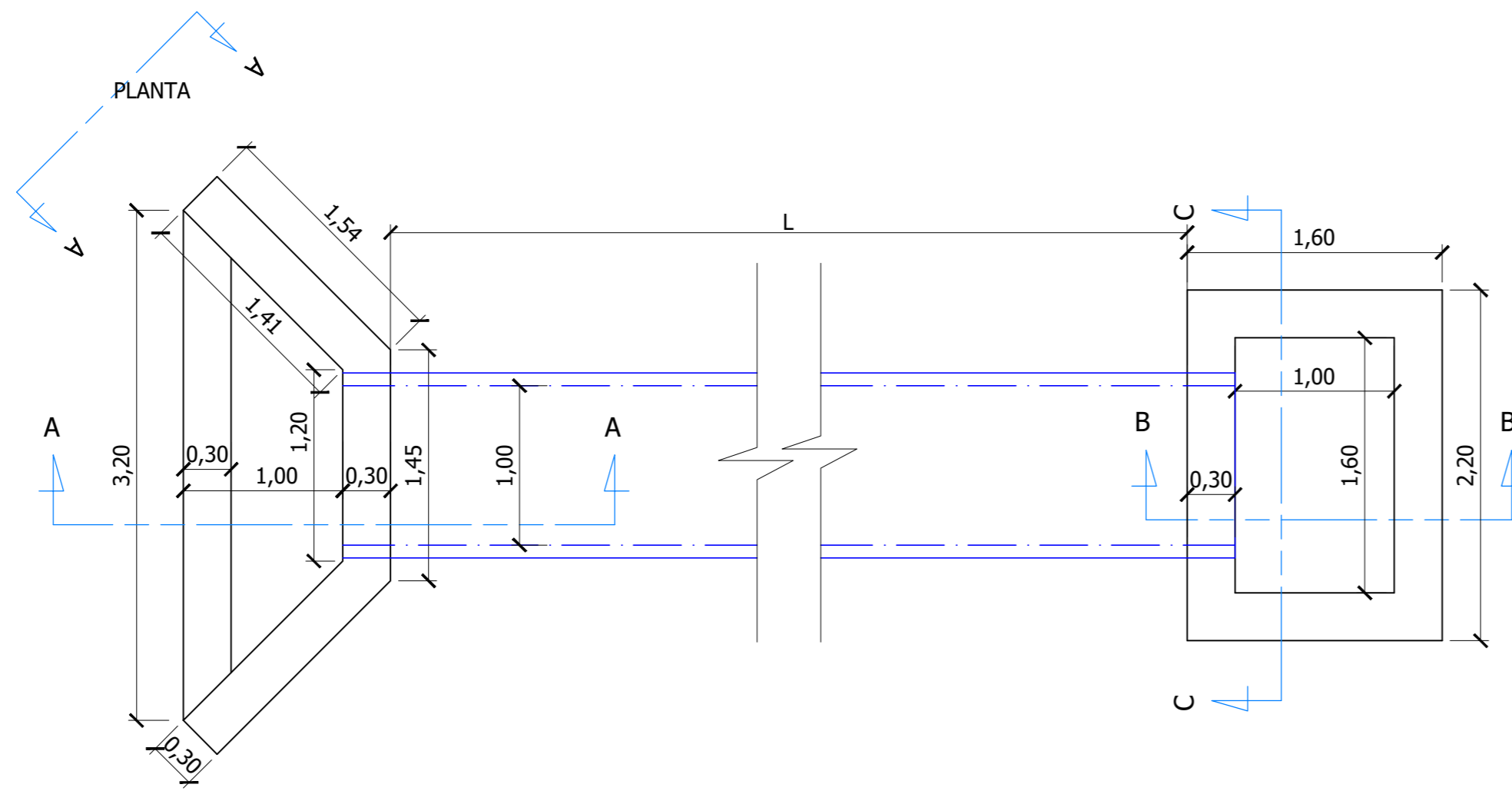
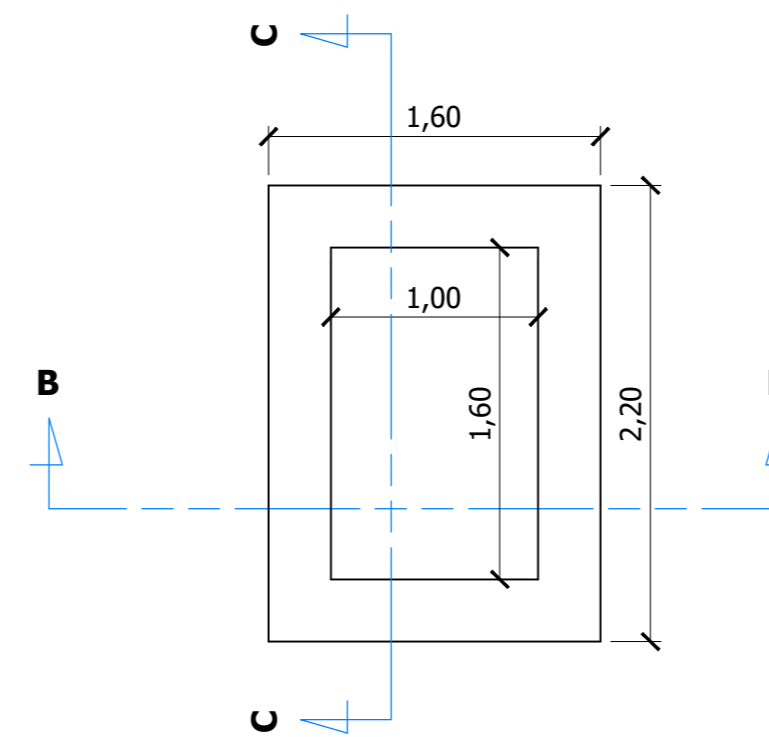


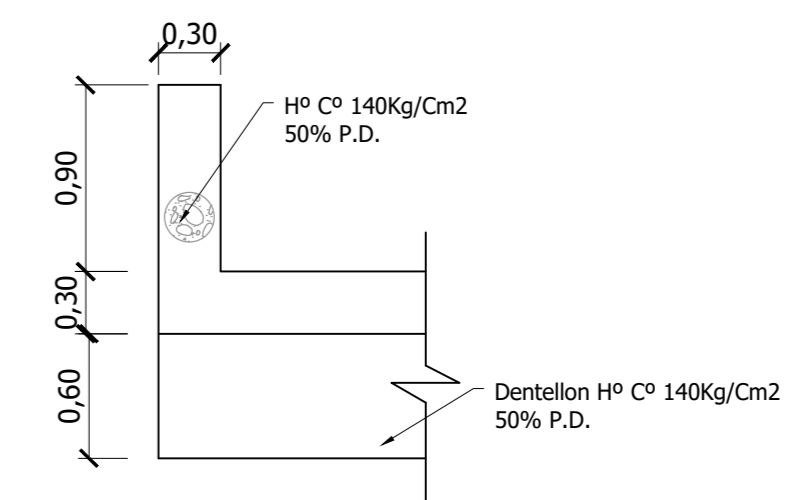
**ALCANTARILLA DE ALIVIO**  
**D = 1000mm (Cajón-Alero)**  
 DIMENSIONES DEL ALERO



