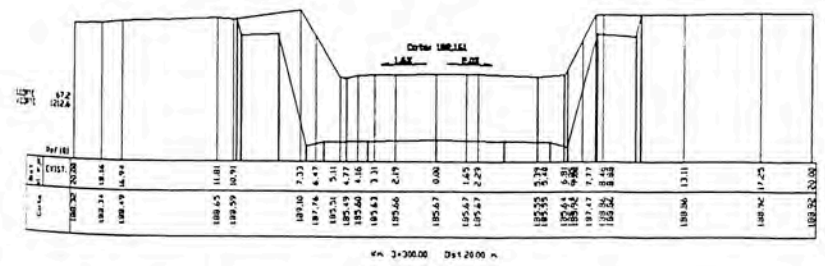
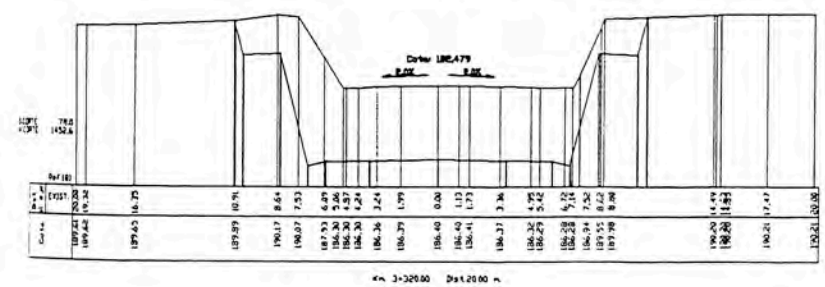
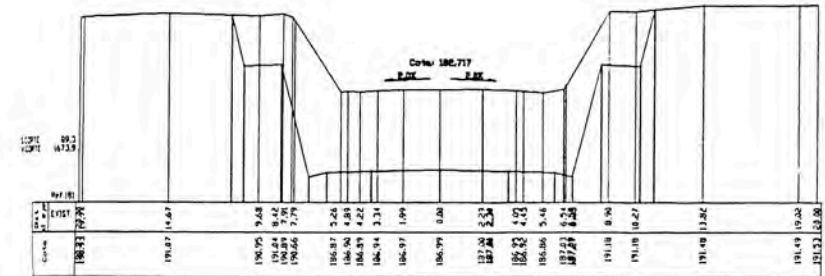


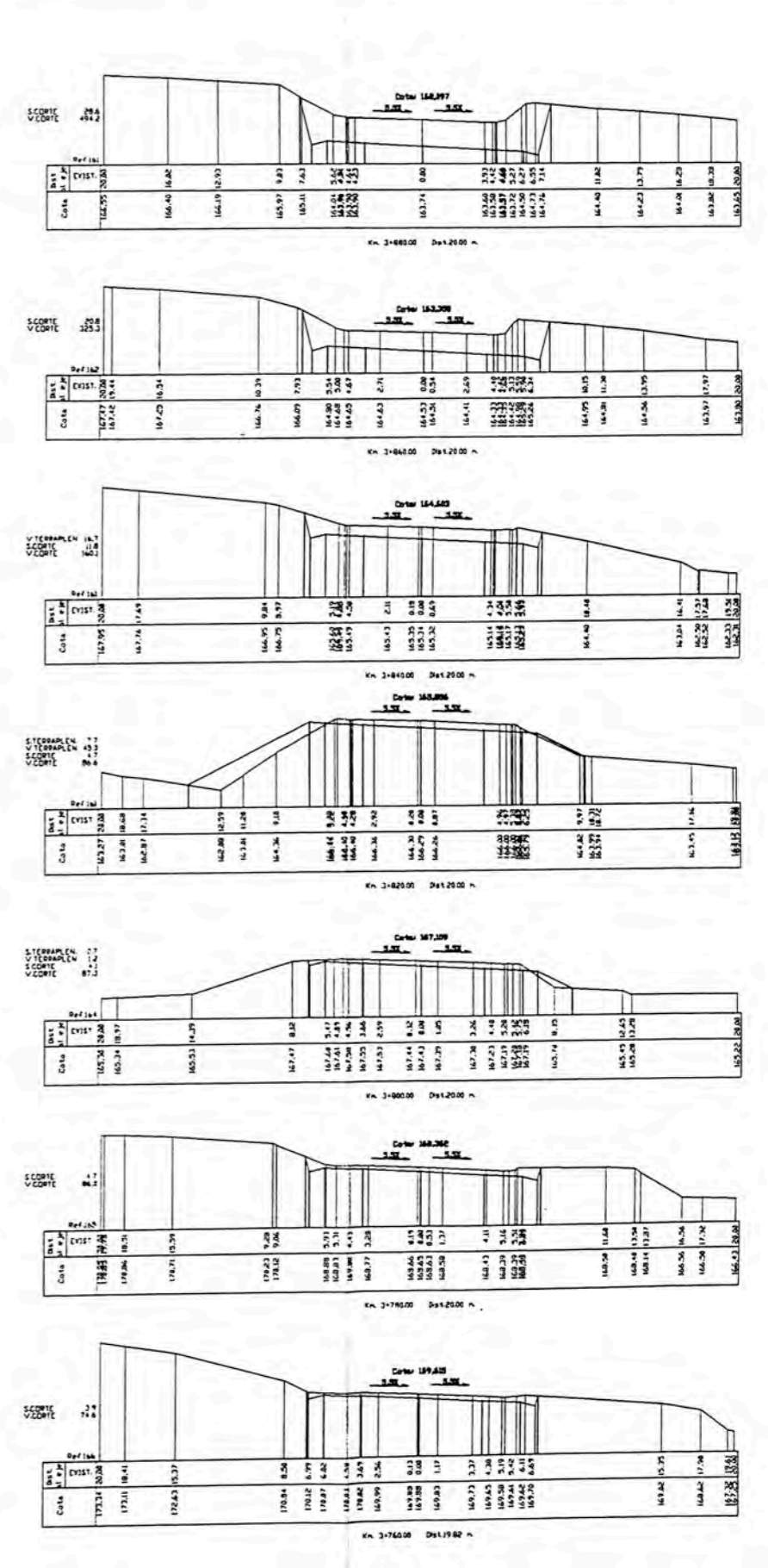
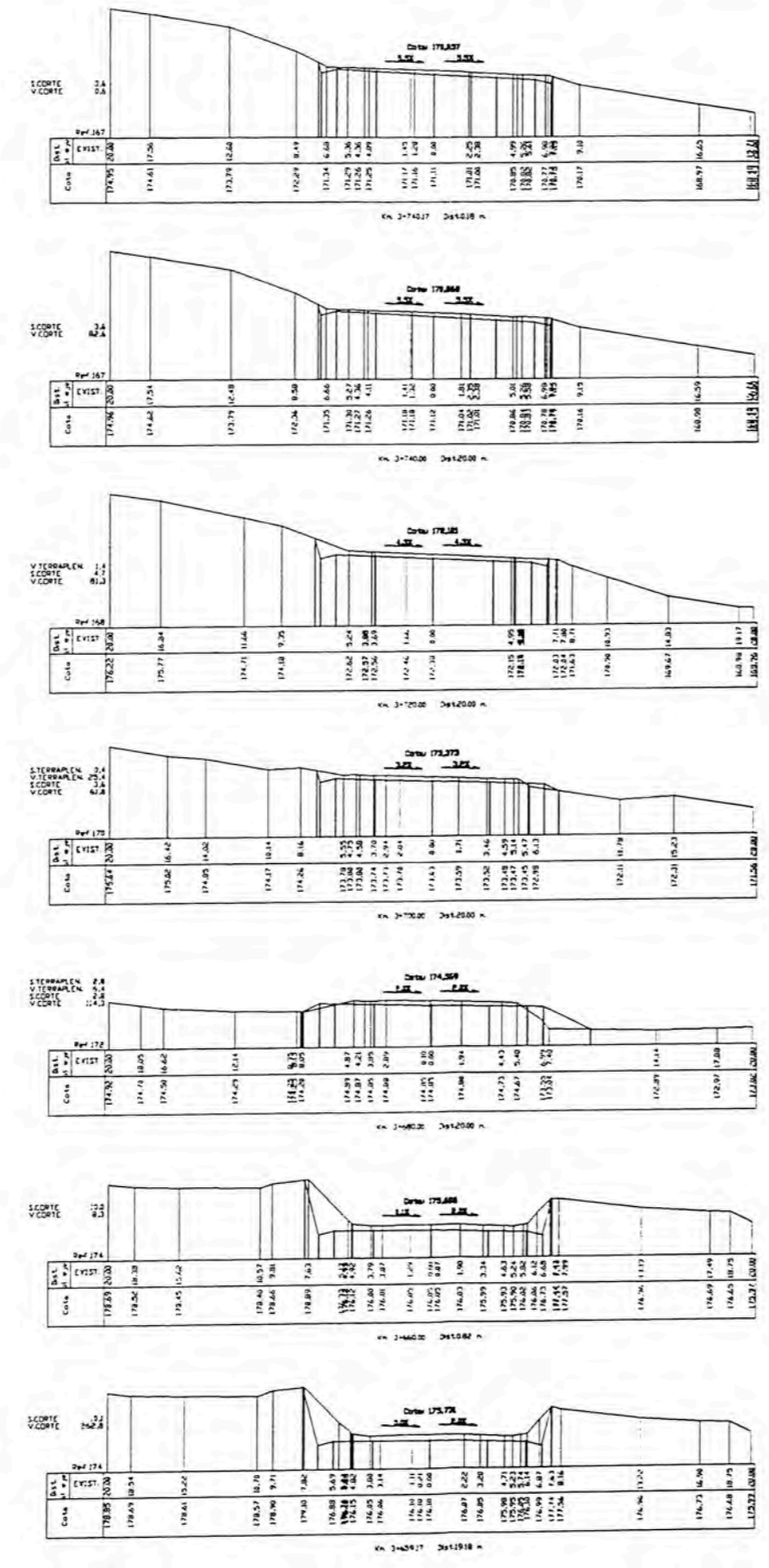
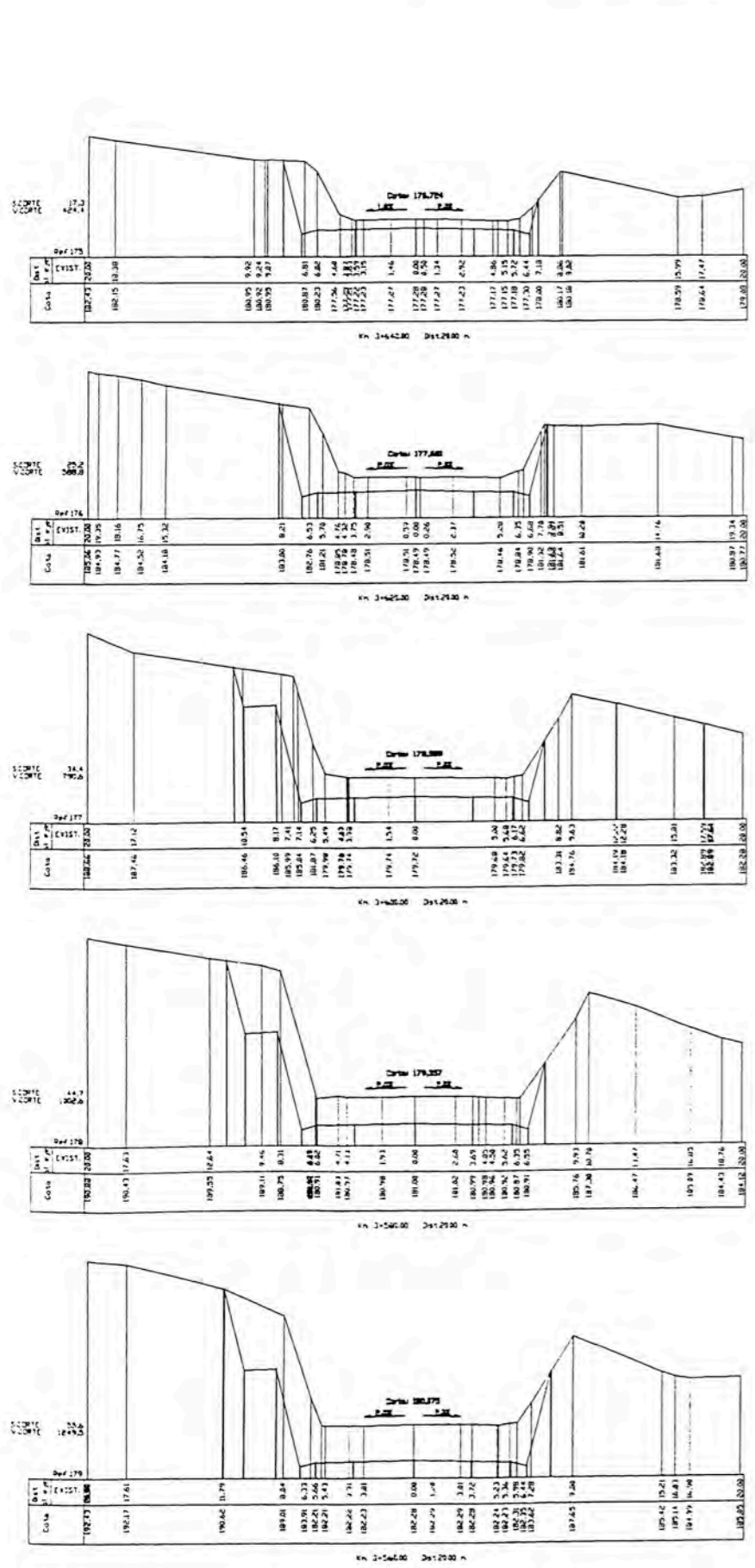
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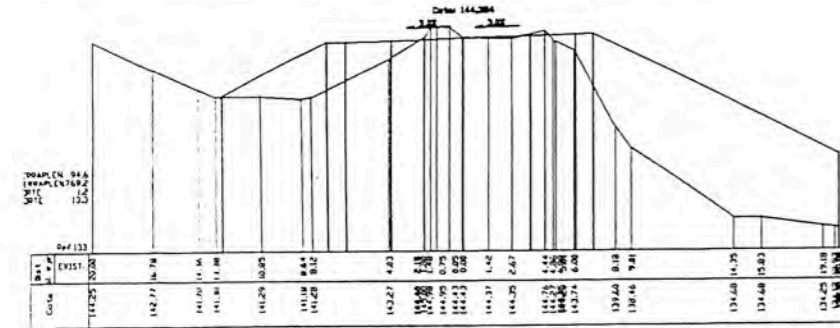


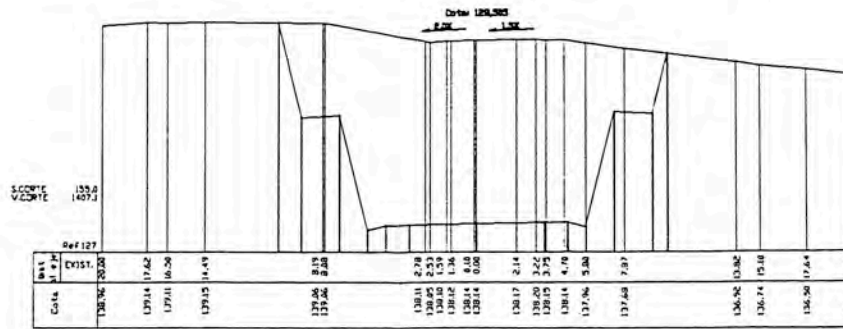
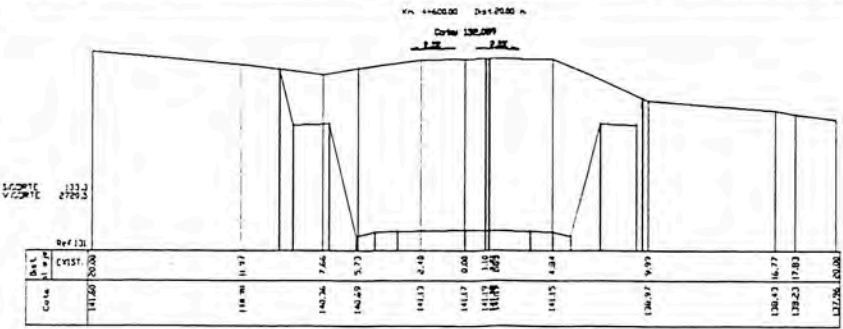
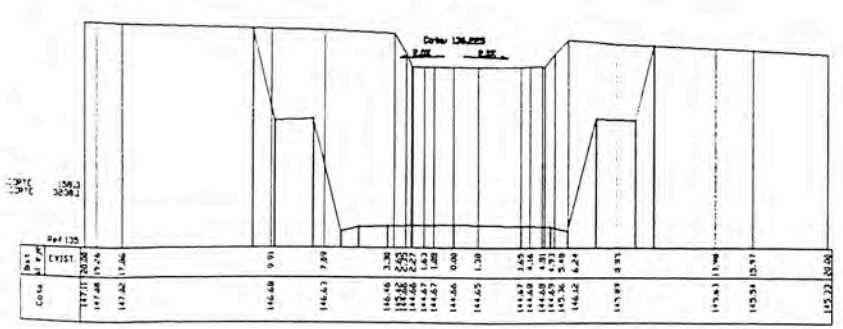
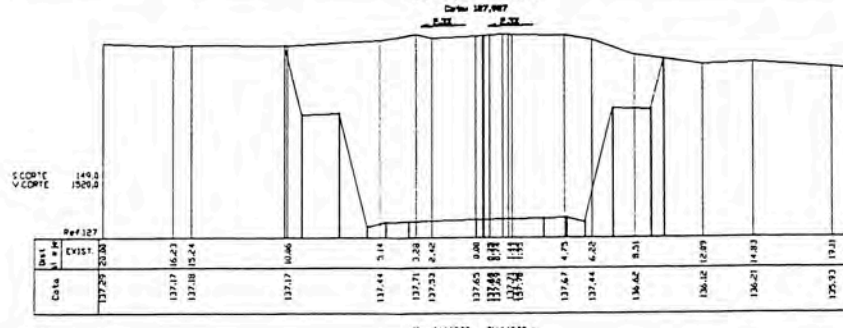
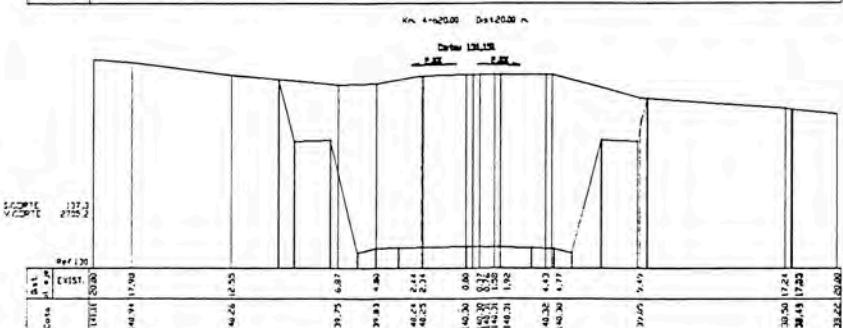
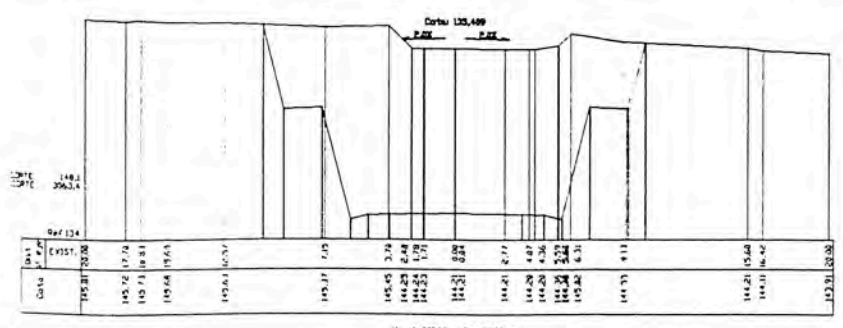
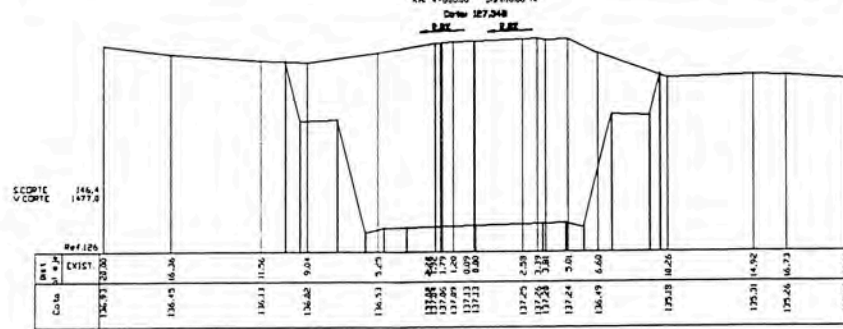
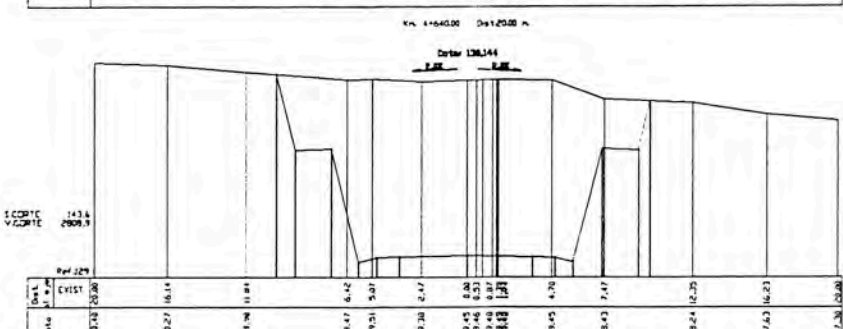
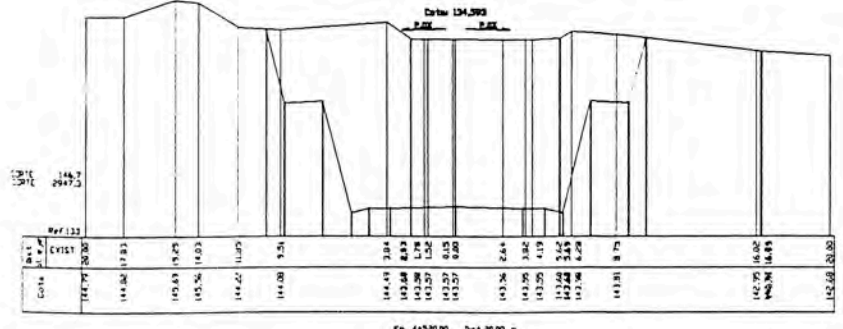
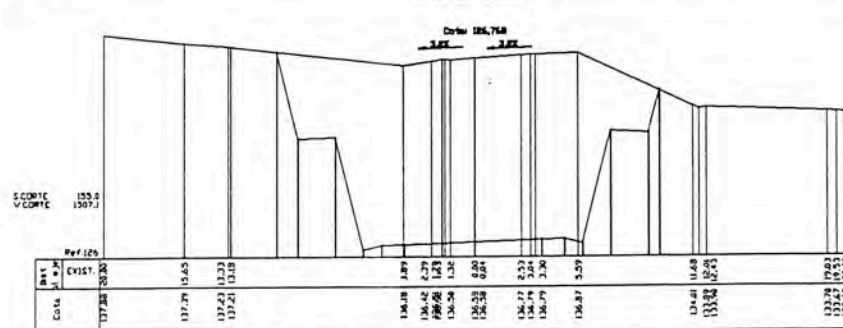
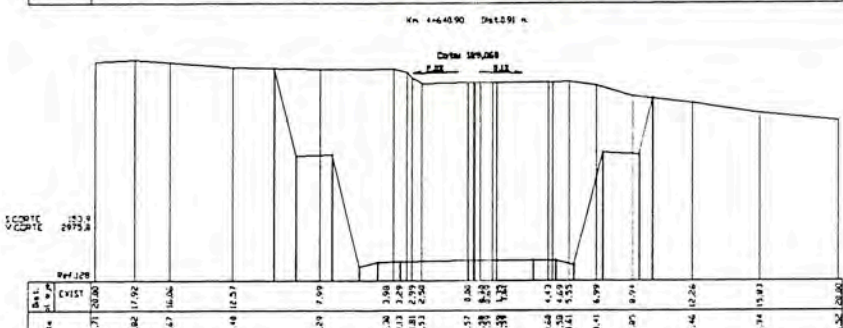
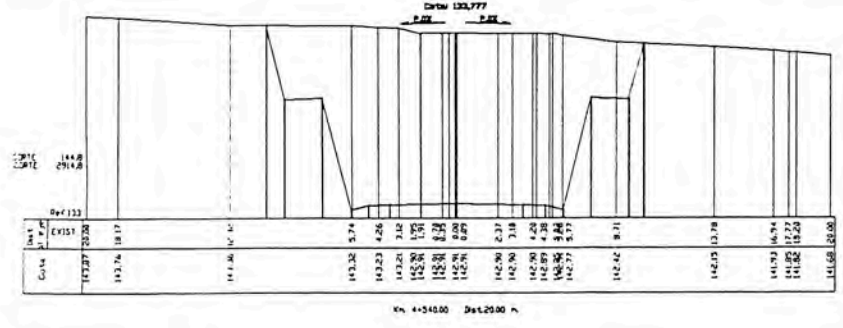
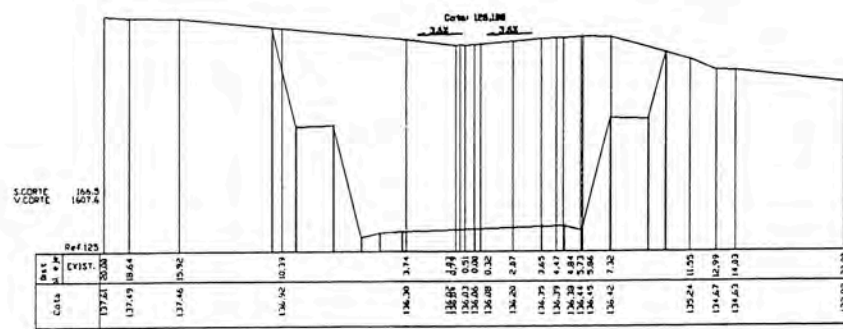
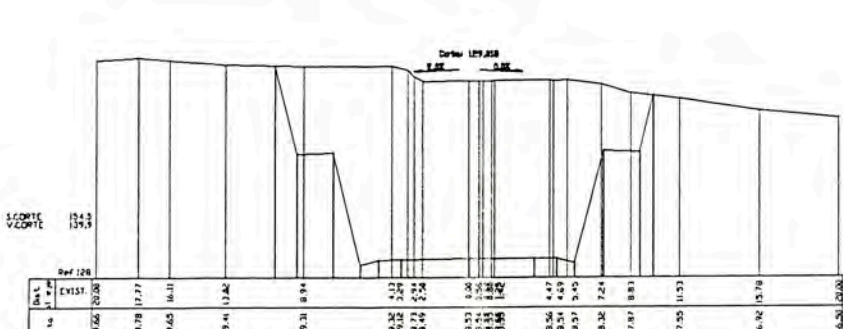
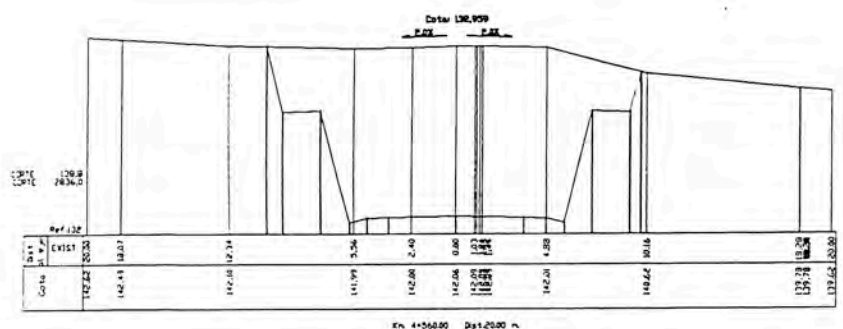


Diseñó:		Beth. A Layre U	Aprobó:		REVISIONES	
Dibujó:		ALLJ	Presentó:		Nº	FECHA
Verificó:		Ing. G. Bravetti B	BETH. A. LAYRE U		DESCRIPCIÓN	
Proyectó:		Beth. A Layre U				

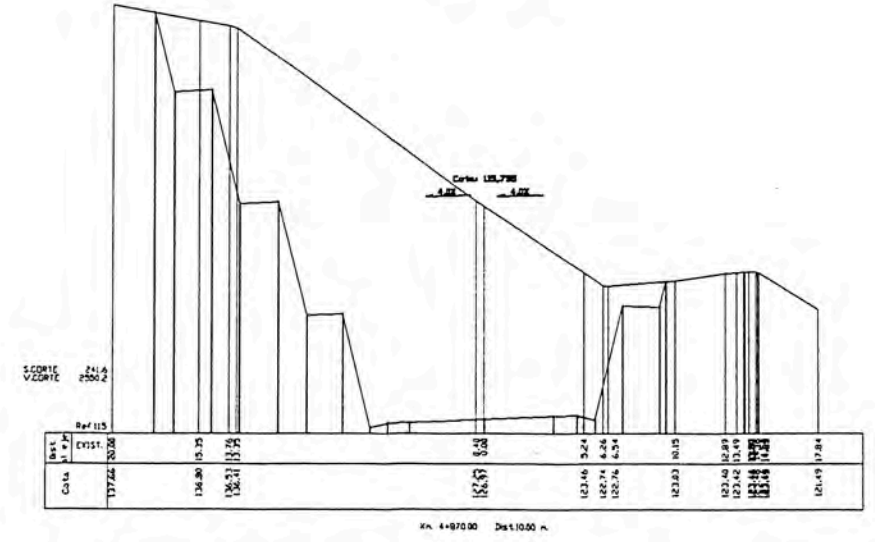
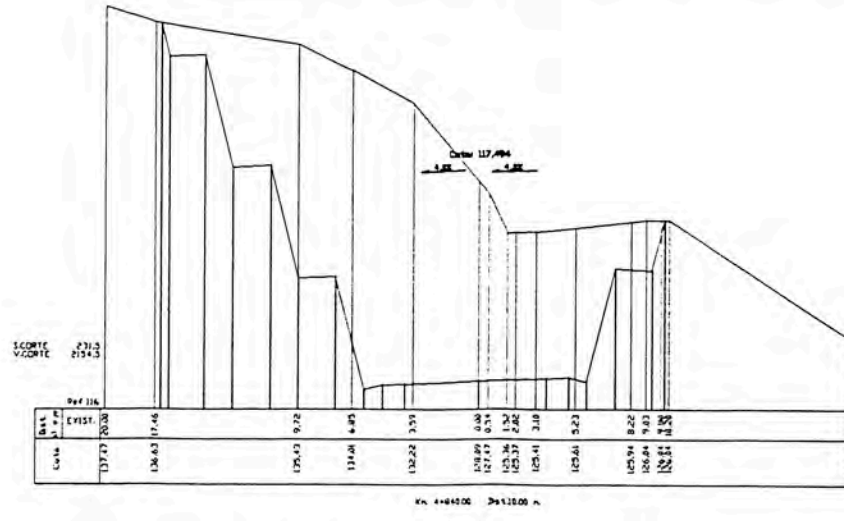
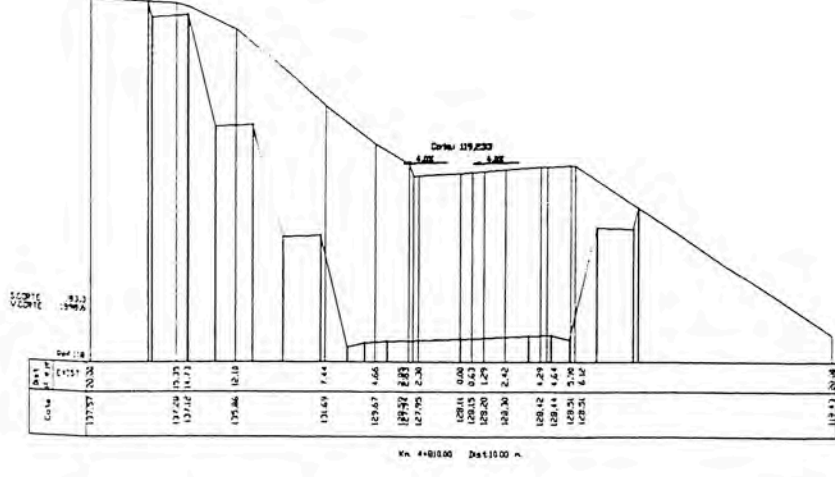
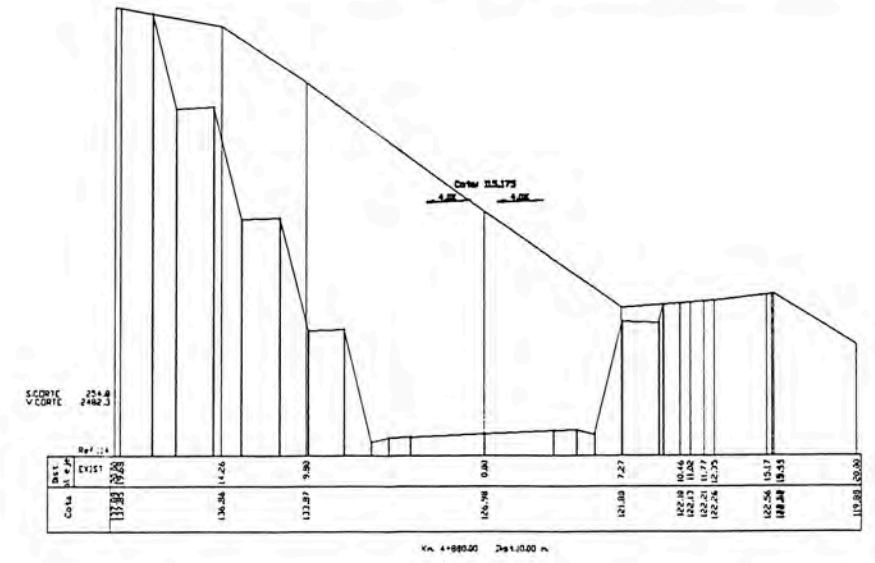
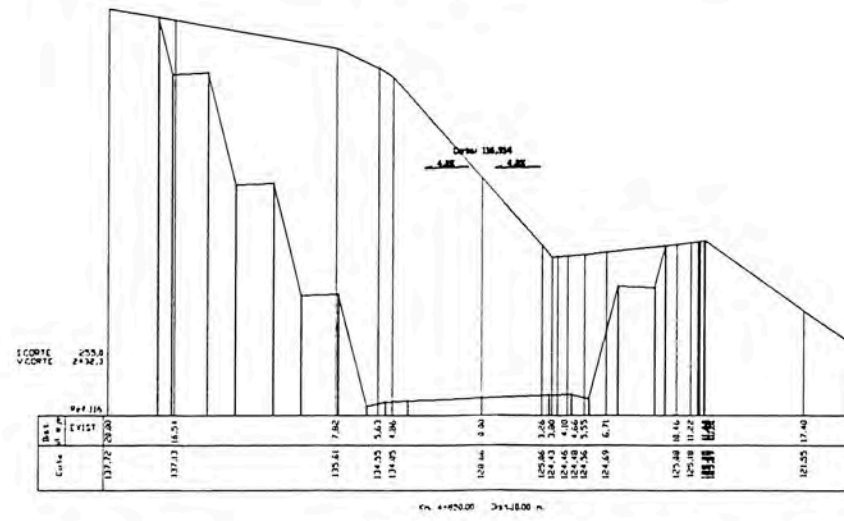
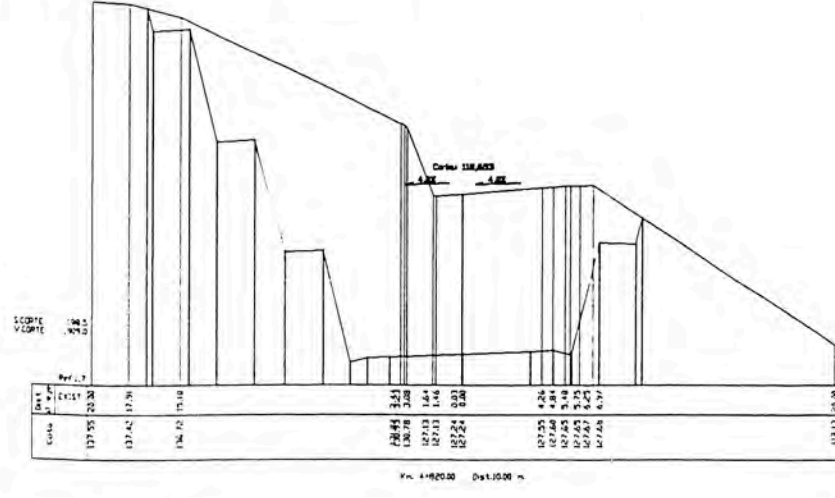
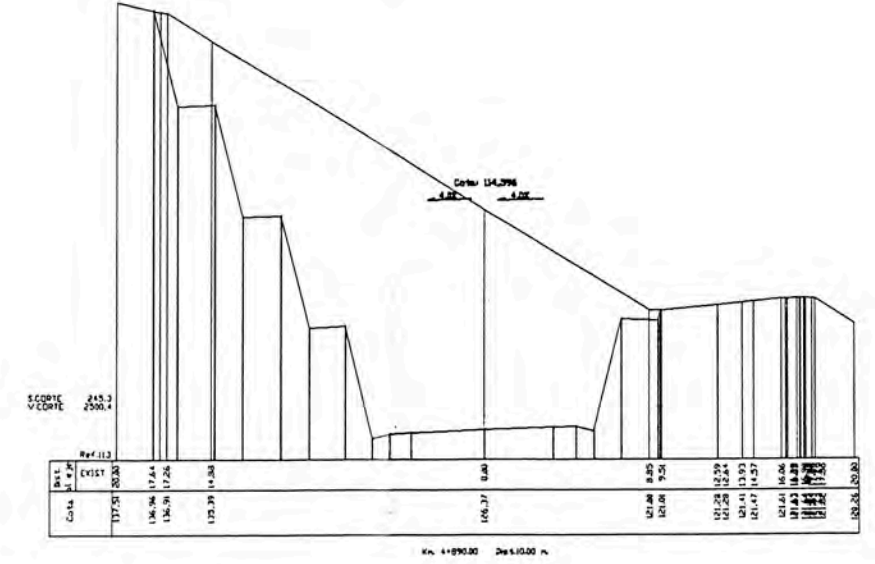
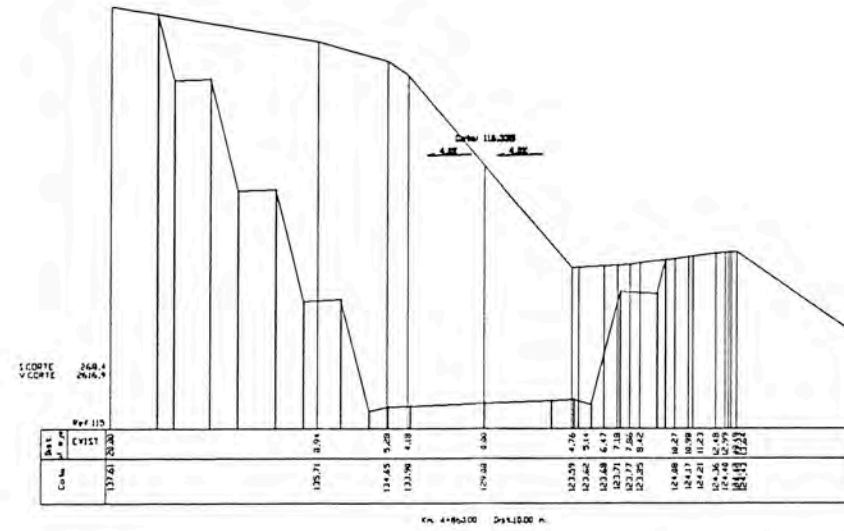
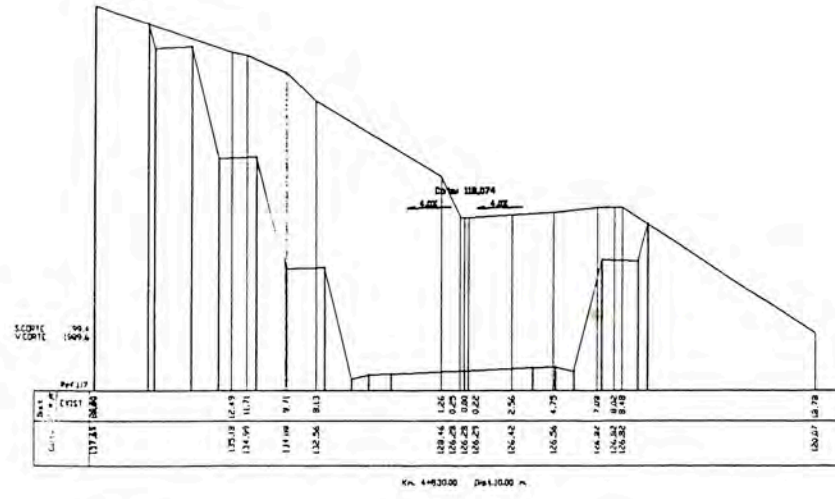




