

DEPARTAMENTO DE ENGENHARIA DE PRODUÇÃO E TRANSPORTES
LABORATÓRIO DE SISTEMAS DE TRANSPORTE

PROJETO PONTO DE PARTIDA

PARTE II

EDIÇÃO UFRGS 2021/2

Daniel Sergio Presta Garcia
Gabriel Warken
Magno Vargas Bertoglio
Júlia Martins Rodríguez de Azevedo
Thales Mezzacasa Brum

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EDIÇÃO UFRGS 2021/2

PORTO ALEGRE

UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL

2022

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CAPÍTULO III

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REPÚBLICA FEDERATIVA DO BRASIL

UNIVERSIDADE FEDERAL DE SANTA MARIA – UFSM

CENTRO DE TECNOLOGIA - CT

CURSO DE ENGENHARIA CIVIL

LABORATÓRIO DE MOBILIDADE E LOGÍSTICA – *PROJECT-BASED LEARNING* – PROJETO PONTO DE PARTIDA

PROJETO BÁSICO PARA IMPLANTAÇÃO DE TRECHO RODOVIÁRIO

ENTRE INDEPENDÊNCIA E ALEGRIA

Rodovia:	PPP- 2022/01
Norma Técnica:	DNER/1999
Classe da rodovia:	III
Região:	MONTANHOSA
Configuração:	pista simples com acostamentos
Classificação do solo:	1ª Categoria
Faixa de exploração:	2 x 250m
Extensão aproximada	15,8 Km, em diretriz km



GRUPO 22123 – NEXUM BR
AGOSTO/2022

DADOS DE IDENTIFICAÇÃO

Instituição: **Universidade Federal de Santa Maria – UFSM**

Unidade: **Centro de Tecnologia - CT**

Curso: **Engenharia Civil – EC**

Laboratório: **Laboratório de Mobilidade e Logística – LAMOT**

Projeto: **Aplicação de metodologias ativas e experiências inovadoras de ensino-aprendizagem tecnológico (Projeto Ponto de Partida)**

Disciplina: **Projeto Geométrico de Rodovias**

Edição: **2022/1**

Ano: **2022**

Semestre: **1**

Disciplina: **Rodovias I**

Turma: **12**

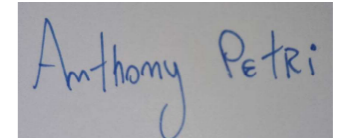
Número da Equipe: **22123**

Nome: **NEXUM B**

integrantes do grupo:



Ana Lúcia Atarão Horn



Anthony Da Silva Petri



Augusto Carre Sosa

Lucas Rossi

Lucas Rossi

SUMÁRIO

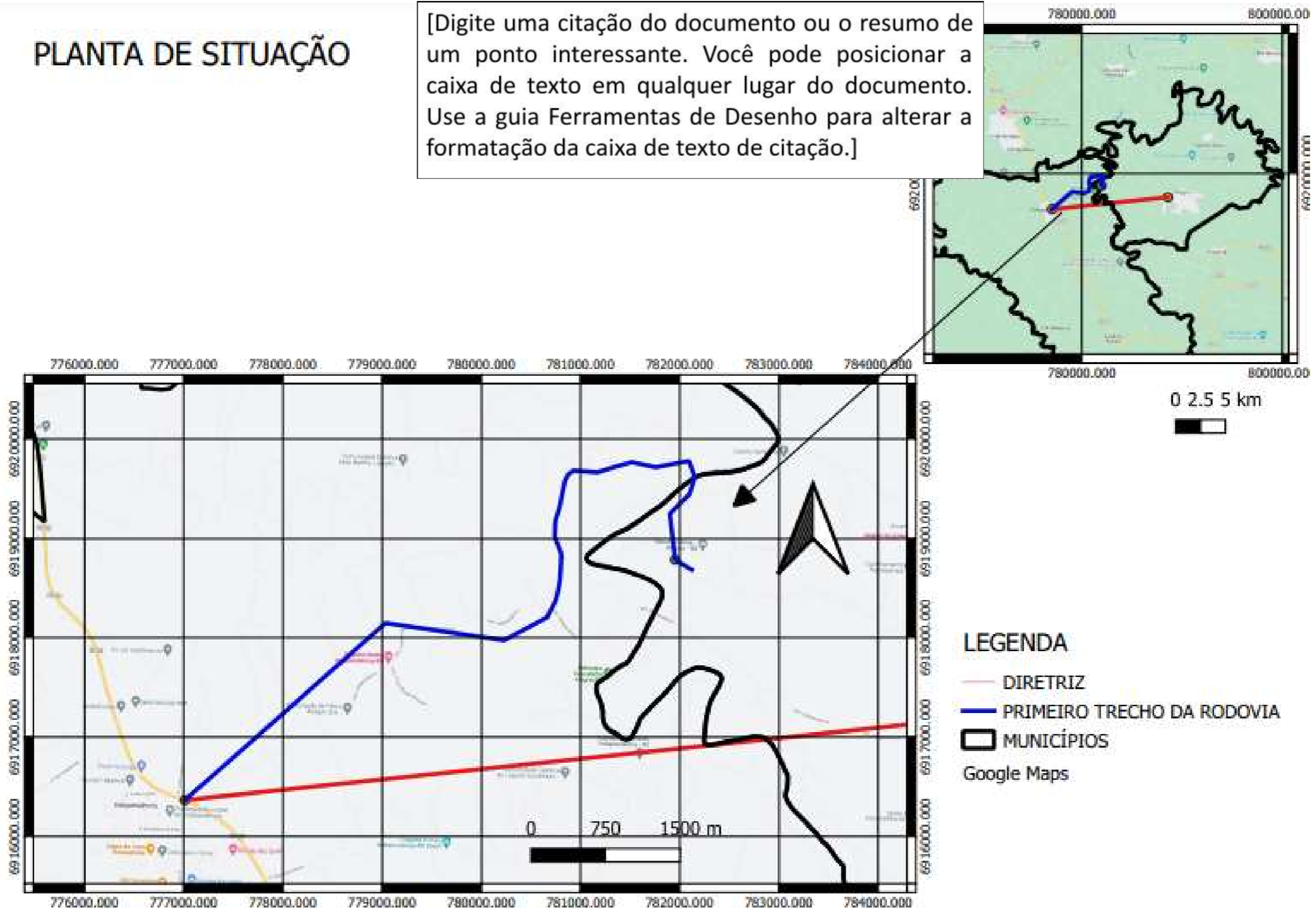
1 APRESENTAÇÃO	6
Mapa de situação	6
Mapa de Localização	8
Quadro de características técnicas	10
2 PROJETO GEOMÉTRICO	13
Seções transversais tipo	13
Linha geral	15
Detalhamento do Projeto Geométrico	17
Seções transversais	18
3 CRONOGRAMA PLANEJADO/REALIZADO	20

