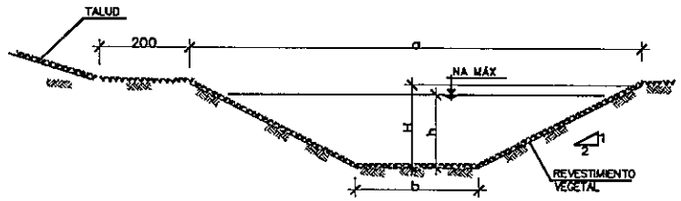
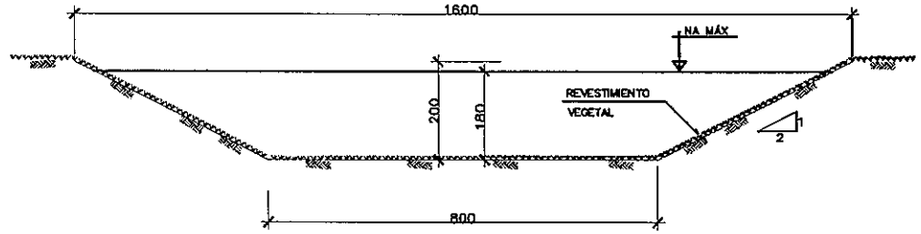
CANALES DE DESVIO

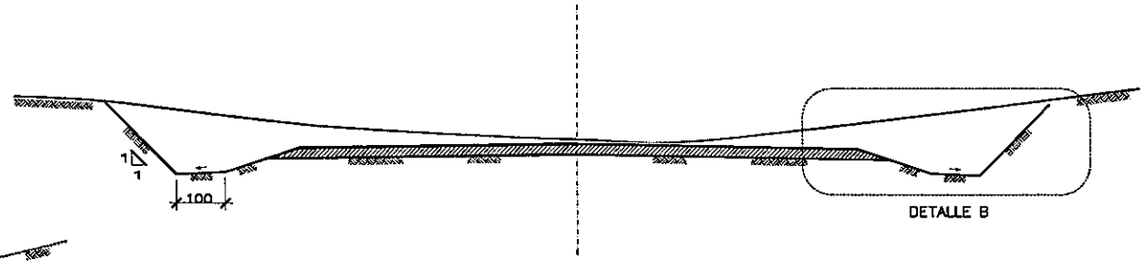


SECCION TRANSVERSAL TIPO – CANALES

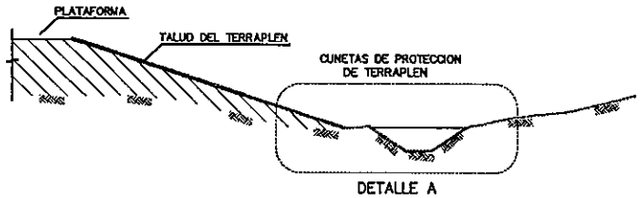
PROGRESIVA 44+840 (AGUAS ABAJO)



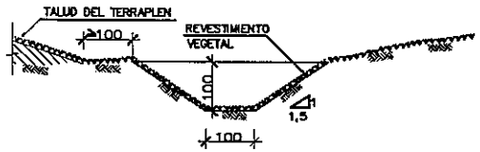
CUNETAS LATERALES



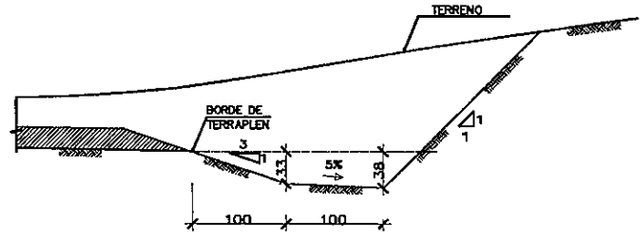
CUNETAS DE PROTECCION



DETALLE A



DETALLE B



NOTAS :

1-

2-

3-

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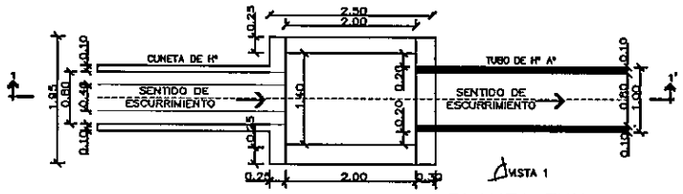
TRAMO 1: CONCEPCION - KM 52

CUNETAS DE PROTECCION
CUNETAS LATERALES
CANALES DE DESVIO

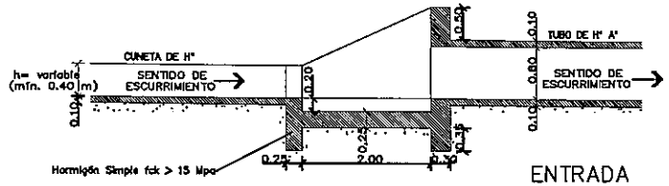
ESCALA: VARIAS

LAMINA: ST 3.4-1/1

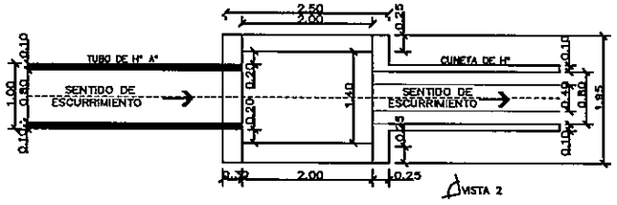
INTERSECCION DE CUNETA REVESTIDA CON ALCANTARILLAS LATERALES



PLANTA ENTRADA

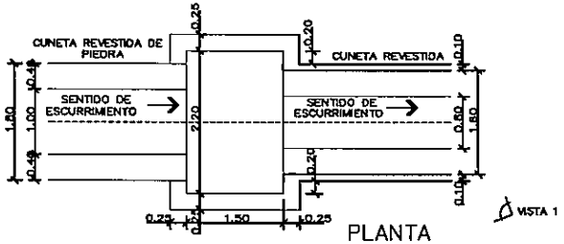


ENTRADA
CORTE LONGITUDINAL 1–1'

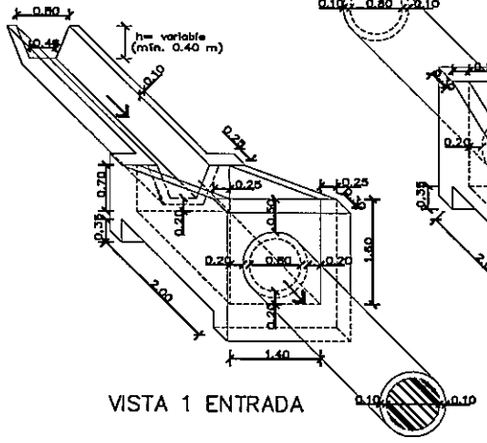


PLANTA SALIDA

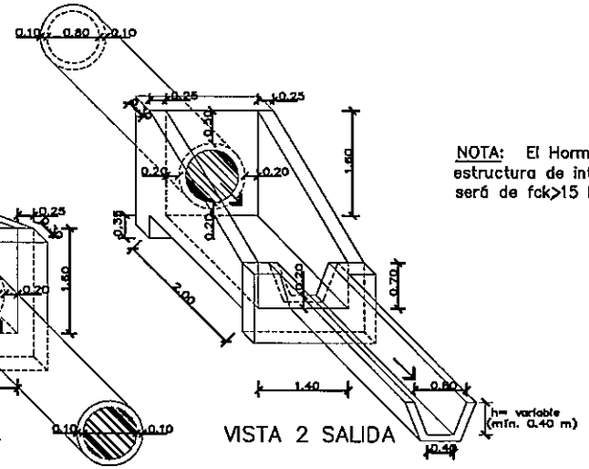
DETALLE DE SUMIDERO EN ZONA URBANA EMPALME CUNETA REVESTIDA DE PIEDRA LADO DERECHO



PLANTA

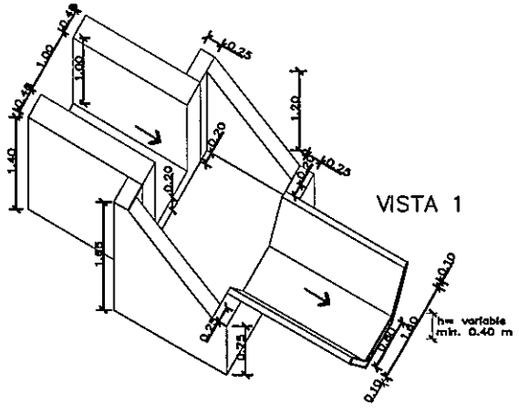


VISTA 1 ENTRADA



VISTA 2 SALIDA

NOTA: El Hormigón para estructura de interconexión será de fck>15 Mpa



VISTA 1

NOTAS :
1-
2-
3-

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TRAMO 1: CONCEPCION - KM 52

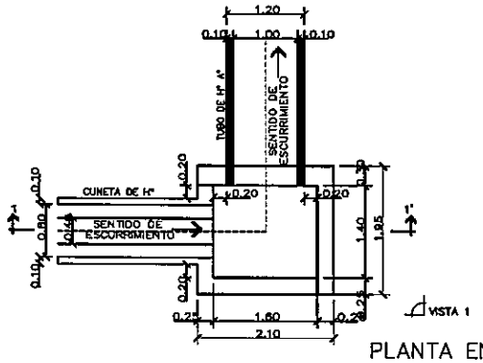
DETALLE DE OBRAS ALCANTARILLAS LATERALES

ESCALA: 1/2.000

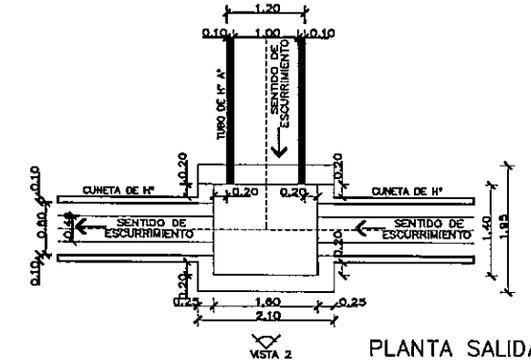
LAMINA: DR 6.4-1/8

MOPC
AREA DEL PROYECTO

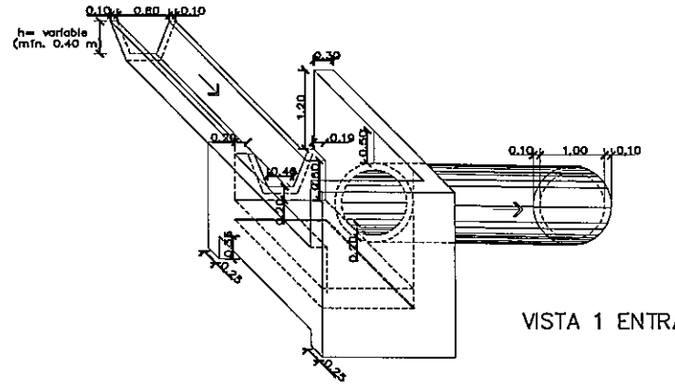
INTERSECCION DE CUNETA REVESTIDA CON ALCANTARILLAS TRANSVERSALES



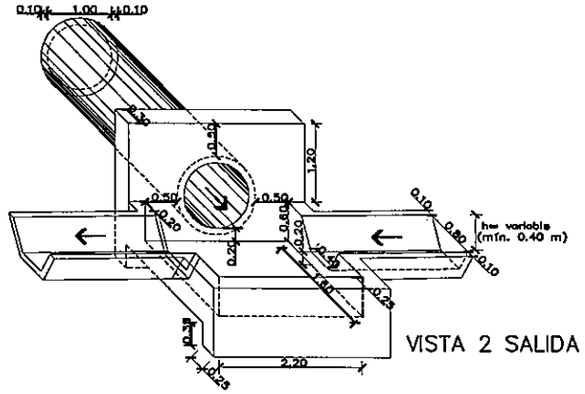
PLANTA ENTRADA



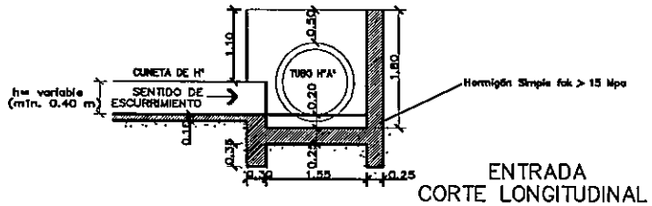
PLANTA SALIDA



VISTA 1 ENTRADA



VISTA 2 SALIDA



ENTRADA
CORTE LONGITUDINAL 1–1'

NOTA: El Hormigón para estructura de interconexión será de fck>15 Mpa

NOTAS :

1-

2-

3-

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DETALLE DE OBRAS ALCANTARILLAS TRANSVERSALES

ESCALA: 1/2.000

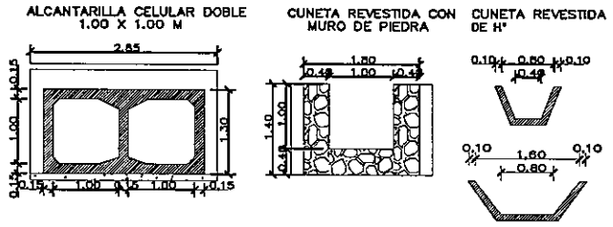
LAMINA: DR 6.4-2/5

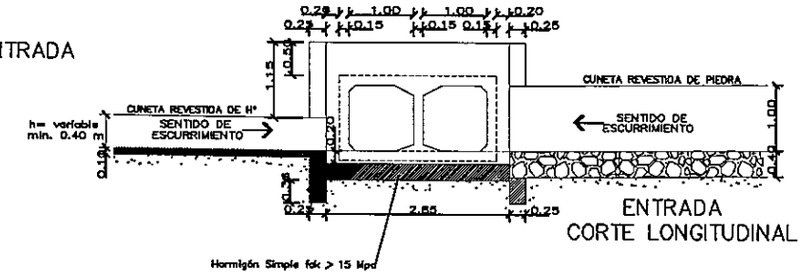
MOPC

DETALLE DE SUMIDERO EN ZONA URBANA
LADO IZQUIERDO

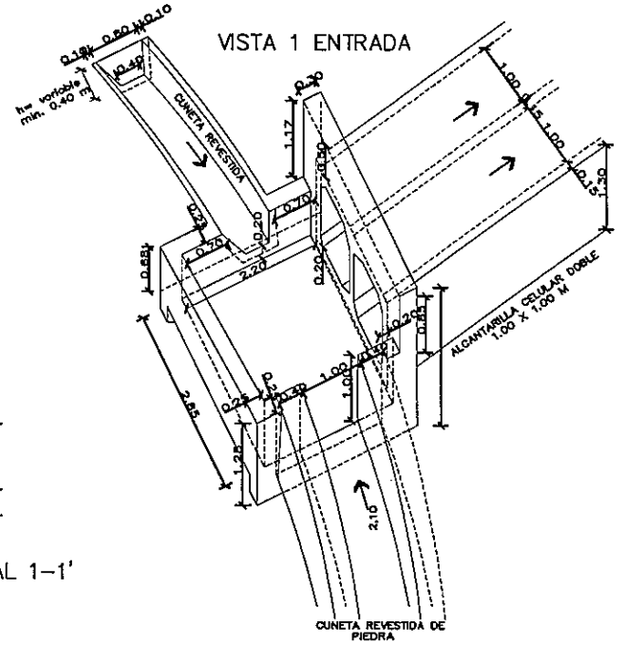
PLANTA ENTRADA

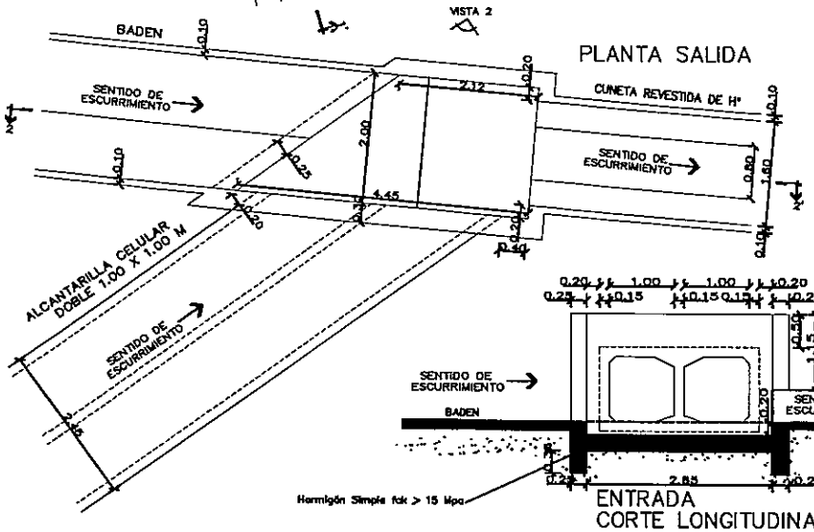
CORTE TRANSVERSAL





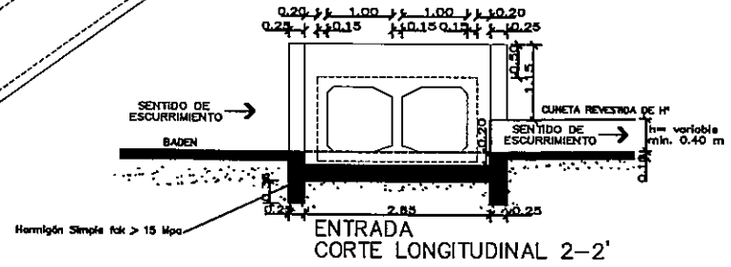
ENTRADA
CORTE LONGITUDINAL 1–1'



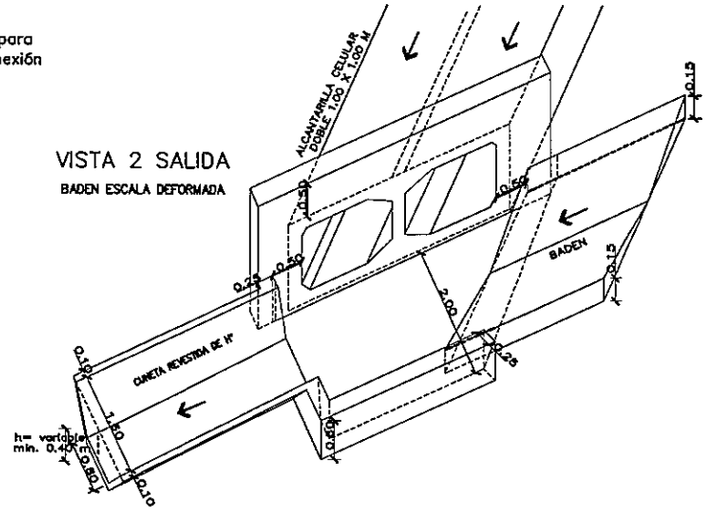


PLANTA SALIDA

NOTA: El Hormigón para estructura de interconexión será de fck>15 Mpa



ENTRADA
CORTE LONGITUDINAL 2–2'



NOTAS :
1-
2-
3-

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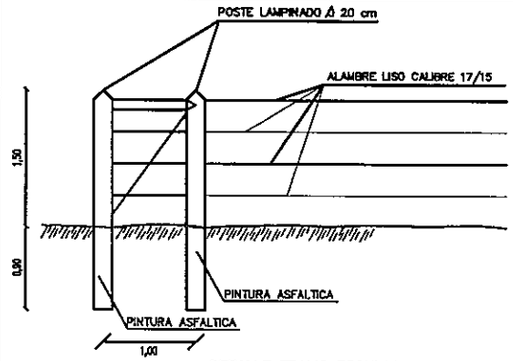
DETALLE DE OBRAS ALCANTARILLAS URBANAS

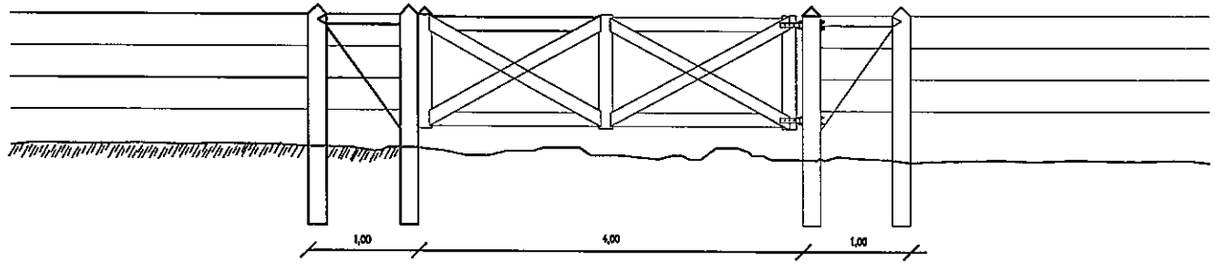
ESCALA:	LAMINA:
1/2.000	DR 6.4-3/8

MOPC

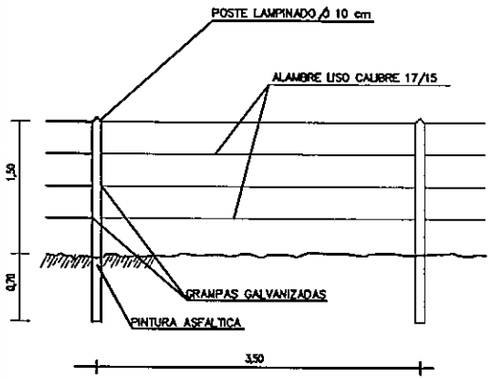


DETALLE TRAMO ESQUINERO

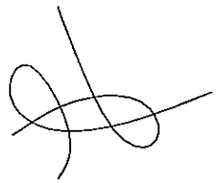
VISTA FRONTAL DEL PORTON DE ACCESO



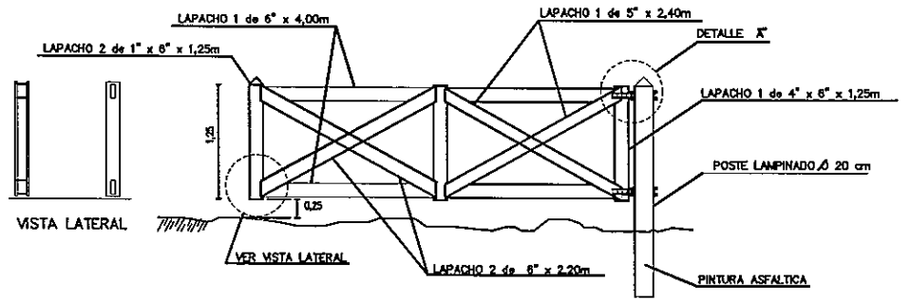
DETALLE PORTON DE ACCESO



DETALLE TRAMO INTERMEDIO

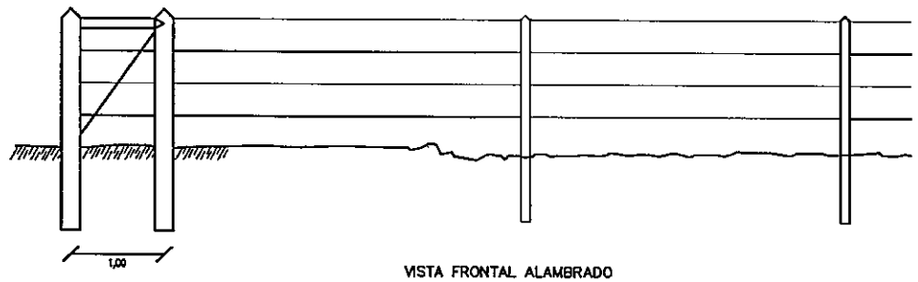


ATADURA PARA ALAMBRE

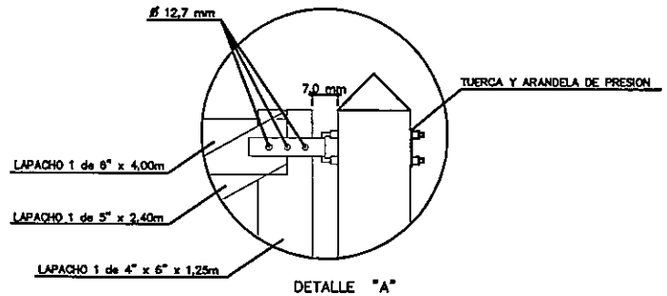


VISTA LATERAL

UNION A MEDIA MADERA C/ BULON 1/2"



VISTA FRONTAL ALAMBRADO



DETALLE "A"

NOTAS :

1-

2-

3-

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TRAMO 1: CONCEPCION - KM 82

DETALLE DE ALAMBRADAS TRANQUERAS

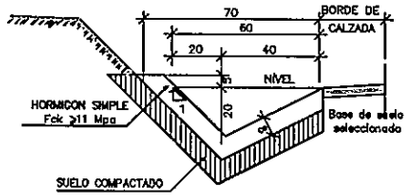
SIN ESCALA

LAMINA: OC 8.1-1/1

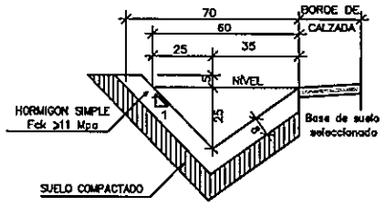
MOPC

CUNETAS TRIANGULARES DE H

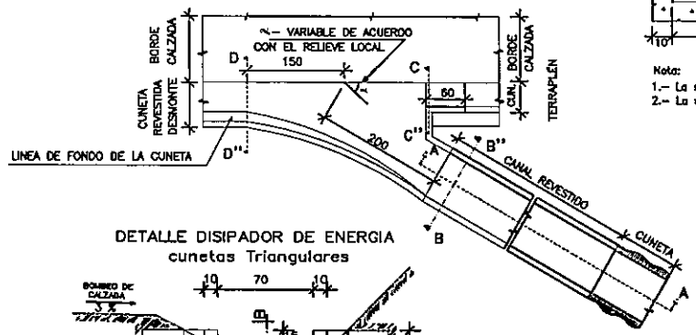
CUNETA DE DESMONTES (CD-01)
PARA BORDES DE CALAZADA
Para largos ≤ 50 m



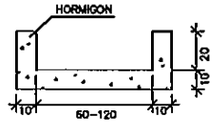
CUNETA DE DESMONTES (CD-02)
PARA BORDES DE CALAZADA
Para largos entre 50 y 100 m



SALIDA DE AGUA EN EXCAVACION
(CUNETA REVESTIDA)
PLANTA

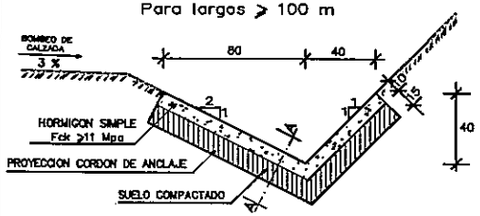


CORTE B–B''

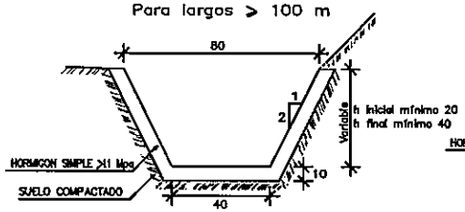


Nota:
1.– La sección BB'– 60 para cunetas en borde de calzada
2.– La sección BB'– 120 para cunetas en borde de talud

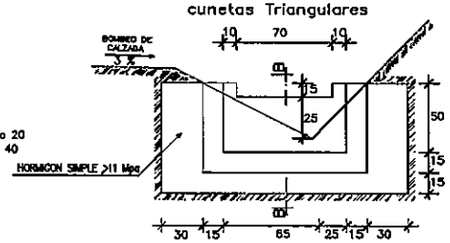
DETALLE DE CUNETA REVESTIDA
PARA BORDES DE TALUDES
Para largos ≥ 100 m



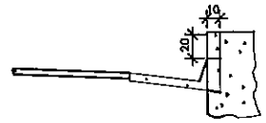
CUNETAS TRAPEZOIDALES
DE HORMIGON
Para largos > 100 m



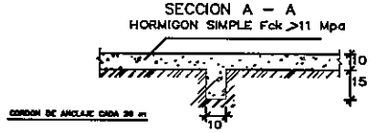
DETALLE DISIPADOR DE ENERGIA
cunetas Triangulares



CORTE C–C''
S/ESCALA

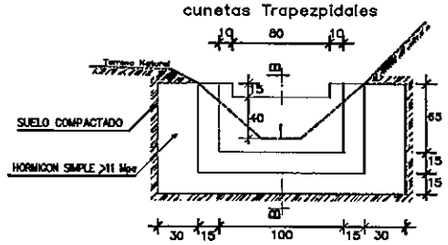


SECCION A – A
HORMIGON SIMPLE Fck ≥11 Mpa

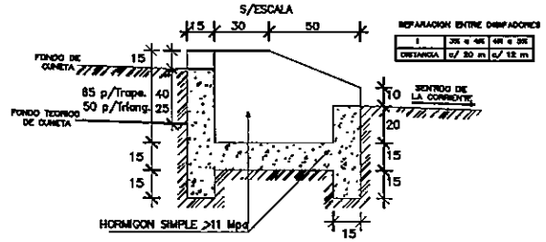


NOTA: – LAS CUNETAS REVESTIDAS SERAN UTILIZADAS EN TRAMOS CON PENDIENTES MAYOR A 8%
– LAS JUNTAS DE DILATACION TENDRAN UNA SEPARACION DE 3.0 m

DETALLE DISIPADOR DE ENERGIA
cunetas Trapezpidales

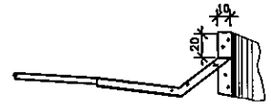


SECCION B – B
S/ESCALA

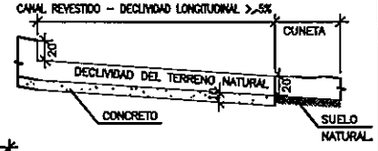


SEPARACION ENTRE DISIPADORES		
I	3% a 4%	4% a 5%
DISTANCIA	c/ 30 m	c/ 12 m

CORTE D–D''
S/ESCALA

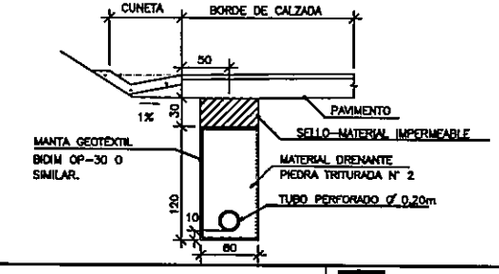


CORTE A–A''
S/ESCALA

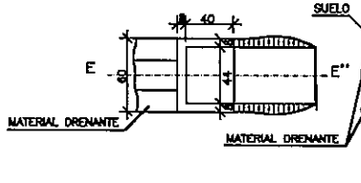


CONSUMO MEDIO DE HORMIGON
1– DE LA SALIDA 0,464 m³/u
2– DEL CANAL : 0,120 m³/m
Fck≥11Mpa

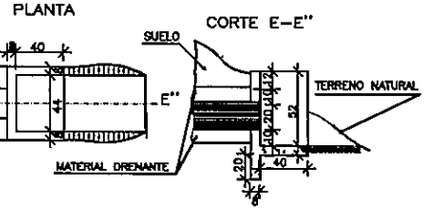
DRENAJE PROFUNDO LONGITUDINAL



TERMINAL DEL DRENO
PLANTA

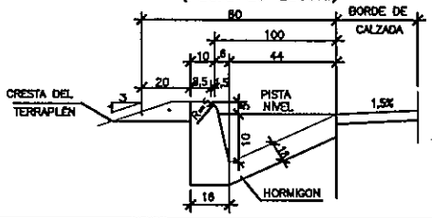


CORTE E–E''



VOLUMEN DE HORMIGON DEL TERMINAL: 0,090 m³/u–fck≥13,5MPa.

CORDON CUNETA
Y ACCESO A PUENTES
(Fuera de Escala)



NOTAS:
1-
2-
3-

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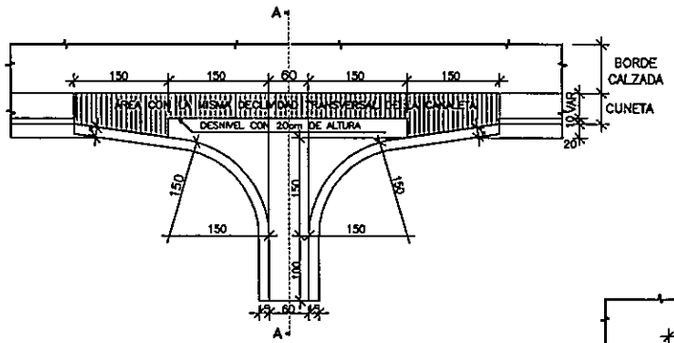
TRAMO 1: CONCEPCION - KM 82

MOPC

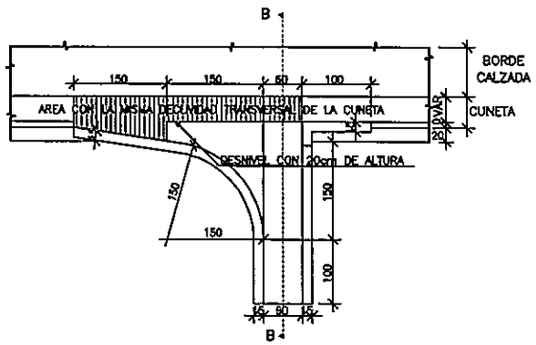
DISPOSITIVO DE DRENAJE EN TERRAPLENES DOBLES – DDT–02

PLANTA



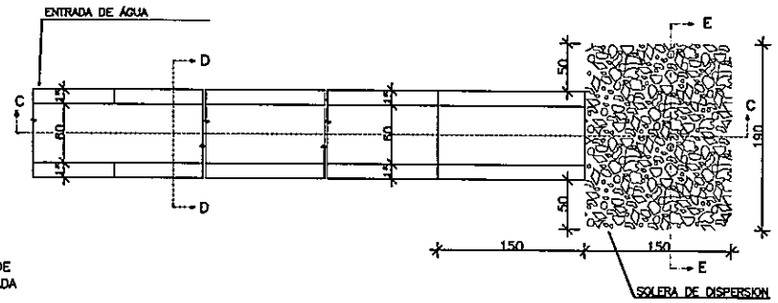
DISPOSITIVO DE DRENAJE EN TERRAPLENES SIMPLES–SAT–01

PLANTA

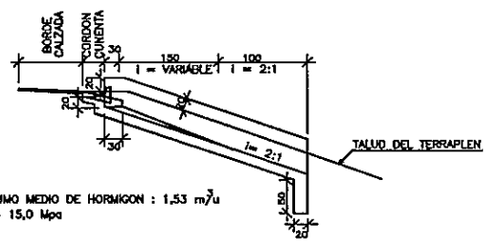


DESCENSO DE AGUA EN TERRAPLEN

PLANTA–FORMA

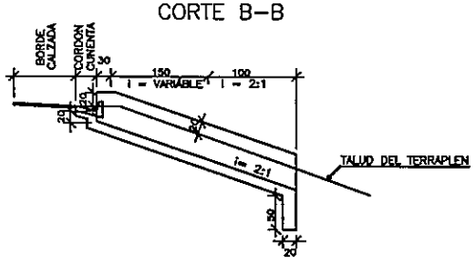


CORTE A–A

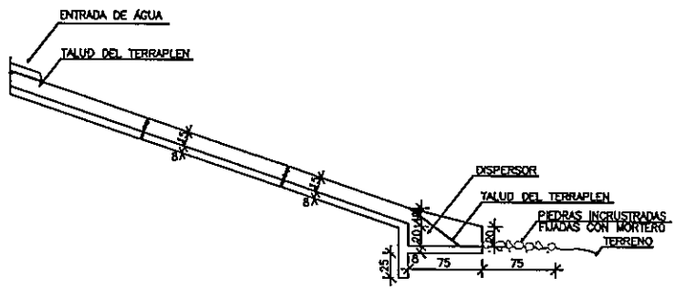


CONSUMO MEDIO DE HORMIGON : 1,53 m^3/u
Fck > 15,0 Mpa

CORTE B–B

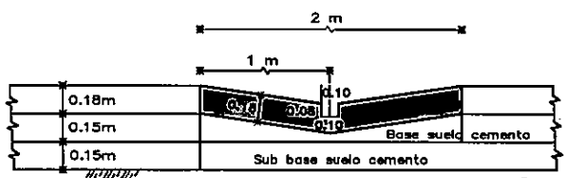


CORTE C–C



BADEN H° HIDRAULICO Fck>21Mpa

CORTE TRANSVERSAL
Fuera de escala

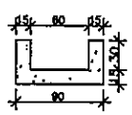


CONSUMO MEDIO DE CONCRETO : 1,34 m^3/u
Fck > 21,0 Mpa

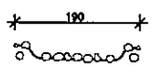
Nota:
Pendiente transversal = 10 % (PT)
Pendiente longitudinal = 1,5 % (PL)
Longitud = Variable (L)

CORTE D–D

CONSUMO DE HORMIGON;
1 – DEL DESCENSO : 0.225 m^3/m
2 – DEL ANCLAJE: 0,10 m^3/u
3 – DEL DISPERSOR : 0,66 m^3/u
Fck > 15,0 MPa



CORTE E–E



CONSUMO DE PIEDRAS: 0,43 m^3/u
Ø MAXIMO : 15 cm

NOTAS:
1-
2-
3-

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DISPOSITIVO DE DESAGUE

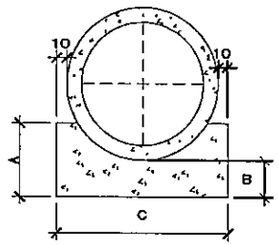
FECHA: 2004

LAMINA: DR 6.3-2/3

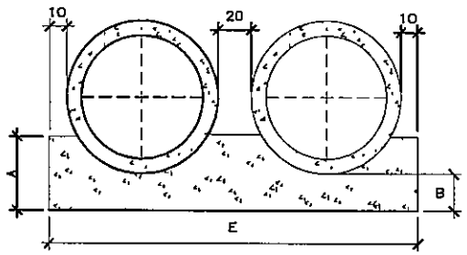
MOPC

PLATEA DE HORMIGON PARA ASIENTO DE ALCANTARILLAS

ALCANTARILLA SIMPLE
(ASTH°)



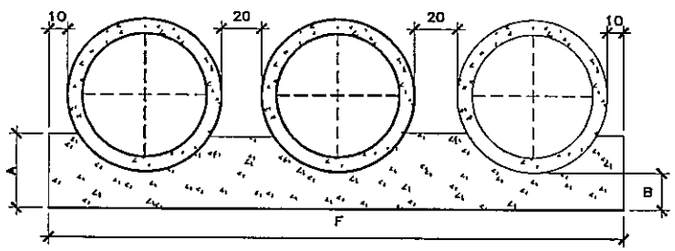
ALCANTARILLA DOBLE
(ADTH°)



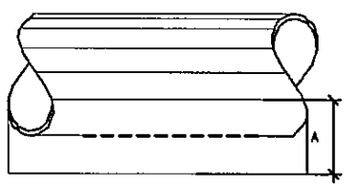
CUADRO DE DIMENSIONES					
DIAMETRO	A	B	C	E	F
60	34	15	96	–	–
80	45	20	120	–	–
100	56	25	144	288	432

CUANTIDADES POR METRO LINEAL DE PLATEA						
DIAMETRO (m)	SIMPLES		DOBLE		TRIPLE	
	HORMIGON (m^3)	FORMA (m^2)	HORMIGON (m^3)	FORMA (m^2)	HORMIGON (m^3)	FORMA (m^2)
60	0,238	0,660	–	–	–	–
80	0,386	0,900	–	–	–	–
100	0,570	1,120	1,141	1,120	1,711	1,120

ALCANTARILLA TRIPLE
(ATTH°)



VISTA LATERAL



NOTAS:

1) UTILIZAR EN LAS PLATEAS DE HORMIGON SIMPLE fck 15,0 MPa.
2) DIMENSIONES EN cm.

NOTAS :
1-
2-
3-

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Alberdi 488 - 4to. Piso - Of. 3 - Tel.: 442.977-441.994
Email: geocorse@telesurf.com.py

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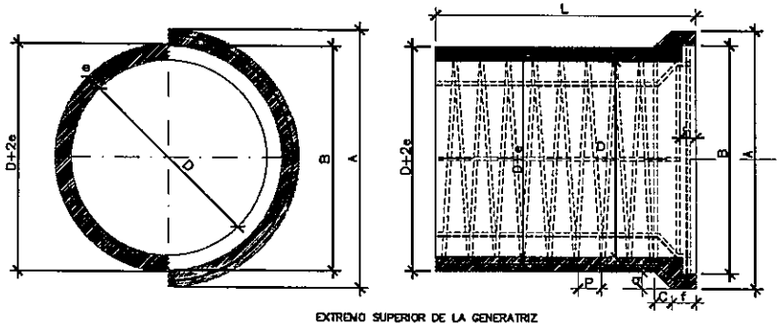
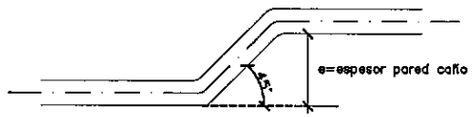
ALCANTARILLAS
TUBULARES DE HORMIGON
PLATEAS

ESCALA: VARIAS
LAMINA: DR 6.1-3/3

TUBOS DE HORMIGION – ARMADURA



EXTREMO SUPERIOR DE LA GENERATRIZ



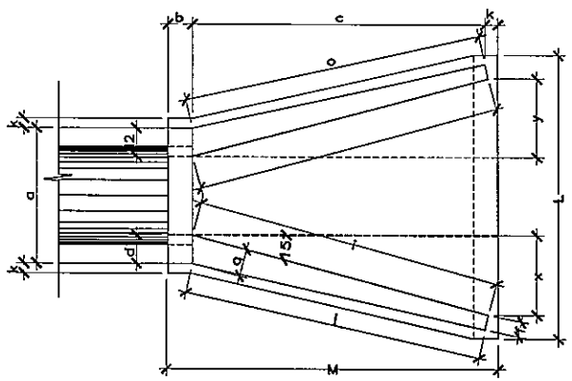
DIAMETRO	ESPESOR PARED	LARGO UTIL	ARMADURAS DE HIERRO				PESO TOTAL DE LA ARM.	DIMENSIONES (m)						VOL. DE HORMIGÓN
				ESPIRALES										
D (m)	e (m)	L LONG. (m)	(mm)	Ø (mm)	P (m)	Ø EST. DE LA ESPIRAL	Kgr.	A	B	C	f	g	h	(m^3)
0,400	0,040	1,000	7Ø8	6	0,10	0,452	7,580	0,570	0,490	0,045	0,080	0,045	0,060	0,061
0,500	0,045	1,000	8Ø8	6	0,10	0,557	8,590	0,690	0,600	0,050	0,080	0,050	0,060	0,085
0,600	0,050	1,000	9Ø8	6	0,11	0,666	14,620	0,810	0,710	0,055	0,085	0,055	0,060	0,112
0,800	0,060	1,000	12Ø8	10	0,11	0,875	27,763	1,056	0,935	0,065	0,100	0,068	0,065	0,172
1,000	0,075	1,000	14Ø8	12	0,11	1,092	46,722	1,320	1,170	0,080	0,115	0,085	0,075	0,278

CARACTERISTICAS DEL HORMIGON

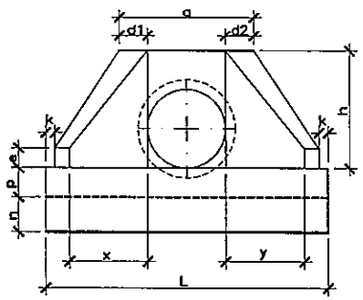
HORMIGÓN CLASE A: 1: 1,5: 3. POR VOLUMEN CON UN MÍNIMO DE 350 Kgr. DE CEMENTO PORTLAND POR m^3 DE HORMIGÓN. PIEDRA TRITURADA DE 5 A 15 mm PARA CAÑOS DE 0,40 m Y 0,60 m DE DIÁMETRO Y DE 5mm A 20mm PARA CAÑOS DE 0,80 m Y 1,00 m DE DIÁMETRO.

ALA PARA ALCANTARILLA SIMPLE TUBULAR DE HORMIGON

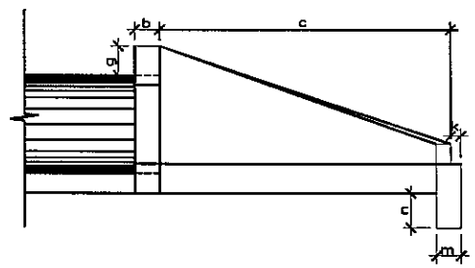
PLANTA



VISTA FRONTAL



VISTA LATERAL



DIMENSIONES Y CONSUMO MÉDIO PARA ALCANTARILLA SIMPLE – escons.=0° (fck > 15 MPa)																									
Ø	B°	a	b	c	d1	d2	e	f	g	h	i	j	k	l	m	n	o	p	q	x	y	L	M	FORMAS (m^2)	HORMIGON (m^3)
60	15	106	20	249	23	23	15	10	50	98	258	253	10	258	20	30	253	23	20	67	67	233	279	10,37	2,01
80	15	138	25	300	29	29	20	15	50	120	311	303	10	311	25	35	303	30	25	80	80	289	335	15,49	4,09
100	15	170	30	351	35	35	25	20	50	142	363	354	10	363	30	40	354	37	30	94	94	346	391	19,70	7,07

NOTAS :

1-

2-

3-

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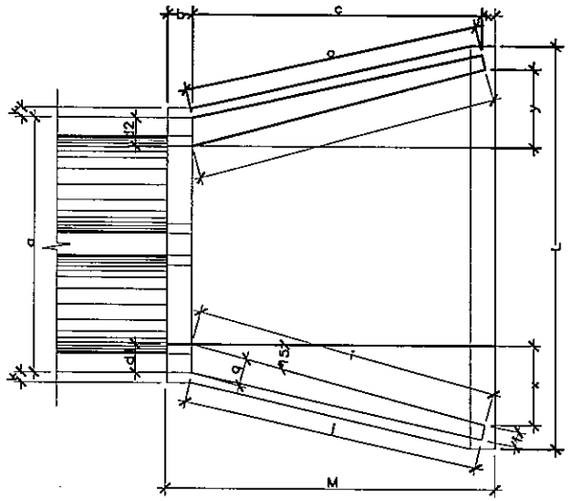
ALCANTARILLAS TUBULARES DE HORMIGON ARMADURA Y ALA SIMPLE

ESCALA: VARIAS

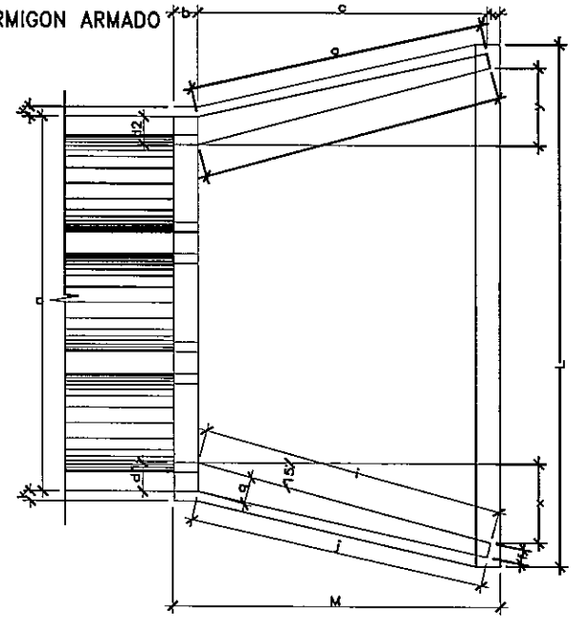
LAMINA: DR 6.1-1/3

MOPC

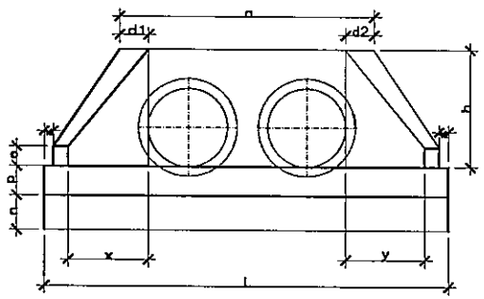
ALA DE ALCANTARILLA DOBLE Y TRIPLE TUBULAR DE HORMIGON ARMADO



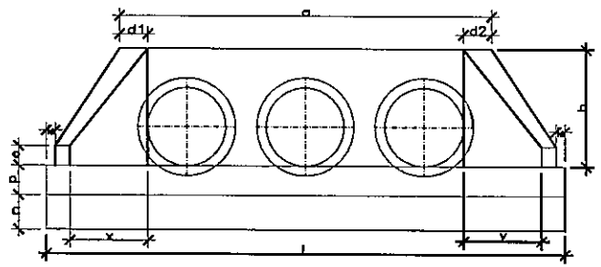
PLANTA



PLANTA

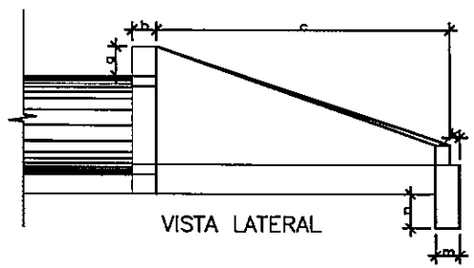


VISTA FRONTAL



VISTA FRONTAL

DIMENSIONES Y CONSUMO MÉDIO PARA ALCANTARILLA DOBLES – escons.=0° (fck > 15 MPa)																								
ø	B'	a	b	c	d1	d2	e	f	g	h	i	j	k	l	m	n	o	p	q	x	y	L	M	FORMAS (m²)	HORMIGON (m³)
100	15	314	30	351	35	35	25	20	30	142	363	354	10	363	30	40	354	37	30	94	94	489	391	25,55	9,78
DIMENSIONES Y CONSUMO MÉDIO PARA ALCANTARILLA TRIPLES – escons.=0°																									
ø	B'	a	b	c	d1	d2	e	f	g	h	i	j	k	l	m	n	o	p	q	x	y	L	M	FORMAS (m²)	HORMIGON (m³)
100	15	458	30	351	35	35	25	20	30	142	363	354	10	363	30	40	354	37	30	94	94	633	391	30,10	12,15



VISTA LATERAL

NOTAS :
1-
2-
3-

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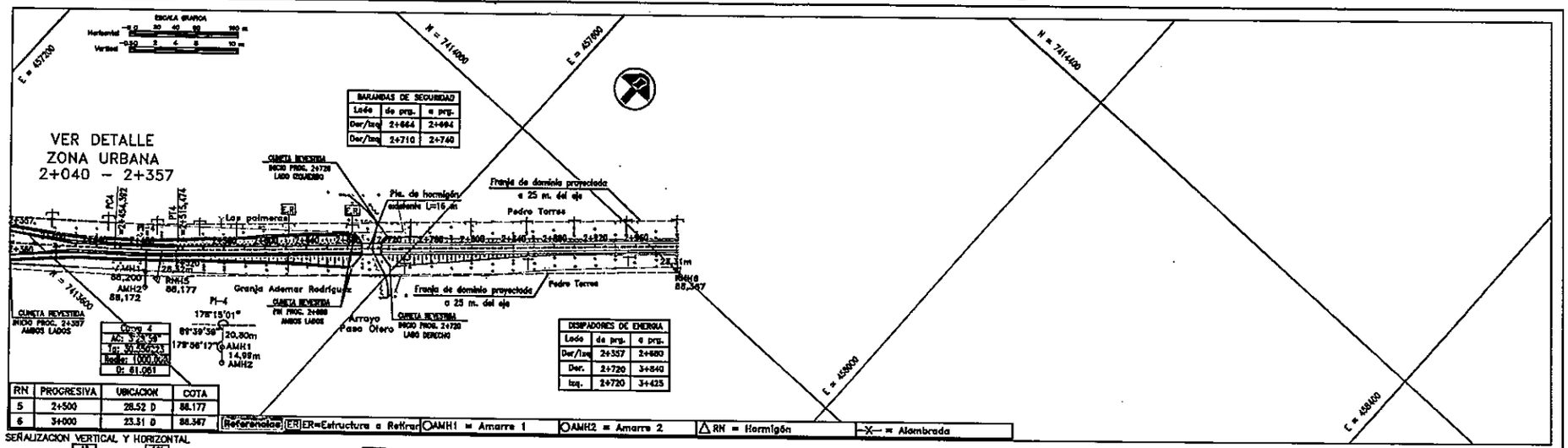
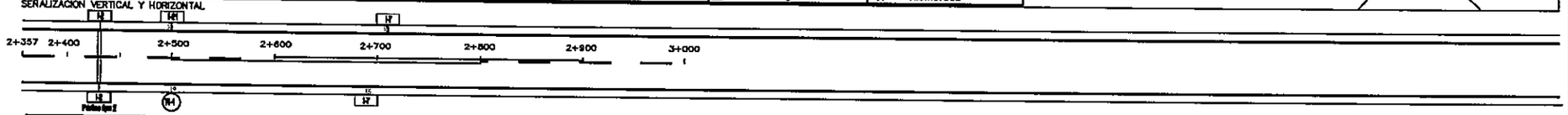
ALCANTARILLAS TUBULARES DE H° DETALLES ALAS DOBLES Y TRIPLES

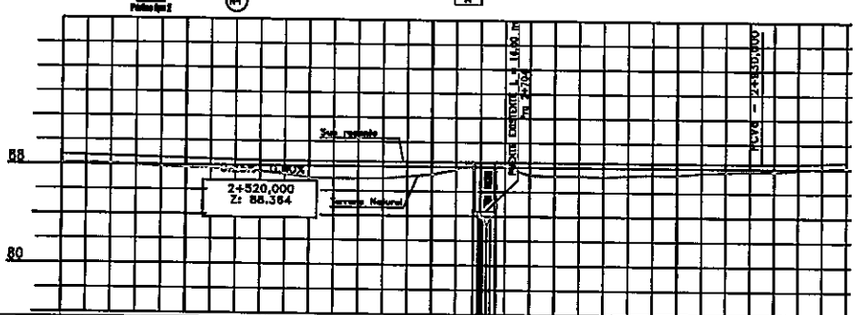
ESCALA: VARIAS

LAMINA: DR 6.1-2/3



SEÑALIZACION VERTICAL Y HORIZONTAL





Progresiva	2+357,000	2+377,000	2+397,000	2+417,000	2+437,000	2+457,000	2+477,000	2+497,000	2+517,000	2+537,000	2+557,000	2+577,000	2+597,000	2+617,000	2+637,000	2+657,000	2+677,000	2+697,000	2+705,000	2+725,000	2+740,000	2+760,000	2+780,000	2+800,000	2+820,000	2+840,000	2+860,000	2+880,000	2+900,000	2+920,000	2+940,000	2+960,000	2+980,000	3,000
Cotas del Terreno	88,067	88,086	88,095	87,987	87,872	87,798	87,778	87,841	87,917	87,979	87,972	87,909	87,913	87,901	87,861	87,809	87,749	86,436	83,130	85,783	87,333	87,318	87,324	87,256	87,351	87,428	87,435	87,600	87,680	87,793	87,786	87,862	88,049	88,107
Sub rasante Proyectada	88,777	88,727	88,678	88,625	88,574	88,518	88,468	88,415	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,364	88,401	88,467	88,565

Elementos Horizontales: TANGENTE — TC — C-4 R = 1000.000 — ST — TANGENTE

Elementos Verticales: 0.00% en 410.00 — 2+500,000 — 2+530,000 — 2+930,000

| Cota Roja | 0,690 | 0,641 | 0,591 | 0,658 | 0,707 | 0,723 | 0,770 | 0,688 | 0,717 | 0,773 | 0,836 | 0,917 | 1,055 | 1,336 | 1,361 | 1,359 | 1,361 | 1,172 | 1,093 | 0,918 | -0,064 | -0,104 | 0,727 | 1,032 | 1,046 | 1,040 | 1,108 | 1,014 | 0,936 | 0,929 | 0,785 | 0,664 | 0,571 | 0,592 | 0,509 | 0,416 | 0,558 |

NOTAS :

1-

2-

3-

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Alberdi 485 - 4to. Piso - Of. 3 - Tel.: 442.977-481.984
Email: geocorsa@telesurf.com.py

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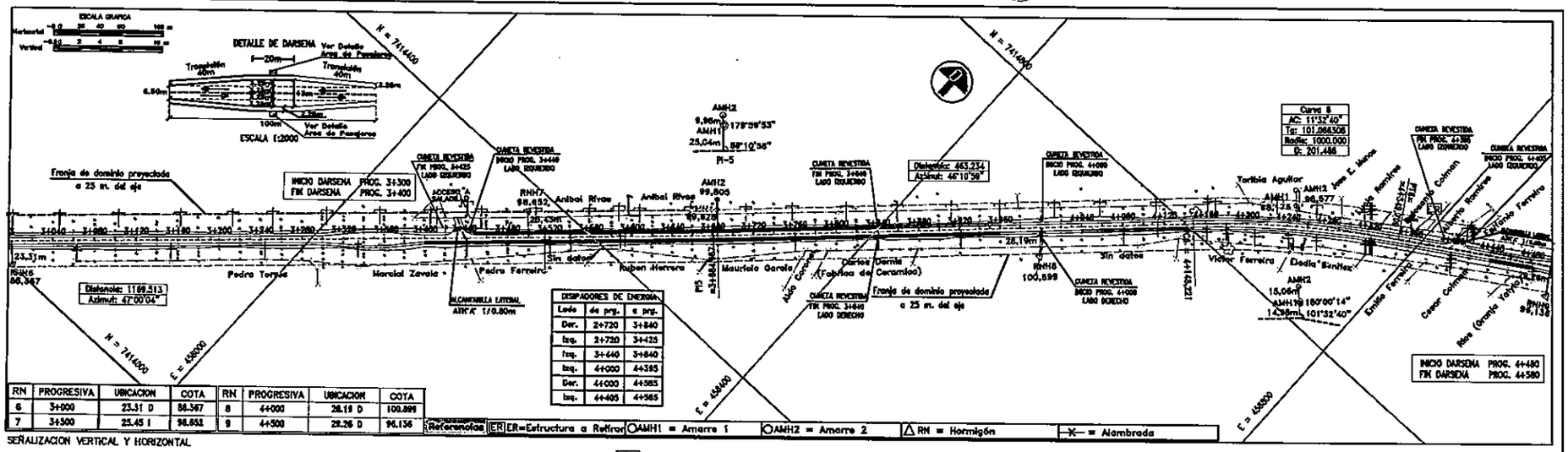
DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 2+357 - 3+000

ESCALAS: H: 1/1.000 V: 1/100

LAMINA: GM 4.2-01/34

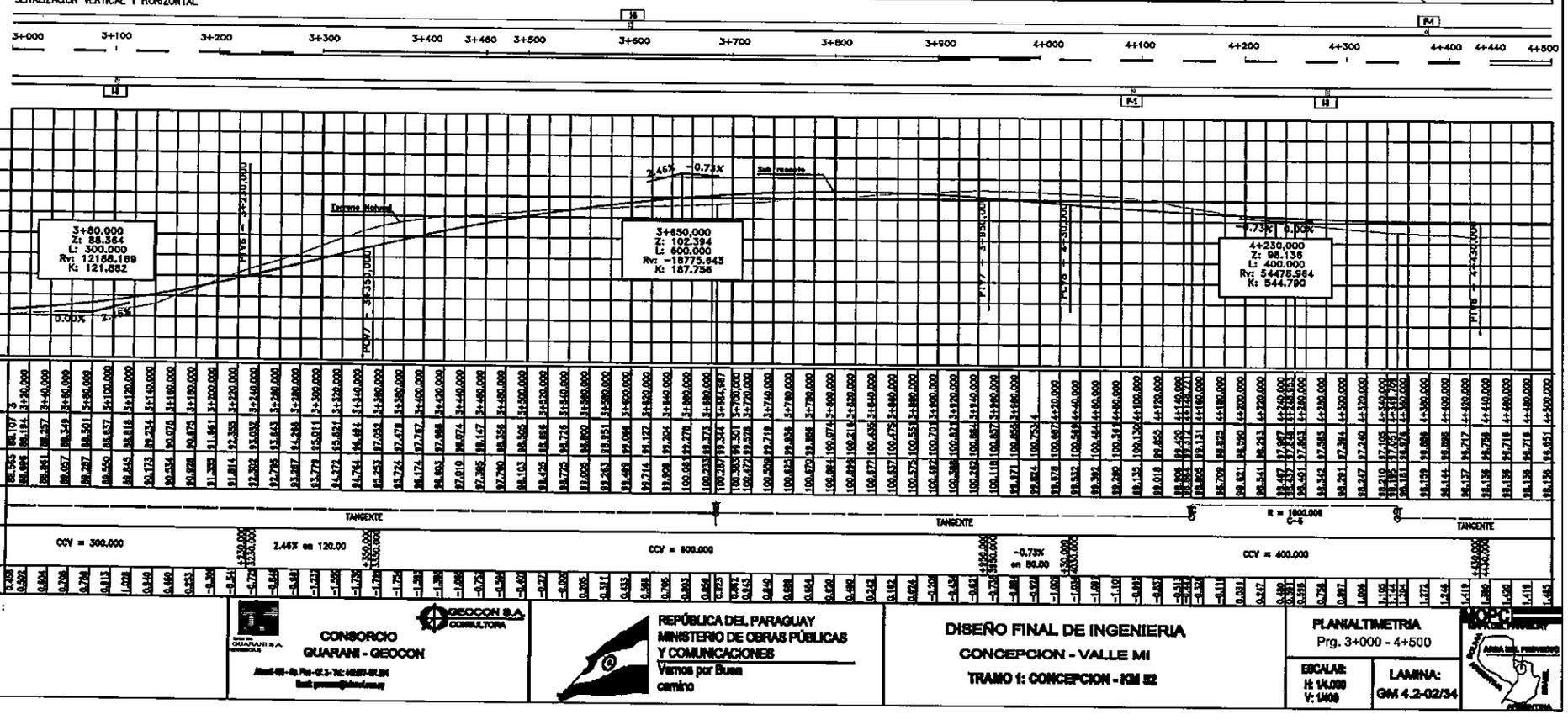


RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
6	3+000	23.31 D	86.367	8	4+000	28.19 D	100.899
7	3+500	25.45 I	98.652	9	4+500	28.26 D	96.136