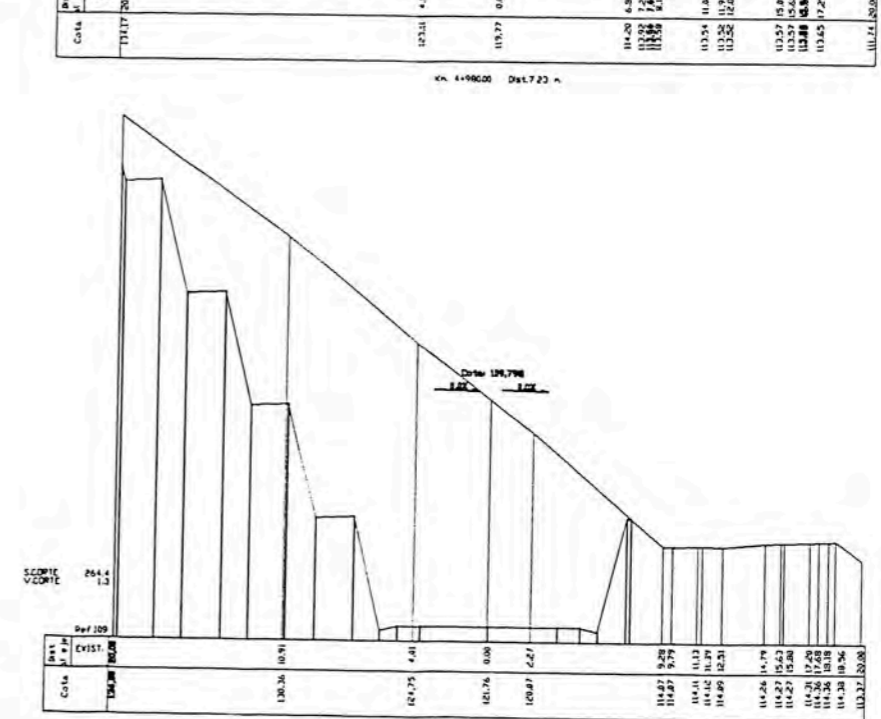
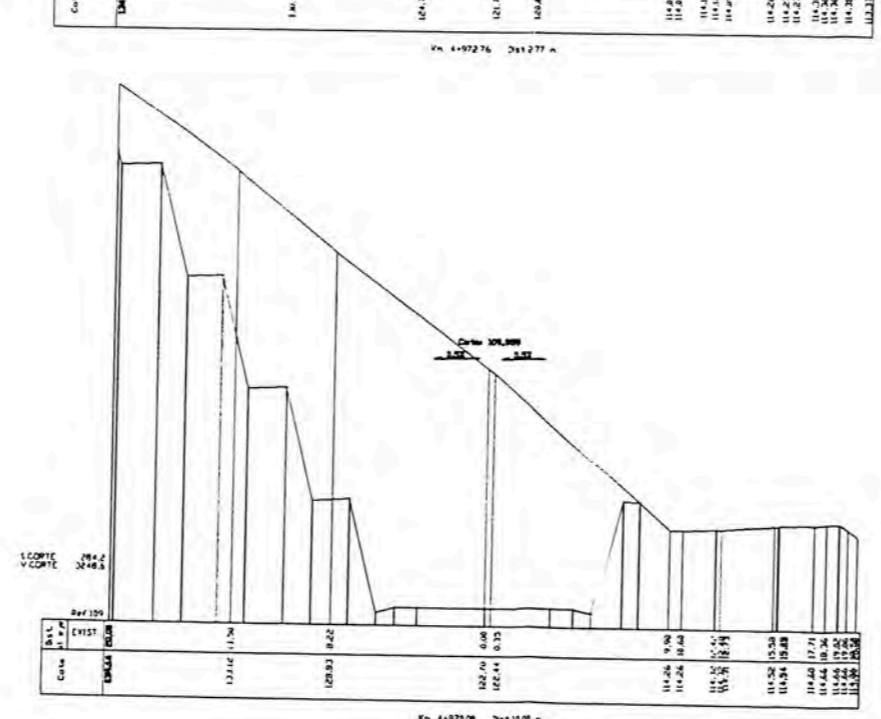
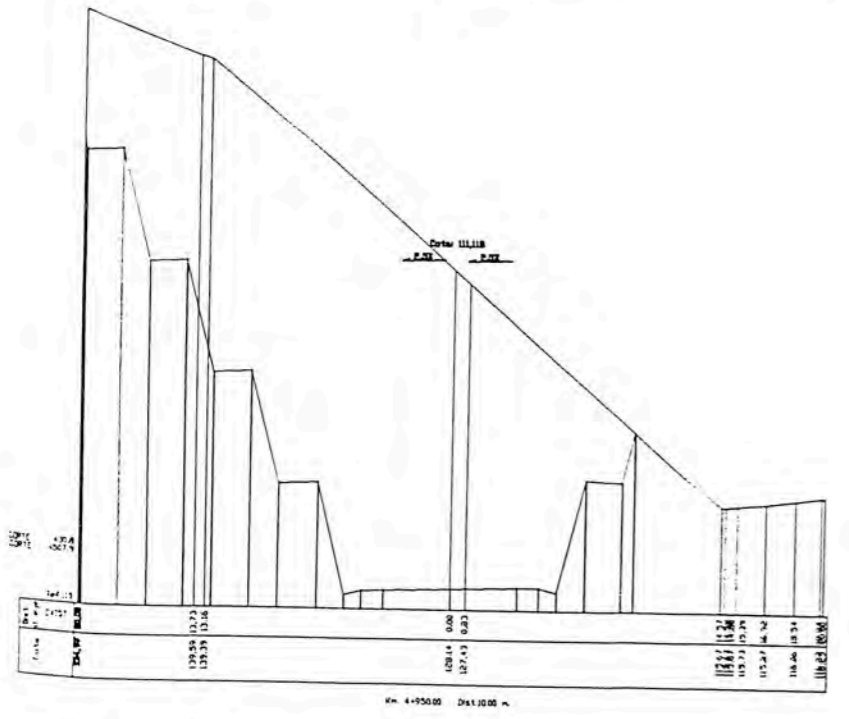
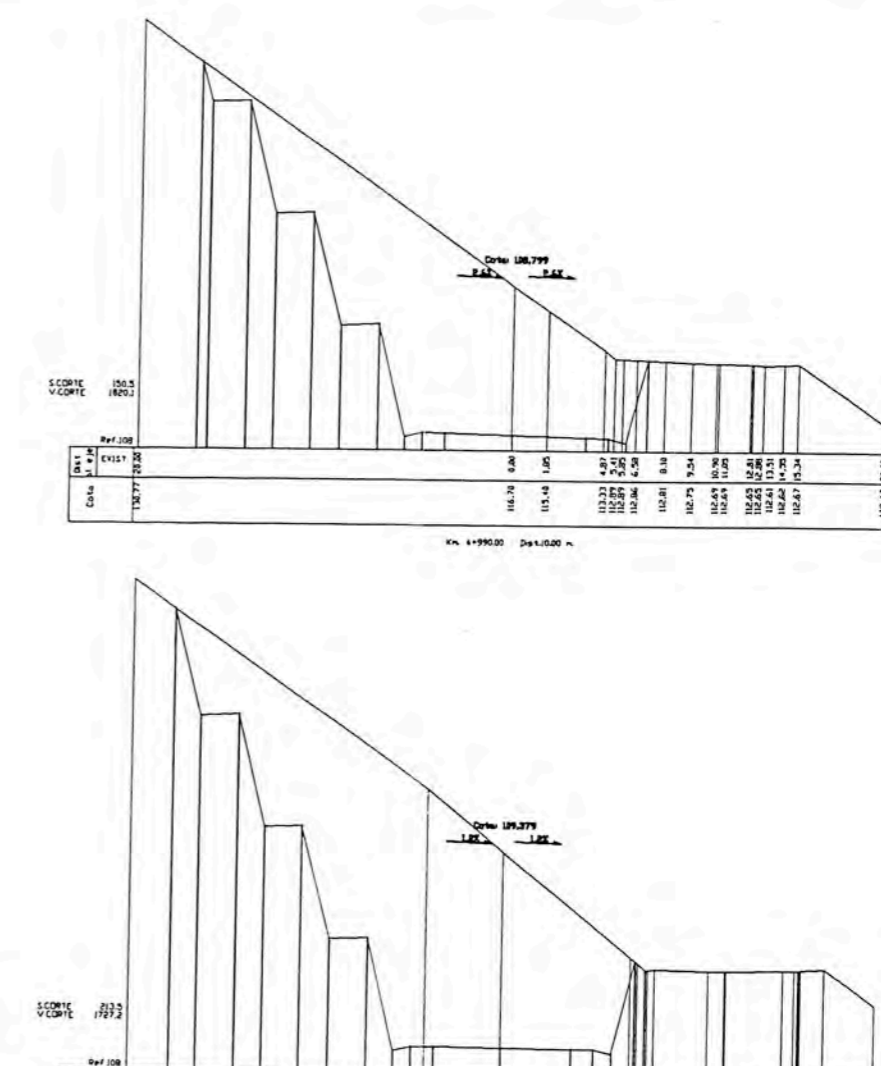
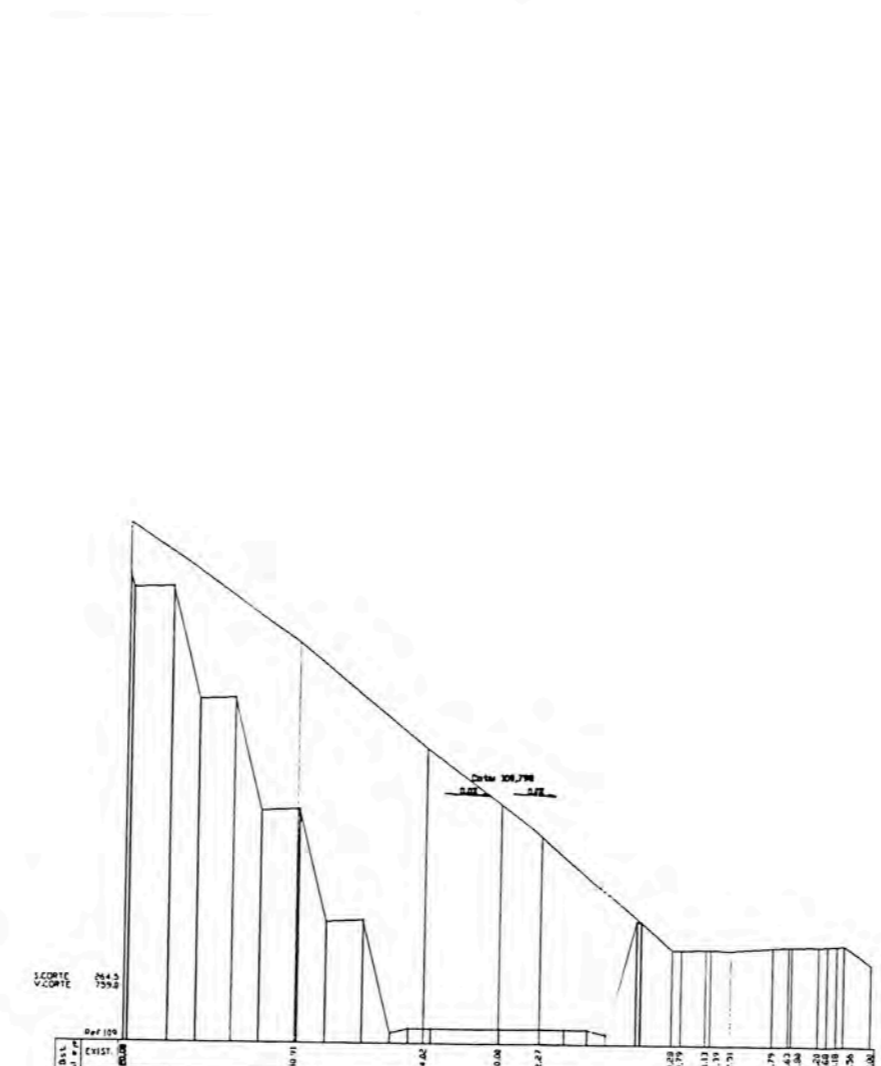
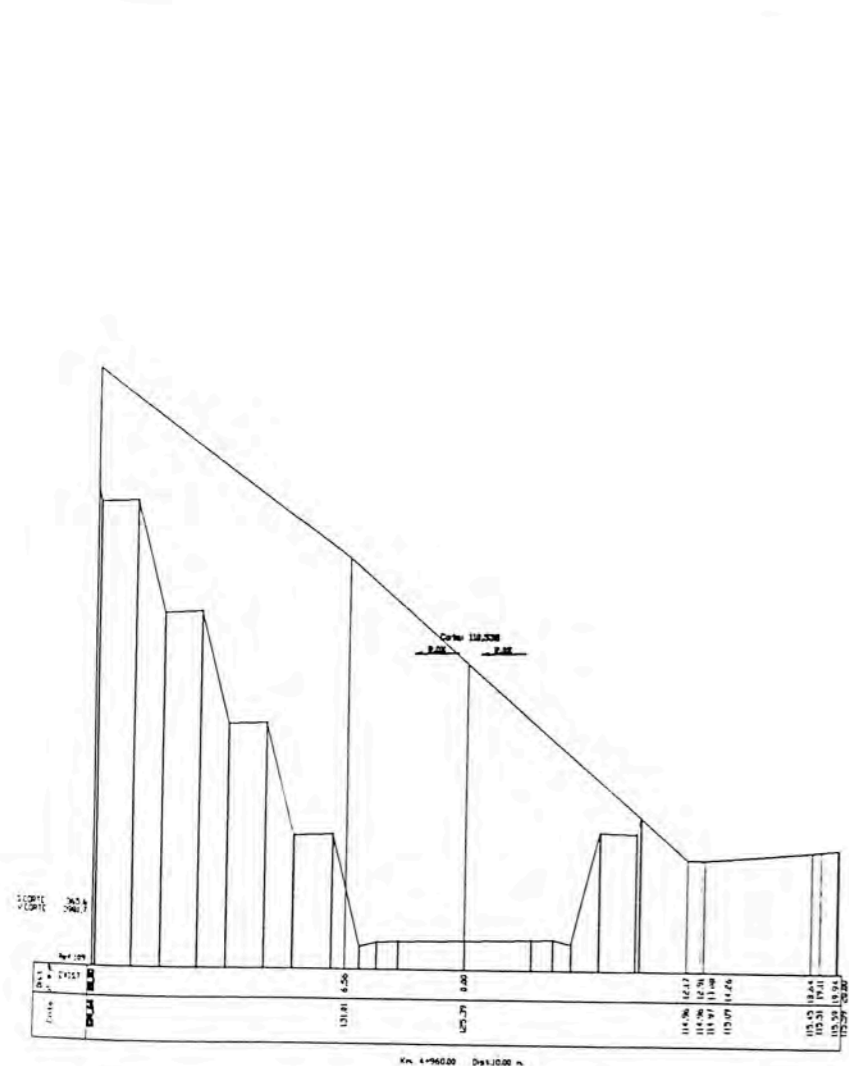




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UNIVERSIDAD NACIONAL DE INGENIERIA
 FACULTAD DE INGENIERIA CIVIL
 DEPARTAMENTO ACADÉMICO DE TOPOGRAFIA Y VIAS DE TRANSPORTE

Diseñó: Rom. A. Lopez U
 Dibujó: ALJU
 Verificó: Ing. G. Berríos B
 Presentó: Rom. A. Lopez U

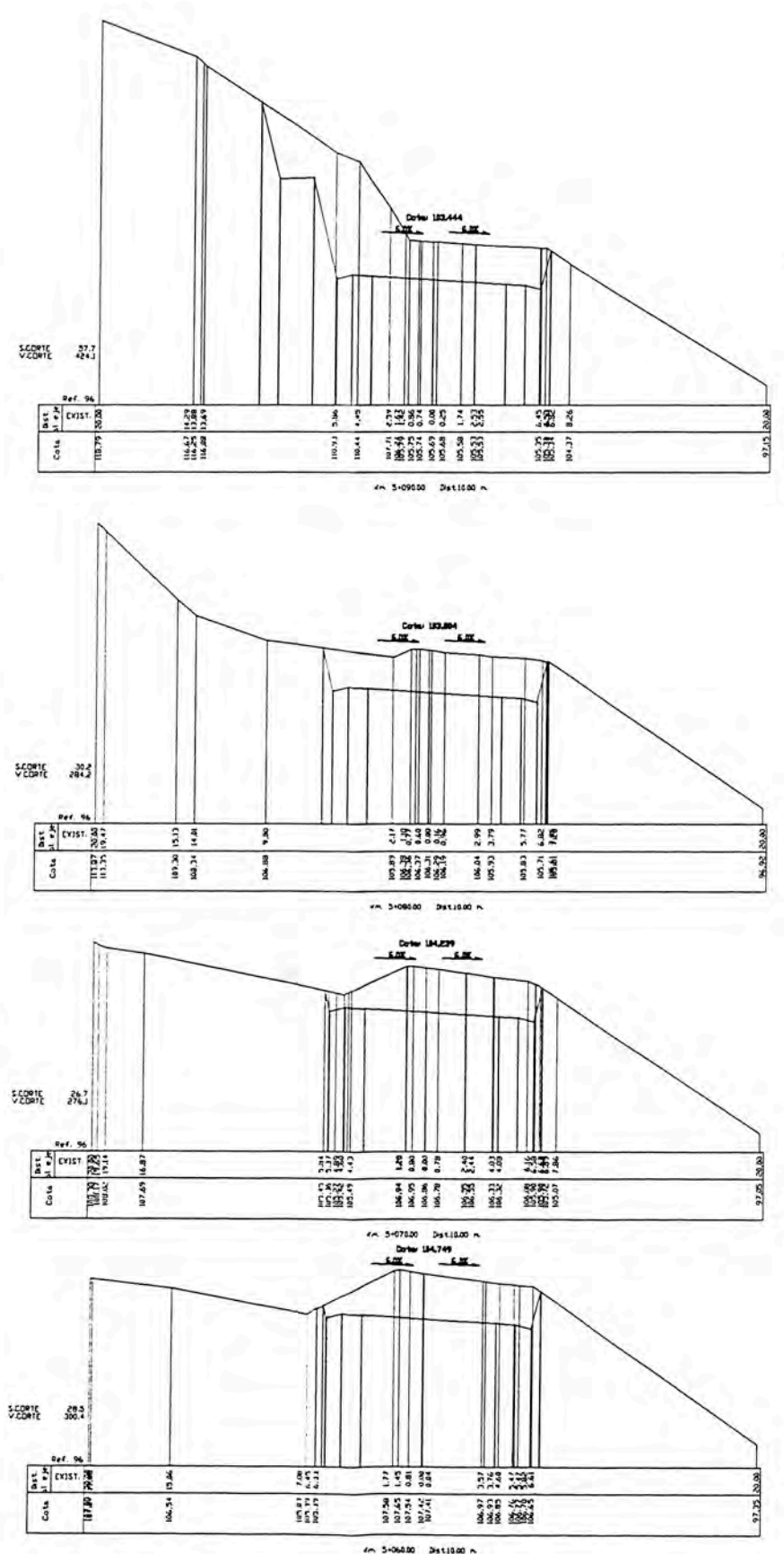
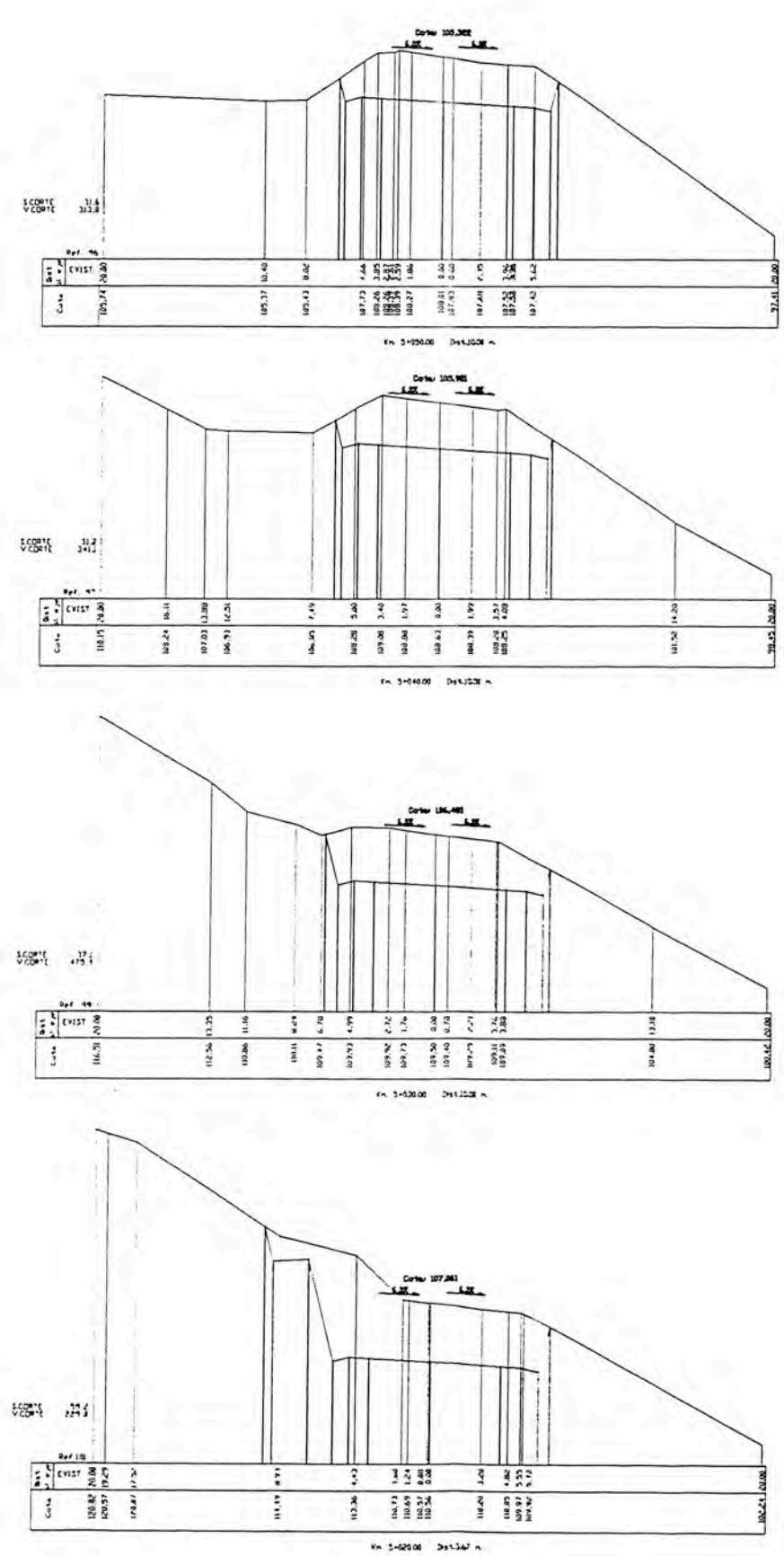
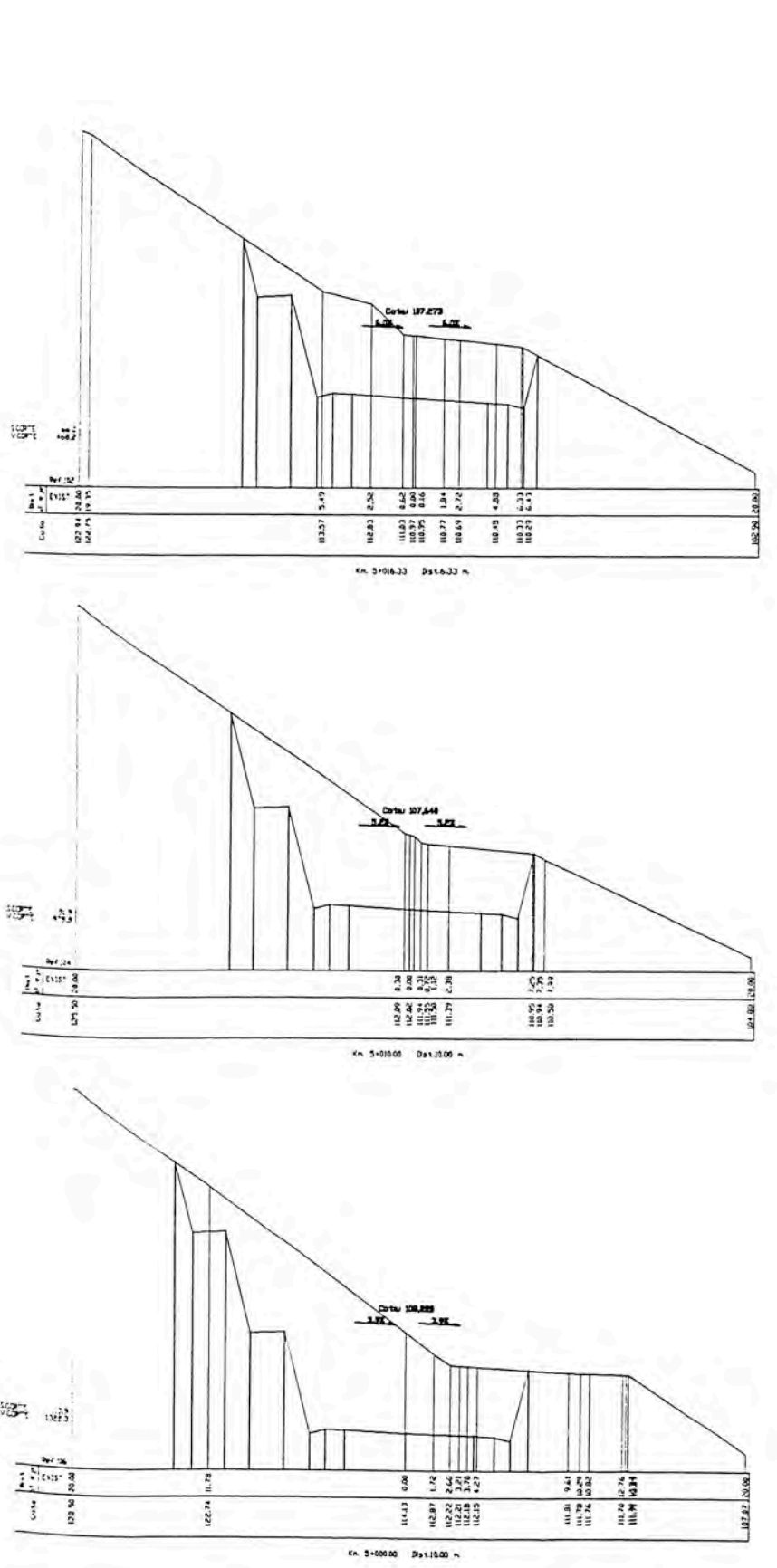
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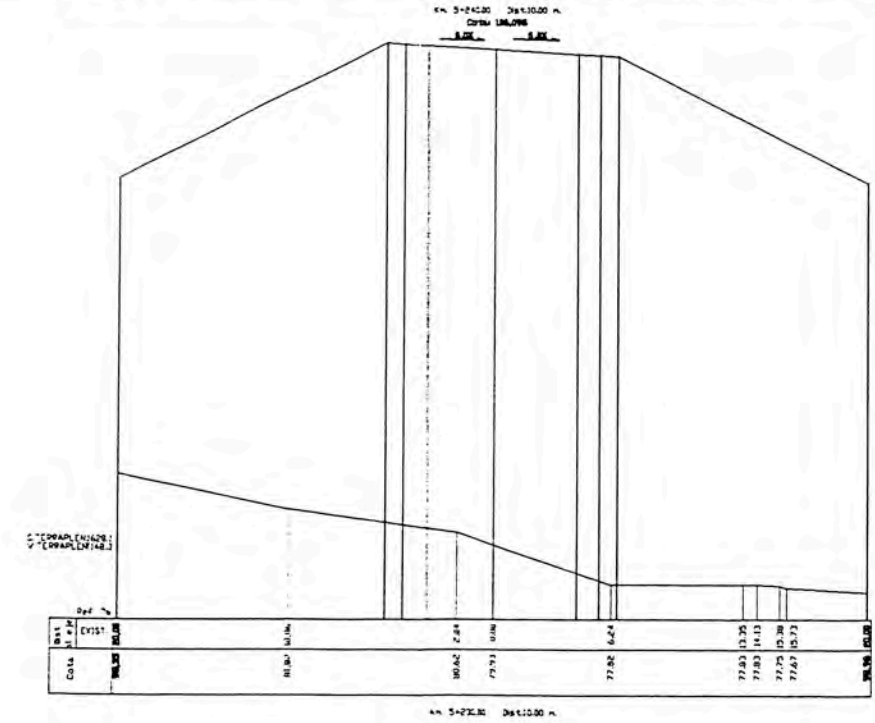
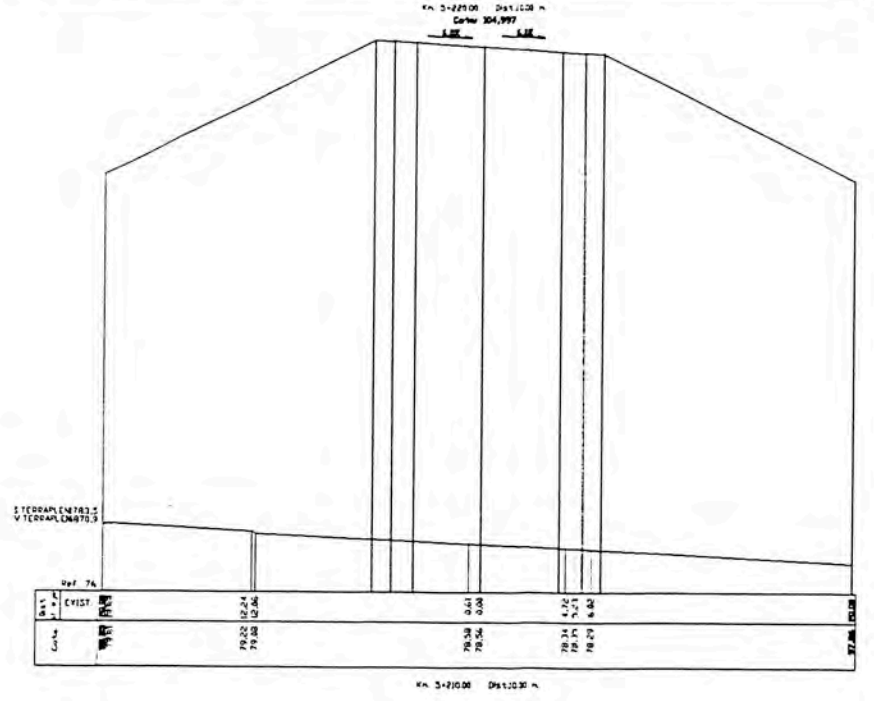
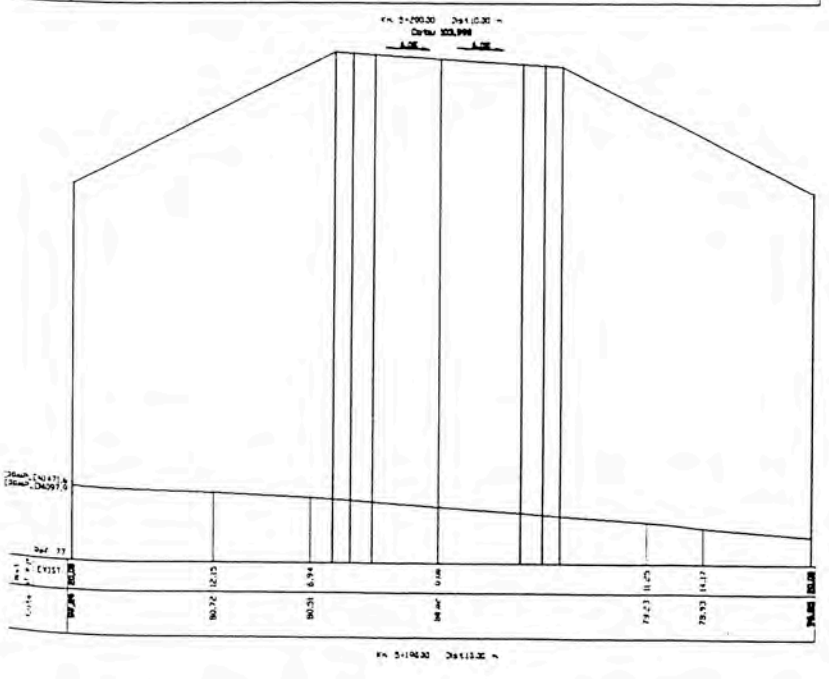
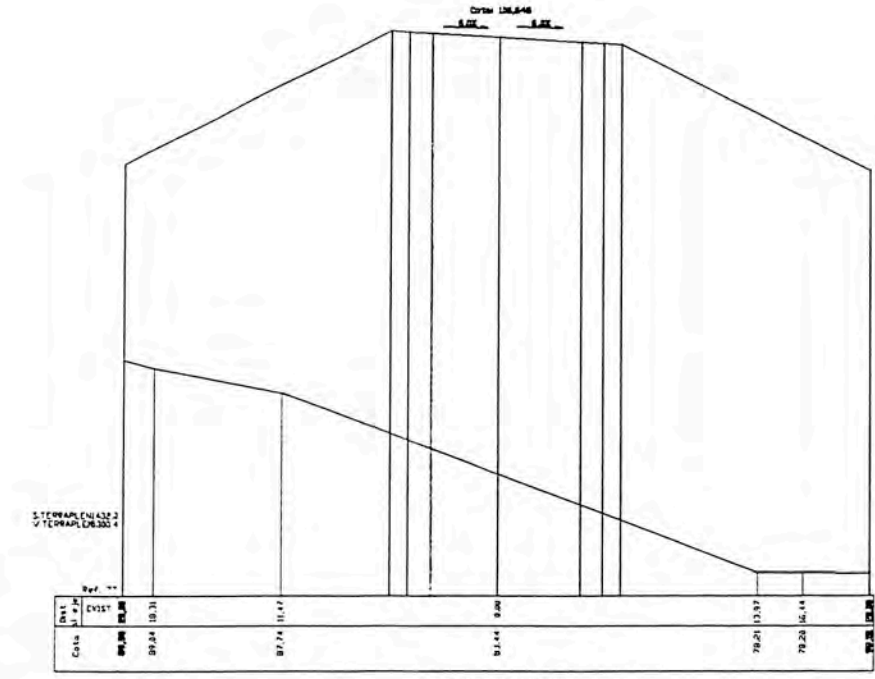
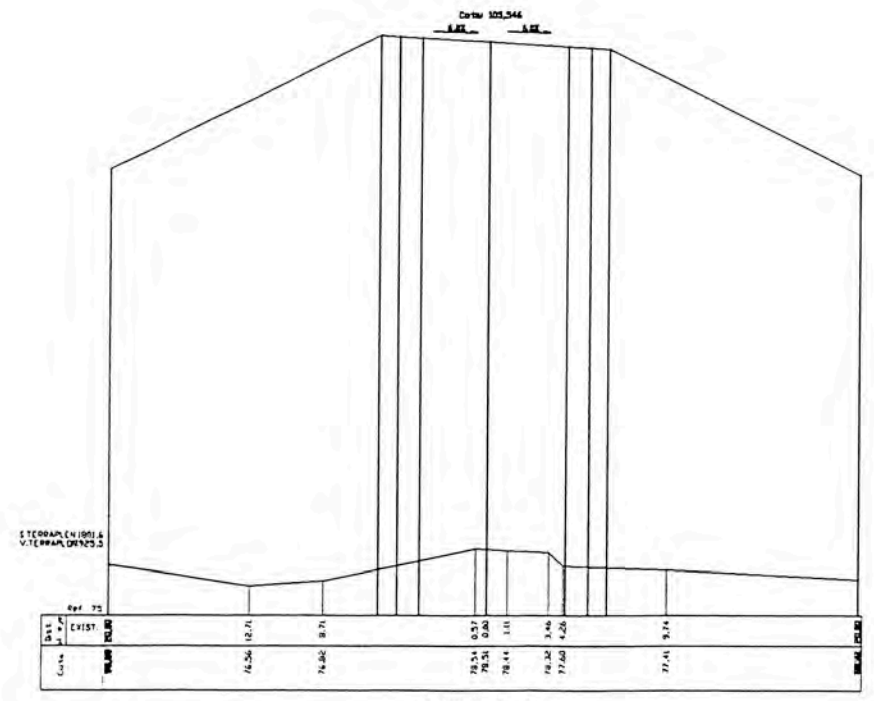
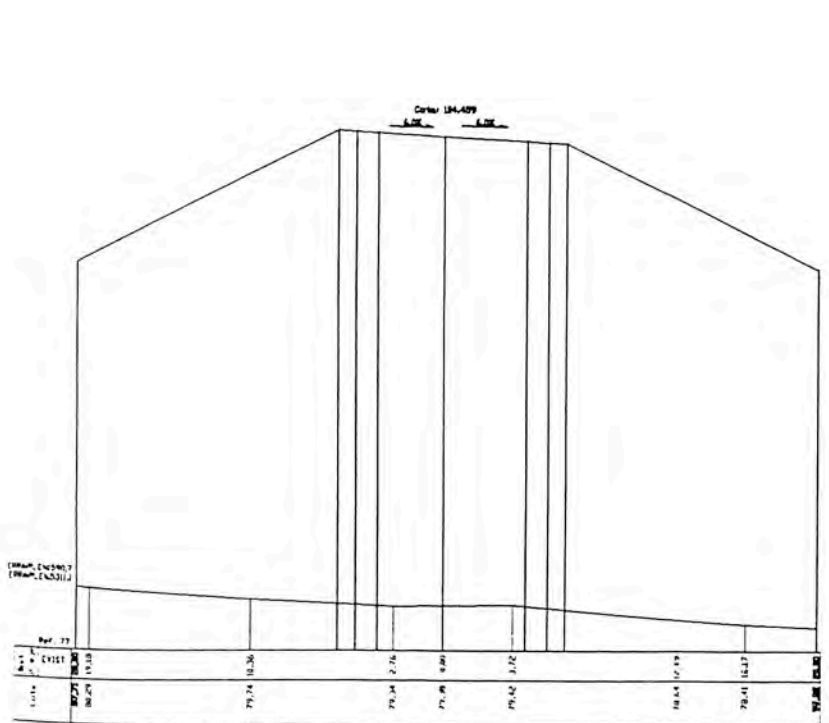
ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