1 APRESENTAÇÃO

Mapa de situação

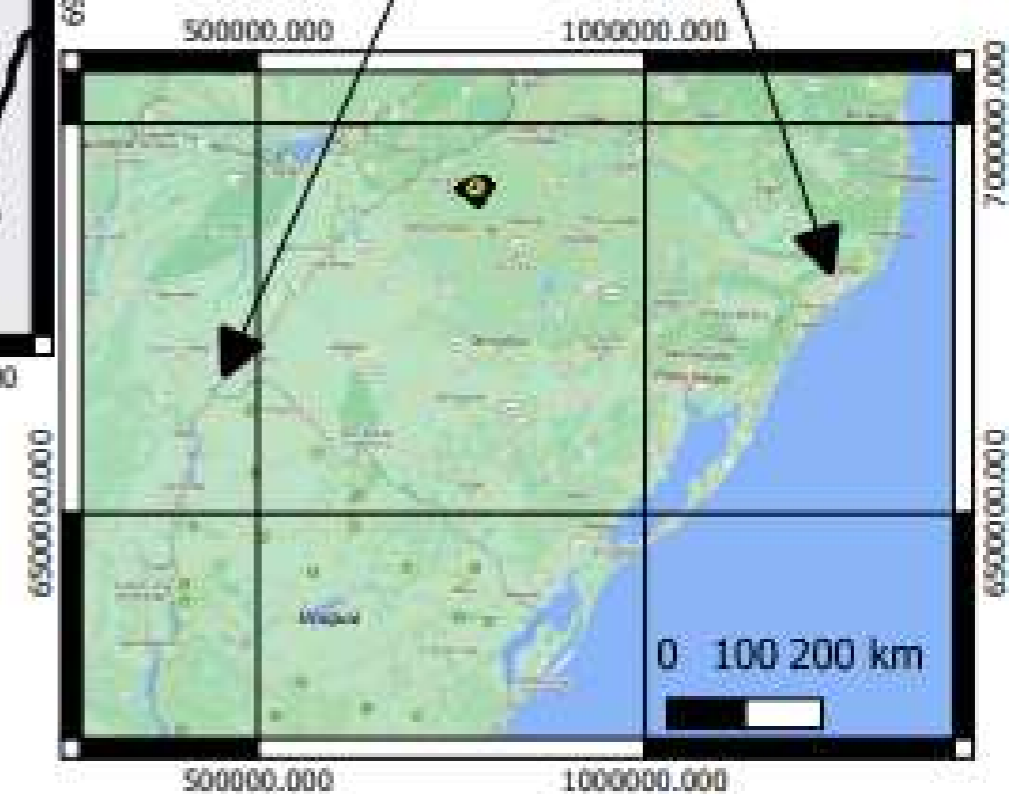