DISIPADORES DE ENERGIA	
Lado	de prg.	a prg.
Der.	2+720	3+840
Izq.	2+720	3+425
Izq.	3+440	3+840
Izq.	4+000	4+395
Der.	4+000	4+585
Izq.	4+405	4+585

Referencias: ER ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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CONSORCIO GUARANI - GEOCON

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - IGM 52

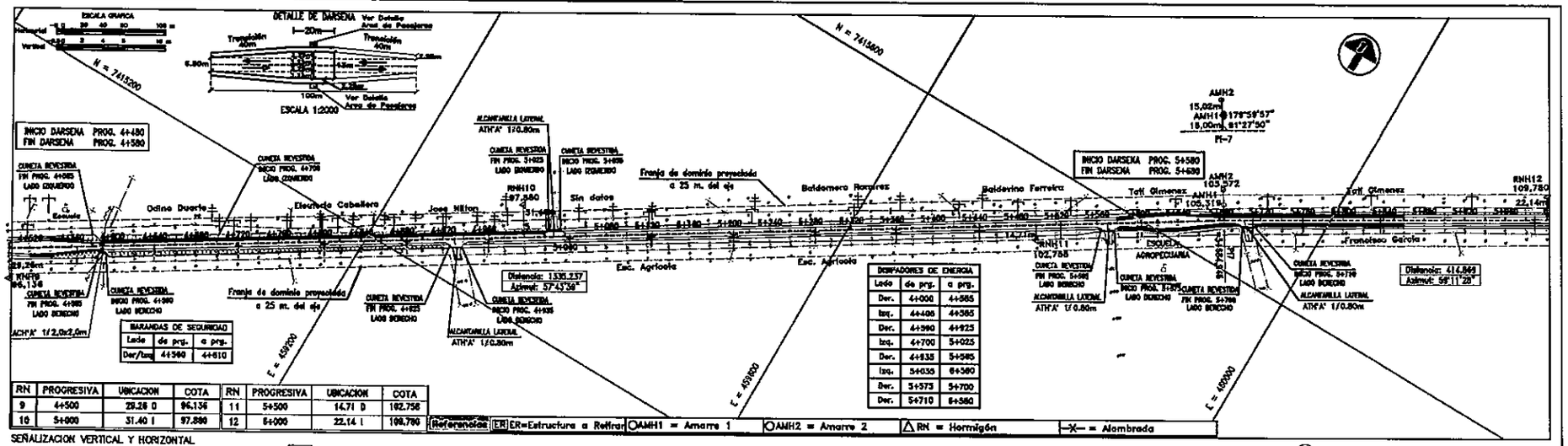
PLANALTIMETRIA

Prg. 3+000 - 4+500

ESCALAS: H: 1/4.000 V: 1/400

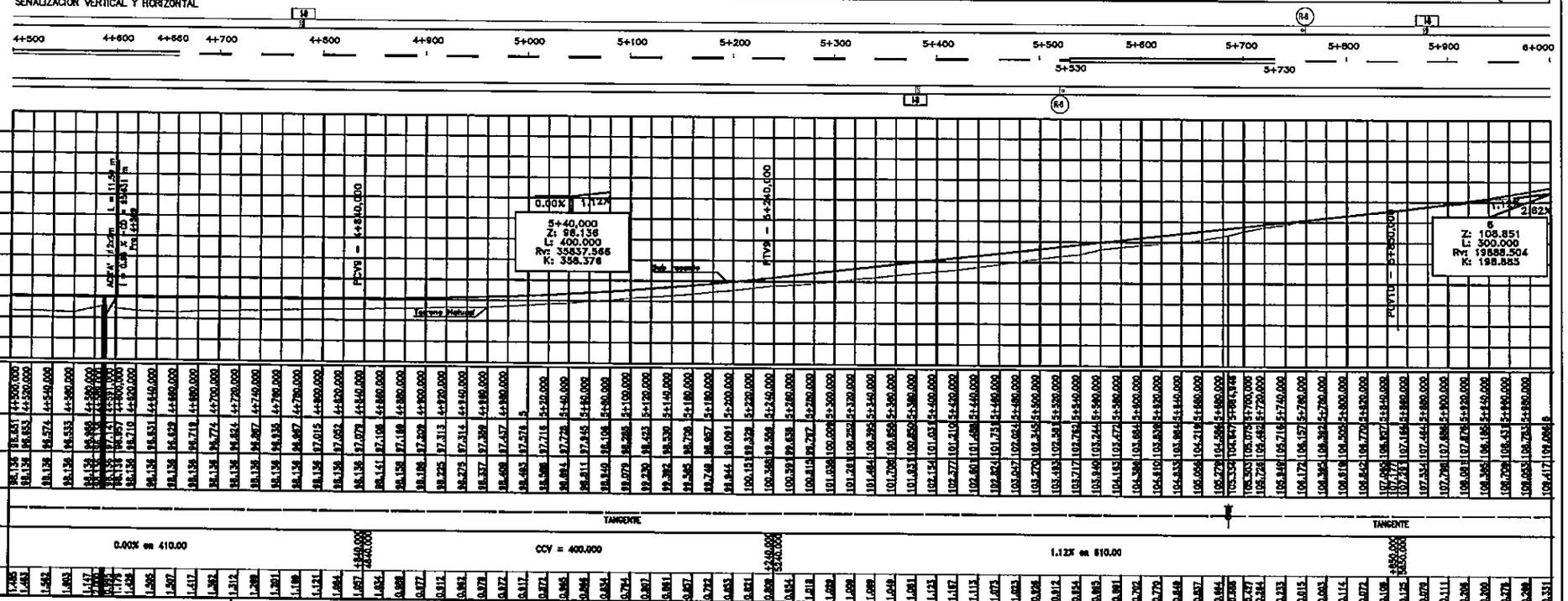
LAMINA: GM 4.2-02/34

MOPC



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
9	4+500	29.26 D	96.136	11	5+500	14.71 D	102.756
10	5+000	31.40 I	97.880	12	6+000	22.14 I	109.780

SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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CONSORCIO GUARANI - GEOCON

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 82

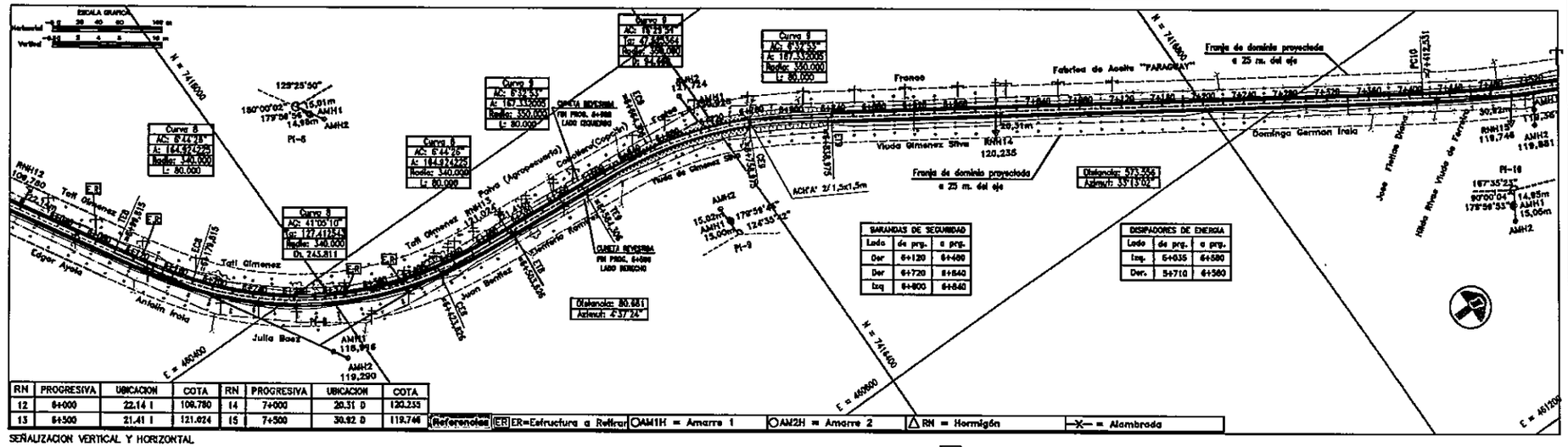
PLANALTIMETRIA

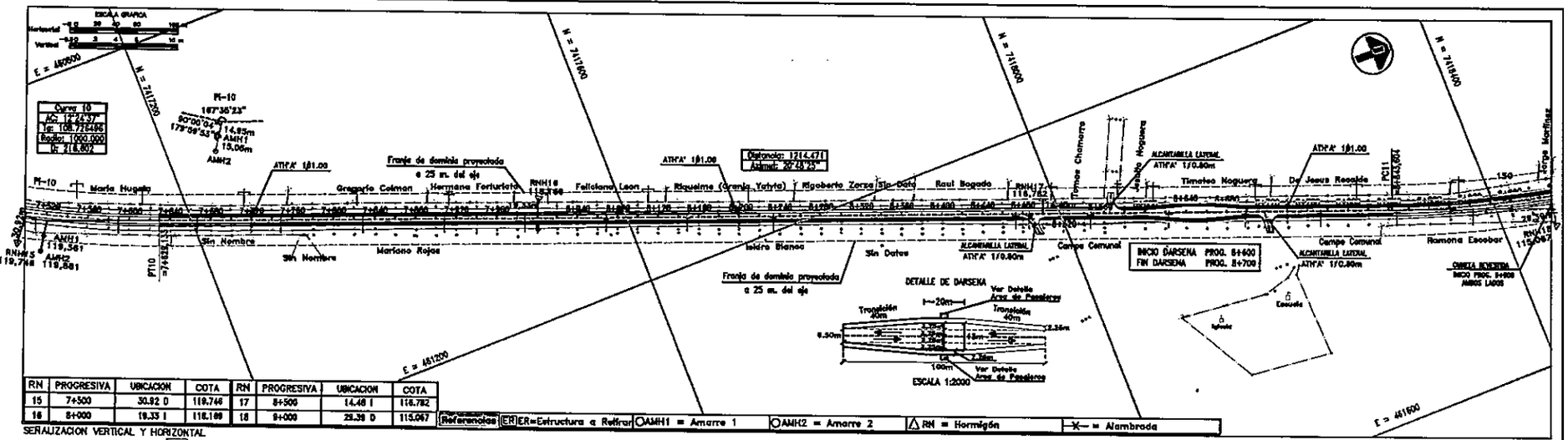
Prg. 4+500 - 6+000

ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GM 4.2-03/34

MOPC

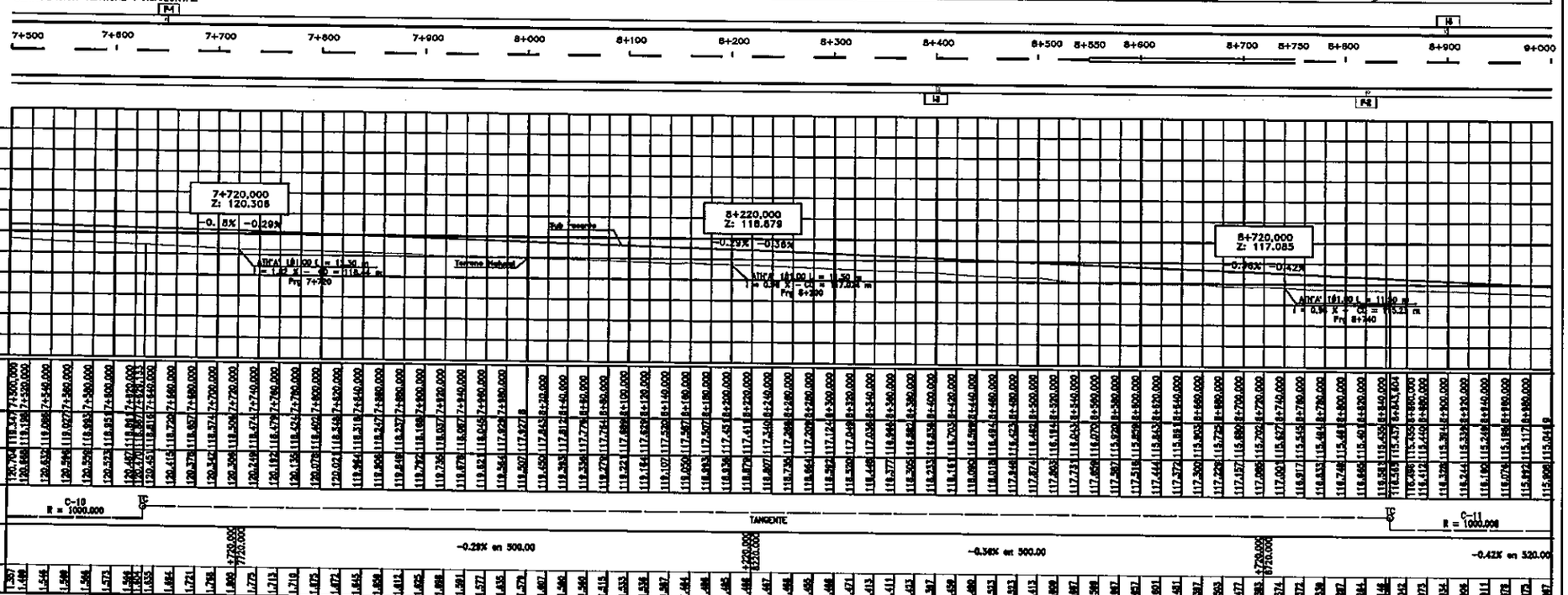

ESCALA GRAFICA
Horizontal
Vertical
N = 7416000
N = 7414400
E = 460400
E = 460800
E = 461200
Curva 8
AC: 8°44'28"
A: 164.974225
Radio: 340.000
L: 80.000
Curva 8
AC: 41°05'10"
Tg: 127.412251
Radio: 340.000
Dt: 243.811
Curva 8
AC: 6°44'28"
A: 164.974225
Radio: 340.000
L: 80.000
Curva 8
AC: 6°32'53"
A: 167.332005
Radio: 350.000
L: 80.000
Curva 8
AC: 19°29'54"
Tg: 47.886563
Radio: 350.000
Dt: 94.696
Curva 8
AC: 6°37'33"
A: 167.332005
Radio: 350.000
L: 80.000
129°25'50"
180°00'02"
179°56'56"
15.01m
14.98m
AMH1
AMH2
PI-5
RHH12
109.780
Taff Gimenez
Edgar Ayala
Antolin Irala
Julio Baez
Taff Gimenez
Polvo (Horqueteria)
Calle Lara (Cruce Sur)
Juan Benitez
Domingo Ramirez
Viuda de Gimenez Silva
Franco
Fabrica de Aceite "PARAGUAY"
Viuda Gimenez Silva
Domingo German Irala
Jose Fleitas Duarte
Viuda Rivas Viuda de Fernandez
Franja de dominio proyectada
a 25 m. del eje
RHH14
120.235
RHH15
119.746
AMH1
AMH2
119.881
PI-10
187°35'23"
90°00'04"
179°59'53"
14.85m
15.05m
PI-9
126°35'22"
ACH'A' 2/1.5x1.5m
Distancia: 80.681
Azimuth: 4°37'24"
Distancia: 573.355
Azimuth: 33°15'02"
BARANDAS DE SEGURIDAD
DISIPADORES DE ENERGIA
CUNETA REVESTIDA
FIN PROG. 6+000
LADO IZQUIERDO
CUNETA REVESTIDA
FIN PROG. 6+000
LADO DERECHO
E.R
E.R
E.R



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
15	7+500	30.92 D	119.746	17	8+500	14.48 I	116.782
16	8+000	19.33 I	116.189	18	9+000	29.39 D	115.067

Referencias: ER ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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3-

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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 82

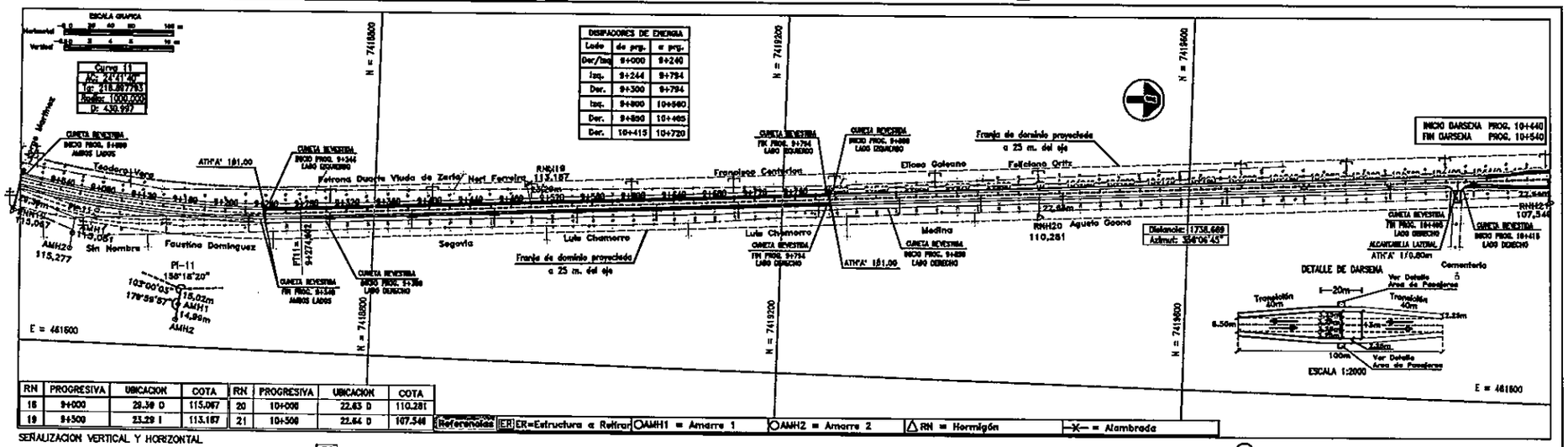
PLANIALTIMETRIA

Prg. 7+500 - 9+000

ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GMI 4.2-05/34

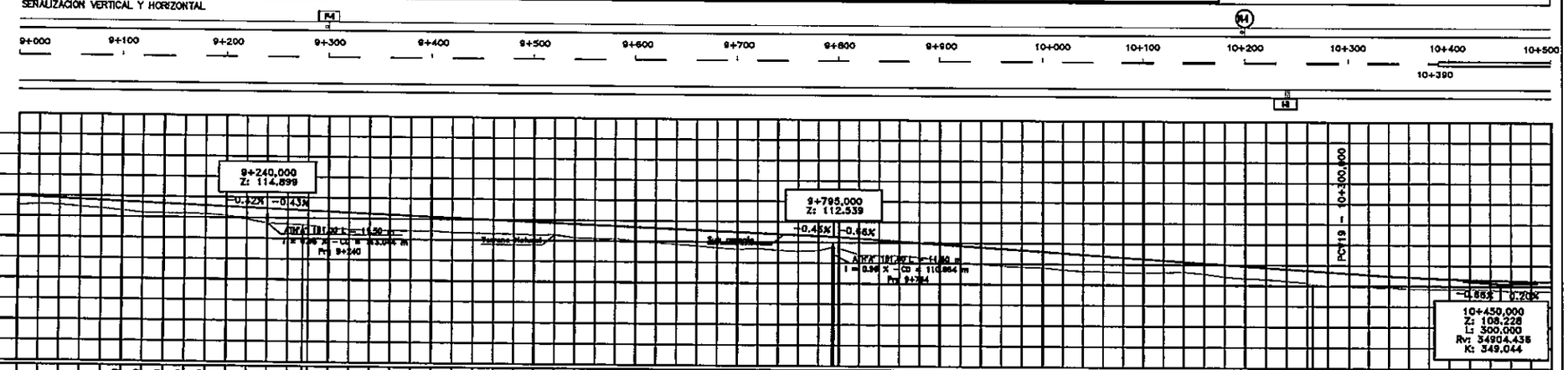
MOPC



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
18	9+000	28.30 D	115.067	20	10+000	22.63 D	110.281
19	9+500	23.29 I	113.167	21	10+500	22.64 D	107.546

Referencias: ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva | Cotas del Terreno | Sub rasante Proyectada | Elementos Horizontales | Elementos Verticales | Cota Rojo

C-11 R = 1000.000 — TANGENTE

-0.43% en 555.00 — -0.66% en 505.00 — CCV = 300.000

NOTAS :
1-
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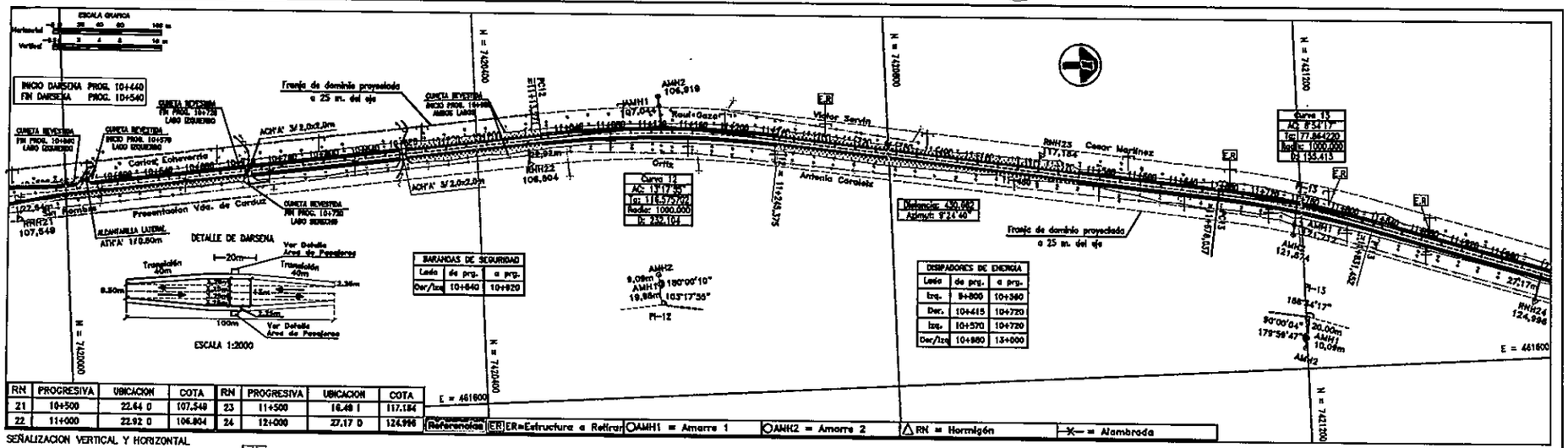
DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 9+000 - 10+500

ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GM 4.2-6/34

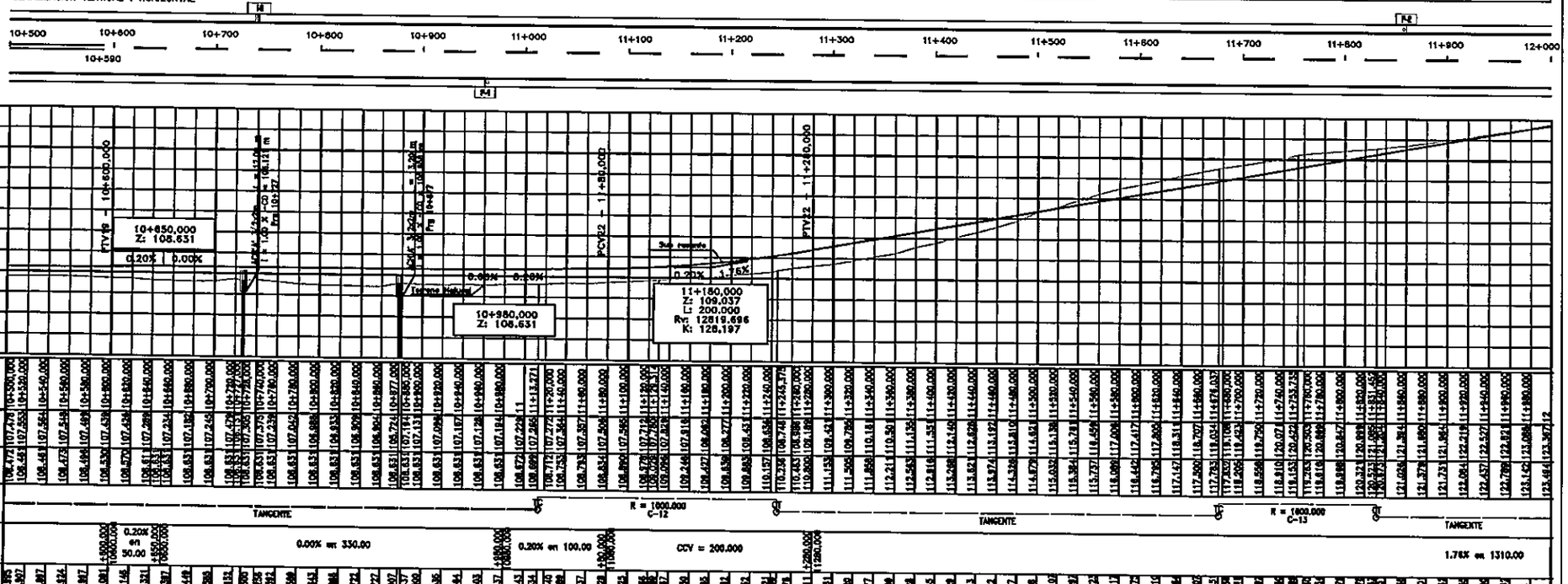
MOPC



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
21	10+500	22.44 D	107.549	23	11+500	16.48 I	117.184
22	11+000	22.92 D	106.804	24	12+000	27.17 D	124.996

Referencias: ER ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; X = Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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Email: geocons@telesurf.com.py

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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

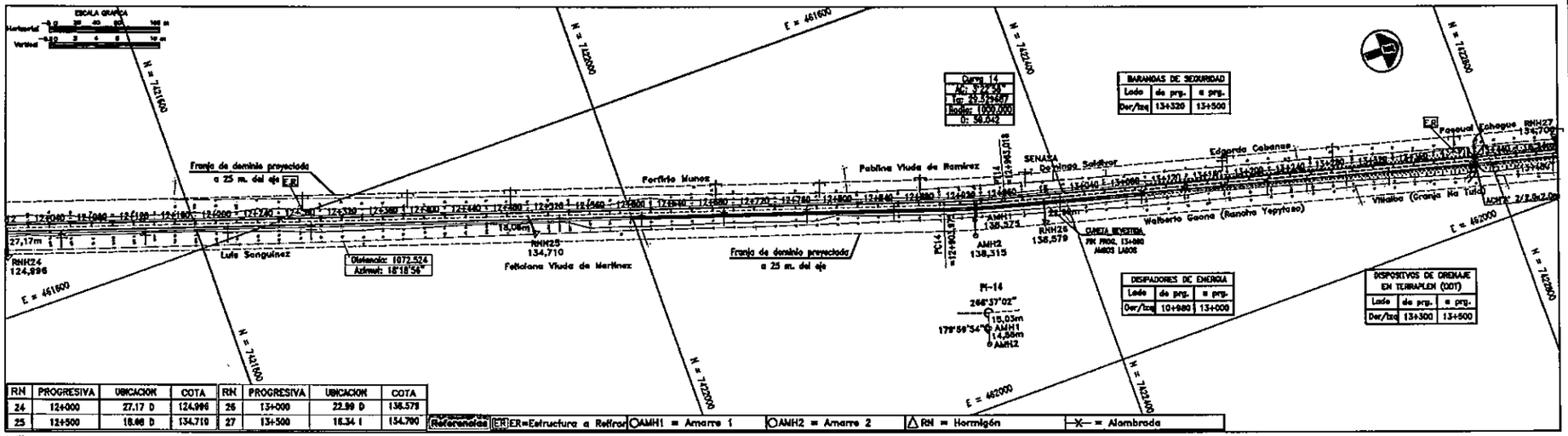
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA

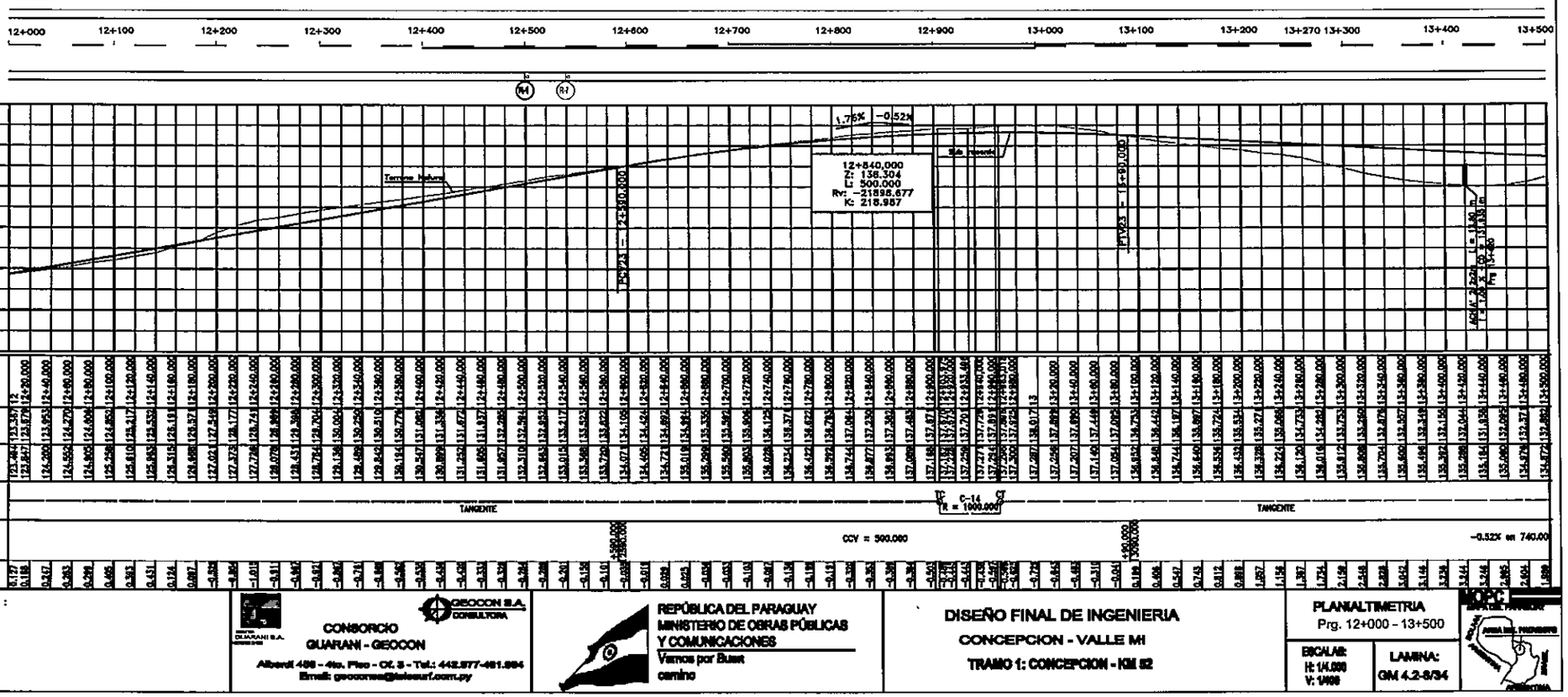
Prg. 10+500 - 12+000

ESCALAS: H: 1/1.000 V: 1/400

LAMINA: GM 4.2-7/34



SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

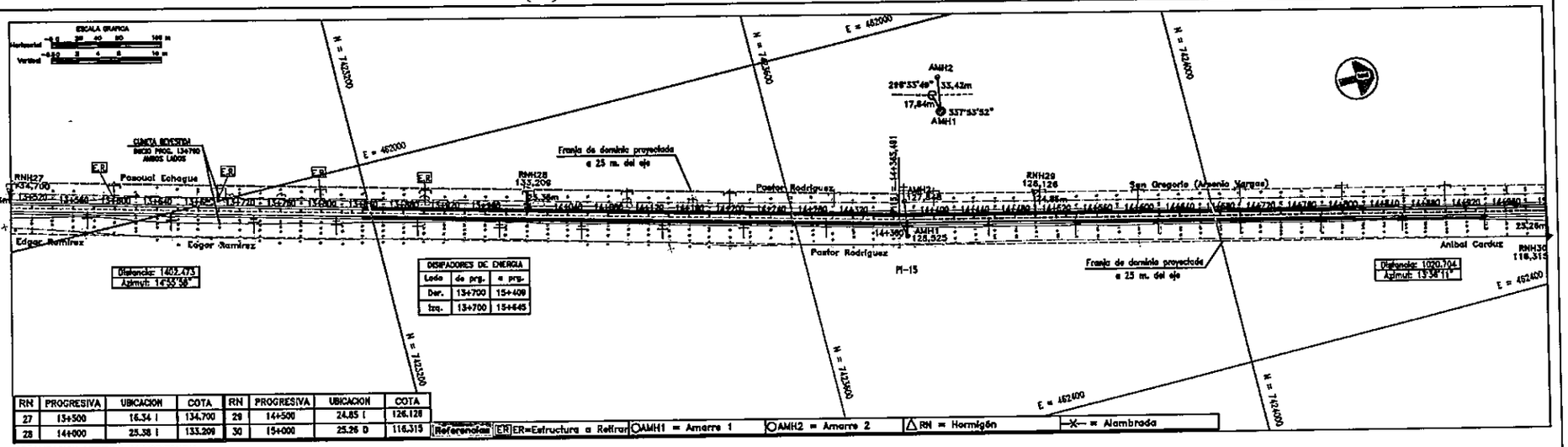
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA

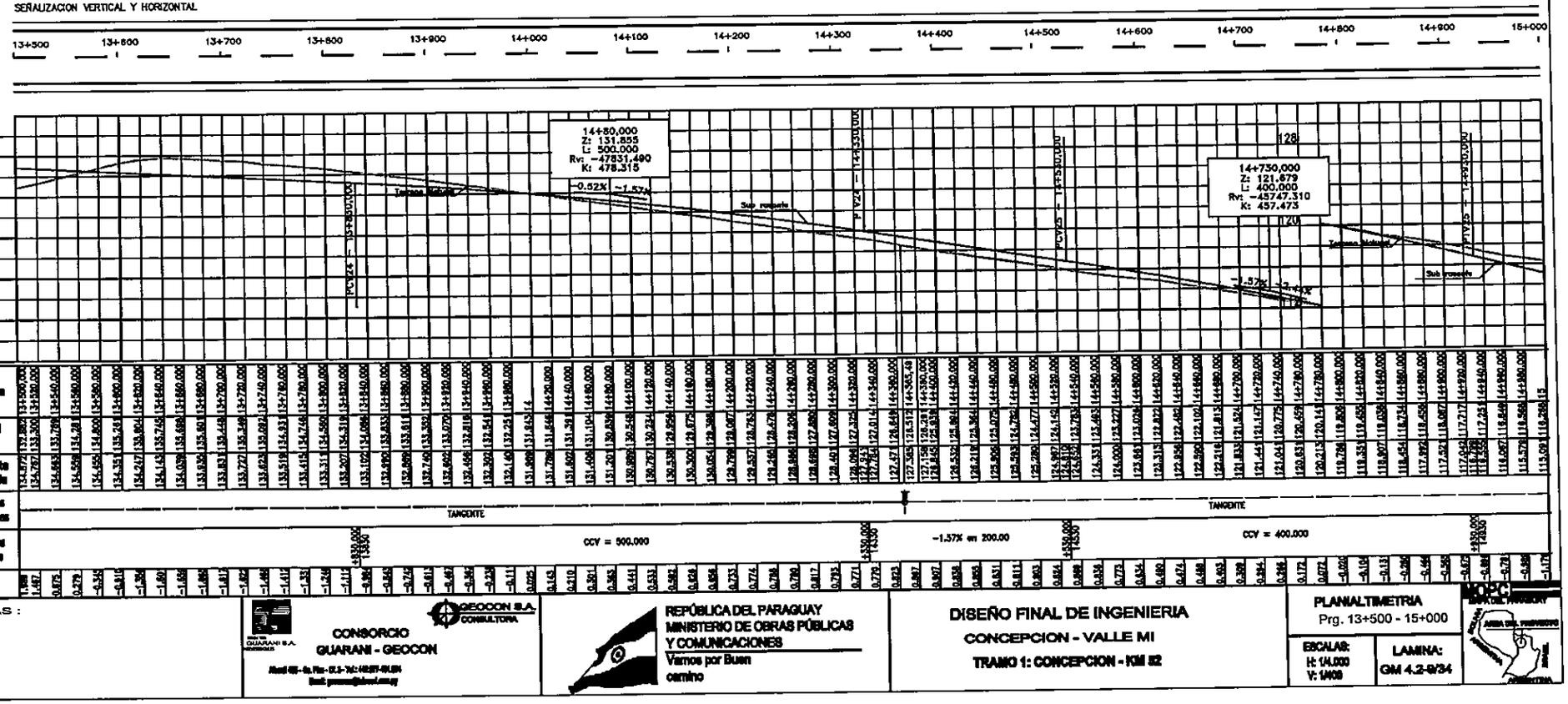
Prg. 12+000 - 13+500

ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GM 4.2-8/34



SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 82

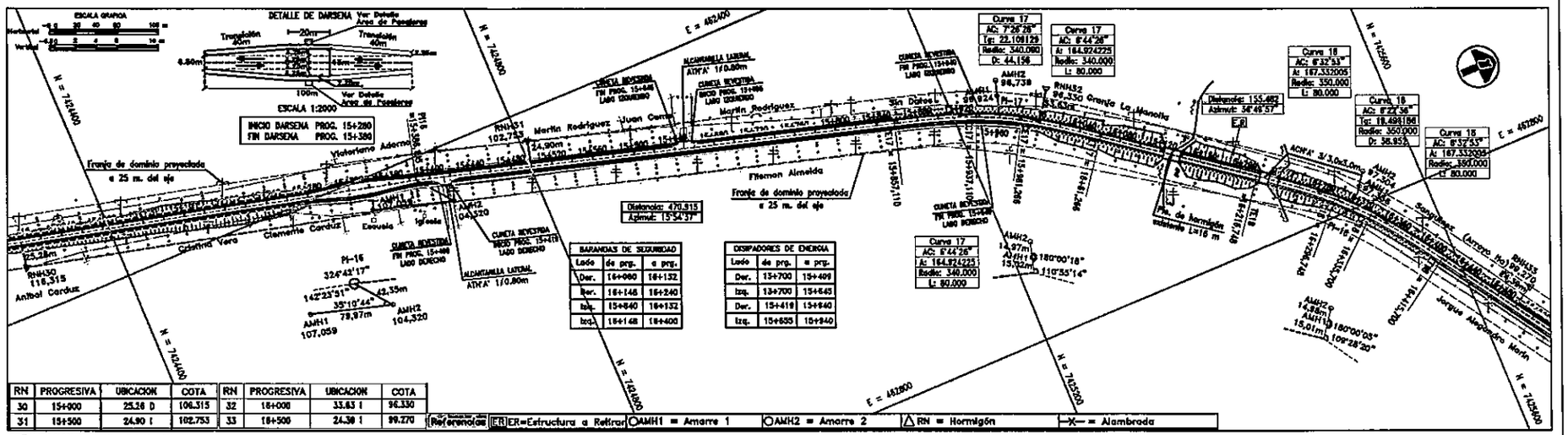
PLANIALTIMETRIA

Prg. 13+500 - 15+000

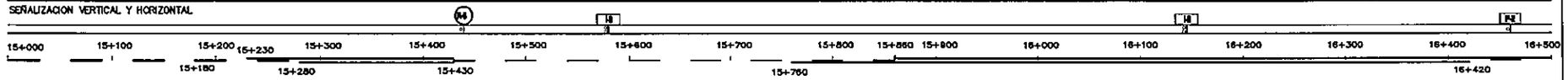
ESCALAS: H: 1/4.000 V: 1/400

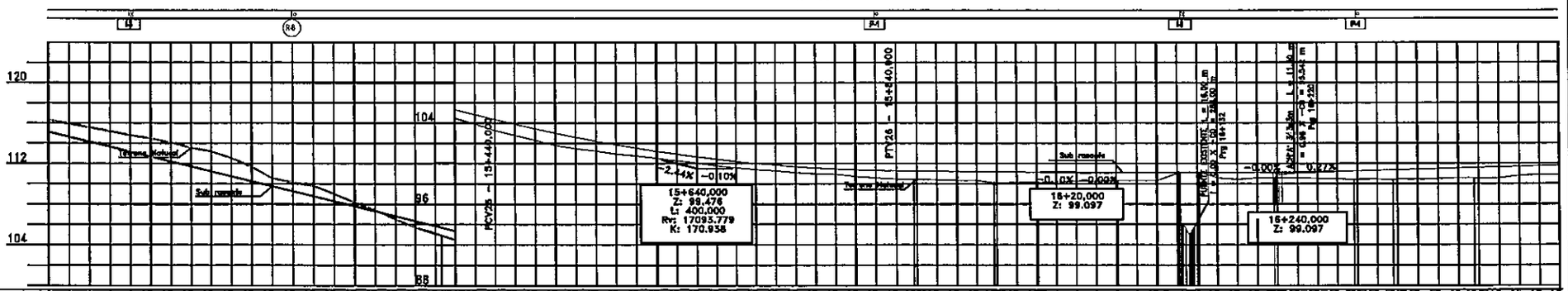
LAMINA: GM 4.2-9/34

MOPC



SEÑALIZACION VERTICAL Y HORIZONTAL





Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Rojo
15+000,000 … 16+500,000	115.067 … 96.288	115.067 … 96.288	TANGENTE; LC=80.000 R = 340.000 C-17; TANGENTE; LC=80.000 R = 350.000 C-18; TANGENTE	-2.44% en 310.00; CCV = 400.000; -0.10% en 180.00; -0.00% en 220.00	-1.178 … 0.501

NOTAS :
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REPÚBLICA DEL PARAGUAY
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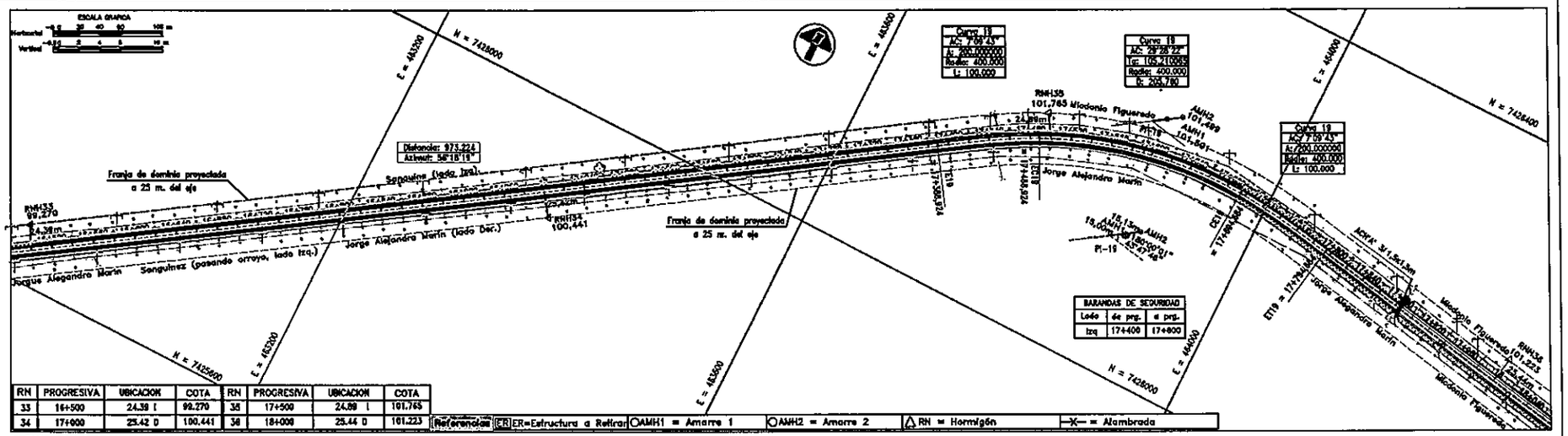
DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 32

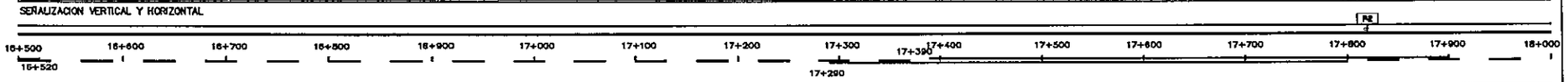
PLANIALTIMETRIA
Prg. 15+000 - 16+500

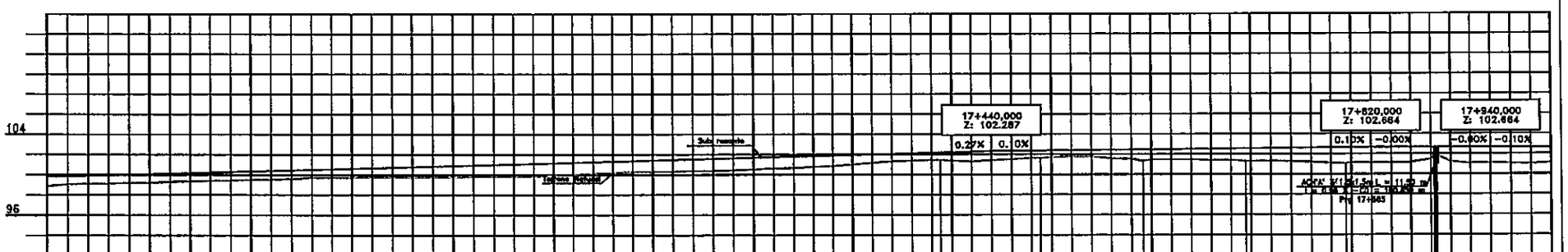
ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GM 4.2-10/34



SERAUZACION VERTICAL Y HORIZONTAL





Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Rojo
16+500,000	99,270	99,841	TANGENTE	0.27% en 1200.00	0,301
16+520,000	99,090	99,895			0,781
16+540,000	99,130	99,949			0,822
16+560,000	99,188	100,001			0,813
16+580,000	99,201	100,054			0,853
16+600,000	99,293	100,107			0,815
16+620,000	99,351	100,161			0,810
16+640,000	99,397	100,214			0,807
16+660,000	99,409	100,267			0,858
16+680,000	99,484	100,320			0,826
16+700,000	99,538	100,373			0,835
16+720,000	99,581	100,426			0,845
16+740,000	99,609	100,480			0,751
16+760,000	99,719	100,533			0,814
16+780,000	99,718	100,586			0,867
16+800,000	99,753	100,639			0,872
16+820,000	99,750	100,692			0,842
16+840,000	99,741	100,745			0,905
16+860,000	99,712	100,799			0,986
16+880,000	99,757	100,852			1,105
16+900,000	99,778	100,905			1,130
16+920,000	99,821	100,958			1,137
16+940,000	99,779	101,011			1,232
16+960,000	99,814	101,064			1,250
16+980,000	99,879	101,118			1,239
17+000,000	99,889	101,171			1,182
17+020,000	100,088	101,224			1,136
17+040,000	100,144	101,277			1,133
17+060,000	100,256	101,330			1,095
17+080,000	100,292	101,383			1,134
17+100,000	100,358	101,437			1,155
17+120,000	100,368	101,490			1,132
17+140,000	100,362	101,543			1,181
17+160,000	100,408	101,596			1,198
17+180,000	100,508	101,649			1,143
17+200,000	100,606	101,703			1,063
17+220,000	100,645	101,756			1,114
17+240,000	100,777	101,809			1,032
17+260,000	100,853	101,862			1,000
17+280,000	100,853	101,915			0,954
17+300,000	100,81	101,968			0,918
17+320,000	101,151	102,022			0,928
17+340,000	101,258	102,075			0,777
17+360,000	101,399	102,128			0,778
17+380,000	101,418	102,181			0,780
17+390,000	101,431	102,207			0,844
17+400,000	101,439	102,234			0,851
17+420,000	101,485	102,287			0,868
17+440,000	101,509	102,307			0,814
17+460,000	101,548	102,327			0,771
17+480,000	101,587	102,347			0,786
17+500,000	101,627	102,367			0,740
17+520,000	101,667	102,387			0,818
17+540,000	101,708	102,406			0,837
17+560,000	101,749	102,426			0,822
17+580,000	101,789	102,446			0,814
17+600,000	101,829	102,466			0,795
17+620,000	101,869	102,486			0,996
17+640,000	101,909	102,506			1,024
17+660,000	101,949	102,526			1,118
17+680,000	101,989	102,546			1,178
17+700,000	102,029	102,566			1,253
17+720,000	102,069	102,586			1,285
17+740,000	102,109	102,606			1,337
17+760,000	102,149	102,626			1,451
17+780,000	102,189	102,646			1,511
17+800,000	102,229	102,664			1,515
17+820,000	102,269	102,664	0.10% en 380.00		1,533
17+840,000	102,309	102,664			1,558
17+860,000	102,349	102,664			1,525
17+880,000	102,389	102,664			1,514
17+900,000	102,429	102,664			1,184
17+920,000	102,469	102,664			2,000
17+940,000	102,509	102,664	-0.00% en 120.00		1,477
17+960,000	102,549	102,664			1,428
17+980,000	102,589	102,664			1,328
18+000,000	102,629	102,664			1,335
18+020,000	102,669	102,664			1,344
18+040,000	102,709	102,664			1,306

Elementos Horizontales: TE, EC, R = 400,000, CE, ET; C-19; LC=100,000; LC=100,000; TANGENTE

NOTAS :

1-

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3-

GEOCON S.A. CONSULTORA
CONSORCIO GUARANI - GEOCON
Alberdi 456 - 4to. Piso - Of. 3 - Tel.: 442.877-461.994
Email: geocones@telesurf.com.py

REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

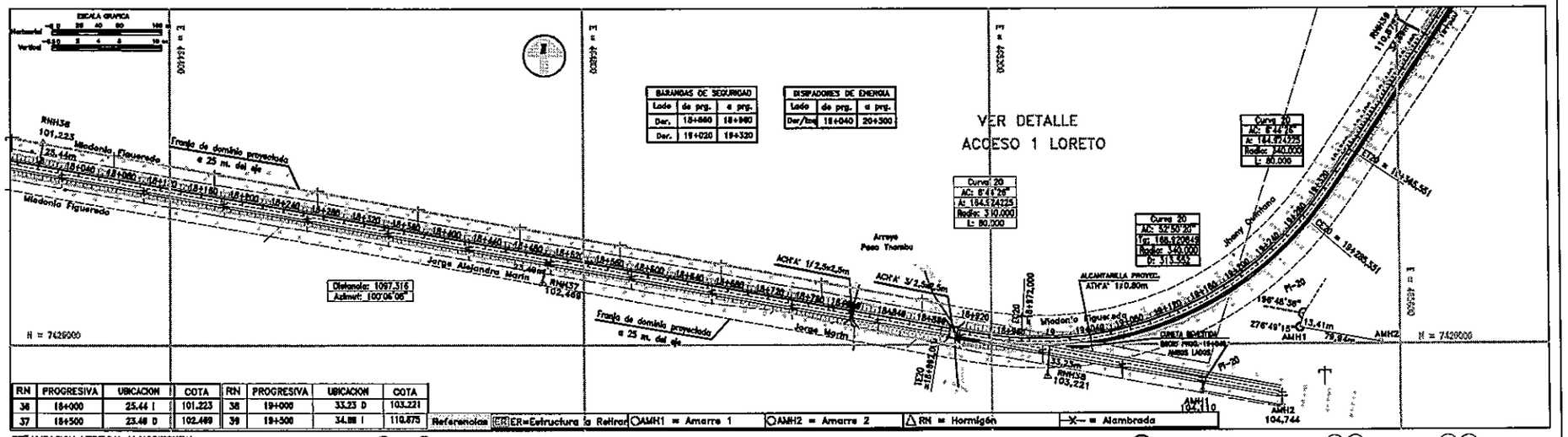
TRAMO 1: CONCEPCION - KM 62

PLANIALTIMETRIA
Prg. 16+500 - 18+000

ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GM 4.2-11/34

MOPC


ESCALA GRAFICA
BARANDAS DE SEGURIDAD
DISIPADORES DE ENERGIA
VER DETALLE
ACCESO 1 LORETO
Franja de dominio proyectada a 25 m. del eje
Madonio Figueredo
Jorge Alejandro Martin
Arroyo Paso Tiambu
Jhony Quintana
Madonio Figueredo
Distancia: 1097.316
Azimut: 100°04'06"
Curva 20
AC: 6°41'26"
Ar: 184.374225
Radio: 310.000
L: 80.000
Curva 20
AC: 52°50'20"
Tg: 169.520845
Radio: 340.000
Cr: 313.352
Curva 20
AC: 6°41'26"
Ar: 184.374225
Radio: 340.000
L: 80.000
ALCANTARILLA PROYECT.
CUNETA MONITOR
AMH1
AMH2
RNH38
101.223
RNH37
102.469
RNH39
110.877
RNH40
103.221
104.744
N = 7429000
E = 454000
E = 455000
E = 456000
E = 457000
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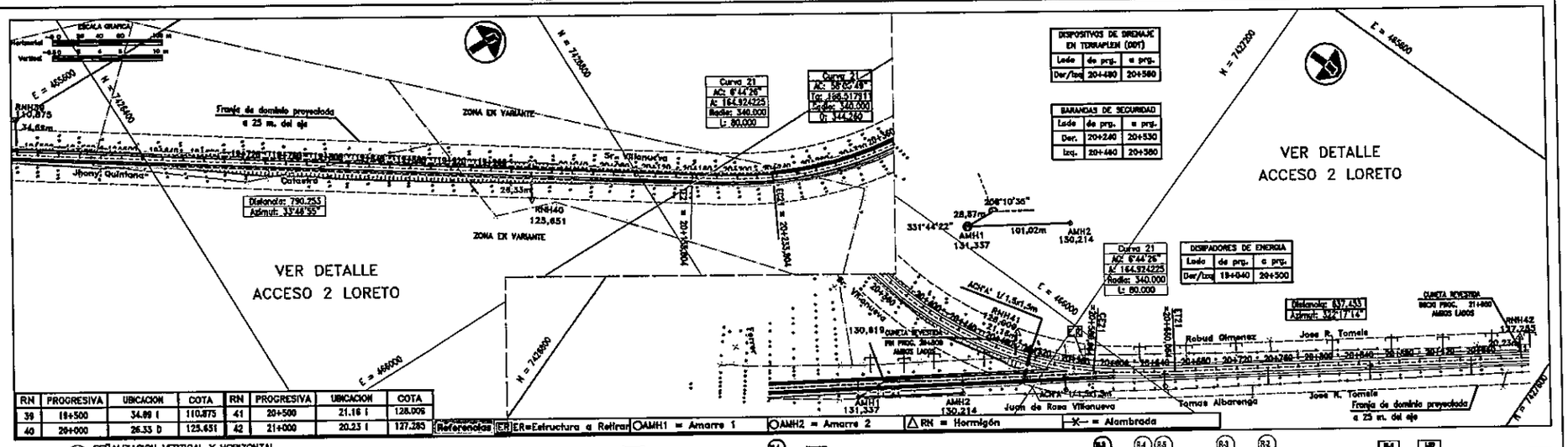
E =



NOTAS :

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS
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DISEÑO FINAL DE INGENIERIA

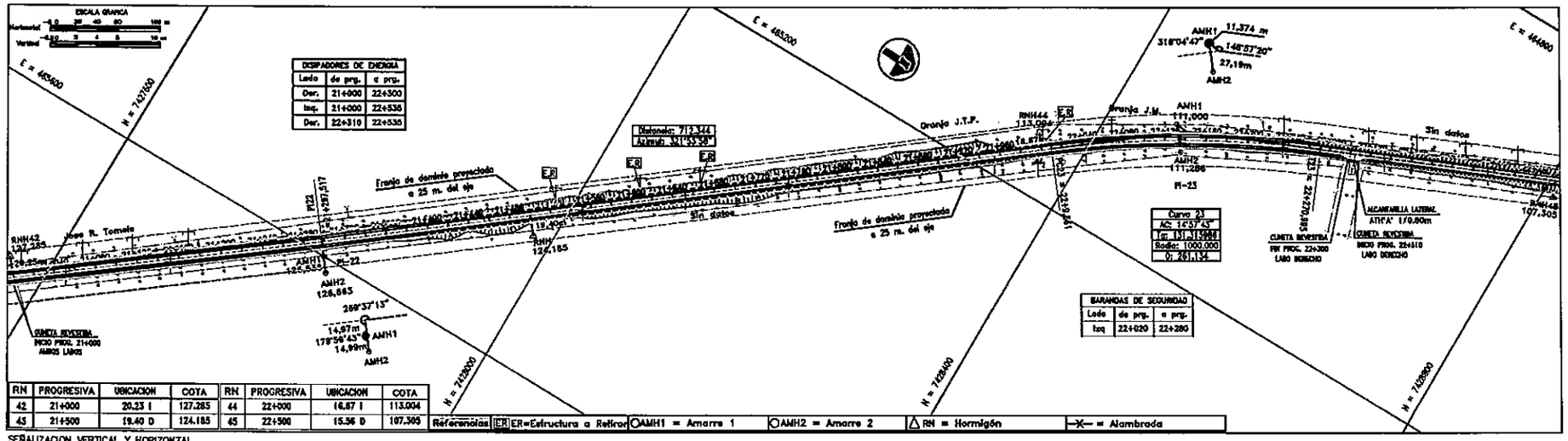
CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 19+500 - 21+000

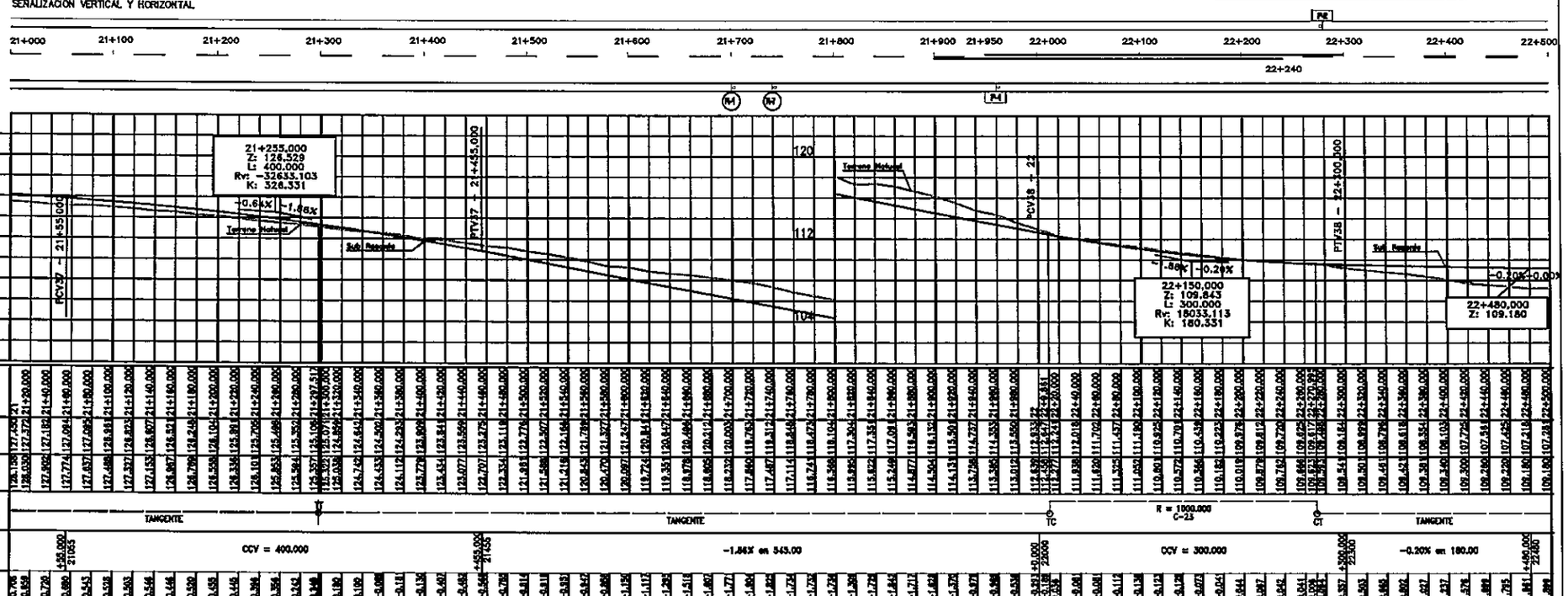
ESCALAS:
H: 1/4.000
V: 1/400

LAMINA:
GM 4.2-13/34



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
42	21+000	20.23 I	127.285	44	22+000	16.87 I	113.004
43	21+500	19.40 D	124.185	45	22+500	15.56 D	107.305

SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS
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Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA