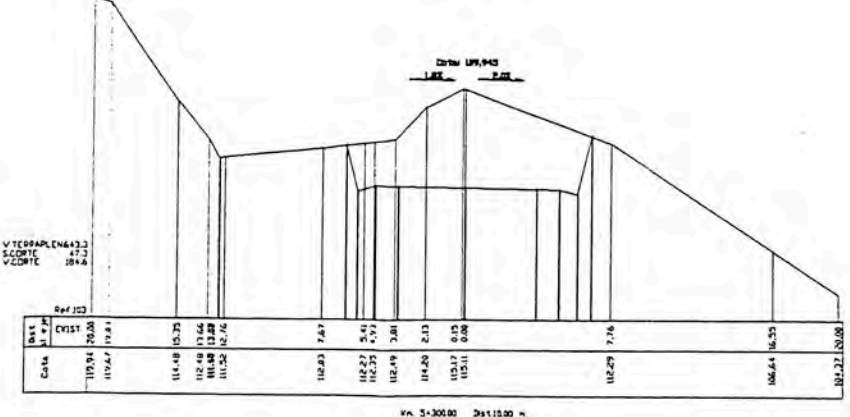
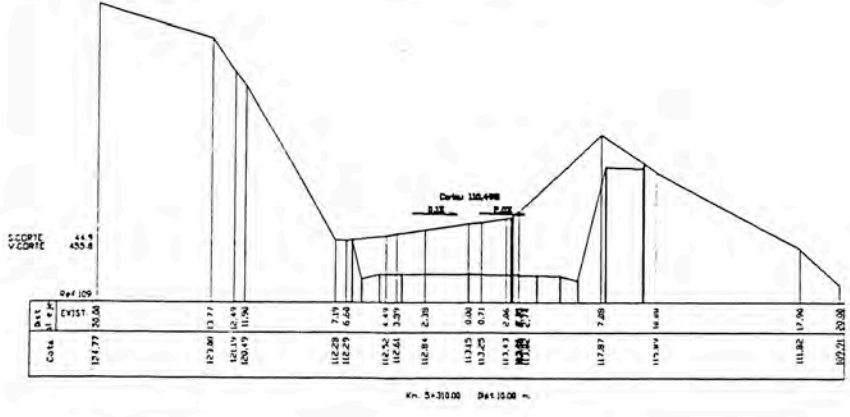
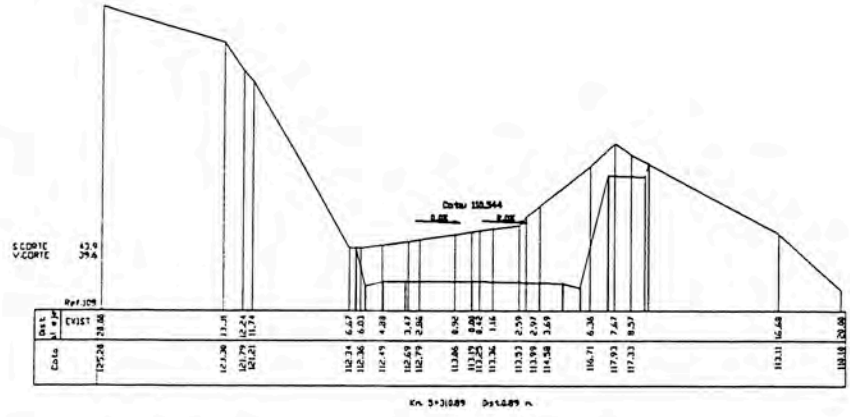
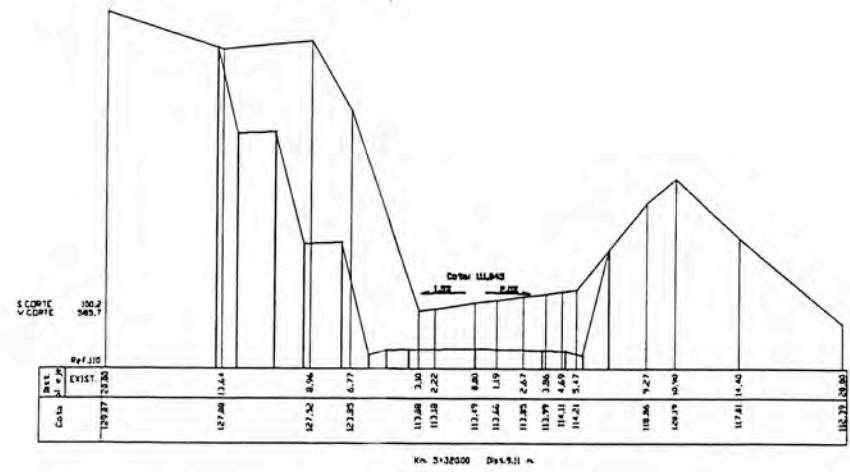
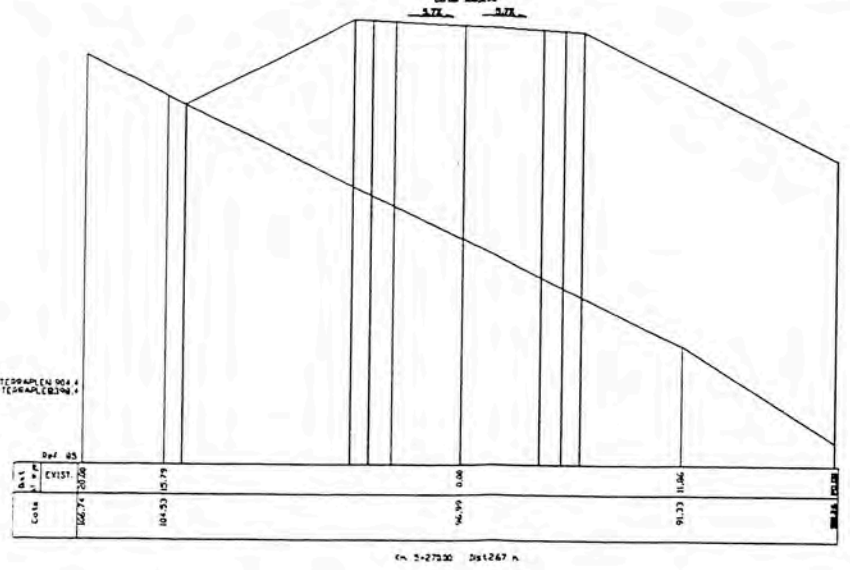
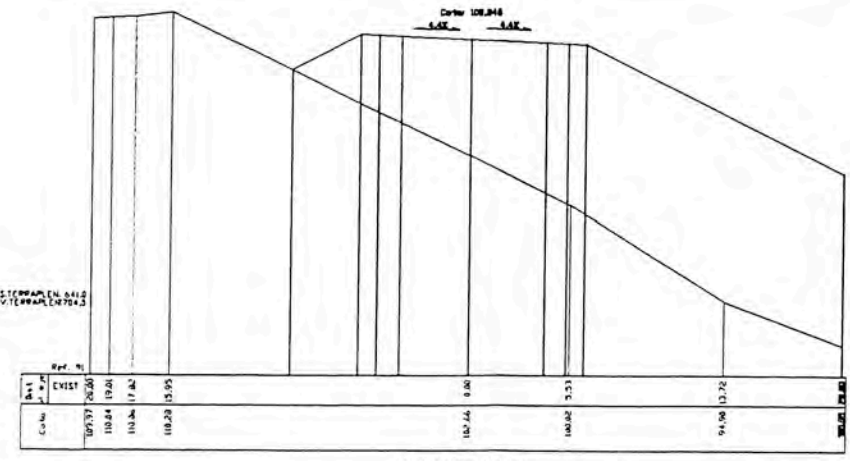
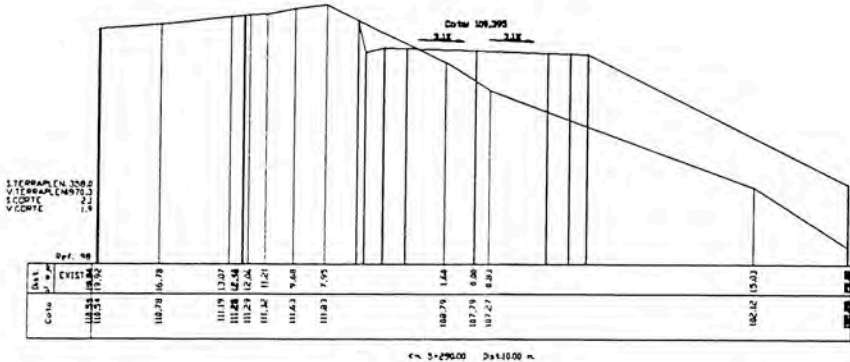
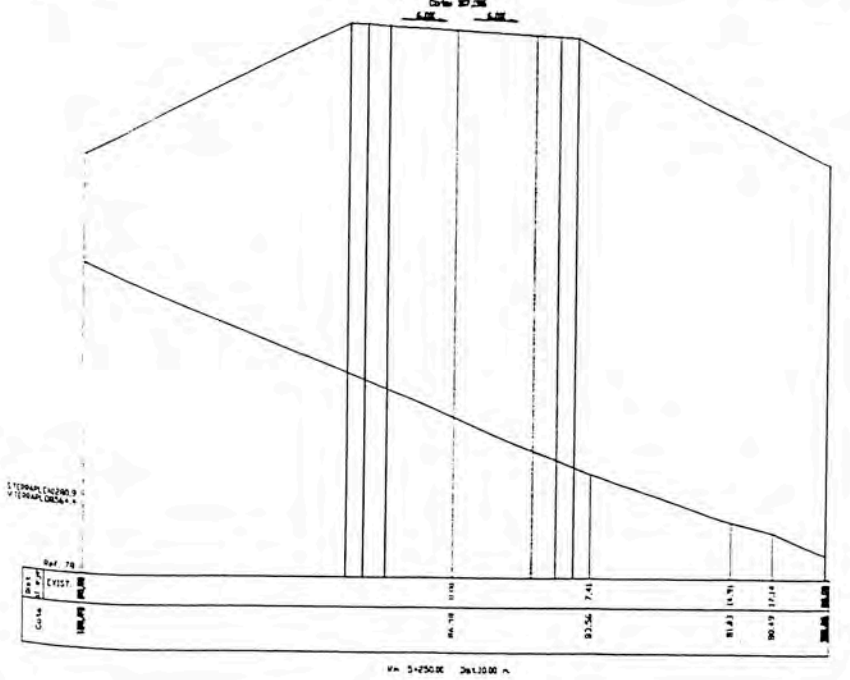
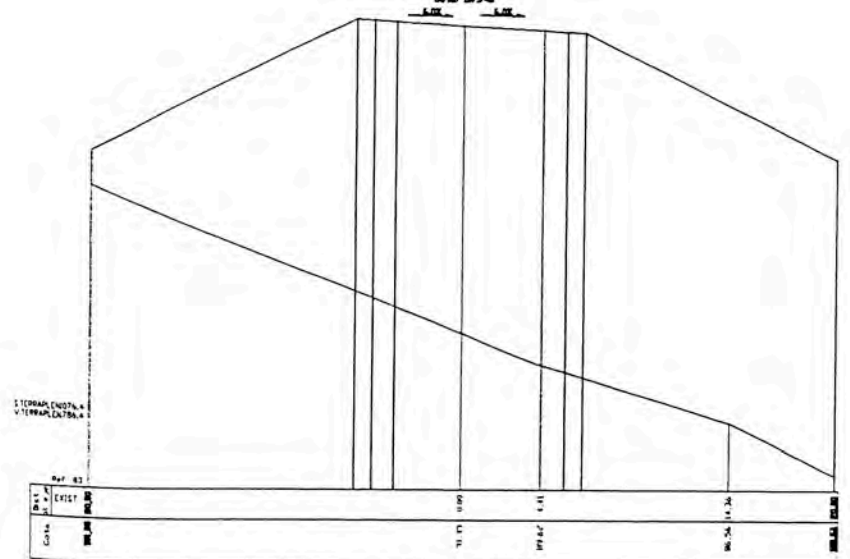
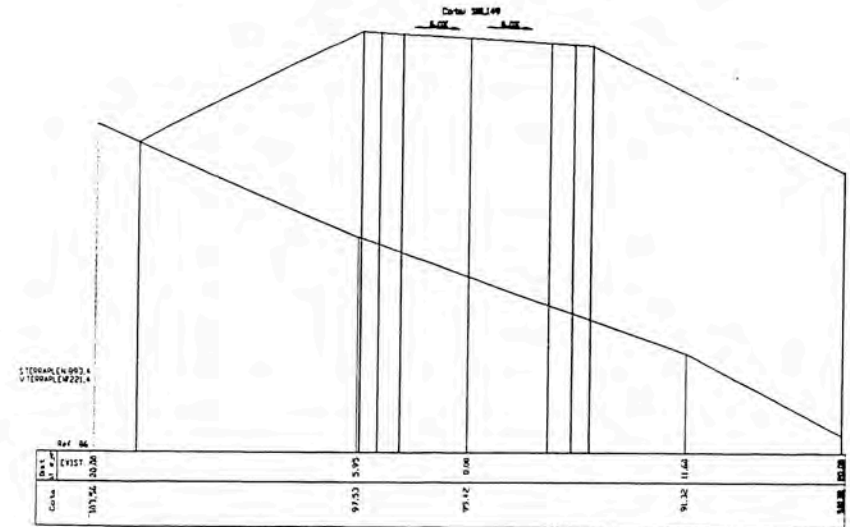
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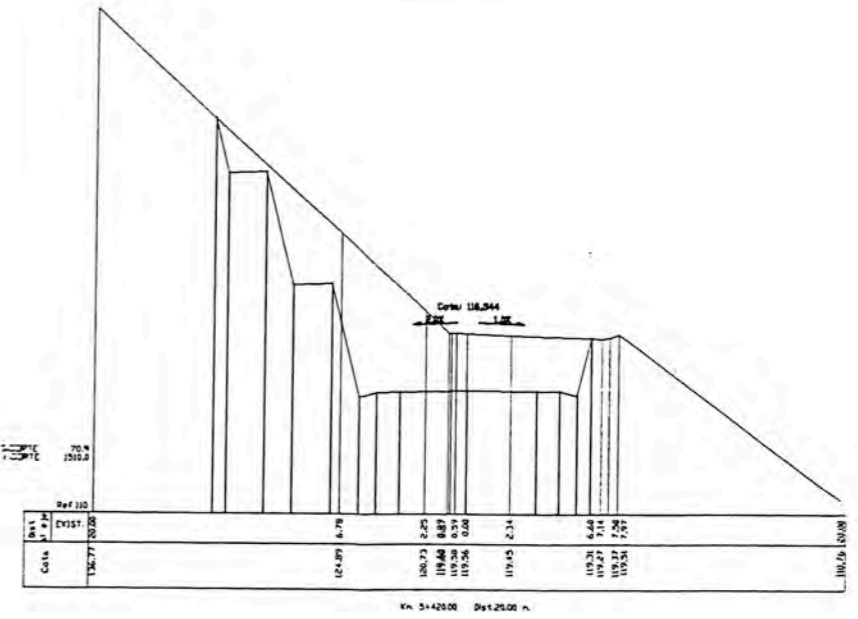
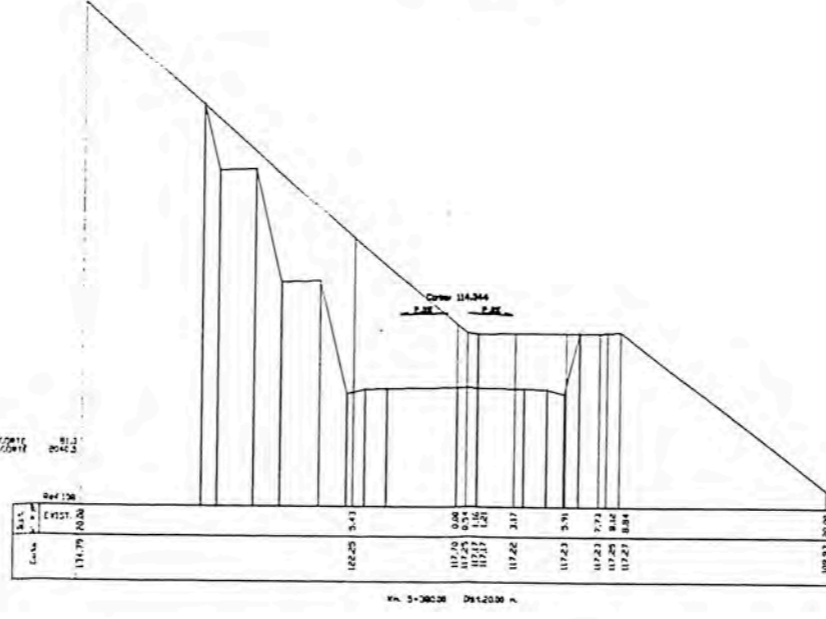
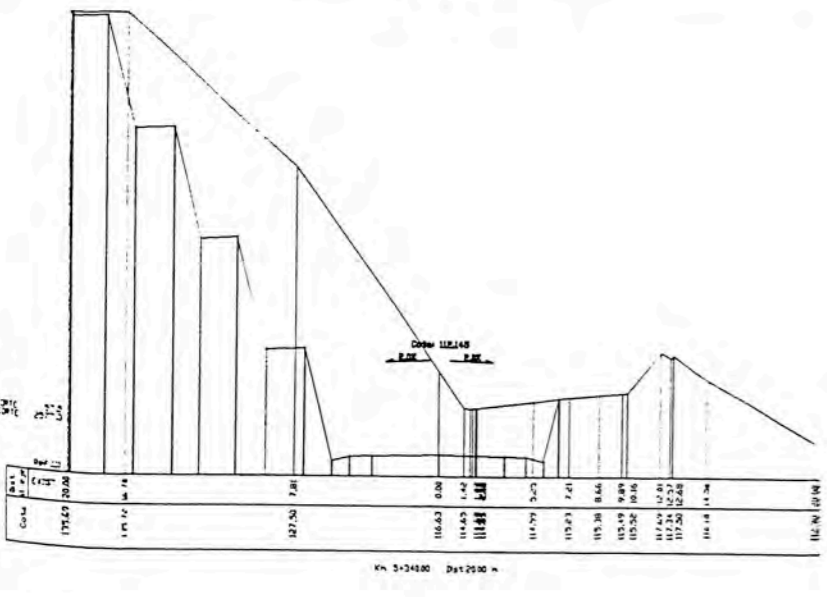
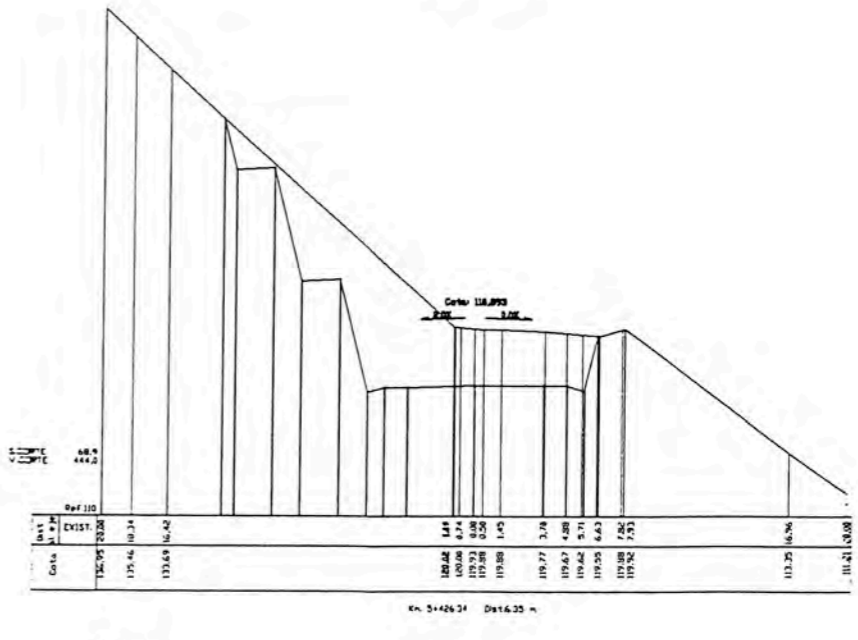
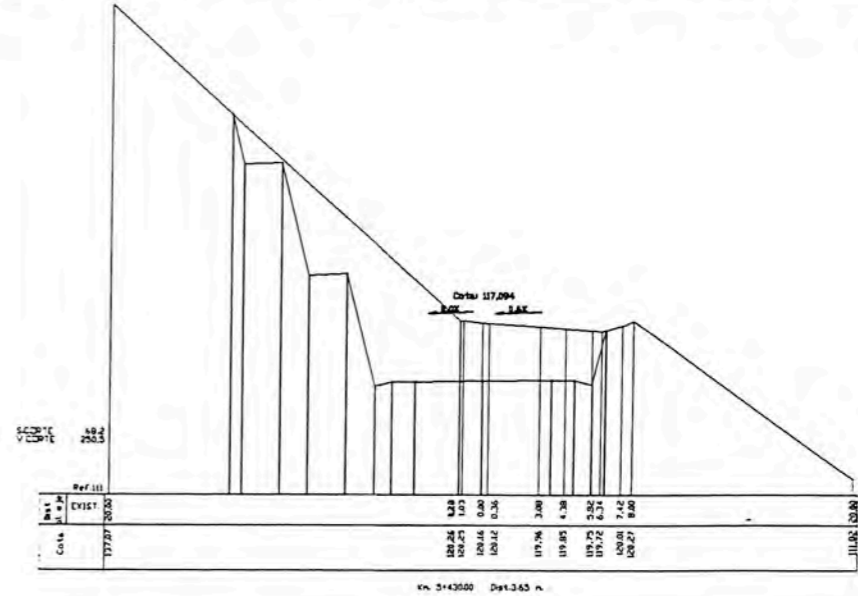
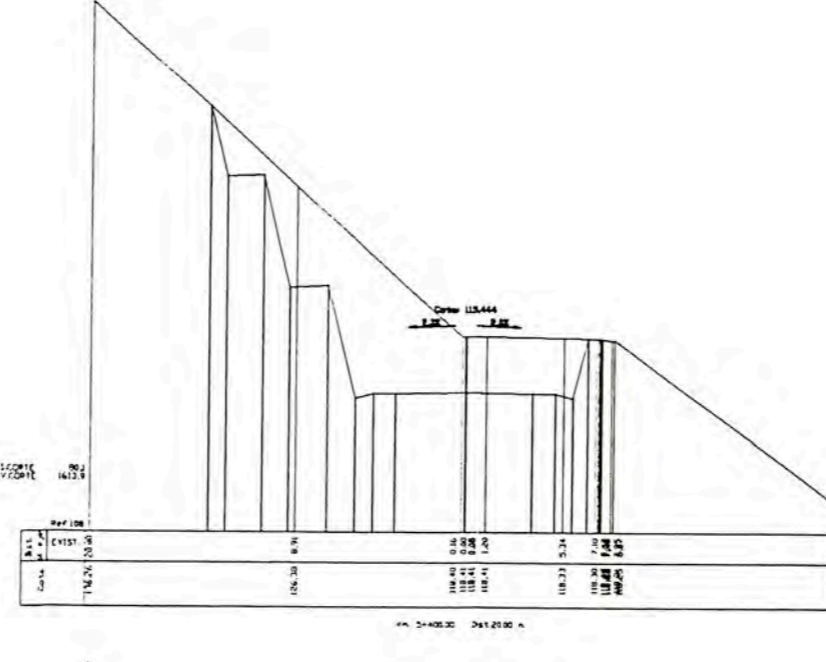
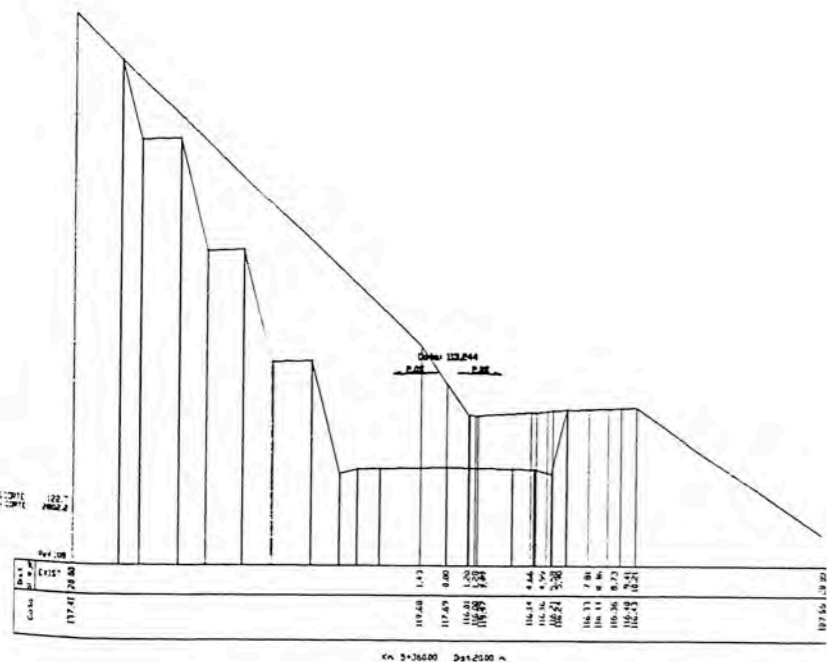


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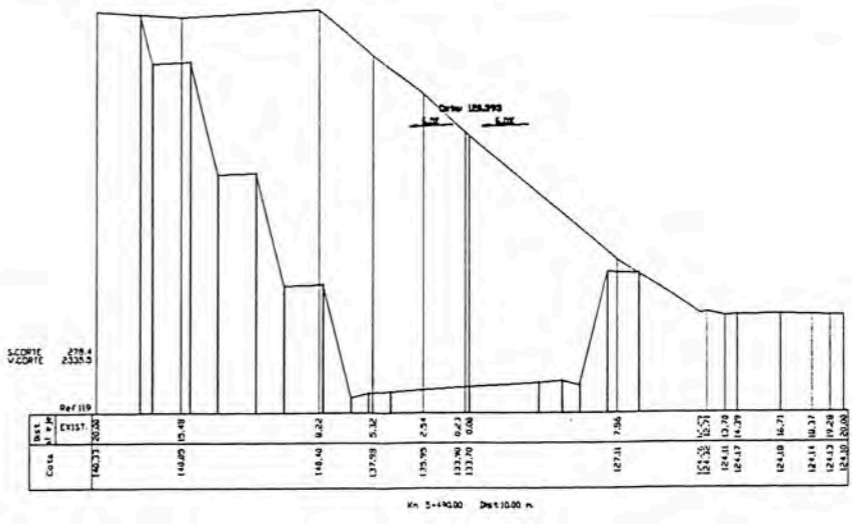
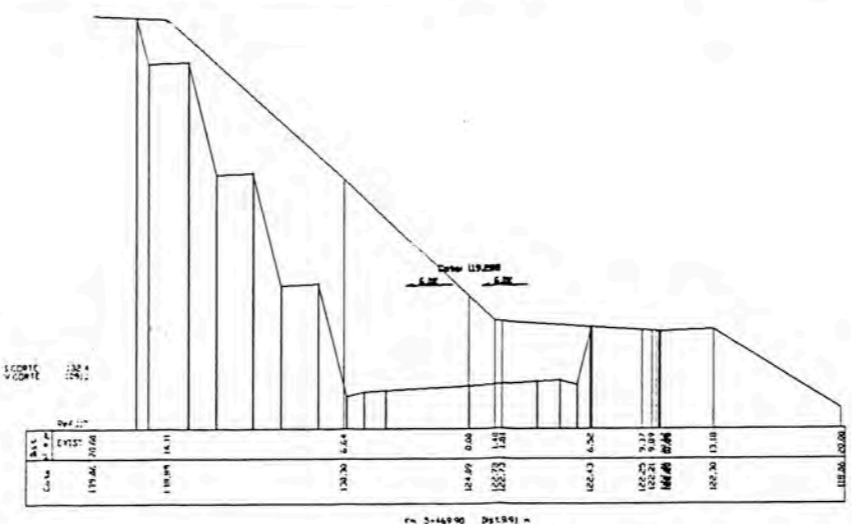
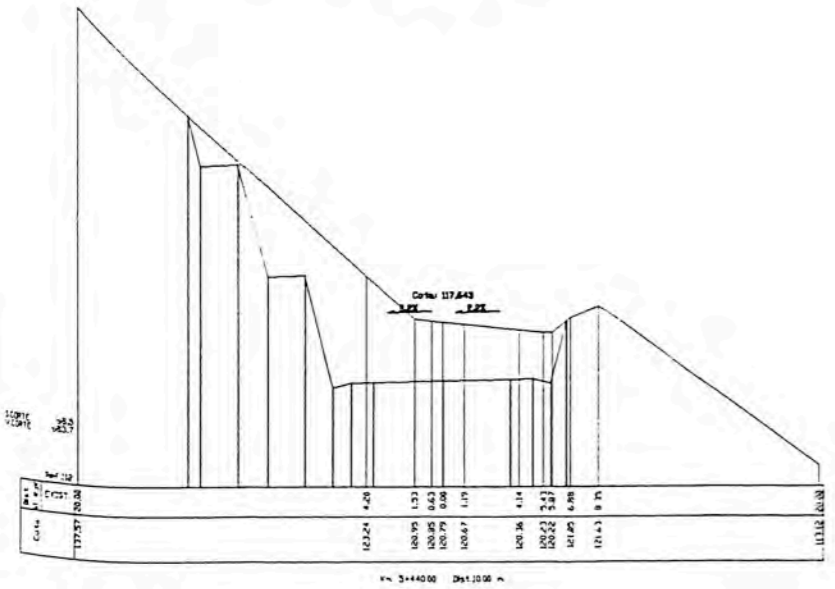
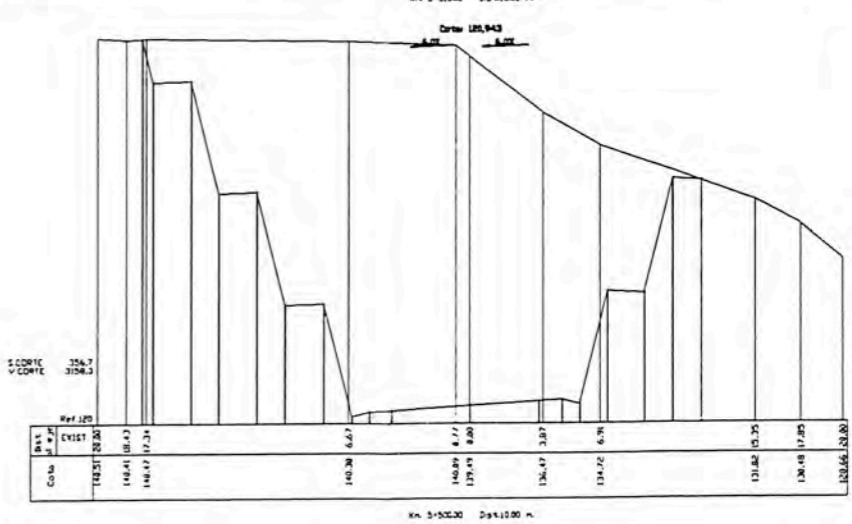
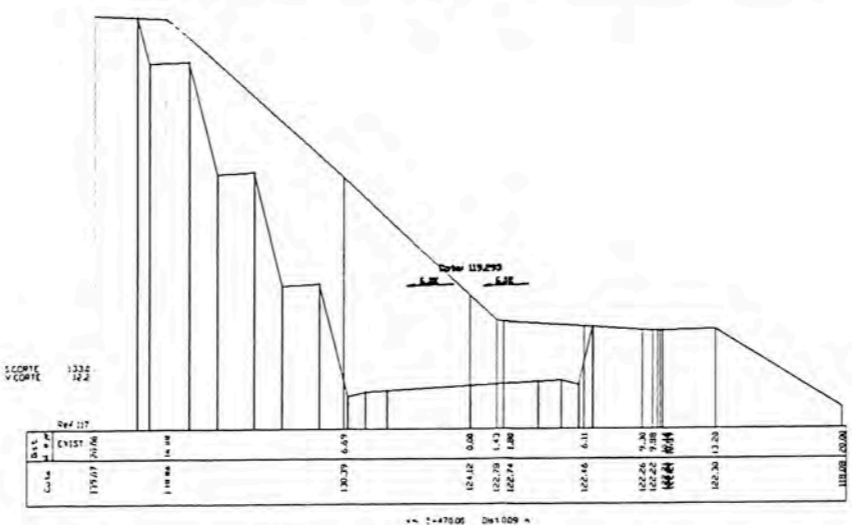
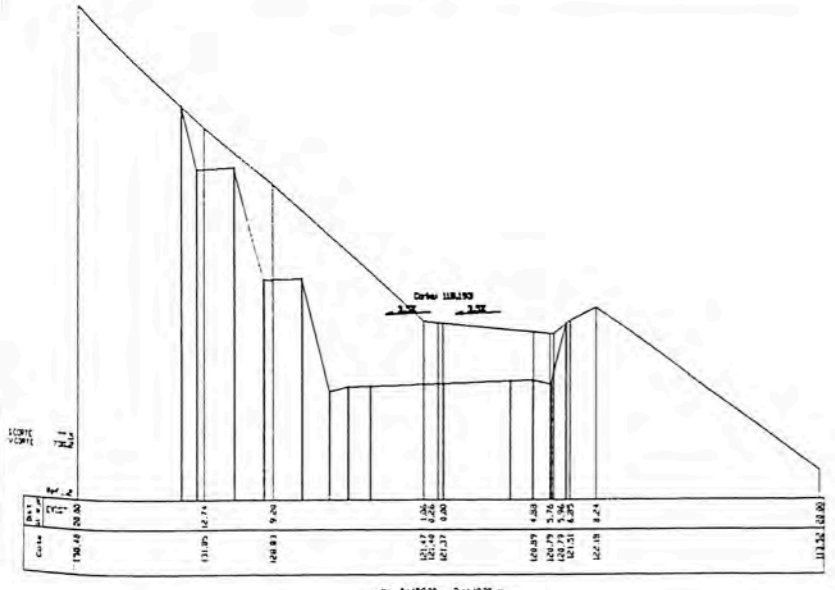
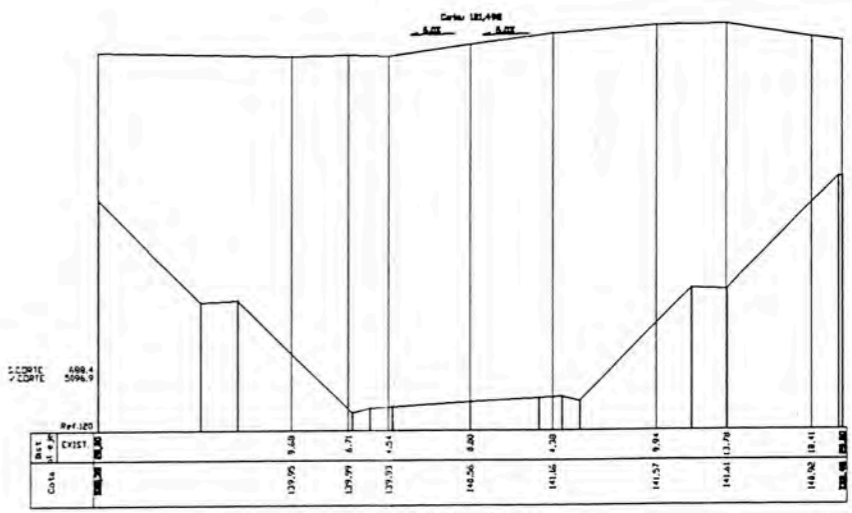
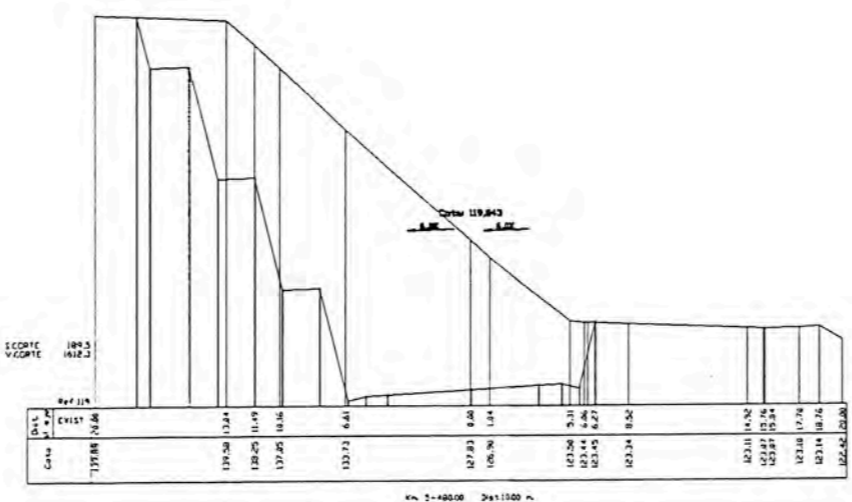
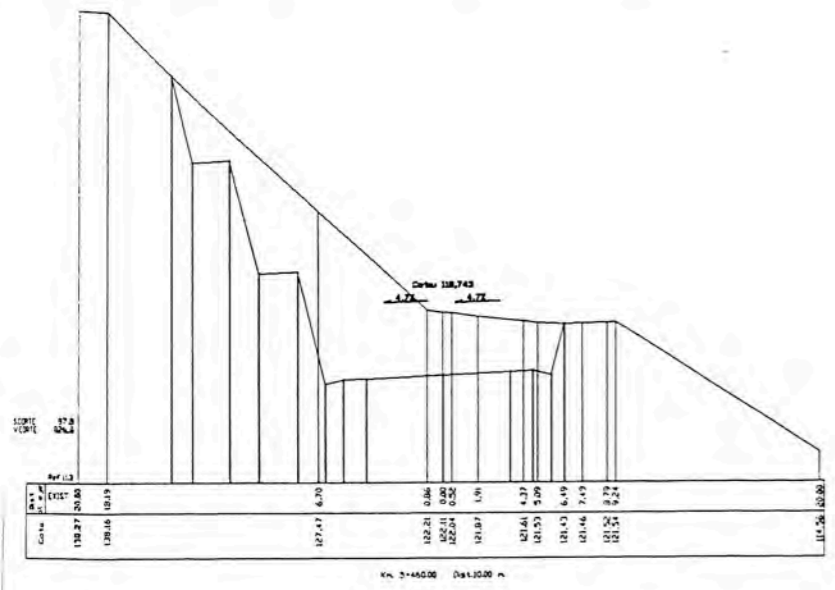