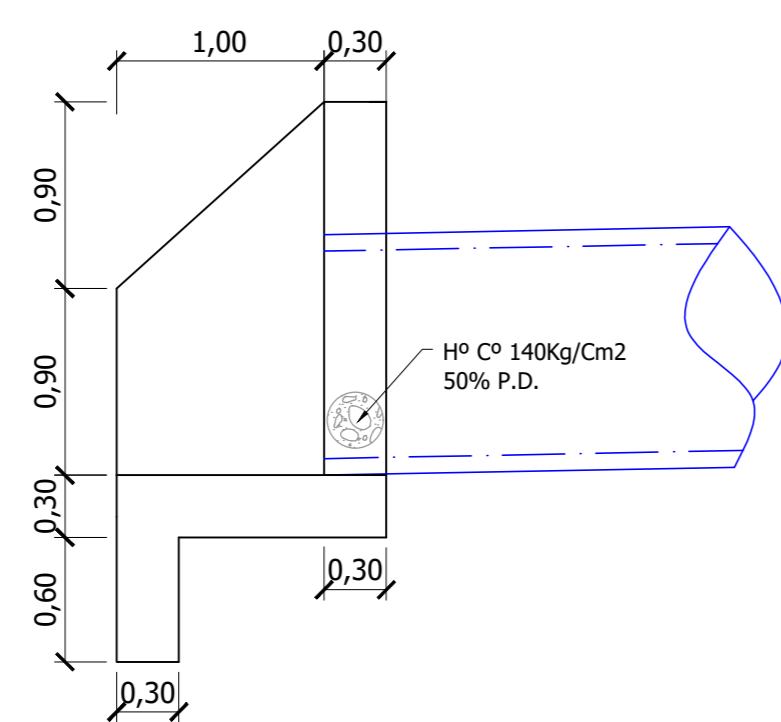
**DIMENSIONES CAJA RECEPTORA**



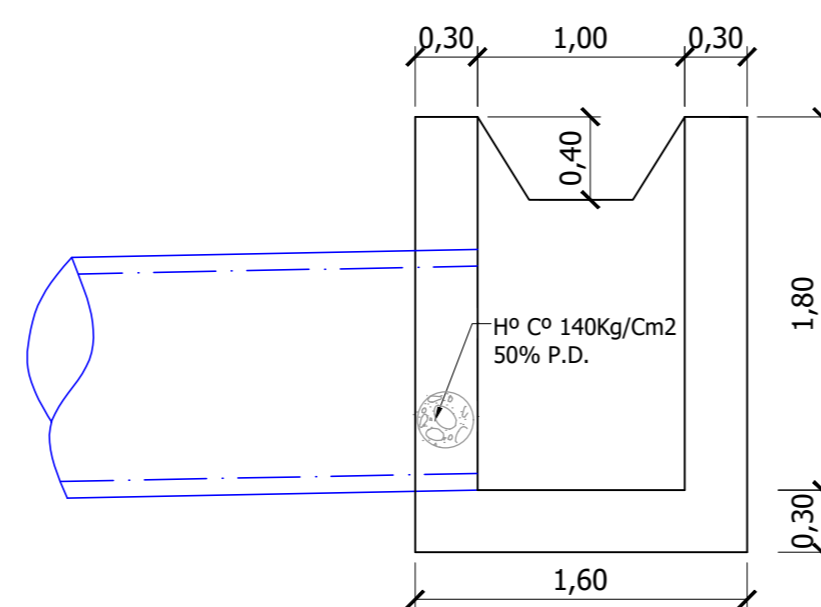
**VISTA A-A**



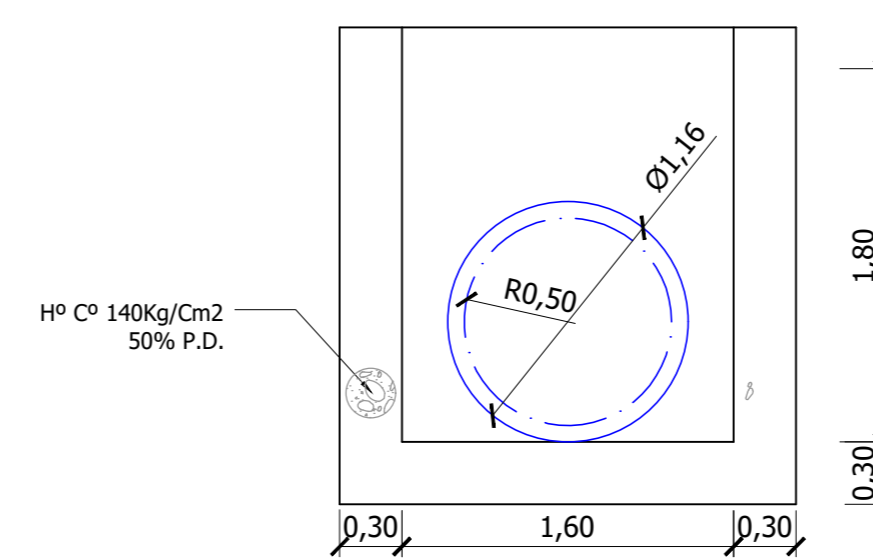
**CORTE A-A**



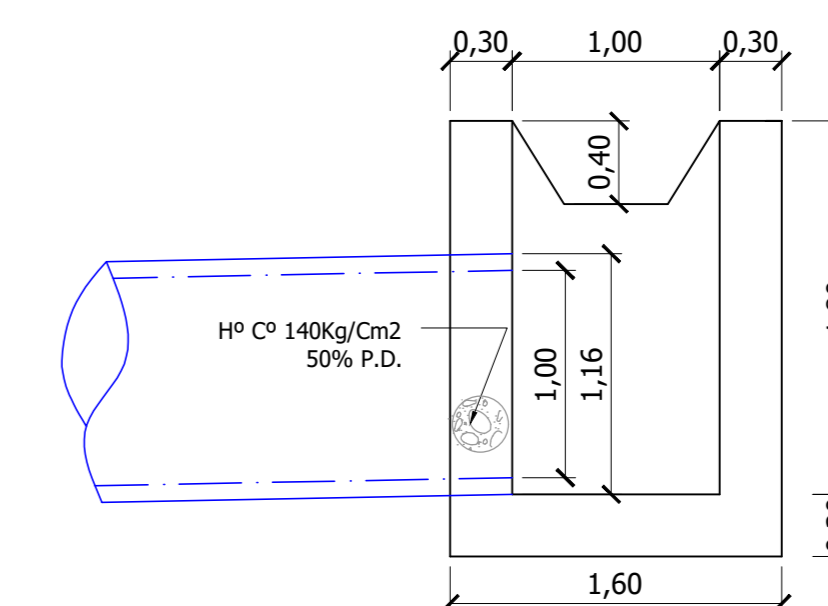