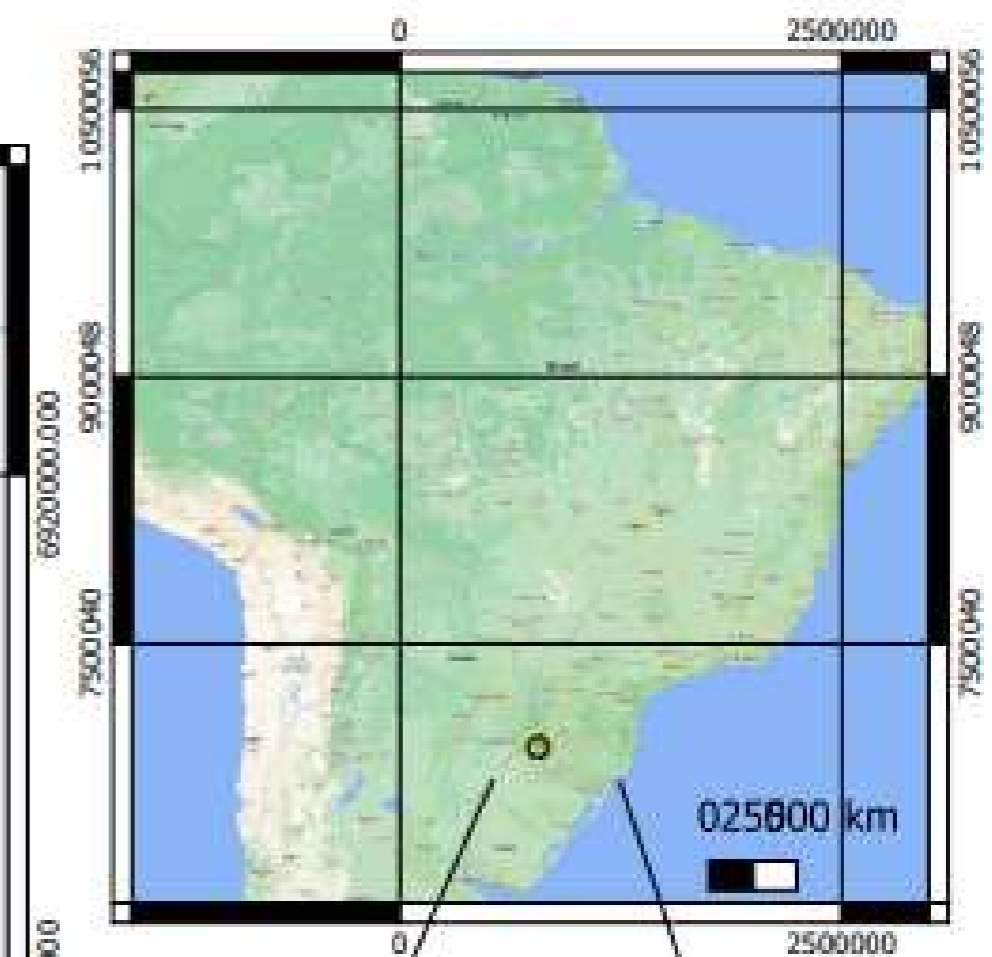
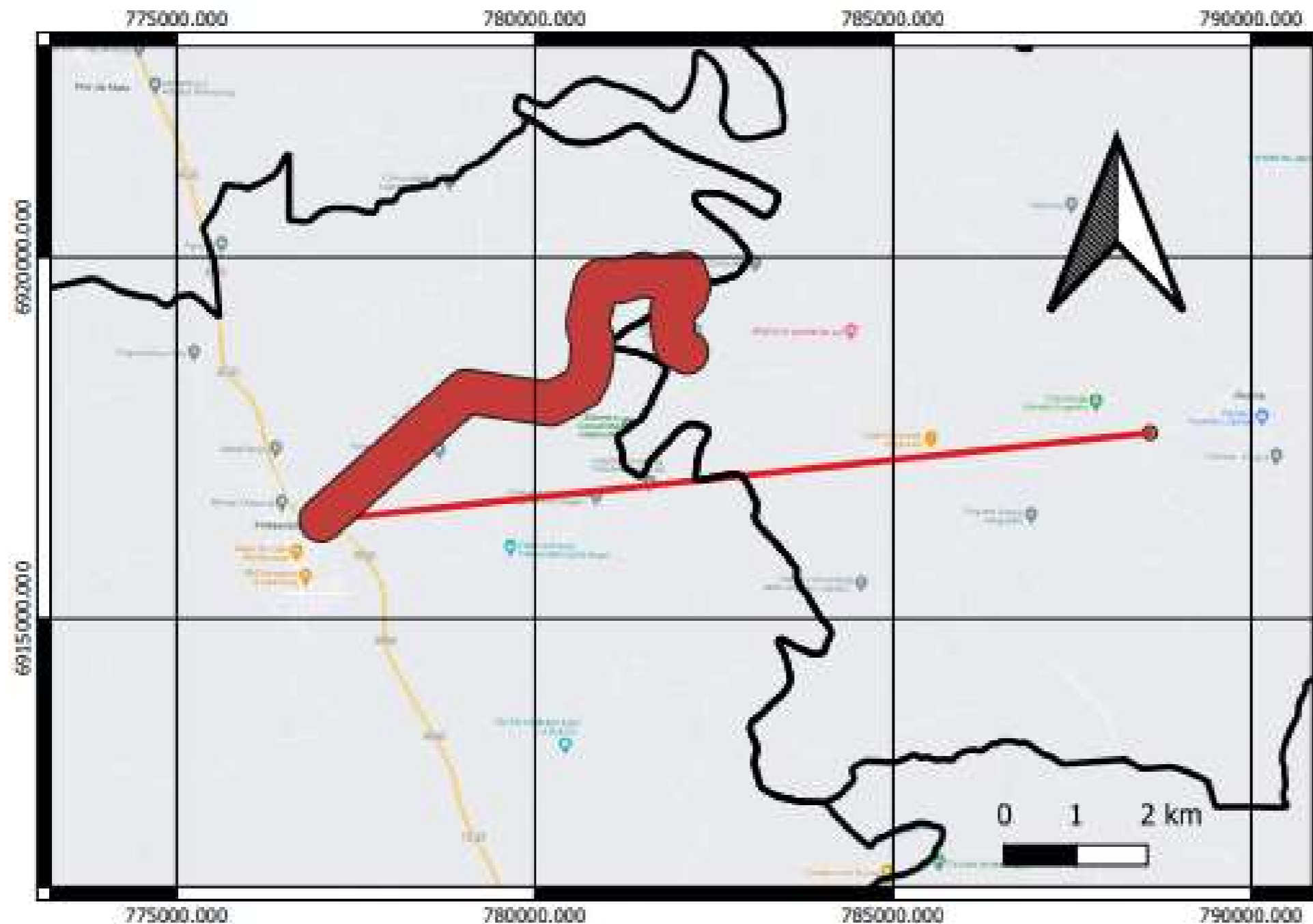
PLANTA DE SITUAÇÃO