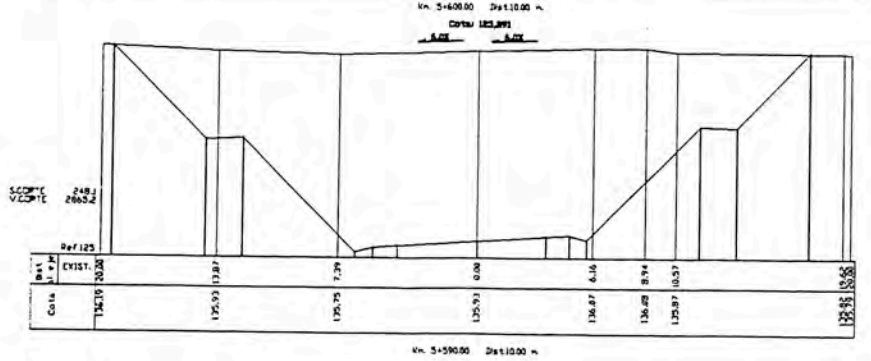
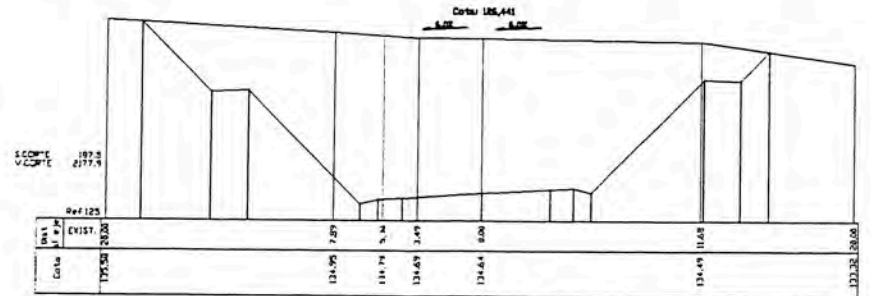
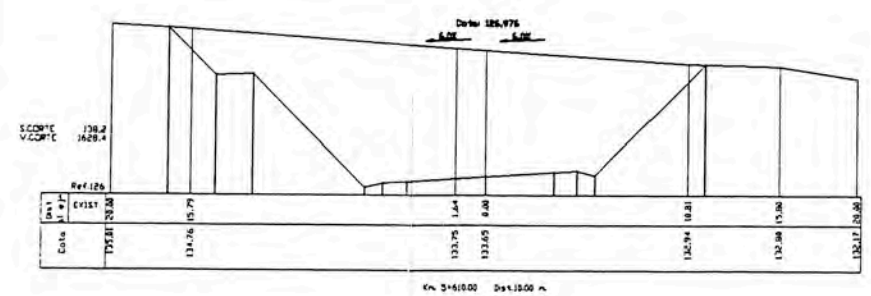
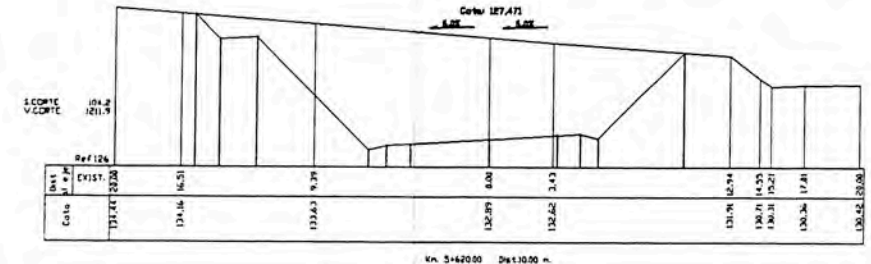
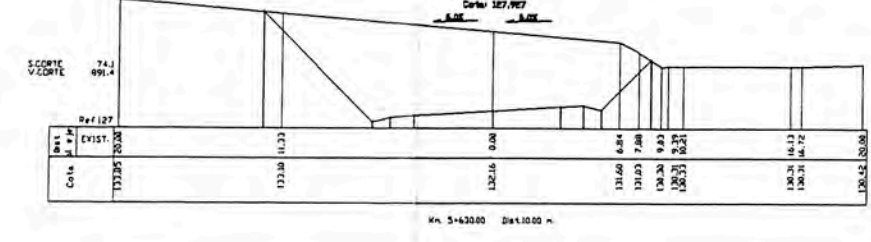
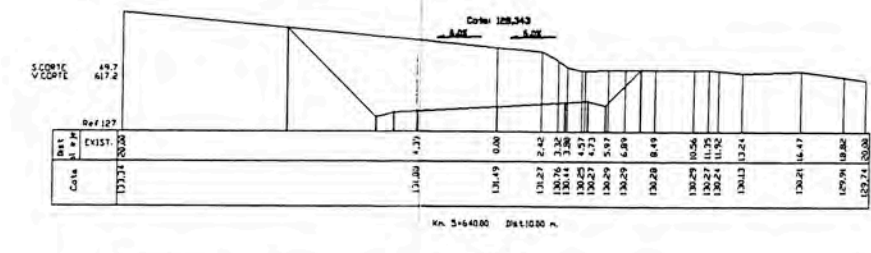
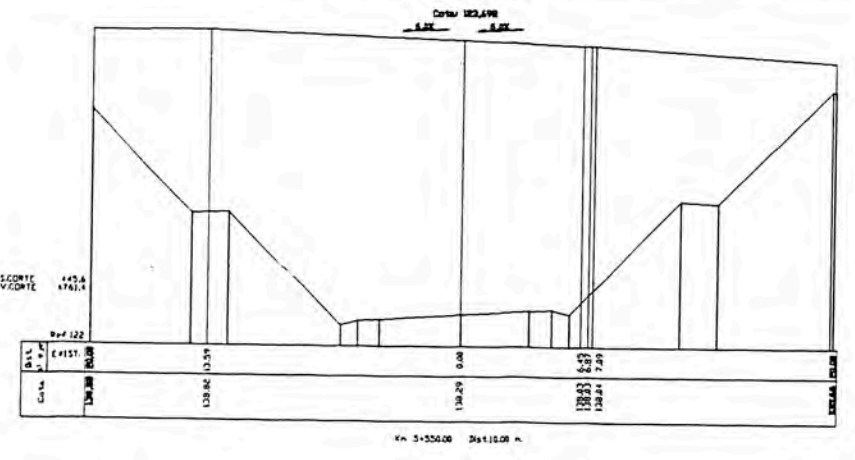
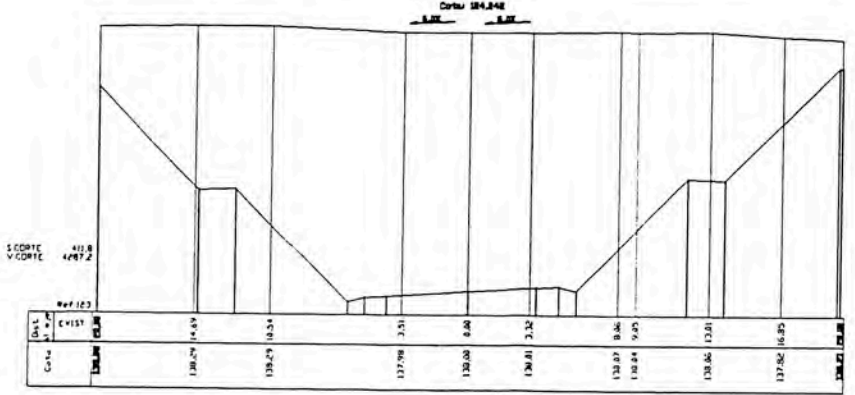
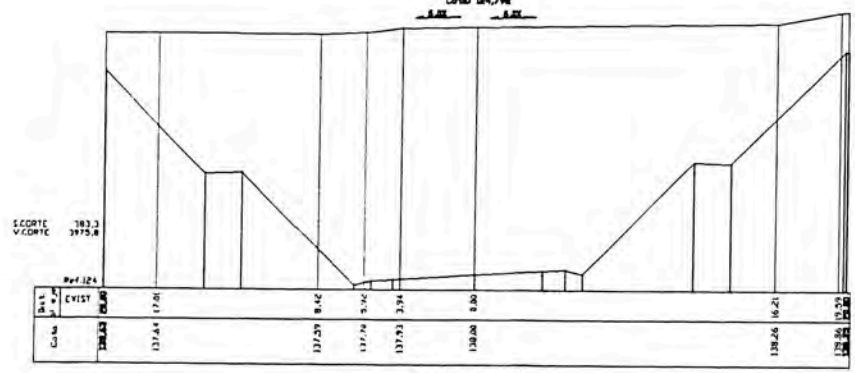
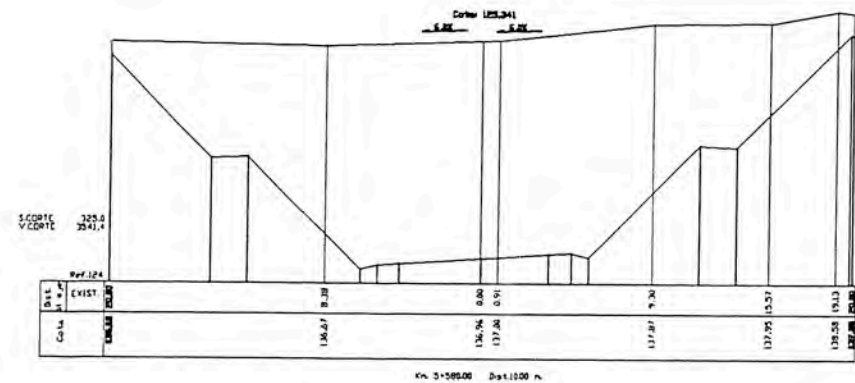
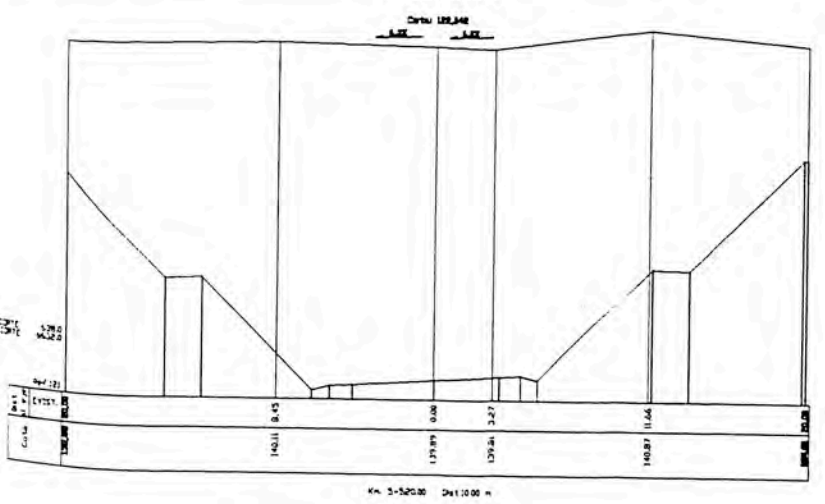
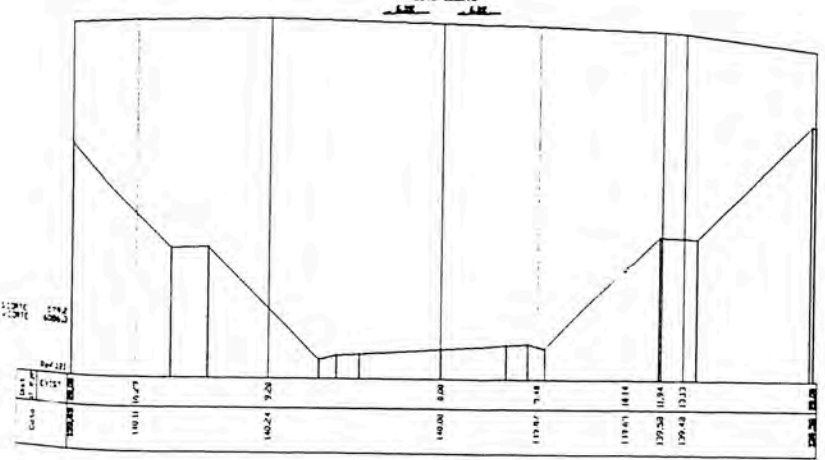
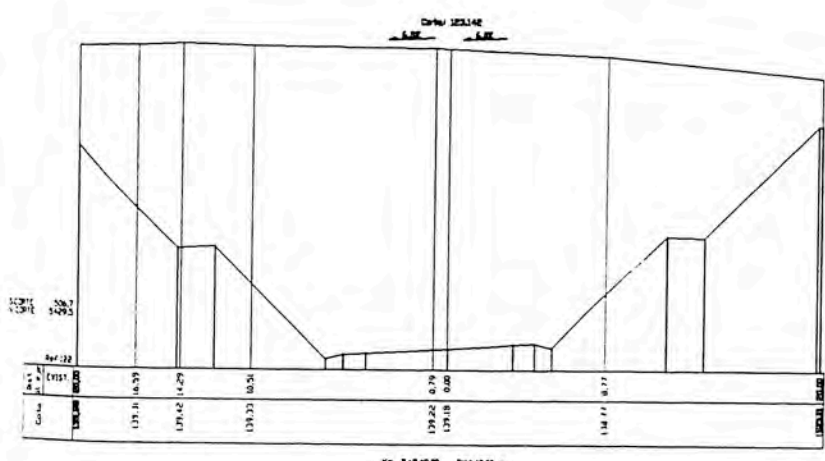
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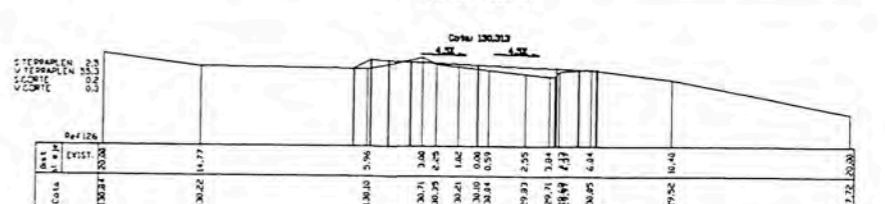
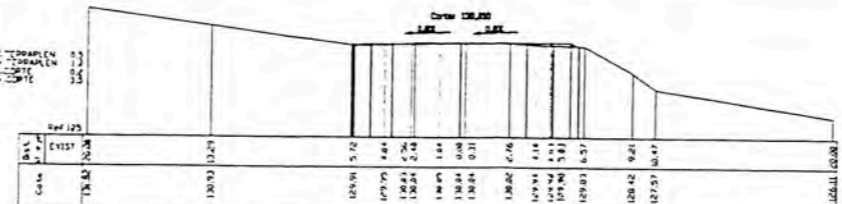
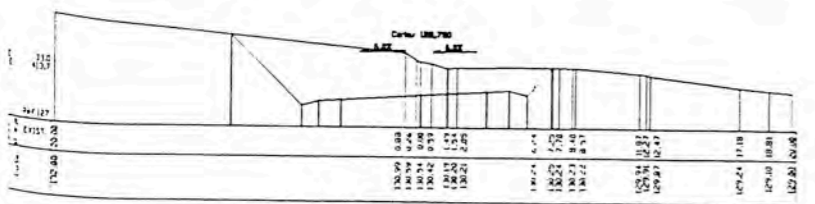
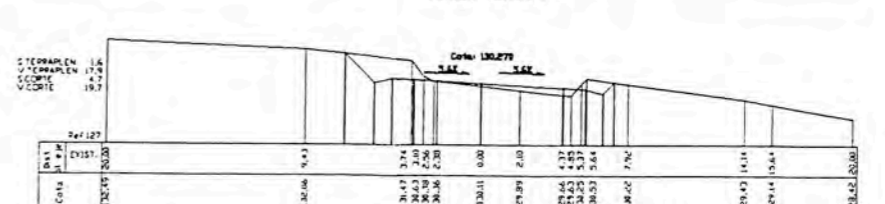
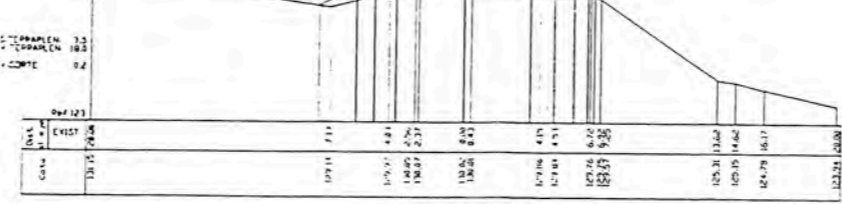
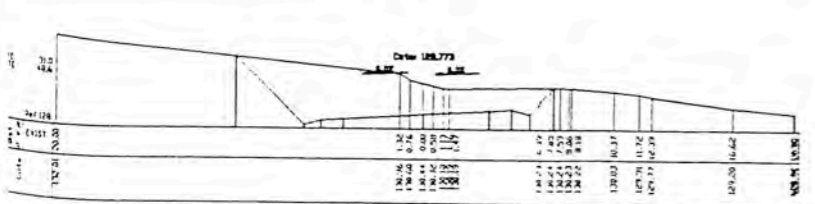
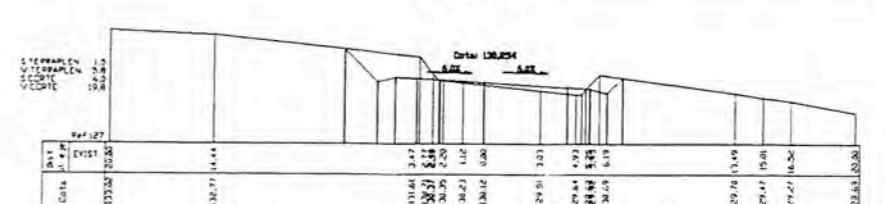
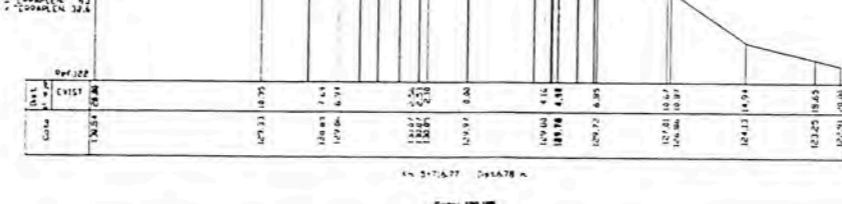
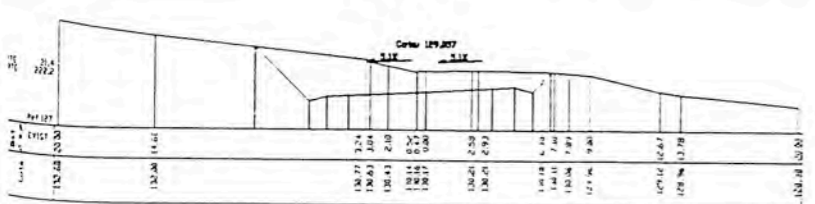
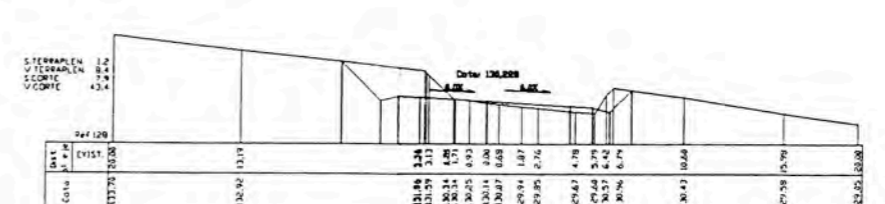
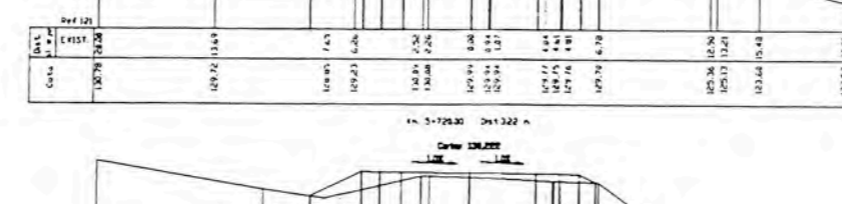
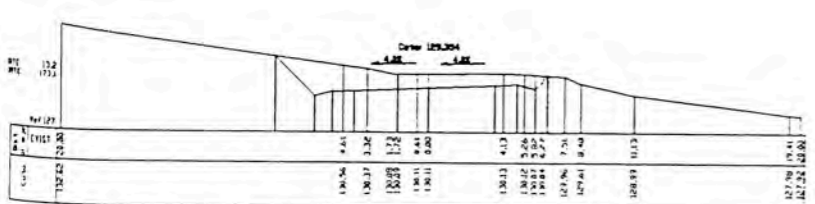
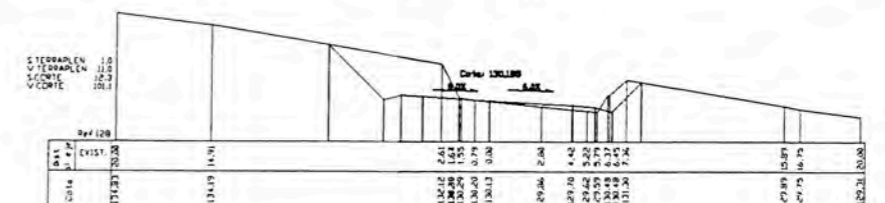
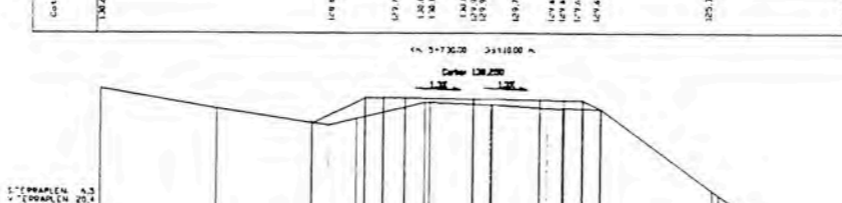
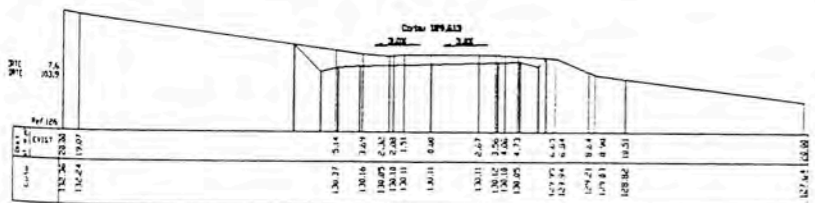
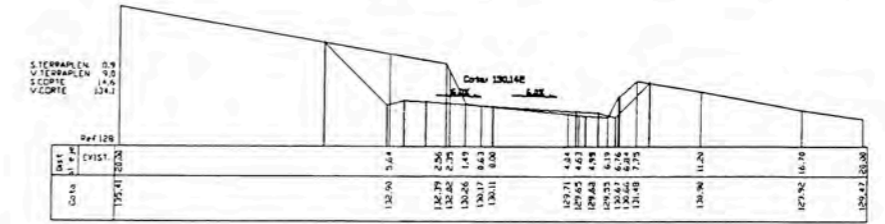
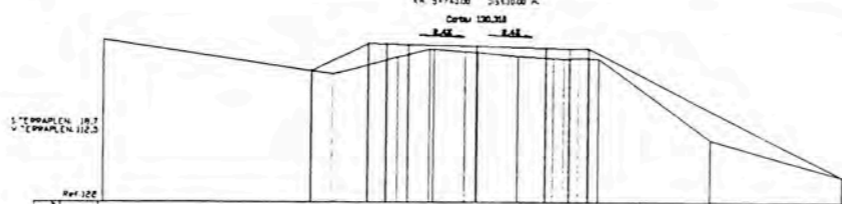
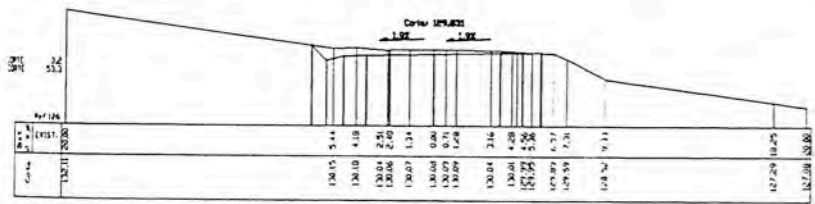
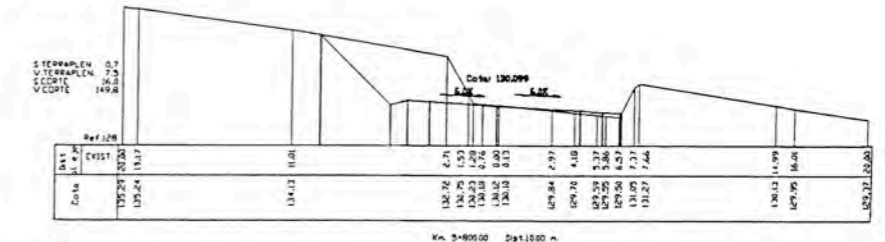
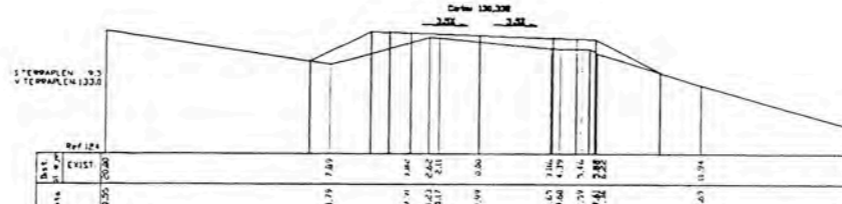
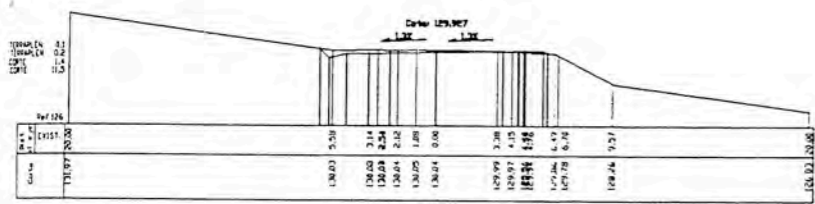


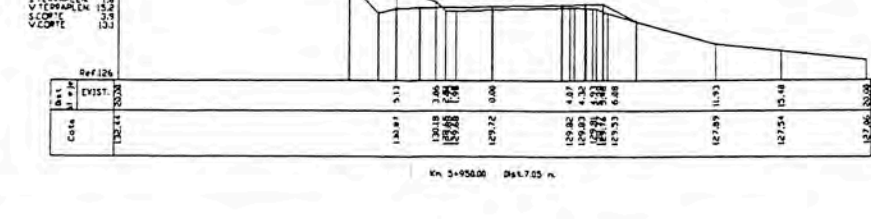
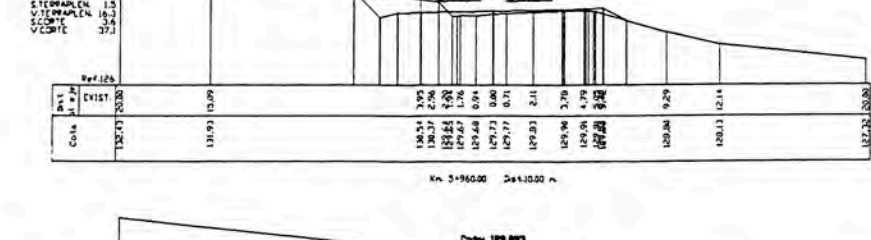
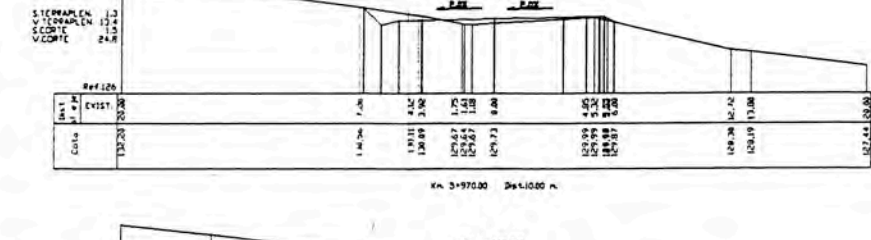
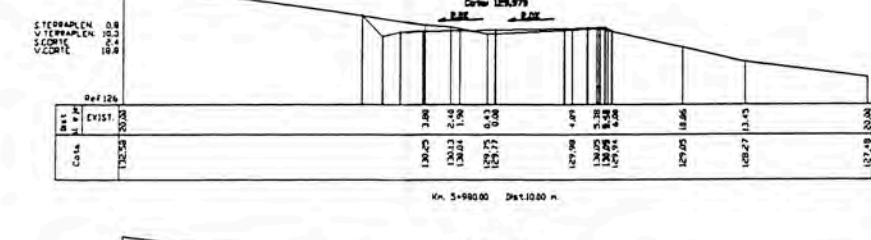
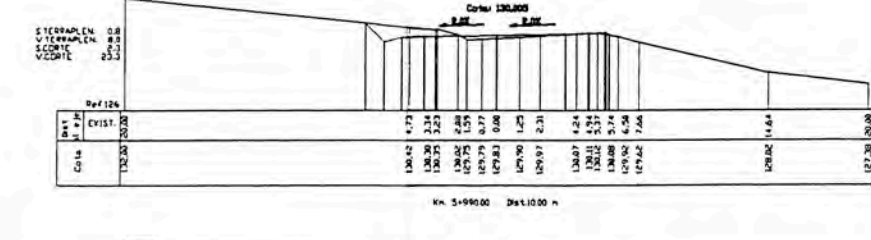
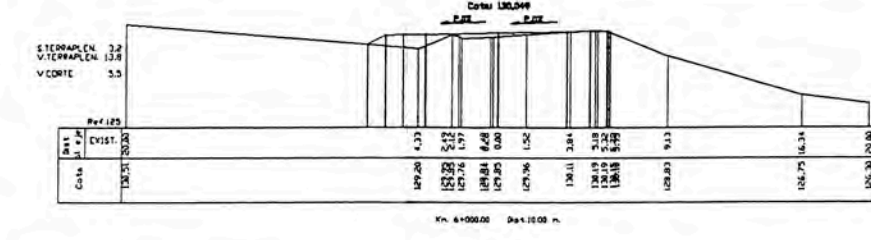
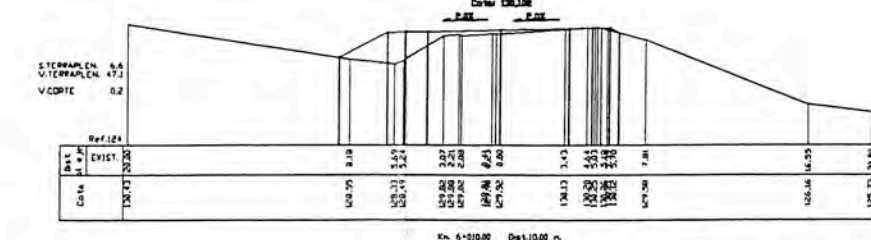
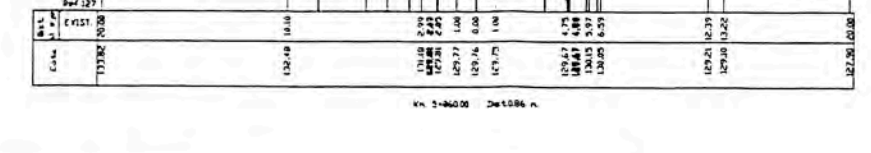
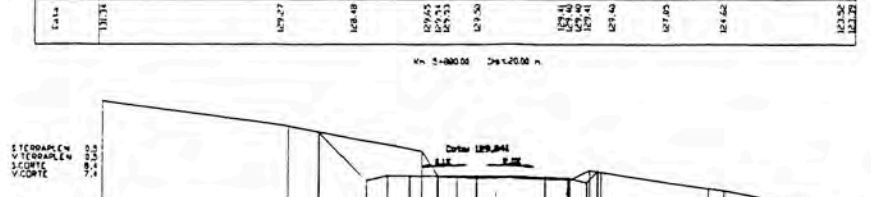
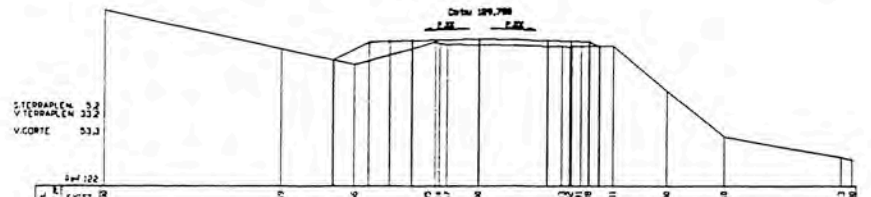
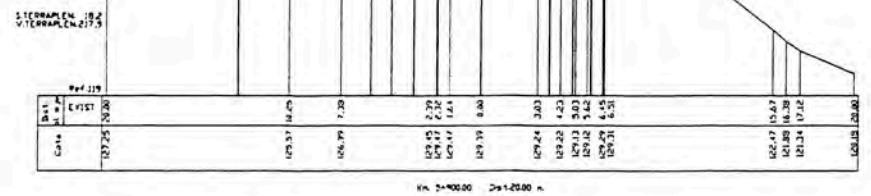
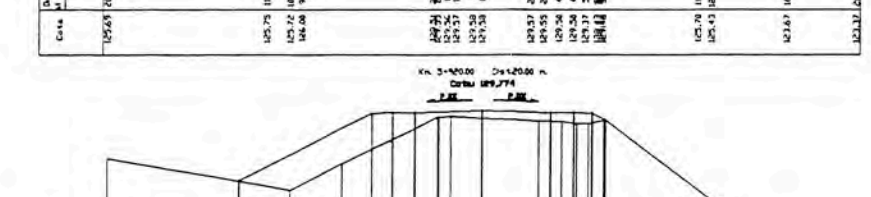
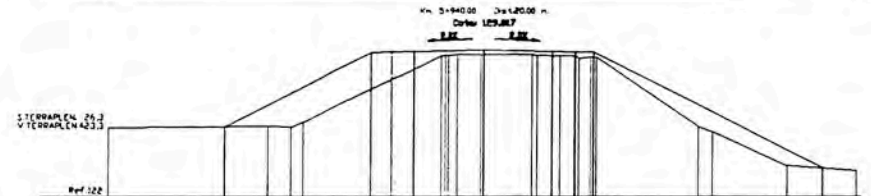
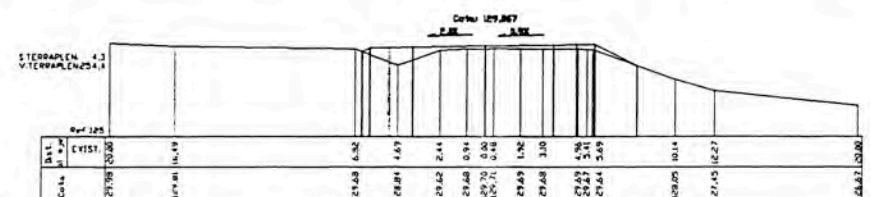
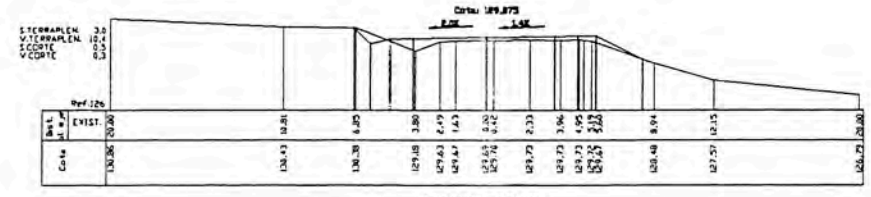
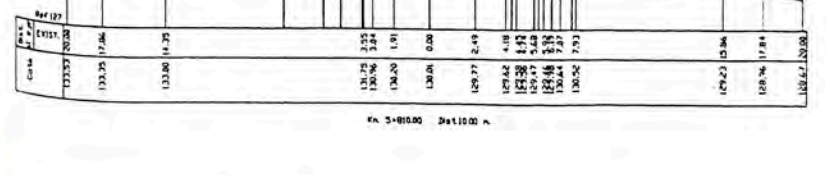
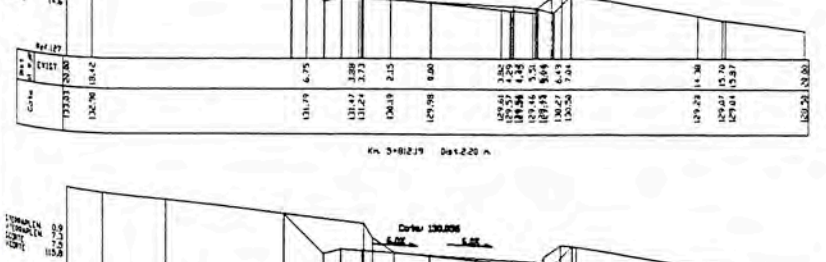
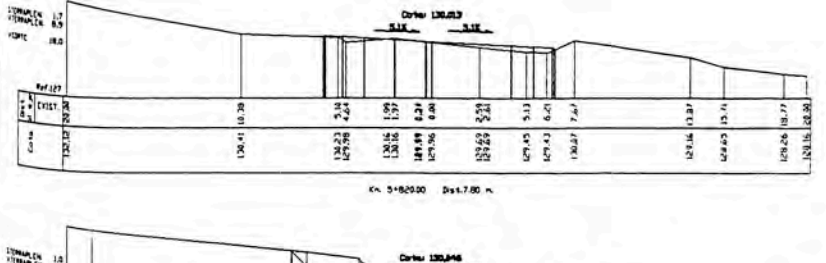
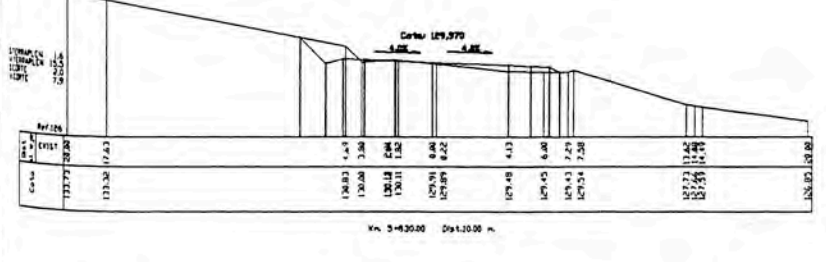
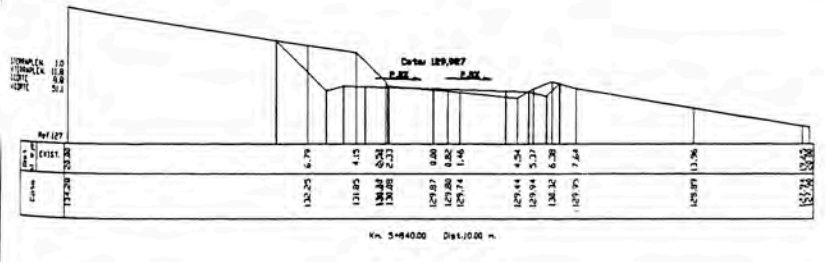
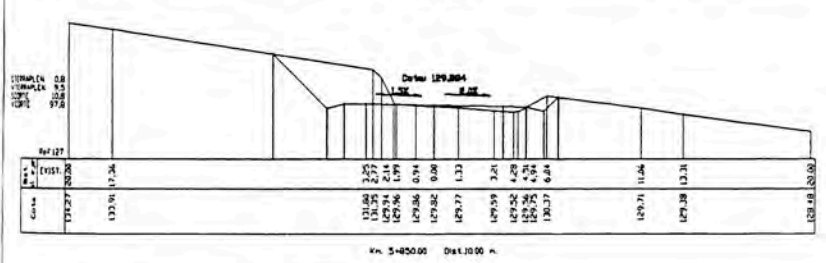
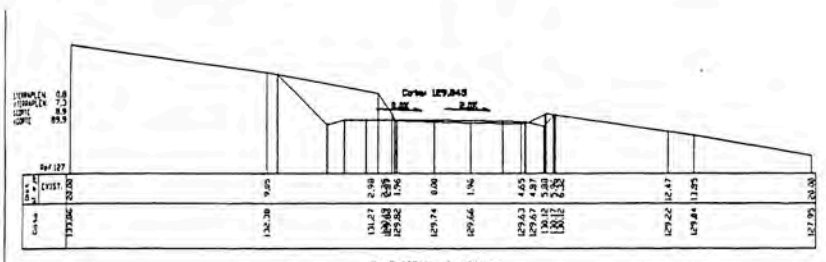
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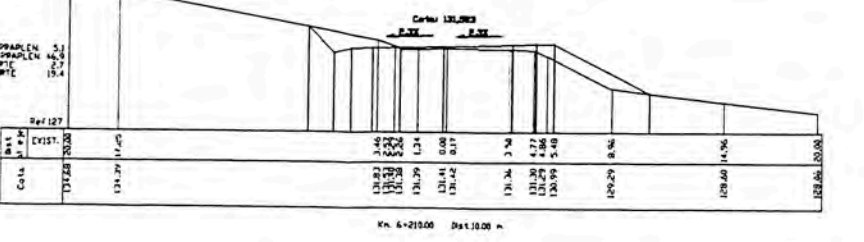
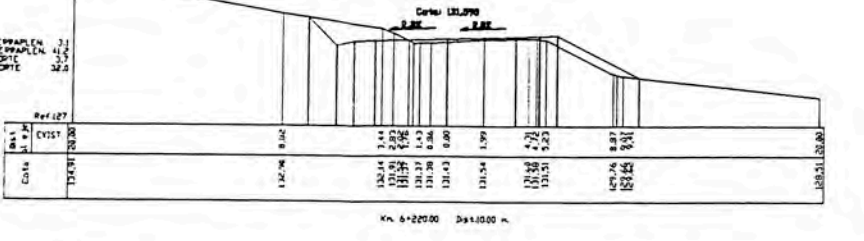
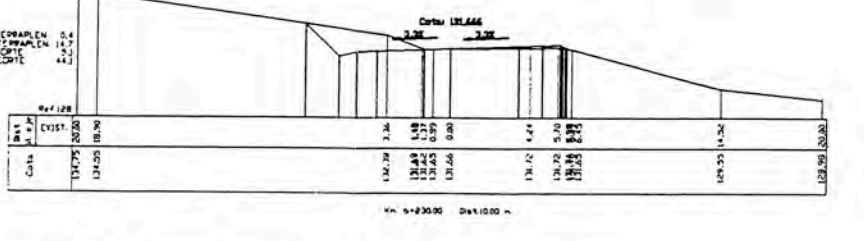
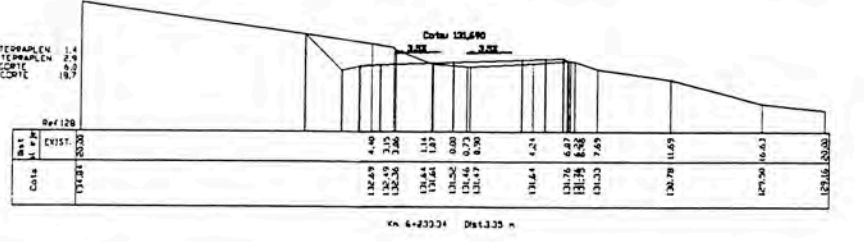
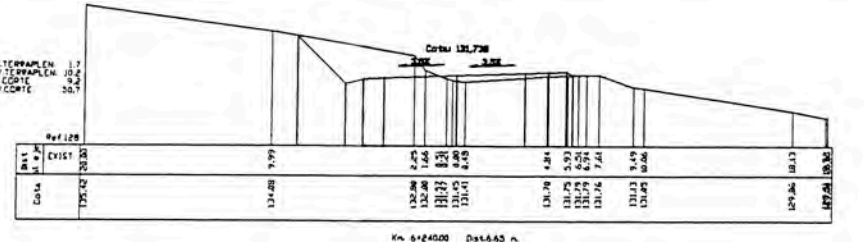
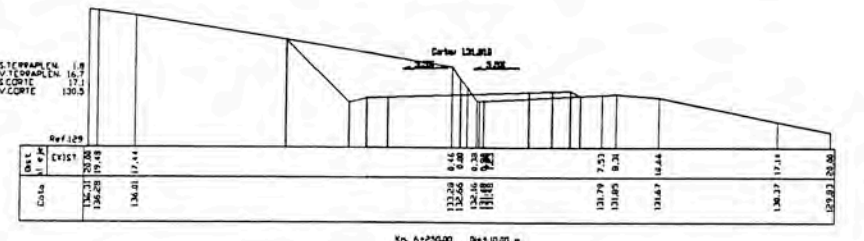
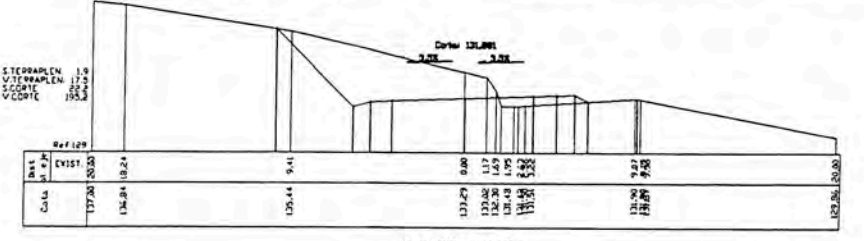
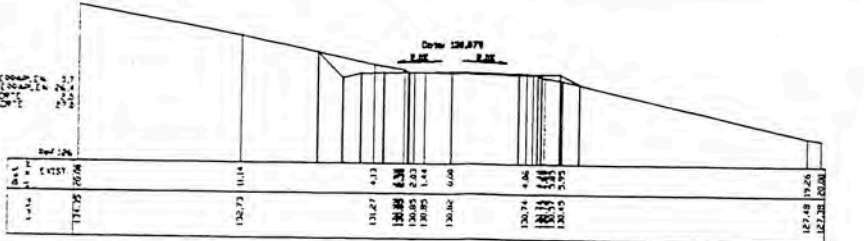
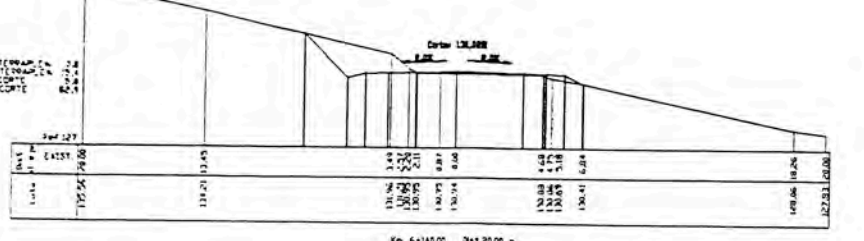
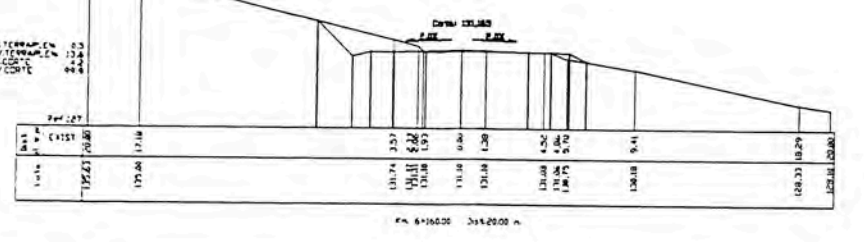
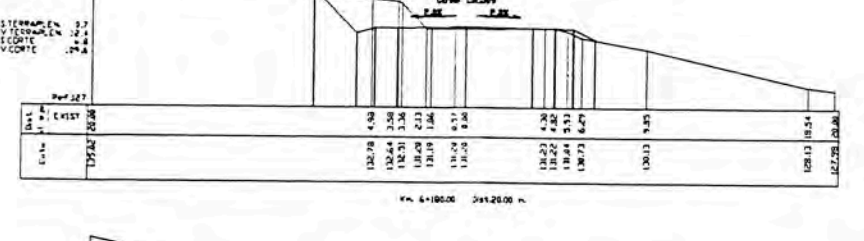
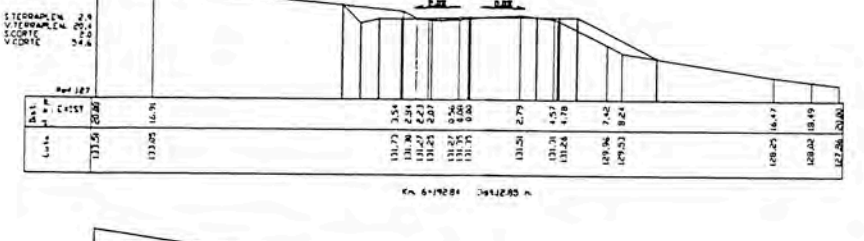
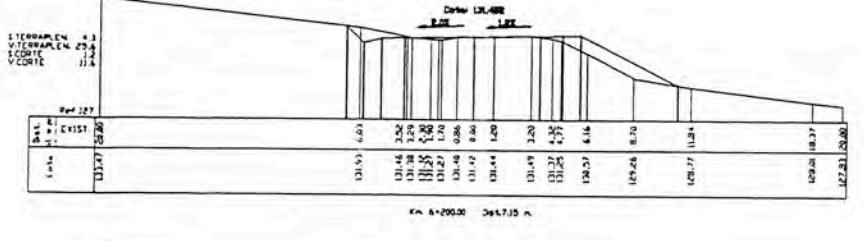
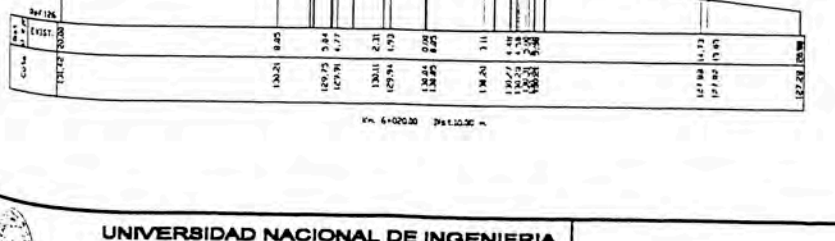
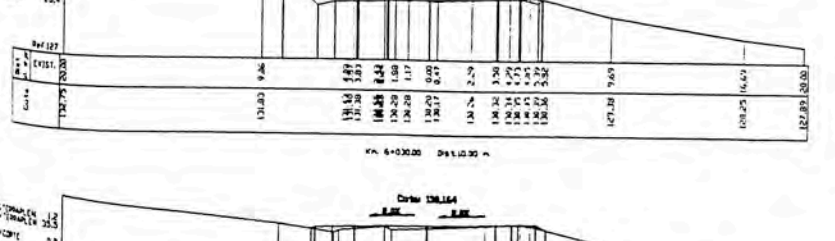
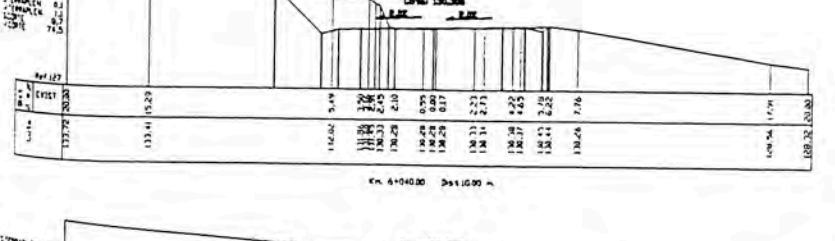
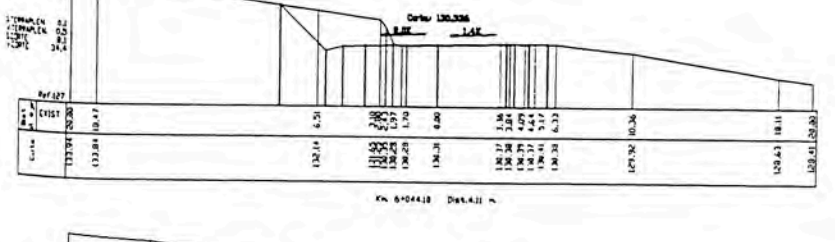
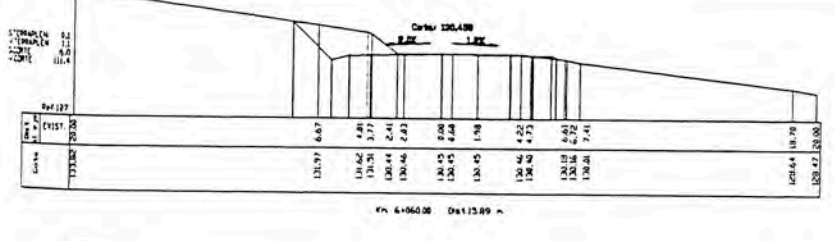
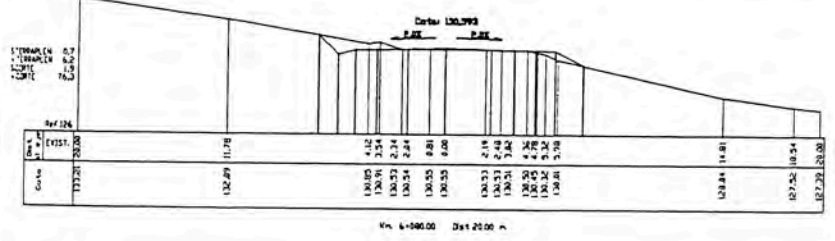
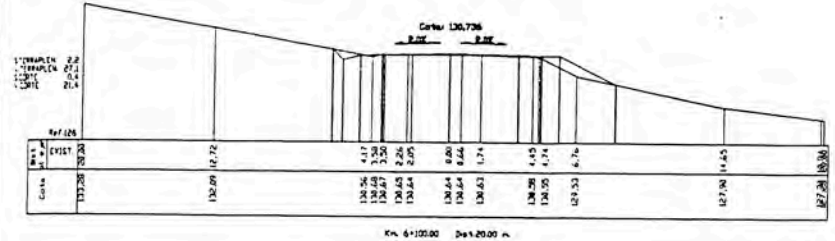