**CORTE B-B**



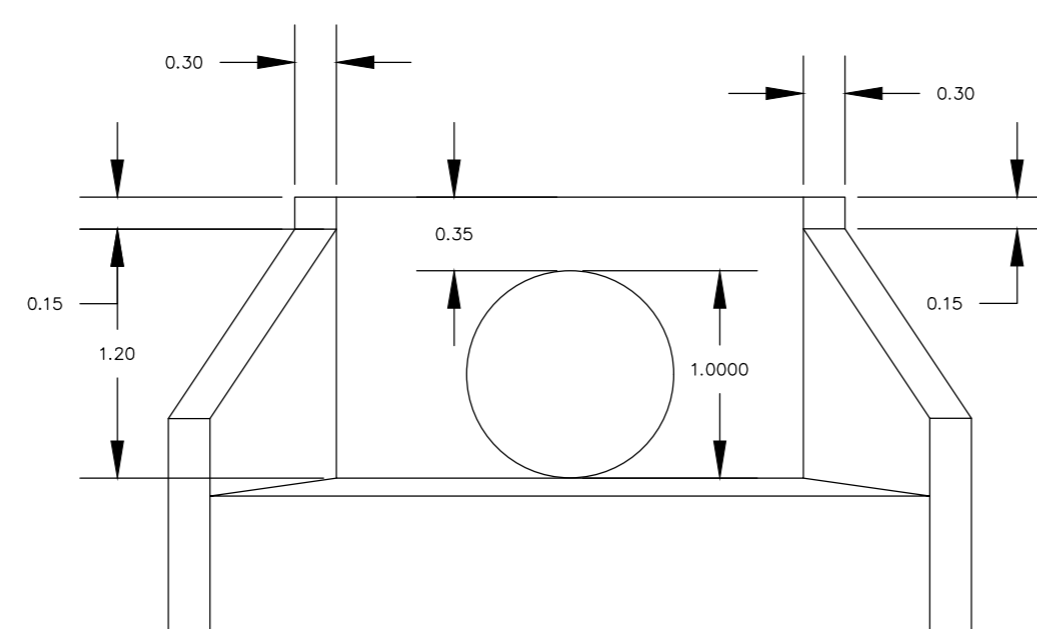
**CORTE C-C**



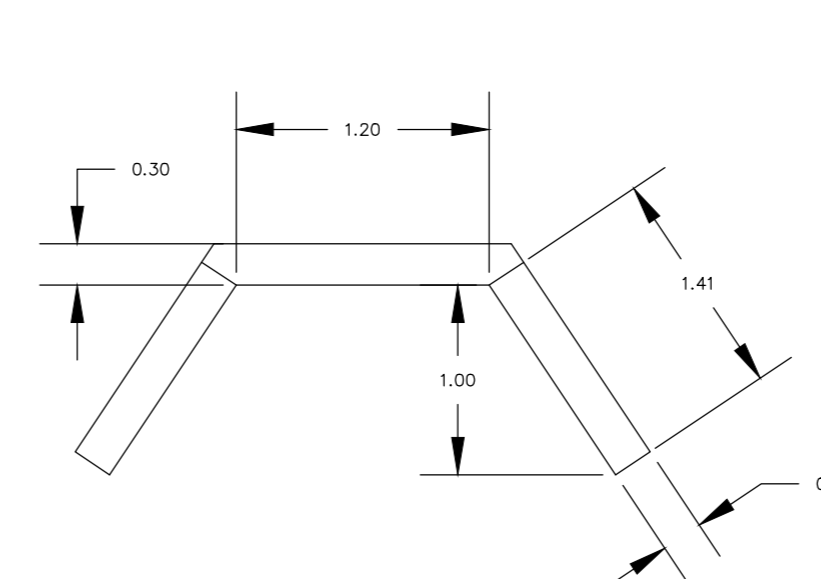
**CORTE B-B**



**VISTA FRONTAL DEL ALERO**

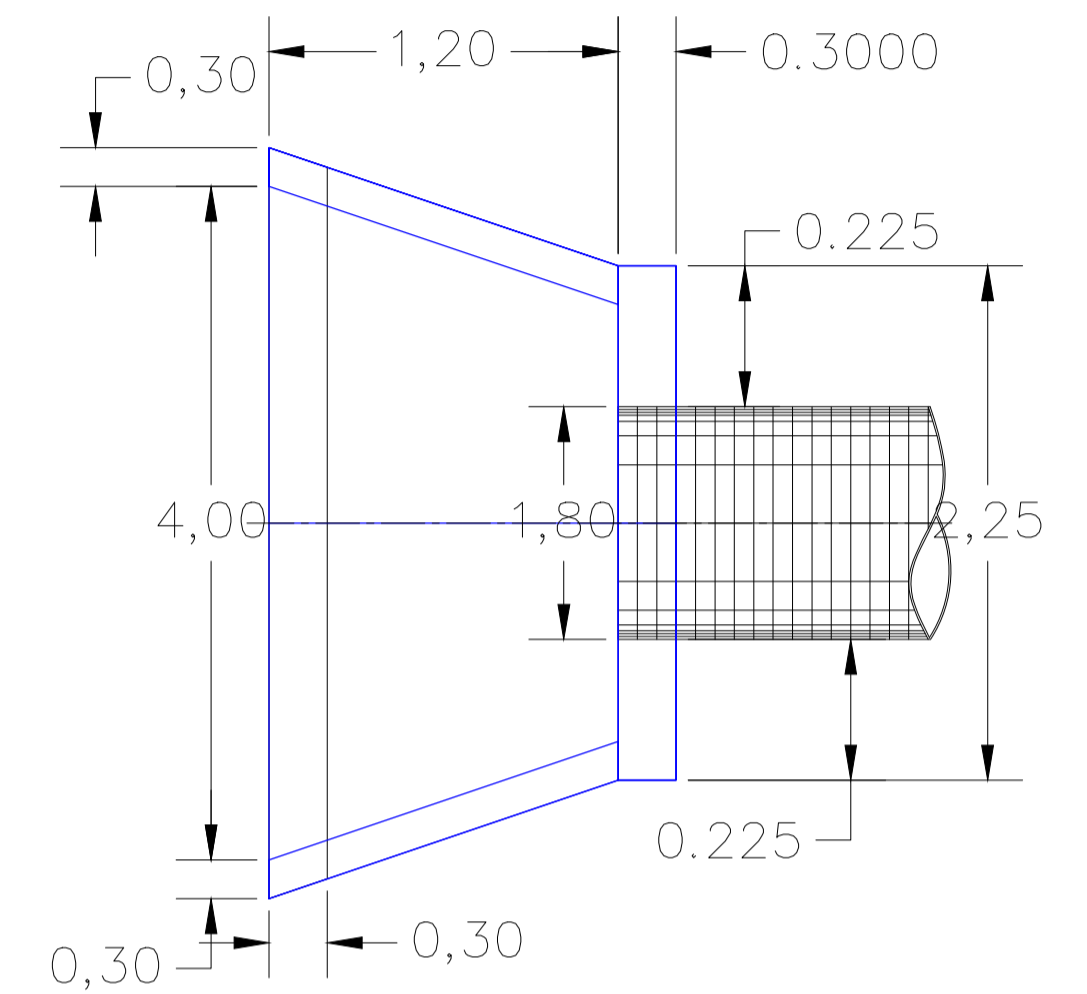
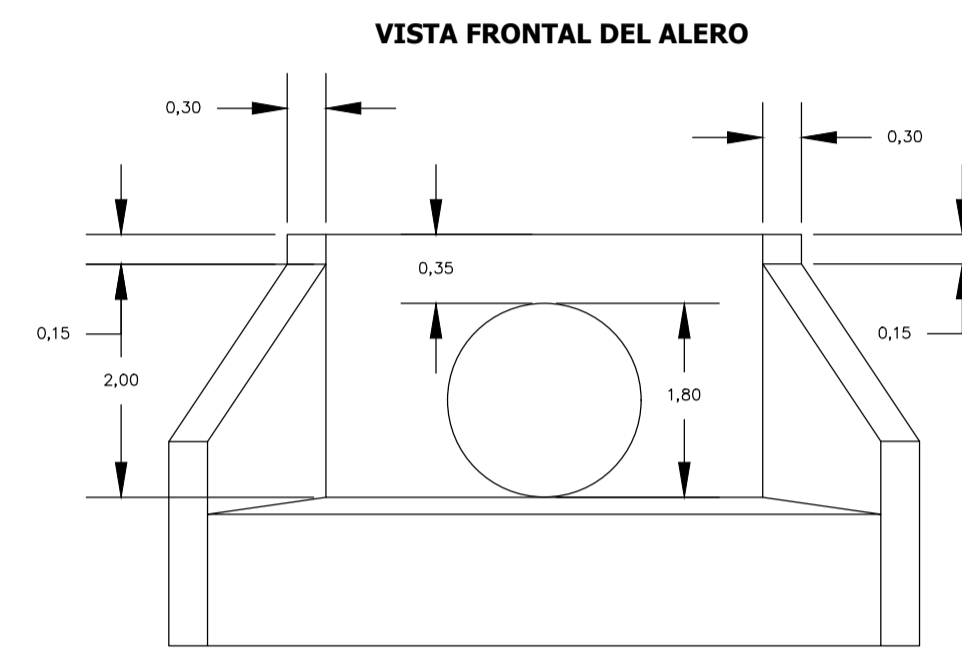
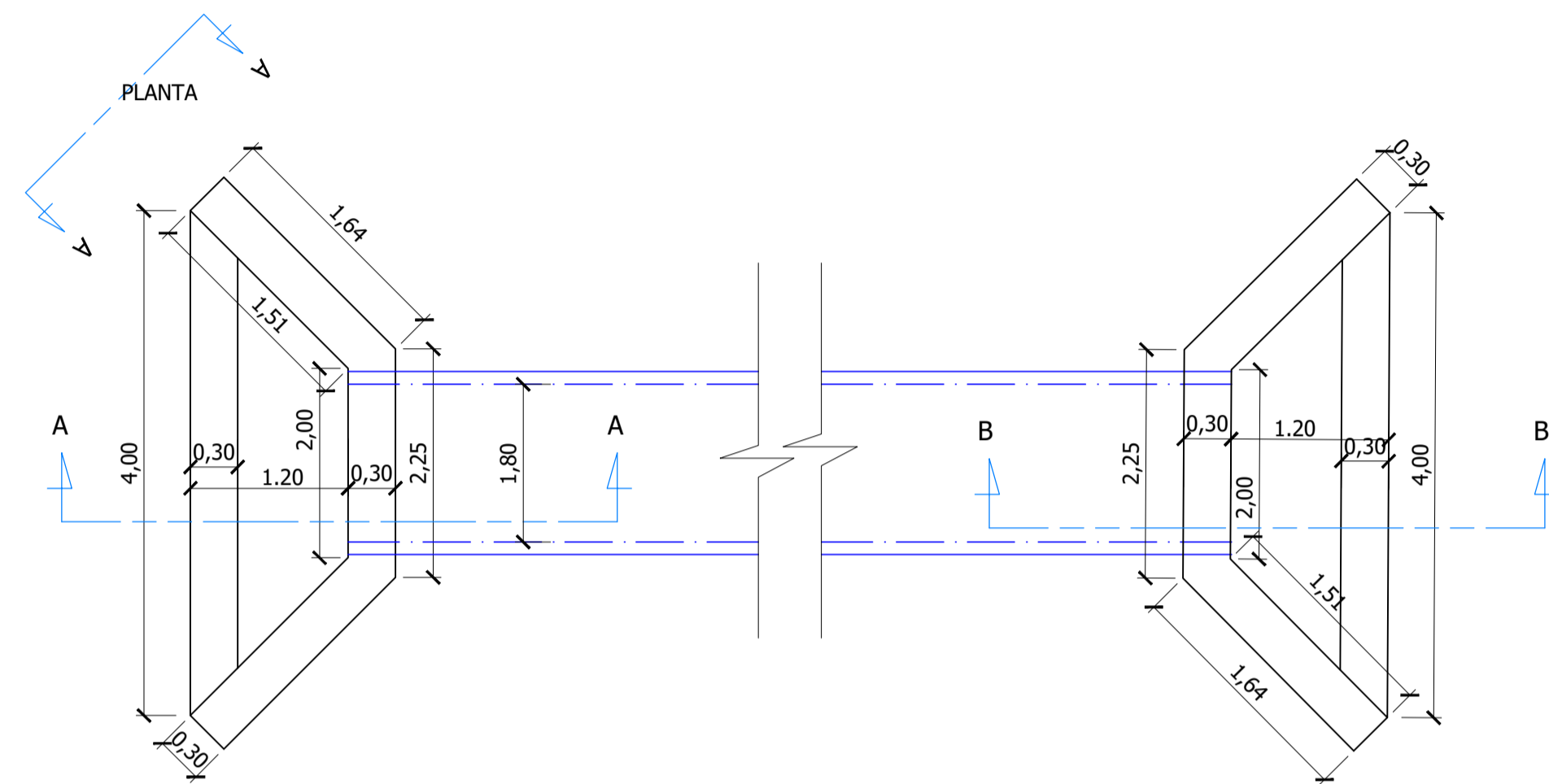