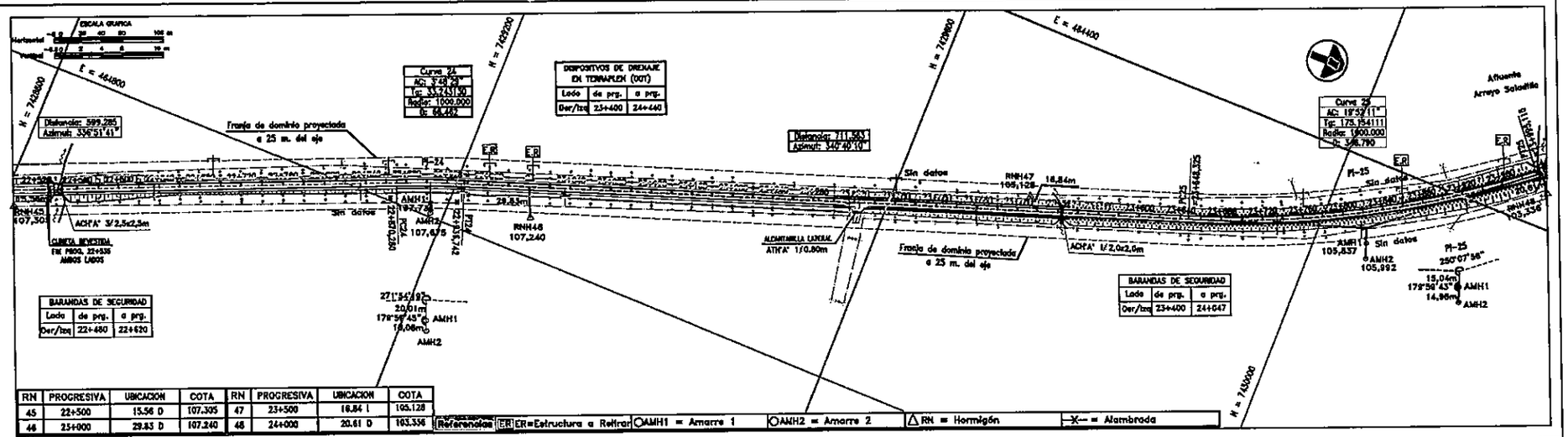
CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 21+000 - 22+500

ESCALAS:
H: 1/4.000
V: 1/400

LAMINA:
GM 4.2-14/34



NOTAS :

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS
Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

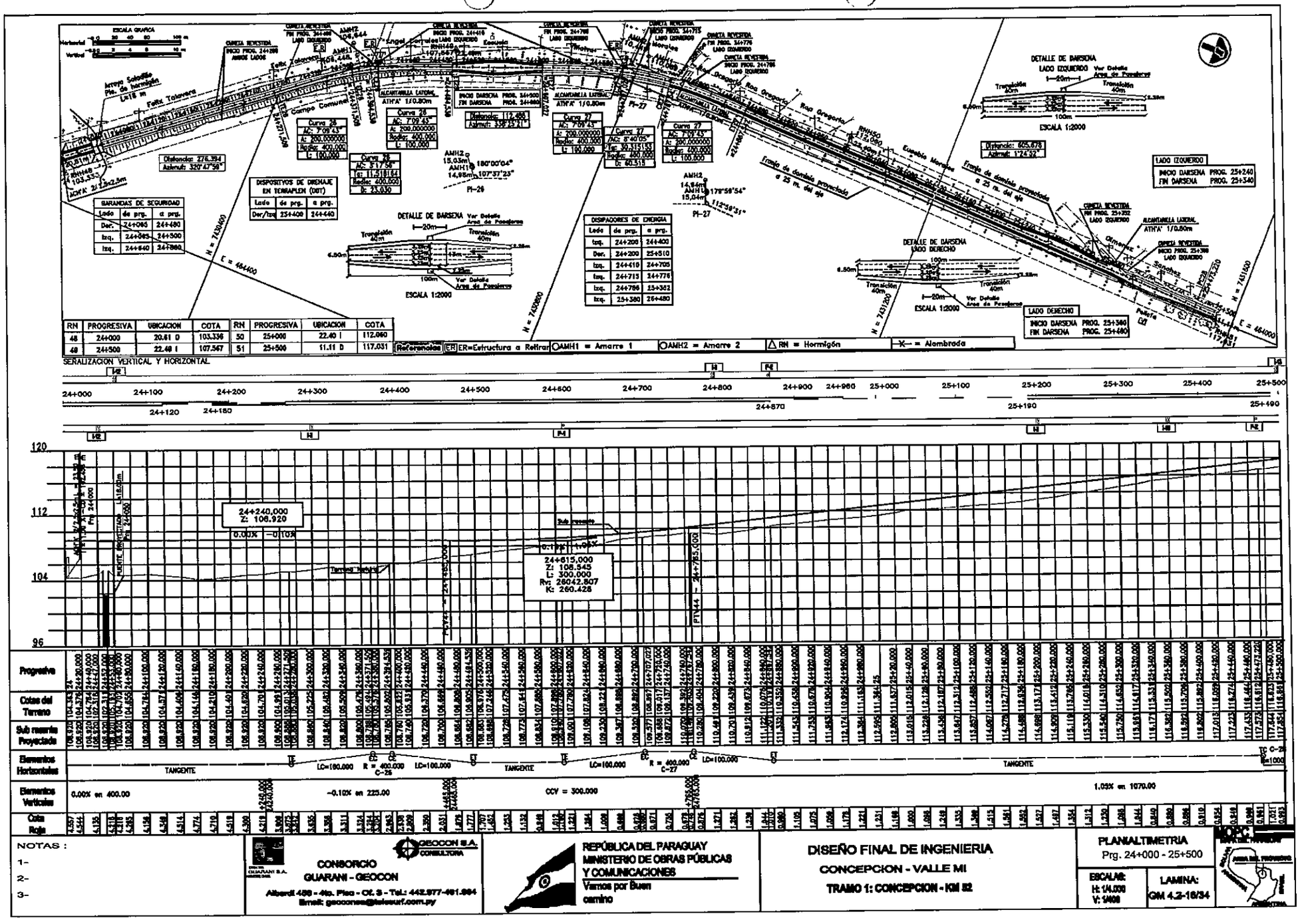
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 22+500 - 24+000

ESCALA:
H: 1/4,000
V: 1/400

LAMINA:
GM 4.2-15/34

OPC
AREA DEL PROYECTO



NOTAS :

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CONSULTORA

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Y COMUNICACIONES
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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

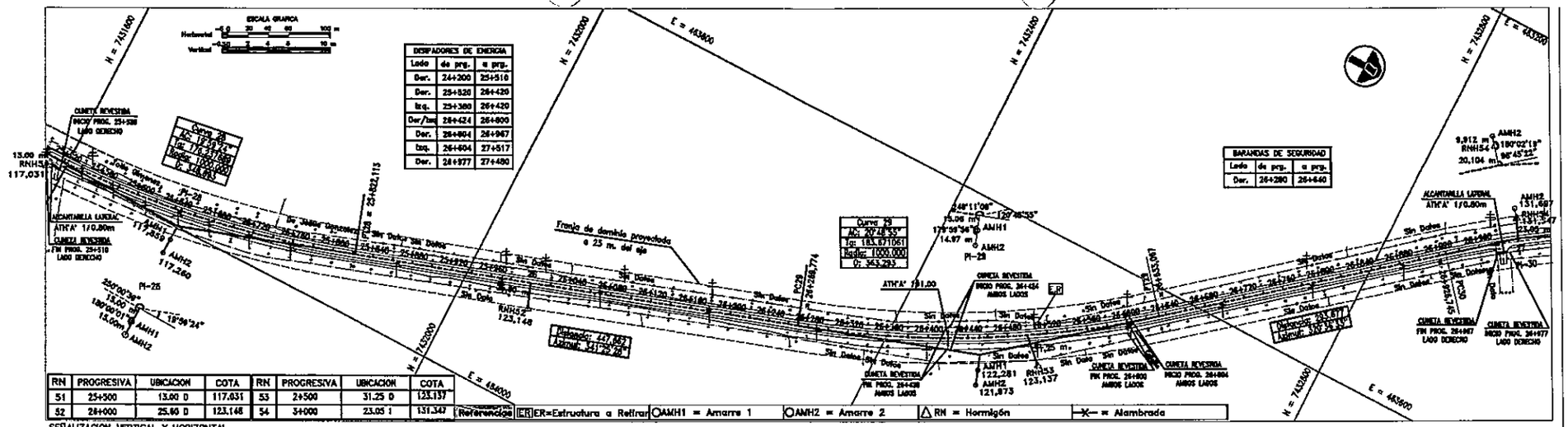
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 24+000 - 25+500

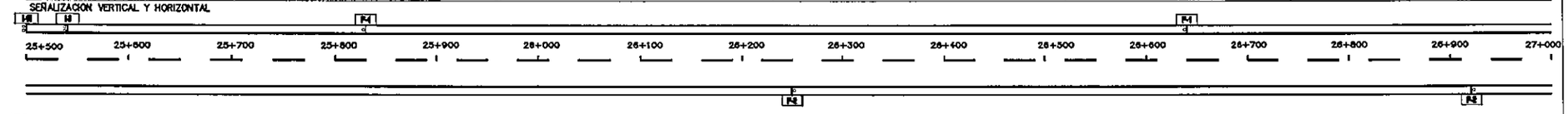
ESCALAS:
H: 1/4.000
V: 1/400

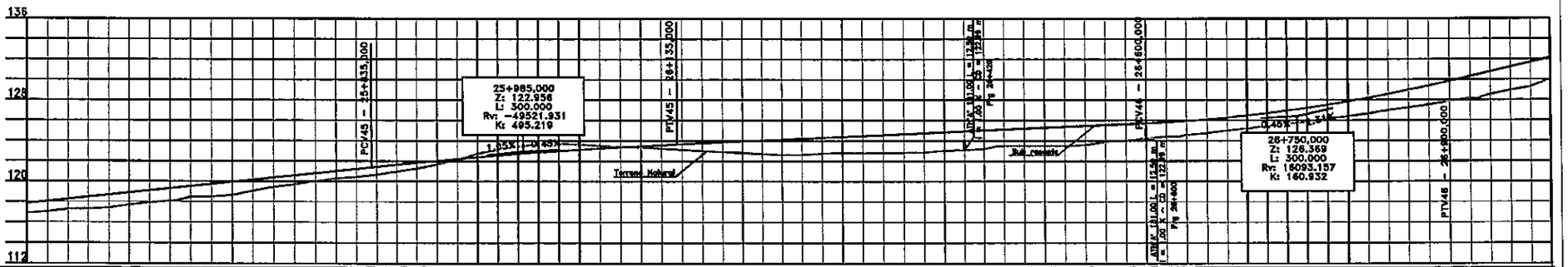
LAMINA:
GM 4.2-16/34

MOPC
DIRECCIÓN GENERAL DE CARRETERAS
AREA DEL TRAMO



SEÑALIZACION VERTICAL Y HORIZONTAL





Progresiva	Cotas del Terreno	Sub rasante Proyectada	Cota Roja
25+500,000	118,261	117,254	0,993
25+520,000	118,045	117,045	1,000
25+540,000	117,839	116,839	1,000
25+560,000	117,635	116,635	1,000
25+580,000	117,431	116,431	1,000
25+600,000	117,231	116,231	1,000
25+620,000	117,031	116,031	1,000
25+640,000	116,831	115,831	1,000
25+660,000	116,631	115,631	1,000
25+680,000	116,431	115,431	1,000
25+700,000	116,231	115,231	1,000
25+720,000	116,031	115,031	1,000
25+740,000	115,831	114,831	1,000
25+760,000	115,631	114,631	1,000
25+780,000	115,431	114,431	1,000
25+800,000	115,231	114,231	1,000
25+820,000	115,031	114,031	1,000
25+840,000	114,831	113,831	1,000
25+860,000	114,631	113,631	1,000
25+880,000	114,431	113,431	1,000
25+900,000	114,231	113,231	1,000
25+920,000	114,031	113,031	1,000
25+940,000	113,831	112,831	1,000
25+960,000	113,631	112,631	1,000
25+980,000	113,431	112,431	1,000
26+000,000	113,231	112,231	1,000
26+020,000	113,031	112,031	1,000
26+040,000	112,831	111,831	1,000
26+060,000	112,631	111,631	1,000
26+080,000	112,431	111,431	1,000
26+100,000	112,231	111,231	1,000
26+120,000	112,031	111,031	1,000
26+140,000	111,831	110,831	1,000
26+160,000	111,631	110,631	1,000
26+180,000	111,431	110,431	1,000
26+200,000	111,231	110,231	1,000
26+220,000	111,031	110,031	1,000
26+240,000	110,831	109,831	1,000
26+260,000	110,631	109,631	1,000
26+280,000	110,431	109,431	1,000
26+300,000	110,231	109,231	1,000
26+320,000	110,031	109,031	1,000
26+340,000	109,831	108,831	1,000
26+360,000	109,631	108,631	1,000
26+380,000	109,431	108,431	1,000
26+400,000	109,231	108,231	1,000
26+420,000	109,031	108,031	1,000
26+440,000	108,831	107,831	1,000
26+460,000	108,631	107,631	1,000
26+480,000	108,431	107,431	1,000
26+500,000	108,231	107,231	1,000
26+520,000	108,031	107,031	1,000
26+540,000	107,831	106,831	1,000
26+560,000	107,631	106,631	1,000
26+580,000	107,431	106,431	1,000
26+600,000	107,231	106,231	1,000
26+620,000	107,031	106,031	1,000
26+640,000	106,831	105,831	1,000
26+660,000	106,631	105,631	1,000
26+680,000	106,431	105,431	1,000
26+700,000	106,231	105,231	1,000
26+720,000	106,031	105,031	1,000
26+740,000	105,831	104,831	1,000
26+760,000	105,631	104,631	1,000
26+780,000	105,431	104,431	1,000
26+800,000	105,231	104,231	1,000
26+820,000	105,031	104,031	1,000
26+840,000	104,831	103,831	1,000
26+860,000	104,631	103,631	1,000
26+880,000	104,431	103,431	1,000
26+900,000	104,231	103,231	1,000
26+920,000	104,031	103,031	1,000
26+940,000	103,831	102,831	1,000
26+960,000	103,631	102,631	1,000
26+980,000	103,431	102,431	1,000
27+000,000	103,231	102,231	1,000

Elementos Horizontales: C-28 R = 1000.000 — TANGENTE — C-29 R = 1000.000 — TANGENTE — C-30 R = 1000.000

Elementos Verticales: CCV = 300.000 (+835.000 / 25+835.000) — 0.45X en 465.00 (+135.000 / 26+135.000) — CCV = 300.000 (+600.000 / 26+600.000) — (+900.000 / 26+900.000)

NOTAS :

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REPÚBLICA DEL PARAGUAY
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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 82

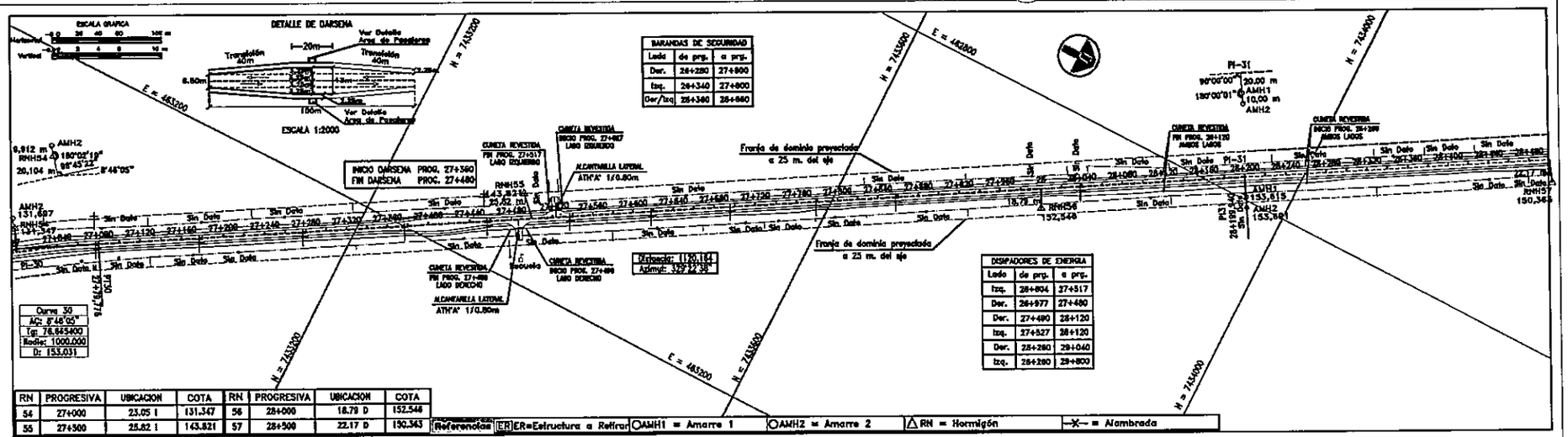
PLANIALTIMETRIA

Prg. 25+500 - 27+000

ESCALAS: H: 1/1.000 V: 1/100

LAMINA: GM 4.2-17/34

MOPC — DIRECCIÓN NACIONAL DE VIALIDAD — AREA DEL PROYECTO — ESTUDIO — PROYECTO — CONSTRUCCIÓN



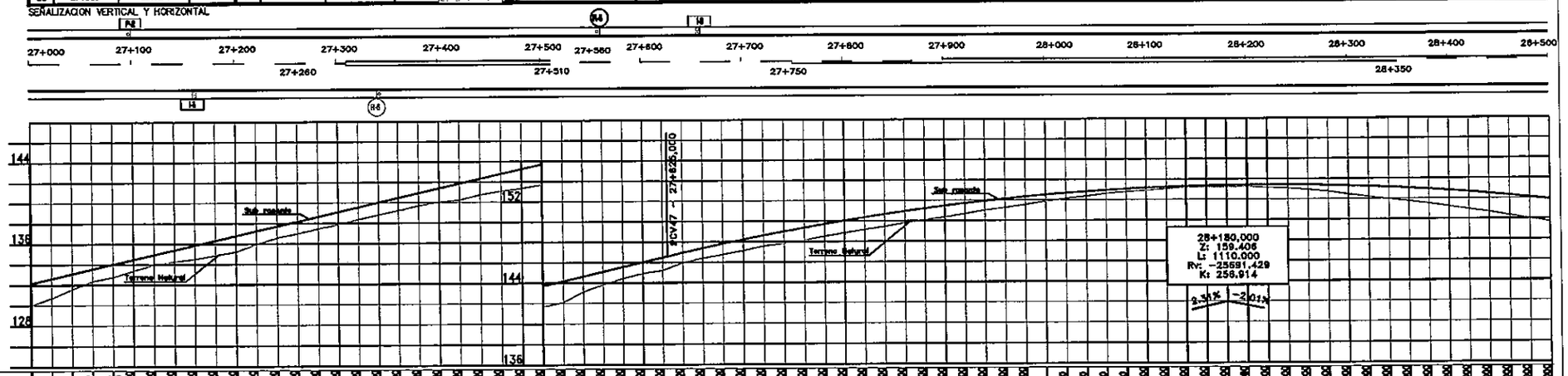
BARANDAS DE SEGURIDAD		
Lado	de prg.	a prg.
Der.	26+280	27+800
Izq.	26+340	27+800
Der/Izq	25+360	26+560

DISIPADORES DE ENERGIA		
Lado	de prg.	a prg.
Izq.	26+804	27+517
Der.	26+977	27+480
Der.	27+490	28+120
Izq.	27+527	28+120
Der.	25+280	29+040
Izq.	26+280	29+800

RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
54	27+000	23.05 I	131.347	56	28+000	18.79 D	152.546
55	27+500	25.82 I	143.821	57	28+500	22.17 D	150.343

Referencias: ER=Estructura a Refrac. | AMH1 = Amarre 1 | AMH2 = Amarre 2 | RN = Hormigón | Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Cota Roja
27+000	130.547	132.745	2.198
27+010	130.729	132.607	1.878
27+020	131.578	133.009	1.431
27+030	132.548	133.531	1.185
27+040	133.723	133.903	0.180
27+050	134.726	133.613	-1.113
27+060	134.775	134.495	-0.280
27+070	135.343	134.917	-0.426
27+080	135.646	135.279	-0.367
27+090	134.775	135.641	0.866
27+100	134.957	135.903	0.946
27+110	134.954	136.795	1.841
27+120	135.223	137.427	2.204
27+130	135.653	137.899	2.246
27+140	135.543	138.151	2.608
27+150	135.859	138.613	2.754
27+160	137.422	139.078	1.656
27+170	137.840	139.538	1.698
27+180	138.331	140.000	1.669
27+190	138.735	140.462	1.727
27+200	139.219	140.924	1.705
27+210	139.708	141.386	1.678
27+220	140.240	141.848	1.608
27+230	140.738	142.310	1.572
27+240	140.721	142.772	2.051
27+250	141.058	143.234	2.176
27+260	141.336	143.696	2.360
27+270	141.499	144.158	2.659
27+280	142.173	144.620	2.447
27+290	143.135	145.082	1.947
27+300	143.536	145.544	2.008
27+310	144.307	146.006	1.699
27+320	144.507	146.468	1.961
27+330	145.357	146.930	1.573
27+340	145.665	147.391	1.726
27+350	146.745	147.853	1.108
27+360	146.103	148.315	2.212
27+370	147.270	148.777	1.507
27+380	147.810	149.238	1.428
27+390	148.156	149.700	1.544
27+400	148.430	150.161	1.731
27+410	148.845	150.623	1.778
27+420	149.357	151.085	1.728
27+430	149.665	151.546	1.881
27+440	150.100	151.910	1.810
27+450	150.357	152.272	1.915
27+460	150.665	152.633	1.968
27+470	150.985	152.995	2.010
27+480	151.267	153.357	2.090
27+490	151.357	153.511	2.154
27+500	151.665	153.673	2.008
27+510	152.125	153.920	1.795
27+520	152.343	154.083	1.740
27+530	152.603	154.245	1.642
27+540	152.795	154.407	1.612
27+550	152.908	154.569	1.661
27+560	153.047	154.731	1.684
27+570	153.172	154.893	1.721
27+580	153.258	155.055	1.797
27+590	153.199	155.217	2.018
27+600	153.239	155.379	2.140
27+610	153.158	155.541	2.383
27+620	153.072	155.703	2.631
27+630	153.025	155.865	2.840
27+640	152.745	156.027	3.282
27+650	152.480	156.189	3.709
27+660	152.316	156.351	4.035
27+670	151.980	156.513	4.533
27+680	151.709	156.675	4.966
27+690	151.409	156.837	5.428
27+700	151.180	156.999	5.819
27+710	150.880	157.161	6.281
27+720	150.580	157.323	6.743
27+730	150.280	157.485	7.205
27+740	149.980	157.647	7.667
27+750	149.680	157.809	8.129
27+760	149.380	157.971	8.591
27+770	149.080	158.133	9.053
27+780	148.780	158.295	9.515
27+790	148.480	158.457	9.977
27+800	148.180	158.619	10.439
27+810	147.880	158.781	10.901
27+820	147.580	158.943	11.363
27+830	147.280	159.105	11.825
27+840	146.980	159.267	12.287
27+850	146.680	159.429	12.749
27+860	146.380	159.591	13.211
27+870	146.080	159.753	13.673
27+880	145.780	159.915	14.135
27+890	145.480	160.077	14.597
27+900	145.180	160.239	15.059
27+910	144.880	160.401	15.521
27+920	144.580	160.563	15.983
27+930	144.280	160.725	16.445
27+940	143.980	160.887	16.907
27+950	143.680	161.049	17.369
27+960	143.380	161.211	17.831
27+970	143.080	161.373	18.293
27+980	142.780	161.535	18.755
27+990	142.480	161.697	19.217
28+000	142.180	161.859	19.679
28+010	141.880	162.021	20.141
28+020	141.580	162.183	20.603
28+030	141.280	162.345	21.065
28+040	140.980	162.507	21.527
28+050	140.680	162.669	21.989
28+060	140.380	162.831	22.451
28+070	140.080	162.993	22.913
28+080	139.780	163.155	23.375
28+090	139.480	163.317	23.837
28+100	139.180	163.479	24.299
28+110	138.880	163.641	24.761
28+120	138.580	163.803	25.223
28+130	138.280	163.965	25.685
28+140	137.980	164.127	26.147
28+150	137.680	164.289	26.609
28+160	137.380	164.451	27.071
28+170	137.080	164.613	27.533
28+180	136.780	164.775	27.995
28+190	136.480	164.937	28.457
28+200	136.180	165.099	28.919
28+210	135.880	165.261	29.381
28+220	135.580	165.423	29.843
28+230	135.280	165.585	30.305
28+240	134.980	165.747	30.767
28+250	134.680	165.909	31.229
28+260	134.380	166.071	31.691
28+270	134.080	166.233	32.153
28+280	133.780	166.395	32.615
28+290	133.480	166.557	33.077
28+300	133.180	166.719	33.539
28+310	132.880	166.881	34.001
28+320	132.580	167.043	34.463
28+330	132.280	167.205	34.925
28+340	131.980	167.367	35.387
28+350	131.680	167.529	35.849
28+360	131.380	167.691	36.311
28+370	131.080	167.853	36.773
28+380	130.780	168.015	37.235
28+390	130.480	168.177	37.697
28+400	130.180	168.339	38.159
28+410	129.880	168.501	38.621
28+420	129.580	168.663	39.083
28+430	129.280	168.825	39.545
28+440	128.980	168.987	40.007
28+450	128.680	169.149	40.469
28+460	128.380	169.311	40.931
28+470	128.080	169.473	41.393
28+480	127.780	169.635	41.855
28+490	127.480	169.797	42.317
28+500	127.180	169.959	42.779

Elementos Horizontales: R = 1000.000 C-30 — TANGENTE — TANGENTE

Elementos Verticales: 2.31% en 725.00 — PCV47 27+625.000 — CCV = 1110.000

NOTAS :
1-
2-
3-

CONSORCIO GUARANI - GEOCON

GEOCON S.A. CONSULTORA

REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

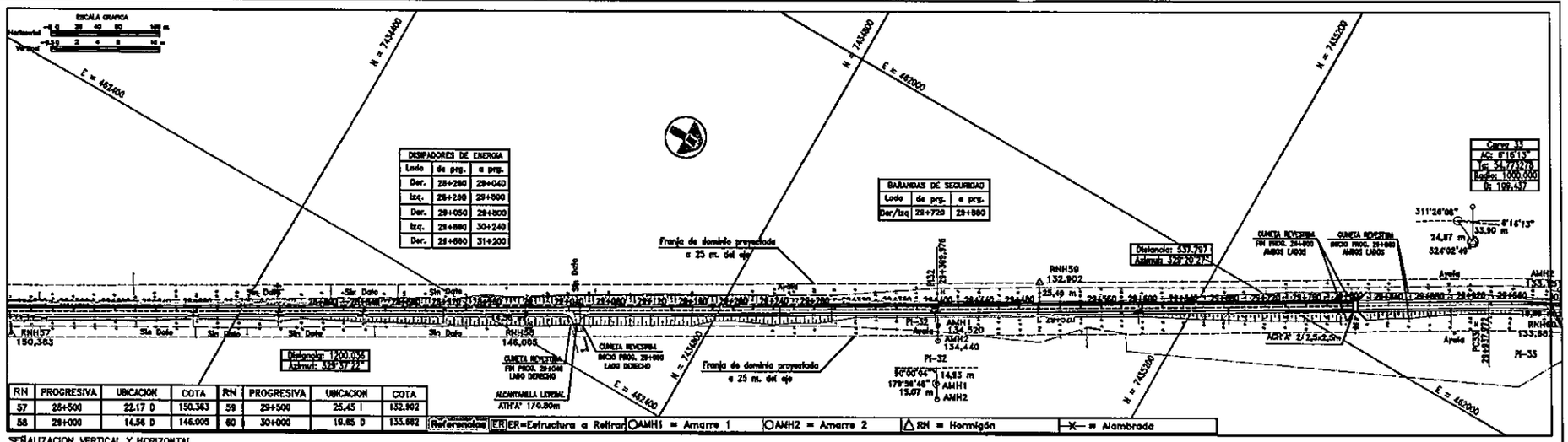
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 27+000 - 28+500

ESCALAS: H: 1/4,000 V: 1/400

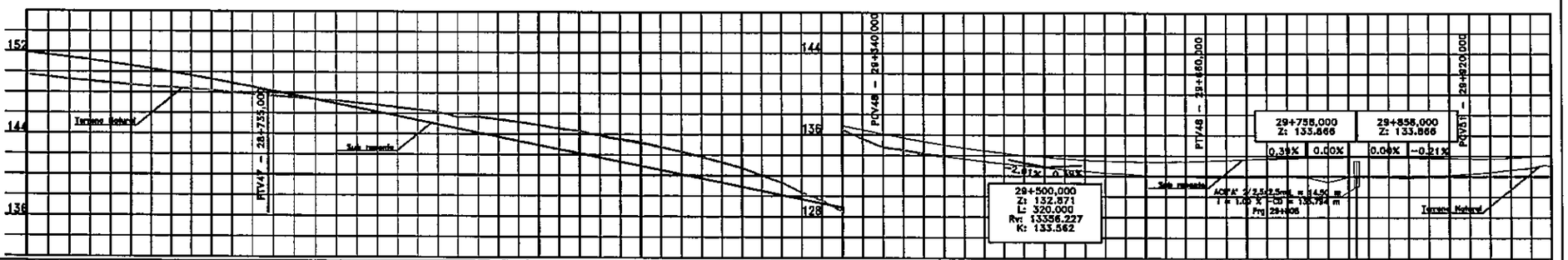
LAMINA: GM 4.2-18/34

MOPC



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
57	28+500	22.17 D	150.363	59	29+500	25.45 I	132.902
58	29+000	14.56 D	146.005	60	30+000	19.85 D	133.882

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Rojo
28+500,000	151,866	151,872	TANGENTE	-2,01% en 805,00	2,198
28+520,000	151,428	151,472			2,170
28+540,000	151,171	151,072			2,151
28+560,000	150,998	150,672			2,079
28+580,000	150,808	150,272			1,862
28+600,000	150,583	150,072			1,683
28+620,000	150,305	149,872			1,441
28+640,000	149,957	149,672			1,083
28+660,000	149,559	149,472			0,688
28+680,000	149,199	149,272			0,316
28+700,000	148,877	149,072			0,201
28+720,000	148,645	148,872			0,000
28+735,000	148,248	148,735			0,224
28+740,000	148,149	147,740			0,012
28+760,000	147,747	147,560			-0,177
28+780,000	147,523	147,380			-0,384
28+800,000	147,333	147,200			-0,585
28+820,000	147,215	147,020			-0,783
28+840,000	147,095	146,840			-0,980
28+860,000	146,944	146,660			-1,177
28+880,000	146,753	146,480			-1,373
28+900,000	146,544	146,300			-1,569
28+920,000	146,330	146,120			-1,764
28+940,000	146,109	145,940			-1,958
28+960,000	145,872	145,760			-2,152
29+980,000	145,629	145,580			-2,346
29+000,000	145,376	145,400			-2,539
29+020,000	145,117	145,220			-2,732
29+040,000	144,858	145,040			-2,925
29+060,000	144,599	144,860			-3,118
29+080,000	144,340	144,680			-3,311
29+100,000	144,081	144,500			-3,504
29+120,000	143,822	144,320			-3,697
29+140,000	143,563	144,140			-3,890
29+160,000	143,304	143,960			-4,083
29+180,000	143,045	143,780			-4,276
29+200,000	142,786	143,600			-4,469
29+220,000	142,527	143,420			-4,662
29+240,000	142,268	143,240			-4,855
29+260,000	142,009	143,060			-5,048
29+280,000	141,750	142,880			-5,241
29+300,000	141,491	142,700			-5,434
29+320,000	141,232	142,520			-5,627
29+340,000	140,973	142,340			-5,820
29+360,000	140,714	142,160			-6,013
29+380,000	140,455	141,980			-6,206
29+400,000	140,196	141,800			-6,399
29+420,000	139,937	141,620			-6,592
29+440,000	139,678	141,440			-6,785
29+460,000	139,419	141,260			-6,978
29+480,000	139,160	141,080			-7,171
29+500,000	138,901	140,900			-7,364
29+520,000	138,642	140,720			-7,557
29+540,000	138,383	140,540			-7,750
29+560,000	138,124	140,360		CCV = 320,000	-7,943
29+580,000	137,865	140,180			-8,136
29+600,000	137,606	140,000			-8,329
29+620,000	137,347	139,820			-8,522
29+640,000	137,088	139,640			-8,715
29+660,000	136,829	139,460			-8,908
29+680,000	136,570	139,280			-9,101
29+700,000	136,311	139,100			-9,294
29+720,000	136,052	138,920			-9,487
29+740,000	135,793	138,740			-9,680
29+760,000	135,534	138,560			-9,873
29+780,000	135,275	138,380			-10,066
29+800,000	135,016	138,200			-10,259
29+820,000	134,757	138,020			-10,452
29+840,000	134,498	137,840			-10,645
29+860,000	134,239	137,660			-10,838
29+880,000	133,980	137,480			-11,031
29+900,000	133,721	137,300			-11,224
29+920,000	133,462	137,120			-11,417
29+940,000	133,203	136,940			-11,610
29+960,000	132,944	136,760			-11,803
29+980,000	132,685	136,580			-11,996
30+000,000	132,426	136,400			-12,189
30+020,000	132,167	136,220			-12,382
30+040,000	131,908	136,040			-12,575
30+060,000	131,649	135,860			-12,768
30+080,000	131,390	135,680			-12,961
30+100,000	131,131	135,500			-13,154
30+120,000	130,872	135,320			-13,347
30+140,000	130,613	135,140			-13,540
30+160,000	130,354	134,960			-13,733
30+180,000	130,095	134,780			-13,926
30+200,000	129,836	134,600			-14,119
30+220,000	129,577	134,420			-14,312
30+240,000	129,318	134,240			-14,505
30+260,000	129,059	134,060			-14,698
30+280,000	128,800	133,880			-14,891
30+300,000	128,541	133,700			-15,084
30+320,000	128,282	133,520			-15,277
30+340,000	128,023	133,340			-15,470
30+360,000	127,764	133,160			-15,663
30+380,000	127,505	132,980			-15,856
30+400,000	127,246	132,800			-16,049
30+420,000	126,987	132,620			-16,242
30+440,000	126,728	132,440			-16,435
30+460,000	126,469	132,260			-16,628
30+480,000	126,210	132,080			-16,821
30+500,000	125,951	131,900			-17,014
30+520,000	125,692	131,720			-17,207
30+540,000	125,433	131,540			-17,400
30+560,000	125,174	131,360			-17,593
30+580,000	124,915	131,180			-17,786
30+600,000	124,656	131,000			-17,979
30+620,000	124,397	130,820			-18,172
30+640,000	124,138	130,640			-18,365
30+660,000	123,879	130,460			-18,558
30+680,000	123,620	130,280			-18,751
30+700,000	123,361	130,100			-18,944
30+720,000	123,102	129,920			-19,137
30+740,000	122,843	129,740			-19,330
30+760,000	122,584	129,560			-19,523
30+780,000	122,325	129,380			-19,716
30+800,000	122,066	129,200			-19,909
30+820,000	121,807	129,020			-20,102
30+840,000	121,548	128,840			-20,295
30+860,000	121,289	128,660			-20,488
30+880,000	121,030	128,480			-20,681
30+900,000	120,771	128,300			-20,874
30+920,000	120,512	128,120			-21,067
30+940,000	120,253	127,940			-21,260
30+960,000	119,994	127,760			-21,453
30+980,000	119,735	127,580			-21,646
31+000,000	119,476	127,400			-21,839
31+020,000	119,217	127,220			-22,032
31+040,000	118,958	127,040			-22,225
31+060,000	118,699	126,860			-22,418
31+080,000	118,440	126,680			-22,611
31+100,000	118,181	126,500			-22,804
31+120,000	117,922	126,320			-22,997
31+140,000	117,663	126,140			-23,190
31+160,000	117,404	125,960			-23,383
31+180,000	117,145	125,780			-23,576
31+200,000	116,886	125,600			-23,769

NOTAS :

1-

2-

3-

CONSORCIO GUARANI - GEOCON

Alberdi 488 - 4to. Piso - Of. 3 - Tel.: 442.977-461.994
Email: geocorsa@telesurf.com.py

REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

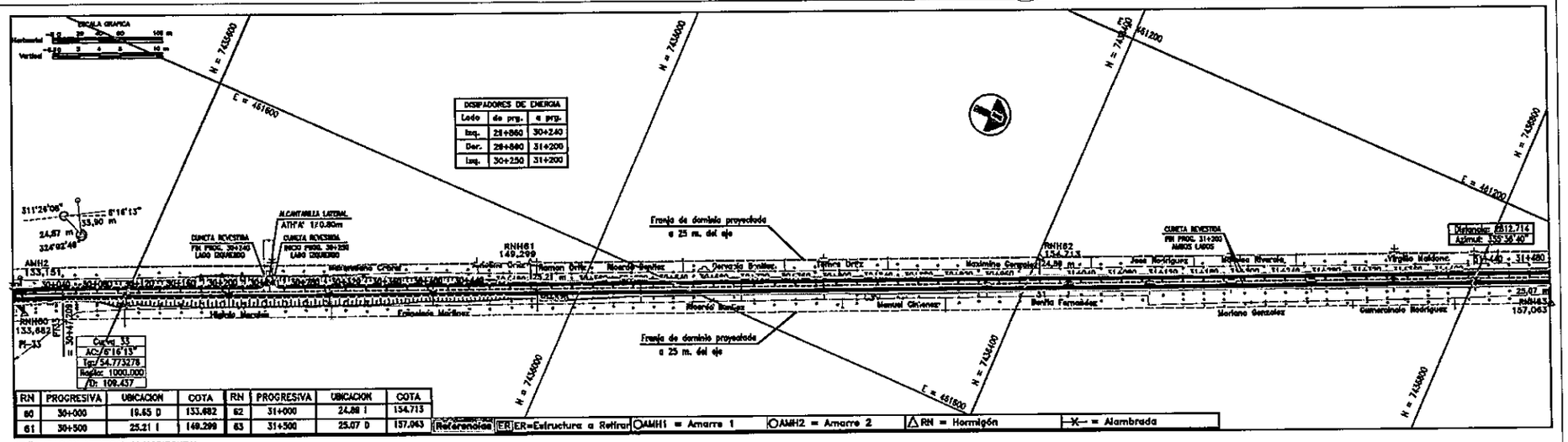
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 28+500 - 30+000

ESCALAS:
H: 1/4.000
V: 1/400

LAMINA:
GM 4.2-19/34

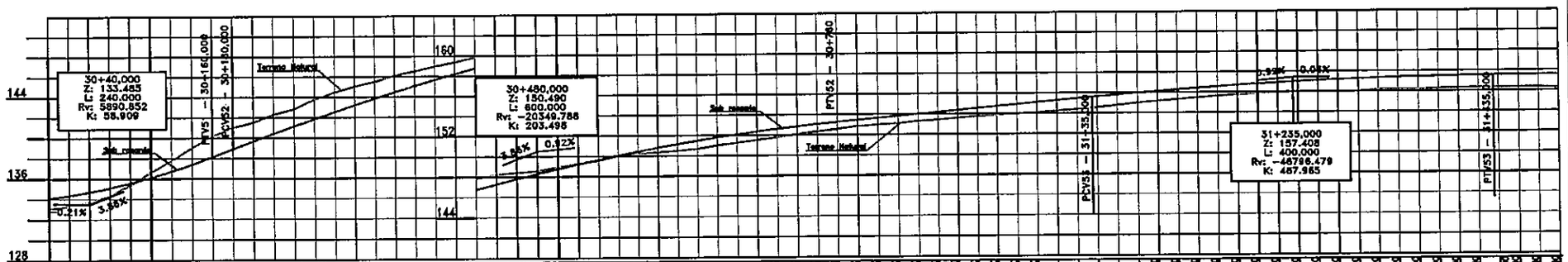
MOPC
AREA DEL PROYECTO
ASUNCION
CONCEPCION
PARAGUAY
ARGENTINA



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
60	30+000	19.65 D	133.682	62	31+000	24.88 I	154.713
61	30+500	25.21 I	149.299	63	31+500	25.07 D	157.063

SEÑALIZACION VERTICAL Y HORIZONTAL

30+000 30+050 30+100 30+200 30+300 30+400 30+500 30+600 30+700 30+800 30+840 30+900 31+000 31+100 31+200 31+300 31+400 31+500



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
30+000.000	133.050	134.112	R = 1000 C-33	CCV = 240.000	1.063
30+020.000	133.359	134.376			1.024
30+040.000	133.698	134.707			1.009
30+060.000	133.924	134.843			0.919
30+080.000	133.974	135.107			0.737
30+100.000	135.361	135.544			0.183
30+120.000	136.695	136.150			-0.545
30+140.000	137.799	136.715			-1.084
30+160.000	138.012	137.364			-1.648
30+180.000	139.118	138.123			-2.995
30+200.000	140.755	138.895			-1.860
30+220.000	140.995	139.659			-1.336
30+240.000	141.509	140.492			-1.017
30+260.000	142.302	141.128			-1.174
30+280.000	142.833	141.830			-1.003
30+300.000	143.759	142.515			-1.244
30+320.000	144.455	143.180			-1.275
30+340.000	145.041	143.825			-1.216
30+360.000	145.483	144.450			-1.033
30+380.000	146.098	145.056			-1.042
30+400.000	146.545	145.642			-0.903
30+420.000	146.973	146.209			-0.764
30+440.000	147.857	146.756			-1.101
30+460.000	149.209	147.283			-1.926
30+480.000	150.411	147.791			-2.620
30+500.000	151.534	148.278			-3.256
30+520.000	152.818	148.737			-4.081
30+540.000	153.357	149.196			-4.161
30+560.000	153.536	149.625			-3.911
30+580.000	153.895	150.035			-3.860
30+600.000	154.211	150.424			-3.787
30+620.000	154.372	150.784			-3.588
30+640.000	154.674	151.144			-3.530
30+660.000	154.864	151.475			-3.389
30+680.000	154.945	151.786			-3.159
30+700.000	154.973	152.077			-2.896
30+720.000	154.857	152.248			-2.609
30+740.000	154.709	152.401			-2.308
30+760.000	154.611	152.514			-2.097
30+780.000	154.534	152.638			-1.896
30+800.000	154.818	152.644			-2.174
30+820.000	154.757	152.801			-1.956
30+840.000	154.536	152.922			-1.614
30+860.000	154.295	153.030			-1.265
30+880.000	154.077	153.130			-0.947
30+900.000	153.897	153.224			-0.673
30+920.000	153.697	153.304			-0.393
30+940.000	153.597	153.380			-0.217
30+960.000	153.424	153.448			0.024
30+980.000	153.388	153.512			0.124
31+000.000	153.279	153.591			0.312
31+020.000	153.155	153.667			0.512
31+040.000	153.338	153.743			0.405
31+060.000	153.522	153.743			0.221
31+080.000	153.709	153.743			0.034
31+100.000	153.880	153.743			-0.137
31+120.000	154.072	153.743			-0.329
31+140.000	154.256	153.743			-0.513
31+160.000	154.438	153.743			-0.695
31+180.000	154.576	153.743			-0.833
31+200.000	154.360	153.743			-0.617
31+220.000	154.324	153.743			-0.581
31+240.000	154.338	153.743			-0.595
31+260.000	154.751	153.743			-1.008
31+280.000	154.872	153.743			-1.129
31+300.000	155.145	153.743			-1.402
31+320.000	155.261	153.743			-1.518
31+340.000	155.463	153.743			-1.720
31+360.000	155.619	153.743			-1.876
31+380.000	155.744	153.743			-2.001
31+400.000	155.823	153.743			-2.080
31+420.000	155.867	153.743			-2.124
31+440.000	155.912	153.743			-2.169
31+460.000	155.955	153.743			-2.212
31+480.000	155.991	153.743			-2.248
31+500.000	155.992	153.743			-2.249
31+520.000	156.000	153.743			-2.257
31+540.000	156.117	153.743			-2.374
31+560.000	156.137	153.743			-2.394
31+580.000	156.128	153.743			-2.385
31+600.000	156.227	153.743			-2.484
31+620.000	156.288	153.743			-2.545
31+640.000	156.305	153.743			-2.562
31+660.000	156.307	153.743			-2.564
31+680.000	156.329	153.743			-2.586
31+700.000	156.333	153.743			-2.590
31+720.000	156.372	153.743			-2.629
31+740.000	156.428	153.743			-2.685

TANGENTE

CCV = 600.000 — 0.92% en 255.00 — CCV = 400.000

NOTAS :
1-
2-
3-

CONSORCIO
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Alvarez 496 - 4to. Piso - Of. 3 - Tel.: 448.977-481.994
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GEOCON S.A. CONSULTORA

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MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

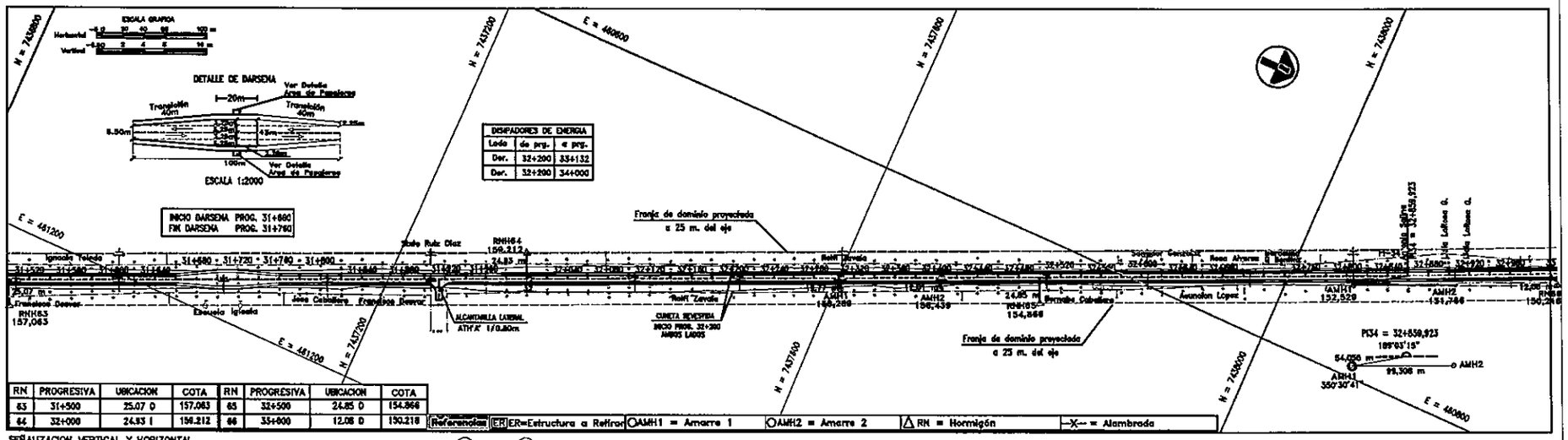
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 30+000 - 31+500

ESCALAS:
H: 1/4.000
V: 1/400

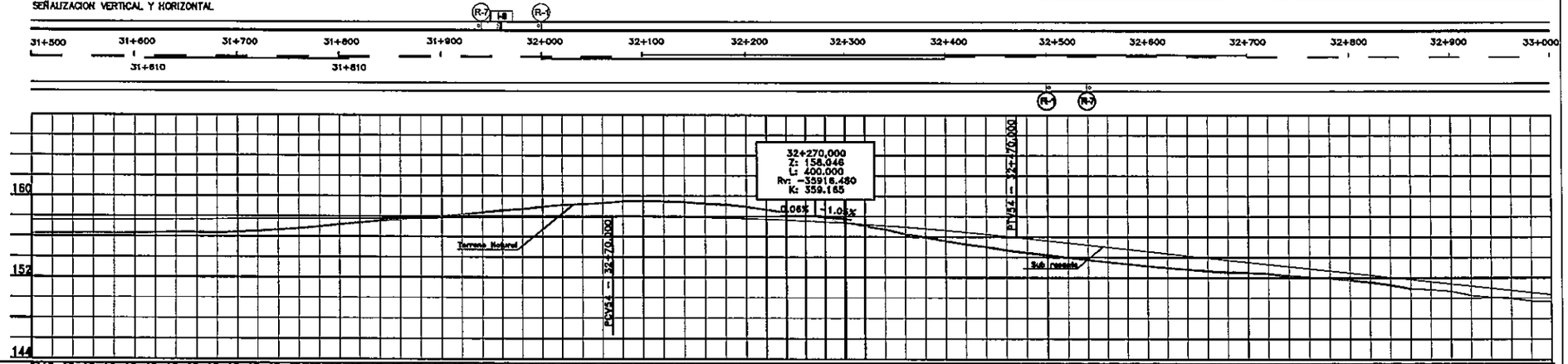
LAMINA:
GM 4.2-20/04

MOPC
DIRECCIÓN GENERAL DE CARRETERAS
AREA DEL PARAGUAY
ASUNCION
ARGENTINA
BRASIL



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
63	31+500	25.07 D	157.063	65	32+500	24.85 D	154.868
64	32+000	24.93 I	159.212	66	33+000	12.08 D	150.218

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
31+500,000	156,323	157,577	TANGENTE		1,344
31+520,000	156,283	157,564			1,302
31+540,000	156,306	157,608			1,314
31+560,000	156,372	157,642			1,302
31+580,000	156,372	157,653			1,280
31+600,000	156,349	157,649			1,253
31+620,000	156,389	157,658			1,258
31+640,000	156,389	157,670			1,273
31+660,000	156,389	157,682			1,293
31+680,000	156,301	157,695			1,394
31+700,000	156,394	157,707			1,313
31+720,000	156,504	157,719			1,215
31+740,000	156,625	157,732			1,107
31+760,000	156,706	157,744			1,038
31+780,000	156,867	157,756			0,889
31+800,000	157,194	157,768			0,574
31+820,000	157,459	157,781			0,322
31+840,000	157,624	157,793			0,169
31+860,000	157,704	157,806			0,102
31+880,000	157,838	157,818			-0,020
31+900,000	157,888	157,830			-0,058
31+920,000	158,133	157,842			-0,291
31+940,000	158,377	157,855			-0,522
31+960,000	158,544	157,867			-0,677
31+980,000	158,684	157,879			-0,805
32+000,000	158,918	157,892			-1,026
32+020,000	159,103	157,904			-1,199
32+040,000	159,183	157,916			-1,267
32+060,000	159,260	157,929			-1,331
32+080,000	159,485	157,941			-1,544
32+100,000	159,519	157,953			-1,566
32+120,000	159,453	157,966			-1,487
32+140,000	159,399	157,978			-1,421
32+160,000	159,333	157,990			-1,343
32+180,000	159,124	158,003			-1,121
32+200,000	158,832	158,015			-0,817
32+220,000	158,509	158,027			-0,482
32+240,000	158,209	158,040			-0,169
32+260,000	157,904	158,052			0,148
32+280,000	157,779	158,064			0,285
32+300,000	157,416	158,077			0,661
32+320,000	157,077	158,089			1,012
32+340,000	156,683	158,102			1,419
32+360,000	156,229	158,114			1,885
32+380,000	155,543	158,126			2,583
32+400,000	155,229	158,139			2,910
32+420,000	154,951	158,151			3,200
32+440,000	154,699	158,163			3,464
32+460,000	154,417	158,176			3,759
32+480,000	154,189	158,188			3,999
32+500,000	153,955	158,201			4,246
32+520,000	153,774	158,213			4,439
32+540,000	153,521	158,225			4,704
32+560,000	153,374	158,238			4,864
32+580,000	153,129	158,250			5,121
32+600,000	152,947	158,263			5,316
32+620,000	152,777	158,275			5,498
32+640,000	152,466	158,287			5,821
32+660,000	152,354	158,300			5,946
32+680,000	152,165	158,312			6,147
32+700,000	151,934	158,325			6,391
32+720,000	151,633	158,337			6,704
32+740,000	151,256	158,349			7,093
32+760,000	151,033	158,362			7,329
32+780,000	151,077	158,374			7,297
32+800,000	150,923	158,386			7,463
32+820,000	150,839	158,399			7,560
32+840,000	150,679	158,411			7,732
32+860,000	150,475	158,424			7,949
32+880,000	150,109	158,436			8,327
32+900,000	150,018	158,448			8,430
32+920,000	149,778	158,461			8,683
32+940,000	149,663	158,473			8,810
32+960,000	149,595	158,485			8,890
32+980,000	149,595	158,498			8,903
33+000,000	149,595	158,510			8,915
33+020,000	149,595	158,522			8,927
33+040,000	149,595	158,535			8,940
33+060,000	149,595	158,547			8,952
33+080,000	149,595	158,559			8,964
33+100,000	149,595	158,572			8,977
33+120,000	149,595	158,584			8,989
33+140,000	149,595	158,596			9,001
33+160,000	149,595	158,609			9,014
33+180,000	149,595	158,621			9,026
33+200,000	149,595	158,633			9,038
33+220,000	149,595	158,646			9,051
33+240,000	149,595	158,658			9,063
33+260,000	149,595	158,670			9,075
33+280,000	149,595	158,683			9,088
33+300,000	149,595	158,695			9,100
33+320,000	149,595	158,707			9,112
33+340,000	149,595	158,720			9,125
33+360,000	149,595	158,732			9,137
33+380,000	149,595	158,744			9,149
33+400,000	149,595	158,757			9,162
33+420,000	149,595	158,769			9,174
33+440,000	149,595	158,781			9,186
33+460,000	149,595	158,794			9,199
33+480,000	149,595	158,806			9,211
33+500,000	149,595	158,818			9,223
33+520,000	149,595	158,831			9,236
33+540,000	149,595	158,843			9,248
33+560,000	149,595	158,855			9,260
33+580,000	149,595	158,868			9,273
33+600,000	149,595	158,880			9,285
33+620,000	149,595	158,892			9,297
33+640,000	149,595	158,905			9,310
33+660,000	149,595	158,917			9,322
33+680,000	149,595	158,929			9,334
33+700,000	149,595	158,942			9,347
33+720,000	149,595	158,954			9,359
33+740,000	149,595	158,966			9,371
33+760,000	149,595	158,979			9,384
33+780,000	149,595	158,991			9,396
33+800,000	149,595	159,003			9,408
33+820,000	149,595	159,016			9,421
33+840,000	149,595	159,028			9,433
33+860,000	149,595	159,040			9,445
33+880,000	149,595	159,053			9,458
33+900,000	149,595	159,065			9,470
33+920,000	149,595	159,077			9,482
33+940,000	149,595	159,090			9,495
33+960,000	149,595	159,102			9,507
33+980,000	149,595	159,114			9,519
34+000,000	149,595	159,127			9,532

Elementos Verticales: 0.06% en 635.00 | CCV = 400.000 | -1.05% en 1040.00

NOTAS :

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CONCEPCION - VALLE MI

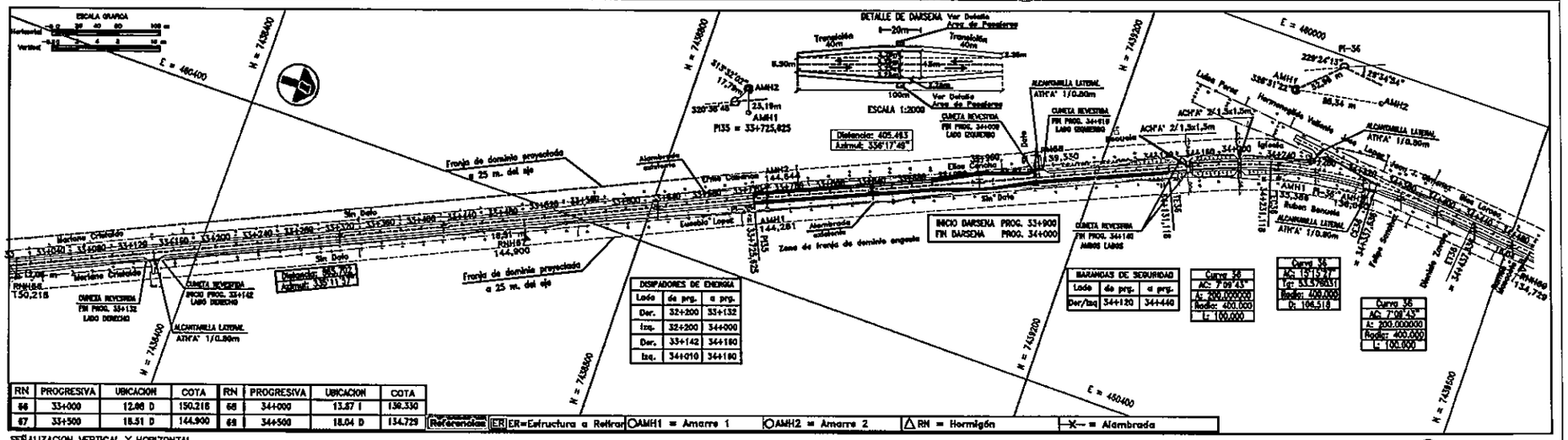
TRAMO 1: CONCEPCION - KM 32

PLANALTIMETRIA

Prg. 31+500 - 33+000

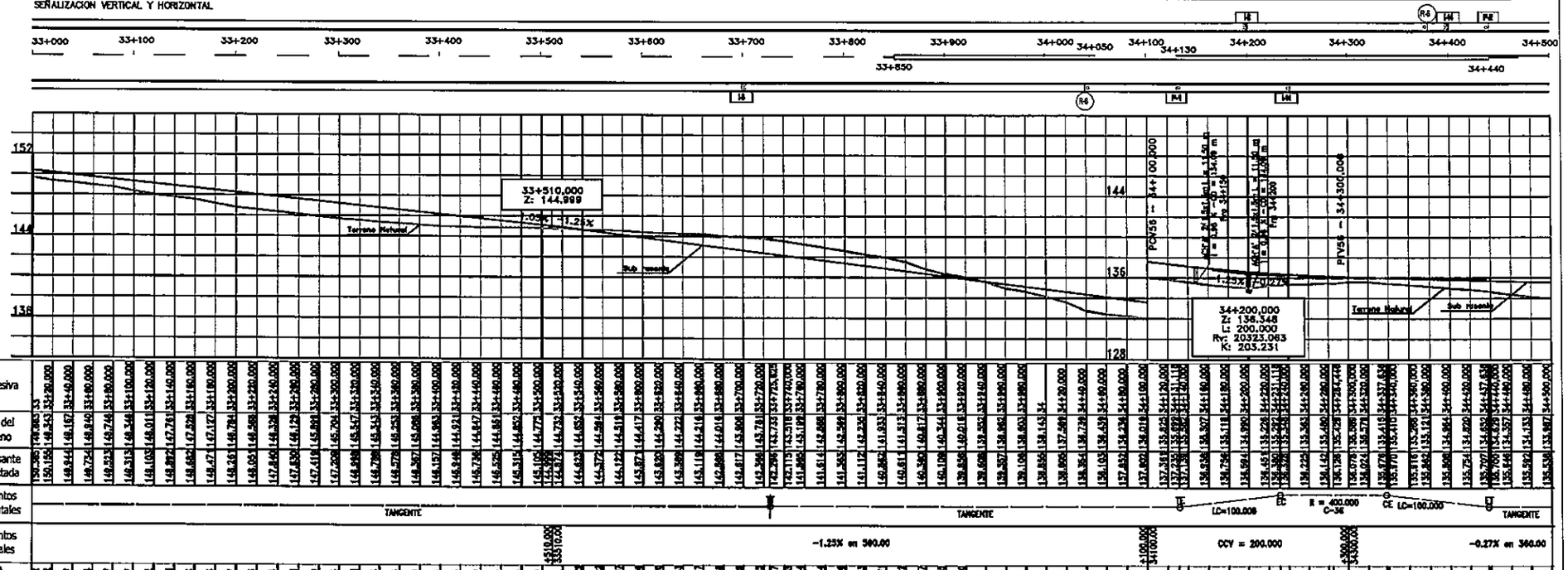
ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GM 4.2-21/04



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
66	33+000	12.86 D	150.218	68	34+000	13.87 I	136.330
67	33+500	18.51 D	144.900	69	34+500	18.04 D	134.729

SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

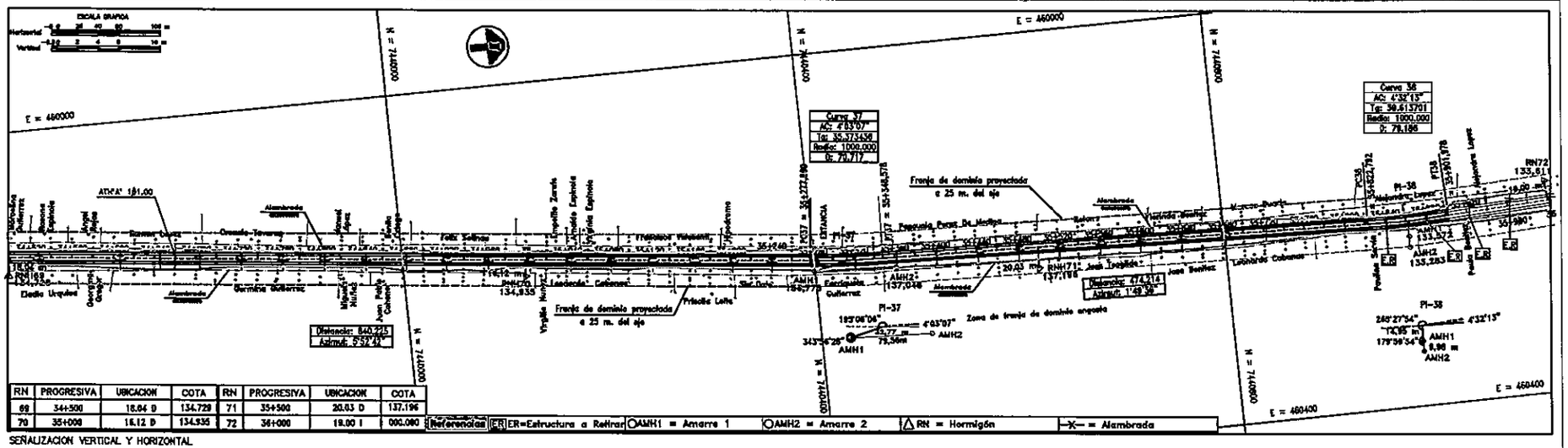
TRAMO 1: CONCEPCION - KM 82

PLANIALTIMETRIA

Prg. 33+000 - 34+500

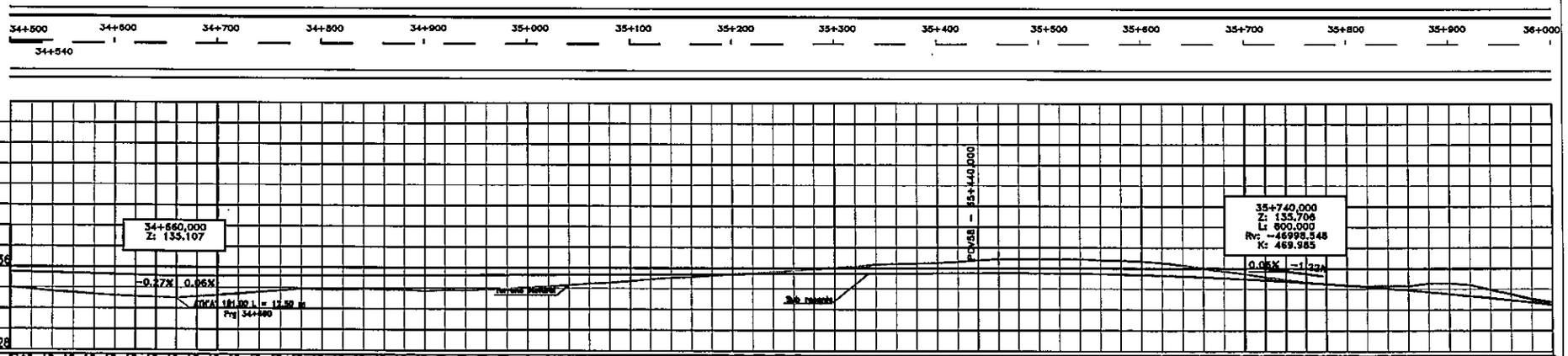
ESCALAS: H: 1/1.000 V: 1/400

LAMINA: GM 4.2-22/34



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
69	34+500	18.04 D	134.729	71	35+500	20.03 D	137.196
70	35+000	18.12 D	134.935	72	36+000	19.00 I	000.000

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
34+500,000 … 36+000,000	133,537 … 137,743	135,536 … 137,514	TANGENTE; C-37 R = 1000,000; TANGENTE; C-38 R = 1000,000; TANGENTE	0.06% en 780.00; 34+660,000; 35+440,000; CCV = 600.000	1,551 … -0,226

NOTAS :

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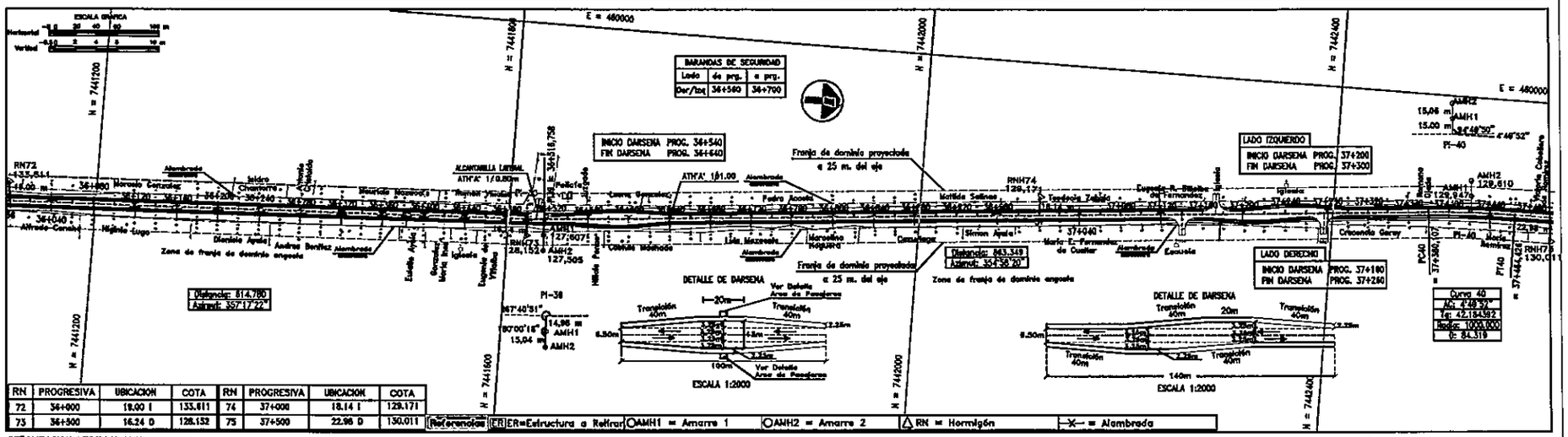
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 34+500 - 36+000

ESCALAS:
H: 1/1.000
V: 1/100

LAMINA:
GM 4.2-23/34

MOPC

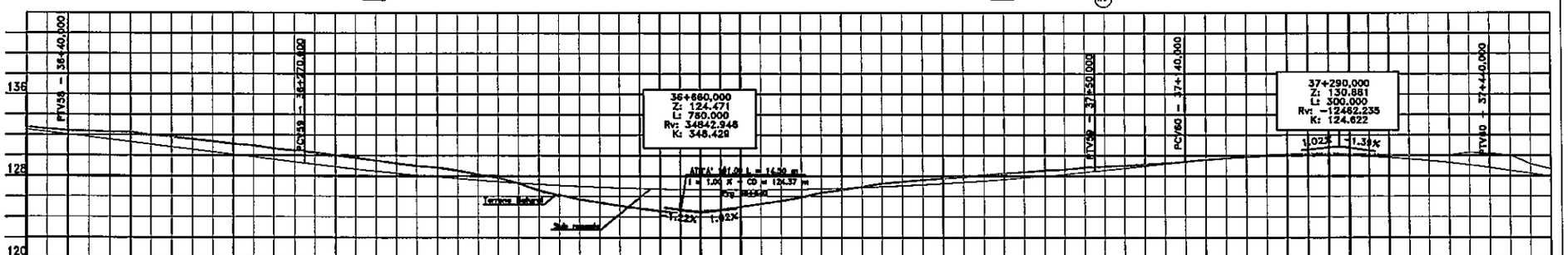


RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
72	36+000	19.00 I	133.611	74	37+000	18.14 I	129.171
73	36+500	16.24 D	128.152	75	37+500	22.96 D	130.011

SEÑALIZACION VERTICAL Y HORIZONTAL

36+000 36+100 36+200 36+300 36+400 36+500 36+540 36+600 36+700 36+800 36+900 37+000 37+100 37+200 37+300 37+400 37+500

36+490 36+690 37+110 37+350



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
36+000 … 37+500	132.745 … 128.886	132.548 … 127.693	TANGENTE; R = 1000.000 C=40; TANGENTE	-1.22% en 230.00; CCV = 780.000; 1.02% en 90.00; CCV = 300.000; -1.38% en 80.00	-0.226 … -1.693

NOTAS :

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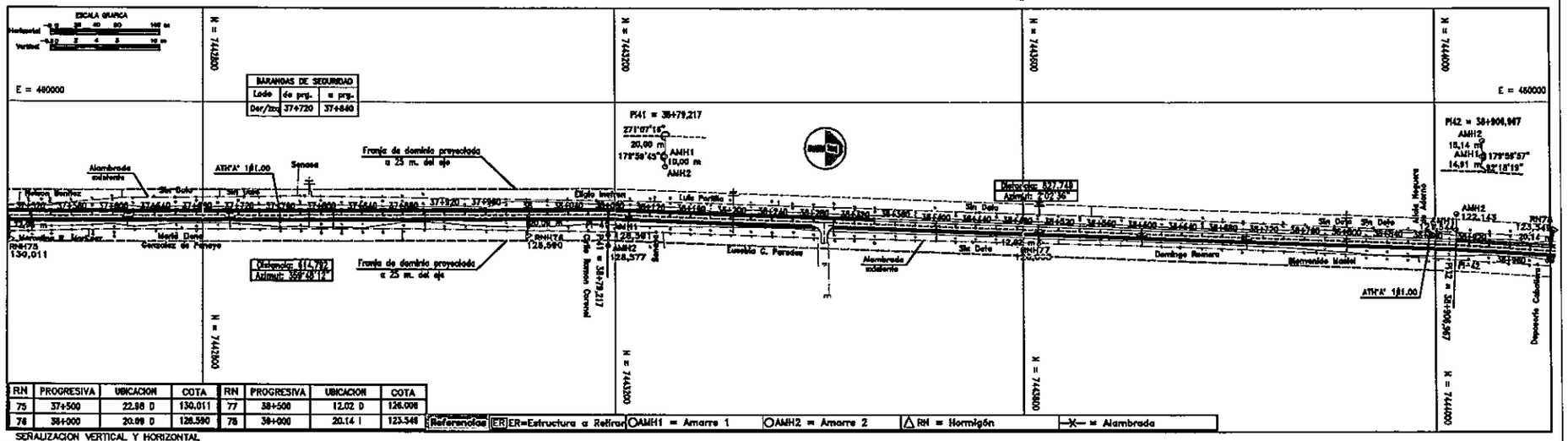
CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 36+000 - 37+500

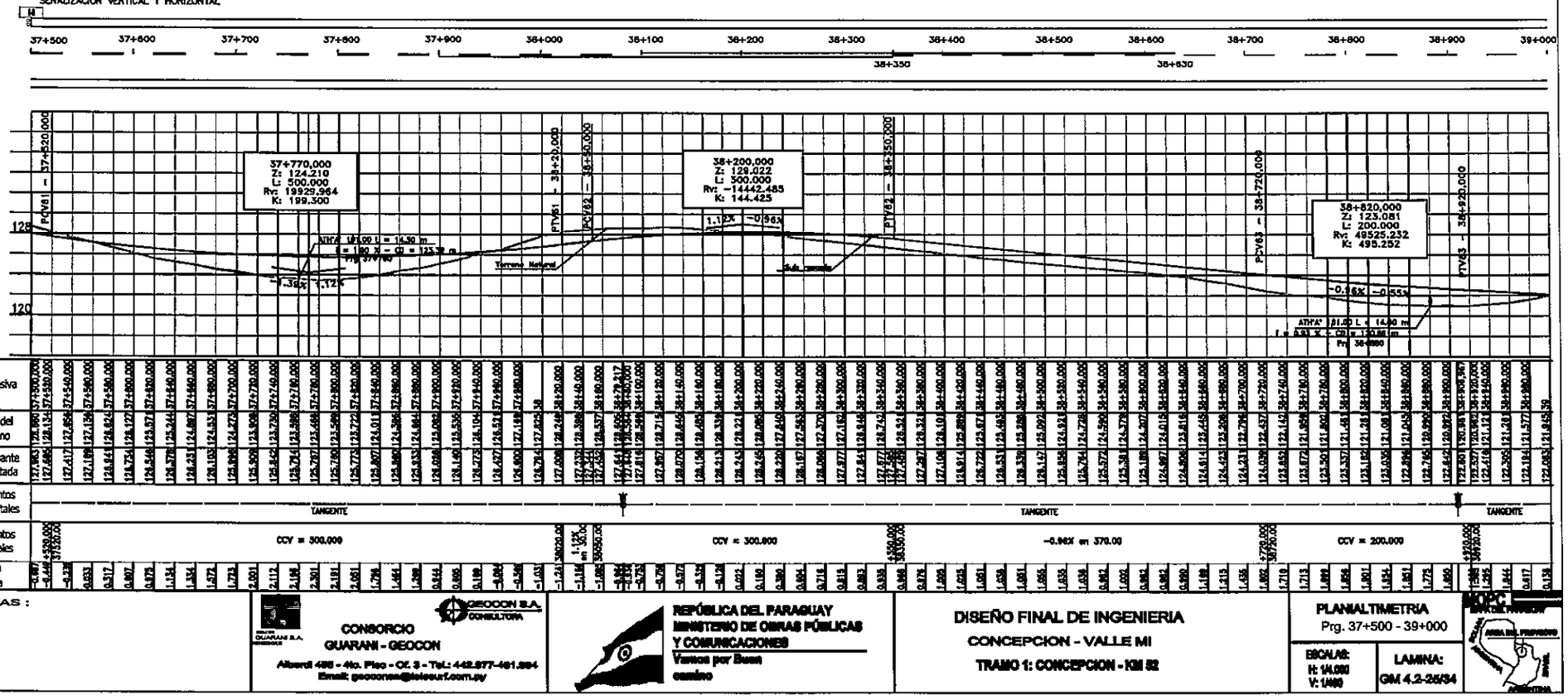
ESCALAS:
H: 1/1.000
V: 1/100

LAMINA:
GM 4.2-24/34



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
75	37+500	22.98 D	130.011	77	38+500	12.02 D	126.008
76	38+000	20.09 D	128.590	78	39+000	20.14 I	123.349

SERALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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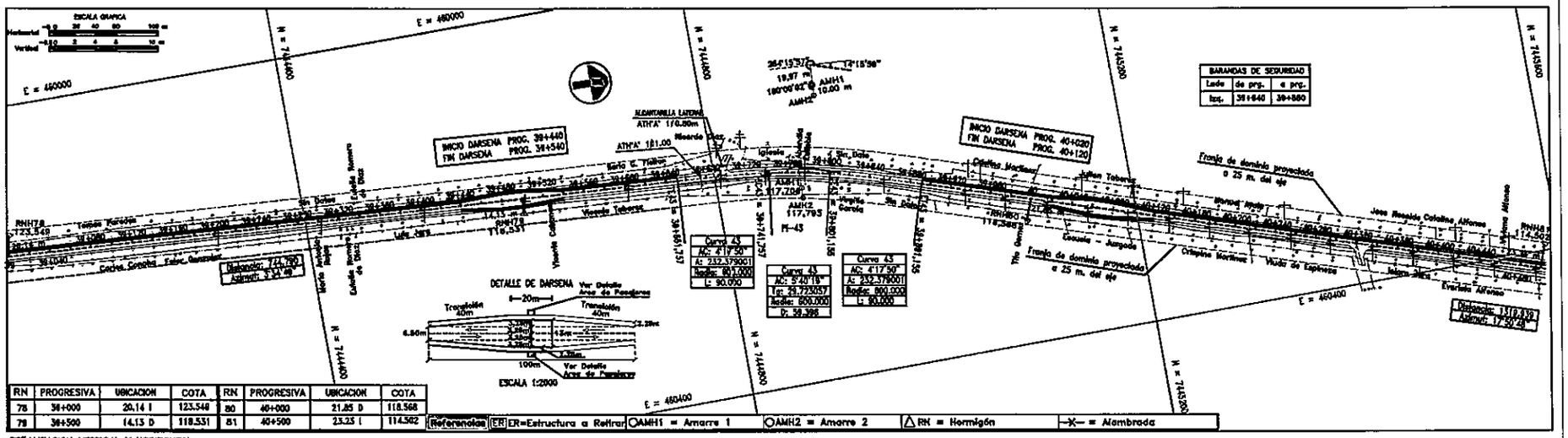
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 82

PLANIALTIMETRIA
Prg. 37+500 - 39+000

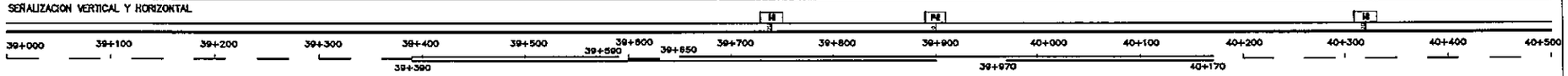
ESCALAS:
H: 1/4.000
V: 1/400

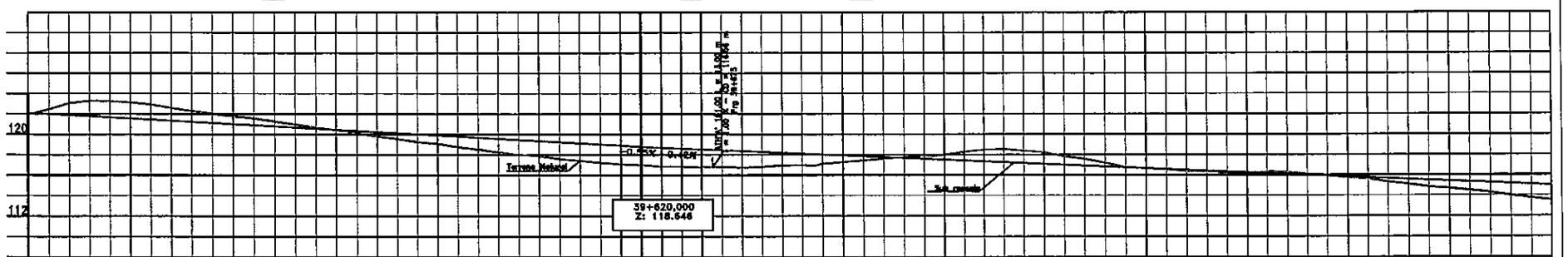
LAMINA:
GM 4.2-26/34



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
78	39+000	20.14 I	123.549	80	40+000	21.85 D	118.568
79	39+500	14.13 D	118.531	81	40+500	23.23 I	114.562

SEÑALIZACION VERTICAL Y HORIZONTAL





Progresiva	39+000	39+010	39+020	39+030	39+040	39+050	39+060	39+070	39+080	39+090	39+100	39+110	39+120	39+130	39+140	39+150	39+160	39+170	39+180	39+190	39+200	39+210	39+220	39+230	39+240	39+250	39+260	39+270	39+280	39+290	39+300	39+310	39+320	39+330	39+340	39+350	39+360	39+370	39+380	39+390	39+400	39+410	39+420	39+430	39+440	39+450	39+460	39+470	39+480	39+490	39+500
Cotas del Terreno	121.545	122.442	123.032	123.258	123.110	122.811	122.553	122.264	122.018	121.773	121.528	121.256	120.955	120.677	120.391	120.107	119.792	119.544	119.220	119.054	118.734	118.519	118.220	118.003	117.750	117.576	117.382	117.211	117.067	116.964	116.845	116.810	116.753	116.513	116.396	116.228	116.144	116.060	115.975	115.891	115.807	115.722	115.638	115.555	115.471	115.388	115.304	115.220	115.137	115.053	114.970	114.886	114.802
Sub rasante Proyectada	122.065	121.972	121.881	121.790	121.699	121.608	121.517	121.426	121.335	121.244	121.153	120.863	120.753	120.642	120.531	120.420	120.309	120.198	119.987	119.876	119.765	119.654	119.543	119.432	119.311	119.200	119.089	118.978	118.867	118.757	118.646	118.535	118.424	118.313	118.202	118.091	117.980	117.869	117.758	117.647	117.536	117.425	117.314	117.203	117.092	116.981	116.870	116.759	116.648	116.537	116.426	116.315	116.204
Elementos Horizontales	TANGENTE																																																			TANGENTE
Elementos Verticales	-0.55% en 700.00																																																		-0.42% en 1100.00
Cota Roja	0.136	-0.471	-1.117	-1.535	-1.611	-1.541	-1.463	-1.426	-1.088	-0.933	-0.779	-0.865	-0.543	-0.311	-0.146	0.222	0.564	0.858	0.543	0.748	0.812	1.021	1.126	1.305	1.418	1.461	1.574	1.687	1.788	1.901	1.783	1.800	1.732	1.760	1.717	1.591	1.602	1.453	1.346	1.235	1.124	1.014	0.903	0.792	0.681	0.570	0.459	0.348	0.237	0.126	0.015	-0.096	-0.207
Cota Roja	-0.318	-0.429	-0.540	-0.651	-0.762	-0.873	-0.984	-1.095	-1.206	-1.317	-1.428	-1.539	-1.650	-1.761	-1.872	-1.983	-1.094	-1.205	-1.316	-1.427	-1.538	-1.649	-1.760	-1.871	-1.982	-1.093	-1.204	-1.315	-1.426	-1.537	-1.648	-1.759	-1.870	-1.981	-1.092	-1.203	-1.314	-1.425	-1.536	-1.647	-1.758	-1.869	-1.980	-1.091	-1.202	-1.313	-1.424	-1.535	-1.646	-1.757	-1.868	-1.979	-1.090

NOTAS :

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CONCEPCION - VALLE MI

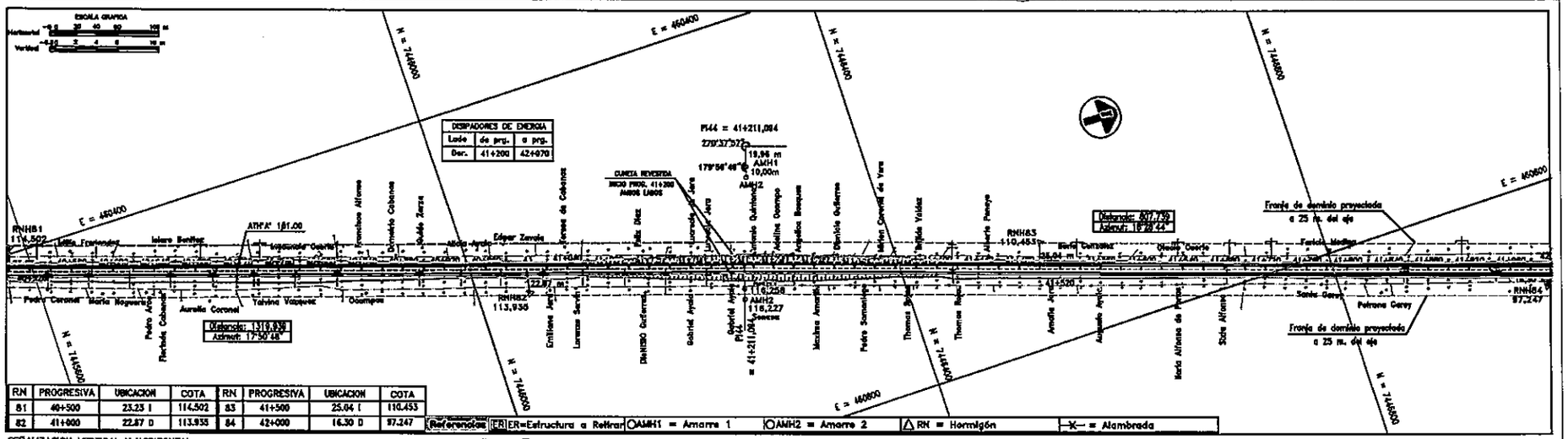
TRAMO 1: CONCEPCION - KM 92

PLANIALTIMETRIA

Prg. 39+000 - 40+500

ESCALAS: H: 1/1.000 V: 1/400

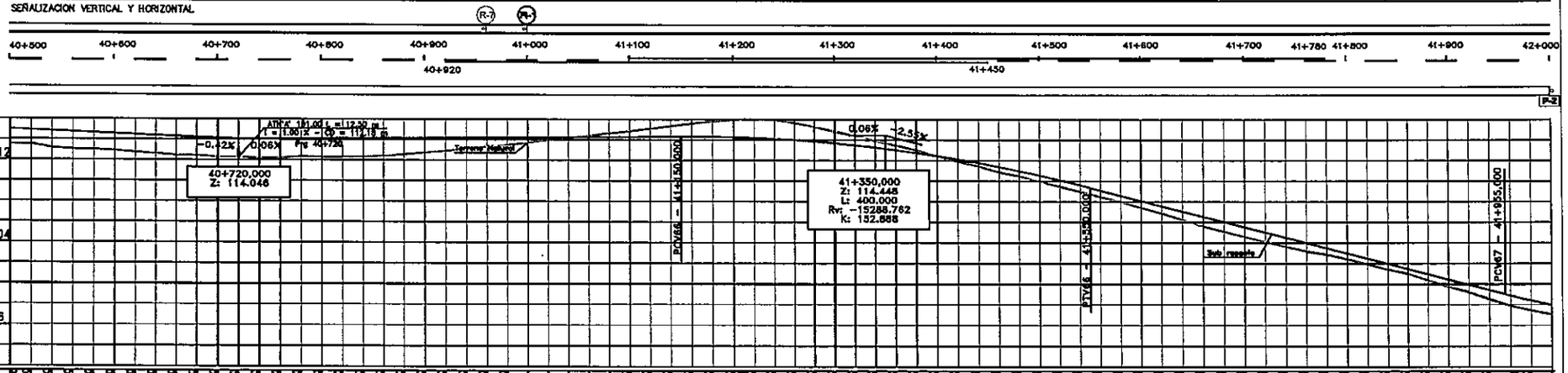
LAMINA: GM 4.2-28/34



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
81	40+500	23.23 I	114.502	83	41+500	25.64 I	110.453
82	41+000	22.87 D	113.935	84	42+000	16.30 D	97.247

Referencias: ER ER=Estructura a Retirar | AMH1 = Amarre 1 | AMH2 = Amarre 2 | RN = Hormigón | = Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Subrasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
40+500.000	113.520	114.502	TANGENTE		1.740
40+520.000	113.512	114.502			1.370
40+540.000	113.188	114.502			1.031
40+560.000	113.027	114.502			0.685
40+580.000	113.015	114.502			0.318
40+600.000	112.984	114.502			0.054
40+620.000	112.735	114.502			1.751
40+640.000	112.603	114.502			1.770
40+660.000	112.463	114.502			1.833
40+680.000	112.419	114.502			1.797
40+700.000	112.294	114.502			1.846
40+720.000	112.248	114.502			1.800
40+740.000	112.210	114.502			1.848
40+760.000	112.191	114.502			1.881
40+780.000	112.337	114.502			1.753
40+800.000	112.479	114.502			1.622
40+820.000	112.267	114.502			1.821
40+840.000	112.330	114.502			1.753
40+860.000	112.403	114.502			1.722
40+880.000	112.533	114.502			1.595
40+900.000	112.717	114.502			1.444
40+920.000	112.895	114.502			1.380
40+940.000	113.077	114.502			1.109
40+960.000	113.202	114.502			0.917
40+980.000	113.496	114.502			0.718
41+000.000	113.907.41	114.502			0.536
41+020.000	113.956	114.502			0.376
41+040.000	113.984	114.502			0.256
41+060.000	114.184	114.502			0.126
41+080.000	114.383	114.502			-0.355
41+100.000	114.478	114.502			-0.541
41+120.000	114.488	114.502			-0.721
41+140.000	114.328	114.502			-1.011
41+160.000	114.305	114.502			-1.296
41+180.000	114.274	114.502			-1.449
41+200.000	114.277	114.502			-1.554
41+220.000	114.277	114.502			-1.616
41+240.000	114.277	114.502			-1.807
41+260.000	114.415	114.502			-1.473
41+280.000	114.574	114.502			-1.410
41+300.000	114.679	114.502			-1.133
41+320.000	114.811	114.502			-0.897
41+340.000	114.953	114.502			-0.810
41+360.000	115.071	114.502			-0.557
41+380.000	115.199	114.502			-0.477
41+400.000	115.436	114.502			0.001
41+420.000	115.709	114.502			0.218
41+440.000	115.980	114.502			0.291
41+460.000	116.250	114.502			0.354
41+480.000	116.479	114.502			0.313
41+500.000	116.670	114.502			0.361
41+520.000	116.836	114.502			0.422
41+540.000	116.979	114.502			0.536
41+560.000	117.012	114.502			0.673
41+580.000	117.757	114.502			0.692
41+600.000	118.436	114.502			0.812
41+620.000	119.109	114.502			0.871
41+640.000	119.730	114.502			0.917
41+660.000	120.301	114.502			0.953
41+680.000	120.819	114.502			0.974
41+700.000	121.279	114.502			0.974
41+720.000	121.679	114.502			0.929
41+740.000	122.020	114.502			0.851
41+760.000	122.301	114.502			0.746
41+780.000	122.520	114.502			0.635
41+800.000	122.680	114.502			0.529
41+820.000	122.779	114.502			0.499
41+840.000	122.818	114.502			0.495
41+860.000	122.797	114.502			0.484
41+880.000	122.715	114.502			0.464
41+900.000	122.573	114.502			0.396
41+920.000	122.372	114.502			0.337
41+940.000	122.112	114.502			0.337
41+960.000	121.793	114.502			0.337
41+980.000	121.415	114.502			0.337
42+000.000	120.978	114.502			0.337

Elementos Verticales: 0.06X en 430.00 (PCV 40+720.000 / PTV 41+150.000); CCV = 400.000; -2.53X en 405.00 (PCV 41+550.000 / PTV 41+955.000)

NOTAS :
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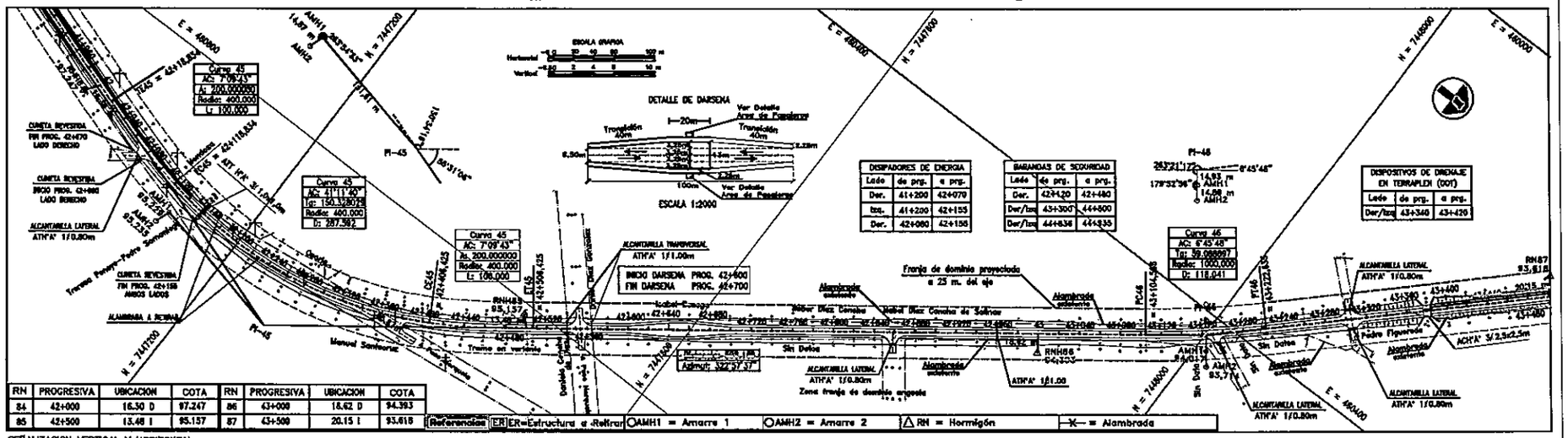
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 62

PLANIALTIMETRIA
Prg. 40+500 - 42+000

ESCALAS: H: 1/4.000 V: 1/400

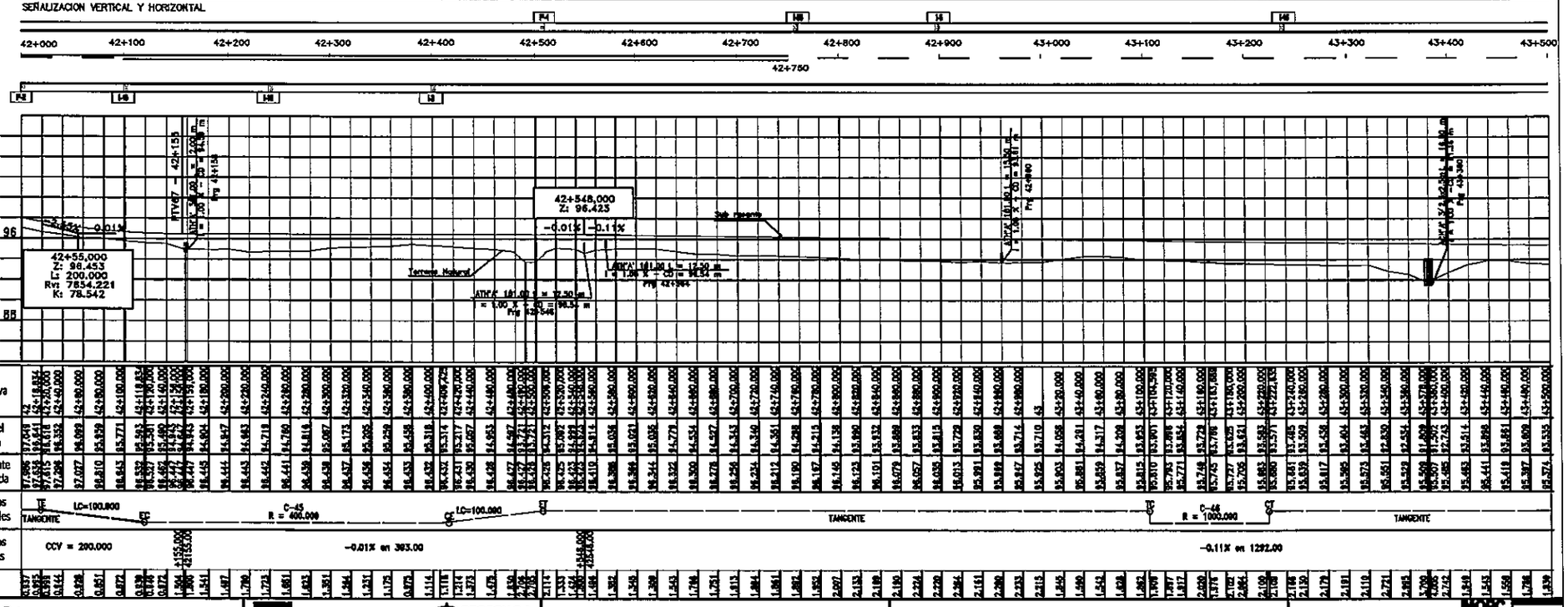
LAMINA: GM 4.2-27/34

MOPC



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
84	42+000	16.50 D	97.247	86	43+000	18.62 D	94.393
85	42+500	13.48 I	95.157	87	43+500	20.15 I	93.618

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Cota Roja
42+000	97.051	97.086	0.035
42+010	97.038	97.074	0.036
42+020	97.025	97.062	0.037
42+030	97.012	97.049	0.037
42+040	96.999	97.036	0.037
42+050	96.986	97.023	0.037
42+060	96.973	97.010	0.037
42+070	96.960	96.997	0.037
42+080	96.947	96.984	0.037
42+090	96.934	96.971	0.037
42+100	96.921	96.958	0.037
42+110	96.908	96.945	0.037
42+118.834	96.896	96.933	0.037
42+120	96.895	96.932	0.037
42+130	96.882	96.919	0.037
42+140	96.869	96.906	0.037
42+150	96.856	96.893	0.037
42+160	96.843	96.880	0.037
42+170	96.830	96.867	0.037
42+180	96.817	96.854	0.037
42+190	96.804	96.841	0.037
42+200	96.791	96.828	0.037
42+210	96.778	96.815	0.037
42+220	96.765	96.802	0.037
42+230	96.752	96.789	0.037
42+240	96.739	96.776	0.037
42+250	96.726	96.763	0.037
42+260	96.713	96.750	0.037
42+270	96.700	96.737	0.037
42+280	96.687	96.724	0.037
42+290	96.674	96.711	0.037
42+300	96.661	96.698	0.037
42+310	96.648	96.685	0.037
42+320	96.635	96.672	0.037
42+330	96.622	96.659	0.037
42+340	96.609	96.646	0.037
42+350	96.596	96.633	0.037
42+360	96.583	96.620	0.037
42+370	96.570	96.607	0.037
42+380	96.557	96.594	0.037
42+390	96.544	96.581	0.037
42+400	96.531	96.568	0.037
42+410	96.518	96.555	0.037
42+420	96.505	96.542	0.037
42+430	96.492	96.529	0.037
42+440	96.479	96.516	0.037
42+450	96.466	96.503	0.037
42+460	96.453	96.490	0.037
42+470	96.440	96.477	0.037
42+480	96.427	96.464	0.037
42+490	96.414	96.451	0.037
42+500	96.401	96.438	0.037
42+510	96.388	96.425	0.037
42+520	96.375	96.412	0.037
42+530	96.362	96.399	0.037
42+540	96.349	96.386	0.037
42+550	96.336	96.373	0.037
42+560	96.323	96.360	0.037
42+570	96.310	96.347	0.037
42+580	96.297	96.334	0.037
42+590	96.284	96.321	0.037
42+600	96.271	96.308	0.037
42+610	96.258	96.295	0.037
42+620	96.245	96.282	0.037
42+630	96.232	96.269	0.037
42+640	96.219	96.256	0.037
42+650	96.206	96.243	0.037
42+660	96.193	96.230	0.037
42+670	96.180	96.217	0.037
42+680	96.167	96.204	0.037
42+690	96.154	96.191	0.037
42+700	96.141	96.178	0.037
42+710	96.128	96.165	0.037
42+720	96.115	96.152	0.037
42+730	96.102	96.139	0.037
42+740	96.089	96.126	0.037
42+750	96.076	96.113	0.037
42+760	96.063	96.100	0.037
42+770	96.050	96.087	0.037
42+780	96.037	96.074	0.037
42+790	96.024	96.061	0.037
42+800	96.011	96.048	0.037
42+810	95.998	96.035	0.037
42+820	95.985	96.022	0.037
42+830	95.972	96.009	0.037
42+840	95.959	95.996	0.037
42+850	95.946	95.983	0.037
42+860	95.933	95.970	0.037
42+870	95.920	95.957	0.037
42+880	95.907	95.944	0.037
42+890	95.894	95.931	0.037
42+900	95.881	95.918	0.037
42+910	95.868	95.905	0.037
42+920	95.855	95.892	0.037
42+930	95.842	95.879	0.037
42+940	95.829	95.866	0.037
42+950	95.816	95.853	0.037
42+960	95.803	95.840	0.037
42+970	95.790	95.827	0.037
42+980	95.777	95.814	0.037
42+990	95.764	95.801	0.037
43+000	95.751	95.788	0.037
43+010	95.738	95.775	0.037
43+020	95.725	95.762	0.037
43+030	95.712	95.749	0.037
43+040	95.699	95.736	0.037
43+050	95.686	95.723	0.037
43+060	95.673	95.710	0.037
43+070	95.660	95.697	0.037
43+080	95.647	95.684	0.037
43+090	95.634	95.671	0.037
43+100	95.621	95.658	0.037
43+110	95.608	95.645	0.037
43+120	95.595	95.632	0.037
43+130	95.582	95.619	0.037
43+140	95.569	95.606	0.037
43+150	95.556	95.593	0.037
43+160	95.543	95.580	0.037
43+170	95.530	95.567	0.037
43+180	95.517	95.554	0.037
43+190	95.504	95.541	0.037
43+200	95.491	95.528	0.037
43+210	95.478	95.515	0.037
43+220	95.465	95.502	0.037
43+230	95.452	95.489	0.037
43+240	95.439	95.476	0.037
43+250	95.426	95.463	0.037
43+260	95.413	95.450	0.037
43+270	95.400	95.437	0.037
43+280	95.387	95.424	0.037
43+290	95.374	95.411	0.037
43+300	95.361	95.398	0.037
43+310	95.348	95.385	0.037
43+320	95.335	95.372	0.037
43+330	95.322	95.359	0.037
43+340	95.309	95.346	0.037
43+350	95.296	95.333	0.037
43+360	95.283	95.320	0.037
43+370	95.270	95.307	0.037
43+380	95.257	95.294	0.037
43+390	95.244	95.281	0.037
43+400	95.231	95.268	0.037
43+410	95.218	95.255	0.037
43+420	95.205	95.242	0.037
43+430	95.192	95.229	0.037
43+440	95.179	95.216	0.037
43+450	95.166	95.203	0.037
43+460	95.153	95.190	0.037
43+470	95.140	95.177	0.037
43+480	95.127	95.164	0.037
43+490	95.114	95.151	0.037
43+500	95.101	95.138	0.037

Elementos Horizontales: TE — TANGENTE — EC — LC=100.000 — R = 400.000 — CE — LC=100.000 — ET — TANGENTE — TE — C-46 R = 1000.000 — CT — TANGENTE

Elementos Verticales: CCV = 200.000 — 42+155.000 — 42+215.000 — -0.01% en 363.00 — 42+548.000 — 42+634.000 — -0.11% en 1292.00

NOTAS :

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GEOCON S.A. CONSULTORA

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CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

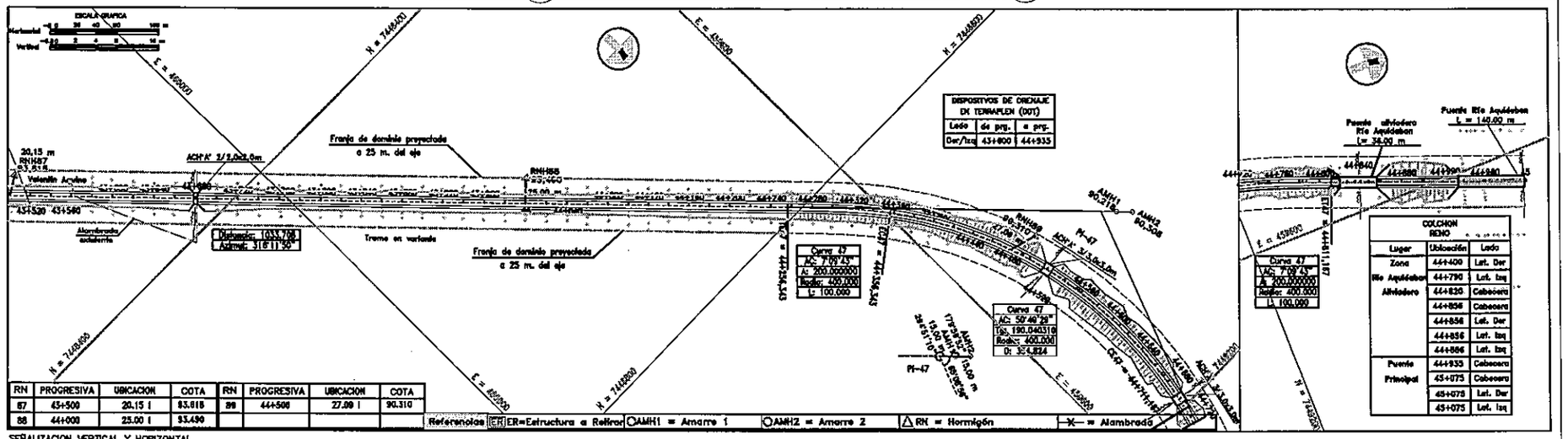
PLANIALTIMETRIA

Prg. 42+000 - 43+500

ESCALAS: H: 1/4.000 V: 1/400

LAMINA: GM 4.2-26/34

KOPC



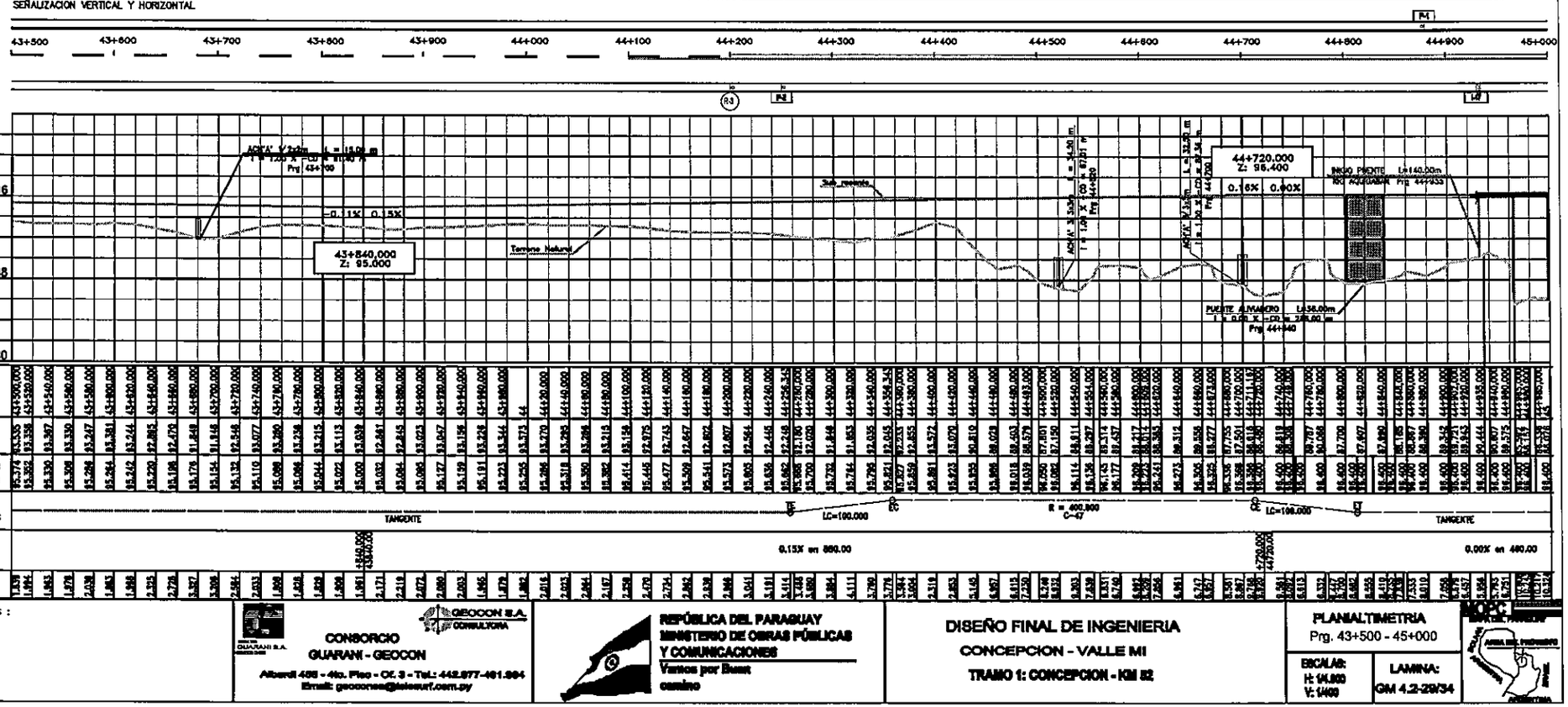
DISPOSITIVOS DE DRENAJE DE TERRAPLEN (DOT)		
Lado	de prg.	a prg.
Der/Izq	43+800	44+935

COLCHON RENO		
Lugar	Ubicación	Lado
Zona Río Aquidaban Alivadero	44+400	Lat. Der
	44+790	Lat. Izq
	44+820	Cabecera
	44+856	Cabecera
	44+856	Lat. Der
	44+856	Lat. Izq
	44+886	Lat. Izq
Puente Principal	44+935	Cabecera
	45+075	Cabecera
	45+075	Lat. Der
	45+075	Lat. Izq

RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
87	43+500	20.15 I	93.818	89	44+500	27.09 I	90.310
88	44+000	25.00 I	93.490				

Referencias: ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; = Alambrado

SEÑALIZACION VERTICAL Y HORIZONTAL



NOTAS :

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CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

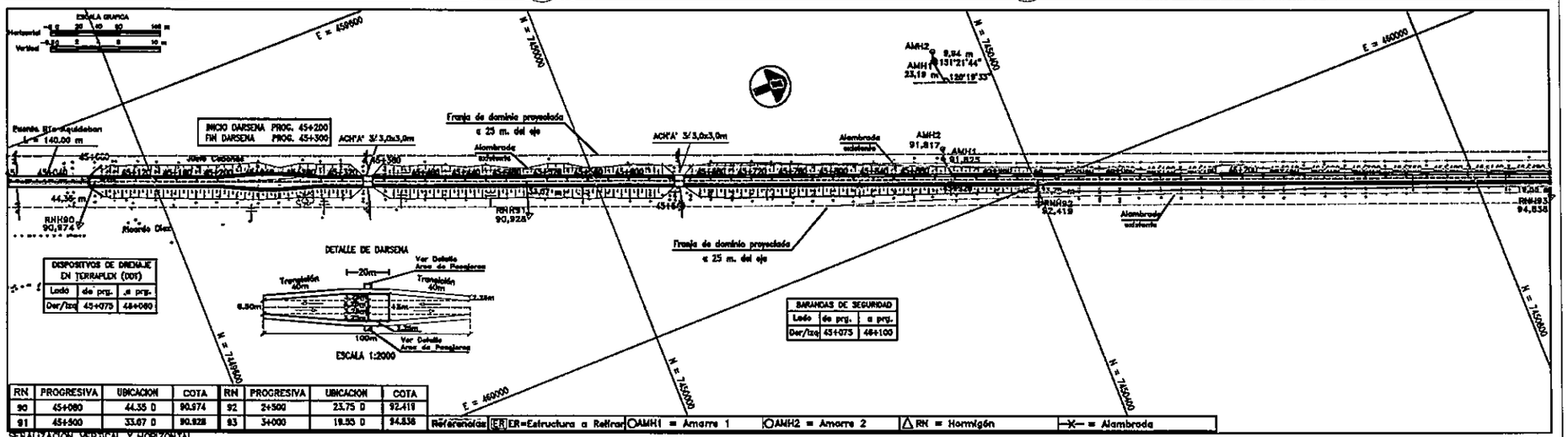
PLANIALTIMETRIA

Prg. 43+500 - 45+000

ESCALAS: H: 1/1.000 V: 1/400

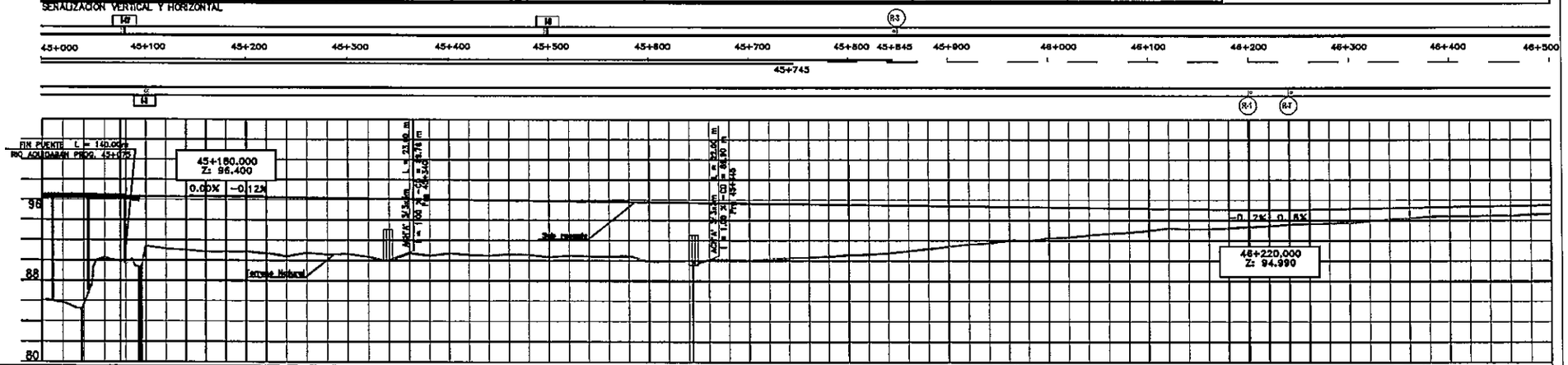
LAMINA: GM 4.2-29/34

MOPC



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
90	45+080	44.35 D	90.974	92	2+500	23.75 D	92.419
91	45+500	33.67 D	90.928	93	3+000	19.55 D	94.836

SENALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
45+000	95.076	96.400	TANGENTE		10.576
45+020	95.958	96.400			10.511
45+040	95.467	96.400			10.116
45+060	97.750	96.400			8.140
45+080	90.273	96.400			6.127
45+100	90.705	96.400			5.540
45+120	90.358	96.400			5.516
45+140	90.531	96.400			5.516
45+160	91.133	96.400			5.531
45+180	91.001	96.400			5.397
45+200	90.855	96.400			5.390
45+220	90.929	96.400			5.545
45+240	90.931	96.400			5.571
45+260	90.882	96.373			5.372
45+280	90.550	96.248			5.344
45+300	90.746	96.319			5.543
45+320	90.538	96.292			5.546
45+340	90.818	96.264			5.728
45+360	90.544	96.237			5.618
45+380	90.880	96.210			5.688
45+400	90.887	96.183			5.703
45+420	90.704	96.156			5.707
45+440	90.443	96.129			5.686
45+460	90.883	96.102			5.417
45+480	90.931	96.075			5.544
45+500	90.489	96.047			5.578
45+520	90.804	96.020			5.416
45+540	90.550	95.993			5.443
45+560	90.332	95.966			5.634
45+580	90.671	95.939			5.488
45+600	90.693	95.912			5.520
45+620	90.398	95.885			5.488
45+640	90.677	95.858			5.431
45+660	90.865	95.830			5.865
45+680	90.887	95.803			5.818
45+700	90.001	95.776			5.775
45+720	90.013	95.737			5.885
45+740	90.140	95.748			5.803
45+760	90.086	95.722			5.926
45+780	90.007	95.695			5.886
45+800	90.146	95.668			5.522
45+820	90.219	95.641			5.426
45+840	90.367	95.614			5.307
45+860	90.387	95.586			5.192
45+880	90.333	95.559			5.024
45+900	90.807	95.532			4.925
45+920	90.725	95.505			4.790
45+940	90.901	95.478			4.577
45+960	91.148	95.451			4.501
45+980	91.150	95.424			4.035
46+000	91.368	95.397			3.775
46+020	91.822	95.369			3.538
46+040	91.731	95.342			3.390
46+060	91.992	95.315			3.306
46+080	91.846	95.288			3.061
46+100	92.277	95.261			2.880
46+120	92.311	95.234			2.717
46+140	92.517	95.207			2.544
46+160	92.683	95.180			2.388
46+180	92.722	95.153			2.196
46+200	92.853	95.125			1.972
46+220	93.198	95.098			2.000
46+240	93.068	95.071			1.818
46+260	93.152	95.044			1.812
46+280	93.232	95.017			1.670
46+300	93.358	94.990			1.562
46+320	93.458	95.027			1.462
46+340	93.585	95.063			1.414
46+360	93.619	95.100			1.392
46+380	93.718	95.137			1.361
46+400	93.778	95.174			1.285
46+420	93.888	95.211			1.176
46+440	94.085	95.247			1.062
46+460	94.193	95.284			0.922
46+480	94.382	95.321			0.908
46+500	94.415	95.358			0.888
46+520	94.570	95.395			0.875
46+540	94.487	95.431			0.870
46+560	94.461	95.468			0.881
46+580	94.577	95.505			0.873
46+600	94.677	95.505			0.873

NOTAS :

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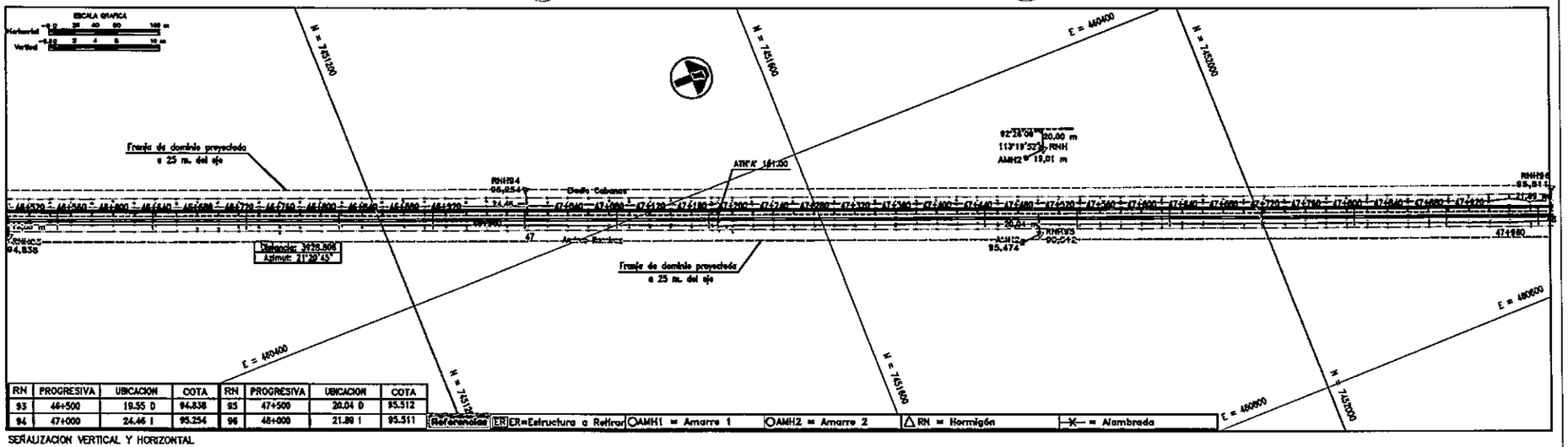
PLANIALTIMETRIA
Prg. 45+000 - 46+500

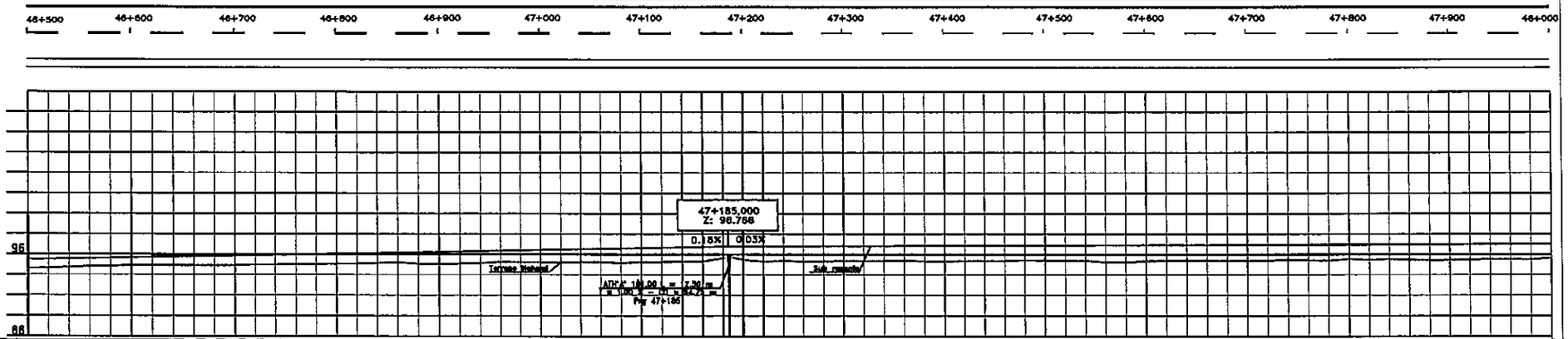
ESCALAS: H: 1/1.000 V: 1/400

LAMINA: GM 4.2-30/34



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
93	46+500	19.55 D	94.838	95	47+500	20.04 D	95.512
94	47+000	24.46 I	95.254	96	48+000	21.89 I	95.511

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Cota Roja
46+500,000	94,837	95,505	0,668
46+510,000	94,851	95,542	0,691
46+520,000	94,715	95,579	0,864
46+530,000	94,785	95,615	0,831
46+540,000	94,852	95,652	0,800
46+550,000	94,919	95,689	0,770
46+560,000	94,925	95,726	0,801
46+570,000	94,923	95,763	0,840
46+580,000	94,921	95,800	0,879
46+590,000	94,918	95,836	0,918
46+600,000	94,914	95,873	0,958
46+610,000	94,902	95,910	0,998
46+620,000	94,891	95,947	1,056
46+630,000	95,010	95,984	0,972
46+640,000	95,038	96,020	0,982
46+650,000	95,053	96,057	1,004
46+660,000	95,064	96,094	1,030
46+670,000	95,142	96,131	0,989
46+680,000	95,195	96,168	0,973
46+690,000	95,242	96,204	1,162
46+700,000	95,032	96,241	1,209
46+710,000	95,093	96,278	1,185
46+720,000	95,133	96,315	1,182
46+730,000	95,254	96,352	1,098
46+740,000	95,237	96,389	1,152
46+750,000	95,511	96,425	0,914
46+760,000	95,705	96,461	0,757
46+770,000	95,720	96,498	0,778
46+780,000	95,254	96,536	1,282
46+790,000	95,122	96,573	1,451
46+800,000	95,254	96,609	1,355
46+810,000	95,258	96,646	1,388
46+820,000	95,288	96,683	1,395
46+830,000	95,313	96,720	1,407
46+840,000	95,650	96,757	1,107
46+850,000	94,766	96,794	2,028
46+860,000	95,442	96,770	1,328
46+870,000	95,945	96,774	0,829
46+880,000	95,778	96,792	1,014
46+890,000	95,775	96,786	1,011
46+900,000	95,820	96,783	0,963
46+910,000	95,858	96,779	0,921
46+920,000	95,854	96,805	0,951
46+930,000	95,351	96,811	1,460
46+940,000	95,881	96,817	0,936
46+950,000	95,392	96,823	1,431
46+960,000	95,404	96,829	1,425
46+970,000	95,358	96,834	1,476
46+980,000	95,382	96,840	1,458
46+990,000	95,220	96,846	1,626
47+000,000	95,228	96,852	1,624
47+010,000	95,370	96,857	1,487
47+020,000	95,360	96,863	1,503
47+030,000	95,398	96,868	1,470
47+040,000	95,350	96,874	1,524
47+050,000	95,391	96,880	1,489
47+060,000	95,352	96,885	1,533
47+070,000	95,388	96,891	1,503
47+080,000	95,429	96,897	1,468
47+090,000	95,413	96,903	1,490
47+100,000	95,385	96,910	1,525
47+110,000	95,318	96,916	1,598
47+120,000	95,451	96,921	1,470
47+130,000	95,532	96,927	1,395
47+140,000	95,472	96,933	1,461
47+150,000	95,424	96,939	1,515
47+160,000	95,438	96,945	1,507
47+170,000	95,491	96,950	1,459
47+180,000	95,538	96,965	1,427
47+190,000	95,487	96,957	1,470
47+200,000	95,658	97,003	1,345