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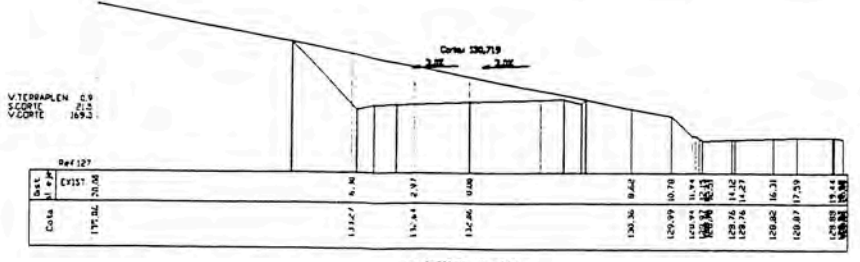
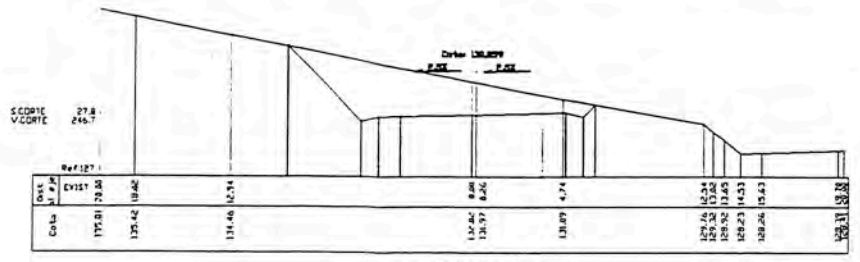
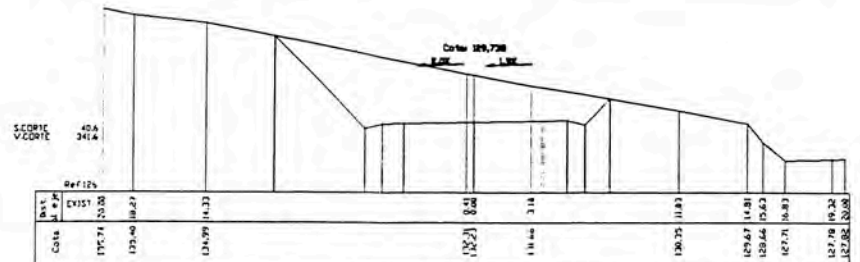
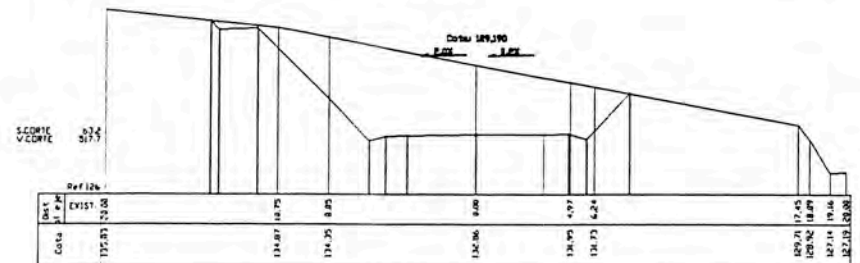
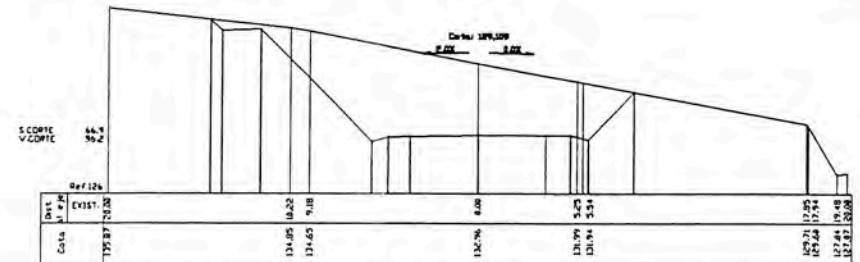
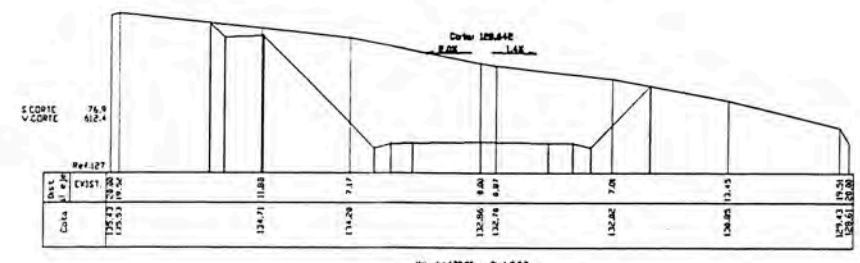
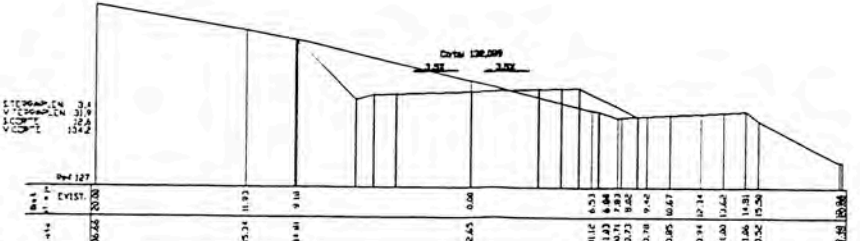
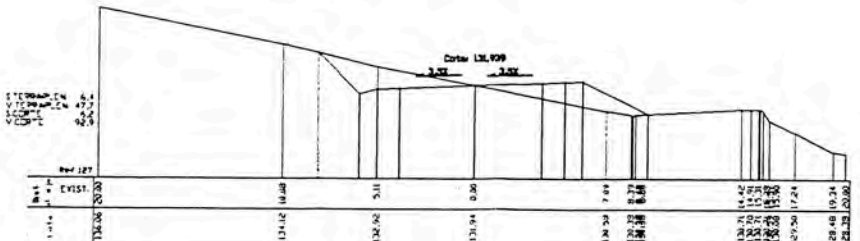
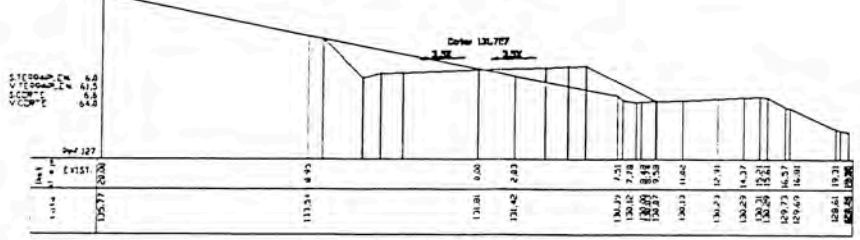
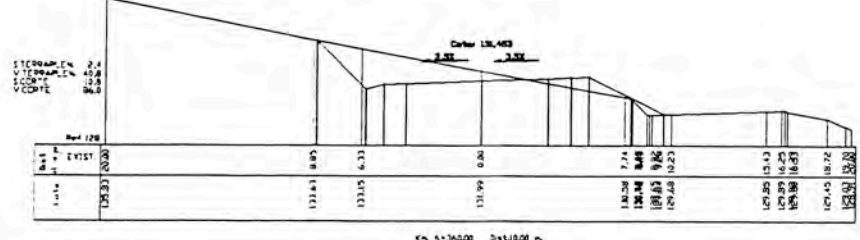
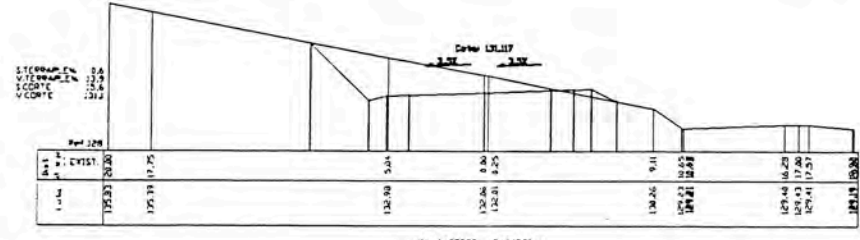
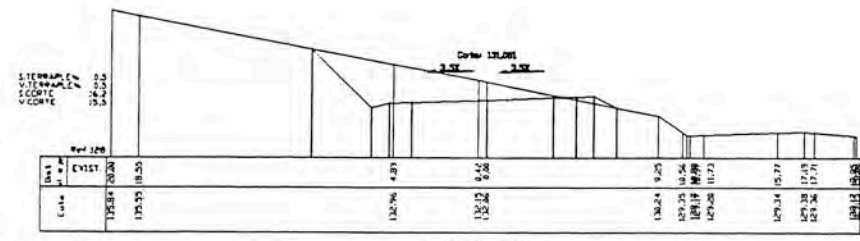
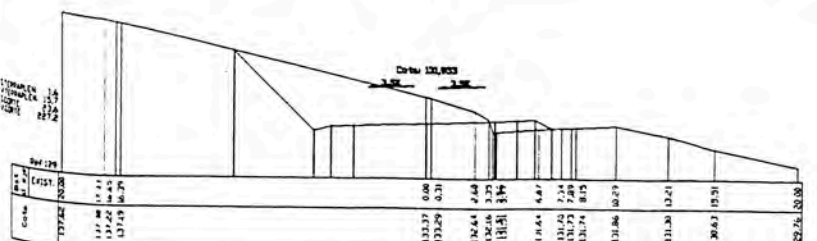
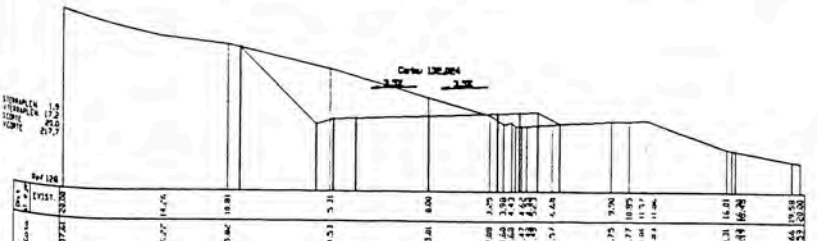
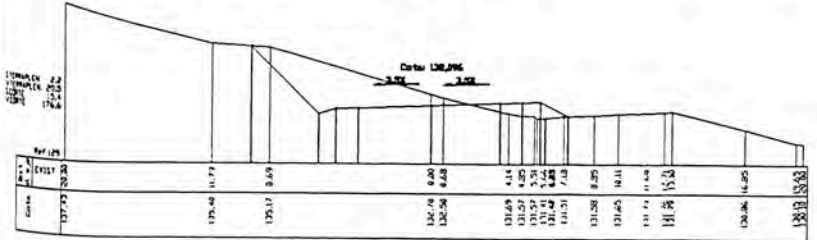
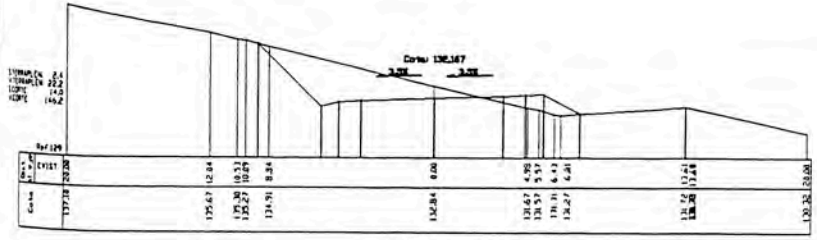
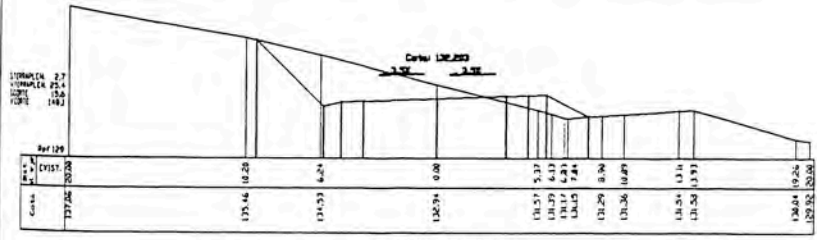
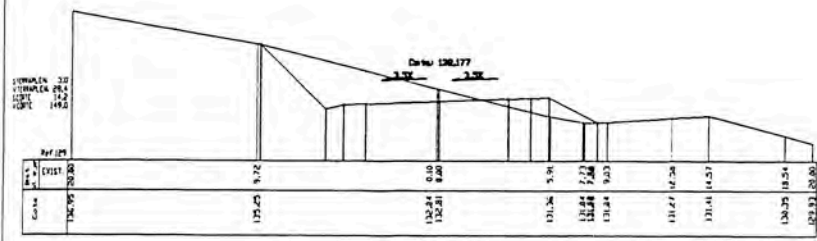




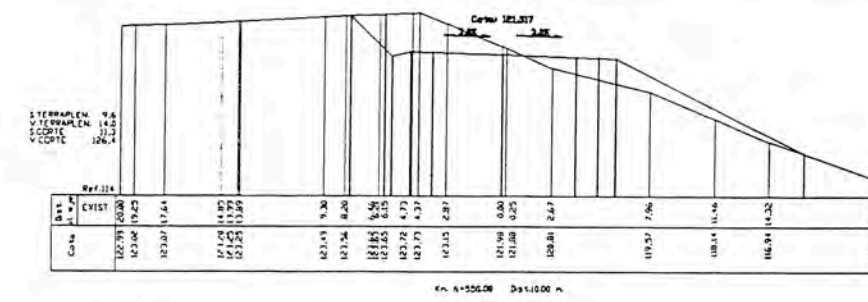
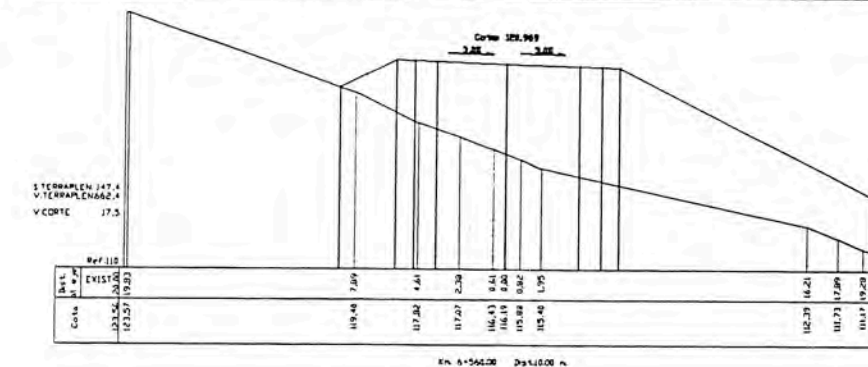
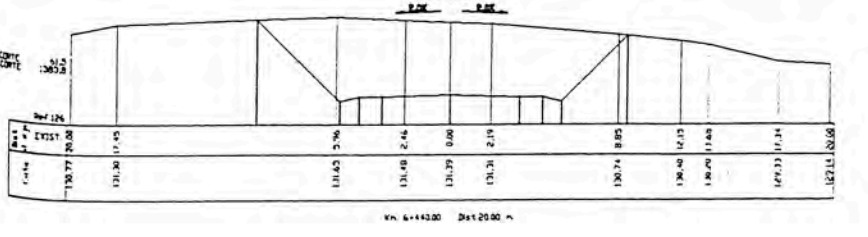
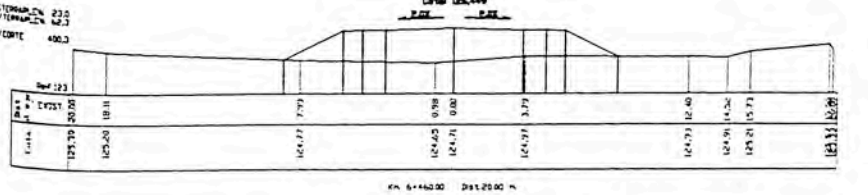
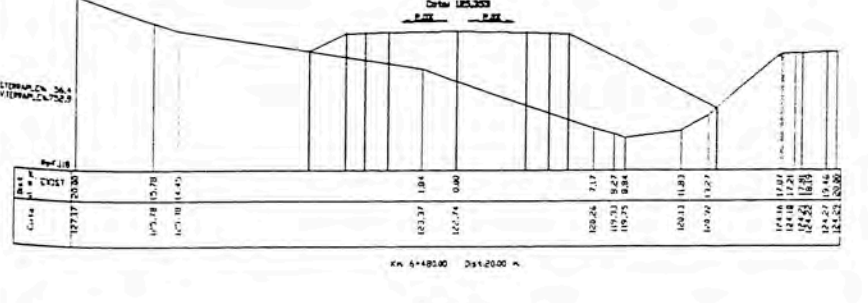
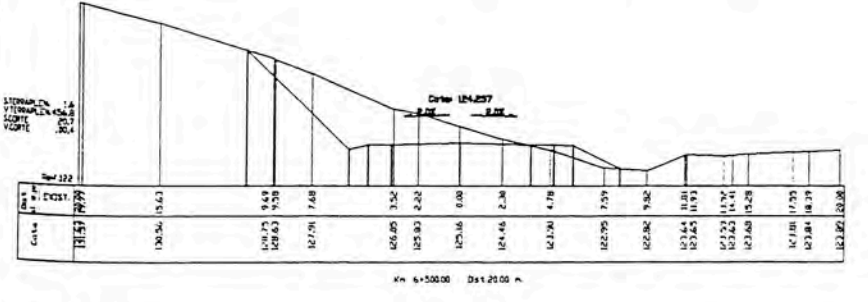
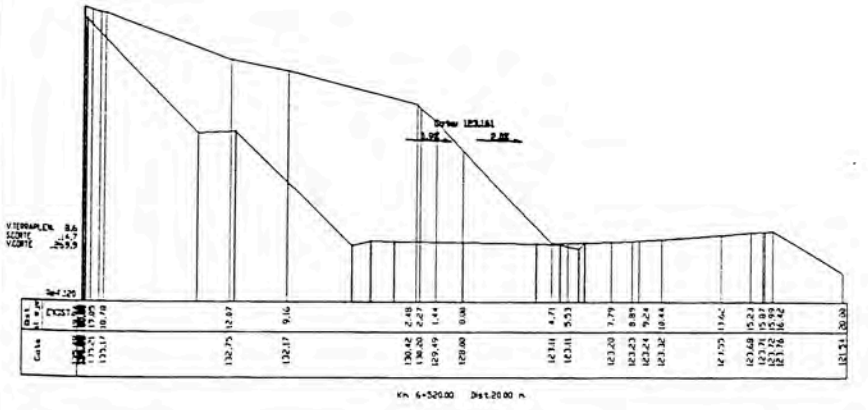
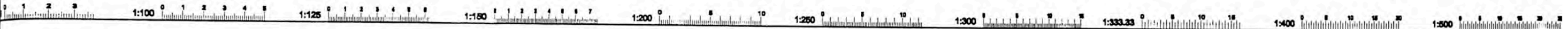


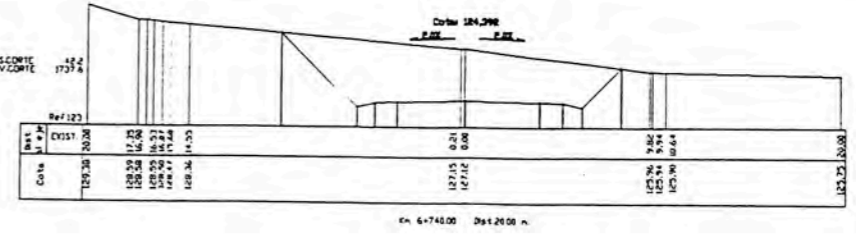
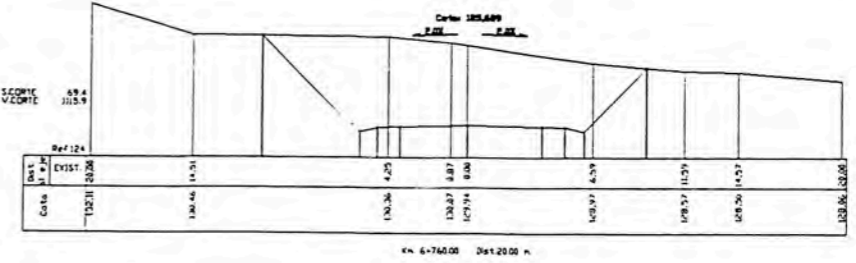
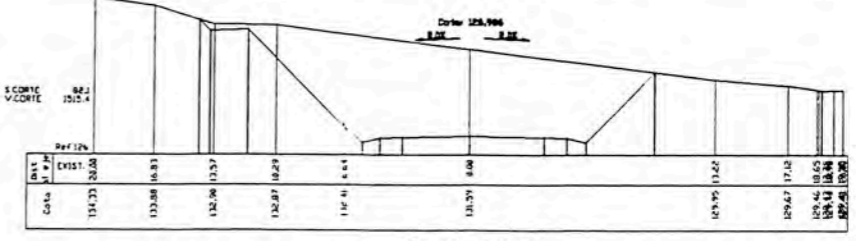
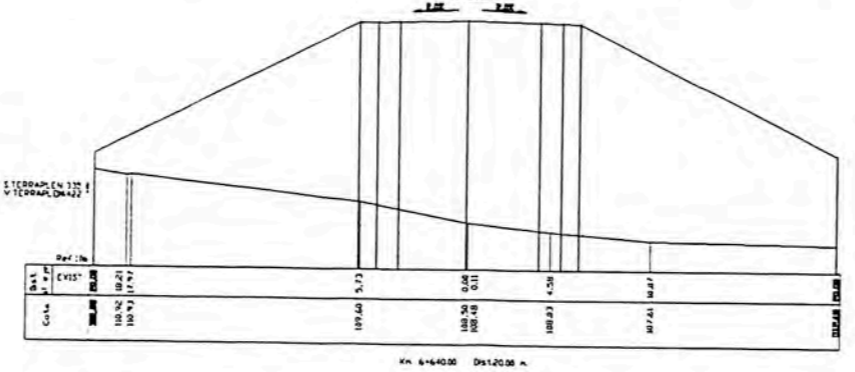
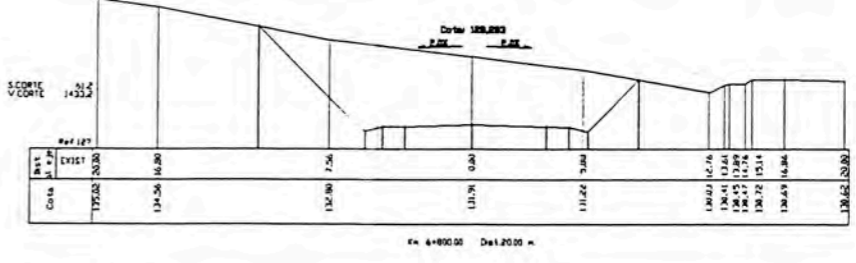
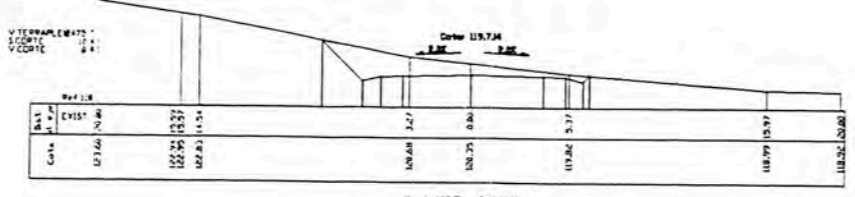
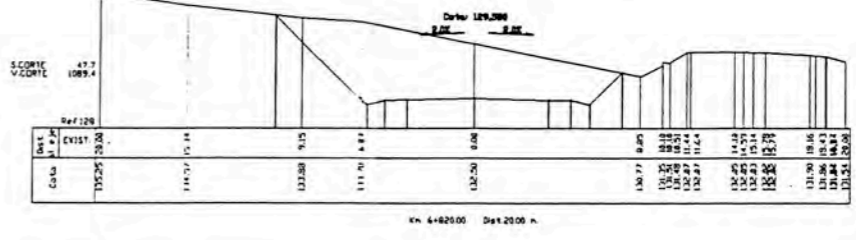
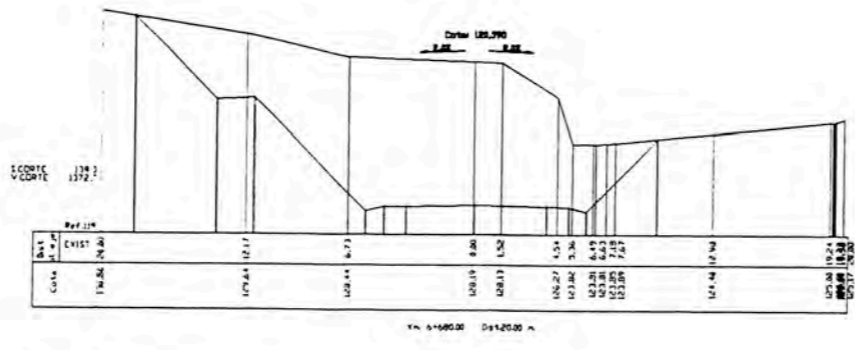
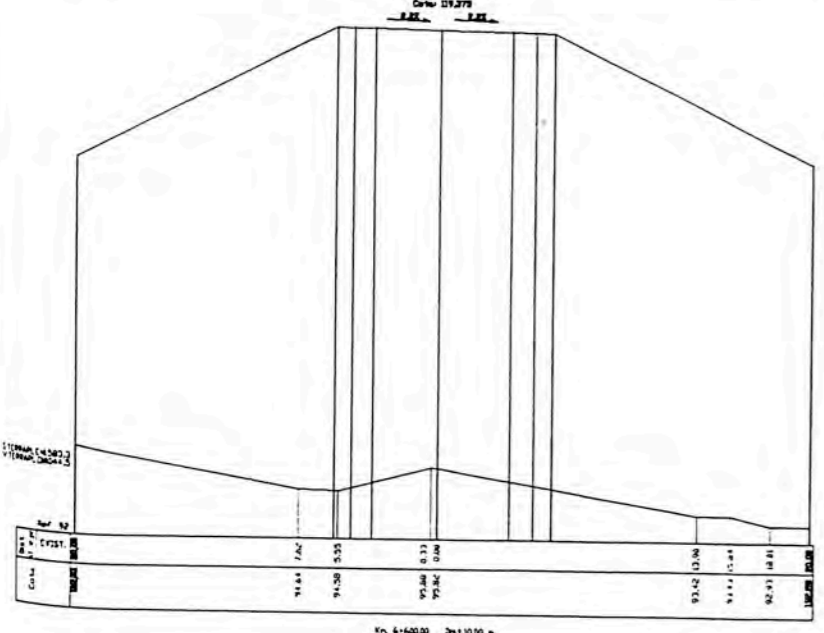
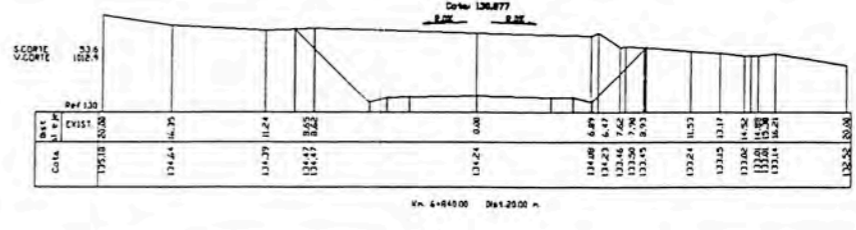
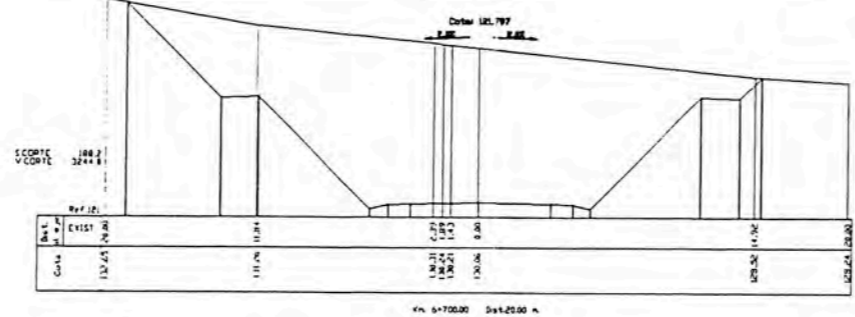
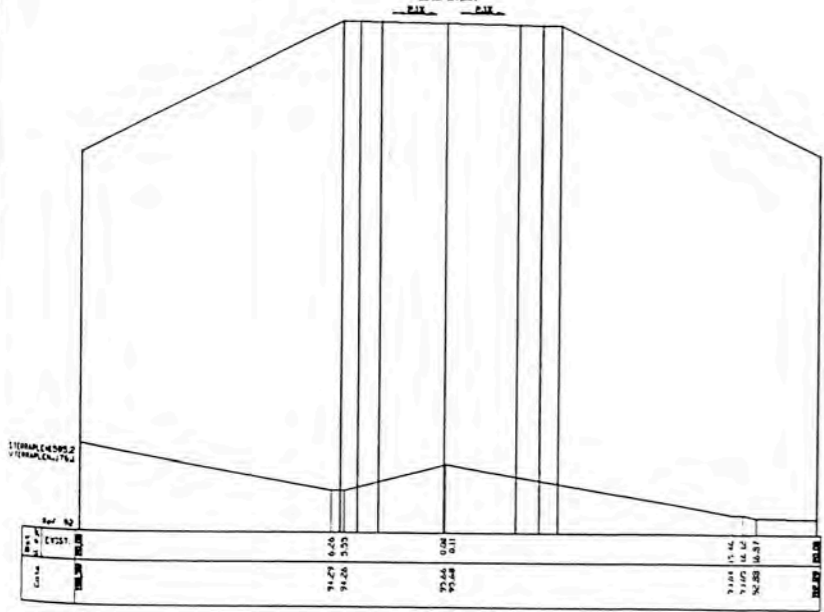
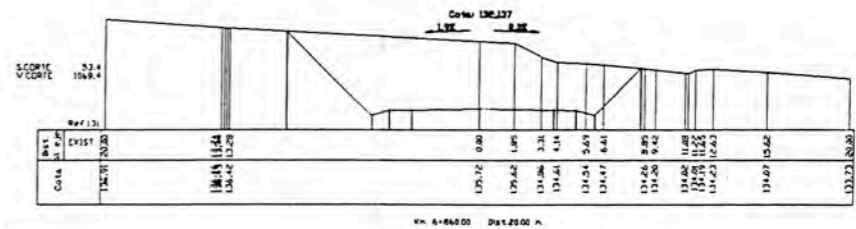
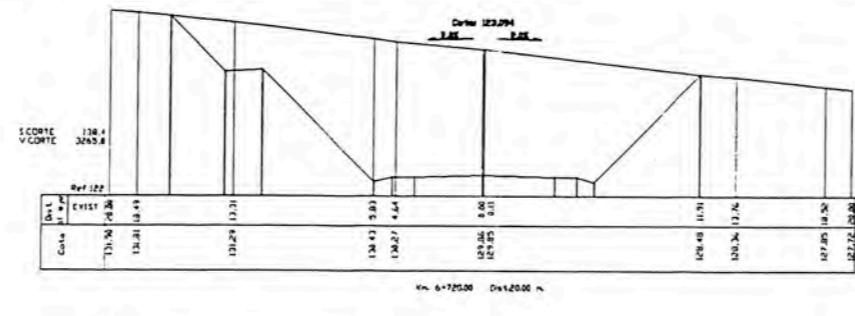
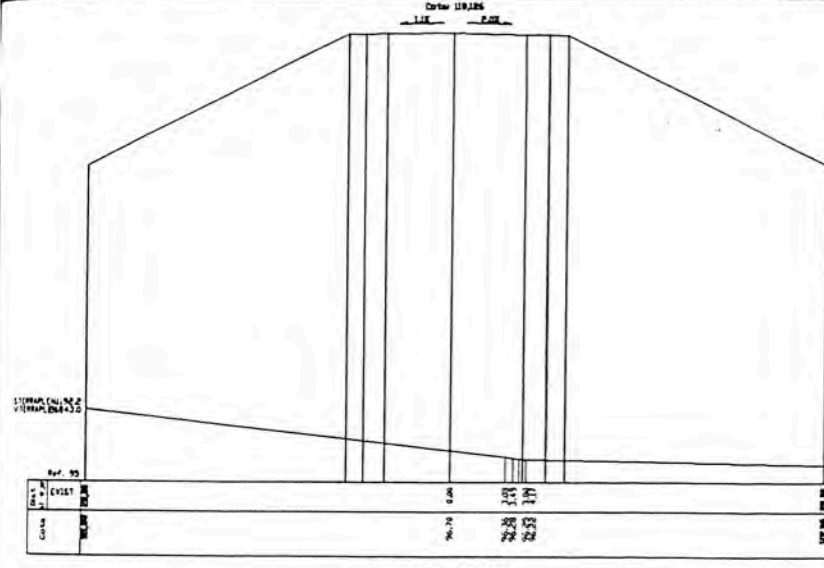
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Nº	FECHA