[Digite uma citação do documento ou o resumo de um ponto interessante. Você pode posicionar a caixa de texto em qualquer lugar do documento. Use a guia Ferramentas de Desenho para alterar a formatação da caixa de texto de citação.]



MAPA DE LOCALIZAÇÃO

PLANTA DE LOCALIZAÇÃO DO PRIMERIO TRAJETO DA RODOVIA



LEGENDA

— 1º PARTE RODOVIA

— DIRETRIZ

▭ CIDADES DE INDENPENDÊNCIA E ALEGRIA

Google Maps

Quadro de características técnicas

CARACTERÍSTICAS TÉCNICAS	
Rodovia:	Grupo de Eixo 1
Trecho:	Eixo 1
Segmento:	km: 0+000,00 ao km: 8+079,90

CARACTERÍSTICAS GERAIS								
DE PROJETO		PLANALTIMÉTRICAS				SEÇÕES TRANSVERSAIS		
NORMA	DNIT	RAIO MIN. COM TRANS.	50,000	K MÍNDES CÔNCAVA	7 / 7	LARG. PISTA DE ROL.		PLATAFORMA ATERRO
CLASSE DA RODOVIA	III	RAIO MIN. SIMPLES	300,000	K MÍNDES CONVEXA	5 / 5	LARG. ADOST. INT.		PLATAFORMA CORTE
REGIÃO	Mortanhosa	RAMPA MÁXIMA	8,000	DIST. VIS. PARADA		LARG. ADOST. EXT.		TALUDE ATERRO
VELOCIDADE DIRETRIZ	40	RAMPA MÍNIMA	0,300	DIST. VIS. ULTRAP.		ABAILAMENTO		TALUDE CORTE 1º CAT.
		EXTENSÃO TOTAL	8079,905	FAIXA DOM. (LEILD+OFF)	20 / 20 + 5	SUPERELEVÇÃO MÁX.		TALUDE CORTE 3º CAT.

PLANIMETRIA						
DISTRIBUIÇÃO DE CURVAS						
T	RAIOS (m)	FREQ.	De (m)	%	Lc1+Lc2 (m)	%
R	R mínimo = 100,000	1	50,175	0,62	60,000	0,74
A	100,000 < R ≤ 100,000					
N	100,000 < R ≤ 200,000	10	624,368	7,73	720,000	8,91
S	200,000 < R ≤ 300,000					
I	300,000 < R ≤ 500,000					
Q	R > 500,000					
	TOTAL EM TRANSIÇÃO	11	674,543	8,35	780,000	9,65
T	RAIOS (m)	FREQ.	De (m)	%		
I	R mínimo = 1000000,000					
M	1000000,00 < R ≤ 500,000					
P	500,000 < R ≤ 700,000					
L	700,000 < R ≤ 1000,000					
E	1000,000 < R ≤ 1500,000					
S	R > 1500,000					
	TOTAL SIMPLES					
	TOTAL EM CURVA	11	674,543	8,35	2129,088	25,35