**VISTA EN PLANTA DEL ALERO**

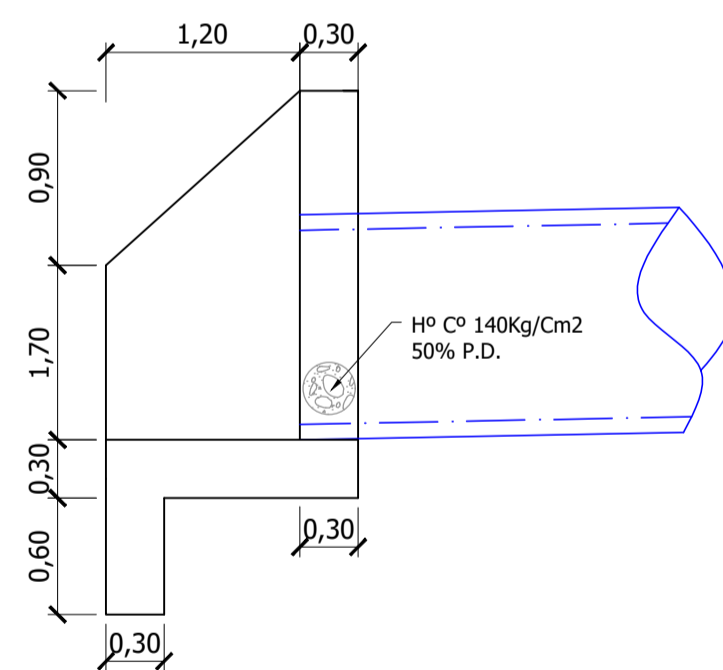


**ALCANTARILLA DE CRUCE**  
**D = 1000mm (Alero - Alero)**

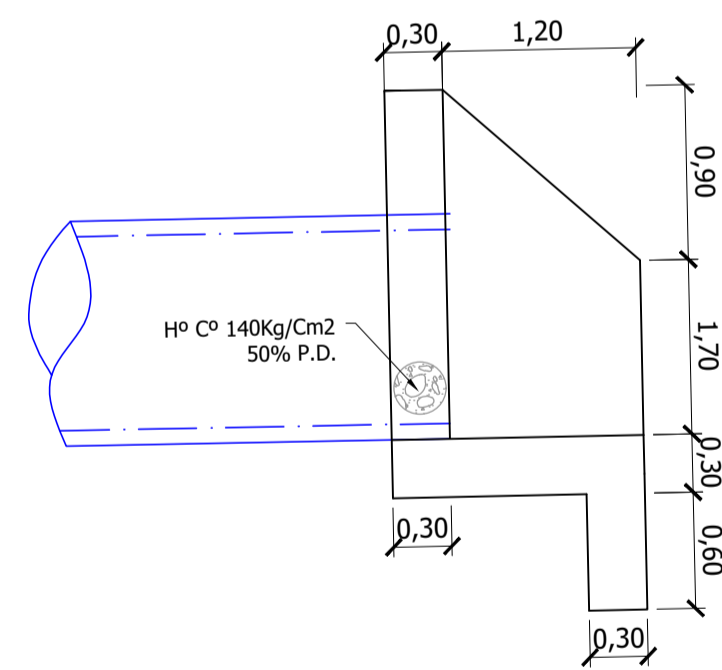
*DIMENSIONES DEL ALERO*



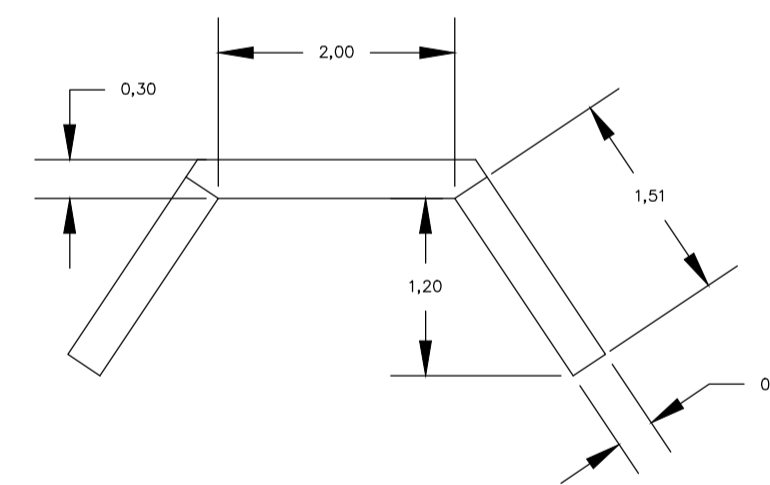
**CORTE A-A**



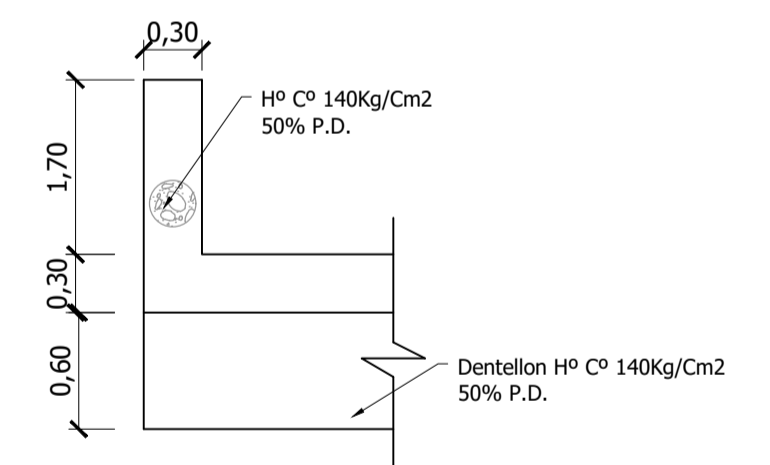
**CORTE B-B**



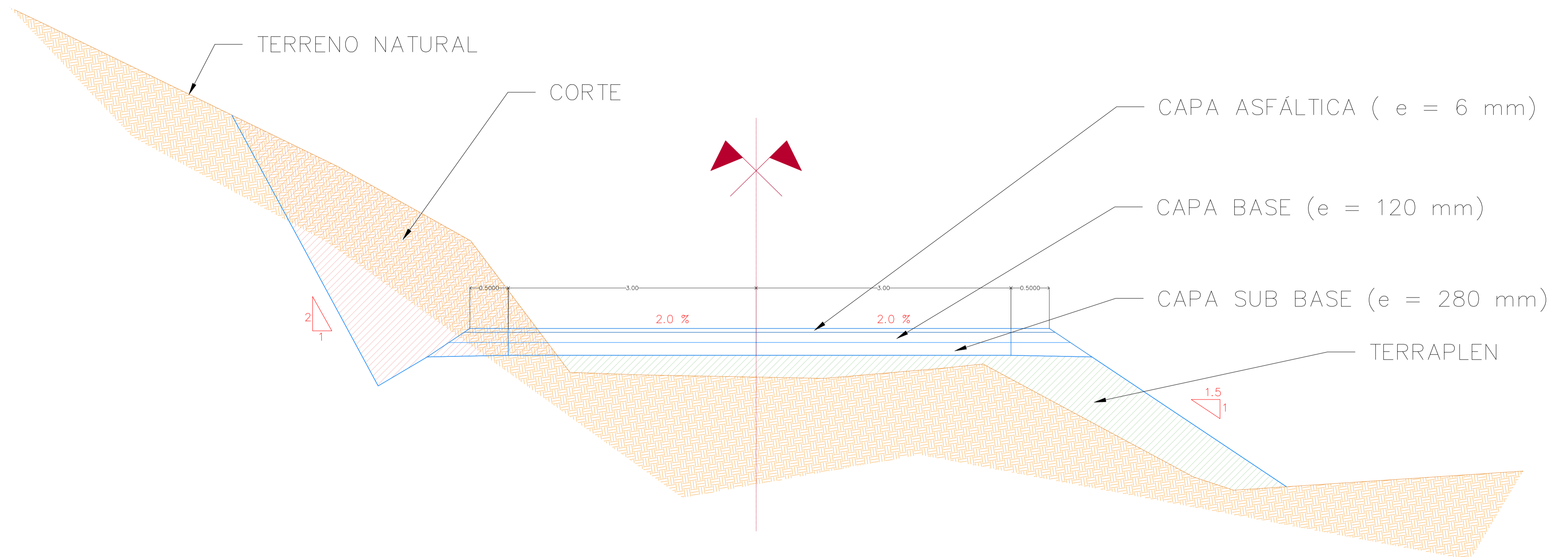
**VISTA EN PLANTA DEL ALERO**

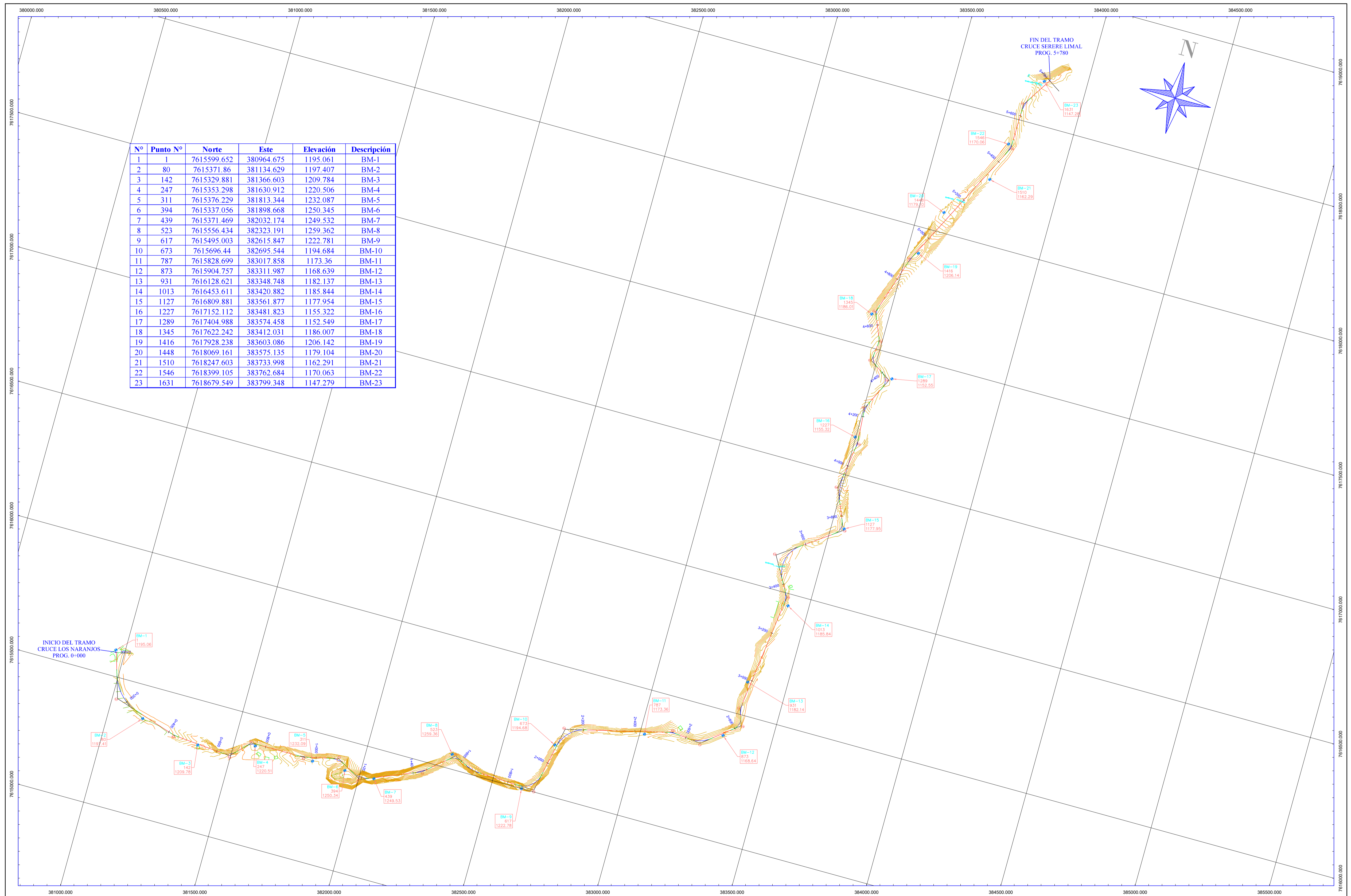


**VISTA A-A**



# GRAFICA DE SECCIÓN TRANSVERSAL





N°	Punto N°	Norte	Este	Elevación	Descripción
1	1	7615599.652	380964.675	1195.061	BM-1
2	80	7615371.86	381134.629	1197.407	BM-2
3	142	7615329.881	381366.603	1209.784	BM-3
4	247	7615353.298	381630.912	1220.506	BM-4
5	311	7615376.229	381813.344	1232.087	BM-5
6	394	7615337.056	381898.668	1250.345	BM-6
7	439	7615371.469	382032.174	1249.532	BM-7
8	523	7615556.434	382323.191	1259.362	BM-8
9	617	7615495.003	382615.847	1222.781	BM-9
10	673	7615696.44	382695.544	1194.684	BM-10
11	787	7615828.699	383017.858	1173.36	BM-11
12	873	7615904.757	383311.987	1168.639	BM-12
13	931	7616128.621	383348.748	1182.137	BM-13
14	1013	7616453.611	383420.882	1185.844	BM-14
15	1127	7616809.881	383561.877	1177.954	BM-15
16	1227	7617152.112	383481.823	1155.322	BM-16
17	1289	7617404.988	383574.458	1152.549	BM-17
18	1345	7617622.242	383412.031	1186.007	BM-18
19	1416	7617928.238	383603.086	1206.142	BM-19
20	1448	7618069.161	383575.135	1179.104	BM-20
21	1510	7618247.603	383733.998	1162.291	BM-21
22	1546	7618399.105	383762.684	1170.063	BM-22
23	1631	7618679.549	383799.348	1147.279	BM-23