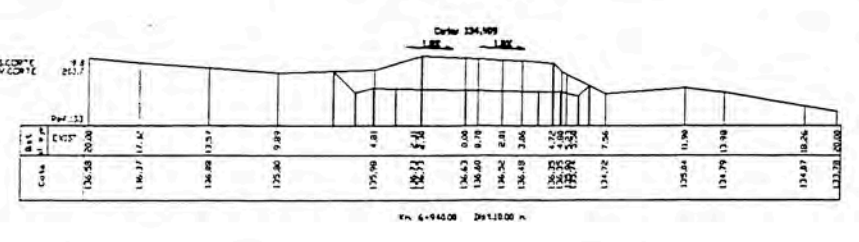
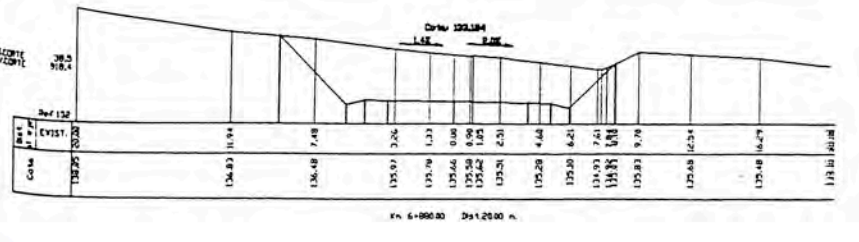
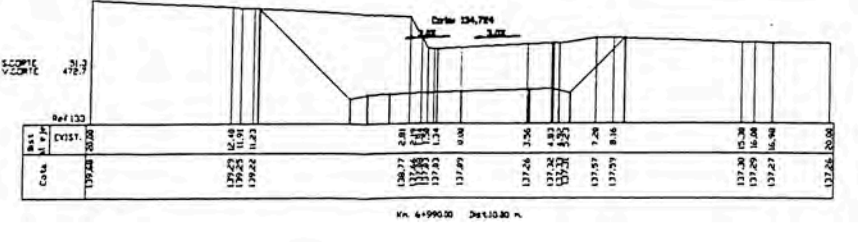
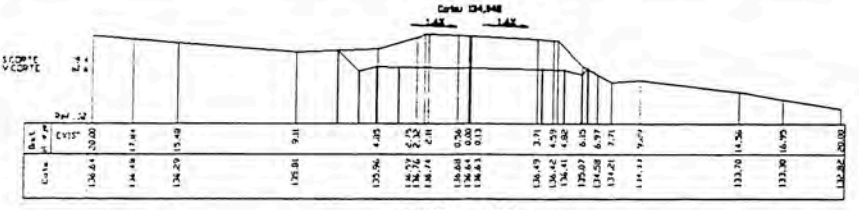
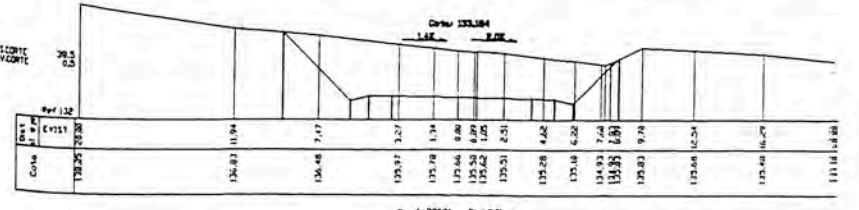
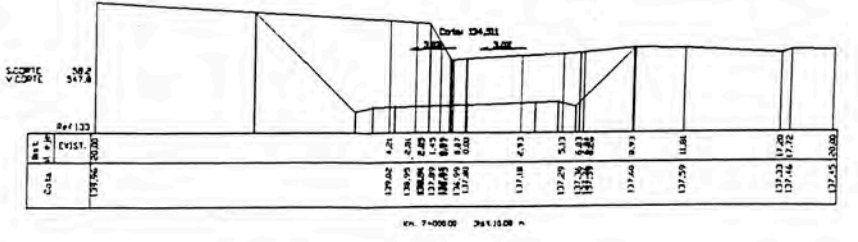
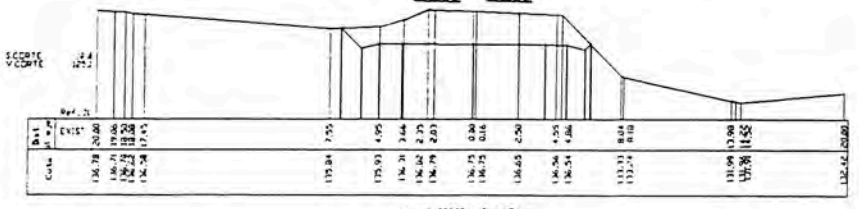
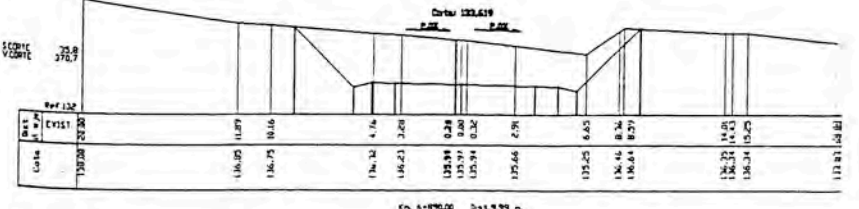
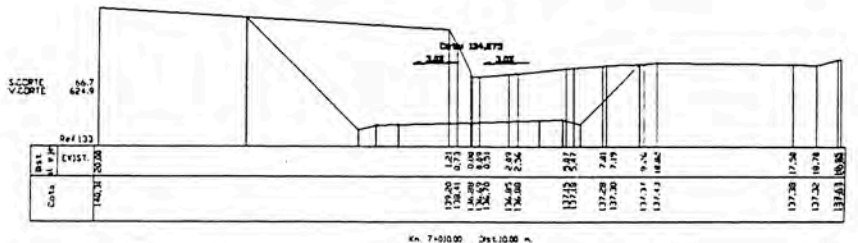
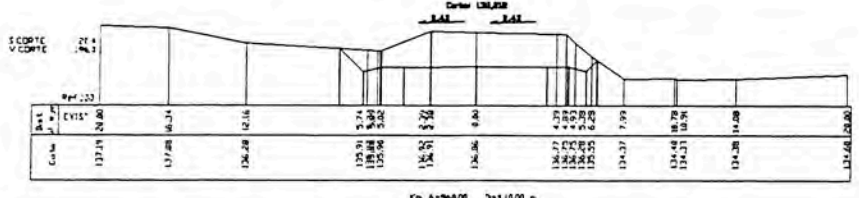
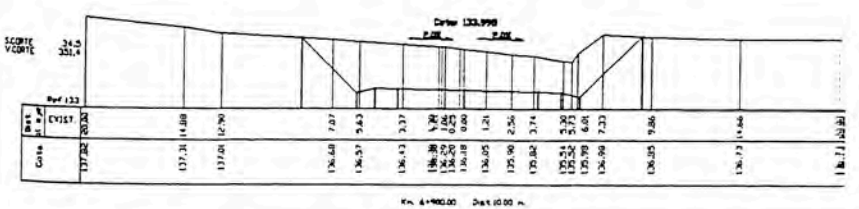
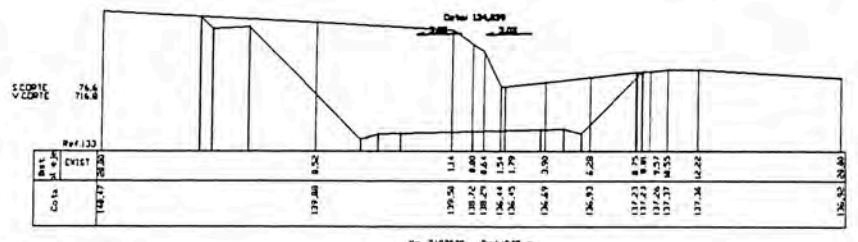
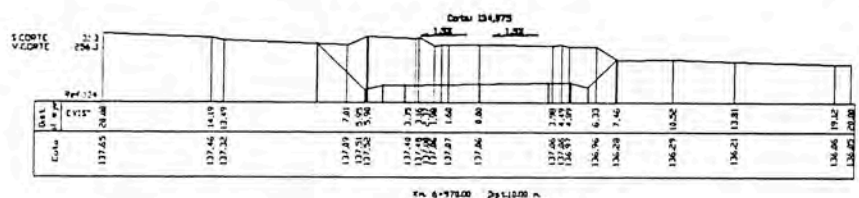
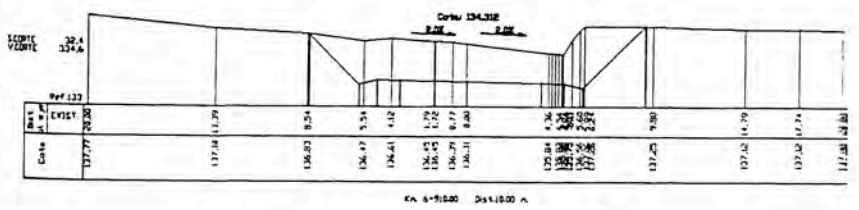
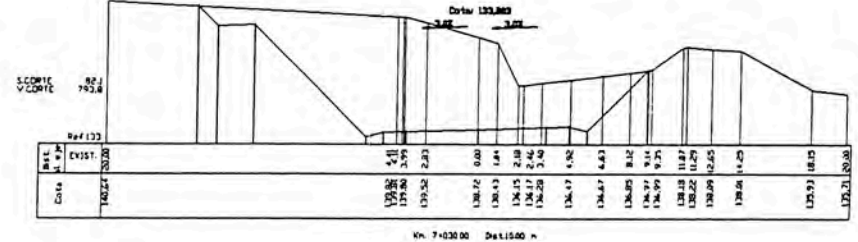
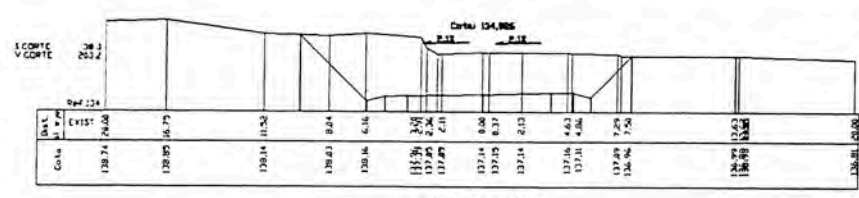
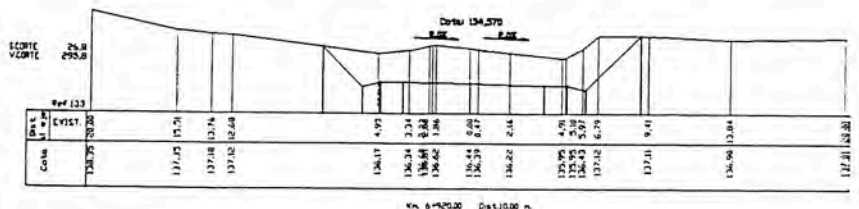
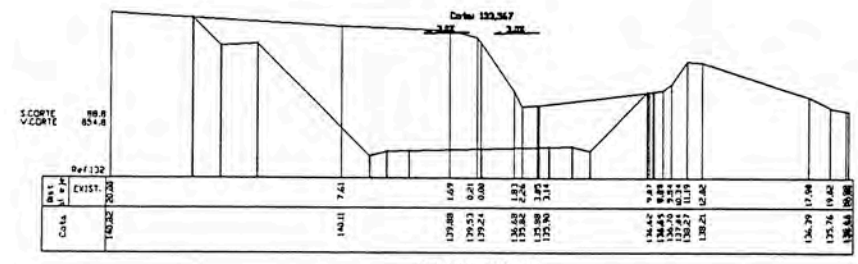
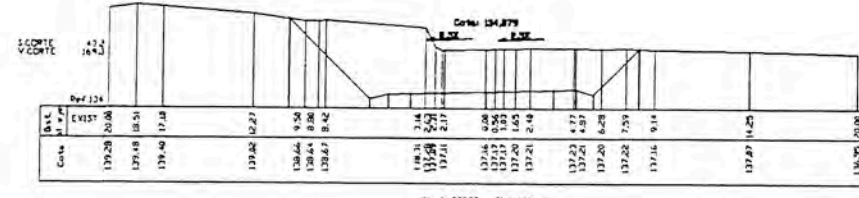
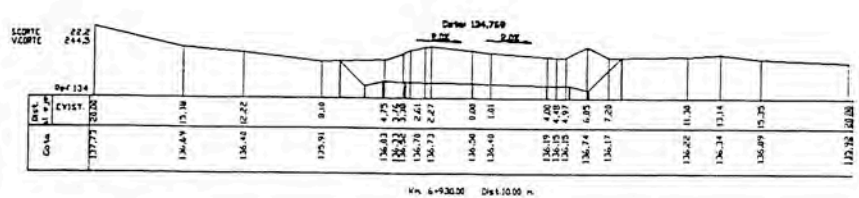
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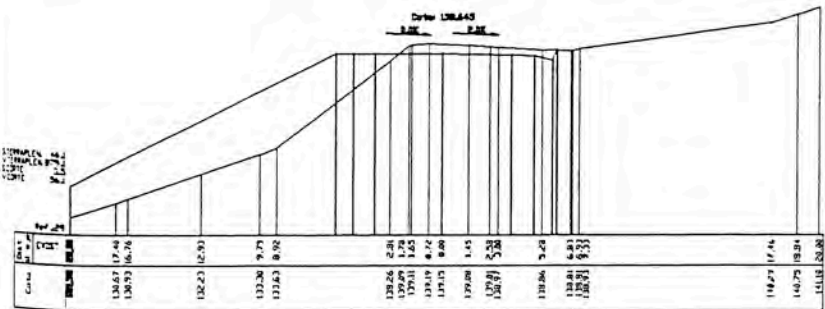
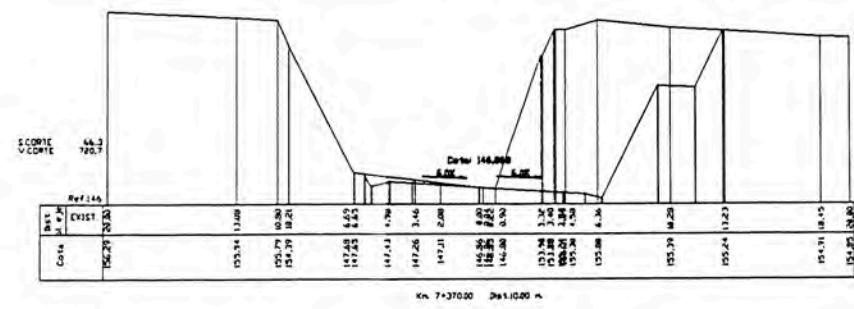
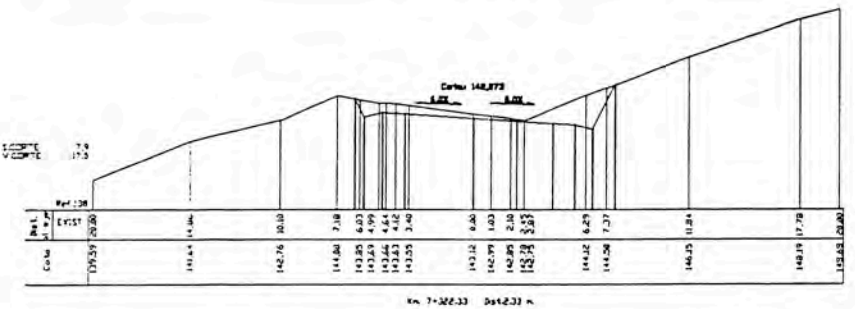
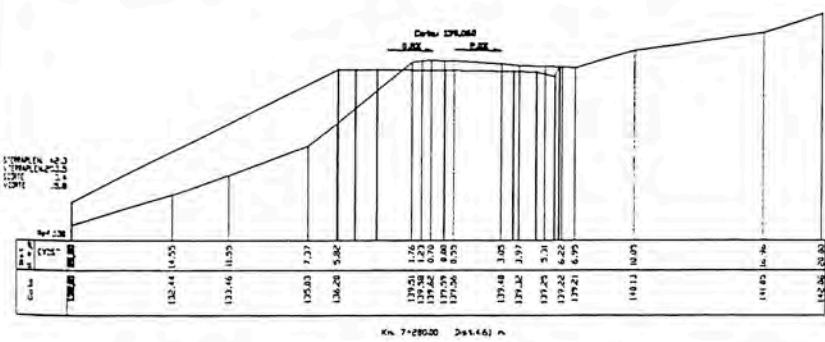
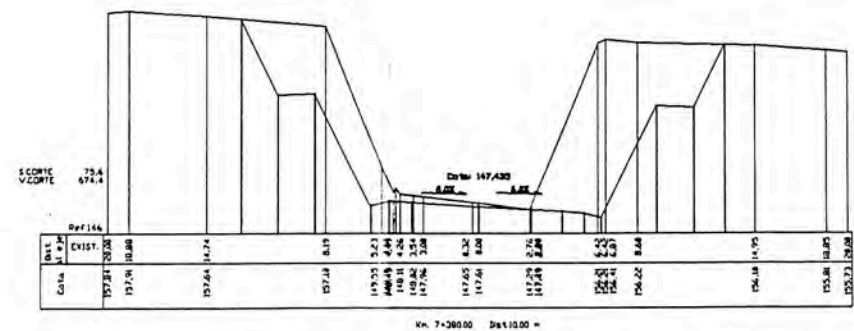
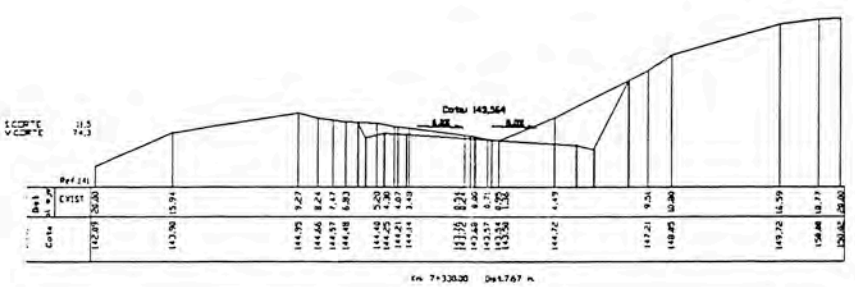
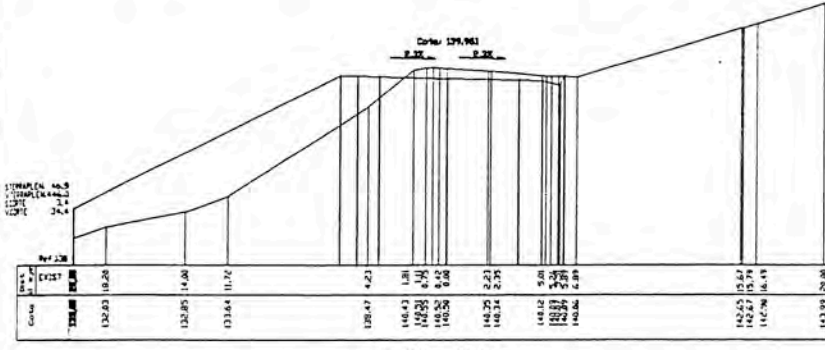
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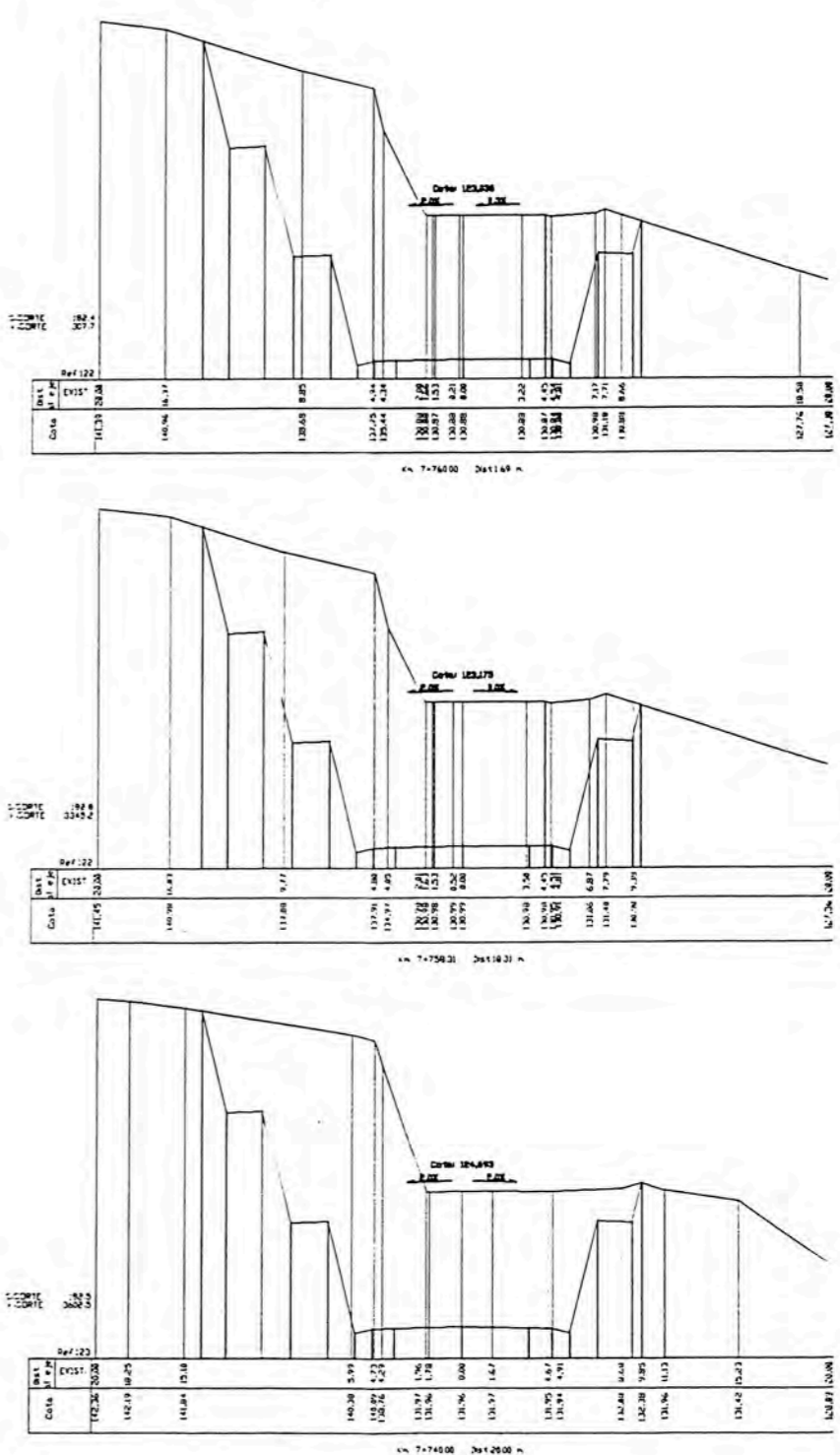
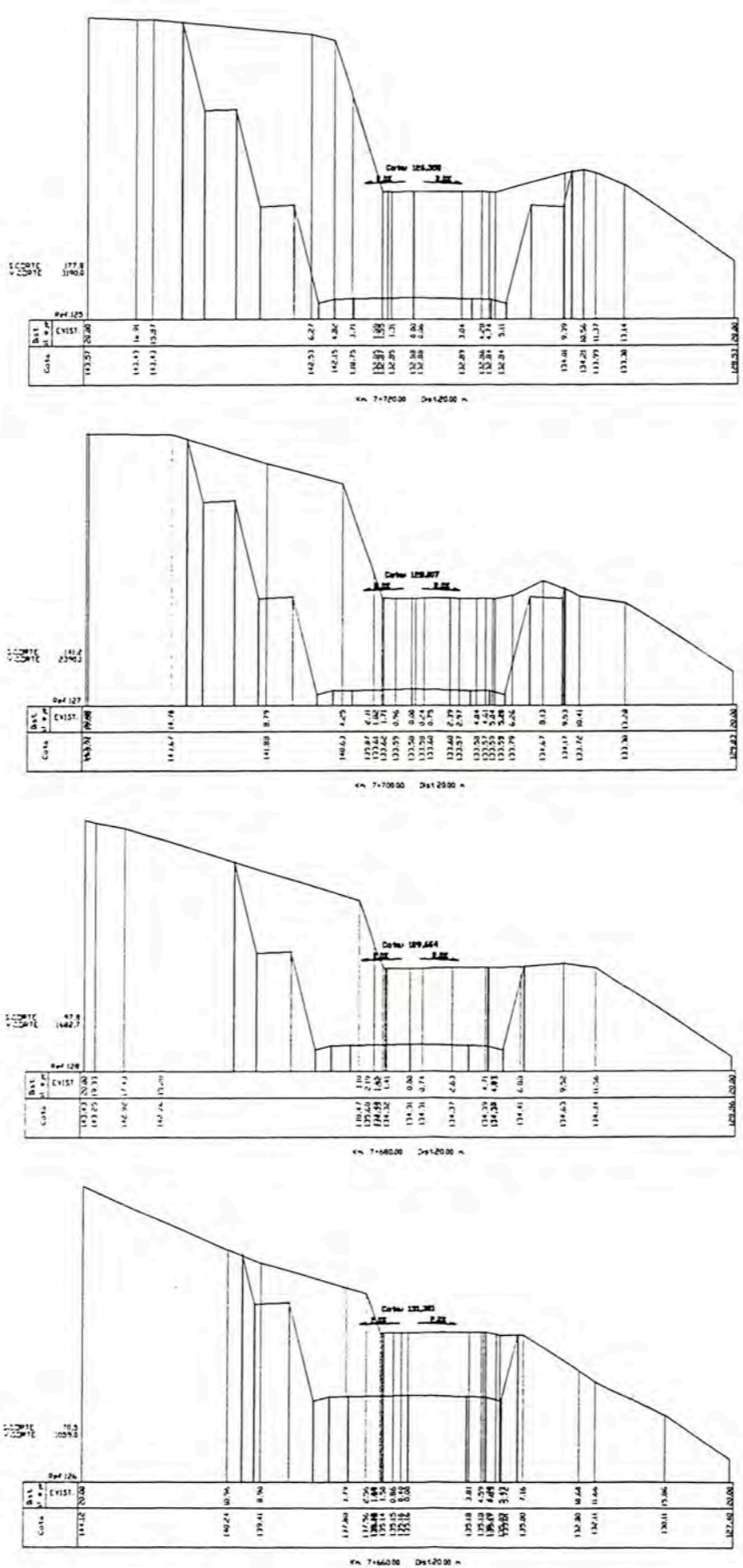
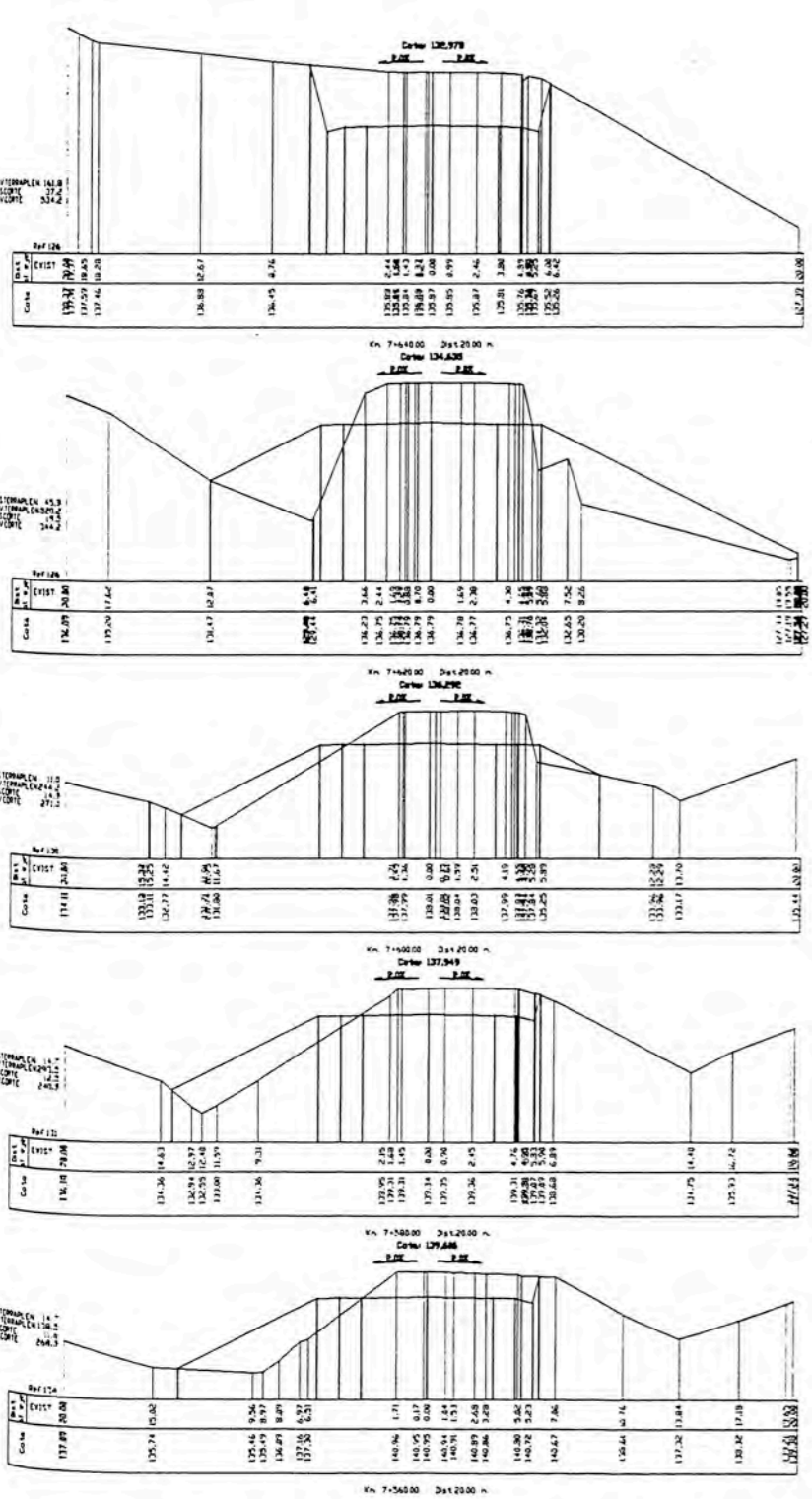




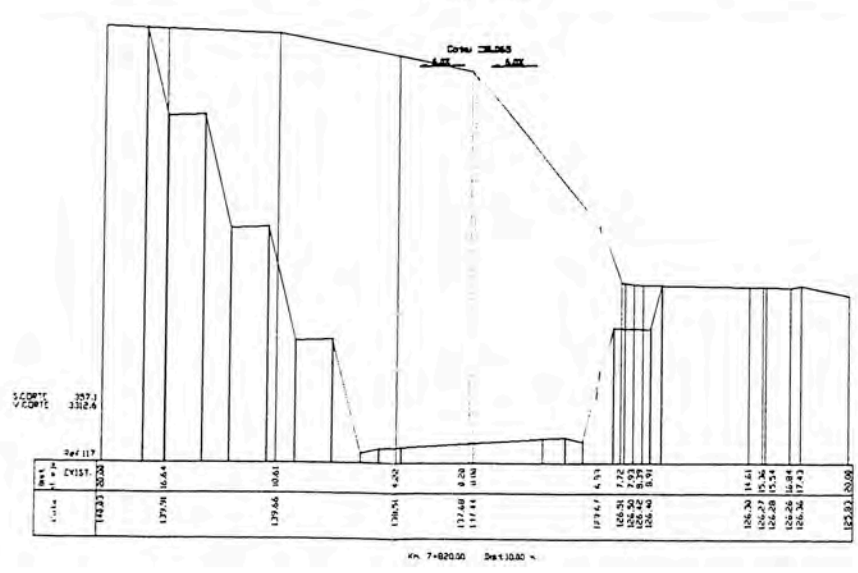
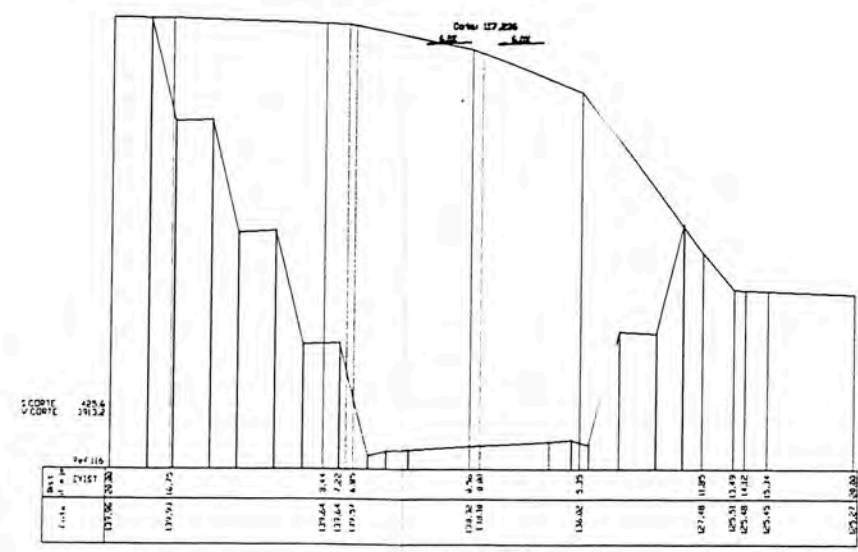
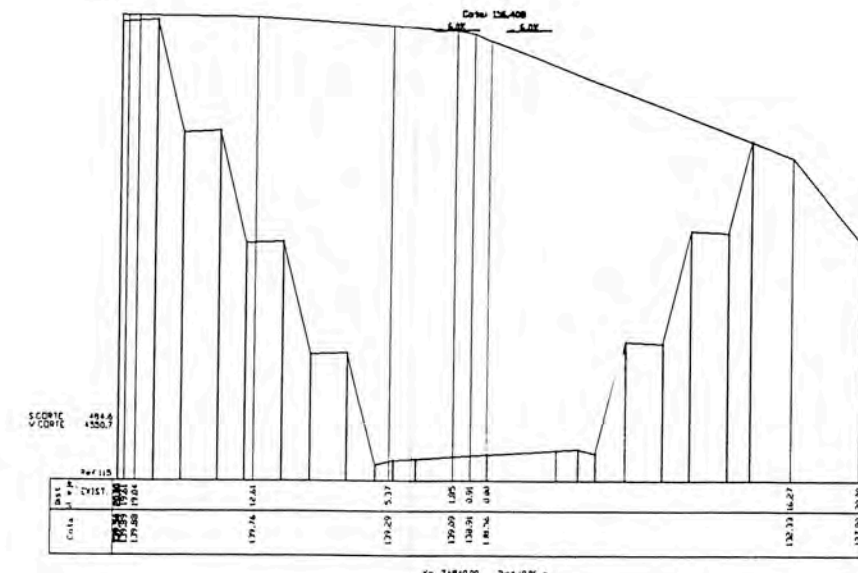
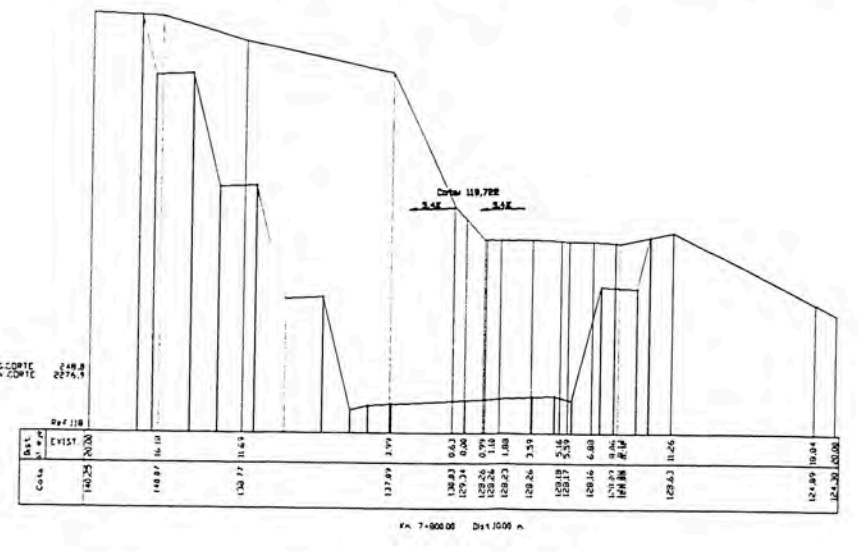
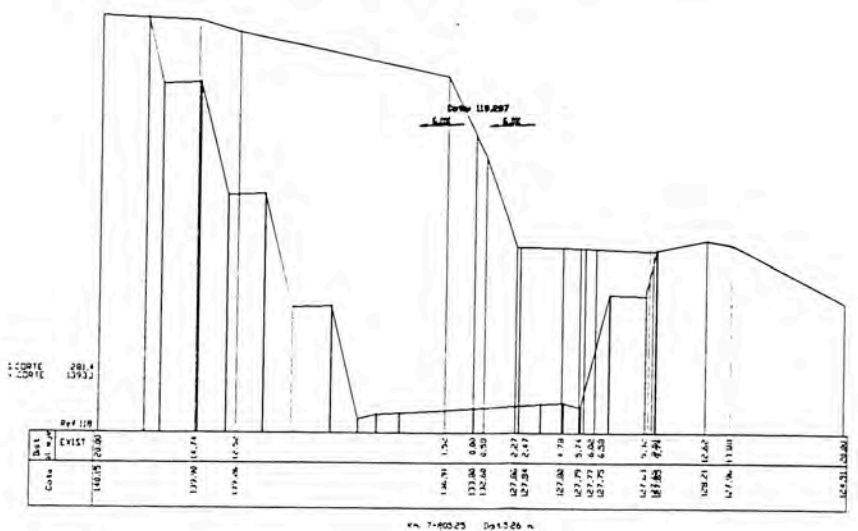
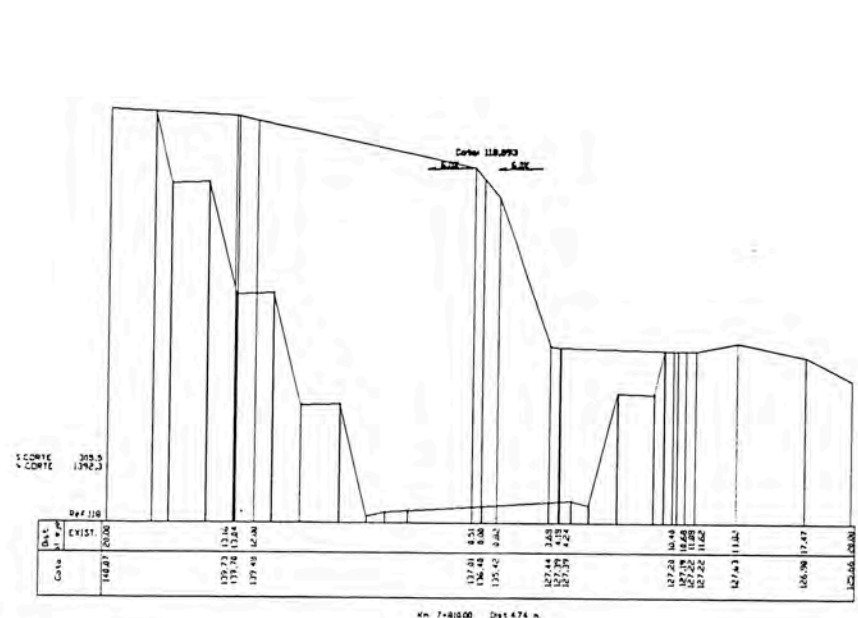
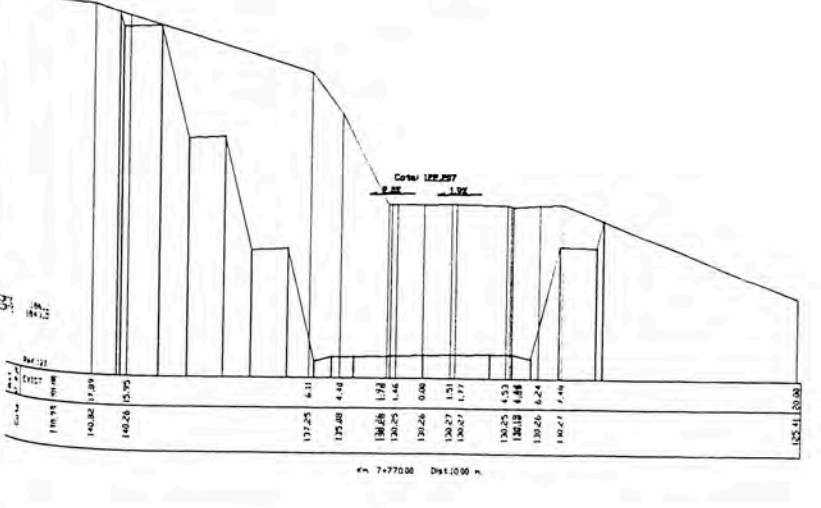
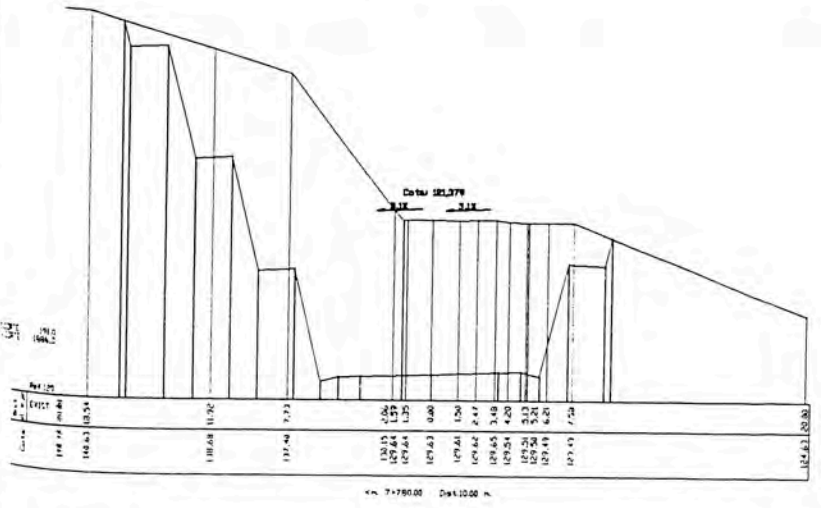
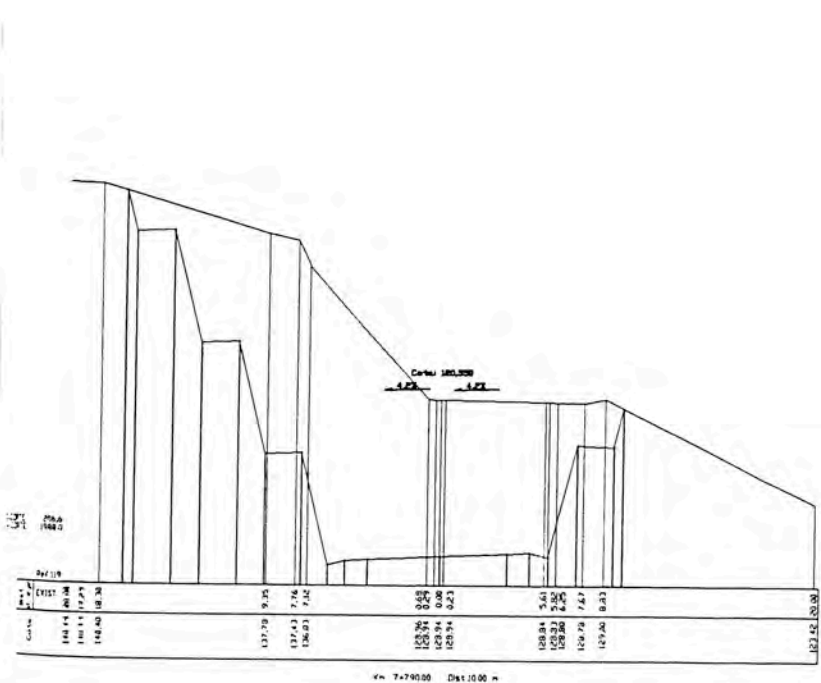


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Nº	FECHA DESCRIPCIÓN





REVISIONES	
Nº	FECHA



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 FACULTAD DE INGENIERIA CIVIL
 DEPARTAMENTO ACADEMICO DE TOPOGRAFIA Y VIAS DE TRANSPORTE

Diseñó: Benh. A. Lopez U.
 Dibujo: A.L.U.
 Verificó: Ing. G. Ramirez B.
 Presentó: Benh. A. Lopez U.