EXTENSÃO DAS INTERTANGENTES					
MÍNIMA		MÁXIMA		TOTAL	
EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%
152,856	1,89	956,378	11,84	6625,361	82,00

PARÂMETROS PLANIMÉTRICOS			
TORTUOSIDADE		DISTÂNCIA EM DIRETRIZ	
TOTAL (°/m)	MÉDIA (°/m.km)	EXTENSÃO (m)	ACRÉSCIMO (%)
2,903	0,359	5505,041	46,773

ALTIMETRIA						
VARIÇÃO ALTIMÉTRICA						
ACLIVES			NÍVEL		DECLIVES	
INTERVALO	EXTENSÃO (m)	%	EXTENSÃO	%	INTERVALO	EXTENSÃO (m)
0 < i ≤ 1					0 < i ≤ 1	
1 < i ≤ 2	51,915	0,64			1 < i ≤ 2	55,376
2 < i ≤ 3	467,476	5,79			2 < i ≤ 3	1166,332
3 < i ≤ 4	369,533	4,57			3 < i ≤ 4	707,000
4 < i ≤ 5	168,000	2,08			4 < i ≤ 5	730,843
5 < i ≤ 6					5 < i ≤ 6	112,949
6 < i ≤ 7					6 < i ≤ 7	261,195
7 < i ≤ 8	181,056	2,24			7 < i ≤ 8	741,179
8 < i ≤ 9					8 < i ≤ 9	517,051
9 < i ≤ 10					9 < i ≤ 10	
i > 10					i > 10	
TOTAL	1237,980	15,32			TOTAL	4291,925

EXTENSÃO DOS ELEMENTOS VERTICAIS							
RAMPA		CURVA CÔNCAVA		CURVA CONVEXA		CURVA TOTAL	
EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%
5529,905	68,44	1340,000	16,58	1210,000	14,98	2550,000	31,56

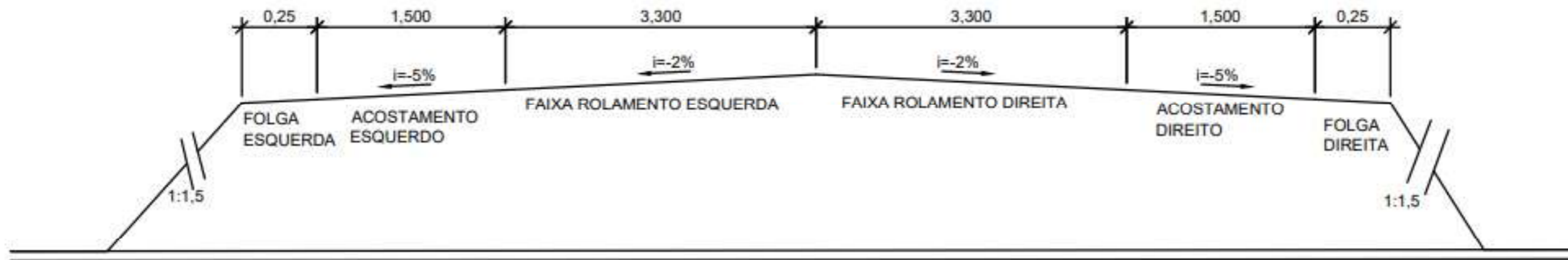
PARÂMETROS K MÍNIMOS ADOTADOS			
EM CURVA CÔNCAVA		EM CURVA CONVEXA	
	7,143		5,457

PARÂMETROS ALTIMÉTRICOS					
COMPRIMENTO VIRTUAL IDA		COMPRIMENTO VIRTUAL VOLTA		COMPRIMENTO VIRTUAL MÉDIO	
EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%
12587,724	155,79	20351,065	251,87	15469,395	203,83