UNIVERSIDAD AUTONOMA JUAN MISAEL SARACHO  
 FACULTAD DE CIENCIAS Y TECNOLOGÍA  
 CARRERA: INGENIERÍA CIVIL

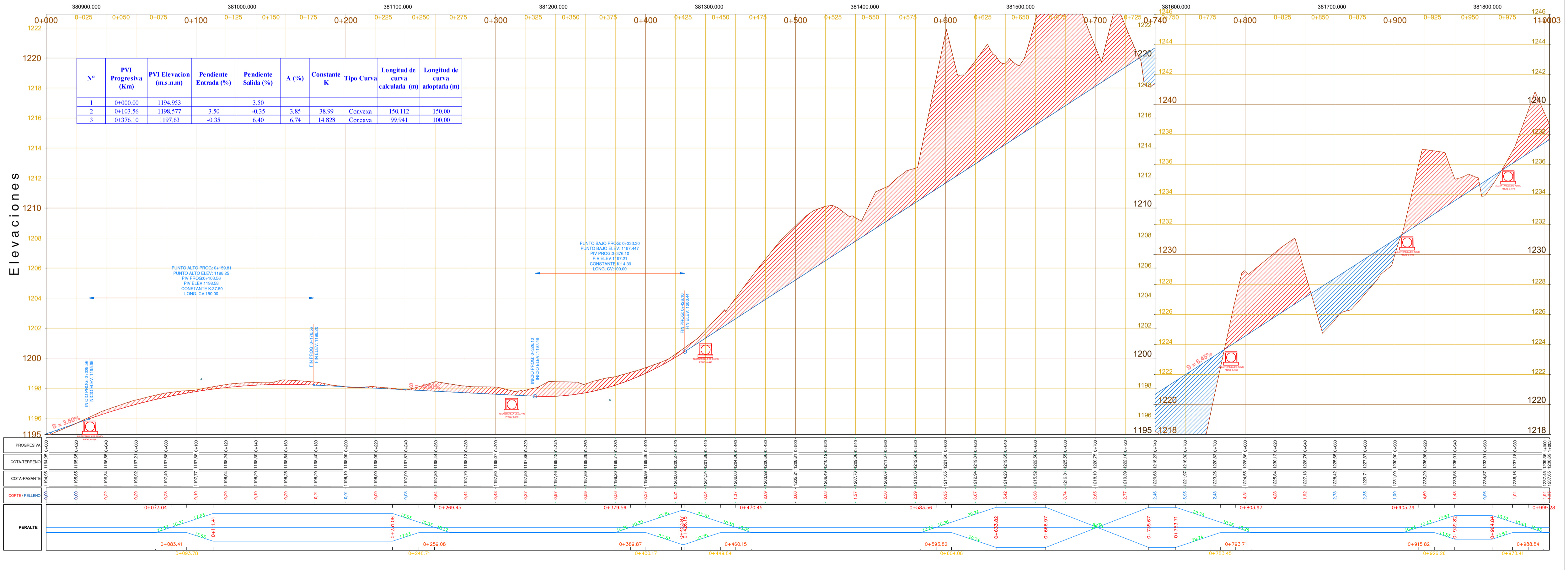
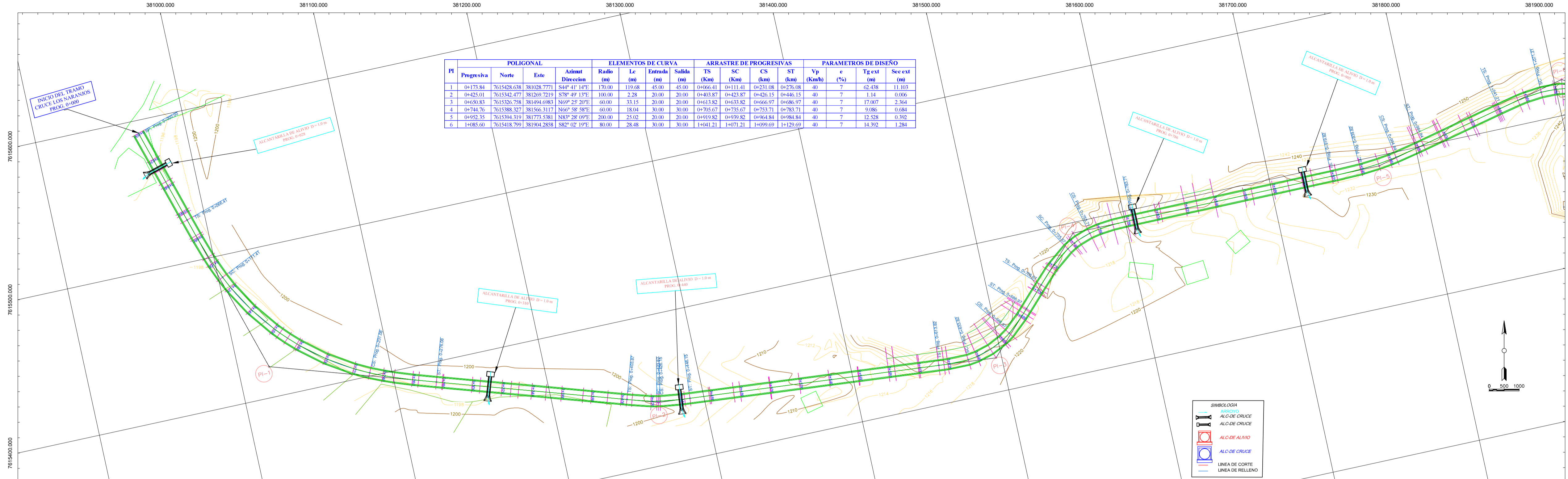
**PROYECTO:** DISEÑO DE INGENIERÍA DEL TRAMO CRUCE LOS NARANJOS - CRUCE SERERE LIMAL  
**CARACTER:** PLANO GENERAL DEL PROYECTO - UBICACIÓN DE BM'S

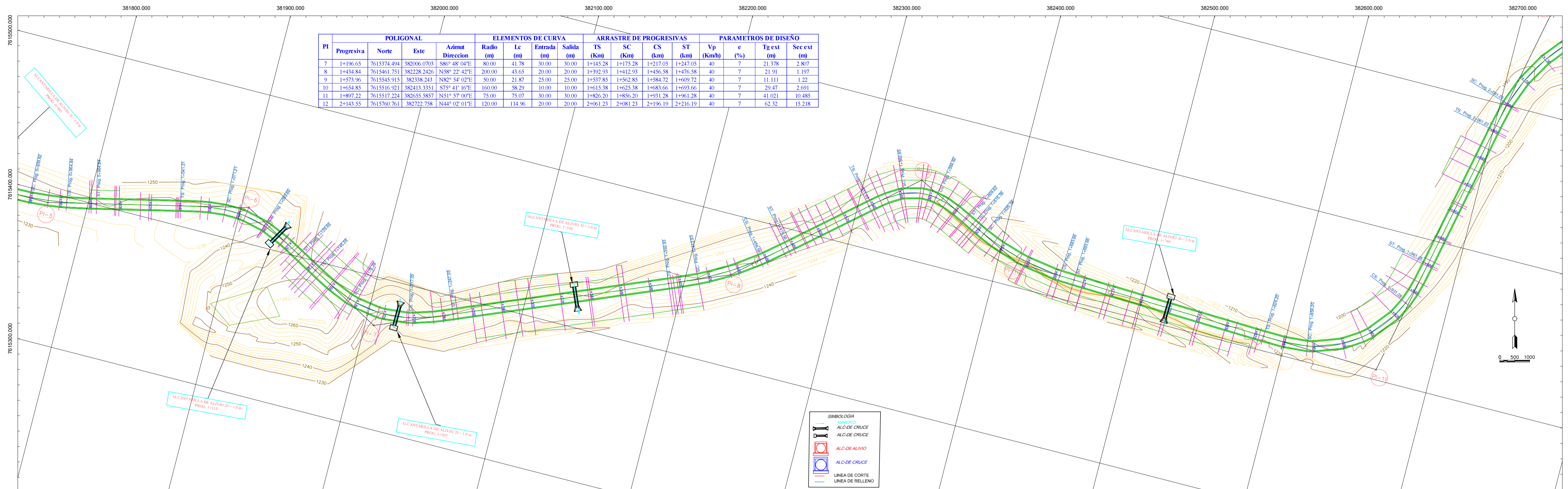
**MATERIA:** CIV - 502 PROYECTO DE INGENIERIA CIVIL II  
**ESTUDIANTE:** MARIO ALBERTO MARTINEZ SALINAS

**FECHA:** 17 DE SEPTIEMBRE DE 2019  
**ESCALA:** 1:5000

N° DE PLANO  
**1/1**

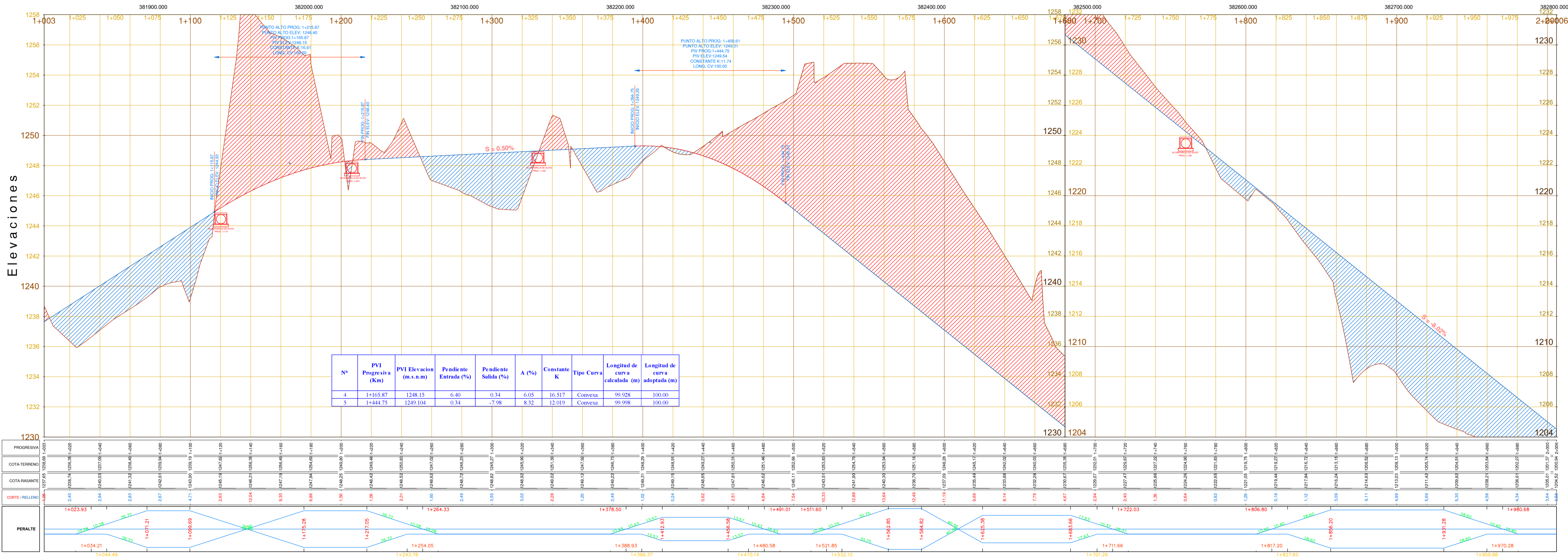
PI	POLIGONAL			Azimut Direccion	ELEMENTOS DE CURVA		ARRASTRE DE PROGRESIVAS				PARAMETROS DE DISEÑO					
	Progresiva	Norte	Este		Radio (m)	Lc (m)	Entrada (m)	Salida (m)	TS (Km)	SC (Km)	CS (Km)	ST (Km)	Vp (Km/h)	e (%)	Tig ext (m)	Sec ext (m)
1	0+173.84	7615428.638	381028.7771	S44° 41' 14"E	170.00	119.68	45.00	45.00	0+066.41	0+111.41	0+231.08	0+276.08	40	7	62.438	11.103
2	0+425.01	7615342.477	381269.7219	S78° 49' 13"E	100.00	2.28	20.00	20.00	0+403.87	0+423.87	0+426.15	0+446.15	40	7	1.14	0.006
3	0+650.83	7615326.758	381494.6983	N69° 25' 20"E	60.00	33.15	20.00	20.00	0+613.82	0+633.82	0+666.97	0+686.97	40	7	17.007	2.364
4	0+744.76	7615388.327	381566.3117	N66° 58' 58"E	60.00	18.04	30.00	30.00	0+705.67	0+735.67	0+753.71	0+783.71	40	7	9.086	0.684
5	0+952.35	7615394.319	381773.5381	N83° 28' 09"E	200.00	25.02	20.00	20.00	0+919.82	0+939.82	0+961.84	0+981.84	40	7	12.528	0.392
6	1+085.60	7615418.799	381904.2838	S82° 02' 19"E	80.00	28.48	30.00	30.00	1+041.21	1+071.21	1+099.69	1+129.69	40	7	14.392	1.284