Aprobó:

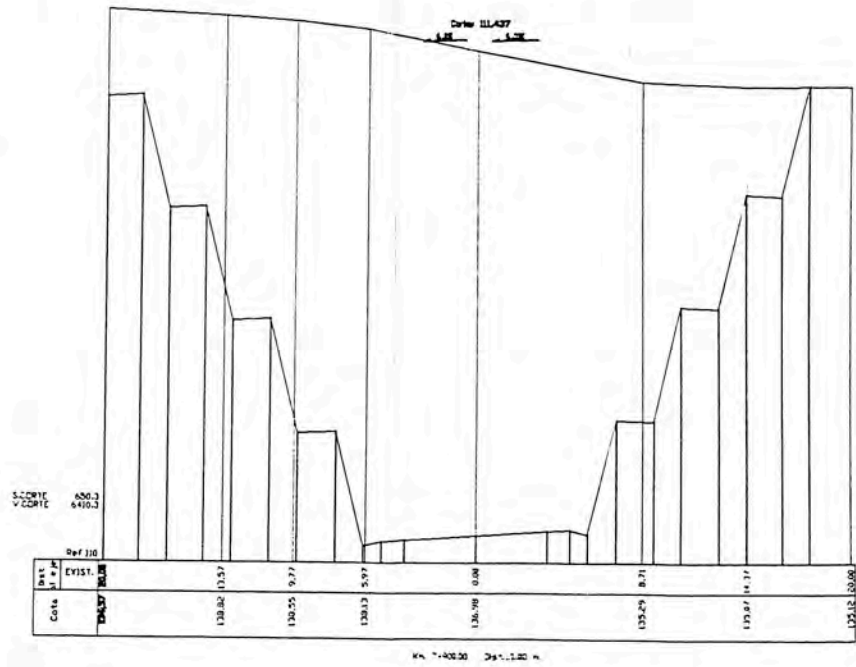
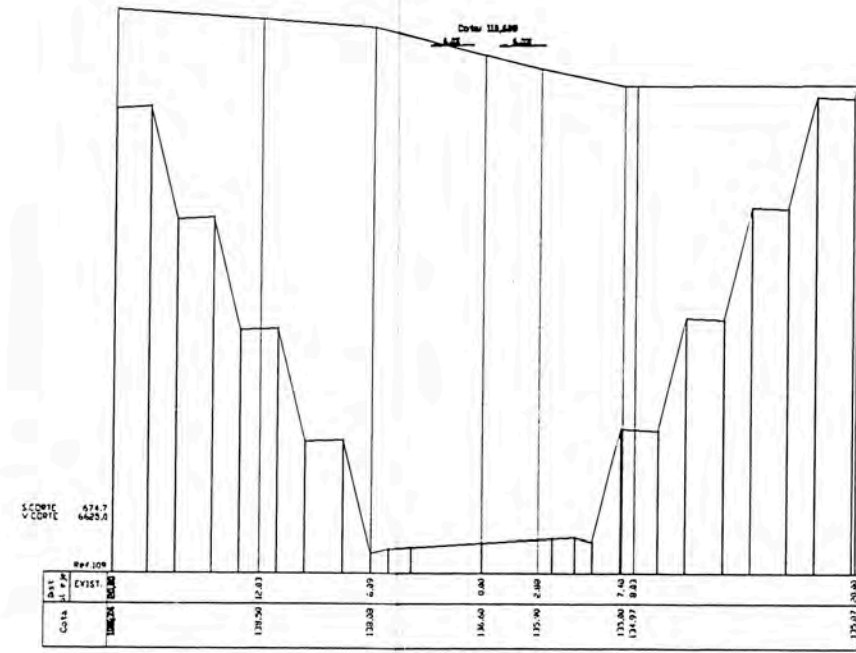
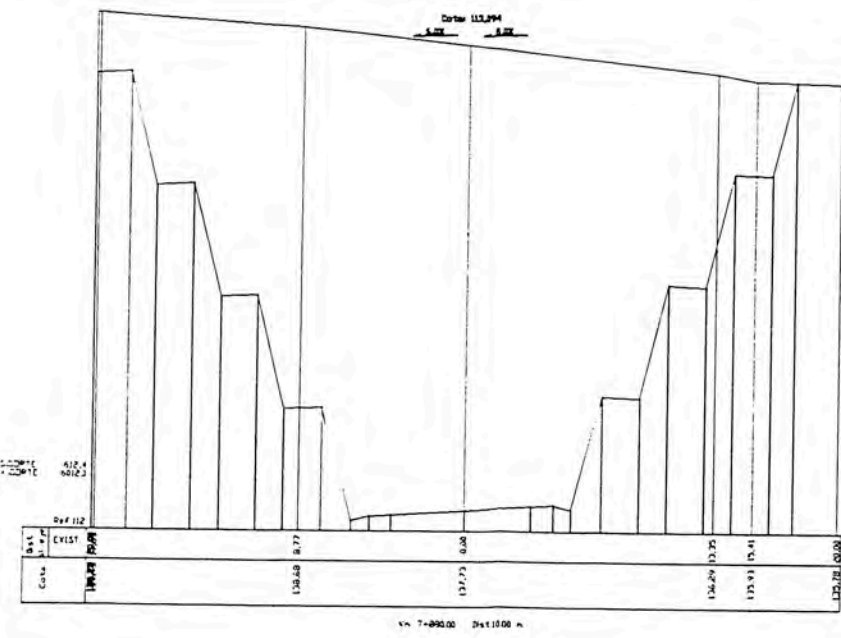
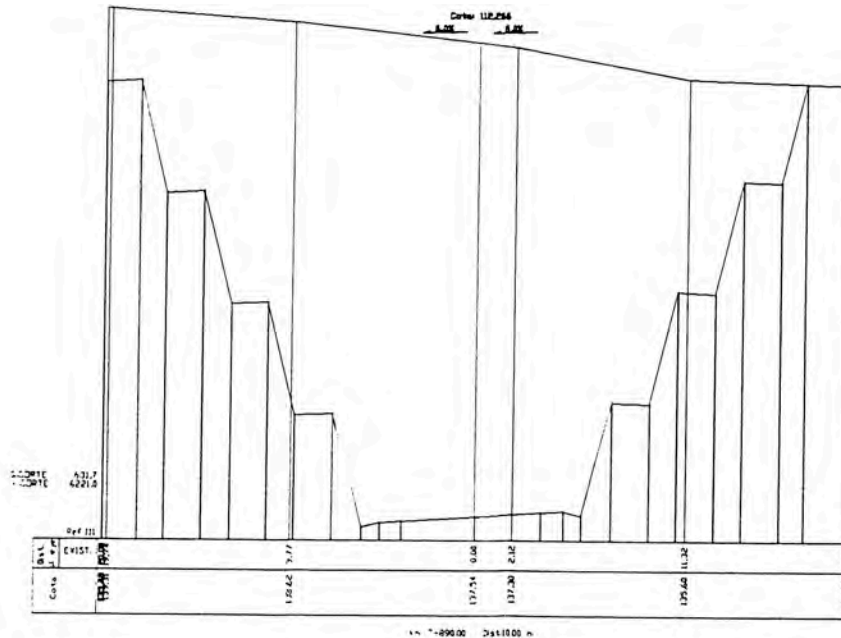
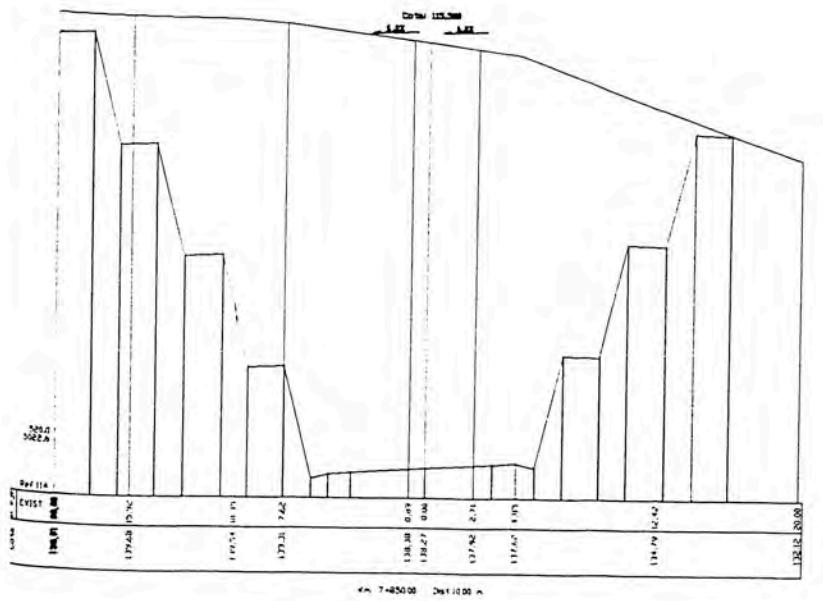
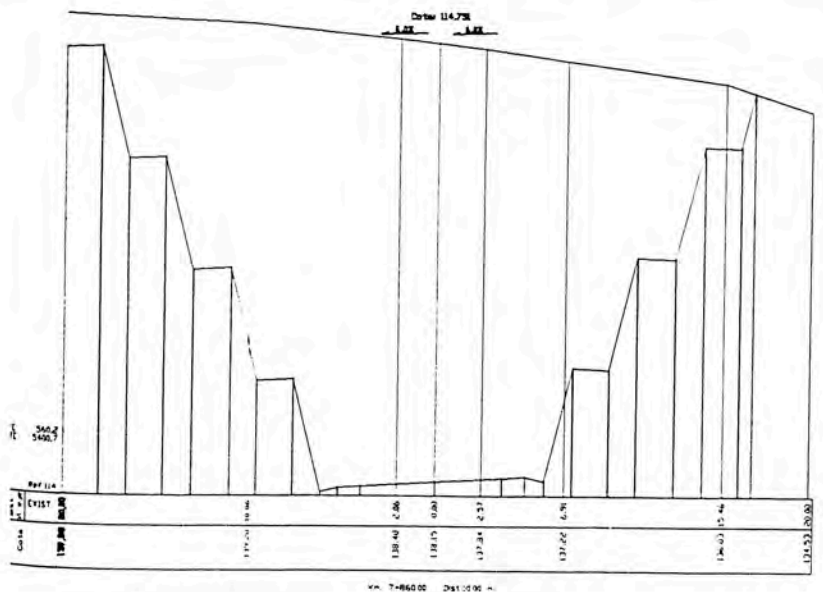
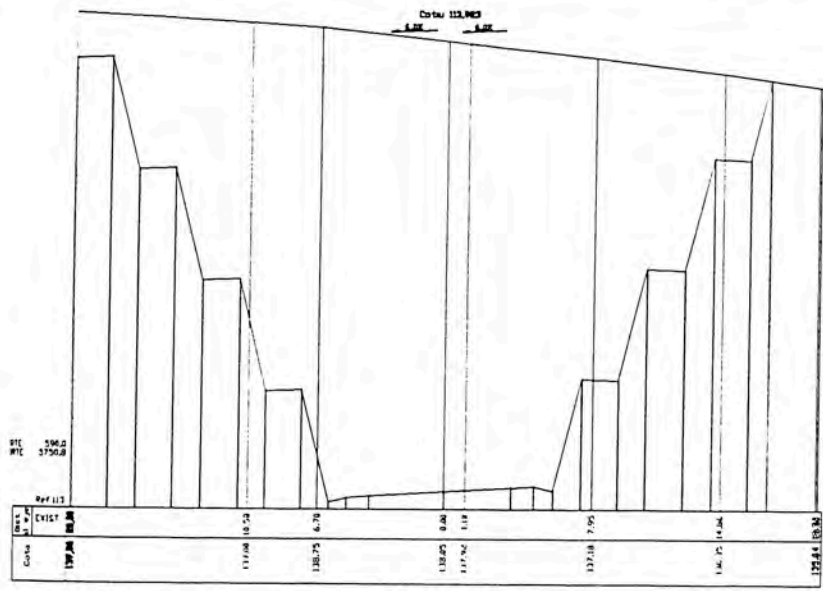
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ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

SECTOR: MATARANI - MOLLEDO
 SECCIONES TRANSVERSALES
 km. 7+770.00 - km. 7+840.00

ESCALA: 1:400
 FECHA: DICIEMBRE 2000
 PT - 039



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Diseñó: Rom. A. Lopez U
 Dibujó: A.L.U.
 Verificó: Ing. G. Barrantes B
 Presentó: Rom. A. Lopez U

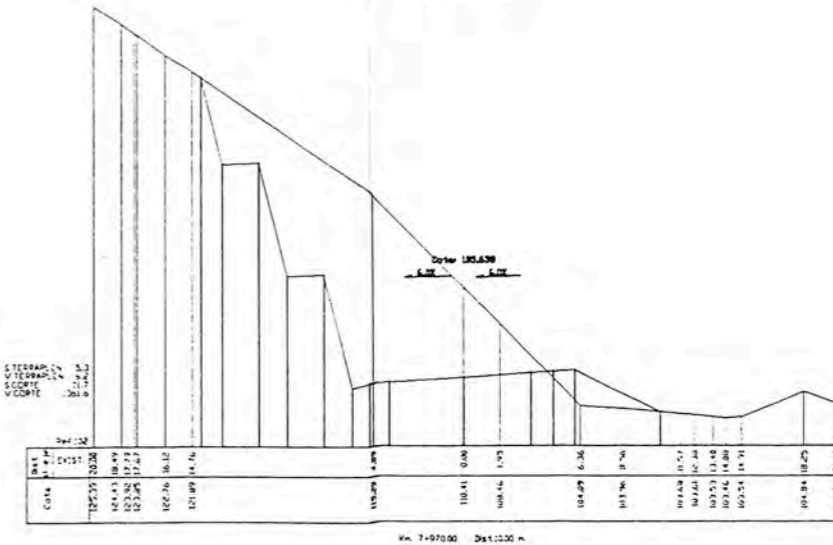
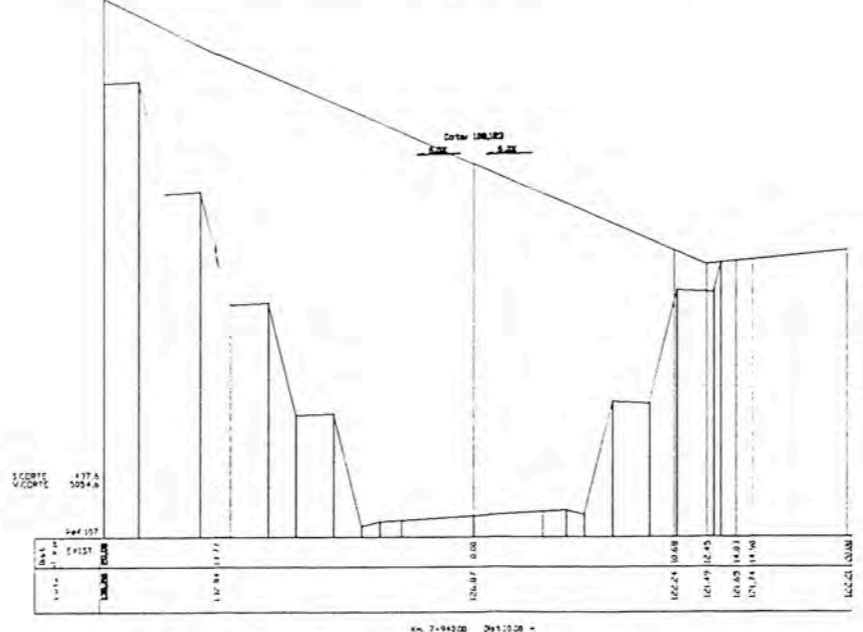
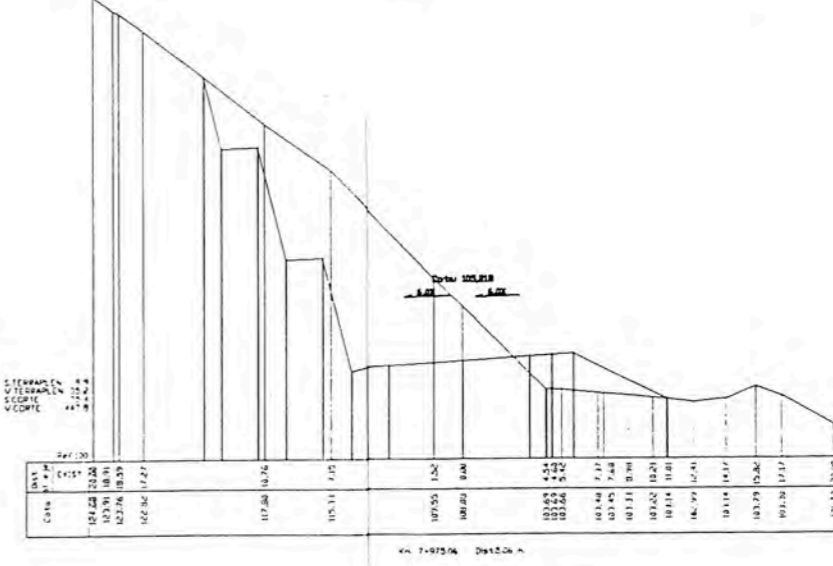
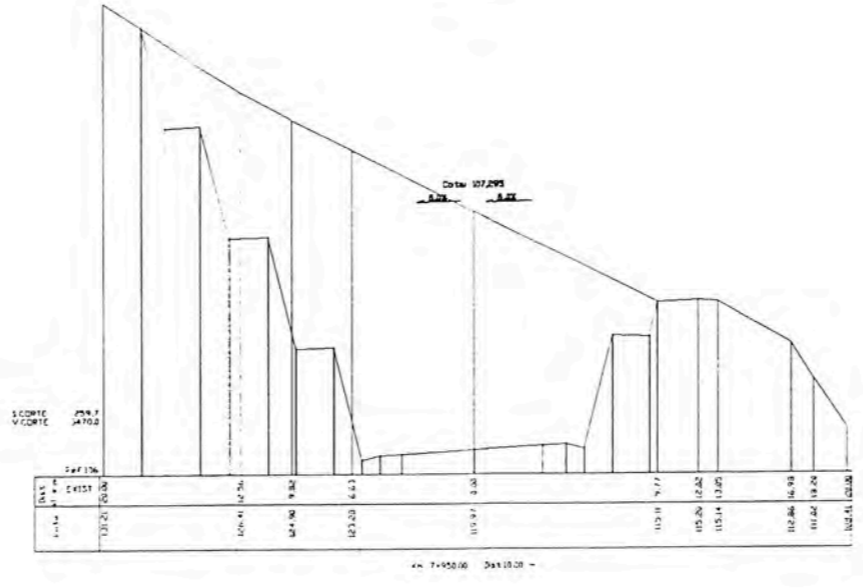
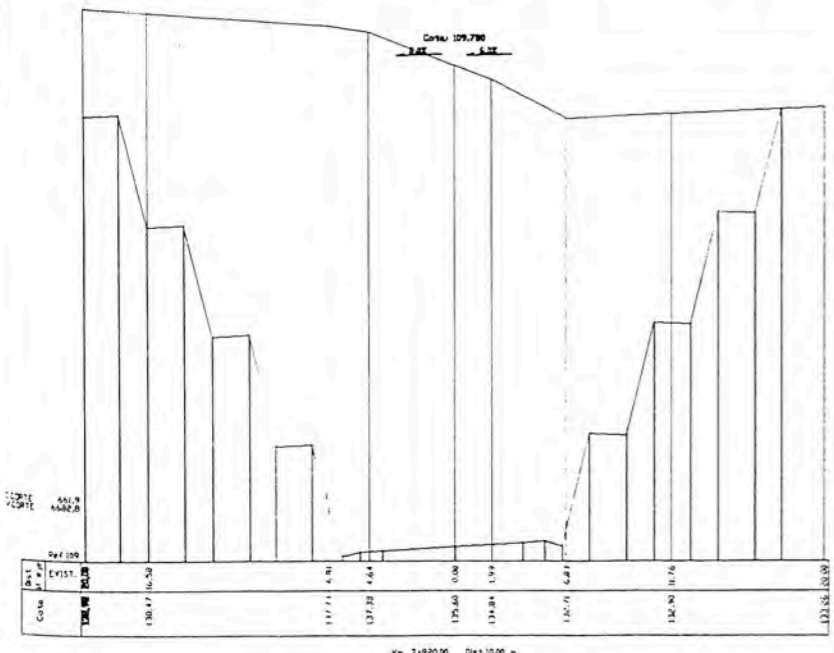
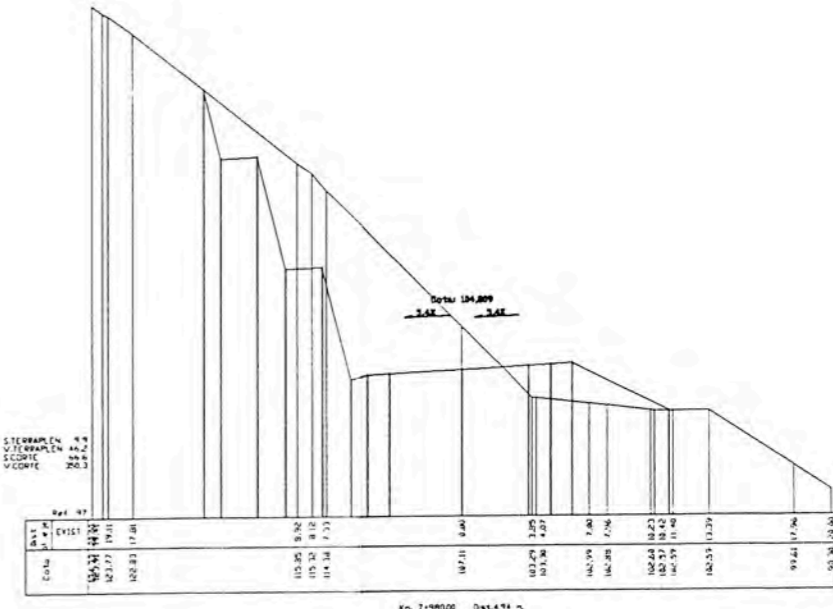
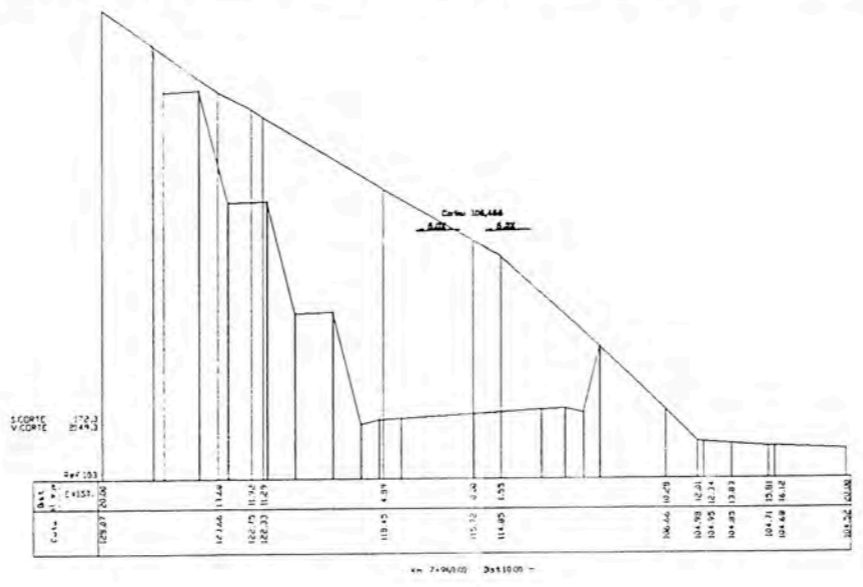
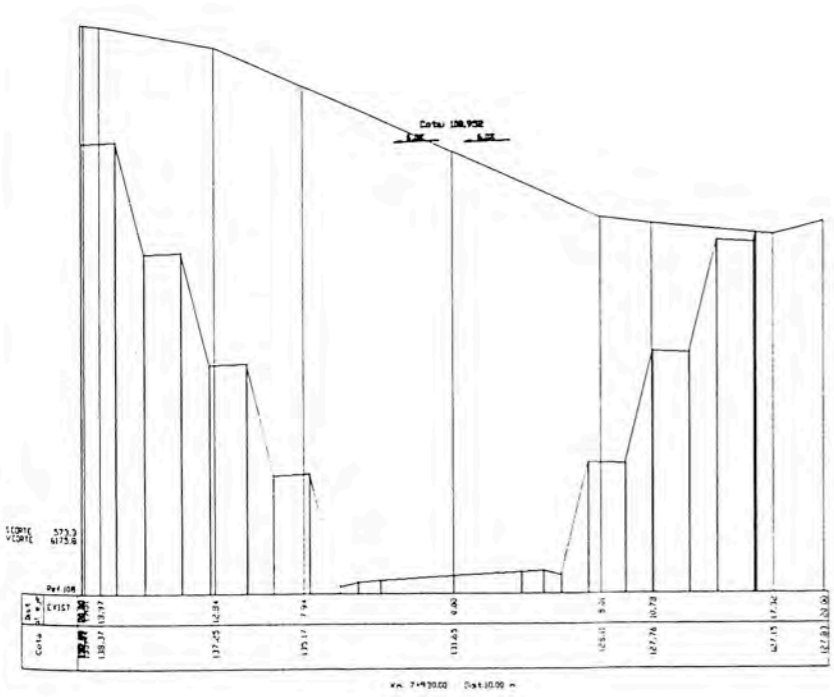
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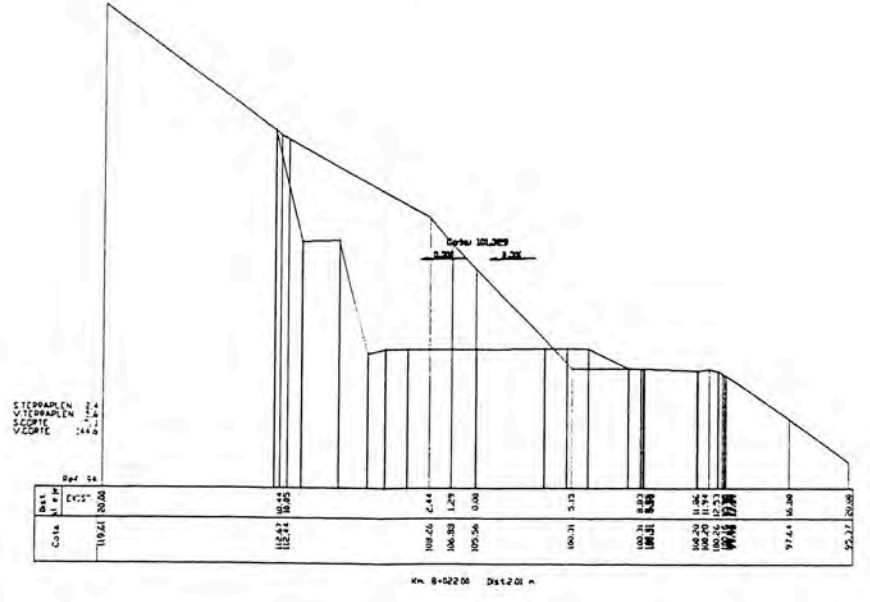
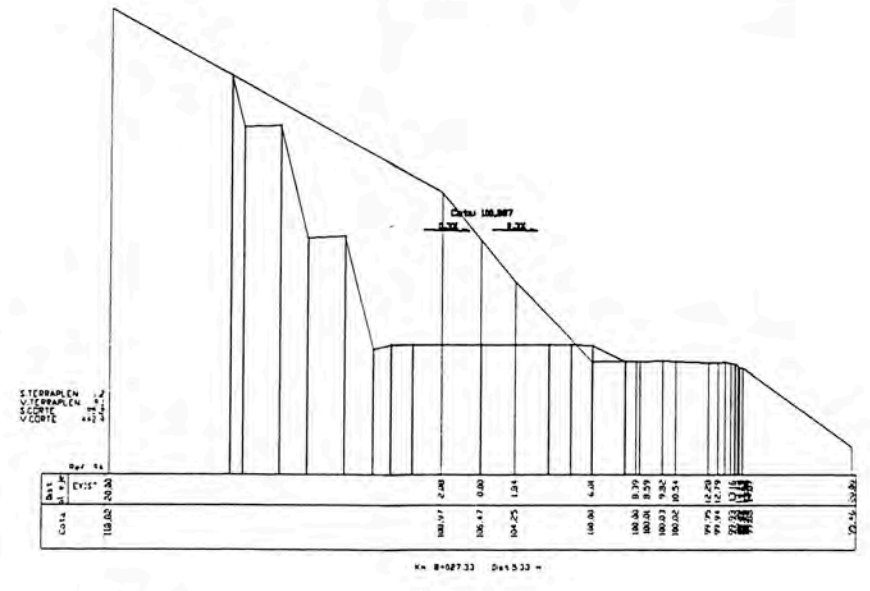
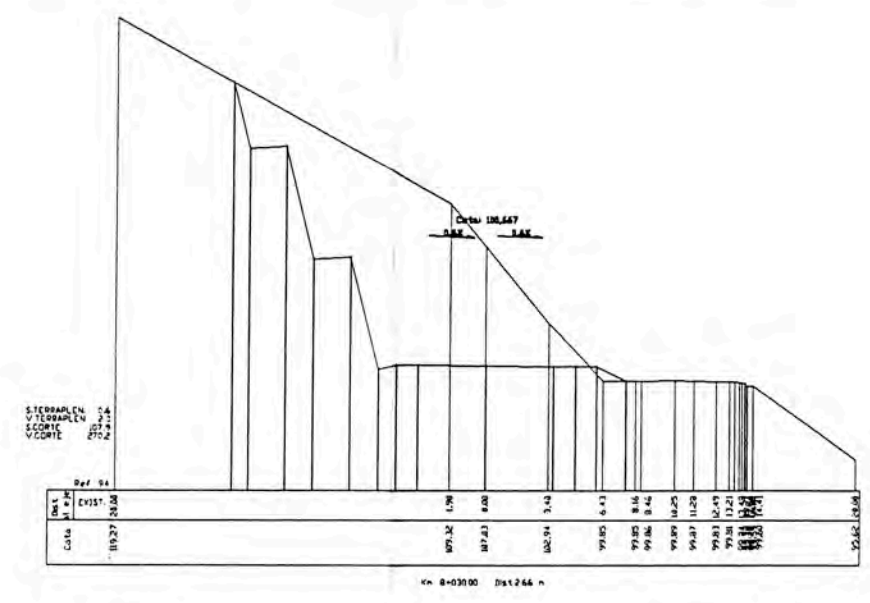
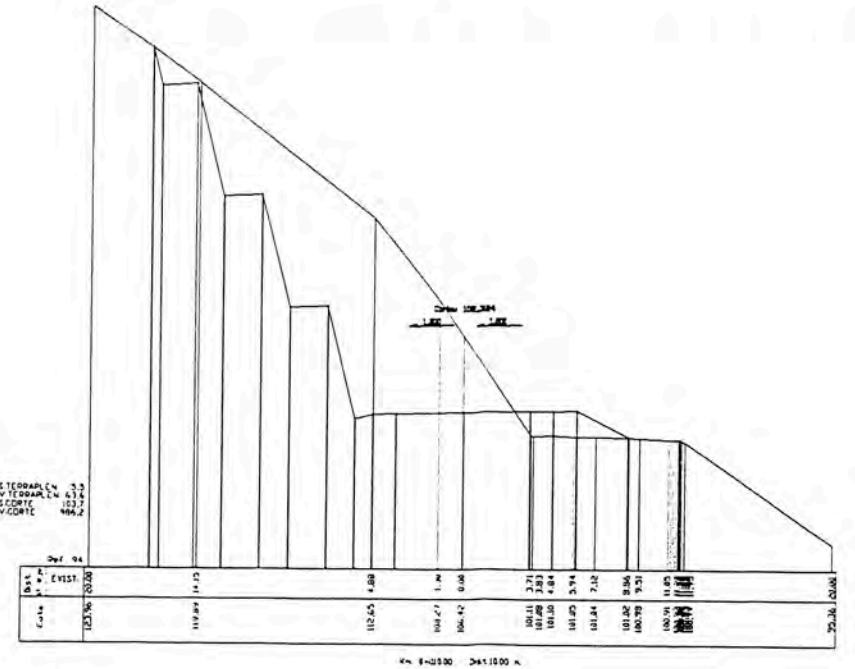
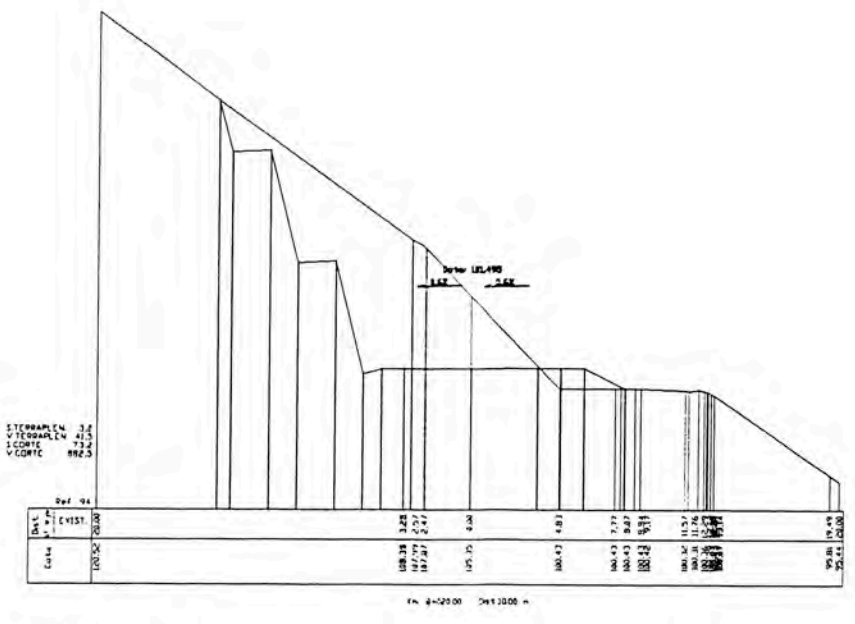
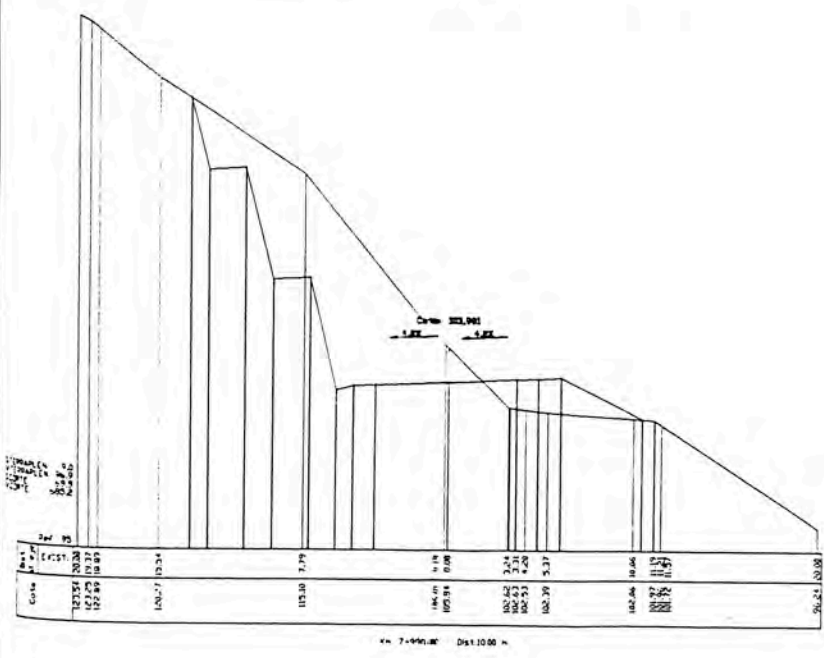
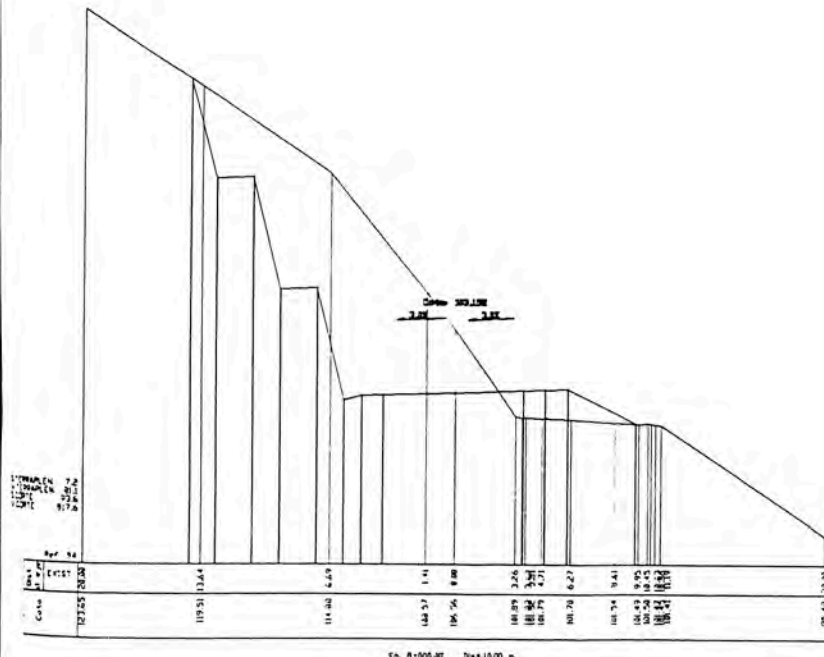
ESTUDIOS DE INGENIERIA
 PARA EL DISEÑO GEOMETRICO
 DE LA CARRETERA MATARANI - ILO