Elementos Horizontales: TANGENTE

Elementos Verticales: 0.18% en 963.00 — 47+185,000 — 0.03% en 1097.00

NOTAS :
1-
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CONSORCIO GUARANI - GEOCON
Alberdi 488 - 4to. Piso - Of. 3 - Tel.: 442.877-481.984
Email: geocorsa@telesurf.com.py

REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
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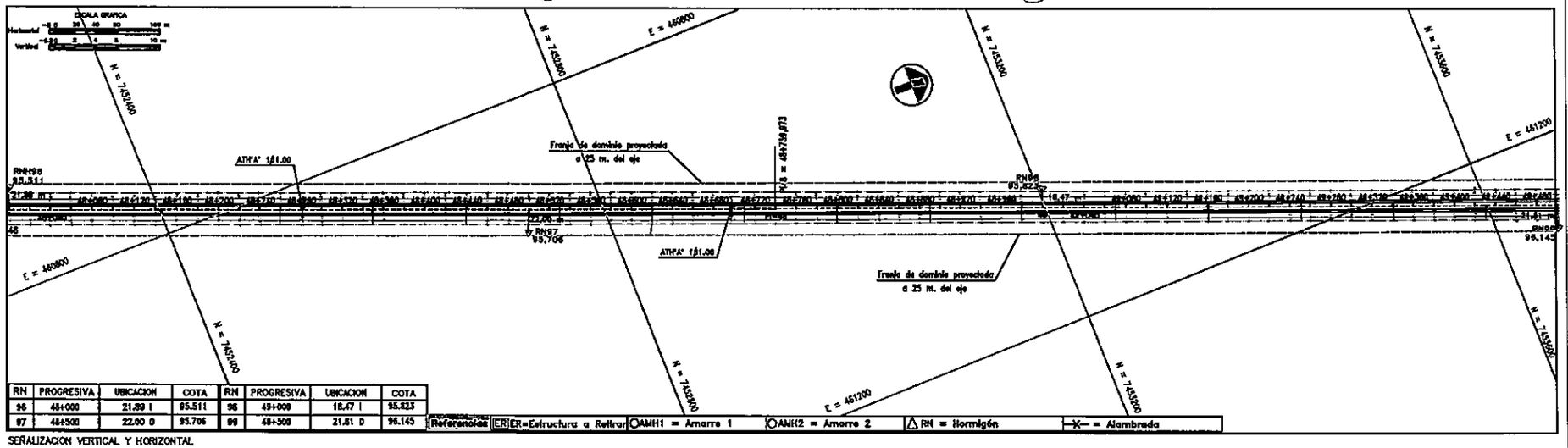
DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
Prg. 46+500 - 48+000

ESCALAS: H: 1/1.000 V: 1/400

LAMINA: GM 4.2-31/34

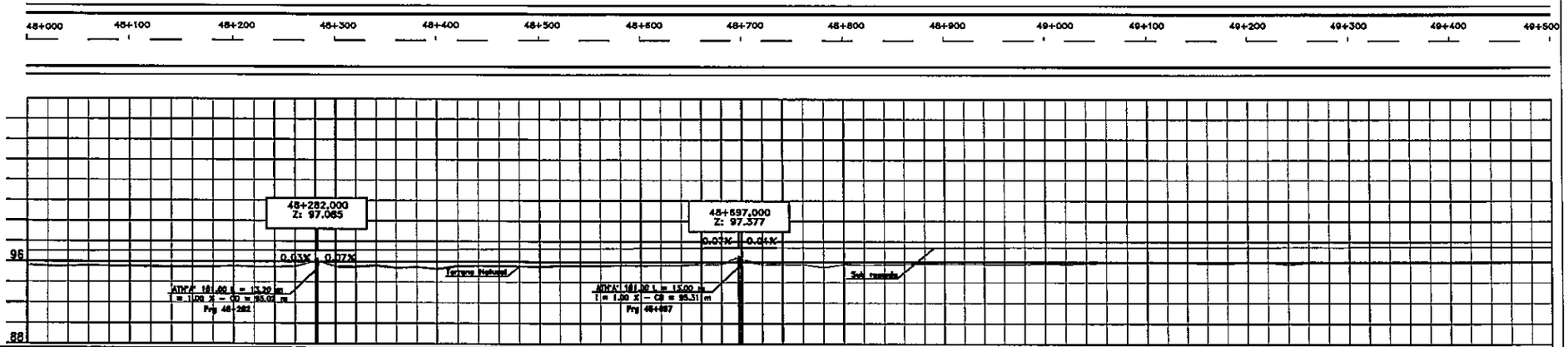
MOPC



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
96	48+000	21,89 I	95.511	98	49+000	18,47 I	95.823
97	48+500	22,00 D	95.706	99	48+500	21,81 D	96.145

Referencias: ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
48+000.000	95.859	97.003	TANGENTE		1.547
48+010.000	95.545	97.009			1.484
48+020.000	95.548	97.014			1.433
48+030.000	95.597	97.020			1.451
48+040.000	95.573	97.026			1.479
48+050.000	95.553	97.032			1.526
48+060.000	95.512	97.038			1.558
48+070.000	95.485	97.044			1.540
48+080.000	95.509	97.049			1.559
48+090.000	95.499	97.055			1.510
48+100.000	95.551	97.061			1.509
48+110.000	95.498	97.067			1.506
48+120.000	95.467	97.073			1.540
48+130.000	95.559	97.078			1.521
48+140.000	96.112	97.084			0.477
48+150.000	95.606	97.090		0.07% en 415.00	0.100
48+160.000	95.511	97.097			1.566
48+170.000	95.511	97.112			1.601
48+180.000	95.616	97.126			1.619
48+190.000	95.370	97.140			1.770
48+200.000	95.493	97.154			1.658
48+210.000	95.286	97.168			1.862
48+220.000	95.672	97.182			1.653
48+230.000	95.598	97.196			1.598
48+240.000	95.567	97.210			1.613
48+250.000	95.553	97.224			1.671
48+260.000	95.510	97.238			1.728
48+270.000	95.617	97.252			1.635
48+280.000	95.605	97.266			1.661
48+290.000	95.580	97.280			1.700
48+300.000	95.665	97.294			1.631
48+310.000	95.613	97.309			1.696
48+320.000	95.663	97.323			1.660
48+330.000	95.673	97.337			1.663
48+340.000	95.736	97.351			1.615
48+350.000	95.783	97.365			1.572
48+360.000	95.377	97.377			2.000
48+370.000	95.214	97.377			1.113
48+380.000	95.729	97.360			1.631
48+390.000	95.247	97.362			1.635
48+400.000	95.780	97.364			1.615
48+410.000	95.488	97.367			1.888
48+420.000	95.707	97.369			1.652
48+430.000	95.722	97.372			1.673
48+440.000	95.740	97.374			1.654
48+450.000	95.743	97.377			1.614
48+460.000	95.783	97.379			1.586
48+470.000	95.813	97.381			1.607
48+480.000	95.794	97.384			1.635
48+490.000	95.780	97.386			1.627
48+500.000	95.778	97.389			1.669
48+510.000	95.740	97.391			1.650
48+520.000	95.791	97.394			1.578
48+530.000	95.826	97.396			1.548
48+540.000	95.768	97.399			1.566
48+550.000	95.859	97.401			1.523
48+560.000	95.868	97.404			1.532
48+570.000	95.871	97.406			1.486
48+580.000	95.865	97.409			1.472
48+590.000	95.886	97.411			1.490
48+600.000	96.018	97.414			1.511
48+610.000	96.027	97.416			1.560
48+620.000	95.988	97.419			1.518
48+630.000	95.994	97.421			1.487
48+640.000	96.048	97.424			1.490
48+650.000	96.054	97.426			1.486
48+660.000	96.071	97.429			1.477
48+670.000	96.081	97.431			1.465
48+680.000	96.090	97.434			1.454
48+690.000	96.090	97.436			1.441
48+700.000	96.090	97.439			1.433
48+710.000	96.090	97.441			1.474
48+720.000	96.090	97.444			1.471
48+730.000	96.090	97.446			1.421
48+740.000	96.090	97.449			1.415
48+750.000	96.090	97.451			1.401
48+760.000	96.090	97.454			1.383

NOTAS :

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CONSORCIO
GUARANI - GEOCON
Alberdi 488 - 4to. Piso - Of. 2 - Tel.: 442.877-481.984
Email: geocorse@telesar.com.py

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DISEÑO FINAL DE INGENIERIA

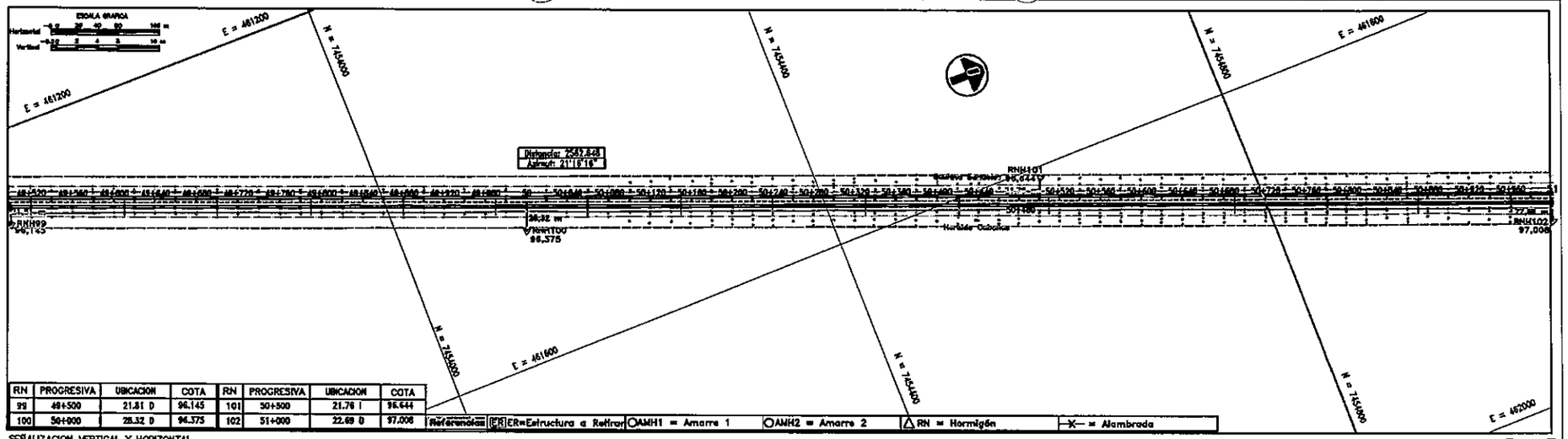
CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 82

PLANIALTIMETRIA
Prg. 48+000 - 49+500

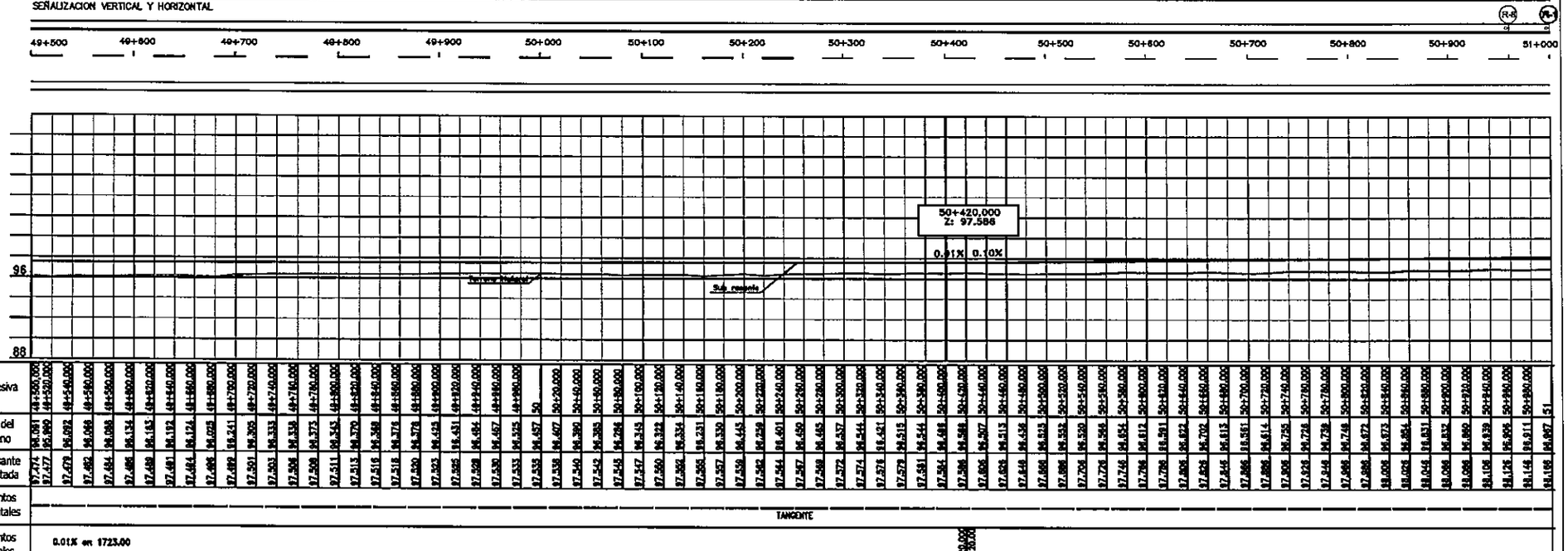
ESCALAS:
H: 1/1.000
V: 1/400

LAMINA:
GM 4.2-32/34



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
99	49+500	21.81 D	96.145	101	50+500	21.76 I	96.644
100	50+000	28.32 D	96.375	102	51+000	22.69 D	97.008

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada
49+500,000	96,061	97,274
49+510,000	95,969	97,477
49+540,000	96,092	97,479
49+550,000	96,068	97,482
49+560,000	96,098	97,484
49+570,000	96,134	97,486
49+580,000	96,163	97,488
49+590,000	96,192	97,491
49+600,000	96,124	97,493
49+610,000	96,075	97,496
49+620,000	96,241	97,499
49+630,000	96,305	97,501
49+640,000	96,333	97,503
49+650,000	96,339	97,506
49+660,000	96,375	97,508
49+670,000	96,345	97,511
49+680,000	96,370	97,513
49+690,000	96,368	97,516
49+700,000	96,376	97,518
49+710,000	96,378	97,520
49+720,000	96,424	97,523
49+730,000	96,431	97,525
49+740,000	96,484	97,528
49+750,000	96,457	97,530
49+760,000	96,525	97,533
49+770,000	96,457	97,535
49+780,000	96,407	97,538
49+790,000	96,380	97,540
49+800,000	96,385	97,543
49+810,000	96,294	97,545
49+820,000	96,345	97,547
49+830,000	96,323	97,550
49+840,000	96,334	97,552
49+850,000	96,231	97,555
49+860,000	96,330	97,557
49+870,000	96,445	97,560
49+880,000	96,258	97,562
49+890,000	96,401	97,564
49+900,000	96,450	97,567
49+910,000	96,485	97,569
49+920,000	96,457	97,572
49+930,000	96,544	97,574
49+940,000	96,421	97,576
49+950,000	96,515	97,579
49+960,000	96,544	97,581
49+970,000	96,488	97,584
49+980,000	96,588	97,586
49+990,000	96,507	97,589
50+000,000	96,513	97,592
50+010,000	96,536	97,594
50+020,000	96,537	97,597
50+030,000	96,523	97,599
50+040,000	96,543	97,602
50+050,000	96,520	97,604
50+060,000	96,566	97,607
50+070,000	96,654	97,609
50+080,000	96,612	97,612
50+090,000	96,591	97,614
50+100,000	96,544	97,617
50+110,000	96,622	97,619
50+120,000	96,702	97,622
50+130,000	96,615	97,624
50+140,000	96,561	97,627
50+150,000	96,614	97,629
50+160,000	96,705	97,632
50+170,000	96,738	97,634
50+180,000	96,739	97,637
50+190,000	96,748	97,639
50+200,000	96,672	97,642
50+210,000	96,673	97,644
50+220,000	96,654	97,647
50+230,000	96,631	97,649
50+240,000	96,632	97,652
50+250,000	96,660	97,654
50+260,000	96,639	97,657
50+270,000	96,611	97,659
50+280,000	96,667	97,662
50+290,000	96,667	97,664
50+300,000	96,667	97,667
50+310,000	96,667	97,669
50+320,000	96,667	97,672
50+330,000	96,667	97,674
50+340,000	96,667	97,677
50+350,000	96,667	97,679
50+360,000	96,667	97,682
50+370,000	96,667	97,684
50+380,000	96,667	97,687
50+390,000	96,667	97,689
50+400,000	96,667	97,692
50+410,000	96,667	97,694
50+420,000	96,667	97,697
50+430,000	96,667	97,699
50+440,000	96,667	97,702
50+450,000	96,667	97,704
50+460,000	96,667	97,707
50+470,000	96,667	97,709
50+480,000	96,667	97,712
50+490,000	96,667	97,714
50+500,000	96,667	97,717
50+510,000	96,667	97,719
50+520,000	96,667	97,722
50+530,000	96,667	97,724
50+540,000	96,667	97,727
50+550,000	96,667	97,729
50+560,000	96,667	97,732
50+570,000	96,667	97,734
50+580,000	96,667	97,737
50+590,000	96,667	97,739
50+600,000	96,667	97,742
50+610,000	96,667	97,744
50+620,000	96,667	97,747
50+630,000	96,667	97,749
50+640,000	96,667	97,752
50+650,000	96,667	97,754
50+660,000	96,667	97,757
50+670,000	96,667	97,759
50+680,000	96,667	97,762
50+690,000	96,667	97,764
50+700,000	96,667	97,767
50+710,000	96,667	97,769
50+720,000	96,667	97,772
50+730,000	96,667	97,774
50+740,000	96,667	97,777
50+750,000	96,667	97,779
50+760,000	96,667	97,782
50+770,000	96,667	97,784
50+780,000	96,667	97,787
50+790,000	96,667	97,789
50+800,000	96,667	97,792
50+810,000	96,667	97,794
50+820,000	96,667	97,797
50+830,000	96,667	97,799
50+840,000	96,667	97,802
50+850,000	96,667	97,804
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50+890,000	96,667	97,814
50+900,000	96,667	97,817
50+910,000	96,667	97,819
50+920,000	96,667	97,822
50+930,000	96,667	97,824
50+940,000	96,667	97,827
50+950,000	96,667	97,829
50+960,000	96,667	97,832
50+970,000	96,667	97,834
50+980,000	96,667	97,837
50+990,000	96,667	97,839
51+000,000	96,667	97,842

Elementos Horizontales: TANGENTE

Elementos Verticales: 0.01% en 1723.00

Progresiva	Cota Roja
49+500,000	1,363
49+510,000	1,367
49+540,000	1,367
49+550,000	1,366
49+560,000	1,365
49+570,000	1,364
49+580,000	1,363
49+590,000	1,362
49+600,000	1,361
49+610,000	1,360
49+620,000	1,359
49+630,000	1,358
49+640,000	1,357
49+650,000	1,356
49+660,000	1,355
49+670,000	1,354
49+680,000	1,353
49+690,000	1,352
49+700,000	1,351
49+710,000	1,350
49+720,000	1,349
49+730,000	1,348
49+740,000	1,347
49+750,000	1,346
49+760,000	1,345
49+770,000	1,344
49+780,000	1,343
49+790,000	1,342
49+800,000	1,341
49+810,000	1,340
49+820,000	1,339
49+830,000	1,338
49+840,000	1,337
49+850,000	1,336
49+860,000	1,335
49+870,000	1,334
49+880,000	1,333
49+890,000	1,332
49+900,000	1,331
49+910,000	1,330
49+920,000	1,329
49+930,000	1,328
49+940,000	1,327
49+950,000	1,326
49+960,000	1,325
49+970,000	1,324
49+980,000	1,323
49+990,000	1,322
50+000,000	1,321
50+010,000	1,320
50+020,000	1,319
50+030,000	1,318
50+040,000	1,317
50+050,000	1,316
50+060,000	1,315
50+070,000	1,314
50+080,000	1,313
50+090,000	1,312
50+100,000	1,311
50+110,000	1,310
50+120,000	1,309
50+130,000	1,308
50+140,000	1,307
50+150,000	1,306
50+160,000	1,305
50+170,000	1,304
50+180,000	1,303
50+190,000	1,302
50+200,000	1,301
50+210,000	1,300
50+220,000	1,299
50+230,000	1,298
50+240,000	1,297
50+250,000	1,296
50+260,000	1,295
50+270,000	1,294
50+280,000	1,293
50+290,000	1,292
50+300,000	1,291
50+310,000	1,290
50+320,000	1,289
50+330,000	1,288
50+340,000	1,287
50+350,000	1,286
50+360,000	1,285
50+370,000	1,284
50+380,000	1,283
50+390,000	1,282
50+400,000	1,281
50+410,000	1,280
50+420,000	1,279
50+430,000	1,278
50+440,000	1,277
50+450,000	1,276
50+460,000	1,275
50+470,000	1,274
50+480,000	1,273
50+490,000	1,272
50+500,000	1,271
50+510,000	1,270
50+520,000	1,269
50+530,000	1,268
50+540,000	1,267
50+550,000	1,266
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50+580,000	1,263
50+590,000	1,262
50+600,000	1,261
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50+630,000	1,258
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50+670,000	1,254
50+680,000	1,253
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50+700,000	1,251
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50+730,000	1,248
50+740,000	1,247
50+750,000	1,246
50+760,000	1,245
50+770,000	1,244
50+780,000	1,243
50+790,000	1,242
50+800,000	1,241
50+810,000	1,240
50+820,000	1,239
50+830,000	1,238
50+840,000	1,237
50+850,000	1,236
50+860,000	1,235
50+870,000	1,234
50+880,000	1,233
50+890,000	1,232
50+900,000	1,231
50+910,000	1,230
50+920,000	1,229
50+930,000	1,228
50+940,000	1,227
50+950,000	1,226
50+960,000	1,225
50+970,000	1,224
50+980,000	1,223
50+990,000	1,222
51+000,000	1,221

NOTAS :

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CONSORCIO GUARANI - GEOCON

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REPUBLICA DEL PARAGUAY
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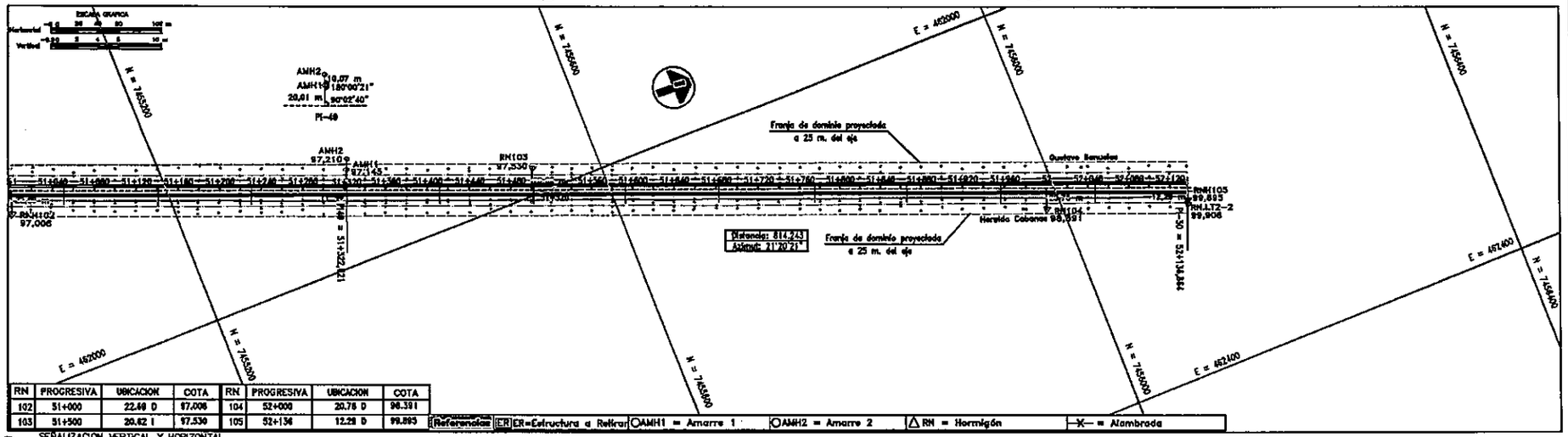
REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

PLANI/ALTIMETRIA
Prg. 49+500 - 51+000

ESCALAS:
H: 1/4.000
V: 1/400

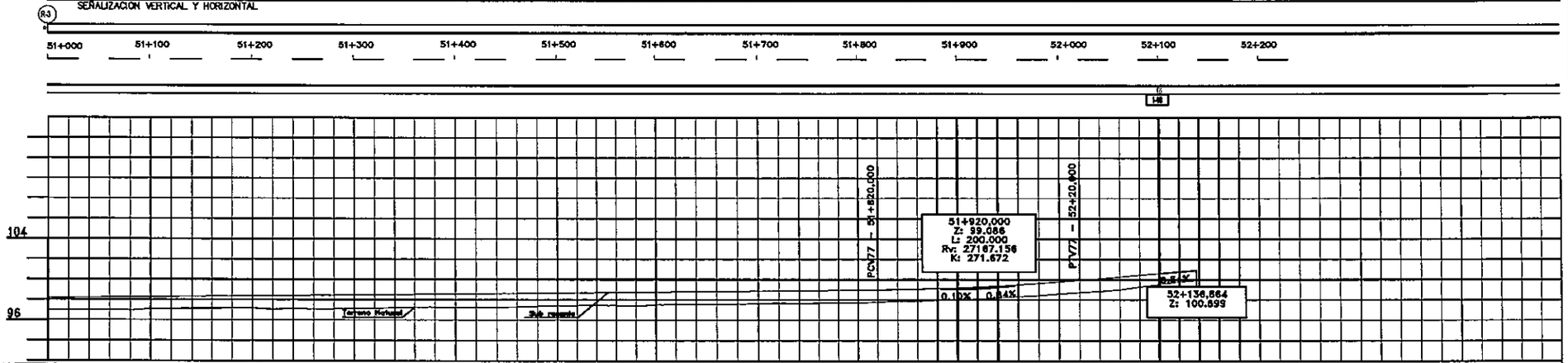
LAMINA:
GM 4.2-33/34

MOPC
AREA DEL PROYECTO



RN	PROGRESIVA	UBICACION	COTA	RN	PROGRESIVA	UBICACION	COTA
102	51+000	22.40 D	97.006	104	52+000	20.76 D	98.391
103	51+500	20.82 I	97.530	105	52+136	12.29 D	99.805

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	51	51+20,000	51+40,000	51+60,000	51+80,000	51+100,000	51+120,000	51+140,000	51+160,000	51+180,000	51+200,000	51+220,000	51+240,000	51+260,000	51+280,000	51+300,000	51+320,000	51+340,000	51+360,000	51+380,000	51+400,000	51+420,000	51+440,000	51+460,000	51+480,000	51+500,000	51+520,000	51+540,000	51+560,000	51+580,000	51+600,000	51+620,000	51+640,000	51+660,000	51+680,000	51+700,000	51+720,000	51+740,000	51+760,000	51+780,000	51+800,000	51+820,000	51+840,000	51+860,000	51+880,000	51+900,000	51+920,000	51+940,000	51+960,000	52	52+20,000	52+40,000	52+60,000	52+80,000	52+100,000	52+120,000	52+136,864
Cotas del Terreno	96,967	97,006	96,983	97,020	96,981	97,077	97,127	97,140	97,144	97,198	97,192	97,070	97,159	97,097	97,118	97,173	97,148	97,155	97,220	97,264	97,258	97,242	97,260	97,270	97,315	97,379	97,412	97,436	97,470	97,458	97,398	97,319	97,356	97,540	97,558	97,603	97,614	97,690	97,640	97,698	97,682	97,707	97,779	97,845	97,861	97,868	98,006	98,092	98,209	98,372	98,435	98,595	98,718	98,855	99,017	99,282	99,514	99,772	99,900
Sub rasante Proyectada	96,196	96,228	96,244	96,266	96,299	96,320	96,334	96,348	96,366	96,386	96,408	96,428	96,448	96,468	96,488	96,508	96,528	96,548	96,568	96,588	96,608	96,628	96,648	96,668	96,688	96,708	96,728	96,748	96,768	96,788	96,808	96,828	96,848	96,868	96,884	96,904	96,924	96,944	96,964	96,984	99,013	99,055	99,112	99,184	99,270	99,371	99,457	99,517	99,582	99,595	99,722	100,060	100,257	100,424	100,563	100,738	100,889
Elementos Horizontales	TANGENTE																																																											
Elementos Verticales	0.10% en 1400.00																																																											
Cota Roja	1,199	1,222	1,261	1,255	1,198	1,150	1,186	1,192	1,158	1,174	1,318	1,281	1,339	1,326	1,313	1,346	1,334	1,334	1,362	1,388	1,334	1,339	1,311	1,307	1,354	1,350	1,334	1,358	1,346	1,347	1,330	1,327	1,298	1,343	1,321	1,314	1,366	1,338	1,364	1,308	1,198	1,185	1,145	1,175	1,172	1,186	1,158	1,192	1,187	1,308	1,335	1,240	1,154	1,077	0,986	0,989

PCV77 = 51+820,000 / 3,180,000
CCV = 200,000
PTV77 = 52+20,000 / 3,020,000
0.84% en 116.86

NOTAS :
1-
2-
3-

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS
Y COMUNICACIONES
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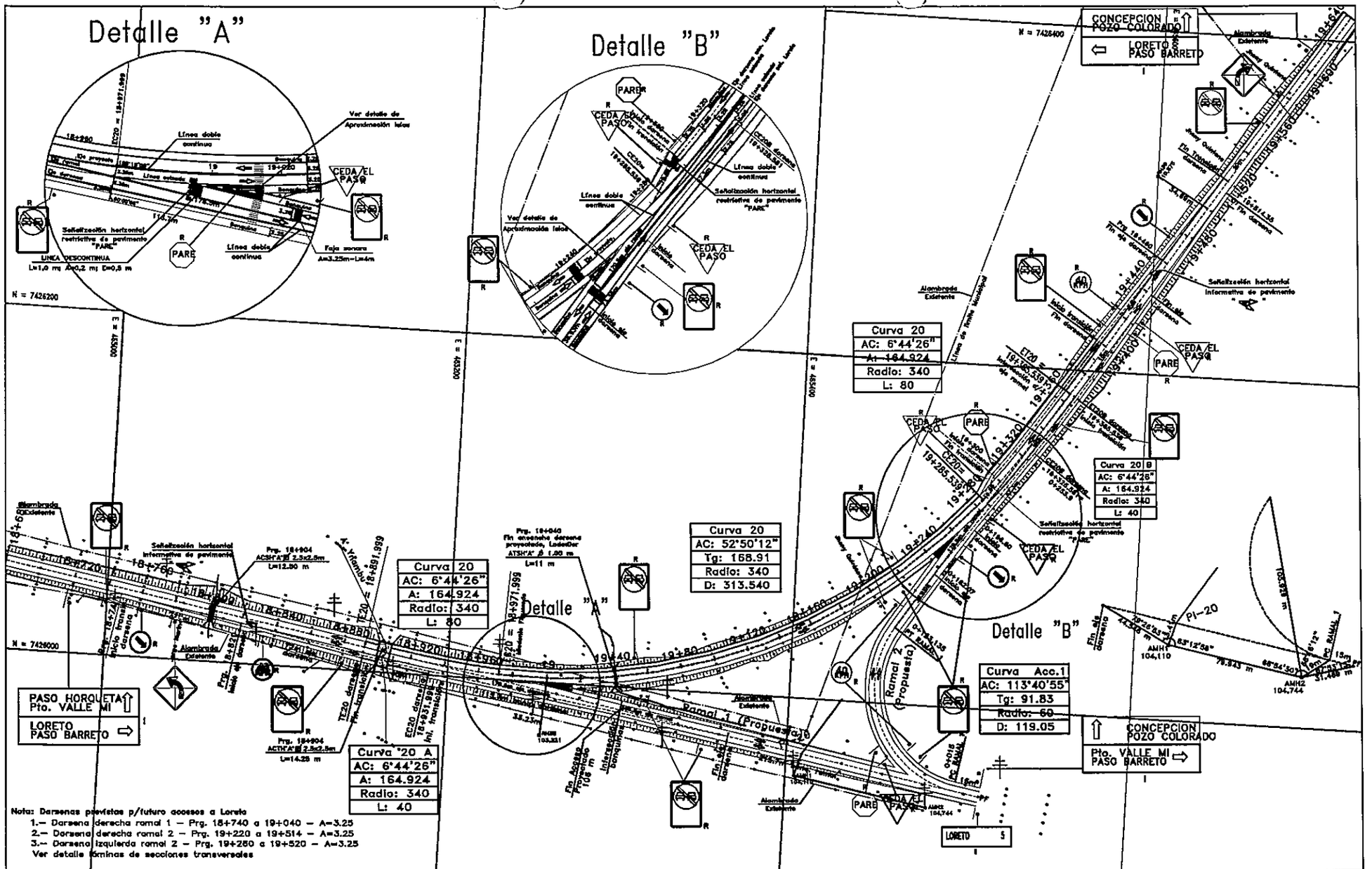
DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 82

PLANALTIMETRIA
Prg. 51+000 - 52+136.864

ESCALAS:
H: 1/4.000
V: 1/400

LAMINA:
GM 4.2-34/34

MOPC



NOTAS:

1- Las dimensiones son en "m" excepto donde se indiquen

2-

3-

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Email: geccon@telesoftnet.py

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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - [illegible]

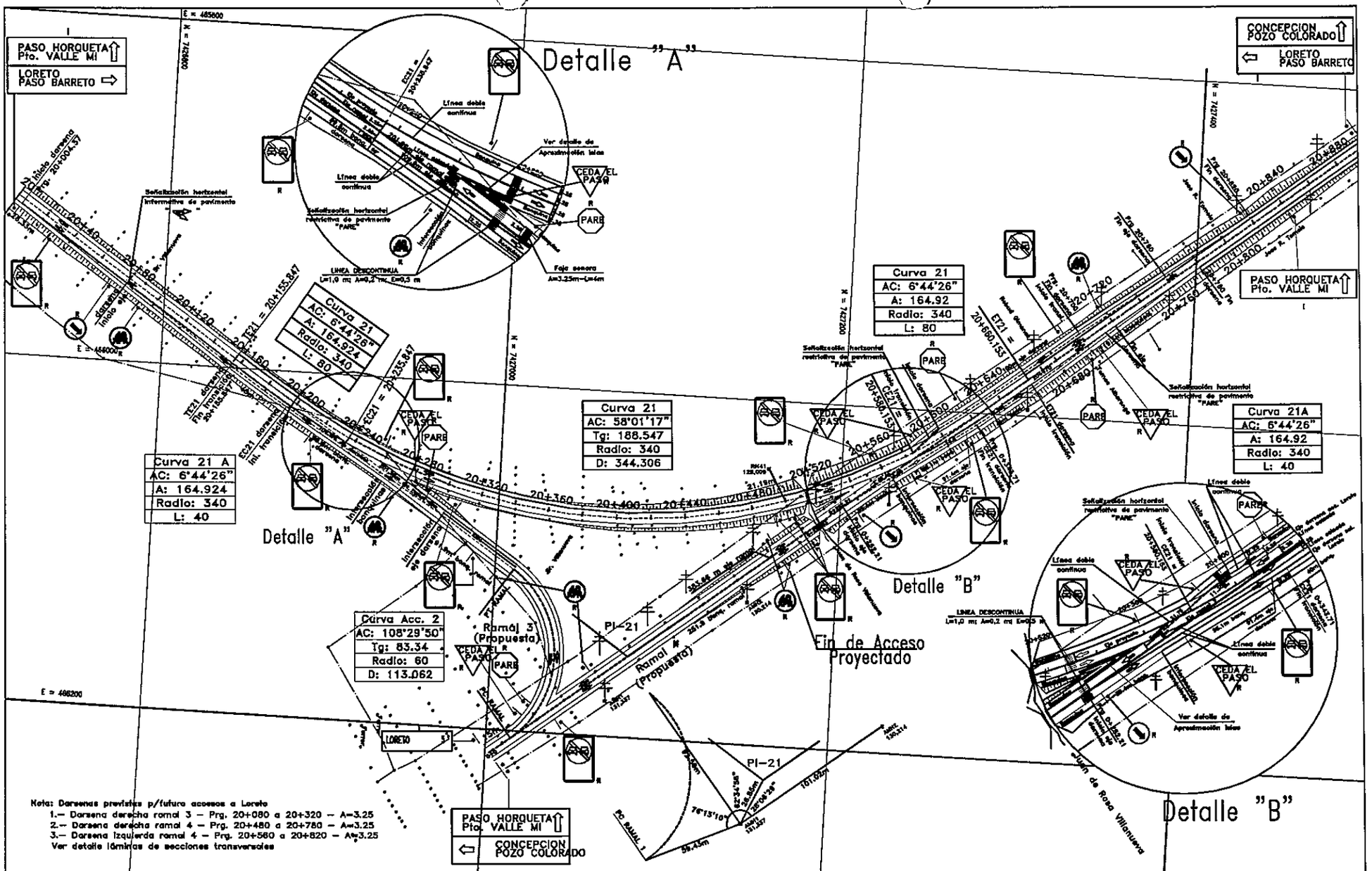
INGENIECON

ACCESO 1 - LORETO

HOJA

LÁMINA: IN 6.3-1/2

MOPC



NOTAS:

1- Las dimensiones son en "m" excepto donde se indiquen

2-

3-

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

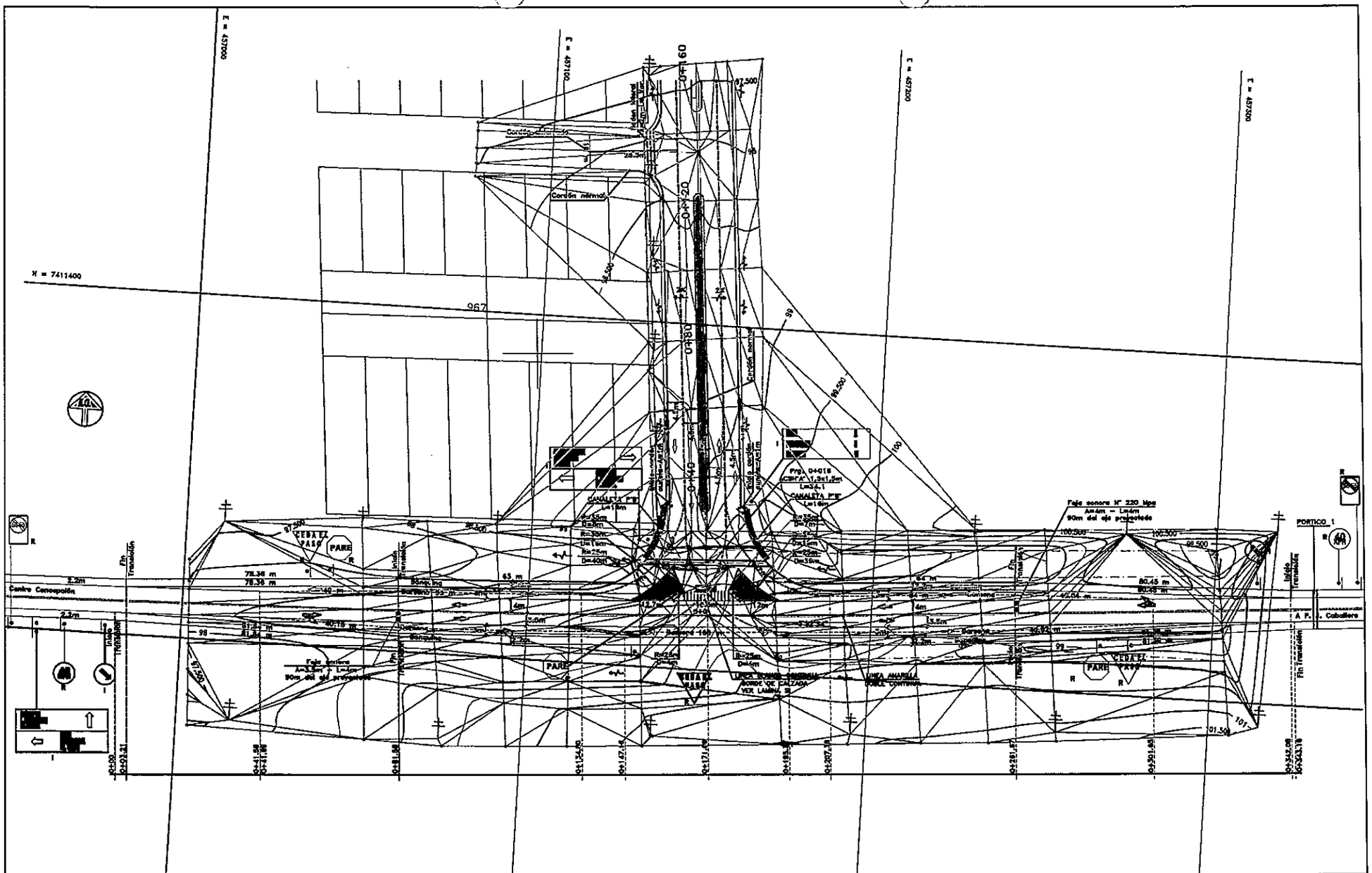
TRAMO 1: CONCEPCION - MM 12

INTERSECCION
ACCESO 2 - LORETO

ESCALA

LAMINA:
IN 0.3-3.12

MOPC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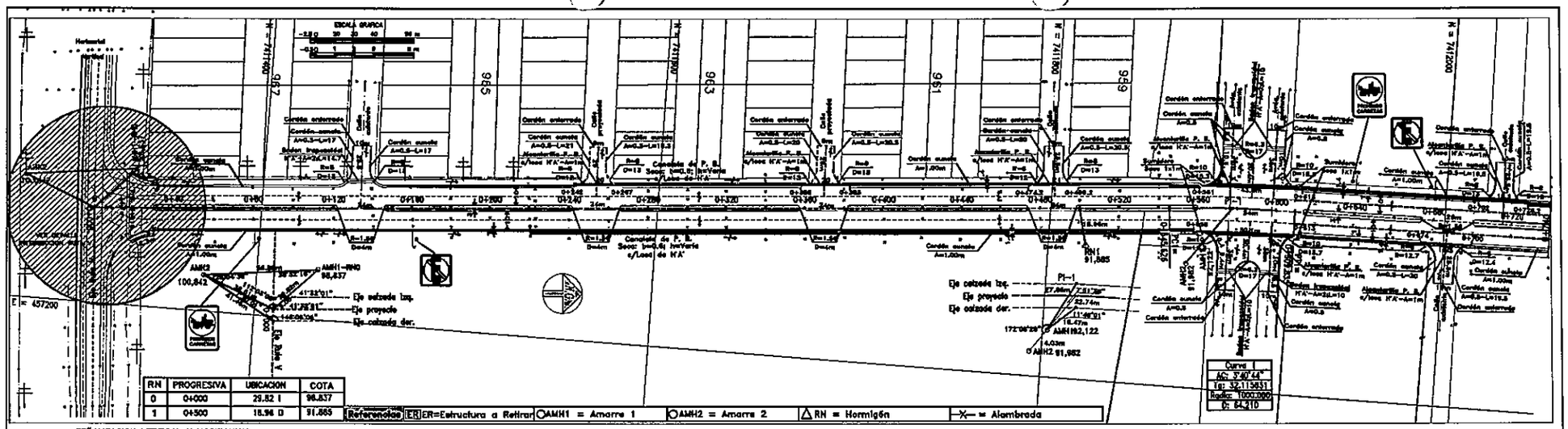
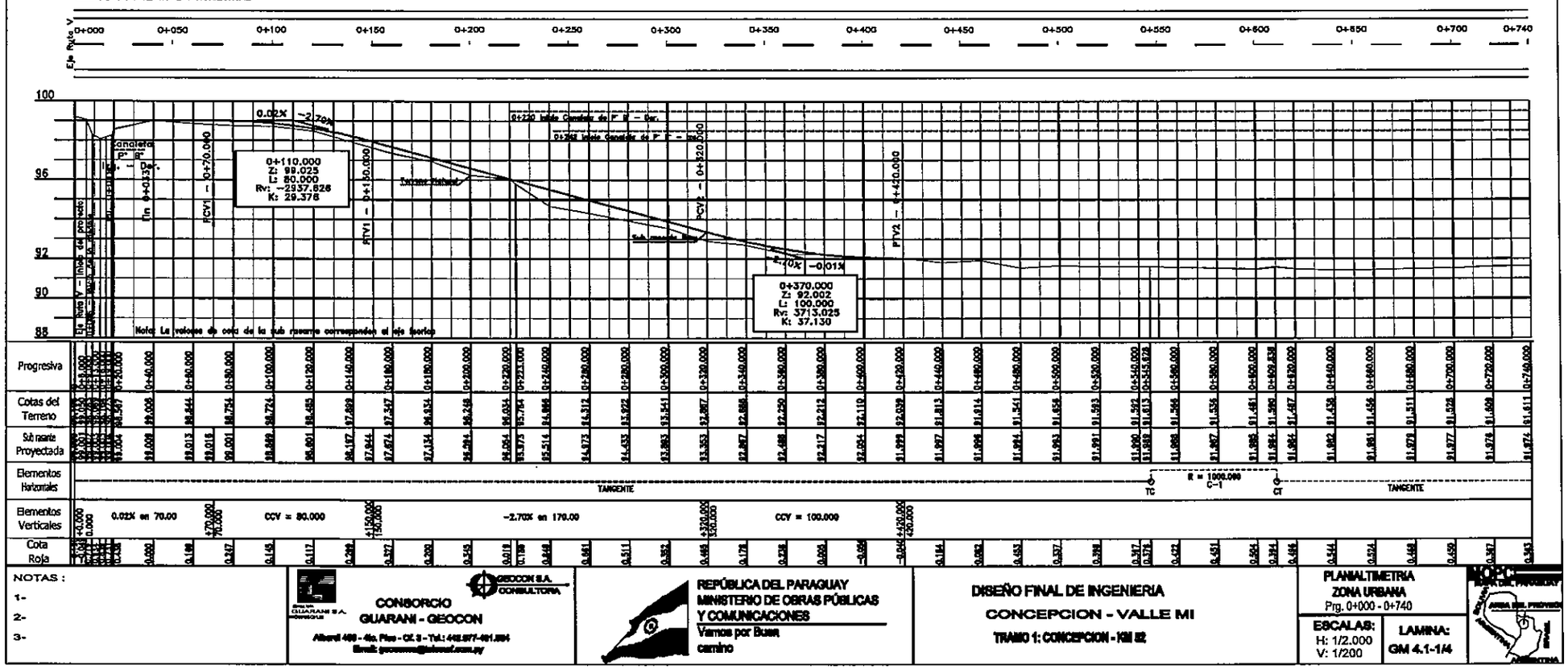
E = 457000
E = 457100
E = 457200
E = 457300
967
Cerrión normal
Cerrión normal
Cerrión normal



RN	PROGRESIVA	UBICACION	COTA
0	0+000	29.82 I	96.837
1	0+500	18.96 D	91.865

Referencias: ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL



Progresiva	Cotas del Terreno	Sub rasante Proyectada	Elementos Horizontales	Elementos Verticales	Cota Roja
0+000.000	96.837	96.837	TANGENTE	0.02X en 70.00	0.000
0+010.000	96.838	96.837			0.000
0+020.000	96.547	96.837			0.290
0+030.000	96.008	96.837			0.829
0+040.000	96.844	96.837			0.007
0+050.000	96.754	96.837			0.083
0+060.000	96.724	96.837			0.113
0+070.000	96.685	96.837			0.152
0+080.000	97.899	96.837			1.062
0+090.000	97.547	96.837			0.710
0+100.000	96.934	96.837			0.097
0+110.000	96.748	96.837			−0.089
0+120.000	96.054	96.837			−0.783
0+130.000	95.764	96.837			−1.073
0+140.000	95.866	96.837			−0.971
0+150.000	95.922	96.837			−0.915
0+160.000	95.541	96.837			−1.296
0+170.000	95.867	96.837		CCV = 80.000	−0.970
0+180.000	95.886	96.837			−0.951
0+190.000	95.250	96.837			−1.587
0+200.000	95.110	96.837			−1.727
0+210.000	95.039	96.837			−1.798
0+220.000	94.593	96.837			−2.244
0+230.000	94.658	96.837			−2.179
0+240.000	94.541	96.837			−2.296
0+250.000	94.481	96.837			−2.356
0+260.000	94.456	96.837			−2.381
0+270.000	94.511	96.837			−2.326
0+280.000	94.538	96.837			−2.299
0+290.000	94.509	96.837			−2.328
0+300.000	94.511	96.837			−2.326
0+310.000	94.538	96.837			−2.299
0+320.000	94.487	96.837			−2.350
0+330.000	94.458	96.837			−2.379
0+340.000	94.456	96.837			−2.381
0+350.000	94.511	96.837			−2.326
0+360.000	94.511	96.837			−2.326
0+370.000	94.538	96.837			−2.299
0+380.000	94.509	96.837			−2.328
0+390.000	94.487	96.837			−2.350
0+400.000	94.458	96.837			−2.379
0+410.000	94.456	96.837			−2.381
0+420.000	94.511	96.837			−2.326
0+430.000	94.511	96.837			−2.326
0+440.000	94.538	96.837			−2.299
0+450.000	94.509	96.837			−2.328
0+460.000	94.487	96.837			−2.350
0+470.000	94.458	96.837			−2.379
0+480.000	94.456	96.837			−2.381
0+490.000	94.511	96.837			−2.326
0+500.000	94.511	96.837			−2.326
0+510.000	94.538	96.837			−2.299
0+520.000	94.509	96.837			−2.328
0+530.000	94.487	96.837			−2.350
0+540.000	94.458	96.837			−2.379
0+550.000	94.456	96.837			−2.381
0+560.000	94.511	96.837			−2.326
0+570.000	94.511	96.837			−2.326
0+580.000	94.538	96.837			−2.299
0+590.000	94.509	96.837			−2.328
0+600.000	94.487	96.837			−2.350
0+610.000	94.458	96.837			−2.379
0+620.000	94.456	96.837			−2.381
0+630.000	94.511	96.837			−2.326
0+640.000	94.511	96.837			−2.326
0+650.000	94.538	96.837			−2.299
0+660.000	94.509	96.837			−2.328
0+670.000	94.487	96.837			−2.350
0+680.000	94.458	96.837			−2.379
0+690.000	94.456	96.837			−2.381
0+700.000	94.511	96.837			−2.326
0+710.000	94.538	96.837			−2.299
0+720.000	94.509	96.837			−2.328
0+730.000	94.487	96.837			−2.350
0+740.000	94.511	96.837			−2.326

NOTAS :
1-
2-
3-

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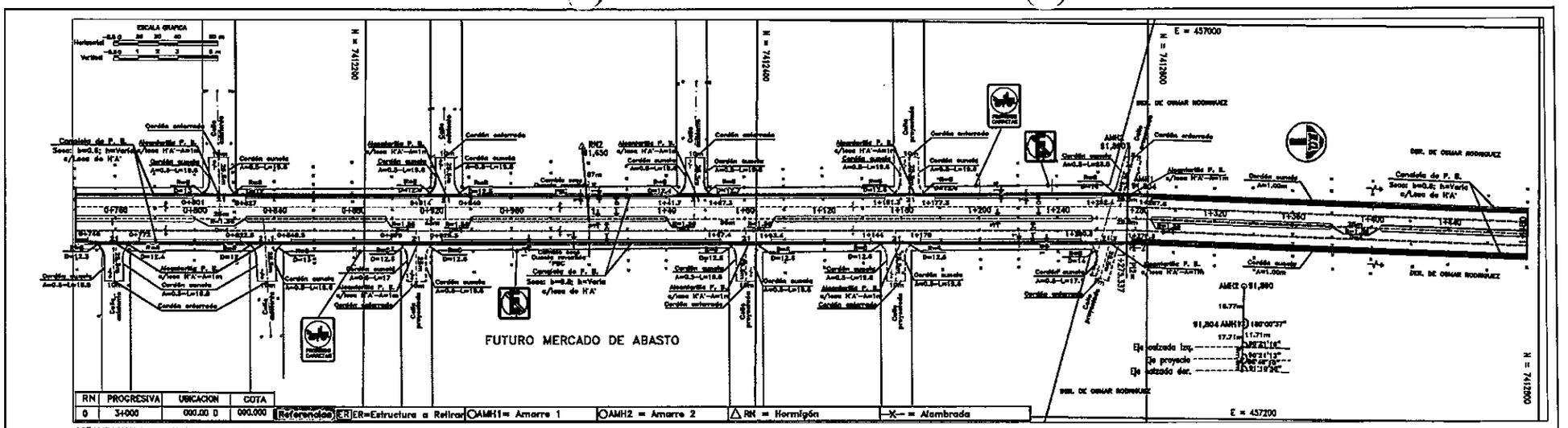
DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 82

PLANALTIMETRIA
ZONA URBANA
Prg. 0+000 - 0+740

ESCALAS: H: 1/2.000 V: 1/200

LAMINA: GM 4.1-1/4

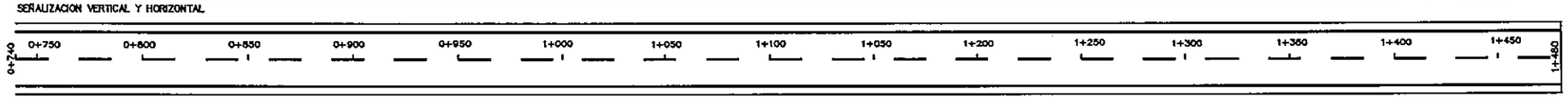
MOPC

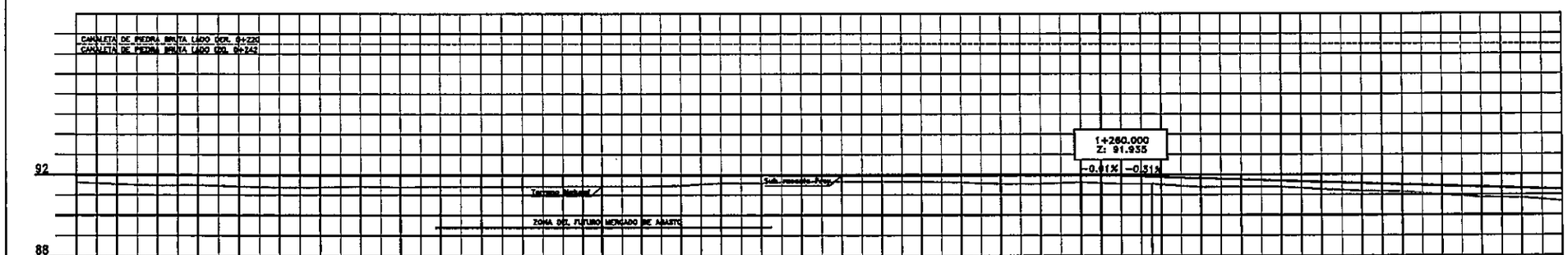


RN	PROGRESIVA	UBICACION	COTA
0	3+000	000.00 D	000.000

Referencias: ER=Estructura a Retirar; AMH1= Amarre 1; AMH2 = Amarre 2; RN = Hormigón; Alambrado

SEÑALIZACION VERTICAL Y HORIZONTAL





Progresiva	0+740.000	0+760.000	0+780.000	0+800.000	0+820.000	0+840.000	0+860.000	0+880.000	0+900.000	0+920.000	0+940.000	0+960.000	0+980.000	1+000.000	1+020.000	1+040.000	1+060.000	1+080.000	1+100.000	1+120.000	1+140.000	1+160.000	1+180.000	1+200.000	1+220.000	1+240.000	1+260.000	1+280.000	1+300.000	1+320.000	1+340.000	1+360.000	1+380.000	1+400.000	1+420.000	1+440.000	1+460.000
Cotas del Terreno	91.611	91.628	91.472	91.487	91.419	91.360	91.385	91.424	91.507	91.421	91.384	91.394	91.411	91.432	91.422	91.482	91.561	91.560	91.648	91.647	91.650	91.648	91.588	91.534	91.547	91.611	91.623	91.546	91.371	91.404	91.385	91.285	91.104	91.144	90.981	90.872	90.830	90.677
Sub rasante Proyectada	91.974	91.973	91.971	91.970	91.968	91.967	91.965	91.964	91.962	91.961	91.958	91.956	91.956	91.955	91.953	91.952	91.950	91.948	91.947	91.946	91.944	91.943	91.941	91.940	91.938	91.937	91.936	91.887	91.810	91.727	91.684	91.622	91.559	91.495	91.434	91.371	91.308	91.246

Elementos Horizontales: TANGENTE — TANGENTE

Elementos Verticales: -0.01% en 540.00

Cota Roja: 0.363, 0.444, 0.488, 0.483, 0.460, 0.407, 0.361, 0.336, 0.275, 0.336, 0.365, 0.343, 0.346, 0.322, 0.331, 0.400, 0.372, 0.308, 0.268, 0.299, 0.293, 0.254, 0.343, 0.405, 0.361, 0.308, 0.417, 0.341, 0.336, 0.436, 0.353, 0.299, 0.387, 0.472, 0.383, 0.451, 0.488, 0.476, 0.568

NOTAS :
1-
2-
3-

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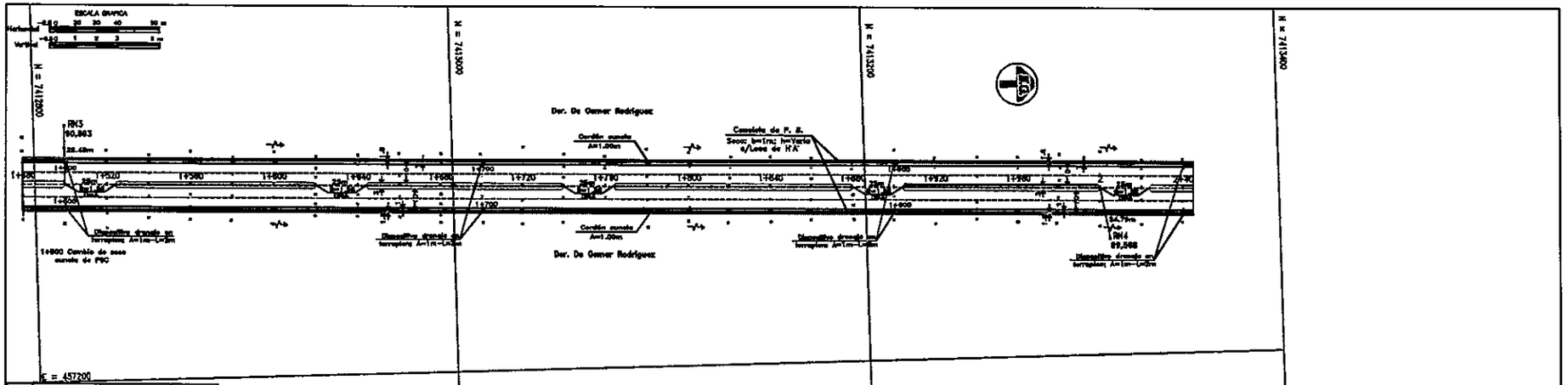
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
ZONA URBANA
Prg. 0+740 - 1+480

ESCALAS: H: 1/2.000 V: 1/200

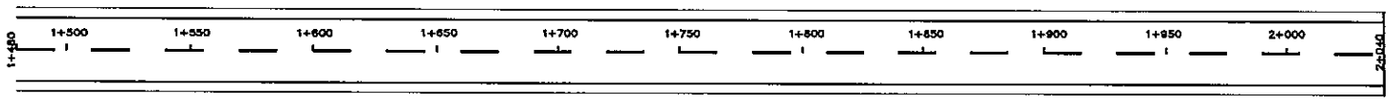
LAMINA: GM 4.1-2/4

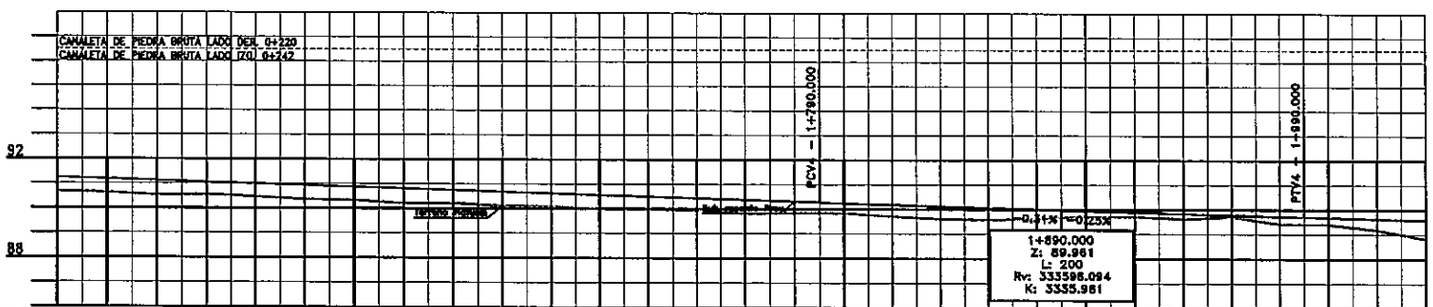


RN	PROGRESIVA	UBICACION	COTA
3	1+500	28.48 I	90.893
4	2+000	24.79 D	89.568

Referencias: ER ER=Estructura a Retirar; AMH1 = Amarre 1; AMH2 = Amarre 2; RN = Hormigón; —X— = Alambrada