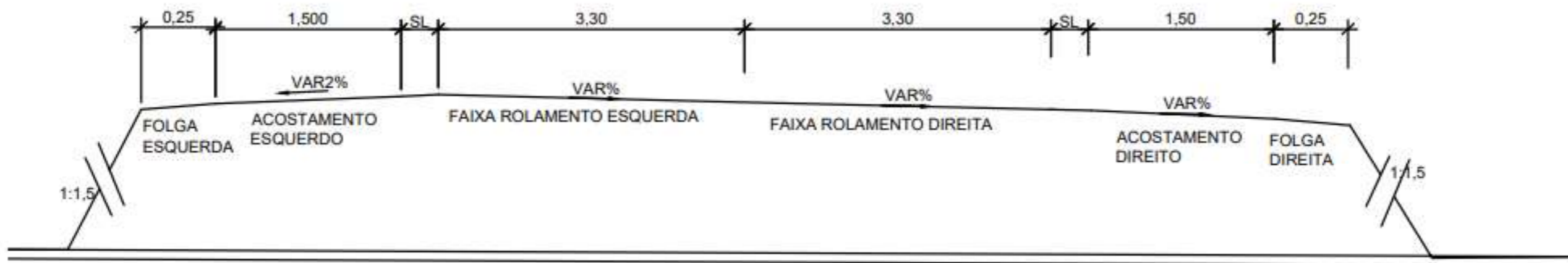
CARACTERÍSTICAS OPERACIONAIS							
ANO DE ABERTURA		VDM ABERTURA		PARÂMETRO			
ANO FINAL DA VIDA ÚTIL		VDM FINAL					

2 PROJETO GEOMÉTRICO

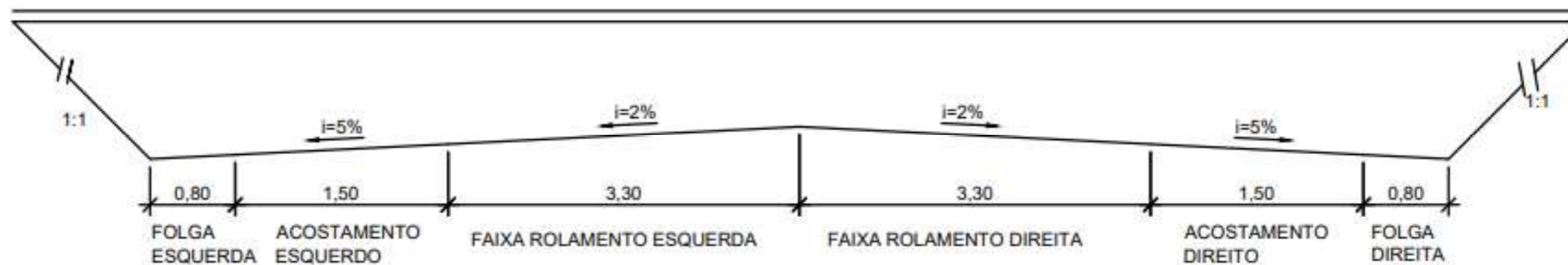
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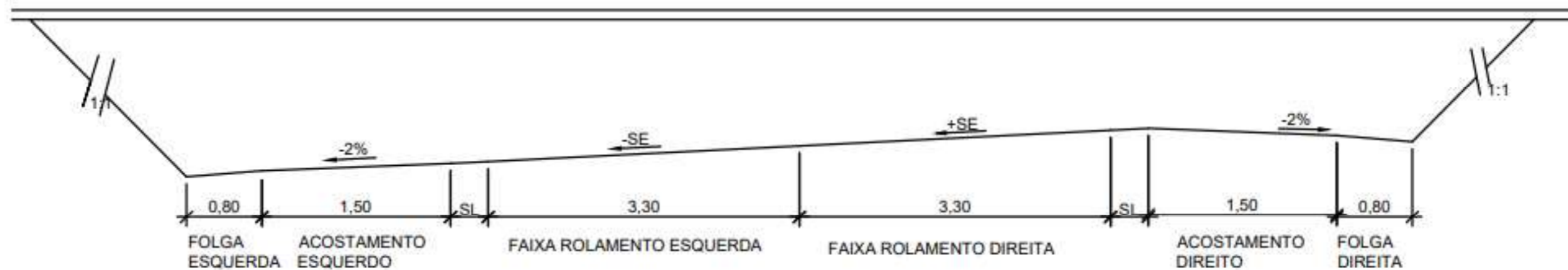
ATERRO EM CURVA (DIREITA)