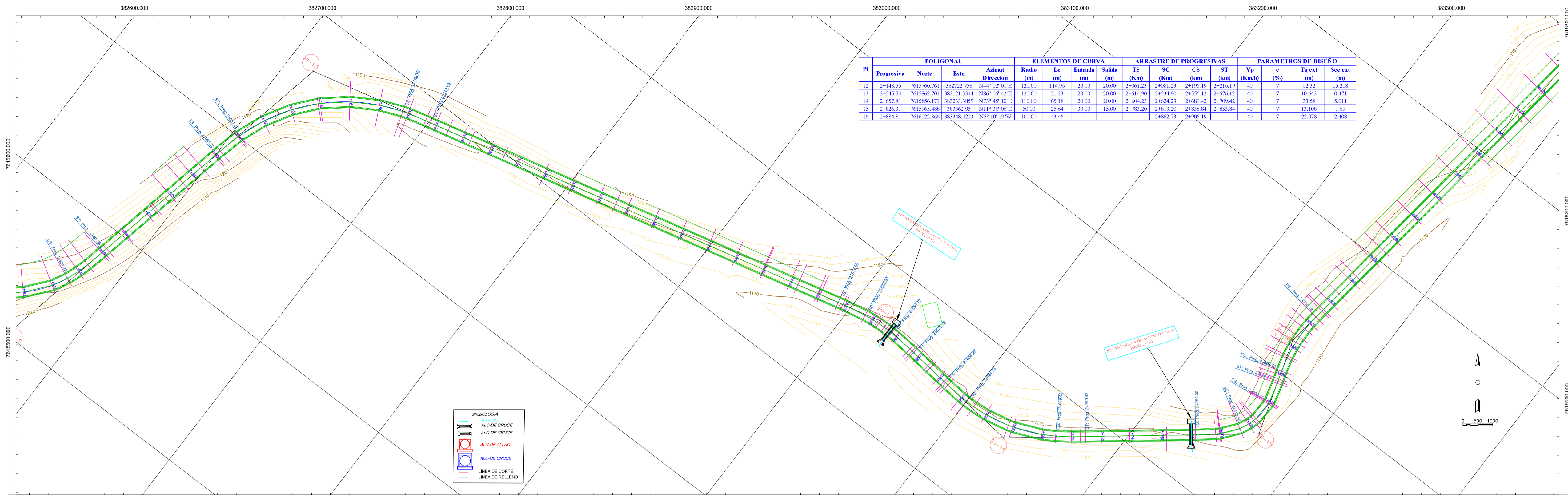


PI	POLIGONAL			ELEMENTOS DE CURVA				ARRASTRE DE PROGRESIVAS				PARAMETROS DE DISEÑO				
	Progresiva	Norte	Este	Radio (m)	Lc (m)	Entrada (m)	Salida (m)	TS (Km)	SC (Km)	CS (Km)	ST (Km)	Vp (Kmh)	e (%)	Tg est (m)	Sec est (m)	
7	1+196.65	7615374.494	382006.0703	886° 48' 04"E	80.00	41.78	30.00	30.00	1+145.28	1+175.28	1+217.05	1+247.05	40	7	21.378	2.807
8	1+434.84	7615461.751	382228.2426	N58° 22' 42"E	200.00	43.65	20.00	20.00	1+392.93	1+412.93	1+456.58	1+476.58	40	7	21.91	1.197
9	1+573.96	7615545.915	382338.243	N82° 54' 02"E	50.00	21.87	25.00	25.00	1+537.85	1+562.85	1+584.72	1+609.72	40	7	11.111	1.22
10	1+634.85	7615516.921	382413.3351	S75° 41' 16"E	160.00	38.29	10.00	10.00	1+615.38	1+625.38	1+683.66	1+693.66	40	7	29.47	2.691
11	1+897.22	7615517.224	382655.5857	N51° 57' 00"E	75.00	75.07	30.00	30.00	1+826.20	1+856.20	1+931.28	1+961.28	40	7	41.021	10.485
12	2+143.55	7615760.761	382722.758	N44° 02' 01"E	120.00	114.96	20.00	20.00	2+061.23	2+081.23	2+196.19	2+216.19	40	7	62.32	15.218

SIMBOLOGIA	
	ALC-DE CRUCE
	ALC-DE CRUCE
	ALC-DE ALIVIO
	ALC-DE CRUCE
	LINEA DE CORTE
	LINEA DE RELLENO

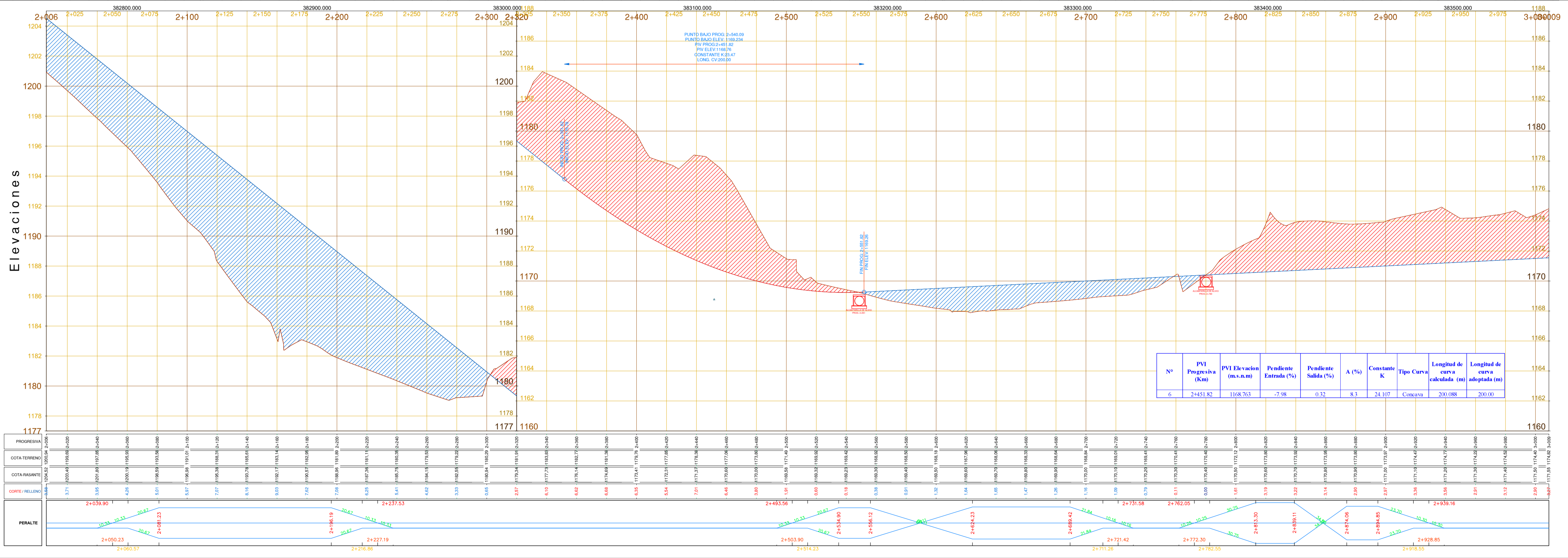


<p><b>UNIVERSIDAD AUTONOMA JUAN MISAEL SARACHO</b> FACULTAD DE CIENCIAS Y TECNOLOGÍA CARRERA: INGENIERÍA CIVIL</p>	<p><b>PROYECTO:</b> DISEÑO DE INGENIERÍA DEL TRAMO CRUCE LOS NARANJOS - CRUCE SERERE LIMAL</p>	<p><b>MATERIA:</b> CIV - 502 PROYECTO DE INGENIERÍA CIVIL II</p>	<p><b>FECHA:</b> 17 DE SEPTIEMBRE DE 2019</p>	<p><b>Nº DE PLANO</b> <b>2/6</b></p>
	<p><b>CARACTER:</b> PLANOS BIMODAL</p>	<p><b>ESTUDIANTE:</b> MARIO ALBERTO MARTINEZ SALINAS</p>	<p><b>ESCALA:</b> 1:1000</p>	

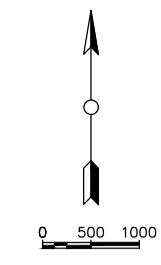


PI	POLIGONAL			ELEMENTOS DE CURVA				ARRASTRE DE PROGRESIVAS				PARAMETROS DE DISEÑO				
	Progresiva	Norte	Este	Radio (m)	Lc (m)	Entrada (m)	Salida (m)	TS (Km)	SC (Km)	CS (km)	ST (km)	Vp (Km/h)	e (%)	Tg ext (m)	Sec ext (m)	
12	2+143.55	7615760.761	382722.758	N44° 02' 01"E	120.00	114.96	20.00	20.00	2+061.23	2+081.23	2+196.19	2+216.19	40	7	62.32	15.218
13	2+545.54	7615862.701	383121.3344	N86° 05' 42"E	120.00	21.23	20.00	2+514.90	2+534.90	2+556.12	2+576.12	40	7	10.642	0.471	
14	2+657.81	7615856.171	383233.3859	N73° 45' 10"E	110.00	65.18	20.00	2+604.23	2+624.23	2+680.42	2+700.42	40	7	33.58	5.011	
15	2+826.31	7615965.488	383362.95	N11° 36' 06"E	80.00	25.64	15.00	2+783.20	2+813.20	2+838.84	2+853.84	40	7	13.108	1.69	
16	2+884.81	7616022.366	383348.4213	N5° 10' 19"W	100.00	43.46	-	-	2+862.73	2+906.19	-	-	40	7	22.078	2.408