SEÑALIZACION VERTICAL Y HORIZONTAL





Progresiva	1+480.000	1+500.000	1+520.000	1+540.000	1+560.000	1+580.000	1+600.000	1+620.000	1+640.000	1+660.000	1+680.000	1+700.000	1+720.000	1+740.000	1+760.000	1+780.000	1+800.000	1+820.000	1+840.000	1+860.000	1+880.000	1+900.000	1+920.000	1+940.000	1+960.000	1+980.000	2+000.000	2+020.000	2+040.000
Cotas del Terreno	90.677	90.625	90.591	90.555	90.452	90.383	90.374	90.191	90.210	90.102	90.091	90.089	89.973	89.831	89.807	89.845	89.844	89.715	89.609	89.567	89.617	89.719	89.712	89.628	89.710	89.418	89.400	89.187	88.828
Sub rasante Proyectada	91.248	91.183	91.120	91.056	90.995	90.932	90.870	90.807	90.744	90.682	90.619	90.556	90.494	90.431	90.368	90.305	90.271	90.243	90.181	90.121	90.062	90.004	89.948	89.892	89.838	89.785	89.733	89.707	89.682	89.631	89.561
Elementos Horizontales	TANGENTE																												
Elementos Verticales	-0.31% en 530.00																+790.000 1790.000	CCV = 200.000									+990.000 1990.000		
Cota Roja	0.568	0.558	0.529	0.503	0.543	0.567	0.546	0.616	0.534	0.580	0.528	0.487	0.521	0.580	0.561	0.464	0.427	0.487	0.513	0.472	0.398	0.428	0.190	0.210	0.075	0.314	0.282	0.444	0.753

NOTAS :

1-

2-

3-

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CONCEPCION - VALLE MI

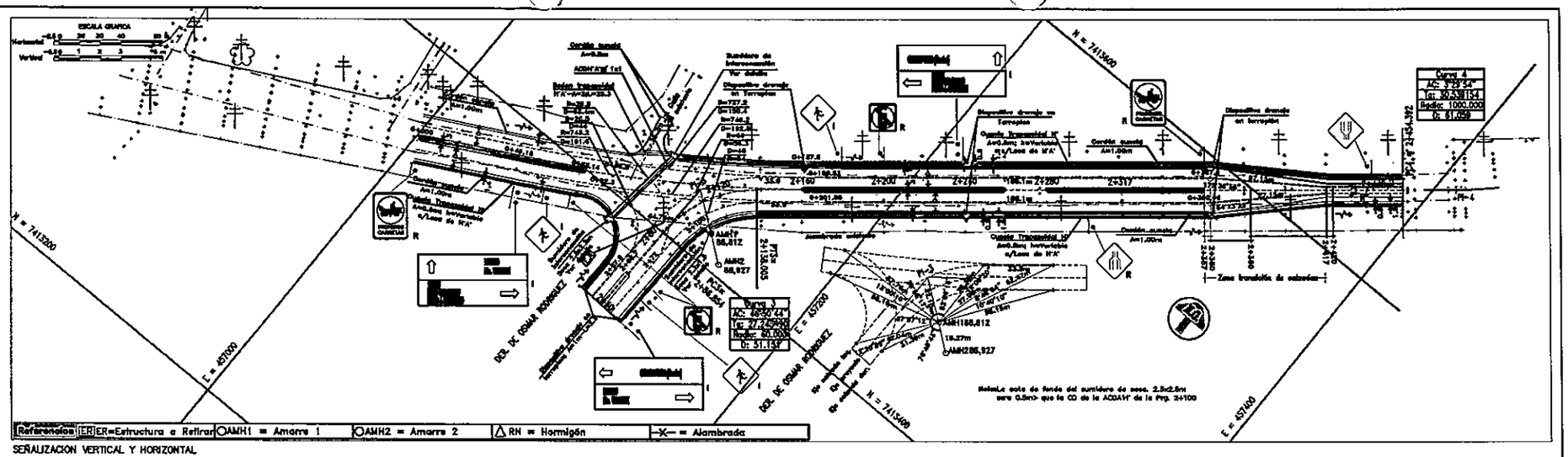
TRAMO 1: CONCEPCION - KM 52

PLANIALTIMETRIA
ZONA URBANA
Prg. 1+480 - 2+040

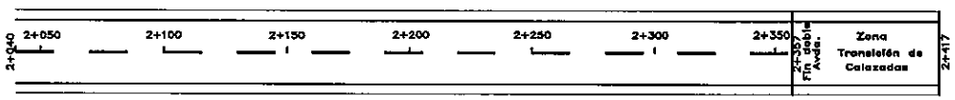
ESCALAS:
H: 1/2.000
V: 1/200

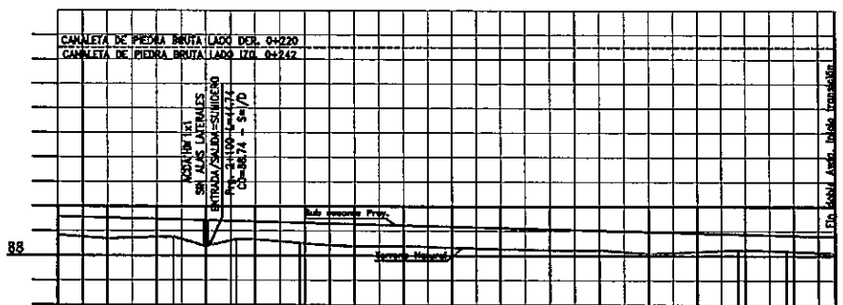
LAMINA:
GM 4.1-3/4

MOPC



SEÑALIZACION VERTICAL Y HORIZONTAL





Progresiva	2+040.000	2+050.000	2+080.000	2+090.000	2+096.851	2+100.000	2+112.264	2+120.000	2+138.006	2+140.000	2+160.000	2+180.000	2+200.000	2+220.000	2+240.000	2+260.000	2+280.000	2+300.000	2+317.000	2+337.000	2+357.000
Cotas del Terreno	88.828	88.691	88.752	88.752	88.774	88.668	88.650	88.315	88.490	88.368	88.390	88.265	88.239	88.228	88.092	88.181	88.245	88.159	88.097	88.097	88.097
Sub rasante Proyectada	89.541	89.530	89.479	89.462	89.429	89.397	89.378	89.332	89.327	89.278	89.226	89.175	89.124	89.073	89.023	88.972	88.922	88.873	88.825	88.777	88.727
Elementos Horizontales	TANGENTE		TC			R = 60 C-S			CT	TANGENTE											
Elementos Verticales	-0.25% en 530.00																				
Cota Roja	0.753	0.839	0.727	0.710	1.064	0.729	0.727	0.817	0.837	0.907	0.936	0.968	0.990	0.934	0.796	0.890	0.741	0.934	0.872	0.880	0.880

NOTAS :

1-

2-

3-

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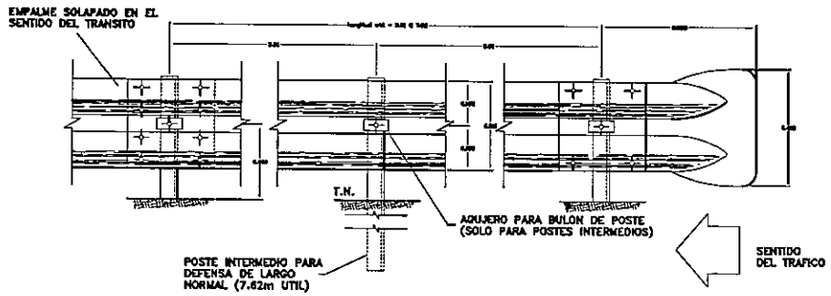
PLANIALTIMETRIA
ZONA URBANA
Prg. 2+040 - 2+357

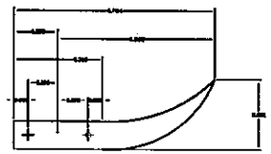
ESCALAS:
H: 1/2.000
V: 1/200

LAMINA:
GM 4.1-4/4

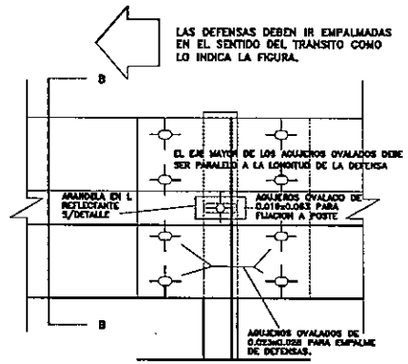


DETALLE ALA TERMINAL COMUN

EMPALME EN EL SENTIDO DEL TRANSITO

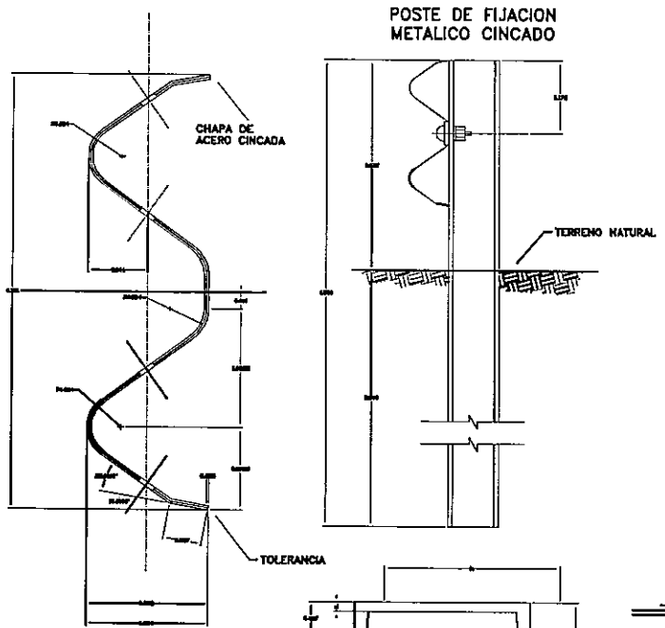


DETALLE EMPALME DE LAS DEFENSAS Y FIJACION A POSTE METALICO



ALZADO

POSTE DE FIJACION METALICO CINCADO

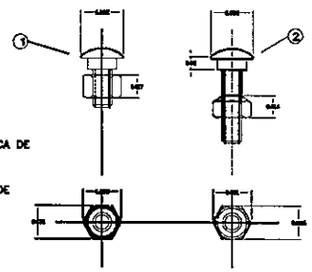


SECCION TRANSVERSAL

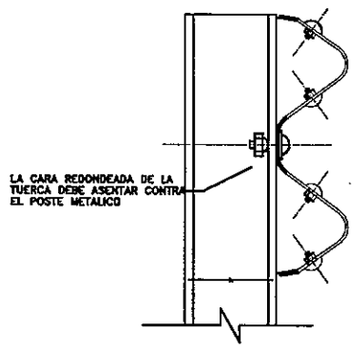
TIPO	DIMENSIONES				PESO
	h	b	d	t	Kg/m
LIVIANO	152.4	46.77	5.08	8.71	12.2
PESADO	177.8	53.08	6.33	8.33	14.6

① BULON DE 0.032mm DE LONG. CON TUERCA DE CARAS RECTAS CON DOBLE HENDIDURA PARA EMPALME DE LAS DEFENSAS.

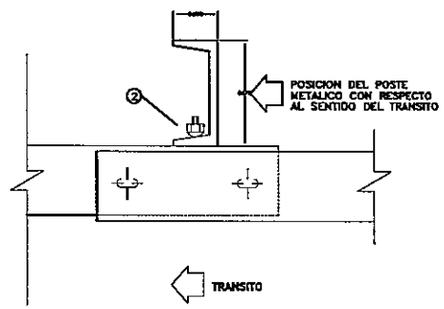
② BULON DE 0.045mm LONG. CON TUERCA DE UNA CARA REDONDEADA PARA FIJAR LAS DEFENSAS A LOS POSTES METALICOS.



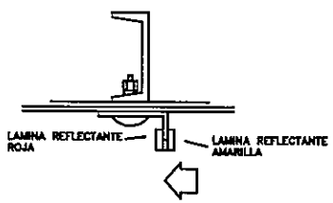
DETALLE TUERCA Y BULON



SECCION B–B



PLANTA



DETALLE DE ARANDELA REFLECTANTE

DIMENSIONES DE LAS DEFENSAS METALICAS				
CLASE	CALIBRE	AREA DE SECCION TRANSVERSAL	PESO DE LA DEFENSA DE	
	e		3.81m	7.62m
			Kg	Kg
A	12(2.3mm)	12.84	42.3	78.7
B	10(3.2mm)	16.98	49.7	96.6

NOTAS:

CUANDO NO SE INDIQUE LO CONTRARIO EN EL PROYECTO LOS POSTES DE FIJACION SERAN METALICOS CINCADOS.

LAS DEFENSAS EN CURVA, CUYO RADIO SEA MAYOR DE 46.00m PODRAN ADAPTARSE DIRECTAMENTE EN OBRA AL SER INSTALADAS.

LAS DE RADIO MENOR DEBEN SER PROVISTAS CURVADAS PREVIAMENTE.

NOTAS :

1-

2-

3-

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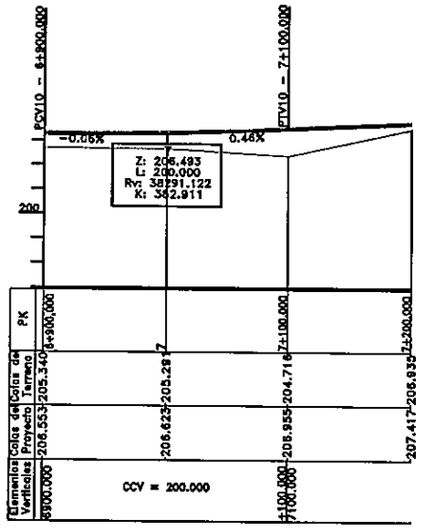
OBRAS COMPLEMENTARIAS
BARANDAS METALICAS

FUERA DE ESCALA

LAMINA: OC 8.3-1/2

MOPC

PERFIL DEL TERRENO Y RASANTE

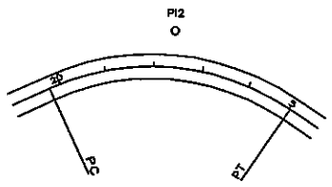


PROYECTO DE LA SUBRASANTE

TERRENO NATURAL

PCV – PUNTO DE LA CURVA VERTICAL
PTV – PUNTO DE LA TANGENCIA VERTICAL
PIV – PUNTO DE LA INTERSECCION VERTICAL
Z – COTA DEL PIV
L – LONGITUD DE LA PARABOLA
Rv – RADIO VERTICAL
K – CONSTANTE DE LA PARABOLA

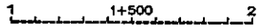
CURVA HORIZONTAL CIRCULAR



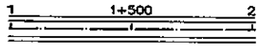
PC – PUNTO DE INICIO DE CURVA
PT – PUNTO DE TANGENTE
PI – PUNTO DE INTERSECCION DE LAS TANGENTES

NORTE

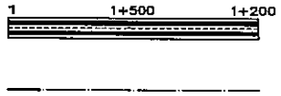
EJE DEL PROYECTO



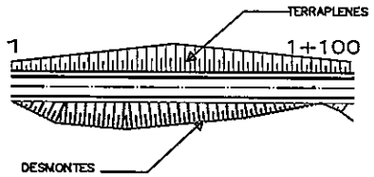
LIMITES DE LA PLATAFORMA



FRANJA DE DOMINIO



LIMITES DE LOS OFF-SETS



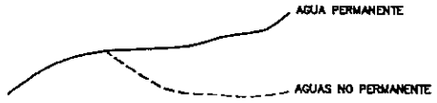
SONDEOS

SONDEO EN PLANTA

SONDEO EN PERFIL Y CLASIFICACION HRB

A-7-5

CURSOS DE AGUA



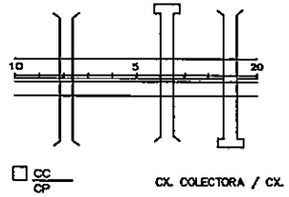
SEÑALIZACION VERTICAL

R-19 — SEÑALES RECLAMENTARIAS

P-5 — SEÑALES PREVENTIVAS

I-37 — SEÑALES INFORMATIVAS

ALCANTARILLAS PROYECTADAS EN PLANTA



CX. COLECTORA / CX. PASO

ALCANTARILLAS PROYECTADAS EN PERFIL

AT H° A° 1 Ø 0.80 L=17 m
ALCANTARILLA TUBULAR DE H° A°
UN Ø DE 0.80 Y LONGITUD=17m
I = 0.05 % – CO = 288.000 m
PENDIENTE TRANSVERSAL
COTA DE DESAGUE
Prg. 15+500
PROGRESIVA

AC H° A° 1 ☐ 2x2.00 L=17 m
ALCANTARILLA CELULAR DE H° A°
UN ☐ DE 2x2 Y LONGITUD=17m
I = 0.05 % – CO = 288.000 m
PENDIENTE TRANSVERSAL
COTA DE DESAGUE
Prg. 15+500
PROGRESIVA

AC H° A° 2 ☐ 2x2.00 L=17 m
ALCANTARILLA CELULAR DE H° A°
DOS ☐ DE 2x2 Y LONGITUD=17m
I = 0.05 % – CO = 288.000 m
PENDIENTE TRANSVERSAL
COTA DE DESAGUE
Prg. 15+500
PROGRESIVA

NOTAS :
1-
2-
3-

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CONVENCIONES
Y ABREVIATURAS

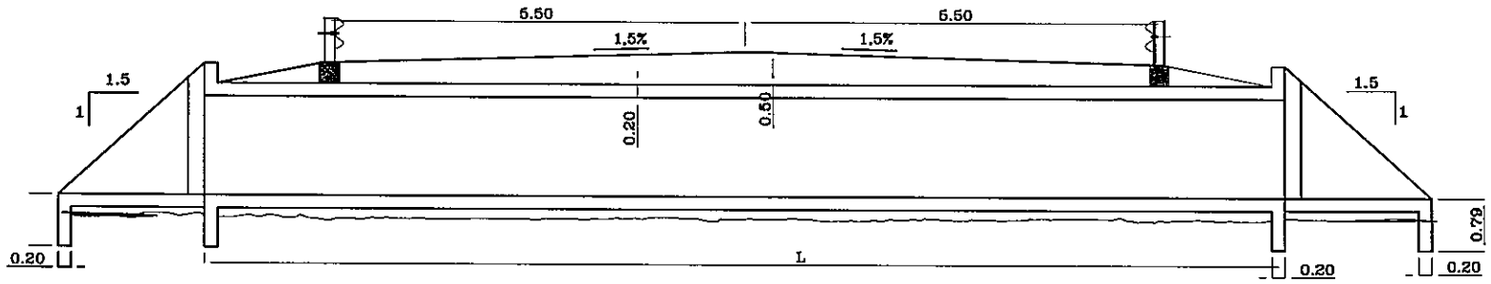
FUERA DE ESCALA

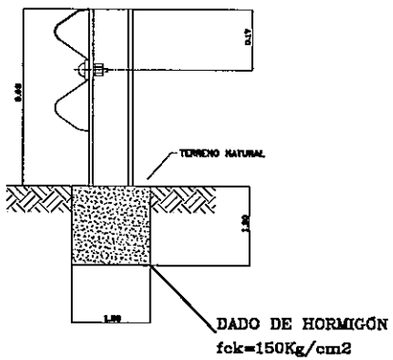
LAMINA: CA 1/1

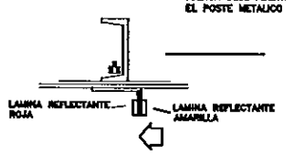
MOPC

DETALLES DE IMPLANTACION PARA BARANDA DE SEGURIDAD

FLEX BEAM EN ALCANTARILLAS

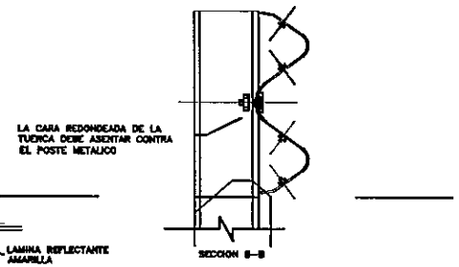






DETALLE DE ARANDELA REFLECTANTE

DETALLE TUERCA Y BULON



DIMENSIONES DE LAS DEFENSAS METALICAS				
CLASE	GALIBRE e	AREA DE SECCION TRANSVER. mm^2	PESO DE LA DEFENSA DE	
			3,5 m	7,5 m
			Kg	Kg
A	12(2,5mm)	12,84	42,3	76,7
B	10(3,2mm)	16,52	49,7	93,8

Nota:

1.- En los lugares con alcantarillas celulares en donde la tapada sea > a 1 m se colocara las barandas de seguridad

2.- Para la zona de puente se colocara las barandas de seguridad cuando el el talud del terraplen de acceso sea > a 1 m

NOTAS :

1-

2-

3-

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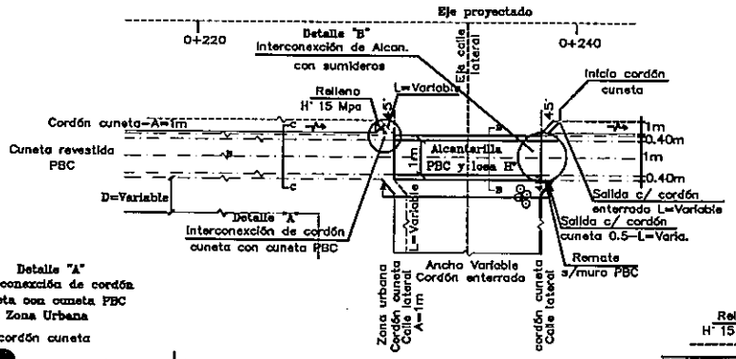
DETALLE DE IMPLANTACION BARANDAS FLEX BEAM

ESCALAS: VARIAS

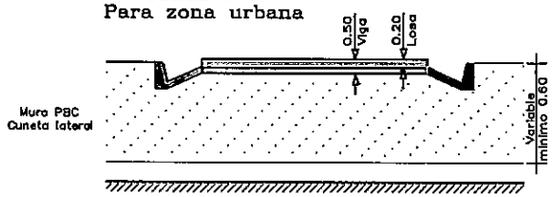
LAMINA: OC 8.3-2/2

MOPC — AREA DEL PROYECTO

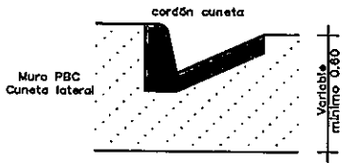
DETALLE DE IMPLANTACION CORDON CUNETA EN ALCANTARILLA LATERALES ACCESOS SECUNDARIOS



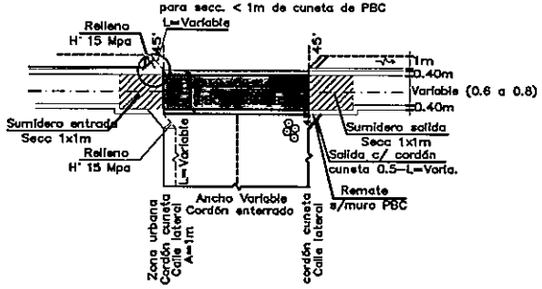
CORTE A-A
Para zona urbana



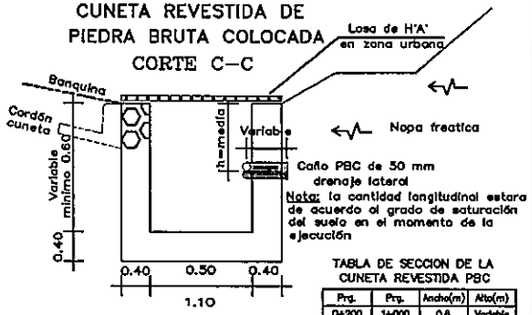
Detalle "A"
Interconexción de cordón cuneta con cuneta PBC en Zona Urbana



Detalle "B"
Interconexción de Alcantarillas con sumideros y cordón cunetas laterales para secc. < 1m de cuneta de PBC



CUNETA REVESTIDA DE PIEDRA BRUTA COLOCADA
CORTE C-C



Nota: la cantidad longitudinal estara de acuerdo al grado de saturación del suelo en el momento de la ejecución

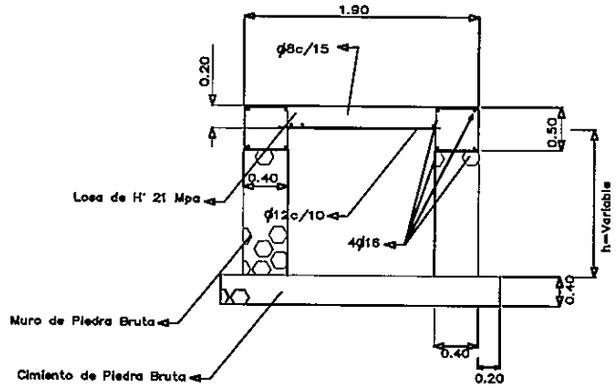
TABLA DE SECCION DE LA CUNETA REVESTIDA PBC

Prg.	Prg.	Ancho(m)	Alto(m)
0+200	1+000	0.6	Variable
1+000	1+500	0.8	Variable
1+500	2+000	1	Variable

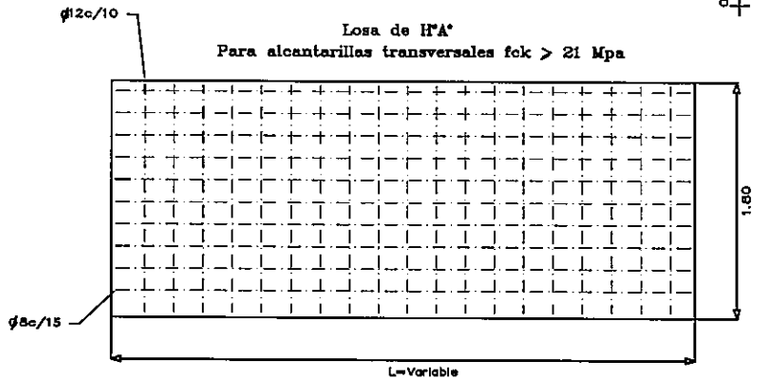
Nota: Las medidas Ancho son internas

DETALLE DE ALCANTARILLA TRANSVERSALES

CORTE B-B



Losa de H°A°
Para alcantarillas transversales fck > 21 Mpa



NOTAS :
1-
2-
3-

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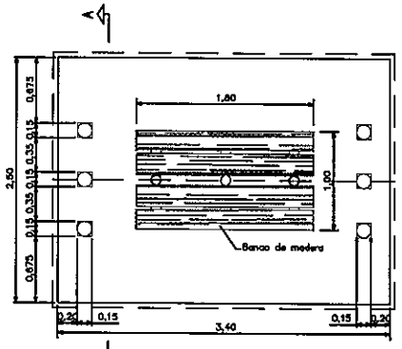
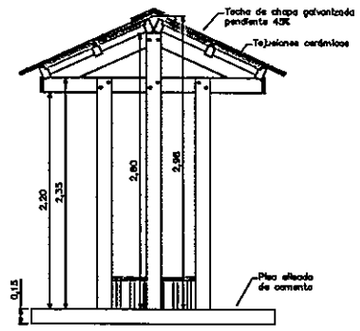
DETALLE DE OBRAS ALTERNATIVA ALCAN. TRANSVERSALES

ESCALA: 1/2.000

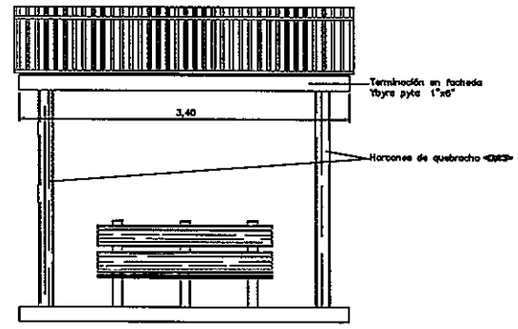
LAMINA: DR 6.3-3/3



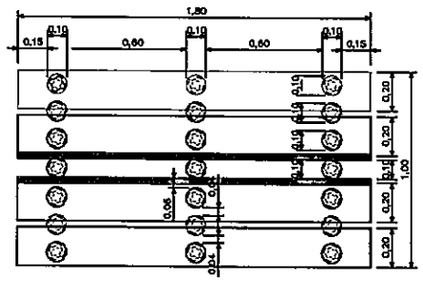
PLANTA ACOTADA
ESC.: 1:20

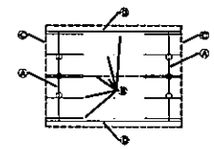


ALZADO LATERAL
ESC.: 1:20



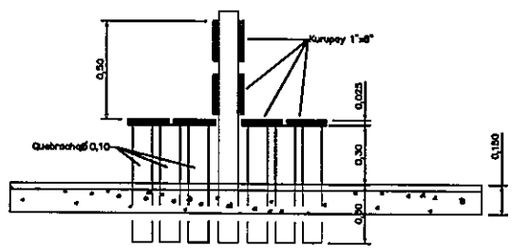
FACHADA FRONTAL
ESC.: 1:20



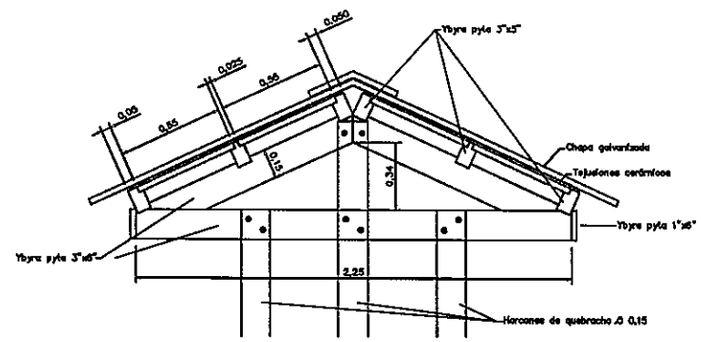


PLANTA Y PLANILLA DE MADERAMEN
ESC.: 1:50

POS.	CANT.	TIPO	ESCUADRIA	LONG.
A	2	Cabriada	3"x6"	2,30 m
B	6	Correa	3"x5"	3,40 m
C	4	Tope tejelán	1"x2"	1,75 m
D	2	Terminación en fachada	1"x6"	3,40 m



DETALLE DEL BANCO
ESC.: 1:10



CORTE A – A
ESC.: 1:10

NOTAS :
1-
2-
3-

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CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 82

DARSENA PARA OMNIBUS
DETALLE AREA PARA PASAJEROS

ESCALA: VARIAS
LAMINA: DR 8.4-1/1

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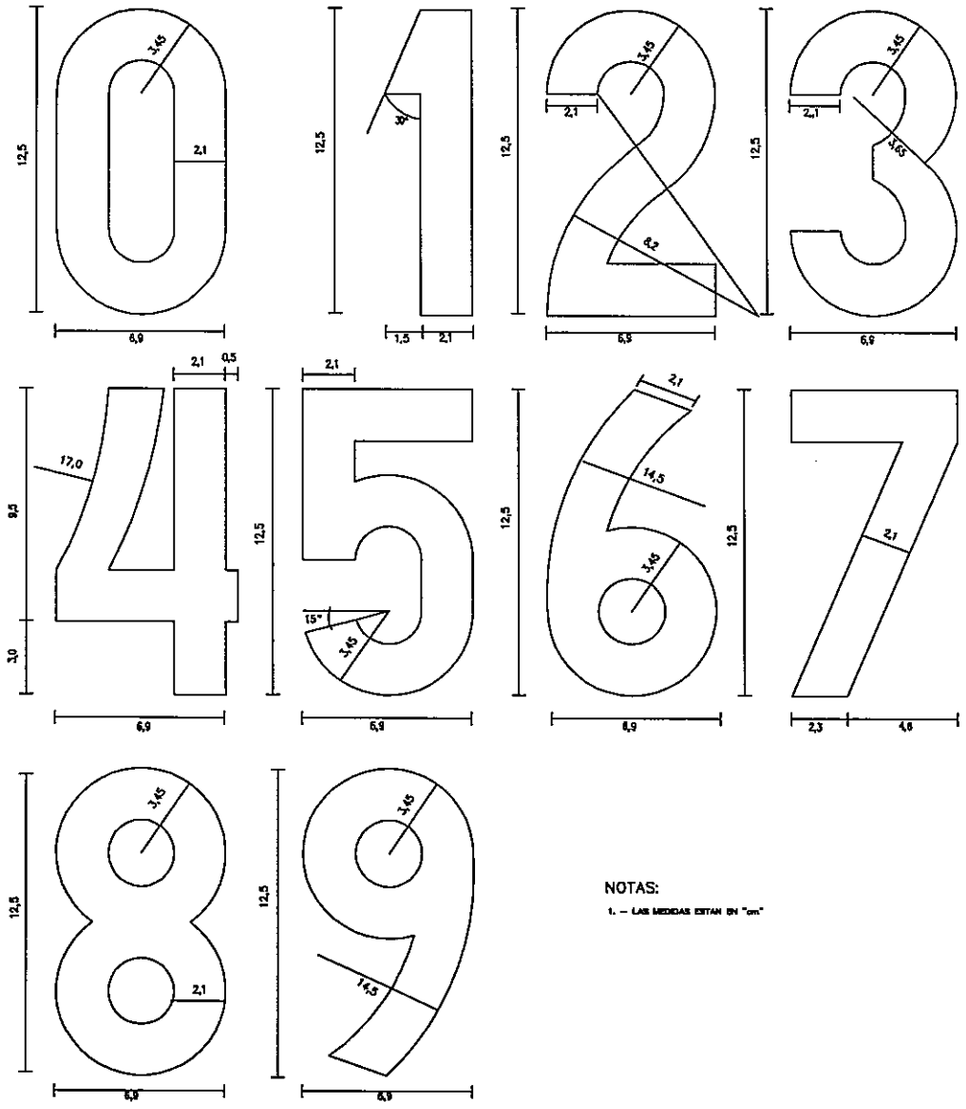
8.3	BARANDAS METALICAS Y DETALLES DE IMPLANTACION	OC 8.3-1/2
8.4	PARADA DE OMNIBUS EN DARSENAS	OC 8.4-1/1
8.5	VIVIENDAS	OC 8.5-1/2

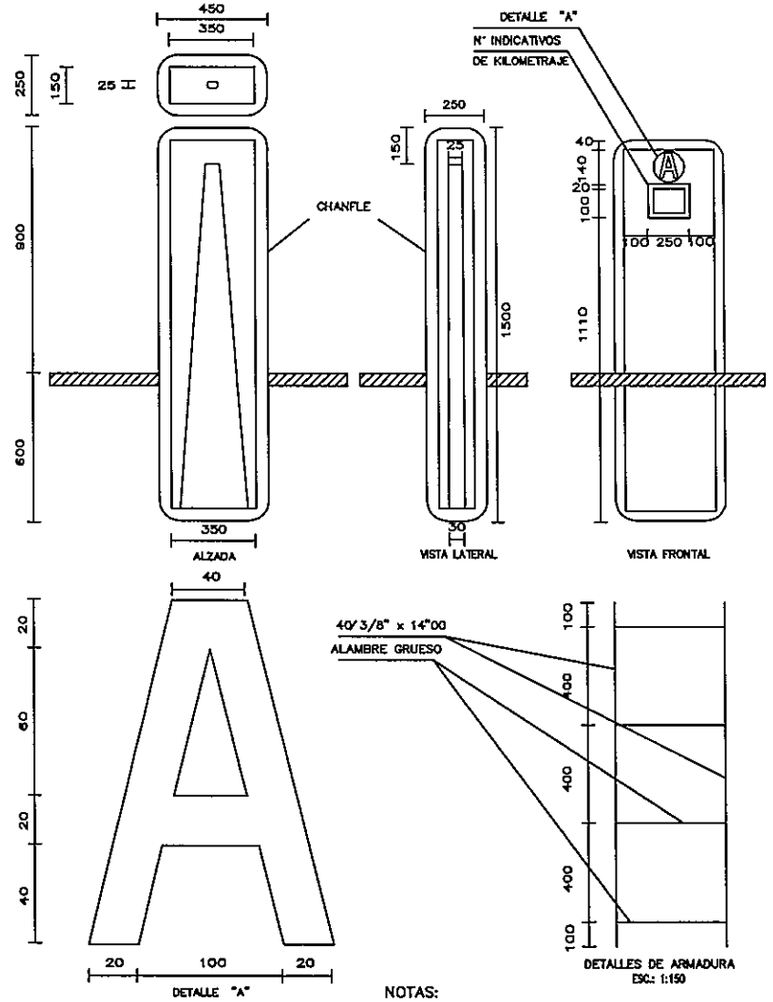
DETALLE DE NUMEROS
ESC.: 1:2



NOTAS:

1. – LAS MEDIDAS ESTAN EN "cm"

DETALLE DE MOJONES DE KILOMETRO
ESC.: 1:150



NOTAS:

1. – LAS MEDIDAS ESTAN EN mm
2. – DOSIFICACION DEL HORMIGON 1:2:3
3. – LETRAS Y NUMEROS DEBEN SER PINTADOS EN COLOR NEGRO

NOTAS :
1-
2-
3-

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TRAMO 1: CONCEPCION - KM 62

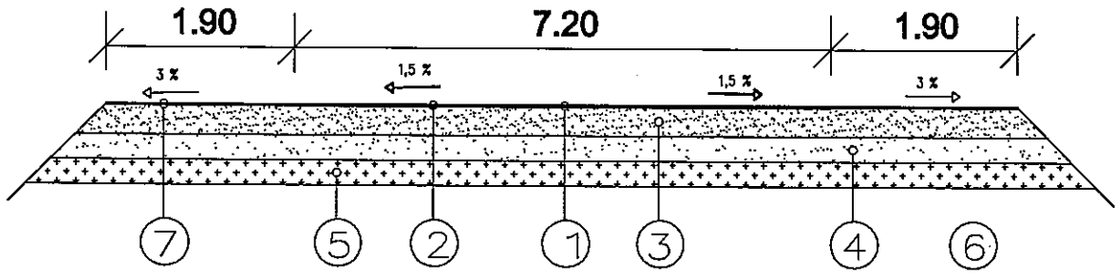
DETALLES DE MOJONES DE KM

ESCALAS: VARIAS

LAMINA: MK 7.4-1/1

MOPC

SECCION TRANSVERSAL TIPO
CONCEPCION – PTO. VALLEMI
TRATAMIENTO SUPERFICIAL TRIPLE



REFERENCIAS
1 Tratamiento superficial triple 7.2 metros de ancho de calzada.
2 Imprimación asfáltica en 11,4 metros en calzada y banquinas.
3 Base ripio suelo cemento al 3%, ancho 0.20 metros.
4 Sub base superior ripio suelo cemento, ancho variable con tramo del proyecto.
5 Sub base inferior suelo cal 3%
6 Terraplén > 5 %
7 Banquina de Tratamiento superficial simple

NOTAS :
1-
2-
3-

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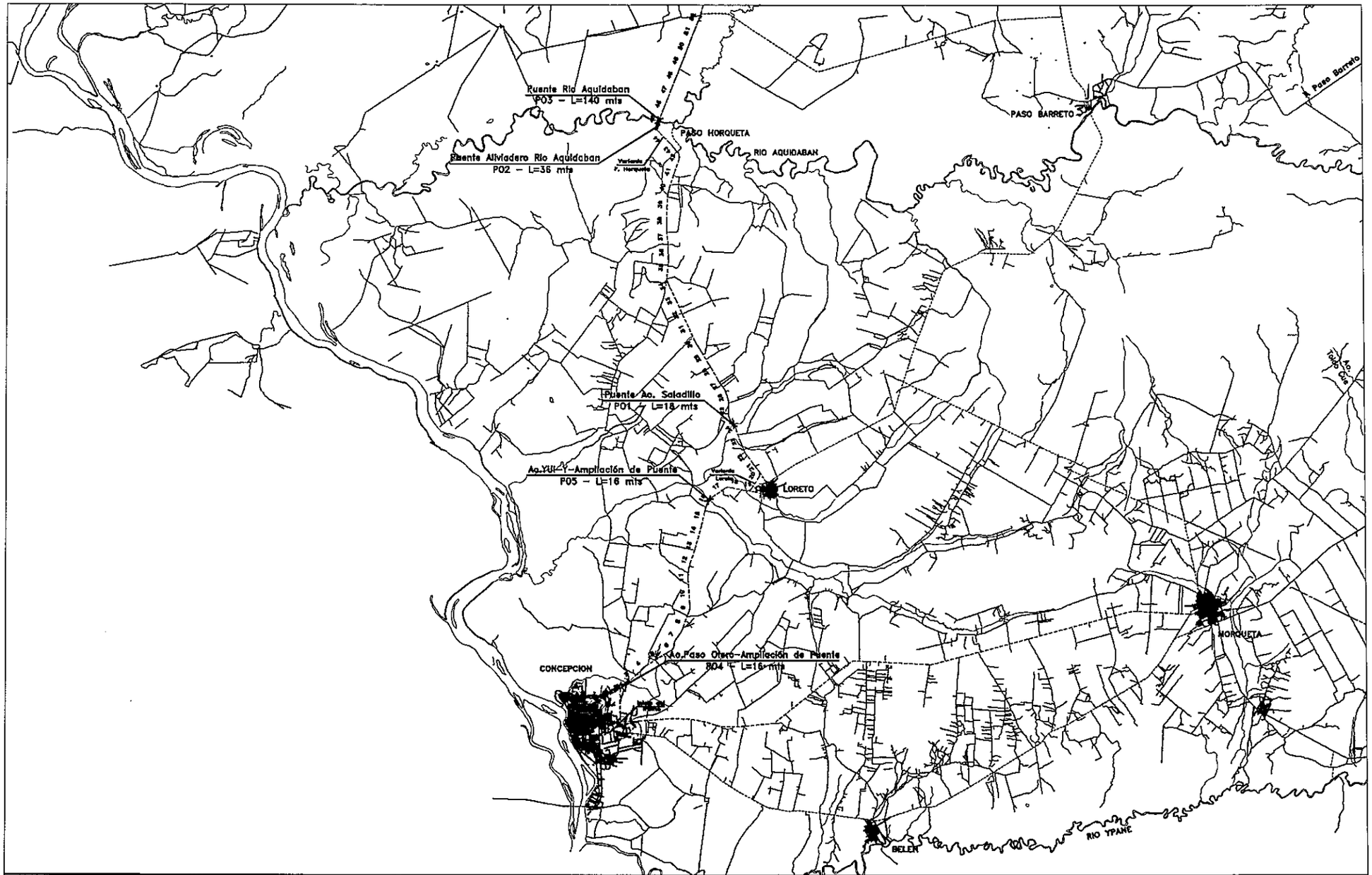
TRAMO 1: CONCEPCION - KM 82

DETALLE PAVIMENTO DE HORMIGON

ESCALAS: VARIAS

LAMINA: ST 3.3-1/1

MOPC



NOTAS :

1-

2-

3-

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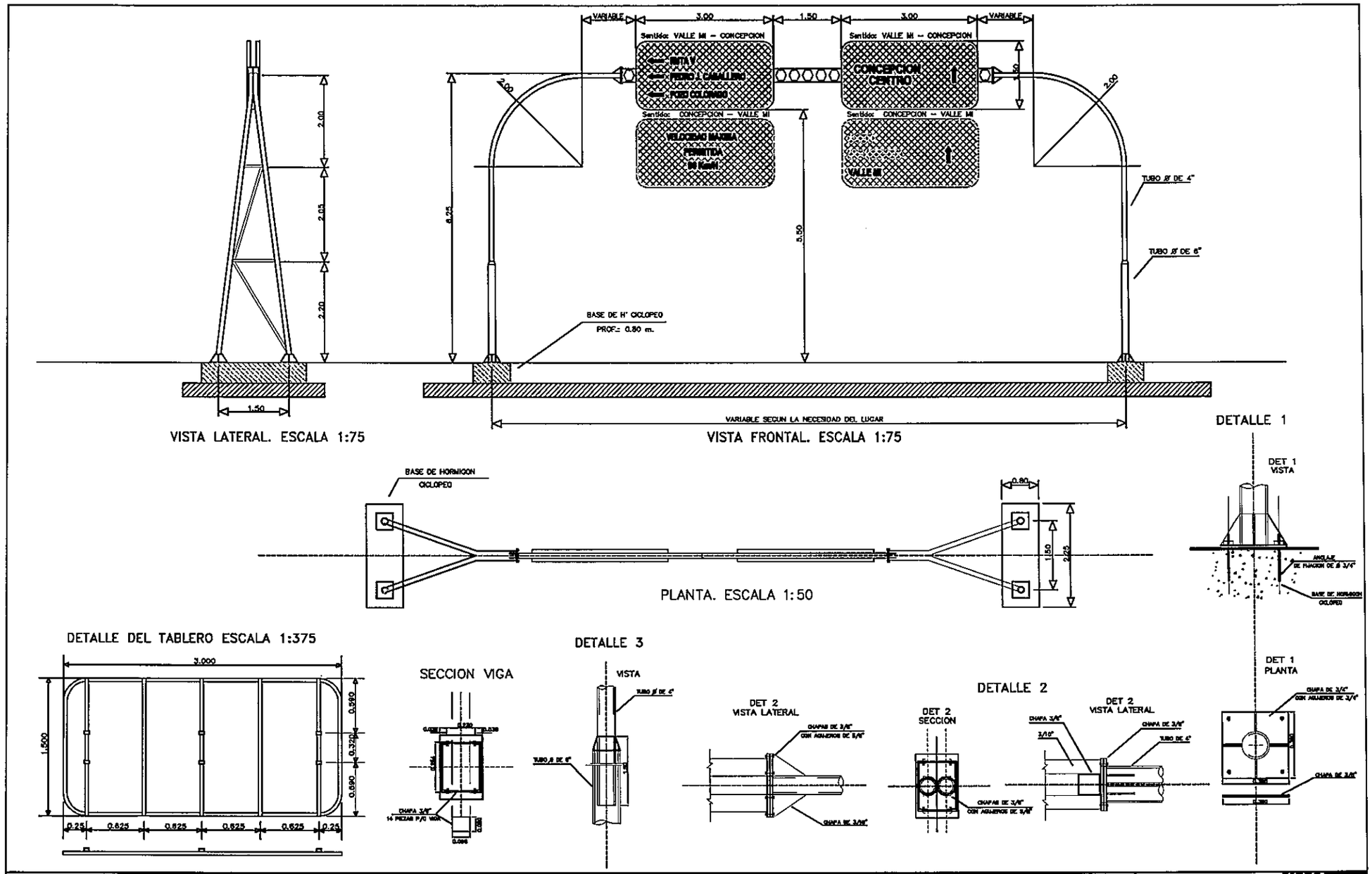
CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - Km 82

PLANTA DE UBICACION

ESCALA:	LAMINA:
H: 1:220.000	I3 1/1



NOTAS :

1-

2-

3-

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DISEÑO FINAL DE INGENIERIA
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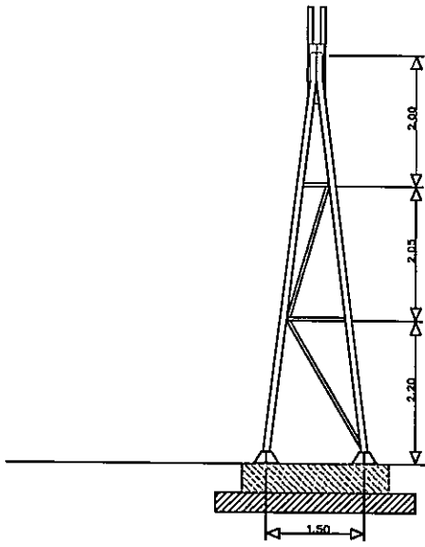
TRAMO 1: CONCEPCION - KM 52

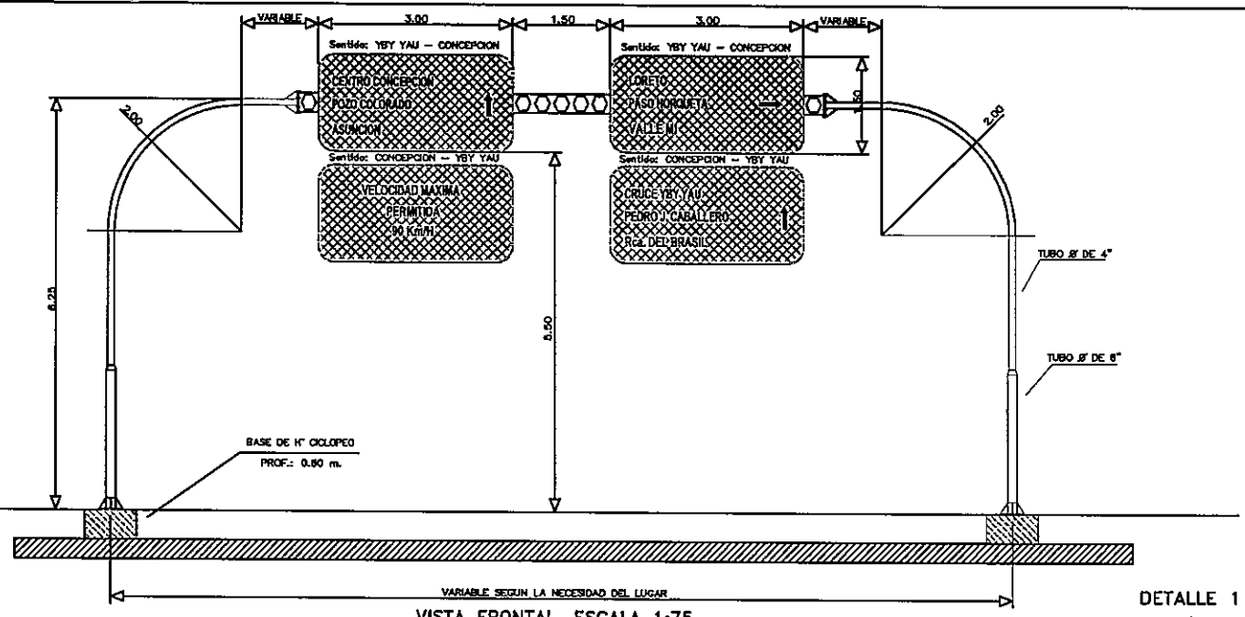
SEÑALIZACIONES PORTICO 2

ESCALA: 1/2.000

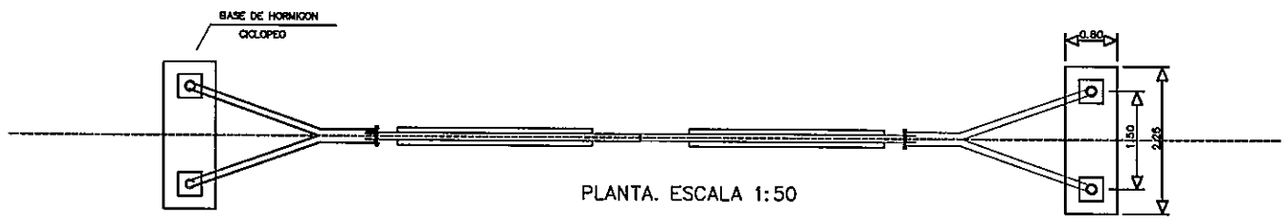
LAMINA: P 7.3-2/2



VISTA LATERAL. ESCALA 1:75

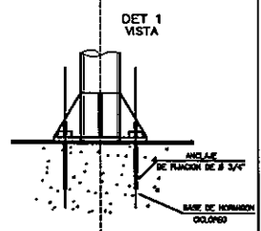


VISTA FRONTAL. ESCALA 1:75

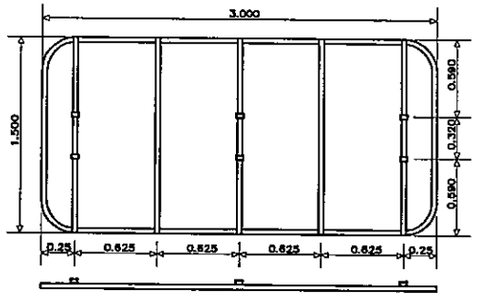


PLANTA. ESCALA 1:50

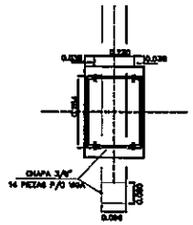
DETALLE 1



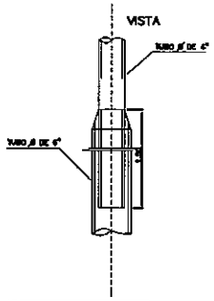
DETALLE DEL TABLERO ESCALA 1:375



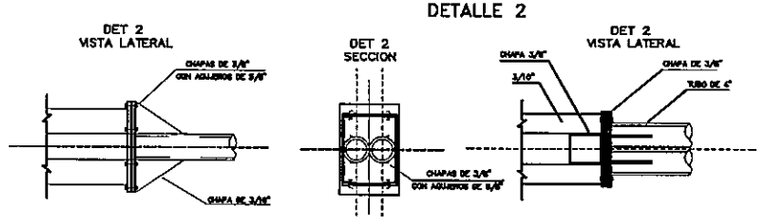
SECCION VIGA



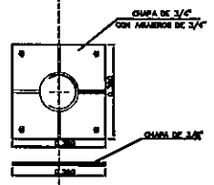
DETALLE 3



DETALLE 2



DET 1
PLANTA



NOTAS :

1-

2-

3-

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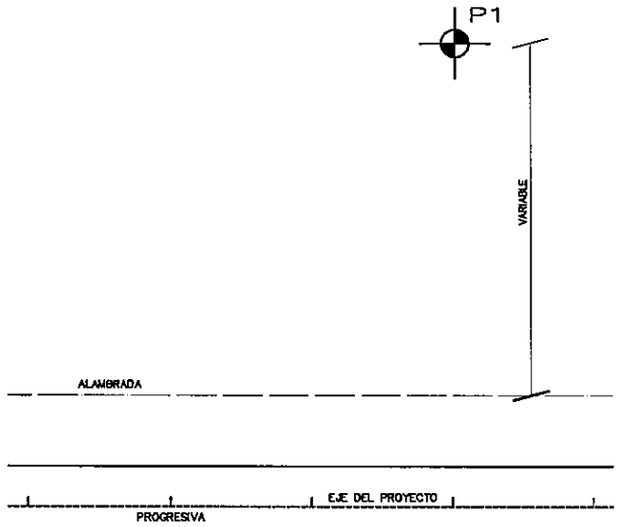
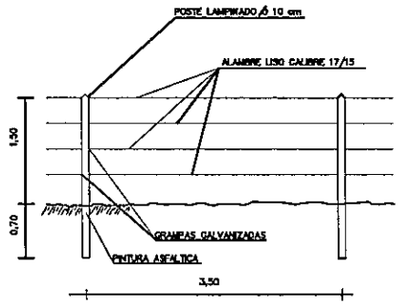
TRAMO 1: CONCEPCION - KM 82

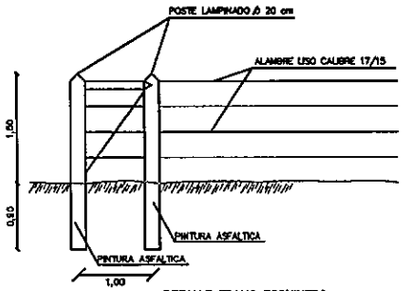
SEÑALIZACIONES PORTICO 1

ESCALA:	LAMINA:
1/2.000	P 7.3-1/2

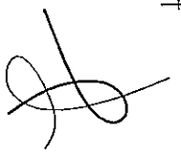




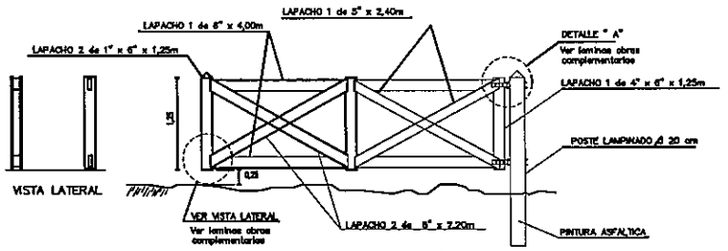
DETALLE TRAMO INTERMEDIO



DETALLE TRAMO ESQUINERO



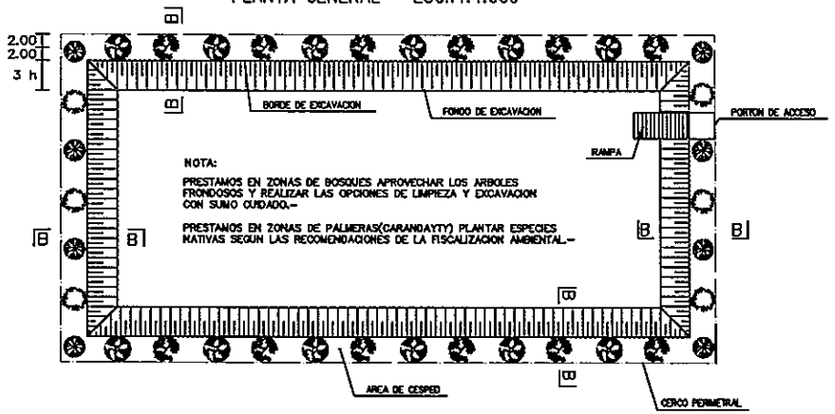
ATADURA PARA ALAMBRE



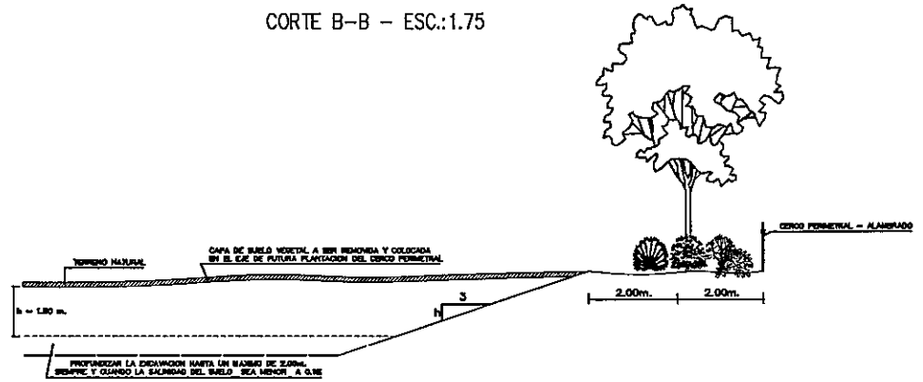
DETALLE PORTON DE ACCESO

PROTECCION DE PRESTAMO

PLANTA GENERAL – ESC.:1:1.000



CORTE B–B – ESC.:1.75



Roja

NOTAS :

1-

2-

3-

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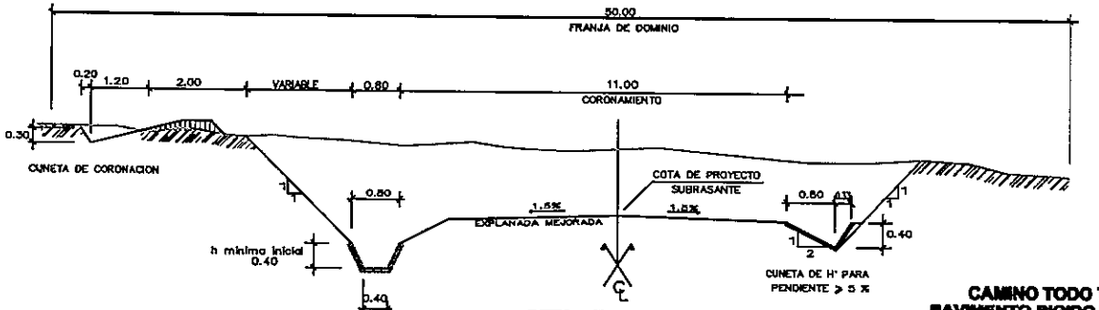
PROTECCION FORESTAL EN AREAS DE PRESTAMOS

ESCALAS: DETALLADAS

LAMINA: OC 8.2-1/1

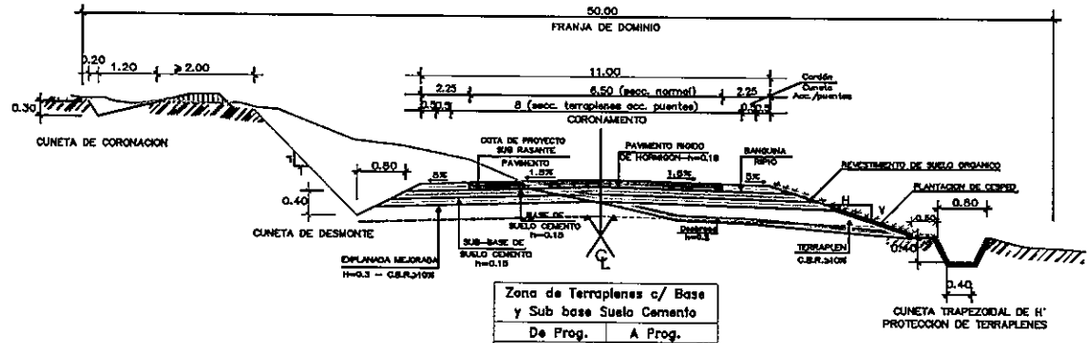
SECCIONES TRANSVERSALES TIPO



DETALLE DE CUNETA
SECCION EN DESMONTE

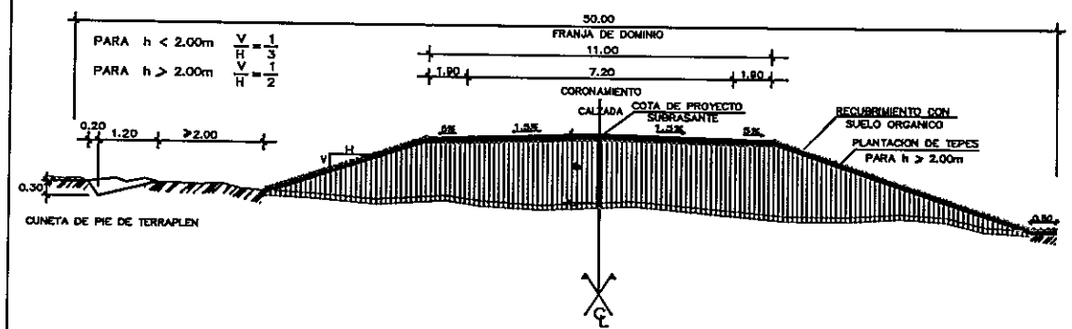
CAMINO TODO TIEMPO
PAVIMENTO RIGIDO DE HORMIGON
SECCION EN MEDIA LADERA

ZONA DE TERRAPLENES c/CORDON CUNETA DE H°		
De Prog.	A Prog.	Long. (m)
13+300	13+500	200
20+460	20+600	140
23+400	24+460	1.060
43+340	44+935	1.595
45+075	46+060	985