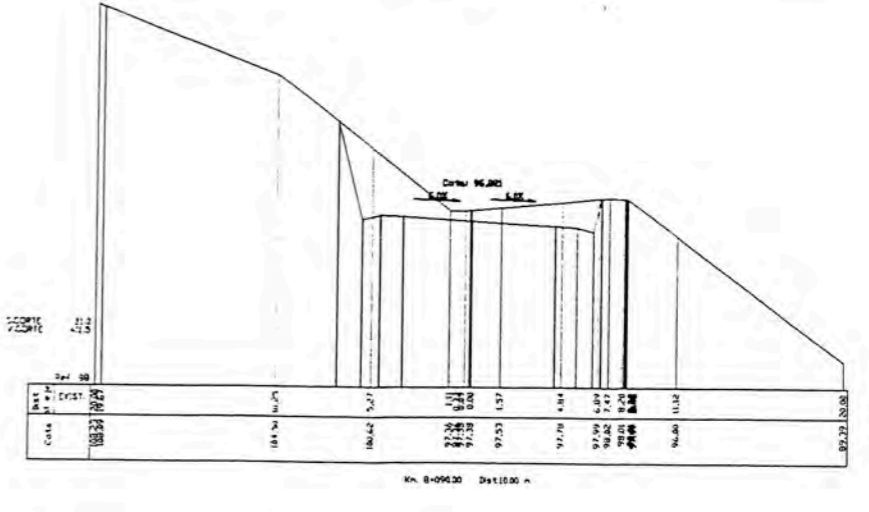
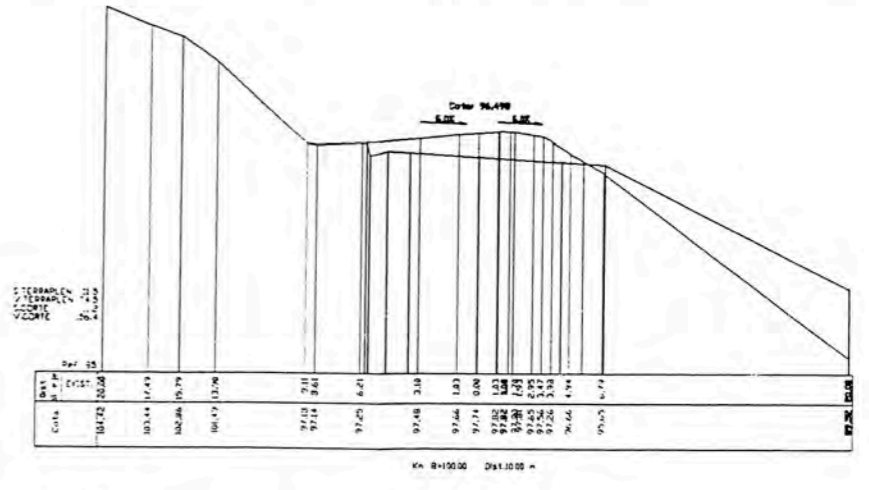
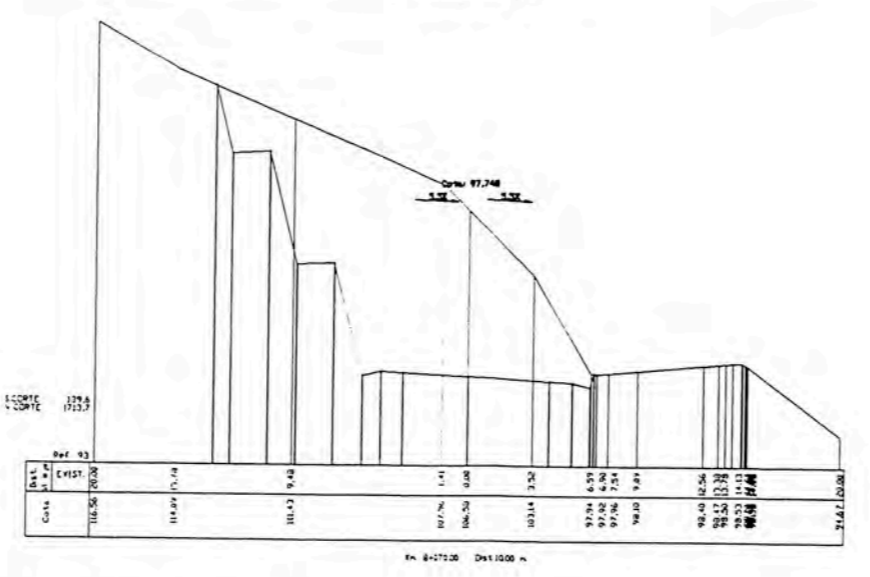
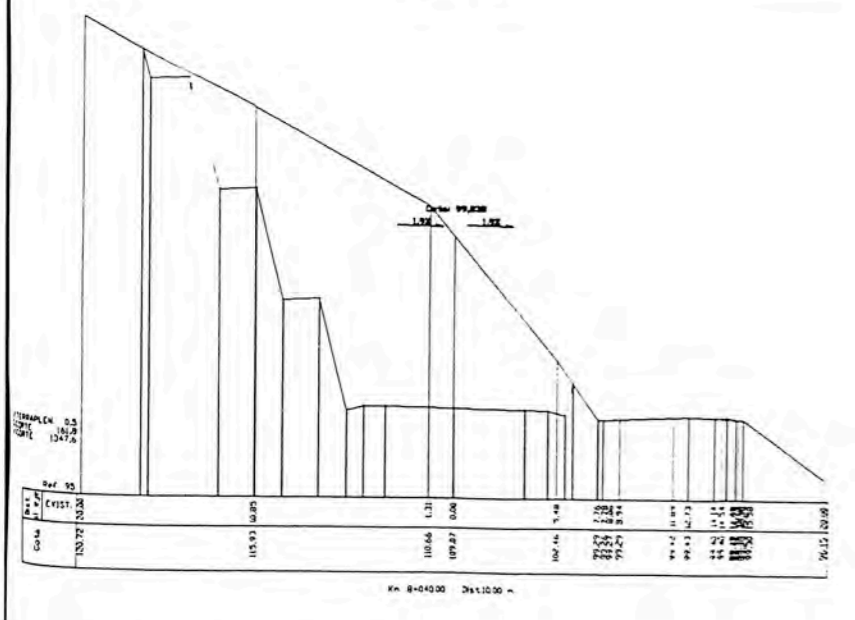
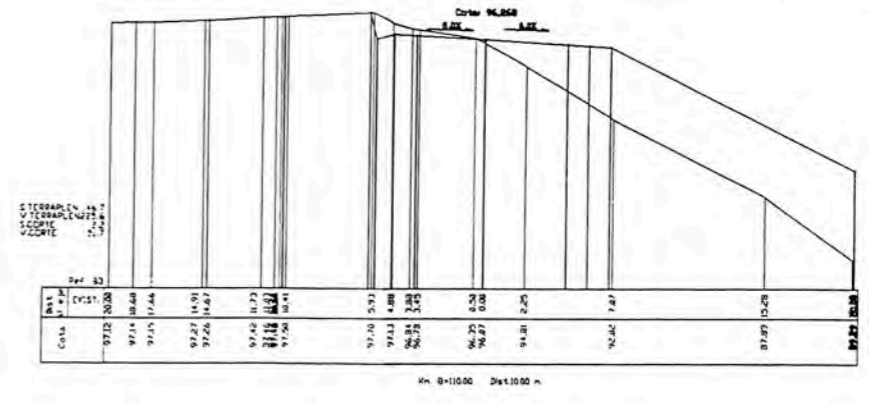
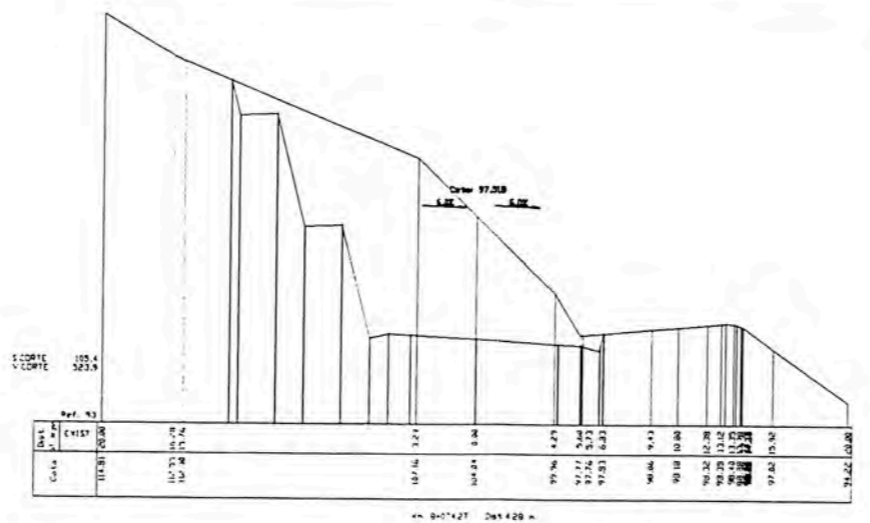
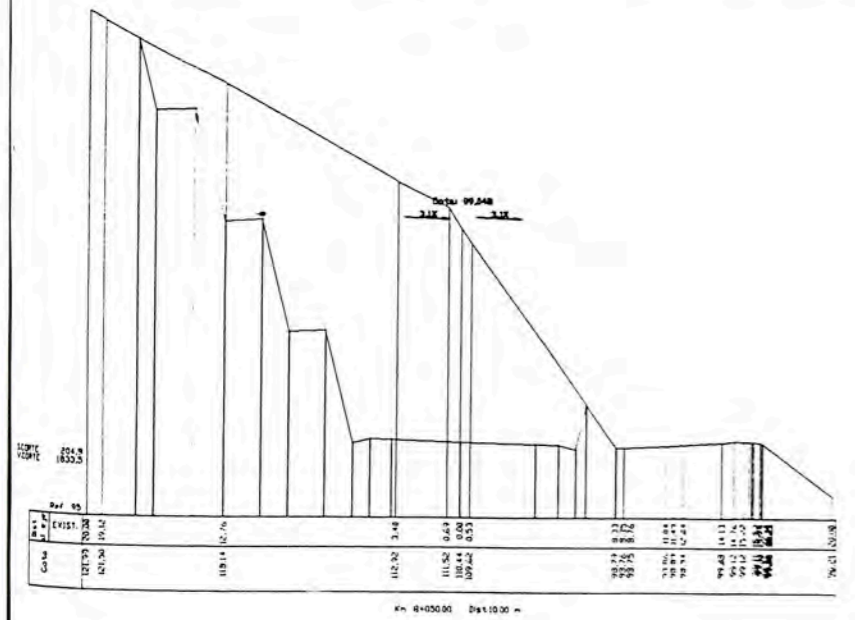
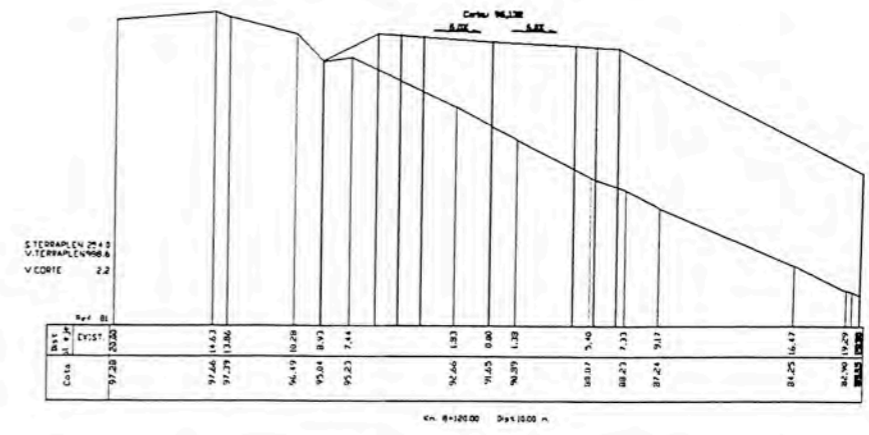
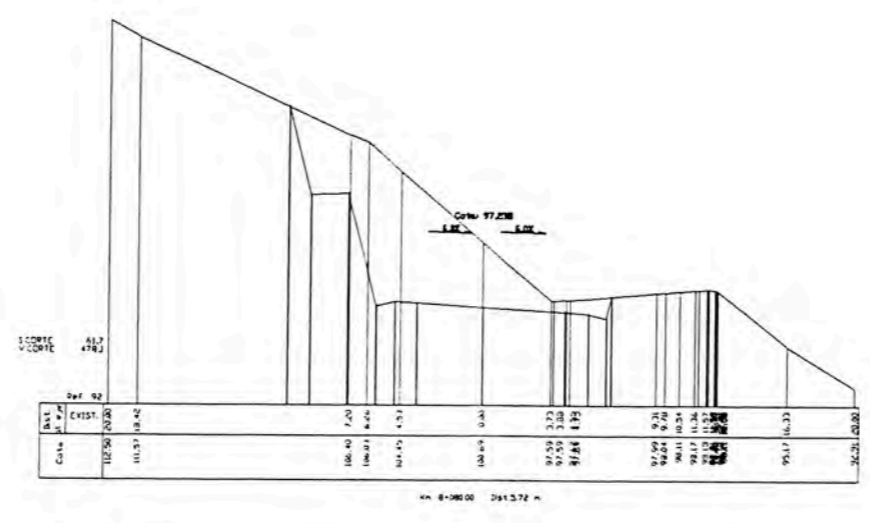
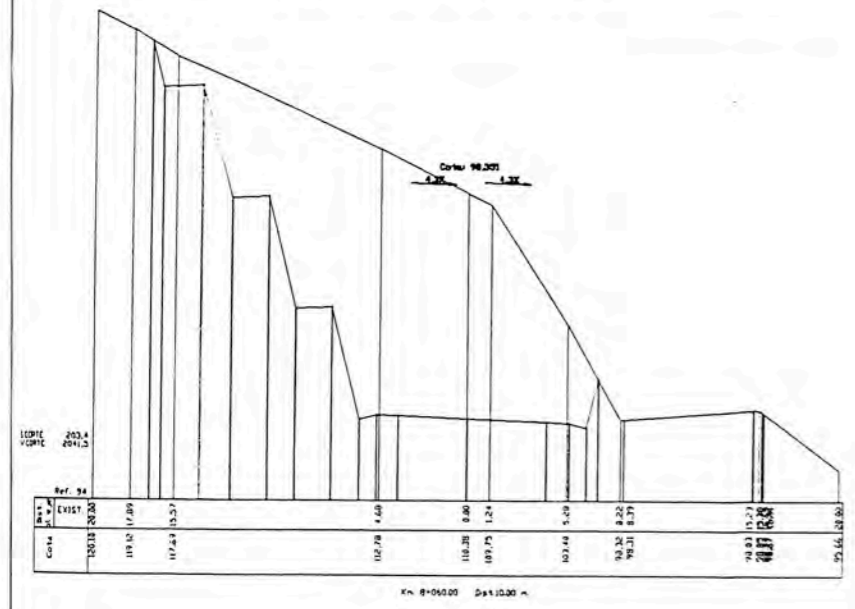
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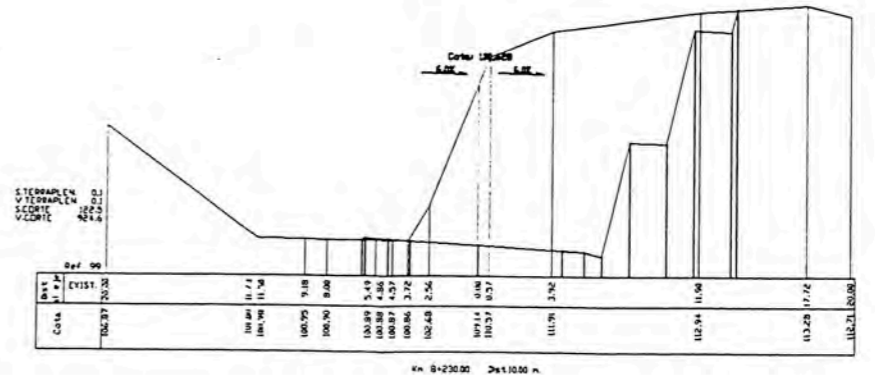
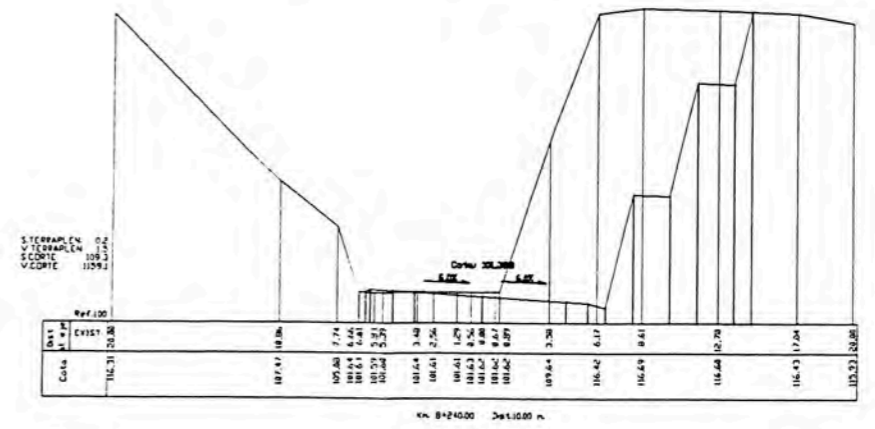
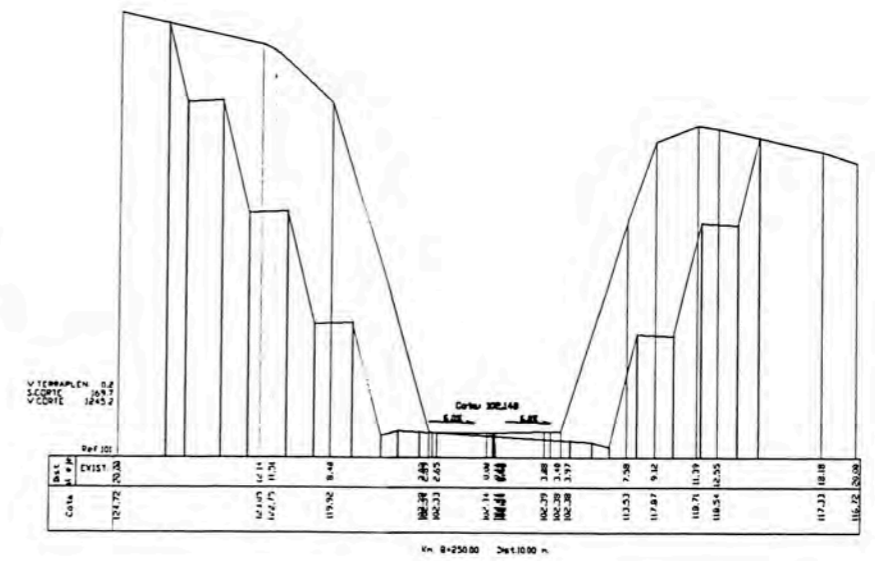
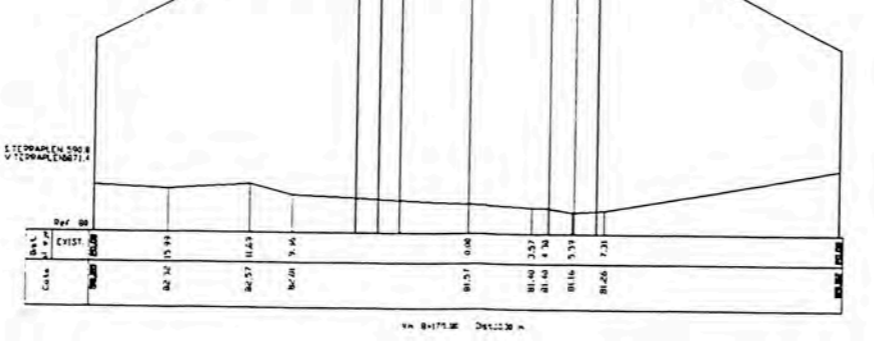
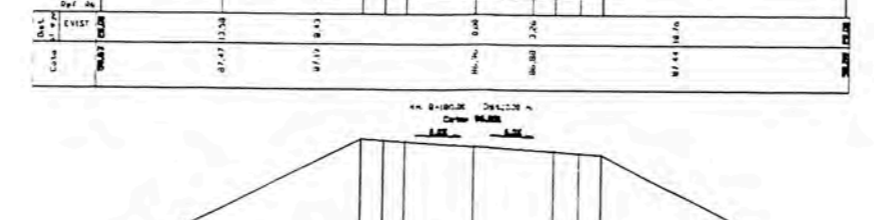
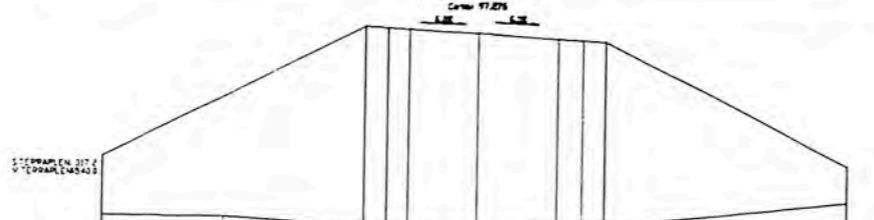
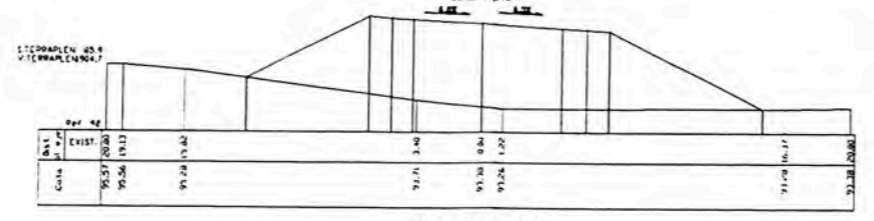
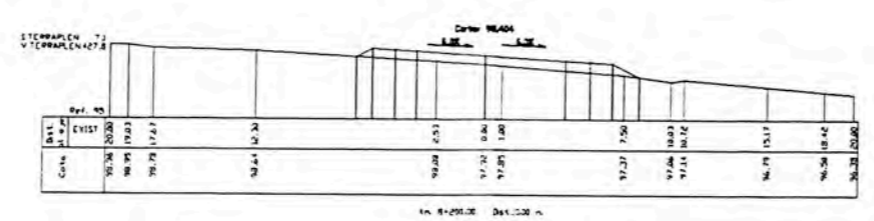
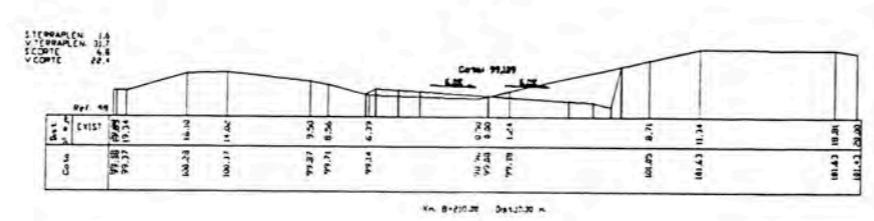
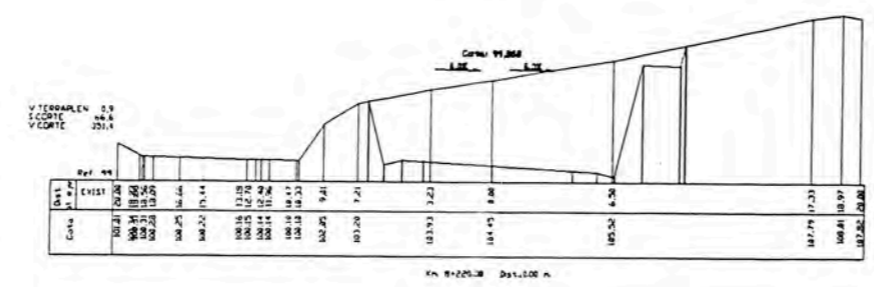
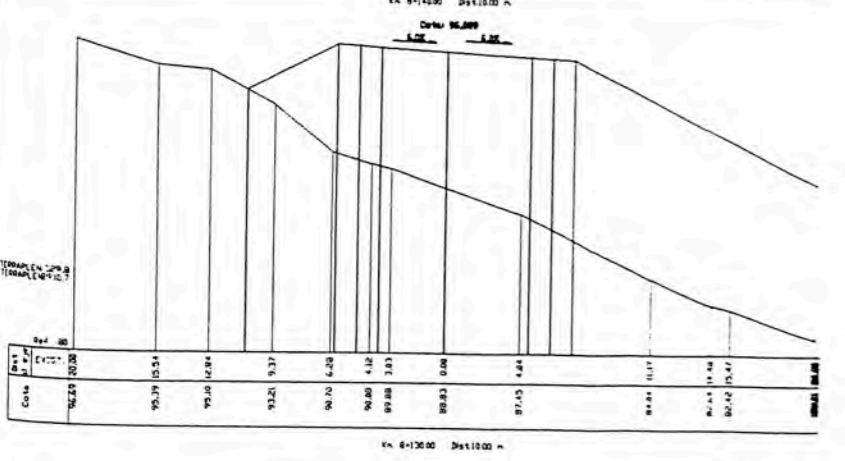
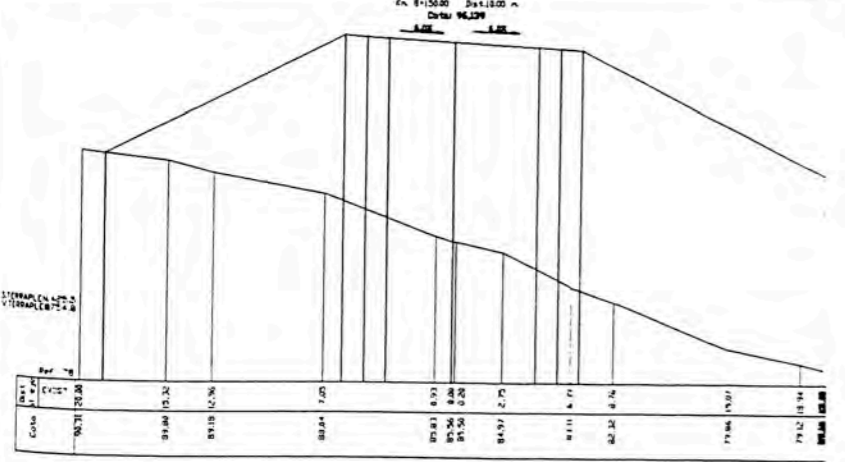
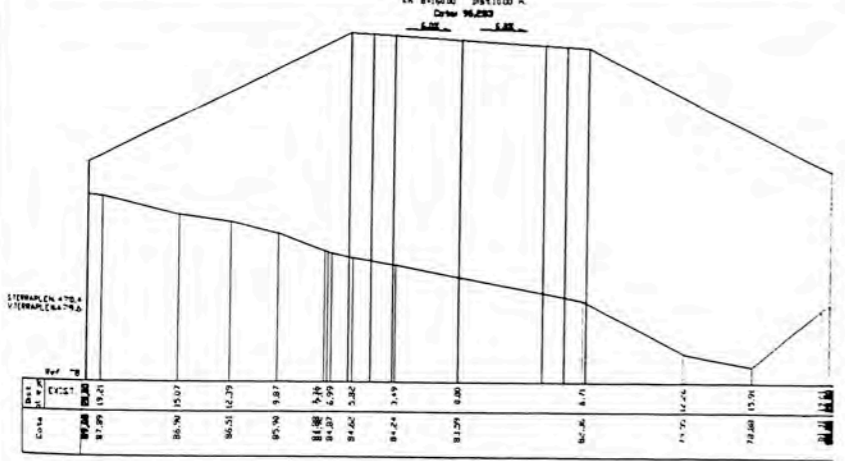
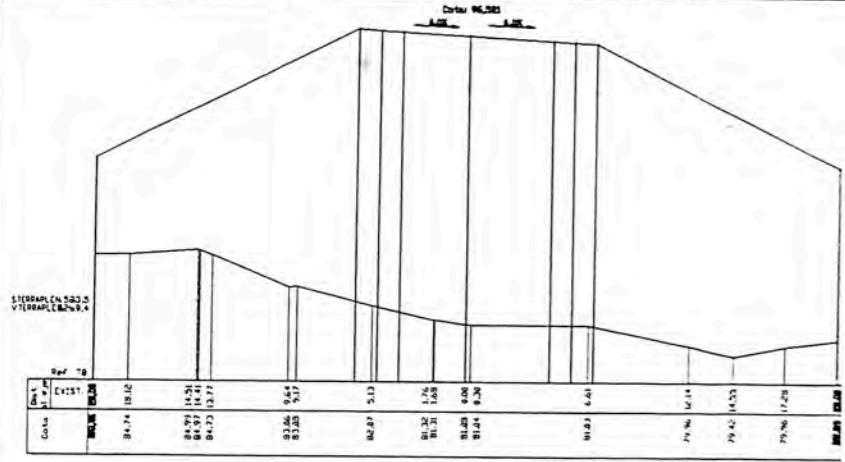
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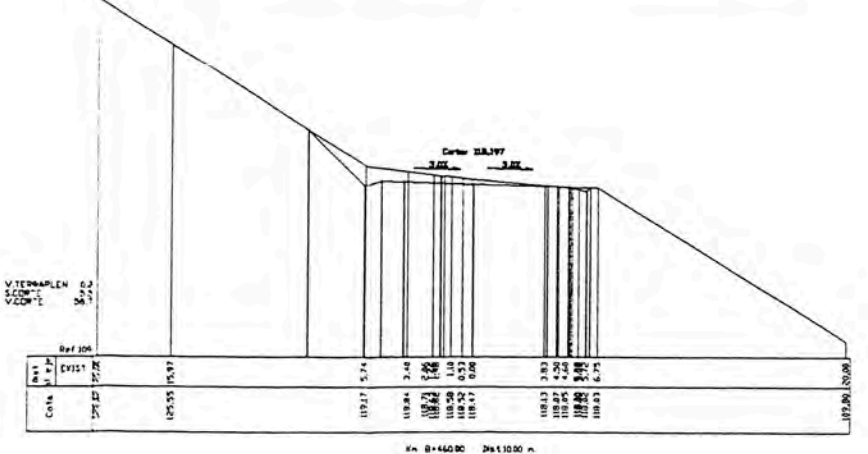
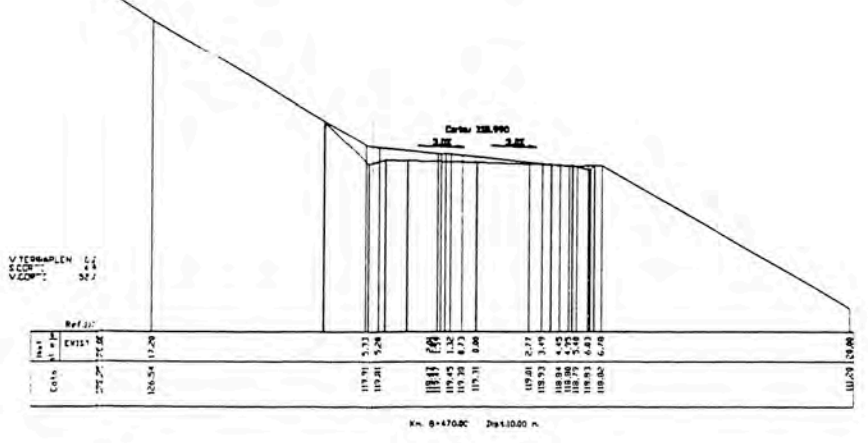
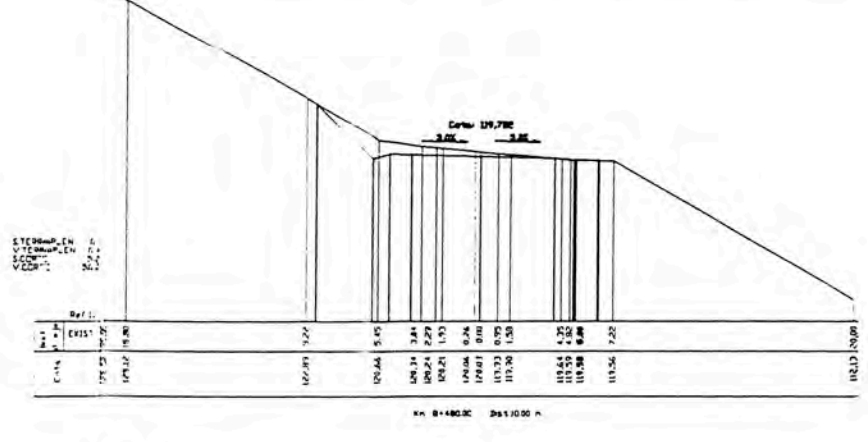
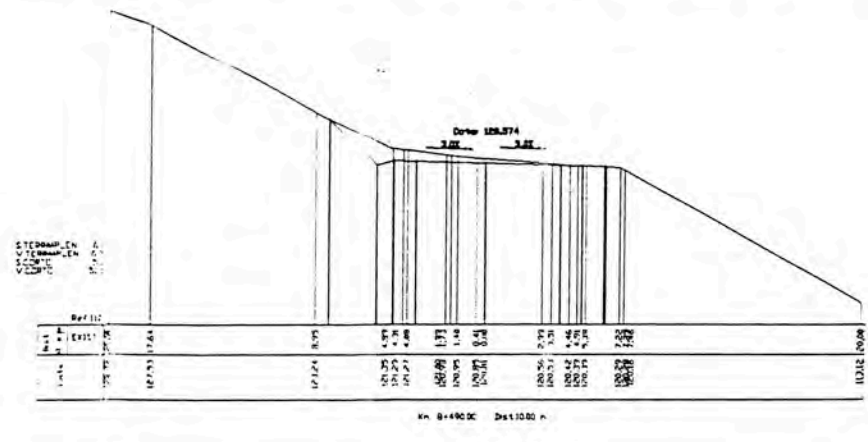
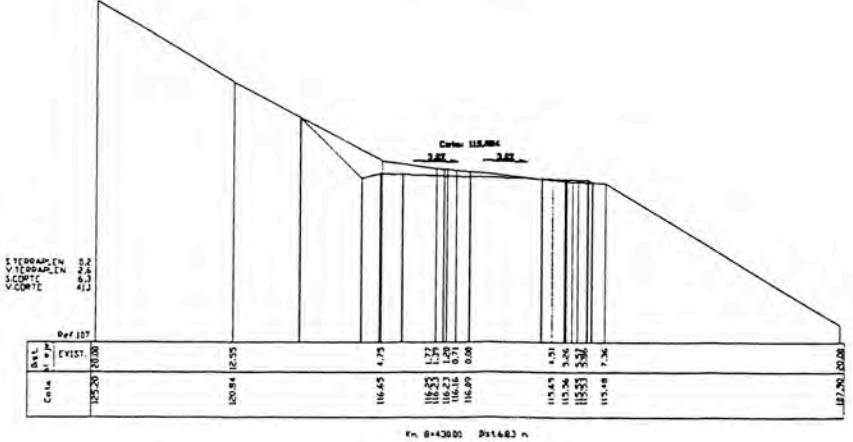
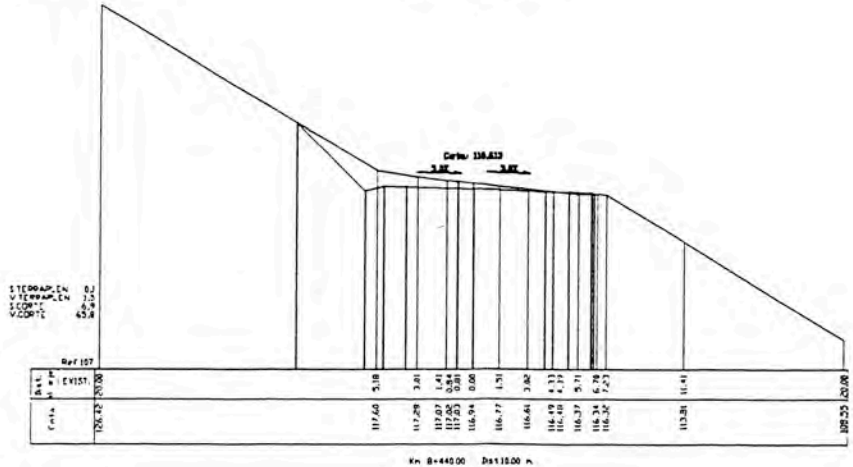
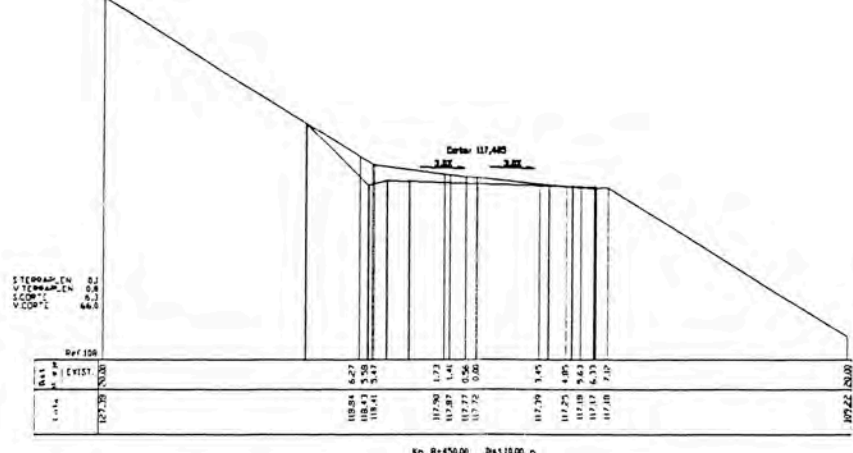
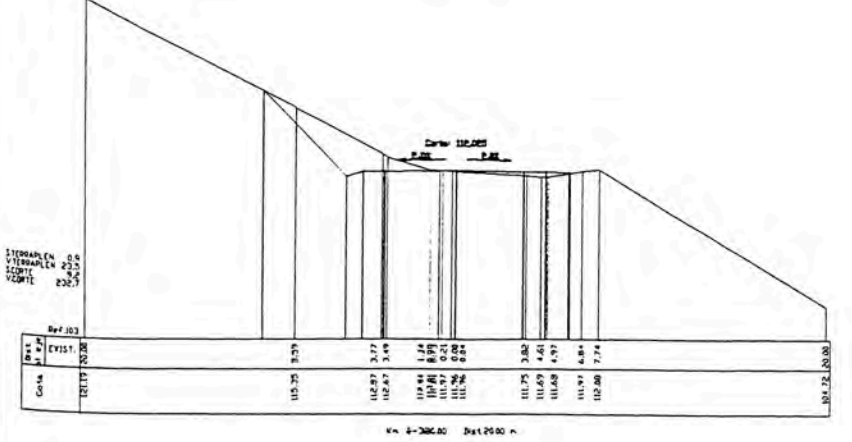
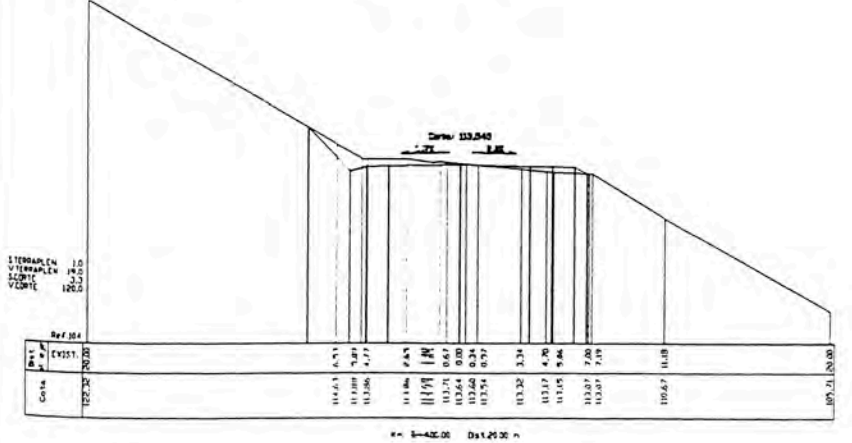
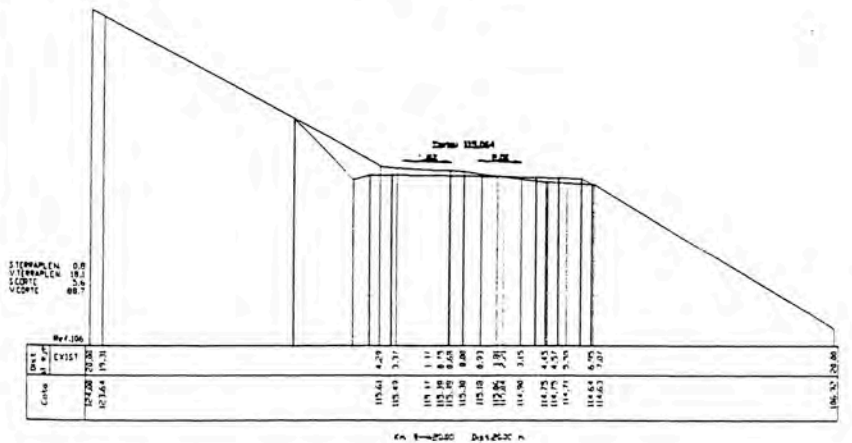
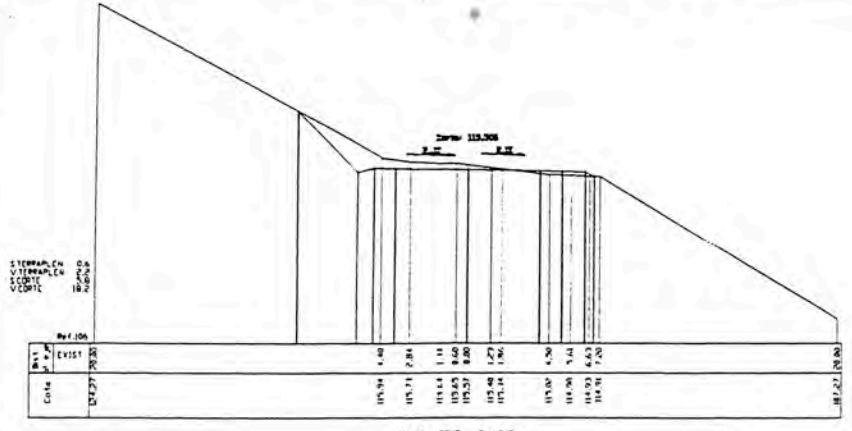


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