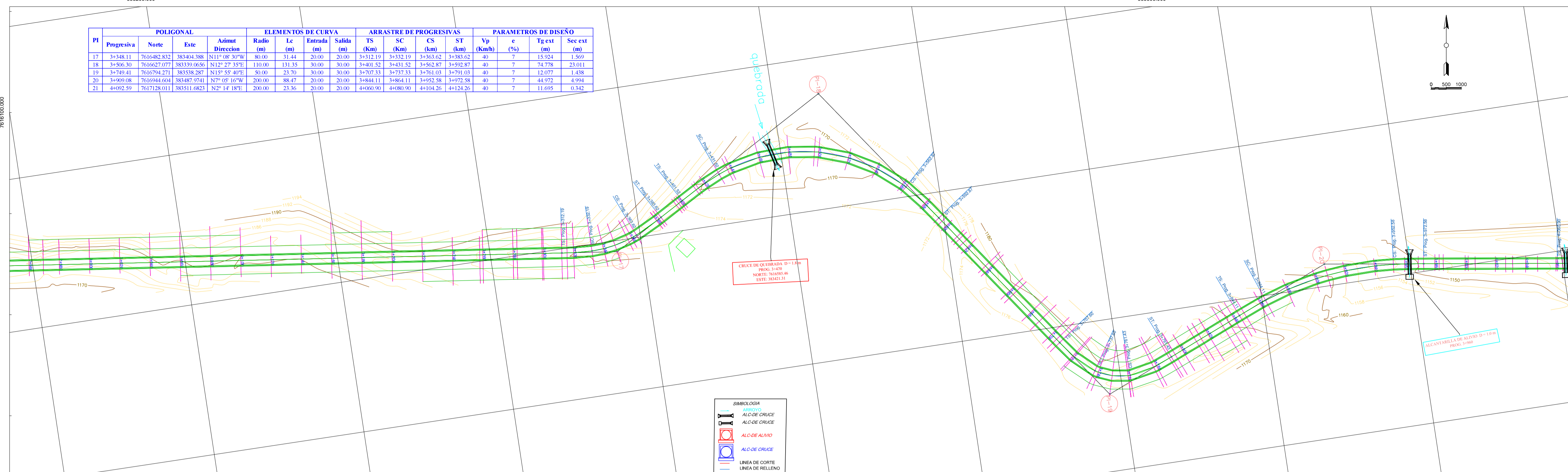
SIMBOLOGIA	
	ALC. DE CRUCE
	ALC. DE CRUCE
	ALC. DE ALIVIO
	ALC. DE CRUCE
	LINEA DE CORTE
	LINEA DE RELLENO



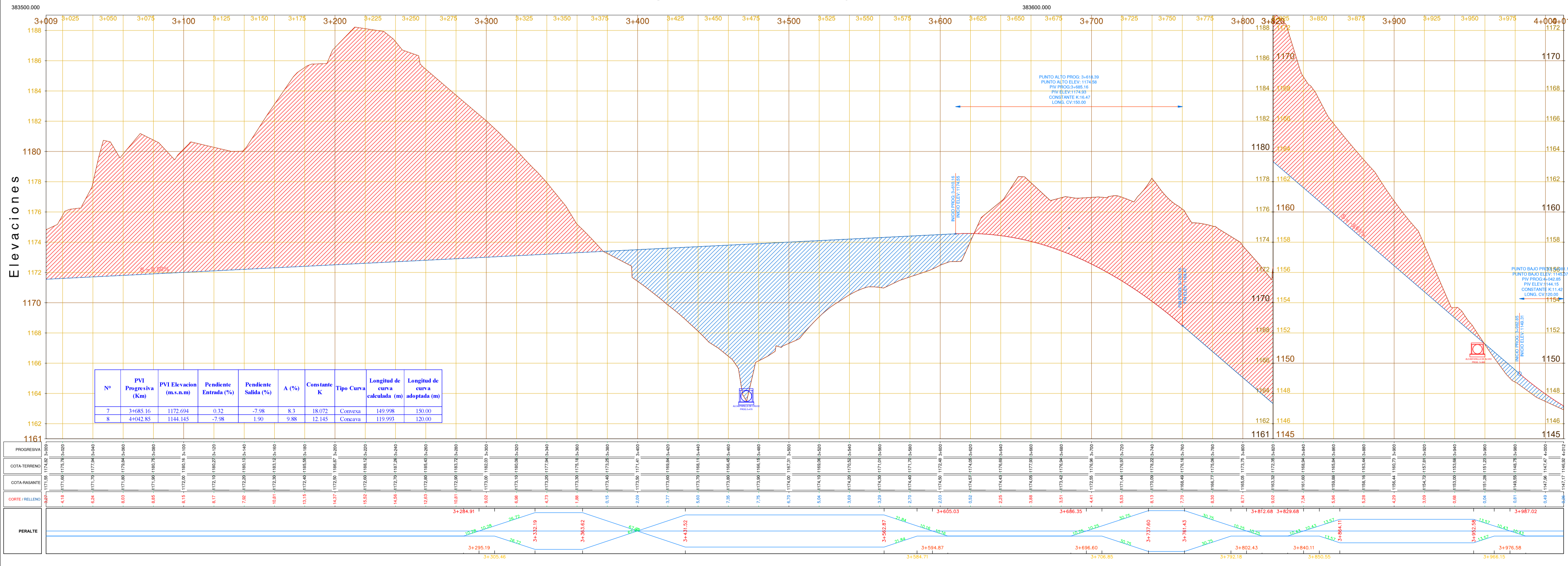




PI	POLIGONAL			ELEMENTOS DE CURVA				ARRASTRE DE PROGRESIVAS				PARAMETROS DE DISEÑO			
	Progresiva	Norte	Este	Radio (m)	Lc (m)	Entrada (m)	Salida (m)	TS (Km)	SC (Km)	CS (Km)	ST (Km)	Vp (Km/h)	e (%)	Tg ext (m)	Sec ext (m)
17	3+348.11	7616482.832	383404.388	80.00	31.44	20.00	20.00	3+312.19	3+332.19	3+383.62	3+383.62	40	7	15.924	1.569
18	3+506.30	7616627.077	383339.058	110.00	131.35	30.00	30.00	3+401.52	3+431.52	3+562.87	3+562.87	40	7	74.778	23.011
19	3+749.41	7616794.271	383338.287	50.00	23.70	30.00	30.00	3+707.33	3+737.33	3+761.03	3+791.03	40	7	12.077	1.438
20	3+909.08	7616944.604	383487.9741	200.00	88.47	20.00	20.00	3+844.11	3+864.11	3+952.58	3+972.58	40	7	44.972	4.994
21	4+092.59	7617128.011	383511.6823	200.00	23.36	20.00	20.00	4+060.90	4+080.90	4+104.26	4+124.26	40	7	11.695	0.342

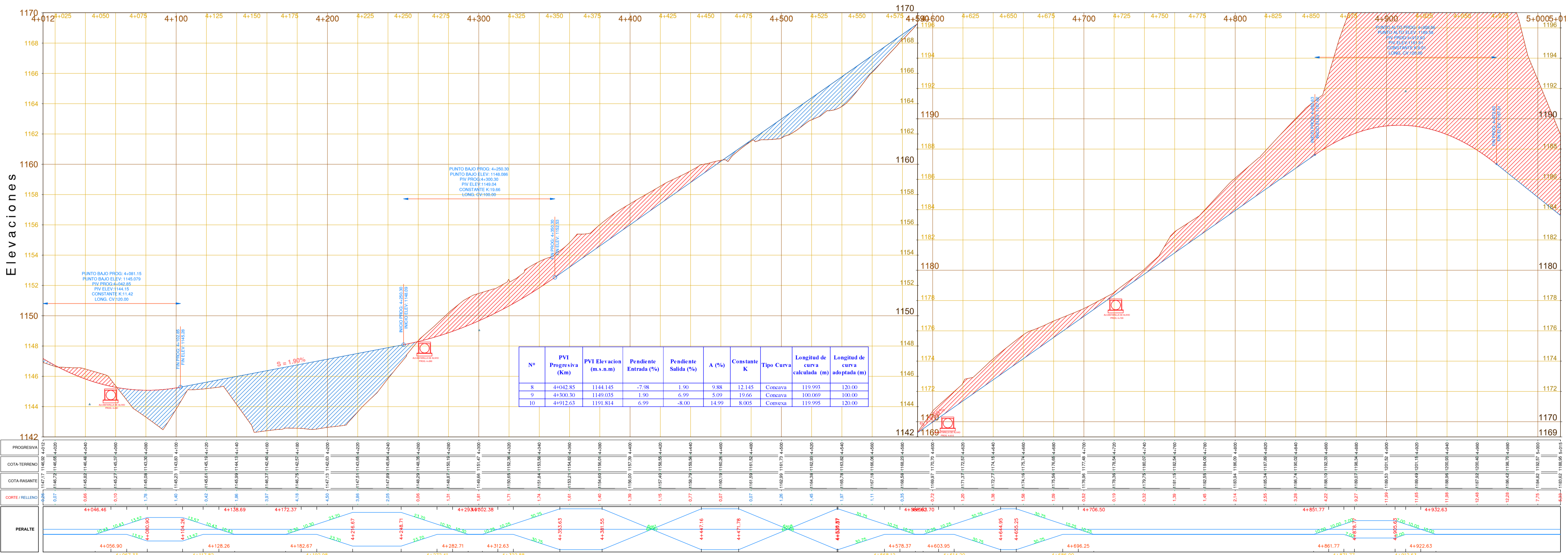
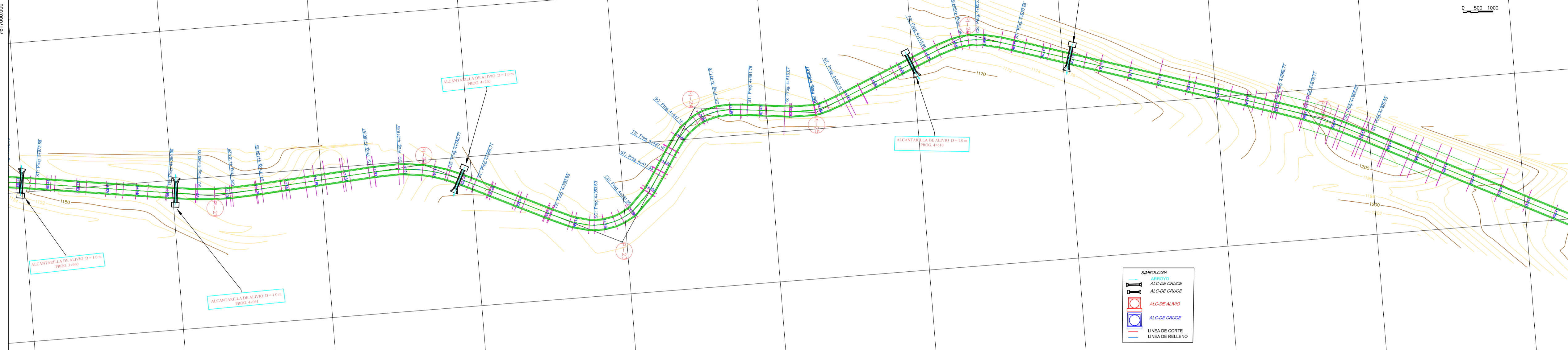