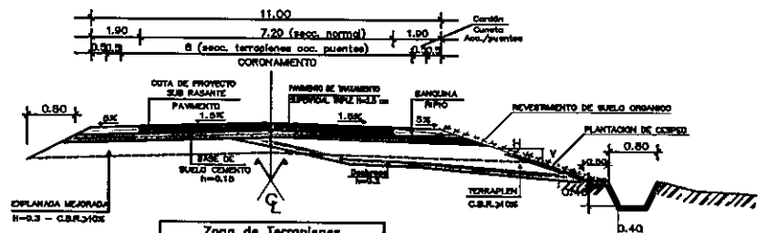


CUNETA TRAPEZOIDAL DE H°
PROTECCION DE TERRAPLENES

Zona de Terraplenes c/ Base y Sub base Suelo Cemento	
De Prog.	A Prog.
19+000	20+600
23+400	24+500
43+000	46+200



DETALLE DE TALUDES
SECCION EN TERRAPLEN



CUNETA TRAPEZOIDAL DE H°
PROTECCION DE TERRAPLENES

Zona de Terraplenes c/ Base Suelo Cemento	
De Prog.	A Prog.
2+357	19+000
20+600	23+400
24+500	43+000
46+200	52+136

NOTAS:
1- Las dimensiones son en "m" excepto donde se indique
2-
3-

CONSORCIO
SUMAK - GECCON

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TRAMO 1: CONCEPCION - KM 52

SECCIONES RURALES

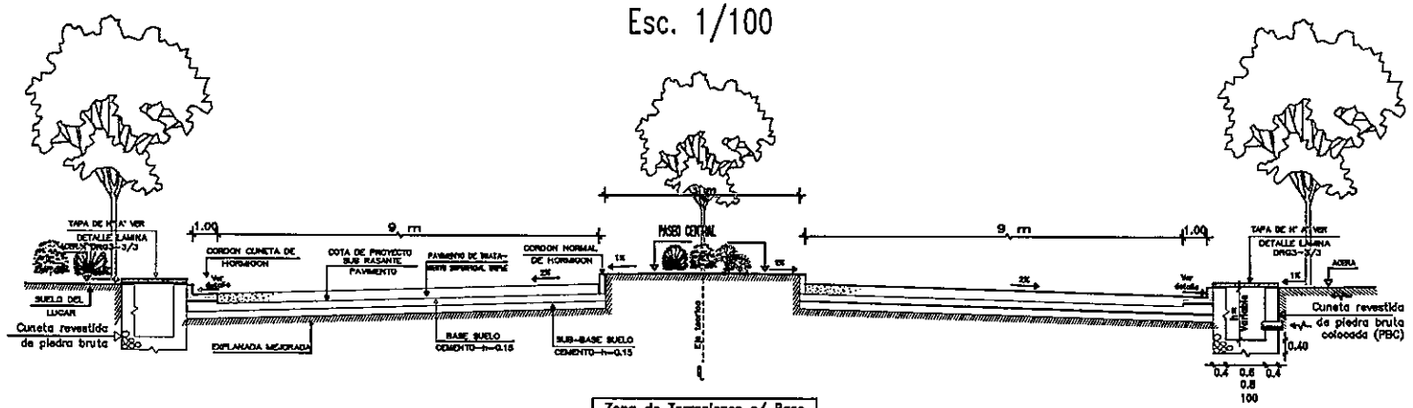
ESCALA: VARIAS
LAMINA: ST 3.3-V1

MOPC

SECCIONES TRANSVERSALES AREA URBANA

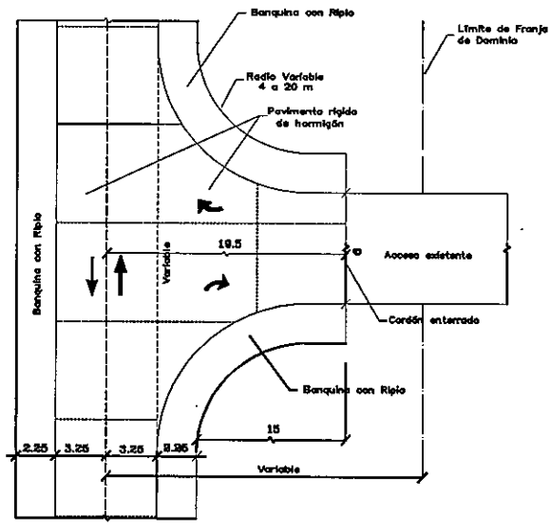
AVENIDA

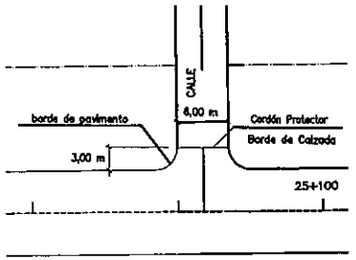
Esc. 1/100



Zona de Terraplenes c/ Base y Sub base Suelo Cemento	
De Prog.	A Prog.
0+020	2+360

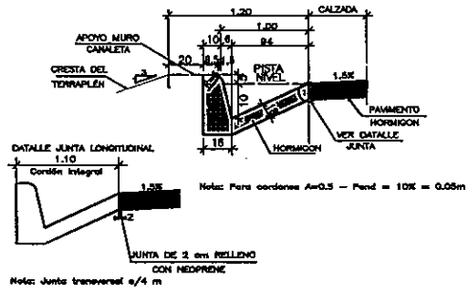
PROYECTO DE ACCESOS MENORES CON PAVIMENTO RIGIDO DE HORMIGON



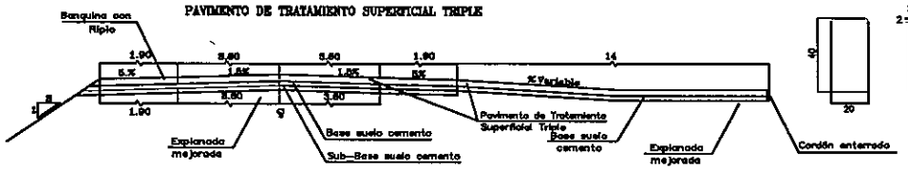


DETALLE UBICACION CORDON PROTECTOR BORDE DE PAVIMENTO EN ACCESO A CALZADA

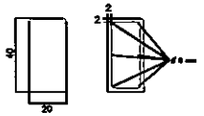
CORDON CUNETA EN AREA URBANA
DIMENSIONES EN "Cm"
Fuera de escala



SECCIÓN TRANSVERSAL
PAVIMENTO DE TRATAMIENTO SUPERFICIAL TRIPLE



CORDON PROTECTOR BORDE DE PAVIMENTO EN ACCESO A CALZADA Y BORDE PASEO CENTRAL
DIMENSIONES MINIMAS EN "Cm"



NOTAS:

1- Las dimensiones son en "m" excepto donde se indiquen

2-

3-

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REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI

SECCION TRANSVERSAL URBANA Y DETALLE DE ACCESOS LATERALES

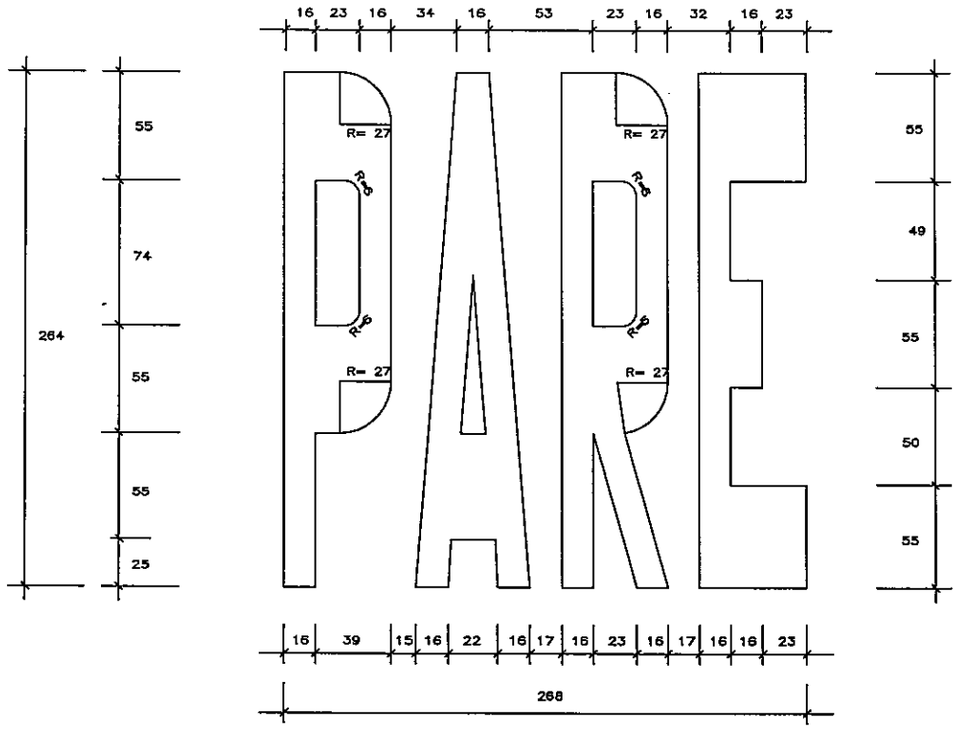
ESCALA: VARIA

LAMINA: ST 3.1-1/1

MOPC

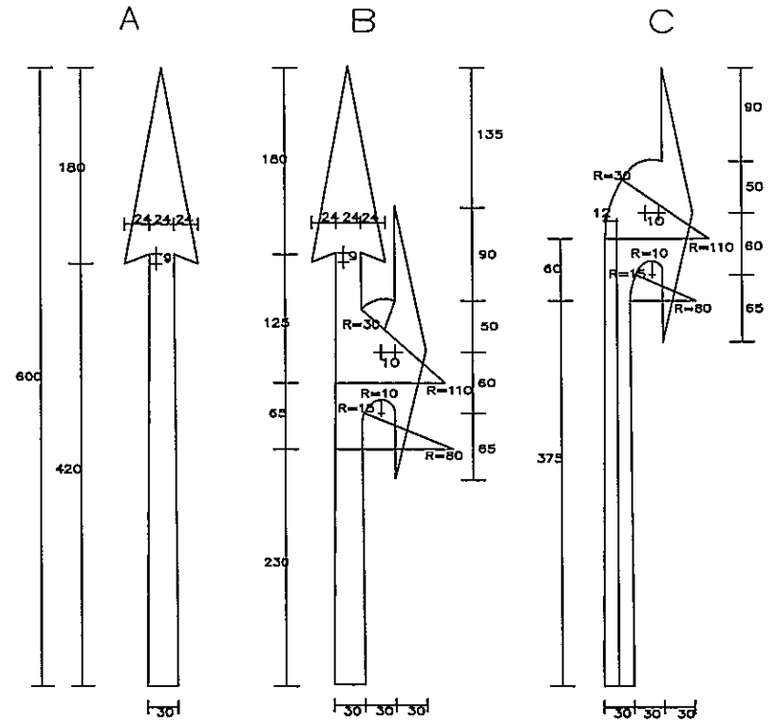
MENSAJE "PARE"

(PINTURA EN EL PAVIMIENTO – Dimensiones em "cm")



FLECHAS PARA CONTROL DE USO DE FRANJA DE TRAFICO

(PINTURA EN EL PAVIMIENTO – Dimensiones en "cm")



NOTAS :

1-

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MINISTERIO DE OBRAS PÚBLICAS
Y COMUNICACIONES
Vamos por Buen camino

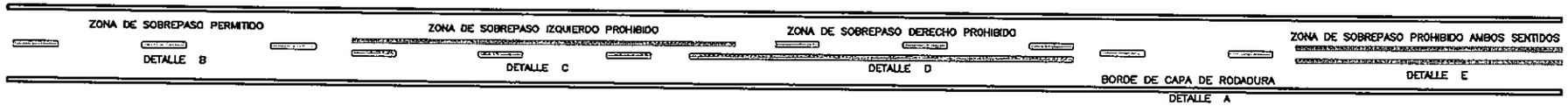
DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 52

SEÑALIZACION
PARE

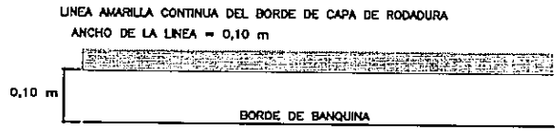
ESCALAS: VARIAS

LAMINA: SH 7.1-2/2

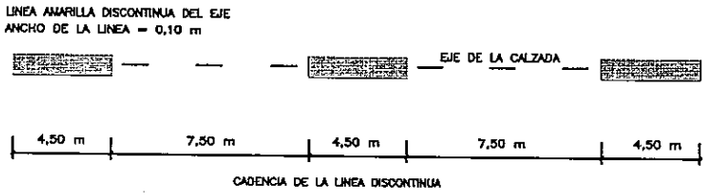
DETALLE CONSTRUCTIVO – SEÑALIZACION HORIZONTAL



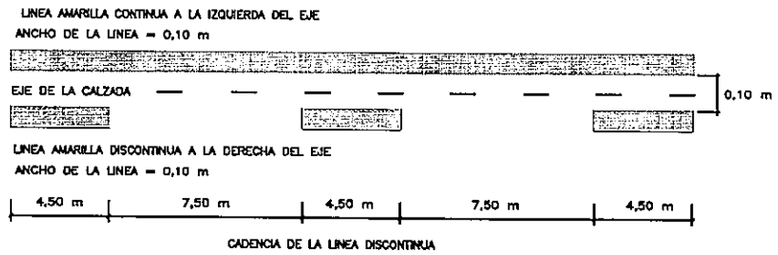
DETALLE A



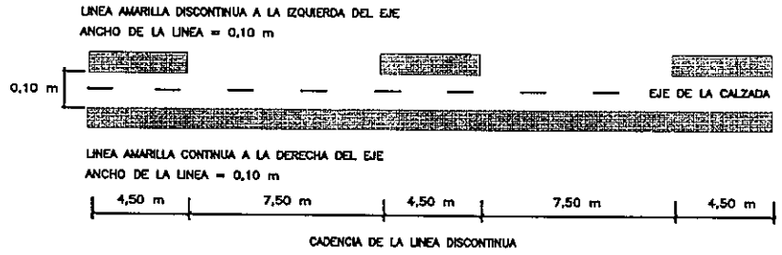
DETALLE B



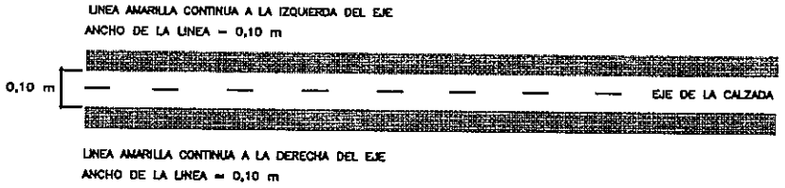
DETALLE C



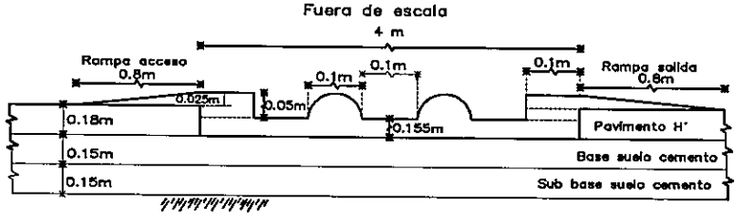
DETALLE D



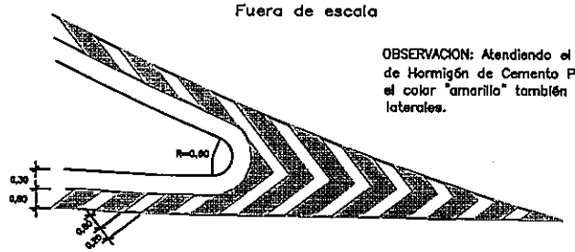
DETALLE E



FAJAS SONORA H° HIDRAULICO Fck>21Mpa
PERFIL LONGITUDINAL
Fuera de escala



DETALLE DE APROXIMACIÓN DE LAS ISLAS E INTERSECCIONES
(PINTURA EN EL PAVIMIENTO – Dimensiones en "m")
Fuera de escala



OBSERVACION: Atendiendo el color del pavimento de Hormigón de Cemento Portland, se propone el color "amarillo" también para las lineas laterales.

NOTAS :

1- Las dimensiones son en "m" excepto donde se indiquen
2-
3-

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MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 52

SEÑALIZACION HORIZONTAL

ESCALA

LAMINA: SH 7.1-1/2

MOPC

SENTIDO: CONCEPCION - Km. 52

SEÑALES PREVENTIVAS

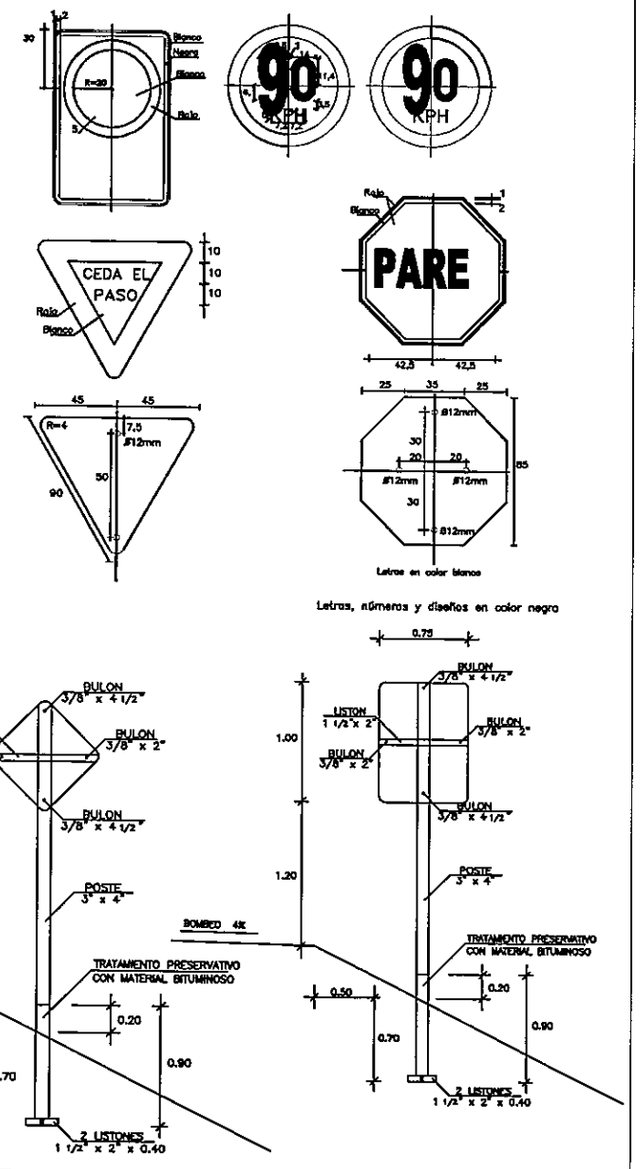
UBICACIÓN	PROGRESIVA	TIPO	SEÑAL	DESCRIPCIÓN
L.D.	4+080 10+960 15+820 16+300 21+960 23+640 24+610 34+130 44+250	P-1		CURVA A LA DERECHA
L.D.	7+380 42+000 8+820 18+760 20+140 25+470 26+250 26+920 39+650	P-2		CURVA A LA IZQUIERDA
L.D.	6+080	P-3		CURVA "S" A LA IZQUIERDA
L.D.	19+200 20+460	P-4	ATENCION SALIDA DE VEHICULOS	SALIDA DE CAMIONES
	Ver plano de detalle Zona Urbana	P-5		ZONA DE PEATONES
	Ver plano de detalle Zona Urbana	P-6		CALZADA ANGOSTA

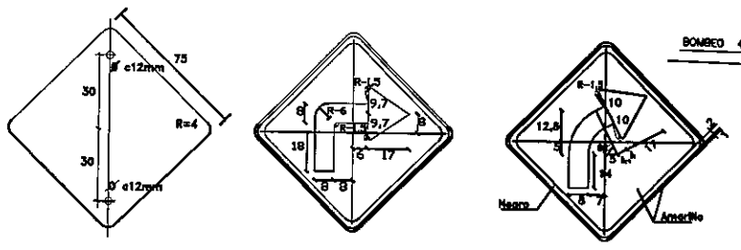
SEÑALES REGLAMENTARIAS

UBICACIÓN	PROGRESIVA	TIPO	SEÑAL	DESCRIPCIÓN
L.D.	2+380 12+500 21+700 32+500 46+200	R-1	90 VELOCIDAD MAXIMA	VEL.MAX. 90Km/H
L.D.	18+740 20+080	R-2	40 KPH VELOCIDAD MAXIMA	VEL.MAX. 40Km/H
L.D.	18+720 19+180 19+340 20+040 20+220 20+610 44+200	R-3		NO ADELANTAR
L.D.	19+420 20+680	R-4	CEDA EL PASO	CEDA EL PASO
L.D.	19+400 20+660	R-5	PARE	PARE
L.D.	5+520 15+240 27+340 34+040 37+080	R-6		ATENCIÓN ESCUELA
L.D.	12+540 21+740 32+540 46+240	R-7	PROHIBIDO CARRETAS	PROHIBIDO CARRETAS
	Ver plano de detalle Zona Urbana	R-8		PROHIBIDO ESTACIONAR

DETALLE DE CARTELES

Dimensiones en "cm"





NOTAS :

1-

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CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

SEÑALIZACION VERTICAL

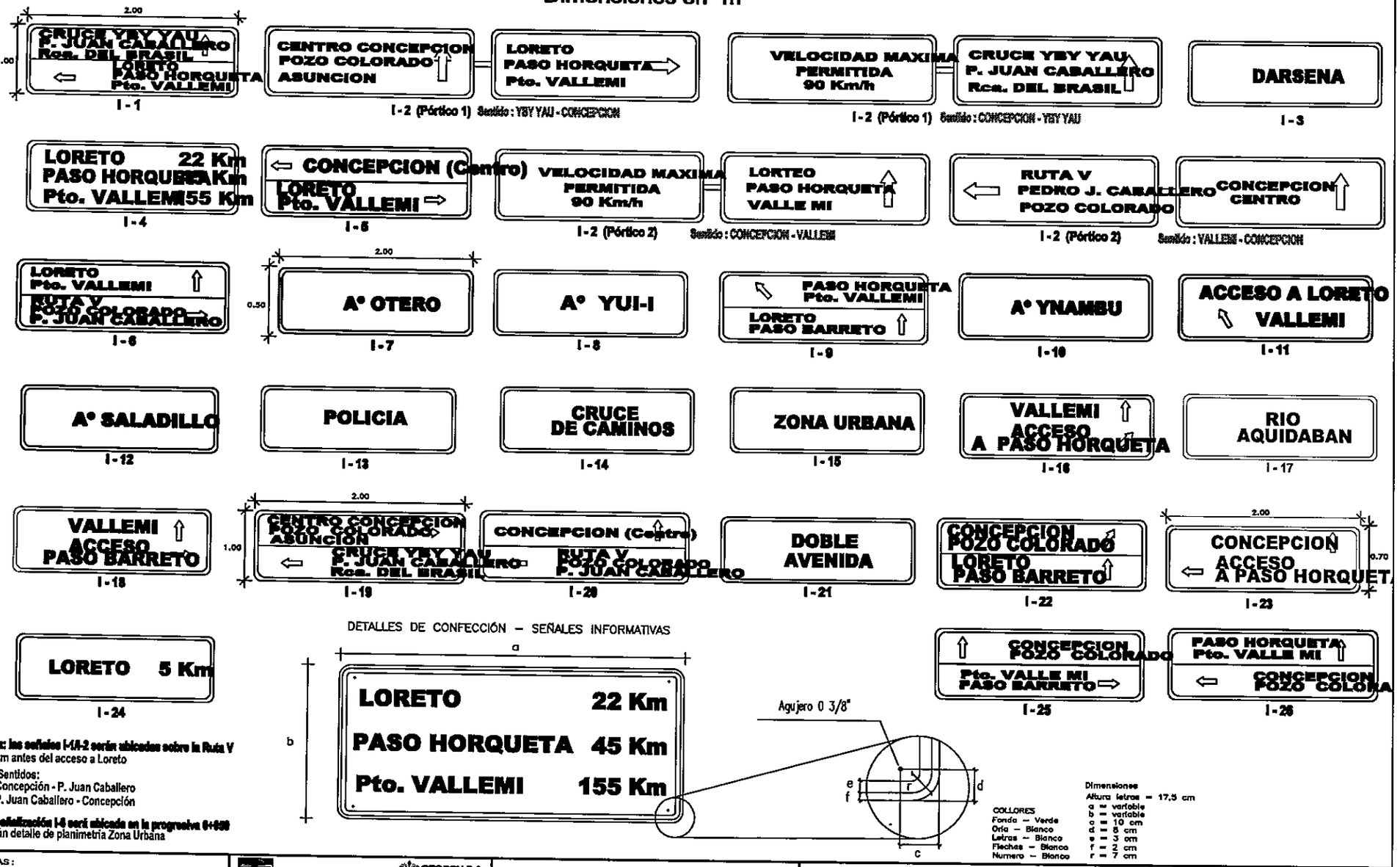
SIN ESCALA

LAMINA: SV 7.2- 1/5

MOPC

DETALLES DE SEÑALES INFOMATIVAS DEL TRAMO

Dimensiones en "m"



Nota: las señales I-1/I-2 serán ubicadas sobre la Ruta V 100 m antes del acceso a Loreto

Sentidos:
I-1 Concepción - P. Juan Caballero
I-2 P. Juan Caballero - Concepción

La señalización I-4 será ubicada en la progresiva 0+000 según detalle de planimetría Zona Urbana

NOTAS :
1-
2-
3-

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DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 82

SEÑALIZACION VERTICAL

SIN ESCALA

LAMINA: SV 7.2-3/5

MOPC

SEÑALIZACION VERTICAL: INTERSECCIONES - ZONA URBANA - ACCESOS

SEÑALIZACION VERTICAL (Ver Plano de Detalle de Acceso)			
INTERSECCION RUTA V			
Lado	Prg.	Tipo	Observación
Derecho	S/ Ruta V	R-3	No adelantar
Derecho	S/ Ruta V	I-1	Destino
Derecho	S/ Ruta V	R-2	V. Max= 40 Km/h.
Derecho	S/ Ruta V	I-3	Dársena para Acceso
Derecho	0+150	R-4	Ceda el Paso
Derecho	0+270	R-5	Pare
Derecho	0+280	R-4	Ceda el Paso
Izquierdo	0+050	R-4	Ceda el Paso
Izquierdo	0+060	R-5	Pare
Izquierdo	Isla Izquierda	R-5	Pare
Izquierdo	Isla Derecha	R-4	Ceda el Paso
Izquierdo	S/ Ruta V	I-3	Dársena para Acceso
Izquierdo	S/ Ruta V	I-2	Destino
Izquierdo	S/ Ruta V	R-2	V. Max= 40 Km/h.
Izquierdo	S/ Ruta V	R-3	No adelantar

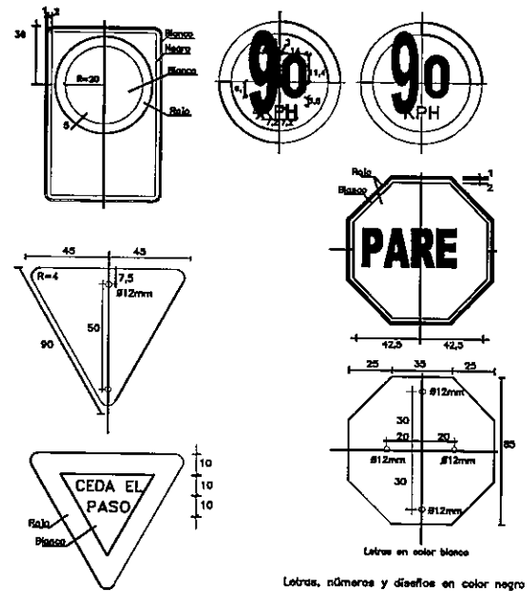
ZONA URBANA (Ver Plano de Detalle)			
Lado	Prg.	Tipo	Observación
Derecho	0+020	I-4	Destino
Derecho	0+080	R-7	Prohibido Carretas
Derecho	0+160	R-8	Prohibido Estacionar
Derecho	0+880	R-7	Prohibido Carretas
Derecho	0+950	R-8	Prohibido Estacionar
Derecho	2+040	I-5	Destino
Derecho	2+050	P-5	Peatones
Derecho	2+060	R-8	Prohibido Estacionar
Derecho	2+300	P-6	Calzada angosta
Lado	Prg.	Tipo	Observación
Izquierdo	0+020	I-19	Destino
Izquierdo	0+640	R-7	Prohibido Carretas
Izquierdo	0+680	R-8	Prohibido Estacionar
Izquierdo	1+200	R-7	Prohibido Carretas
Izquierdo	1+240	R-8	Prohibido Estacionar
Izquierdo	2+190	P-5	Peatones
Izquierdo	2+200	R-8	Prohibido Estacionar
Izquierdo	2+240	I-20	Destino
Izquierdo	2+380	R-7	Prohibido Carretas
Izquierdo	2+440	P-6	Calzada Angosta

S/Camino a Concepción (Ver Plano de Detalle de Intersección RUTA V)			
	0+000	R-7	Prohibido Carretas
	0+050	I-5	Destino
	0+070	P-5	Peatones

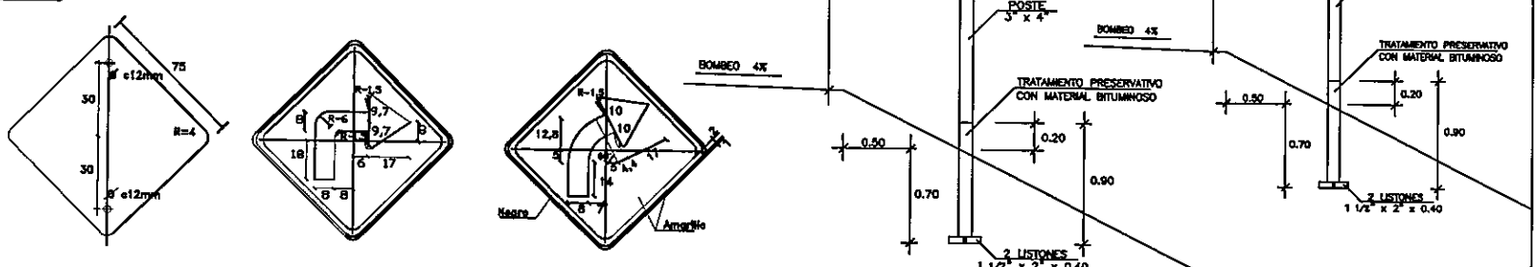
ACCESO A LORETO (Ver Detalle de Acceso		
ACCESO 1		
SOBRE RAMAL 1		
Tipo	Obsevación	Cantidad
R-3	No adelantar	2
R-5	Pare	2
I-24	Destino	1
SOBRE RAMAL 2		
Tipo	Obsevación	Cantidad
R-5	Pare	2
R-4	Ceda el Paso	2
R-3	No adelantar	2
R-2	V. Max= 40 Km/h.	2
ACCESO 2		
SOBRE RAMAL 3		
Tipo	Obsevación	Cantidad
R-2	V. Max= 40 Km/h.	2
R-3	No adelantar	1
R-5	Pare	2
R-4	Ceda el Paso	2
SOBRE RAMAL 4		
Tipo	Obsevación	Cantidad
I-22	Destino	1
R-3	No adelantar	3
R-2	V. Max= 40 Km/h.	3

DETALLE DE CARTELES

Dimensiones en "cm"



Letras, números y diseños en color negro



NOTAS :

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MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 82

SEÑALIZACION VERTICAL

SIN ESCALA

LAMINA: SV 7.2- 5/5

SENTIDO: Km. 52 - CONCEPCION

SEÑALES PREVENTIVAS

UBICACIÓN	PROGRESIVA	TIPO	SEÑAL	DESCRIPCIÓN
L.I.	7+650 9+300 20+100 20+840 25+830 26+640 42+510	P-1		CURVA A LA DERECHA
L.I.	4+380 11+860 16+460 17+820 22+280 24+000 24+870 27+100 34+440 38+280 41+880	P-2		CURVA A LA IZQUIERDA
L.I.	6+910	P-3		CURVA "S" A LA IZQUIERDA
L.I.	19+040 20+280	P-4	ATENCION SALIDA DE VEHICULOS	SALIDA DE CAMIONES

SEÑALES REGLAMENTARIAS

UBICACIÓN	PROGRESIVA	TIPO	SEÑAL	DESCRIPCIÓN
L.I.	18+400 32+000 41+000 51+000	R-1	VELOCIDAD MAXIMA	VEL.MAX. 90Km/H
L.I.	19+420 20+720	R-2	VELOCIDAD MAXIMA	VEL.MAX. 40Km/H
L.I.	19+100 19+400 19+560 20+680 45+850	R-3		NO ADELANTAR
L.I.	19+290 20+600	R-4	CEDA EL PASO	CEDA EL PASO
L.I.	19+310 20+620	R-5	PARE	PARE
L.I.	5+760 15+440 27+500 34+380 37+320	R-6		ATENCIÓN ESCUELA
L.I.	18+380 31+940 40+800 50+900	R-8	PROHIBIDO CARRETAS	PROHIBIDO CARRETAS

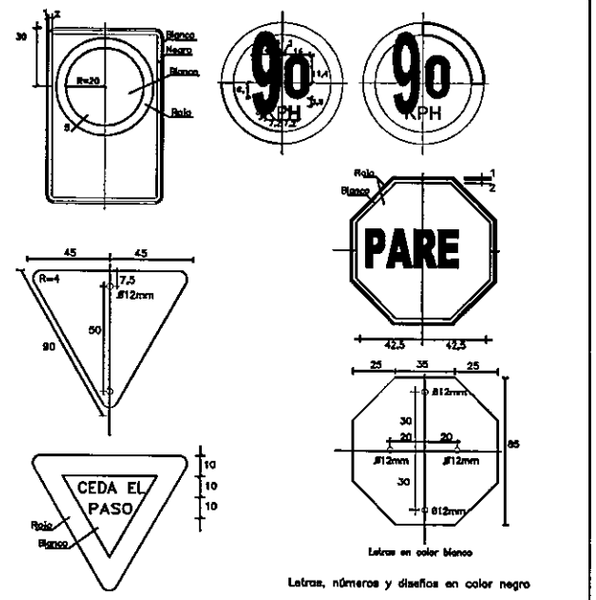
COMPUTO DE SEÑALIZACIÓN VERTICAL

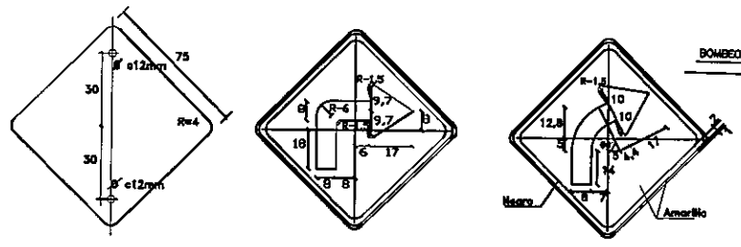
TIPO DE CARTEL	CANTIDAD	Area en m2
0.500 m2	57	32.034
0.75m2	64	48.00
0.387m2	13	7.761
0.35m2	12	4.20
1.00 m2	53	53.00
1.40 m2	8	11.20
2.00 m2	6	12.00

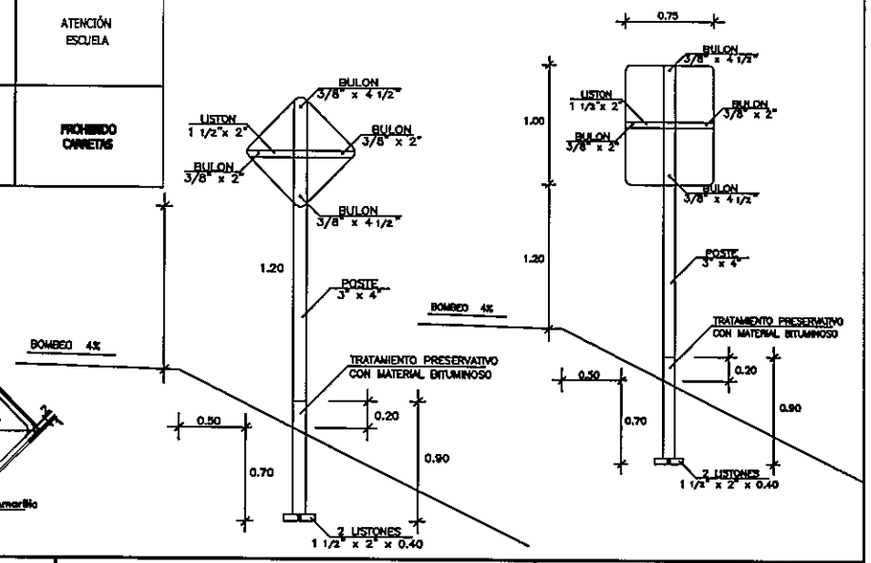
TIPO DE CARTEL	CANTIDAD	Area en m2
4.50 m2	8	36.00
TOTAL DEL TRAMO :		204.195 m2

DETALLE DE CARTELES

Dimensiones en "cm"







NOTAS :

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DISEÑO FINAL DE INGENIERIA

CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - km 62

SEÑALIZACION VERTICAL

SIN ESCALA

LAMINA: SV 7.2-2/5

MOPC

DETALLES DE SEÑALES INFOMATIVAS DEL TRAMO

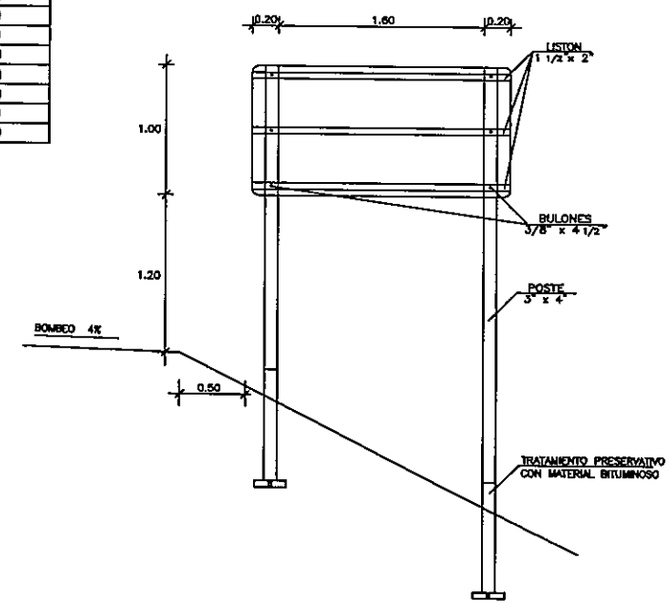
... Dimensiones en "m"

SEÑALES INFORMATIVAS

Ubicación	Progresiva	Tipo	Descripción	Dimensión (m)
L.D.	RUTA V	I-1	DESTINO	2.00 x 1.00
	RUTA V	I-2	VER PORTICO 1	VER DETALLE
L.D.	RUTA V	I-3	DARSENA	2.00 x 0.50
L.D.	RUTA V	I-3	DARSENA	2.00 x 0.50
L.D.	0+030	I-4	DESTINO	2.00 x 1.00
	2+430	I-2	VER PORTICO 2	VER DETALLE
L.D.	2+040	I-5	DESTINO	2.00 x 0.70
L.D.	0+000	I-6	DESTINO (W/ Acceso)	2.00 x 1.00
L.D.	2+000	I-7	Aº OTERO	2.00 x 0.50
L.D.	3+100	I-3	DARSENA	2.00 x 0.50
L.D.	4+200	I-3	DARSENA	2.00 x 0.50
L.D.	5+300	I-3	DARSENA	2.00 x 0.50
L.D.	6+400	I-3	DARSENA	2.00 x 0.50
L.D.	10+240	I-3	DARSENA	2.00 x 0.50
L.D.	15+000	I-3	DARSENA	2.00 x 0.50
L.D.	16+125	I-8	Aº YUI-I	2.00 x 0.50
L.D.	18+700	I-9	DESTINO	2.00 x 0.70
L.D.	19+900	I-10	Aº YNAMBU	2.00 x 0.50
L.D.	19+900	I-11	DESTINO	2.00 x 0.70
L.D.	24+045	I-12	Aº SALADILLO	2.00 x 0.50
L.D.	24+300	I-3	DARSENA	2.00 x 0.50
L.D.	25+200	I-3	DARSENA	2.00 x 0.50
L.D.	26+300	I-13	POLICIA	2.00 x 0.50
L.D.	27+100	I-3	DARSENA	2.00 x 0.50
L.D.	31+400	I-3	DARSENA	2.00 x 0.50
L.D.	33+700	I-3	DARSENA	2.00 x 0.50
L.D.	34+240	I-14	CRUCE DE CAMINOS	2.00 x 0.50
L.D.	36+340	I-3	DARSENA	2.00 x 0.50
L.D.	36+900	I-3	DARSENA	2.00 x 0.50
L.D.	38+240	I-3	DARSENA	2.00 x 0.50
L.D.	39+420	I-3	DARSENA	2.00 x 0.50
L.D.	42+100	I-15	ZONA URBANA	2.00 x 0.50
L.D.	42+240	I-16	DESTINO	2.00 x 0.70
L.D.	42+400	I-3	DARSENA	2.00 x 1.00
L.D.	44+000	I-17	RIO AQUIDABAN	2.00 x 0.50
L.D.	45+100	I-3	DARSENA	2.00 x 0.50
L.D.	62+100	I-18	DESTINO	2.00 x 0.70

SEÑALES INFORMATIVAS

Ubicación	Progresiva	Tipo	Descripción	Dimensión
L.I.	0+020	I-19	DESTINO	2.00 x 1.00
L.I.	2+240	I-20	DESTINO	2.00 x 1.00
L.I.	2+600	I-21	DOBLE AVENIDA	2.00 x 0.50
L.I.	2+710	I-7	Aº OTERO	2.00 x 0.50
L.I.	3+600	I-3	DARSENA	2.00 x 0.50
L.I.	4+700	I-3	DARSENA	2.00 x 0.50
L.I.	5+800	I-3	DARSENA	2.00 x 0.50
L.I.	8+900	I-3	DARSENA	2.00 x 0.50
L.I.	10+740	I-3	DARSENA	2.00 x 0.50
L.I.	15+600	I-3	DARSENA	2.00 x 0.50
L.I.	16+145	I-8	Aº YUI-I	2.00 x 0.50
L.I.	18+905	I-10	Aº YNAMBU	2.00 x 0.50
L.I.	20+600	I-22	DESTINO	2.00 x 0.70
L.I.	24+095	I-12	Aº SALADILLO	2.00 x 0.50
L.I.	24+600	I-3	DARSENA	2.00 x 0.50
L.I.	25+800	I-13	POLICIA	2.00 x 0.50
L.I.	25+540	I-3	DARSENA	2.00 x 0.50
L.I.	27+600	I-3	DARSENA	2.00 x 0.50
L.I.	31+900	I-3	DARSENA	2.00 x 0.50
L.I.	34+200	I-3	DARSENA	2.00 x 0.50
L.I.	34+400	I-14	CRUCE DE CAMINOS	2.00 x 0.50
L.I.	36+540	I-3	DARSENA	2.00 x 0.50
L.I.	37+600	I-3	DARSENA	2.00 x 0.50
L.I.	39+740	I-3	DARSENA	2.00 x 0.50
L.I.	40+320	I-3	DARSENA	2.00 x 0.50
L.I.	42+700	I-23	DESTINO	2.00 x 0.70
L.I.	42+600	I-3	DARSENA	2.00 x 0.50
L.I.	43+240	I-15	ZONA URBANA	2.00 x 0.50
L.I.	46+080	I-17	RIO AQUIDABAN	2.00 x 0.50
L.I.	46+600	I-3	DARSENA	2.00 x 0.50



Nota: las señales I-1 / I-2 (Pórtico 1) serán ubicadas sobre la Ruta V 150 m antes de la intersección con la Ruta Concepción - Valle mi

I-1 Concepción - P. Juan Caballero
I-2 Ver Detalle de Pórtico 1

La señalización I-6 será ubicada en la progresiva 0+000 según detalle de planimetría Zona Urbana sobre acceso a Concepción (Centro)

NOTAS :
1-
2-
3-

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GEOCON S.A. CONSULTORA
Alberdi 488 - 4to. Piso - Of. 3 - Tel.: 442.977-491.894
Email: geocons@telesur.com.py

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CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - KM 62

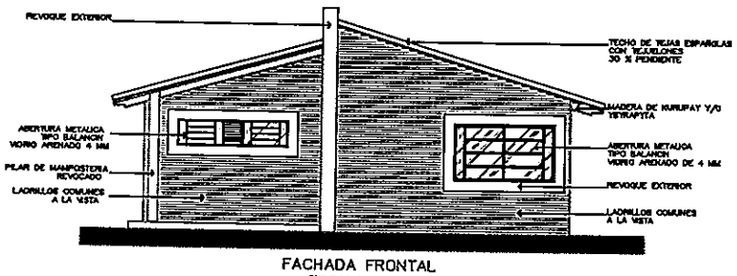
SEÑALIZACION VERTICAL

SIN ESCALA

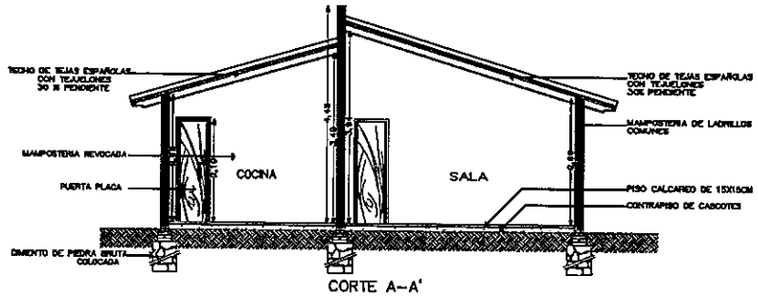
LAMINA: SV 7.2- 4/5

MOPC

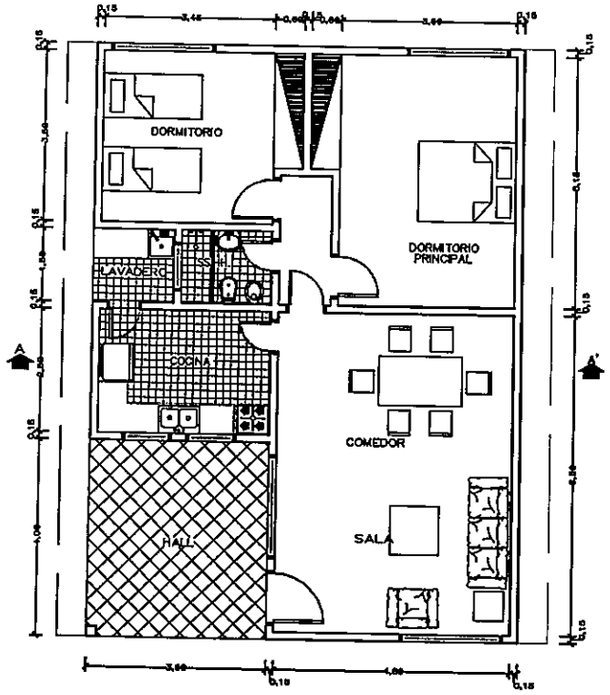
SUPERFICIE 105.30 M2



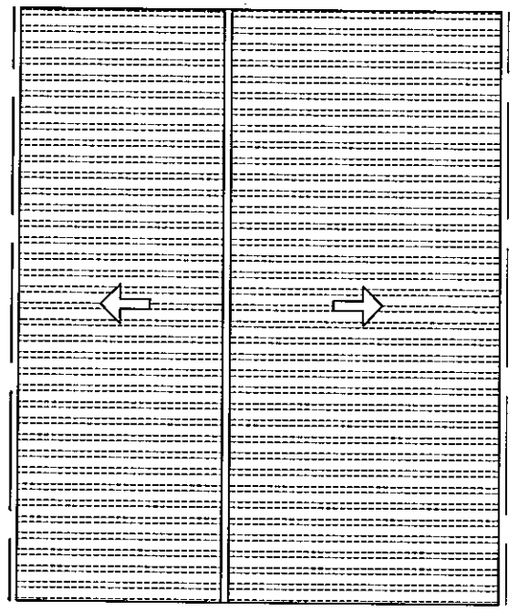
FACHADA FRONTAL
ESCALA 1:50



CORTE A–A'
ESCALA 1:50



VIVIENDA PROFESIONAL
ESCALA 1:50



PLANTA DE TECHO
ESCALA 1:50

NOTAS:
1-
2-
3-

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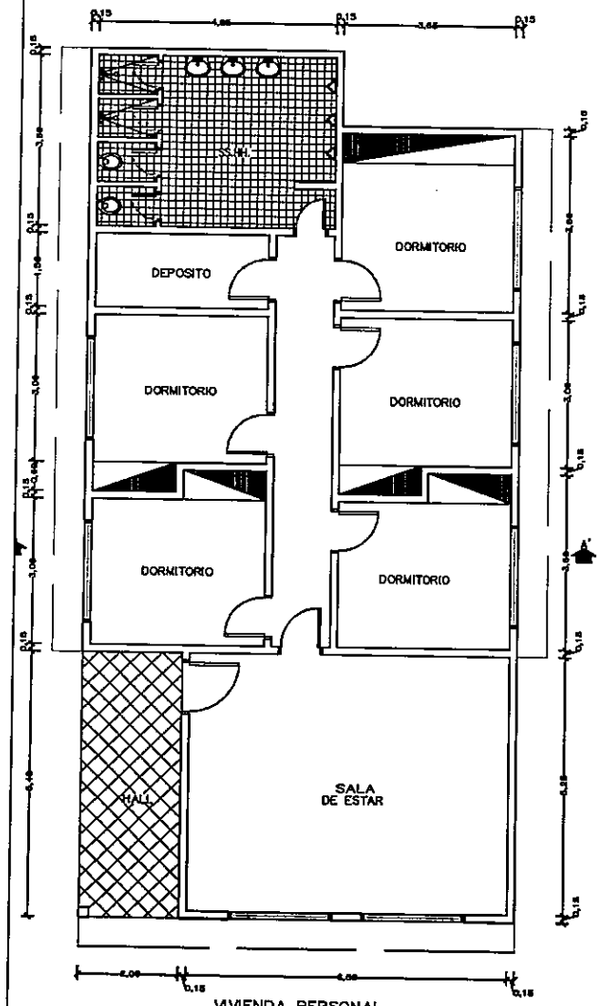
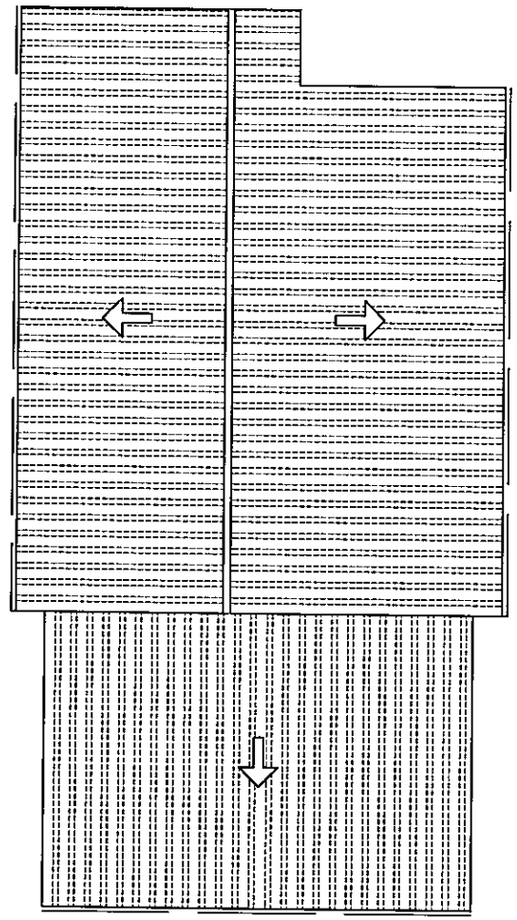
SERIE
VIVIENDA TIPO "A"

ESCALA:
1/100

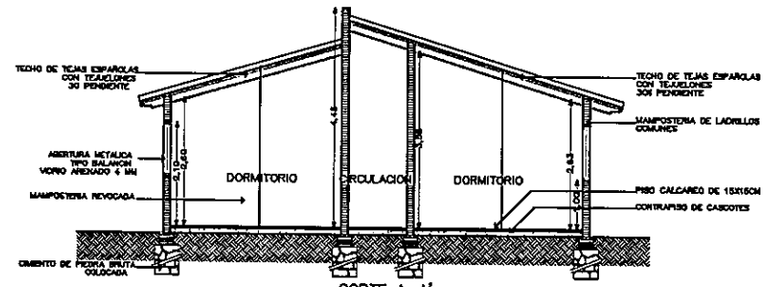
LAMINA:
DR.3.3-02



VIVIENDA PERSONAL
ESCALA 1:50

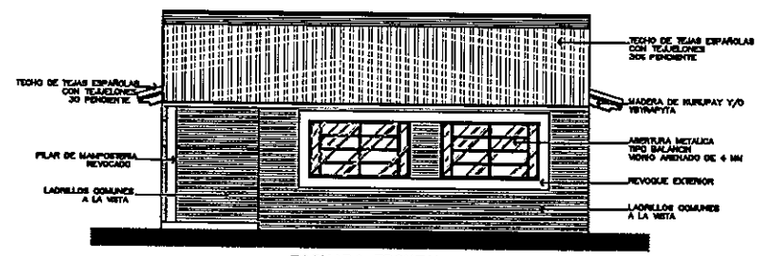


PLANTA DE TECHO
ESCALA 1:50



CORTE A-A'
ESCALA 1:50

SUPERFICIE: 150.55 M2



FACHADA FRONTAL
ESCALA 1:50

NOTAS:
1-
2-
3-

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CONCEPCION - VALLE MI
TRAMO 1: CONCEPCION - ION 02

DETALLE
VIVIENDA TIPO "B"

ESCALA: [illegible]
LAMINA: [illegible]

ALCANTARILLAS CELULARES
TABLAS DE DIMENSIONES Y CANTIDAD DE MATERIALES

ALCANTARILLA CELULAR DE 1.00 x 1.00

fs ≥ MPa		0.09	0.10
MEDIDAS	UNID.	SIMPLE	DOBLE
A	cm.	130	245
B	cm.	130	130
C	cm.	160	275
a	cm.	10	10
b	cm.	—	30
d	cm.	15	15
CONTRAPISO	m²	0.16	0.28
ENCOFRADO	m²	8.10	9.02
HORMIGON	m³	0.71	1.26

ALCANTARILLA CELULAR DE 1.50 x 1.50

fs ≥ MPa		0.09	0.10	0.10
MEDIDAS	UNID.	SIMPLE	DOBLE	TRIPLE
A	cm.	180	345	510
B	cm.	180	180	180
C	cm.	210	375	540
a	cm.	10	10	10
b	cm.	—	30	30
d	cm.	15	15	15
CONTRAPISO	m²	0.21	0.38	0.54
ENCOFRADO	m²	8.10	12.20	16.50
HORMIGON	m³	1.01	1.79	2.57

ALCANTARILLA CELULAR DE 2.00 x 2.00

fs ≥ MPa		0.09	0.13	0.13
MEDIDAS	UNID.	SIMPLE	DOBLE	TRIPLE
A	cm.	230	445	660
B	cm.	230	230	230
C	cm.	260	475	690
a	cm.	10	10	10
b	cm.	—	30	30
d	cm.	15	15	15
CONTRAPISO	m²	0.26	0.48	0.69
ENCOFRADO	m²	10.60	16.60	22.00
HORMIGON	m³	1.31	2.32	3.32

ALCANTARILLA CELULAR DE 2.50 x 2.50

fs ≥ MPa		0.10	0.21	0.21
MEDIDAS	UNID.	SIMPLE	DOBLE	TRIPLE
A	cm.	290	545	810
B	cm.	290	290	290
C	cm.	320	575	840
a	cm.	15	15	15
b	cm.	—	45	45
d	cm.	20	15	15
CONTRAPISO	m²	0.32	0.58	0.84
ENCOFRADO	m²	13.20	20.00	27.20
HORMIGON	m³	2.21	2.94	4.25

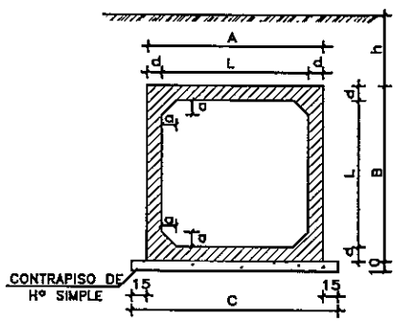
ALCANTARILLA CELULAR DE 3.00 x 3.00

fs ≥ MPa		0.12	0.21	0.21
MEDIDAS	UNID.	SIMPLE	DOBLE	TRIPLE
A	cm.	350	660	960
B	cm.	350	340	340
C	cm.	380	690	1010
a	cm.	15	15	15
b	cm.	—	45	45
d	cm.	25	20	20
CONTRAPISO	m²	0.38	0.69	1.01
ENCOFRADO	m²	15.90	24.20	32.90
HORMIGON	m³	3.30	4.82	6.84

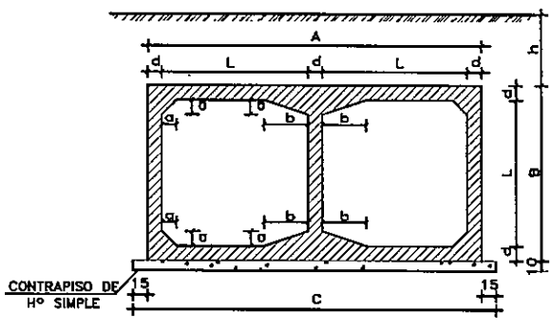
DETALLE DE ENCOFRADOS

ESC. 1:100

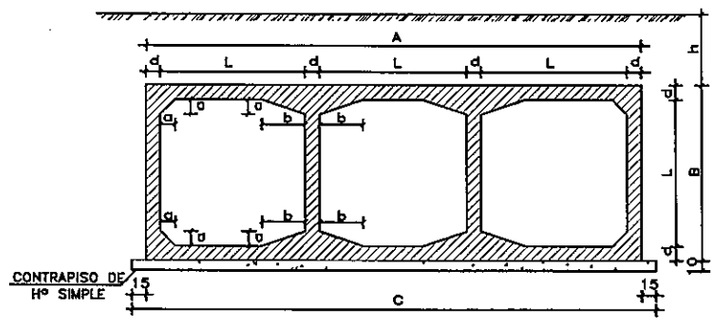
ALCANTARILLA SIMPLE



ALCANTARILLA DOBLE



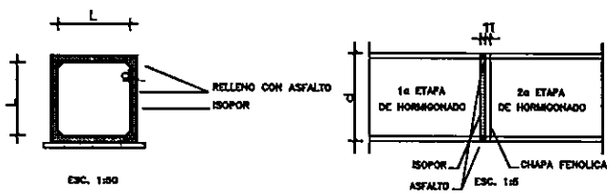
ALCANTARILLA TRIPLE



OBSERVACIONES:

1- HORMIGON fck ≥ 21 MPa
2- CONTRAPISO DE HORMIGON SIMPLE fck ≥ 15,0 MPa
3- VEHICULO TIPO TB 36
4- NOMENCLATURA: h = ALTURA DEL TERRAPLEN SOBRE LA GALERIA
fs = TENSION ADMISIBLE DEL SUELO BAJO LA GALERIA
5- REALIZAR JUNTA DE DILATACION EN ALCANTARILLAS CON LONGITUD

DETALLES DE LA JUNTA DE DILATACION



NOTA:

DESPUES DEL HORMIGONADO DE LA 1a ETAPA DEBERAN RETIRARSE LAS CHAPAS FENOLICAS DE LA JUNTA.