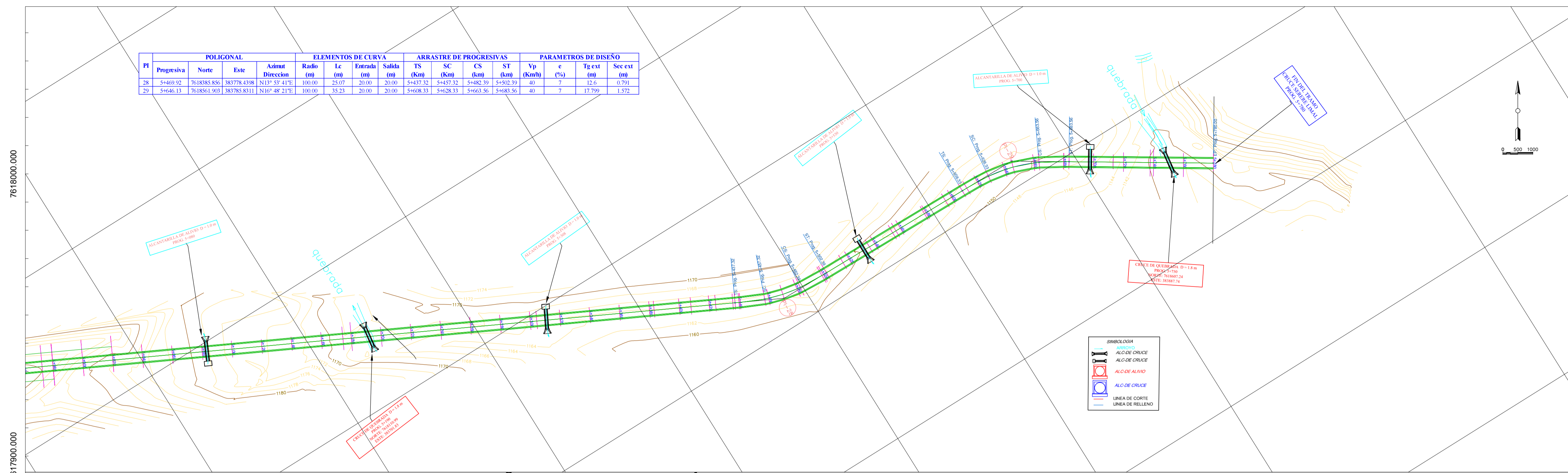
SIMBOLOGIA	
	ARROYO
	ALC-DE CRUCE
	ALC-DE ALIVIO
	ALC-DE CRUCE
	LÍNEA DE CORTE
	LÍNEA DE RELLENO



PROGRESIVA	COTA TERRENO	COTA RASANTE	CORTE / RELLENO	PERALTE
3+009	1174.82	1174.82	0.00	
3+050	1177.24	1177.24	0.00	
3+100	1180.00	1180.00	0.00	
3+150	1182.00	1182.00	0.00	
3+200	1184.00	1184.00	0.00	
3+250	1186.00	1186.00	0.00	
3+300	1188.00	1188.00	0.00	
3+350	1190.00	1190.00	0.00	
3+400	1192.00	1192.00	0.00	
3+450	1194.00	1194.00	0.00	
3+500	1196.00	1196.00	0.00	
3+550	1198.00	1198.00	0.00	
3+600	1200.00	1200.00	0.00	
3+650	1202.00	1202.00	0.00	
3+700	1204.00	1204.00	0.00	
3+750	1206.00	1206.00	0.00	
3+800	1208.00	1208.00	0.00	
3+850	1210.00	1210.00	0.00	
3+900	1212.00	1212.00	0.00	
3+950	1214.00	1214.00	0.00	
4+000	1216.00	1216.00	0.00	

POLIGONAL				ELEMENTOS DE CURVA				ARRASTRE DE PROGRESIVAS				PARAMETROS DE DISEÑO				
PI	Progresiva	Norte	Este	Azmut	Radio	Le	Entrada	Salida	TS	SC	CS	ST	Vp	e	Tg ext	Sec ext
		(m)	(m)	(°)	(m)	(m)	(m)	(m)	(Km)	(Km)	(Km)	(Km)	(Km/h)	(%)	(m)	(m)
21	4+092.59	7617128.011	383511.6825	N2° 14' 18"E	200.00	23.36	20.00	20.00	4+060.90	4+080.90	4+104.26	4+124.26	40	7	11.695	0.342
22	4+232.83	7617268.041	383505.1616	N10° 56' 04"E	100.00	32.04	20.00	20.00	4+196.67	4+216.67	4+248.71	4+268.71	40	7	16.157	1.297
23	4+367.46	7617393.376	383352.3771	N15° 38' 35"W	50.00	27.71	30.00	30.00	4+353.23	4+353.23	4+381.95	4+410.95	40	7	14.223	1.984
24	4+459.05	7617455.006	383485.316	N25° 10' 23"W	50.00	24.47	20.00	20.00	4+426.56	4+446.56	4+471.03	4+491.03	40	7	12.487	1.536
25	4+536.37	7617532.282	383487.2289	N7° 54' 25"W	50.00	0.51	20.00	20.00	4+427.12	4+536.12	4+536.63	4+556.63	40	7	0.255	0.001
26	4+630.12	7617638.142	383448.6702	N2° 22' 11"W	50.00	10.30	25.00	25.00	4+619.95	4+644.95	4+655.25	4+680.25	40	7	5.169	0.266
27	4+802.21m	7617869.115	383320.2589	N22° 19' 51"E	300.00	26.86	20.00	20.00	4+858.77	4+878.77	4+905.63	4+925.63	40	7	13.438	0.301

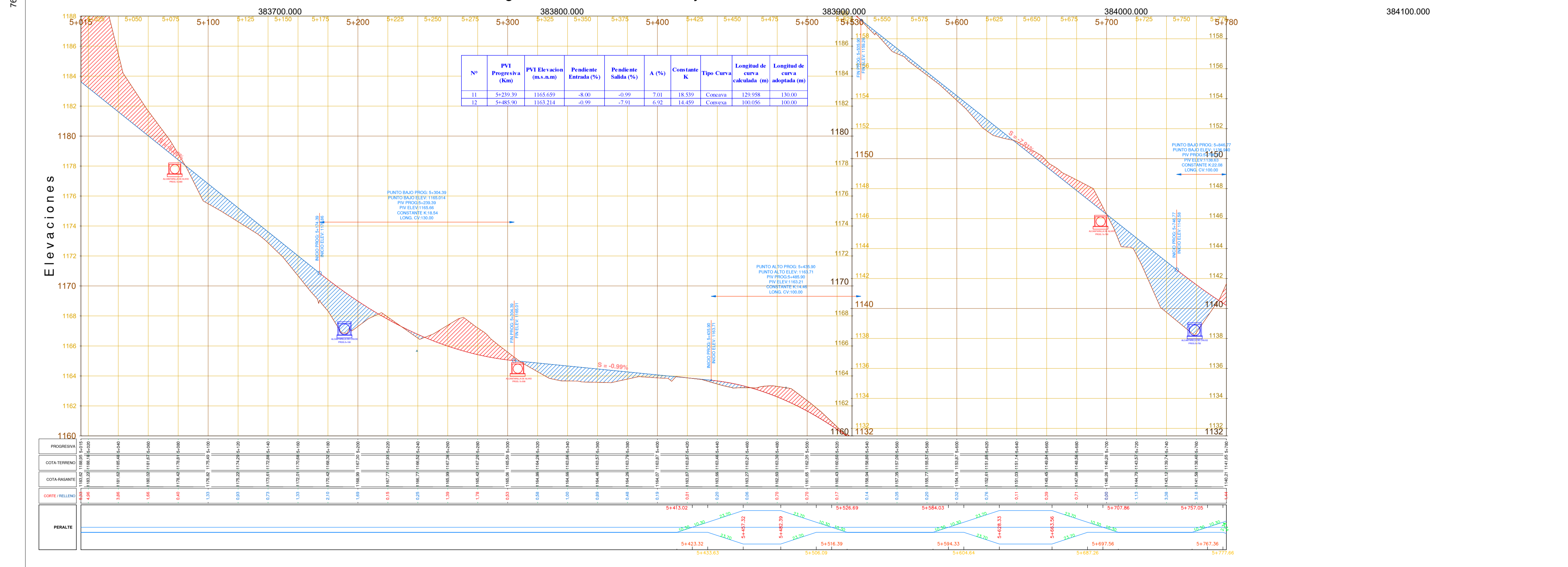




PI	POLIGONAL			ELEMENTOS DE CURVA			ARRASTRE DE PROGRESIVAS				PARAMETROS DE DISEÑO					
	Progresiva	Norte	Este	Ángul. Dirección	Radio (m)	Lc (m)	Entrada (m)	Salida (m)	TS (km)	SC (km)	CS (km)	ST (km)	Vp (km/h)	e (%)	Tg ext (m)	Sec ext (m)
28	5+469.92	7618385.856	383778.4398	N13° 53' 41"E	100.00	25.07	20.00	20.00	5+437.32	5+457.32	5+482.39	5+502.39	40	7	12.6	0.791
29	5+466.13	7618561.903	383785.8311	N16° 48' 21"E	100.00	35.33	20.00	20.00	5+608.33	5+628.33	5+663.36	5+683.36	40	7	17.799	1.572

SIMBOLOGIA

- ALC-DE CRUCE
- ALC-DE ALIJO
- ALC-DE CRUCE
- ALC-DE CRUCE
- LINEA DE CORTE
- LINEA DE RELLENO



PROGRESIVA	5+015	5+050	5+075	5+100	5+125	5+150	5+175	5+200	5+225	5+250	5+275	5+300	5+325	5+350	5+375	5+400	5+425	5+450	5+475	5+500	5+530	5+550	5+575	5+600	5+625	5+650	5+675	5+700	5+725	5+750	5+780	
COTA TERRENO	1189.00	1188.05	1186.00	1184.00	1182.00	1180.00	1178.00	1176.00	1174.00	1172.00	1170.00	1168.00	1166.00	1164.00	1162.00	1160.00	1158.00	1156.00	1154.00	1152.00	1150.00	1148.00	1146.00	1144.00	1142.00	1140.00	1138.00	1136.00	1134.00	1132.00	1130.00	1128.00
COTASANTAL	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00	1180.00
CORTE/RELLENO	4.00	3.00	2.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	
PERALTE	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	