NOTAS :
1-
2-
3-

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Email: geocones@telesurf.com.py

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ALCANTARILLAS CELULARES ENCOFRADOS

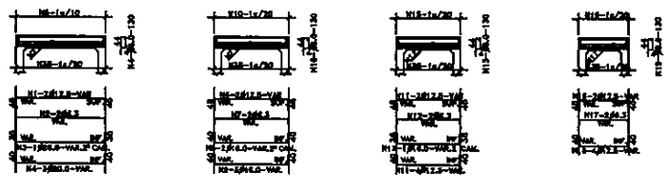
ESCALAS: VARIAS

LAMINA: DR 6.2-1/11

ALCANTARILLA CELULAR SIMPLE

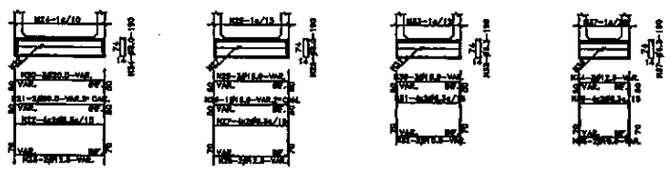
VIGAS DE BORDE DE LA LOSA SUPERIOR – OC = 30º A 45º

L=300 (2x) L=250 (2x) L=200 (2x) L=150 (2x)



VIGAS DE BORDE DE LA LOSA INFERIOR – OC = 30º A 45º

L=300 (2x) L=250 (2x) L=200 (2x) L=150 (2x)

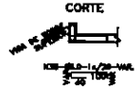


MENSULA

VISTA

VIGA DE BORDE SUPERIOR

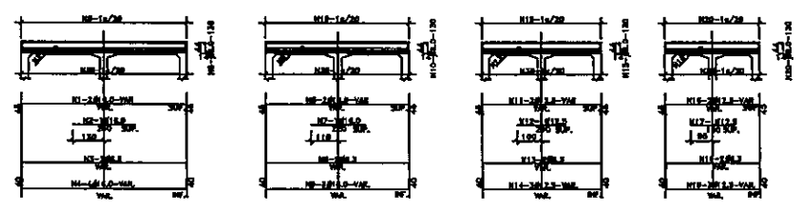
CORTE



ALCANTARILLA CELULAR DOBLE

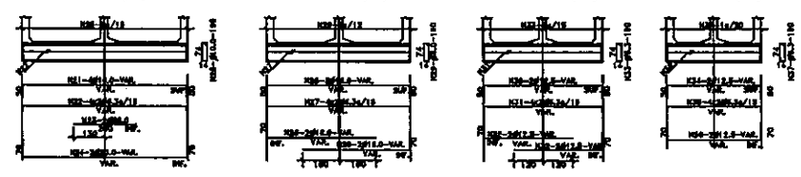
VIGAS DE BORDE DE LA LOSA SUPERIOR – OC = 30º A 45º

L=300 (2x) L=250 (2x) L=200 (2x) L=150 (2x)



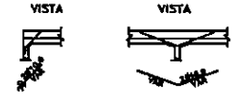
VIGAS DE BORDE DE LA LOSA INFERIOR – OC = 30º A 45º

L=300 (2x) L=250 (2x) L=200 (2x) L=150 (2x)



MENSULAS

VISTA VISTA



VIGA DE BORDE SUPERIOR

CORTE

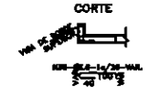


TABLA DE ARMADURAS PARA VIGAS DE BORDE DE LOSA SUPERIOR E INFERIOR

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Ø	12.5	6.3	20.0	20.0	12.5	6.3	16.0	8.0	12.5	6.3	12.5	8.0	12.5	6.3	12.5	8.0	20.0	6.3	12.5	8.0	8.0	6.3	12.5	8.0	16.0	6.3	10.0	6.3	12.5		6.3	10.0	6.3	12.5	6.3	10.0	6.3	8.0
C	4	4	2	—	4	4	6	—	4	4	8	—	4	4	6	—	8	16	4	—	6	16	4	—	4	16	4	—	4		16	4	—	6	16	4	—	—
LONG	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	190	VAR.	VAR.	VAR.	190	VAR.	VAR.	VAR.	190	VAR.		VAR.	VAR.	190	VAR.	VAR.	VAR.	190	VAR.

TABLA DE ARMADURAS PARA VIGAS DE BORDE DE LOSA SUPERIOR E INFERIOR

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Ø	16.0	16.0	6.3	16.0	8.0	16.0	16.0	6.3	16.0	8.0	12.5	12.5	6.3	12.5	8.0	12.5	12.5	6.3	12.5	8.0	8.0	6.3	20.0	20.0	10.0	16.0	6.3	16.0	8.0	12.5	6.3	12.5	6.3	12.5	6.3	12.5	6.3	8.0
C	4	2	4	8	—	4	2	4	6	—	4	2	4	6	—	4	2	4	6	—	8	16	4	4	—	8	16	8	—	4	16	8	—	4	16	4	—	—
LONG	VAR.	260	VAR.	VAR.	130	VAR.	220	VAR.	VAR.	130	VAR.	200	VAR.	VAR.	130	VAR.	150	VAR.	VAR.	130	VAR.	VAR.	260	VAR.	190	VAR.	VAR.	VAR.	190	VAR.	VAR.	190	VAR.	VAR.	VAR.	190	VAR.	VAR.

NOTAS :

1-

2-

3-

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ALCANTARILLAS SIMPLES Y DOBLES VIGAS DE BORDE

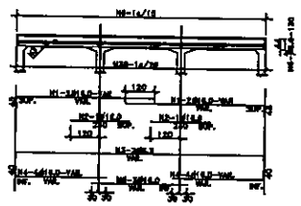
ESCALAS: VARIAS

LAMINA: DR 6.2-2/11

ALCANTARILLA CELULAR TRIPLE

VIGAS DE BORDE DE LA LOSA SUPERIOR
ESCALA 1:100

L=300 (2x)



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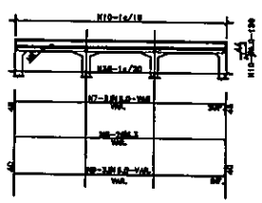

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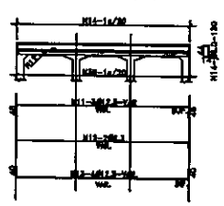
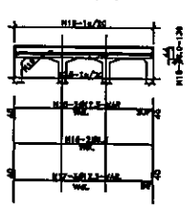
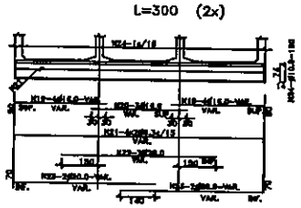


L=150 (2x)

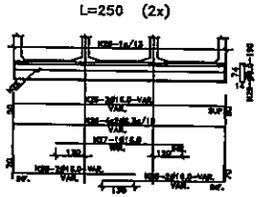


VIGAS DE BORDE DE LA LOSA INFERIOR
ESCALA 1:100

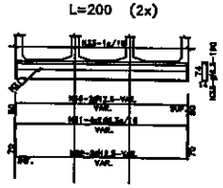
L=300 (2x)



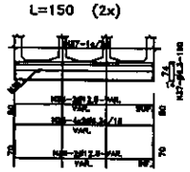
L=250 (2x)



L=200 (2x)



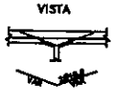
L=150 (2x)



MENSULAS

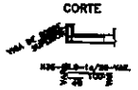
VISTA

VISTA



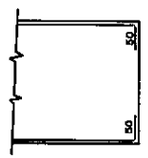
VIGA DE BORDE SUPERIOR

CORTE

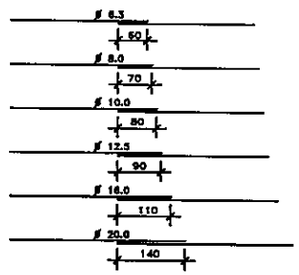


NOTAS Y DETALLES COMPLEMENTARIOS

POSICION DE LA ARMADURA SUPERIOR E INFERIOR DE LAS PAREDES EN LAS EXTREMIDADES
ESCALA 1:5

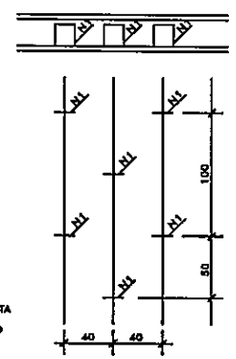


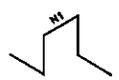
EMPALME DE LAS VARILLAS CORRIDAS (CUANDO SEA NECESARIO)
ESCALA 1:50



COLOCAR LOS EMPALMES EN PUNTOS ALTERNADOS

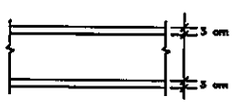
SOPORTE PARA APOYO DE LA ARMADURA SUPERIOR EN LAS LOSAS
ESCALA 1:20





ESTA ARMADURA NO ESTA COMPUTADA EN LOS RESUMENES DE HIERRO

RECUBRIMIENTO
ESCALA 1:10



NOTAS

1- CARACTERISTICA DEL HIERRO: ACERO CA-50
2- ARMADURAS MEDIDAS EN CENTIMETROS
3- CANTIDAD DE HIERROS EN KILOGRAMOS
4- RESUMEN DE HIERROS SIN DESPERDICIOS
5- DEBERAN SER PREVISTOS DADOS DE HORMIGON PARA ASEGURAR EL RECUBRIMIENTO DE 3 cm.
6- LA CANTIDAD Y LAS MEDIDAS DE LAS ARMADURAS DE LAS CABECERAS SERAN DETERMINADAS POR LAS MEDIDAS REALES DEL ENCOFRADO DE CADA TIPO DE ALCANTARILLA

TABLA DE ARMADURAS PARA VIGAS DE BORDE DE LOSA SUPERIOR E INFERIOR

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38
Ø	16.0	6.0	6.3	6.0	16.0	8.0	16.0	6.3	16.0	8.0	12.5	6.3	12.5	8.0	12.5	6.3	12.5	8.0	16.0	16.0	6.3	20.0	20.0	0.0	16.0	6.3	16.0	16.0	8.0	12.5	6.3	12.5	6.3	12.5	6.3	12.5	6.3	8.0
C	8	4	4	16	6	—	6	4	6	—	6	4	8	—	4	4	6	—	16	6	16	4	8	—	4	16	2	6	—	4	16	4	—	4	16	4	—	—
LONG	VAR.	240	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	130	VAR.	VAR.	VAR.	VAR.	VAR.	190	VAR.	VAR.	VAR.	VAR.	190	VAR.	VAR.	VAR.	190	VAR.	VAR.	VAR.	190	VAR.

NOTAS :

1-

2-

3-

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TRAMO 1: CONCEPCION - KM 82

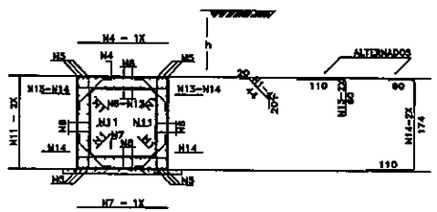
ALCANTARILLAS TRIPLES
VIGAS DE BORDE
NOTAS Y DETALLES COMPLEMENTARIOS

ESCALAS: VARIAS

LAMINA: DR 6.2-3/11

ALCANTARILLAS CELULARES DE 1.50 x 1.50

SECCION TRANSVERSAL SIMPLE

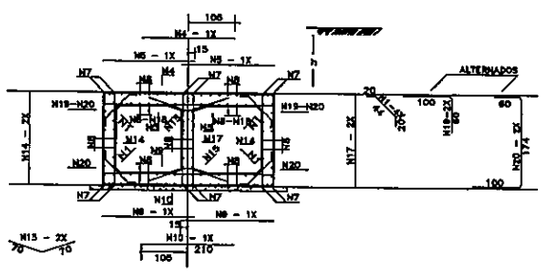


TABLAS DE ARMADURAS POR METRO DE GALERIA

$\tau_s \geq 0.09$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	6	175	c/15cm
5	12.5	12	CORR.	—
6	—	—	—	—
7	12.5	6	175	c/15cm
8	6.3	40	CORR.	c/20cm
9	—	—	—	—
10	—	—	—	—
11	6.3	10	175	c/20cm
12	10.0	7	CORR.	c/20cm
13	12.5	6	172	c/24cm
14	12.5	8	344	c/24cm

RESUMEN		
ø	Kg/m	PESO(Kg)
6.3	0.252	22
10.0	0.624	4
12.5	0.888	75
TOTAL		102 Kg

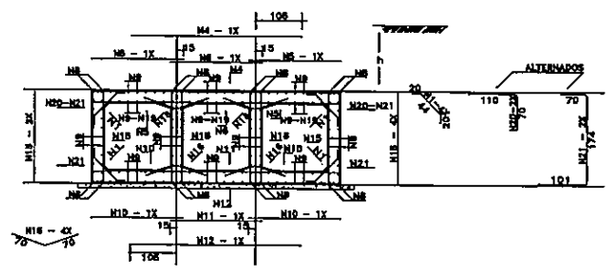
SECCION TRANSVERSAL DOBLE



$\tau_s \geq 0.13$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	8	210	c/12cm
5	10.0	17	190	c/12cm
6	—	—	—	—
7	12.5	12	CORR.	—
8	6.3	84	CORR.	c/20cm
9	10.0	13	190	c/13cm
10	10.0	8	210	c/20cm
11	—	—	—	—
12	—	—	—	—
13	—	—	—	—
14	6.3	13	175	c/15cm
15	6.3	10	140	c/20cm
16	—	—	—	—
17	6.3	10	175	c/20cm
18	10.0	18	CORR.	c/18cm
19	12.51	10	190	c/20cm
20	12.51	10	334	c/20cm

RESUMEN		
ø	Kg/m	PESO(Kg)
6.3	0.252	40
10.0	0.624	51
12.5	0.888	79
TOTAL		170 Kg

SECCION TRANSVERSAL TRIPLE



$\tau_s \geq 0.12$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	30	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	7	375	c/15cm
5	12.5	10	180	c/20cm
6	12.5	5	180	c/20cm
7	—	—	—	—
8	—	—	—	—
9	12.5	18	CORR.	—
10	6.3	115	CORR.	c/20cm
11	6.0	20	180	c/10cm
12	6.0	9	180	c/11cm
13	8.0	8	375	c/15cm
14	—	—	—	—
15	—	—	—	—
16	6.3	13	175	c/15cm
17	6.3	20	140	c/20cm
18	—	—	—	—
19	6.3	72	175	c/15cm
20	9.0	33	CORR.	c/13cm
21	12.51	10	180	c/20cm
22	12.51	10	340	c/20cm

RESUMEN		
ø	Kg/m	PESO(Kg)
6.3	0.252	61
6.0	0.223	47
12.5	0.888	122
TOTAL		230 Kg

NOTAS :

1-

2-

3-

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TRAMO 1: CONCEPCION - KM 62

ALCANTARILLAS CELULARES
ARMADURAS
SECC. 1,5 x 1,5 m

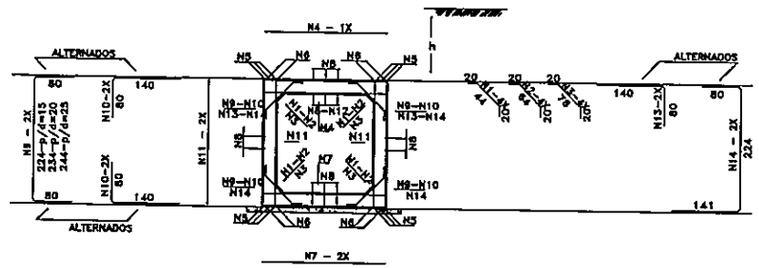
ESCALAS: VARIAS

LAMINA: DR 6.2-4/11

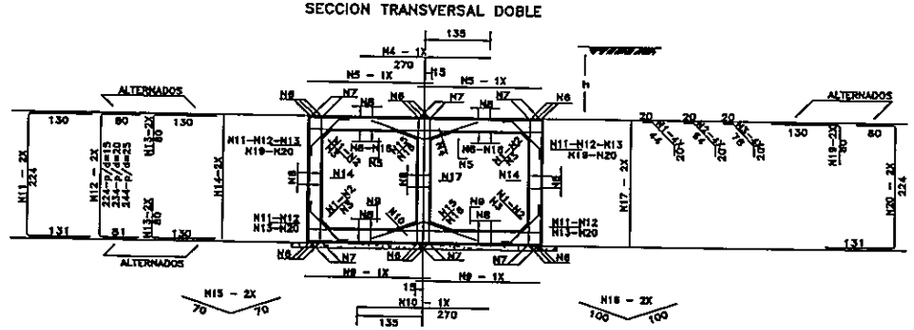
MOPC

ALCANTARILLAS CELULARES DE 2.00 x 2.00

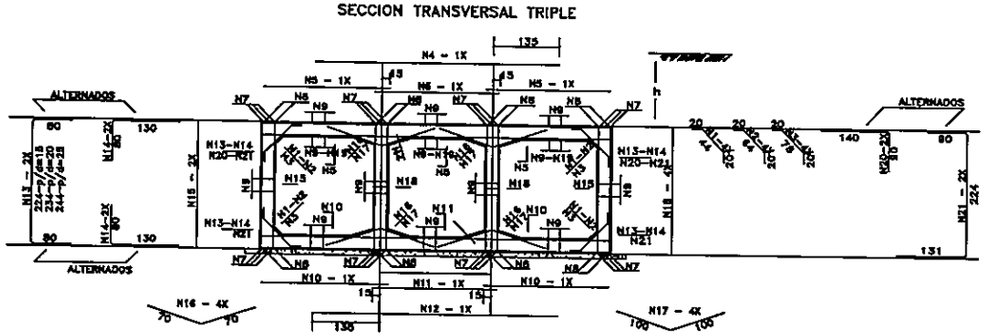
SECCION TRANSVERSAL SIMPLE



SECCION TRANSVERSAL DOBLE



SECCION TRANSVERSAL TRIPLE



TABLAS DE ARMADURAS POR METRO DE GALERIA

$\bar{\tau}_s \geq 0.09$ MPa

No.	ø	C	LONG.	SEP.
1	6.3	20	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	6	225	c/16cm
5	12.5	12	CORR.	—
6	—	—	—	—
7	12.5	6	225	c/16cm
8	6.3	63	CORR.	c/20cm
9	—	—	—	—
10	—	—	—	—
11	6.3	10	225	c/20cm
12	10.0	9	CORR.	c/20cm
13	12.5	8	220	c/24cm
14	12.5	8	445	c/24cm

RESUMEN

ø	Kg/m	PESO(Kg)
6.3	0.252	27
10.0	0.624	6
12.5	0.988	93
TOTAL		126 Kg

$\bar{\tau}_s \geq 0.13$ MPa

No.	ø	C	LONG.	SEP.
1	6.3	20	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	6	270	c/12cm
5	10.0	17	230	c/12cm
6	—	—	—	—
7	12.5	12	CORR.	—
8	6.3	108	CORR.	c/20cm
9	10.0	13	230	c/12cm
10	10.0	5	270	c/20cm
11	—	—	—	—
12	—	—	—	—
13	—	—	—	—
14	6.3	13	225	c/15cm
15	6.3	10	140	c/20cm
16	—	—	—	—
17	6.3	10	225	c/20cm
18	10.0	20	CORR.	c/18cm
19	12.5	10	210	c/20cm
20	12.5	10	438	c/20cm

RESUMEN

ø	Kg/m	PESO(Kg)
6.3	0.252	50
10.0	0.624	65
12.5	0.988	99
TOTAL		214 Kg

$\bar{\tau}_s \geq 0.12$ MPa

No.	ø	C	LONG.	SEP.
1	6.3	20	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	7	485	c/15cm
5	12.5	10	230	c/20cm
6	12.5	5	230	c/20cm
7	—	—	—	—
8	12.5	16	CORR.	—
9	6.3	153	CORR.	c/20cm
10	8.0	20	230	c/10cm
11	8.0	9	230	c/11cm
12	8.0	8	485	c/13cm
13	—	—	—	—
14	—	—	—	—
15	6.3	13	225	c/15cm
16	6.3	20	140	c/20cm
17	—	—	—	—
18	6.3	27	225	c/15cm
19	8.0	42	CORR.	c/13cm
20	12.5	10	230	c/20cm
21	12.5	10	445	c/20cm

RESUMEN

ø	Kg/m	PESO(Kg)
6.3	0.252	75
8.0	0.393	59
12.5	0.988	152
TOTAL		286 Kg

NOTAS :

1-

2-

3-

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ALCANTARILLAS CELULARES ARMADURAS
SECC: 2,0 x 2,0 m

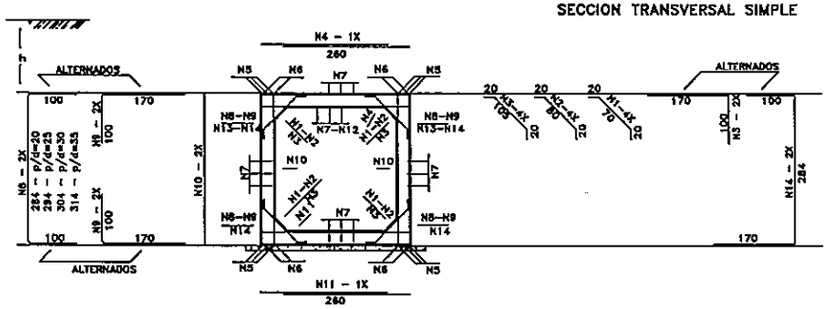
ESCALA: VARIAS

LAMINA: DR 6.2-5/11

MOPC

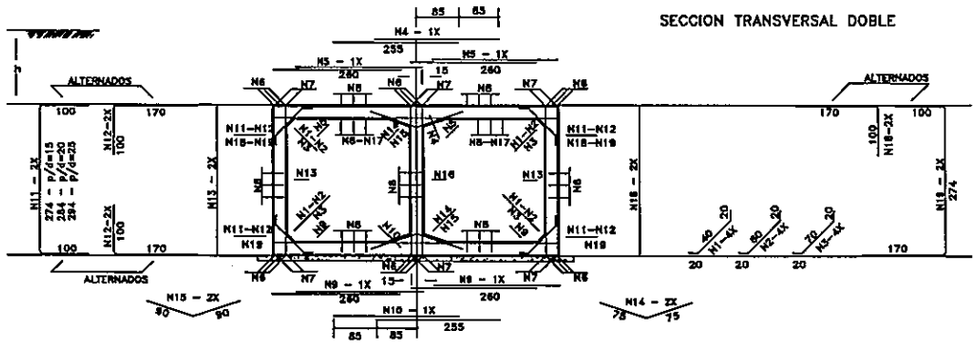
ALCANTARILLAS CELULARES DE 2.50 x 2.50

SECCION TRANSVERSAL SIMPLE



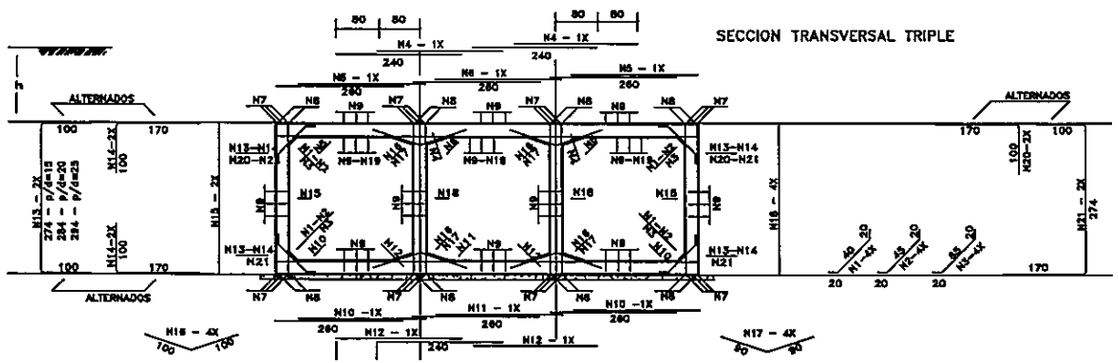
TABLAS DE ARMADURAS POR METRO DE GALERIA				
$\bar{\tau}_s \geq 0.10$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	110	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	6	260	c/16cm
5	—	—	—	—
6	16.0	6	CORR.	—
7	6.3	84	CORR.	c/20cm
8	—	—	—	—
9	—	—	—	—
10	6.3	18	285	c/12cm
11	12.5	6	260	c/16cm
12	12.5	10	CORR.	c/25cm
13	12.5	6	270	c/25cm
14	12.5	6	544	c/26cm
RESUMEN				
ø	Kg/m	PESO(Kg)		
6.3	0.252	41		
12.5	0.988	107		
16.0	1.570	14		
TOTAL		162 Kg		

SECCION TRANSVERSAL DOBLE



$\bar{\tau}_s \geq 0.21$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	80	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	10	255	c/10cm
5	10.0	20	260	c/10cm
6	—	—	—	—
7	12.5	12	CORR.	—
8	6.3	124	CORR.	c/20cm
9	10.0	14	260	c/14cm
10	10.0	6	255	c/13cm
11	—	—	—	—
12	—	—	—	—
13	6.3	9	275	c/11cm
14	6.3	10	150	c/20cm
15	—	—	—	—
16	6.3	12	275	c/13cm
17	10.0	16	CORR.	c/13cm
18	12.5	12	270	c/15cm
19	12.5	12	544	c/16cm
RESUMEN				
ø	Kg/m	PESO(Kg)		
6.3	0.252	63		
10.0	0.824	76		
12.5	0.988	135		
TOTAL		276 Kg		

SECCION TRANSVERSAL TRIPLE



$\bar{\tau}_s \geq 0.21$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	80	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	20	240	c/10cm
5	12.5	14	260	c/14cm
6	10.0	8	260	c/17cm
7	—	—	—	—
8	12.5	16	CORR.	—
9	6.3	204	CORR.	c/20cm
10	10.0	14	260	c/14cm
11	10.0	8	260	c/15cm
12	10.0	12	240	c/13cm
13	—	—	—	—
14	—	—	—	—
15	6.3	20	275	c/10cm
16	—	—	—	—
17	6.3	20	180	c/20cm
18	6.3	20	275	c/20cm
19	10.0	46	CORR.	c/13cm
20	12.5	12	270	c/15cm
21	12.5	12	544	c/16cm
RESUMEN				
ø	Kg/m	PESO(Kg)		
6.3	0.252	98		
10.0	0.824	94		
12.5	0.988	198		
TOTAL		390 Kg		

NOTAS :

1-

2-

3-

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TRAMO 1: CONCEPCION - KM 52

ALCANTARILLAS CELULARES
ARMADURAS
SECC: 2,5 x 2,5 m

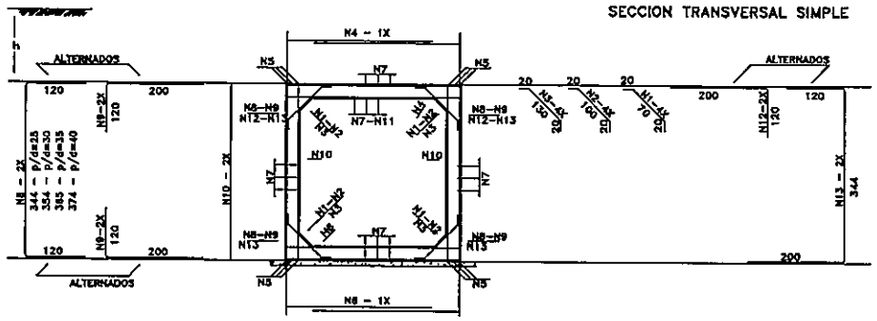
ESCALAS: VARIAS

LAMINA: DR 6.2-6/11

MOPC

ALCANTARILLAS CELULARES DE 3.00 x 3.00

SECCION TRANSVERSAL SIMPLE

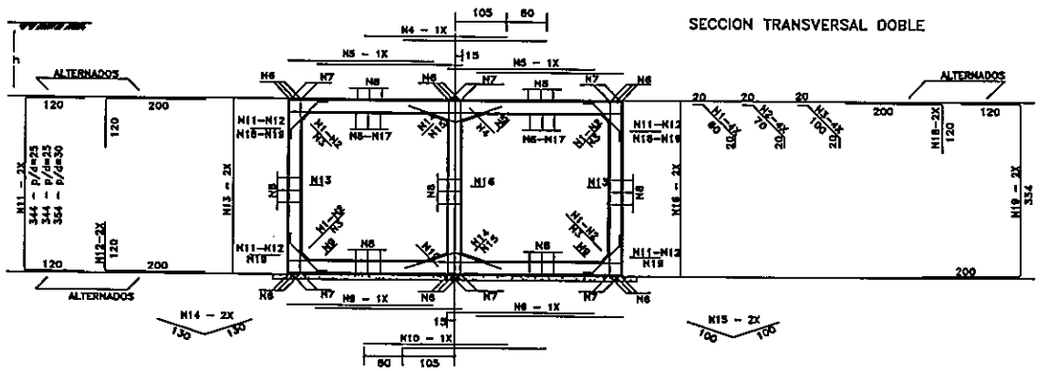


TABLAS DE ARMADURAS POR METRO DE GALERÍA

$\bar{\tau}_a \geq 0.12$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	110	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	6	310	c/15cm
5	16.0	12	CORR.	—
6	12.5	6	310	c/15cm
7	6.3	98	CORR.	c/20cm
8	—	—	—	—
9	—	—	—	—
10	6.3	18	345	c/12cm
11	6.3	29	CORR.	c/10cm
12	12.5	8	320	c/24cm
13	12.5	6	664	c/24cm

RESUMEN		
ø	Kg/m	PESO(Kg)
6.3	0.252	55
12.5	0.988	115
16.0	1.570	21
TOTAL		191 Kg

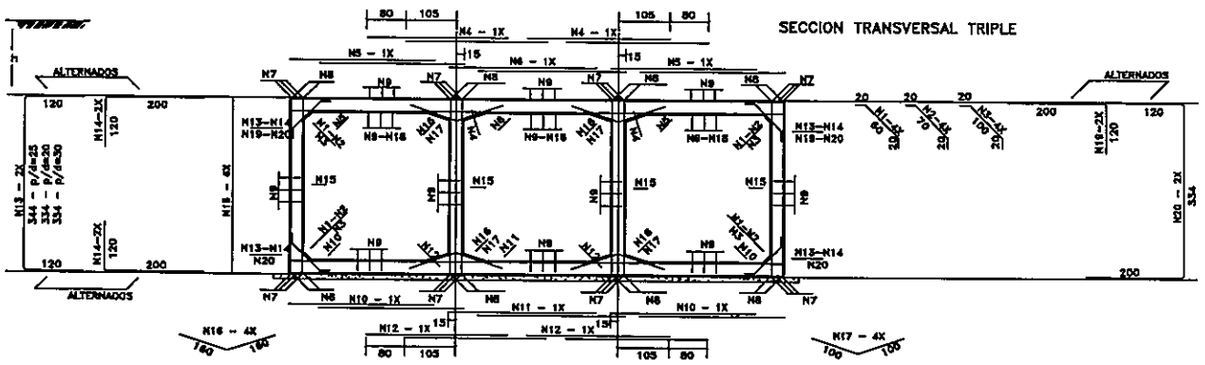
SECCION TRANSVERSAL DOBLE



$\bar{\tau}_a \geq 0.21$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	100	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	10	290	c/10cm
5	10.0	20	290	c/10cm
6	—	—	—	—
7	12.5	12	CORR.	—
8	6.3	168	CORR.	c/20cm
9	10.0	14	290	c/10cm
10	12.5	5	290	c/20cm
11	—	—	—	—
12	—	—	—	—
13	10.0	8	335	c/25cm
14	—	—	—	—
15	6.3	10	200	c/20cm
16	10.0	8	335	c/30cm
17	10.0	32	CORR.	c/10cm
18	12.5	10	320	c/20cm
19	12.5	10	654	c/20cm

RESUMEN		
ø	Kg/m	PESO(Kg)
6.3	0.232	37
10.0	0.624	117
12.5	0.988	153
TOTAL		327 Kg

SECCION TRANSVERSAL TRIPLE



$\bar{\tau}_a \geq 0.21$ MPa				
No.	ø	C	LONG.	SEP.
1	6.3	20	100	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	20	290	c/10cm
5	12.5	12	290	c/15cm
6	12.5	8	290	c/15cm
7	—	—	—	—
8	12.5	16	CORR.	—
9	6.3	238	CORR.	c/20cm
10	8.0	10	290	c/10cm
11	8.0	10	290	c/10cm
12	8.0	20	290	c/10cm
13	—	—	—	—
14	—	—	—	—
15	8.0	30	335	c/20cm
16	—	—	—	—
17	6.3	30	200	c/20cm
18	8.0	68	CORR.	c/15cm
19	12.5	10	320	c/20cm
20	12.5	10	654	c/20cm

RESUMEN		
ø	Kg/m	PESO(Kg)
6.3	0.232	81
8.0	0.383	125
12.5	0.988	222
TOTAL		428 Kg

NOTAS :

1-

2-

3-

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CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

ALCANTARILLAS CELULARES
ARMADURAS
SECC: 3,0 x 3,0 m

ESCALAS: VARIAS

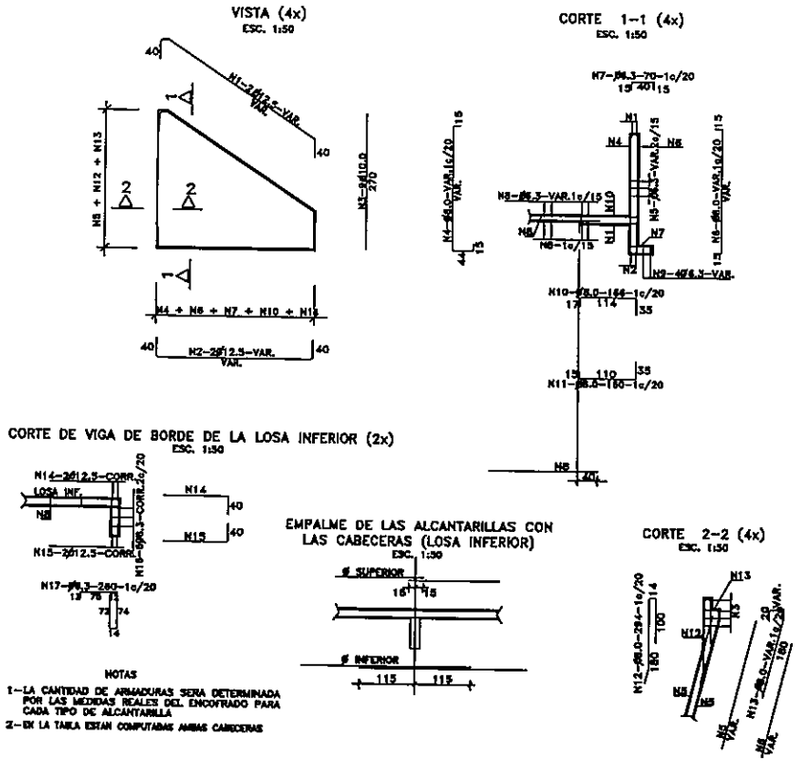
LAMINA: DR 6.2-7/11

MOPC
AREA DEL PROYECTO

RESUMEN DE LAS ARMADURAS PARA DOS CABECERAS

Ø	1.50 x 1.50			2.00 x 2.00		
TIPO	SIMPLE	DOBLE	TRIPLE	SIMPLE	DOBLE	TRIPLE
6.3	492	545	745	531	701	865
8.0	15	98	46	420	450	514
10.0	95	111	161	115	122	172
12.5	161	220	274	167	281	368
16.0	—	—	—	22	—	—
20.0	—	—	—	—	—	—
TOTAL	763 Kg	972 Kg	1.229 Kg	1.275 Kg	1.554 Kg	1.919 Kg

ARMADURAS DE CABECERAS – ALCANTARILLA CELULAR DE 1.50 x 1.50



NOTAS

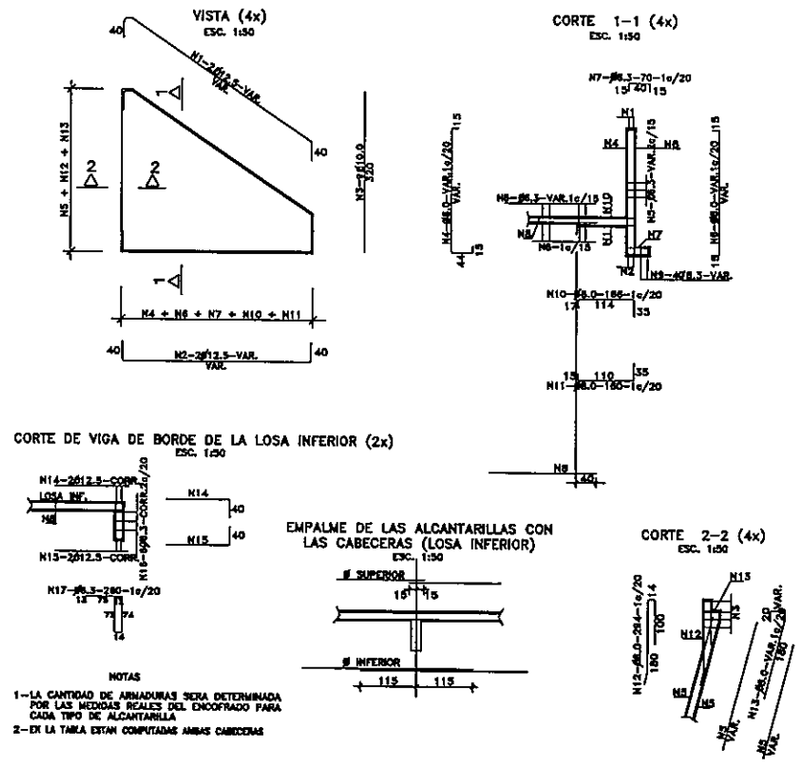
1–LA CANTIDAD DE ARMADURAS SERA DETERMINADA POR LAS MEDIDAS REALES DEL ENCOFRADO PARA CADA TIPO DE ALCANTARILLA

2–EN LA TABLA ESTAN COMPUTADAS AMBAS CABECERAS

TABLA DE ARMADURAS PARA CABECERAS DE ALCANTARILLA CELULAR –

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ø	12.5	12.5	10.0	8.0	6.3	8.0	6.3	6.3	8.0	8.0	8.0	8.0	8.0	12.5	12.5	6.3	6.3
C	8	8	36	—	—	—	—	—	—	—	—	—	—	4	4	12	—
LONG.	462	360	270	VAR.	VAR.	VAR.	70	VAR.	350	168	160	294	VAR.	CORR.	CORR.	CORR.	260

ARMADURAS DE CABECERAS – ALCANTARILLA CELULAR DE 2.00 x 2.00



NOTAS

1–LA CANTIDAD DE ARMADURAS SERA DETERMINADA POR LAS MEDIDAS REALES DEL ENCOFRADO PARA CADA TIPO DE ALCANTARILLA

2–EN LA TABLA ESTAN COMPUTADAS AMBAS CABECERAS

TABLA DE ARMADURAS PARA CABECERAS DE ALCANTARILLA CELULAR –

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ø	12.5	12.5	10.0	8.0	6.3	8.0	6.3	6.3	6.3	8.0	8.0	8.0	8.0	12.5	12.5	6.3	6.3
C	8	8	36	—	—	—	—	—	16	—	—	—	—	4	4	12	—
LONG.	VAR.	VAR.	320	VAR.	VAR.	VAR.	70	VAR.	VAR.	168	160	294	VAR.	CORR.	CORR.	CORR.	260

NOTAS :

1-

2-

3-

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CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 82

ALCANTARILLAS CELULARES
ARMADURAS
CABECERAS NORMALES
SECC: 1,5 Y 2,0 m

ESCALAS: VARIAS

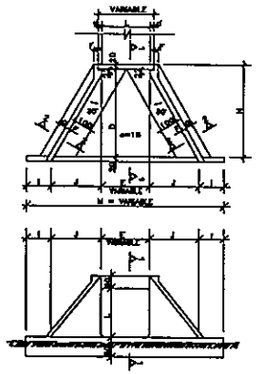
LAMINA: DR 6.2-8/11

MOPC

CABECERAS NORMALES PARA ALCANTARILLAS CELULARES

ALCANTARILLA SIMPLE

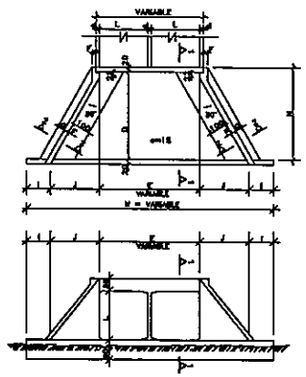
PLANTA



VISTA FRONTAL

ALCANTARILLA DOBLE

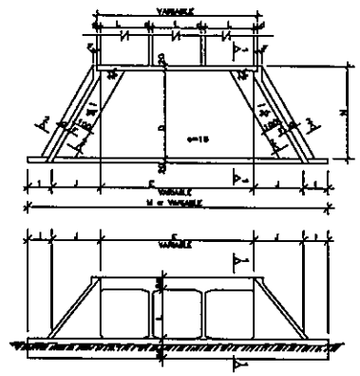
PLANTA



VISTA FRONTAL

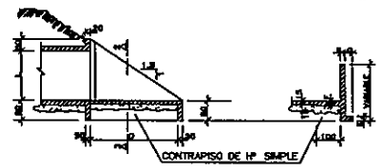
ALCANTARILLA TRIPLE

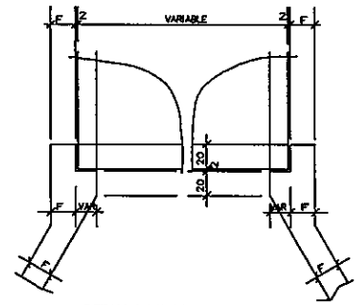
PLANTA



VISTA FRONTAL

CORTE 1–1 CORTE 2–2





DETALLE DE VISTA EN PLANTA

TABLA DE DIMENSIONES Y CANTIDAD DE MATERIALES PARA AMBAS CABECERAS

MEDIDAS (cm)	ALCANTARILLA SIMPLE				
	1.00x1.00m. fe > 0.09 MPa	1.50x1.50m. fe > 0.09 MPa	2.00x2.00m. fe > 0.09 MPa	2.50x2.50m. fe > 0.10 MPa	3.00x3.00m. fe > 0.12 MPa
D	280.0	280.0	355.0	430.0	505.0
E	100.0	150.0	200.0	250.0	300.0
F	15.0	15.0	20.0	20.0	25.0
G	30.0	30.0	30.0	50.0	50.0
I	100.0	100.0	100.0	100.0	100.0
J	180.5	180.5	204.0	247.0	290.5
L	100.0	150.0	200.0	250.0	300.0
M	621.0	671.0	806.0	944.0	1081.0
N	320.0	320.0	395.0	470.0	545.0

MEDIDAS (cm)	ALCANTARILLA DOBLE				
	1.00x1.00m. fe > 0.10 MPa	1.50x1.50m. fe > 0.10 MPa	2.00x2.00m. fe > 0.13 MPa	2.50x2.50m. fe > 0.21 MPa	3.00x3.00m. fe > 0.21 MPa
D	280.0	280.0	355.0	430.0	505.0
E	215.0	2L + d (VER LAMINA No. 7)			
F	15.0	15.0	20.0	20.0	25.0
G	30.0	30.0	30.0	50.0	50.0
I	100.0	100.0	100.0	100.0	100.0
J	180.5	180.5	204.0	247.0	290.5
L	100.0	150.0	200.0	250.0	300.0
M	638.0	200 + 2J + E			
N	320.0	320.0	395.0	470.0	545.0

MEDIDAS (cm)	ALCANTARILLA TRIPLE			
	1.50x1.50m. fe > 0.10 MPa	2.00x2.00m. fe > 0.13 MPa	2.50x2.50m. fe > 0.21 MPa	3.00x3.00m. fe > 0.21 MPa
D	280.0	355.0	430.0	505.0
E	3L + 2d (VER LAMINA No. 7)			
F	15.0	20.0	20.0	25.0
G	30.0	30.0	50.0	50.0
I	100.0	100.0	100.0	100.0
J	180.5	204.0	247.0	290.5
L	150.0	200.0	250.0	300.0
M	200 + 2J + E			
N	320.0	395.0	470.0	545.0

DESCRIPCION	UNID	ALCANTARILLA SIMPLE				
		1.00x1.00m.	1.50x1.50m.	2.00x2.00m.	2.50x2.50m.	3.00x3.00m.
CONTRAPISO	m³	1.69	2.48	4.35	6.30	8.70
ENCOFRADO	m²	65.16	83.90	113.00	144.00	181.00
HORMIGON	m³	7.96	10.85	17.86	24.35	36.53

DESCRIPCION	UNID	ALCANTARILLA DOBLE				
		1.00x1.00m	1.50x1.50m	2.00x2.00m	2.50x2.50m	3.00x3.00m
CONTRAPISO	m³	2.60	3.93	6.45	9.75	13.85
ENCOFRADO	m²	71.70	92.00	120.80	158.00	193.00
HORMIGON	m³	8.57	12.33	20.86	30.05	44.43

DESCRIPCION	UNID	ALCANTARILLA TRIPLE			
		1.50x1.50m	2.00x2.00m	2.50x2.50m	3.00x3.00m
CONTRAPISO	m³	5.40	8.85	13.20	18.45
ENCOFRADO	m²	104.00	138.00	174.00	217.00
HORMIGON	m³	16.40	26.26	35.75	52.43

NOTAS

1–EL PROYECTO DE LAS CABECERAS SE APLICA A TODOS LOS TIPOS DE CELULARES NORMALES, ESTANDO REPRESENTADA LA ALCANTARILLA DE PLANTA, VISTA FRONTAL Y CORTES EN ESCALA 1:100 ; DETALLE EN

2–LAS CANTIDADES INDICADAS EN LAS TABLAS SON PARA DOS CABECERA ESTANDO COMPUTADAS: LAS ALAS (4x); LOSA DE PISO ENTREALAS (BORDE INFERIOR DEL CUERPO DE LA ALCANTARILLA (2x).

3–EL CONTRAPISO BAJO LA LOSA DE PISO ENTREALAS E? DE H SIMPLE DE UN ESPESOR DE 10 cm.

4–HORMIGON PARA CABECERAS fck > 21 MPa.

5–NOMENCLATURA: fe = TENSION ADMISIBLE DEL SUELO BAJO LA GALER

NOTAS :

1-

2-

3-

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CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

ALCANTARILLAS CELULARES
CABEZERAS NORMALES
ENCOFRADOS

ESCALAS: VARIAS

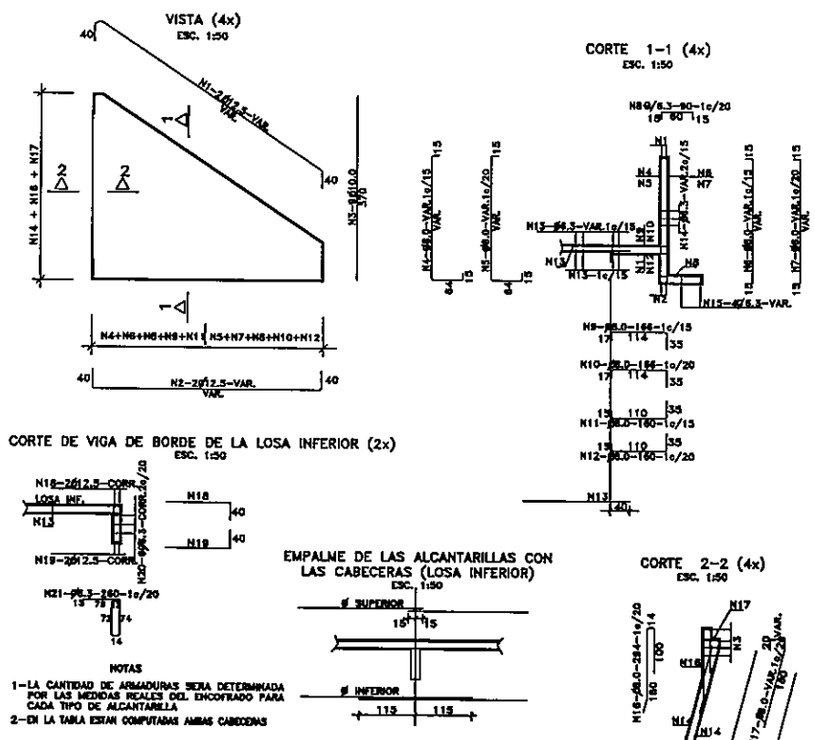
LAMINA: DR 6.2-9/11

MOPC

RESUMEN DE LAS ARMADURAS PARA DOS CABECERAS

Ø	2.50 x 2.50			3.00 x 3.00		
TIPO	SIMPLE	DOBLE	TRIPLE	SIMPLE	DOBLE	TRIPLE
6.3	621	852	1.217	178	233	273
8.0	505	568	644	1.485	1.891	2.296
10.0	345	344	433	560	652	746
12.5	210	198	223	240	229	250
16.0	75	237	339	53	245	390
20.0	—	—	—	86	102	198
TOTAL	1.756 Kg	2.199 Kg	2.856 Kg	2.604 Kg	3.352 Kg	4.153 Kg

ARMADURAS DE CABECERAS – ALCANTARILLA CELULAR DE 2.50 x 2.50



NOTAS

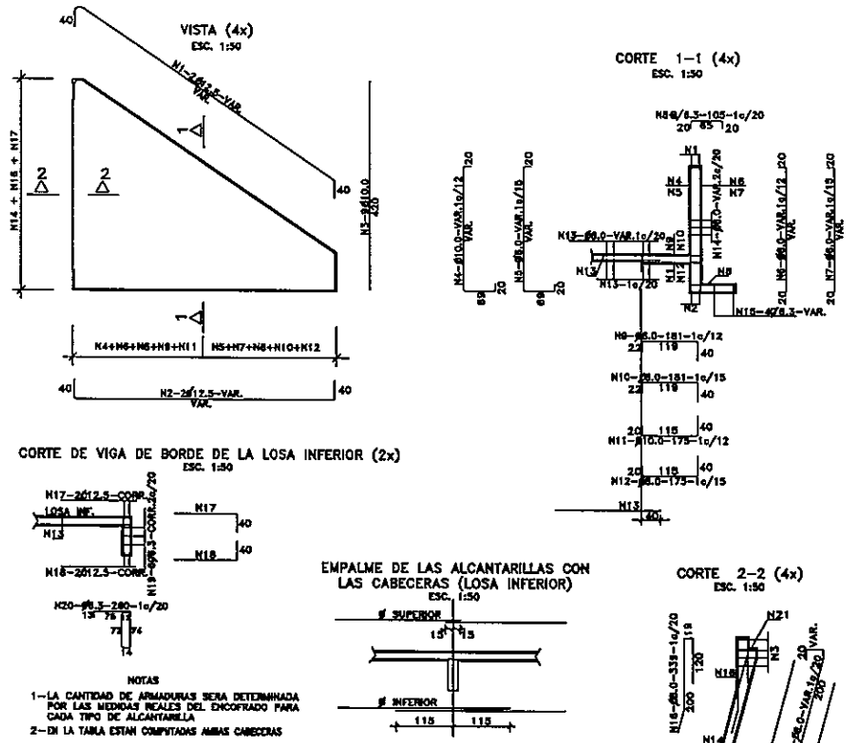
1–LA CANTIDAD DE ARMADURAS SERA DETERMINADA POR LAS MEDIDAS REALES DEL ENCOFRADO PARA CADA TIPO DE ALCANTARILLA

2–EN LA TABLA ESTAN COMPUTADAS AMBAS CABECERAS

TABLA DE ARMADURAS PARA CABECERAS DE ALCANTARILLA CELULAR –

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Ø	12.5	12.5	10.0	10.0	8.0	8.0	8.0	6.3	8.0	8.0	10.0	8.0	6.3	6.3	6.3	8.0	8.0	12.5	12.5	6.3	6.3
C	8	8	36	—	—	—	—	—	—	—	—	—	—	—	16	—	—	4	4	12	—
LONG.	VAR.	VAR.	370	VAR.	VAR.	VAR.	VAR.	90	166	166	160	160	VAR.	VAR.	VAR.	294	VAR.	CORR.	CORR.	CORR.	260

ARMADURAS DE CABECERAS – ALCANTARILLA CELULAR DE 3.00 x 3.00



NOTAS

1–LA CANTIDAD DE ARMADURAS SERA DETERMINADA POR LAS MEDIDAS REALES DEL ENCOFRADO PARA CADA TIPO DE ALCANTARILLA

2–EN LA TABLA ESTAN COMPUTADAS AMBAS CABECERAS

TABLA DE ARMADURAS PARA CABECERAS DE ALCANTARILLA CELULAR –

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Ø	12.5	12.5	10.0	10.0	8.0	8.0	8.0	6.3	8.0	8.0	10.0	8.0	8.0	8.0	6.3	8.0	12.5	12.5	6.3	6.3	8.0
C	8	8	36	—	—	—	—	—	—	—	—	—	—	16	16	—	4	4	12	—	—
LONG.	VAR.	VAR.	420	VAR.	VAR.	VAR.	VAR.	105	181	181	175	175	VAR.	VAR.	VAR.	339	CORR.	CORR.	CORR.	260	VAR.

NOTAS :

1-

2-

3-

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CONCEPCION - VALLE MI

TRAMO 1: CONCEPCION - KM 52

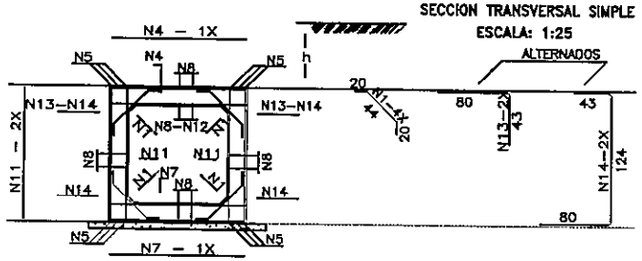
ALCANTARILLAS CELULARES
ARMADURAS
CABECERAS NORMALES
SECC: 2,5 Y 3,0 m

ESCALAS: VARIAS

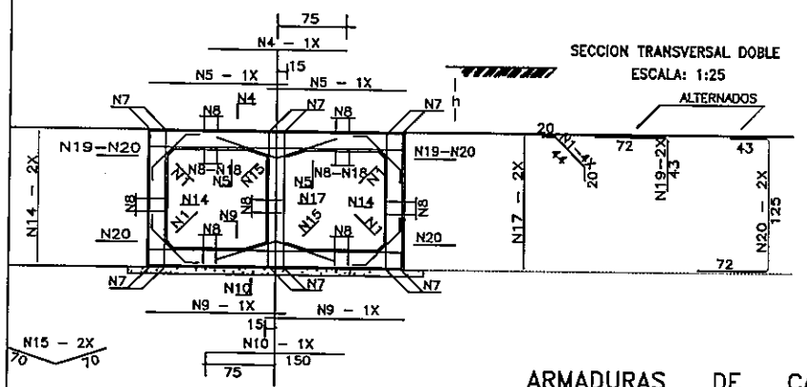
LAMINA: DR 6.2-10/11

MOPC

SECCION TRANSVERSAL SIMPLE
ESCALA: 1:25



SECCION TRANSVERSAL DOBLE
ESCALA: 1:25



TABLAS DE ARMADURAS POR METRO DE GALERIA

SIMPLE

$\bar{f}a \geq 0.09$ MPa

No.	Ø	C	LONG.	SEP.
1	6.3	20	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	8	125	c/15cm
5	12.5	12	CORR.	—
6	—	—	—	—
7	12.5	6	125	c/15cm
8	6.3	48	CORR.	c/20cm
9	—	—	—	—
10	—	—	—	—
11	6.3	10	125	c/20cm
12	10.0	7	CORR.	c/20cm
13	12.5	6	123	c/24cm
14	12.5	5	247	c/24cm

RESUMEN

Ø	Kg/m	PESO(Kg)
6.3	0.252	20
10.0	0.624	5
12.5	0.988	45
TOTAL		70 Kg

DOBLE

$\bar{f}a \geq 0.13$ MPa

No.	Ø	C	LONG.	SEP.
1	6.3	20	84	c/20cm
2	—	—	—	—
3	—	—	—	—
4	12.5	8	150	c/12cm
5	10.0	17	130	c/12cm
6	—	—	—	—
7	12.5	12	CORR.	—
8	6.3	84	CORR.	c/20cm
9	10.0	13	130	c/15cm
10	10.0	5	150	c/20cm
11	—	—	—	—
12	—	—	—	—
13	—	—	—	—
14	6.3	13	125	c/15cm
15	6.3	10	140	c/20cm
16	—	—	—	—
17	6.3	10	125	c/20cm
18	10.0	16	CORR.	c/18cm
19	12.5	10	115	c/20cm
20	12.5	10	240	c/20cm

RESUMEN

Ø	Kg/m	PESO(Kg)
6.3	0.252	37
10.0	0.624	39
12.5	0.988	59
TOTAL		135 Kg

TABLA DE ARMADURAS PARA VIGAS DE BORDE DE LOSA SUPERIOR E INFERIOR

CELULAR SIMPLE

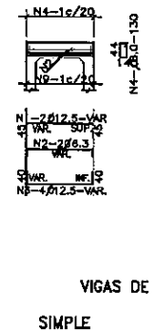
No.	1	2	3	4	5	6	7	8	9
Ø	8.0	20.0	6.3	12.5	12.5	6.3	10.0	6.3	8.0
C	—	8	16	4	6	16	4	—	—
LONG	130	VAR.	VAR.	VAR.	VAR.	VAR.	VAR.	190	VAR.

CELULAR DOBLE

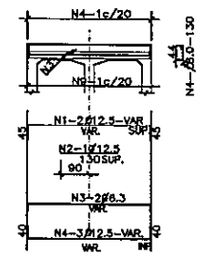
No.	1	2	3	4	5	6	7	8	9
Ø	12.5	12.5	6.3	12.5	12.5	6.3	12.5	6.3	8.0
C	4	2	4	6	4	16	4	—	—
LONG	VAR.	130	VAR.	VAR.	VAR.	VAR.	VAR.	190	VAR.

VIGAS DE BORDE DE LA LOSA SUPERIOR
ESCALA: 1:50

SIMPLE L=100 (2x)

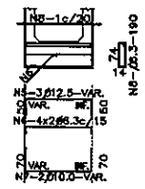


DOBLE L=100 (2x)

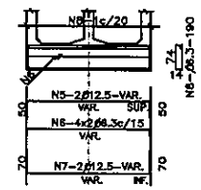


VIGAS DE BORDE DE LA LOSA INFERIOR
ESCALA: 1:50

SIMPLE L=100 (2x)

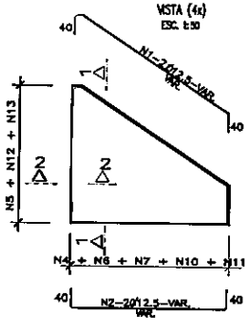


DOBLE L=100 (2x)

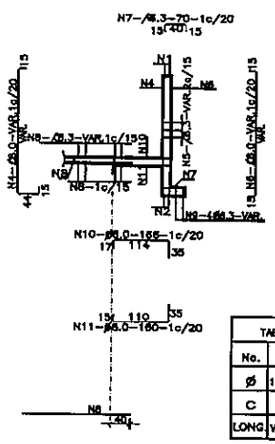


ARMADURAS DE CABECERAS

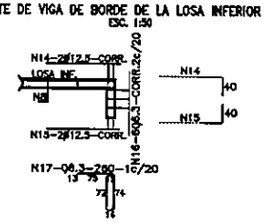
VISTA (4x)
ESC. 1:50



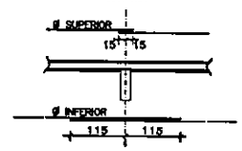
CORTE 1-1 (4x)
ESC. 1:50



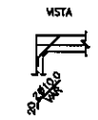
CORTE DE VIGA DE BORDE DE LA LOSA INFERIOR (2x)
ESC. 1:50



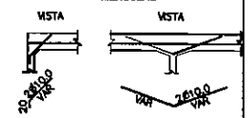
EMPALME DE LAS ALCANTARILLAS CON LAS CABECERAS (LOSA INFERIOR)
ESC. 1:50



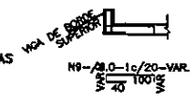
SIMPLE
MENSULA
VISTA



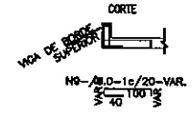
DOBLE
MENSULAS
VISTA VISTA



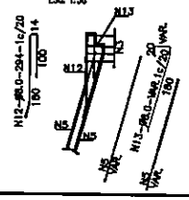
VIGA DE BORDE SUPERIOR
CORTE



VIGA DE BORDE SUPERIOR
CORTE



CORTE 2-2 (4x)
ESC. 1:50



NOTAS

1- LA CANTIDAD DE ARMADURAS SERA DETERMINADA POR LAS MEDIDAS REALES DEL ENCOFRADO PARA CADA TIPO DE ALCANTARILLA

2- EN LA TABLA ESTAN COMPUTADAS AMBAS CABECERAS

TABLA DE ARMADURAS PARA CABECERAS DE ALCANTARILLA CELULAR – 1.00x1.00

No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Ø	12.5	12.5	10.0	8.0	6.3	8.0	6.3	6.3	8.0	8.0	8.0	8.0	8.0	12.5	12.5	6.3	6.3
C	8	8	36	—	—	—	—	—	—	—	—	—	—	4	4	12	—
LONG.	VAR.	VAR.	215	VAR.	VAR.	VAR.	70	VAR.	VAR.	156	160	294	VAR.	CORR.	CORR.	CORR.	260

RESUMEN DE LAS ARMADURAS PARA DOS CABECERAS

Ø	1.00 x 1.00	
TIPO	SIMPLE	DOBLE
6.3	492	545
8.0	15	96
10.0	95	111
12.5	161	220
16.0	—	—
20.0	—	—
TOTAL	763 Kg	972 Kg

NOTAS :
1-
2-
3-

CONSORCIO GUARANI - GEOCON

GEOCON S.A. CONSULTORA

REPÚBLICA DEL PARAGUAY
MINISTERIO DE OBRAS PÚBLICAS Y COMUNICACIONES
Vamos por Buen camino

DISEÑO FINAL DE INGENIERIA
CONCEPCION - VALLE MI
TRAMO I: CONCEPCION - [illegible]

ALCANTARILLA CELULARES
ARMADURAS Y VIGAS
BORDE - SECC 1x1m

ESCALA: VARIAS

LAMINA: DR 6.3-11/11

MOPC
ÁREA DEL PROYECTO