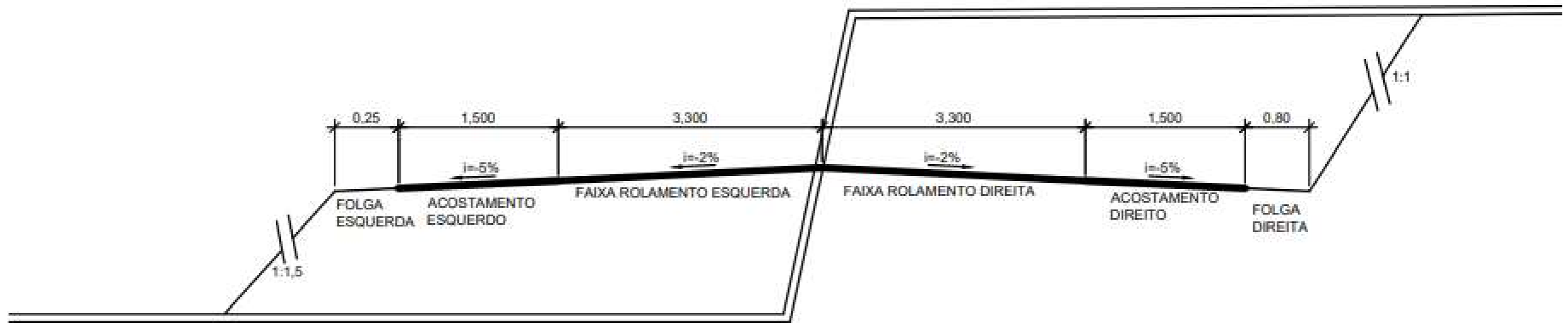
TIPO CORTE EM TANGENTE



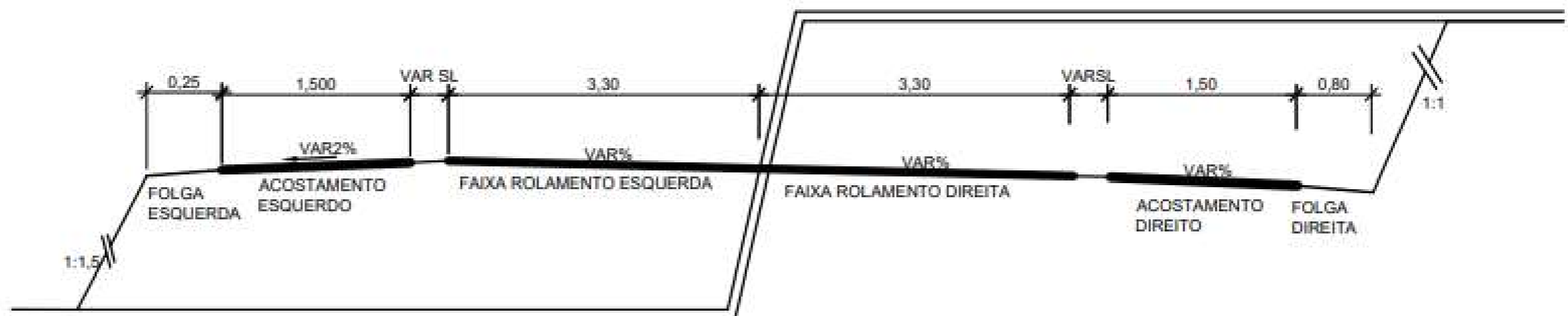
CORTE EM CURVA (ESQUERDA)



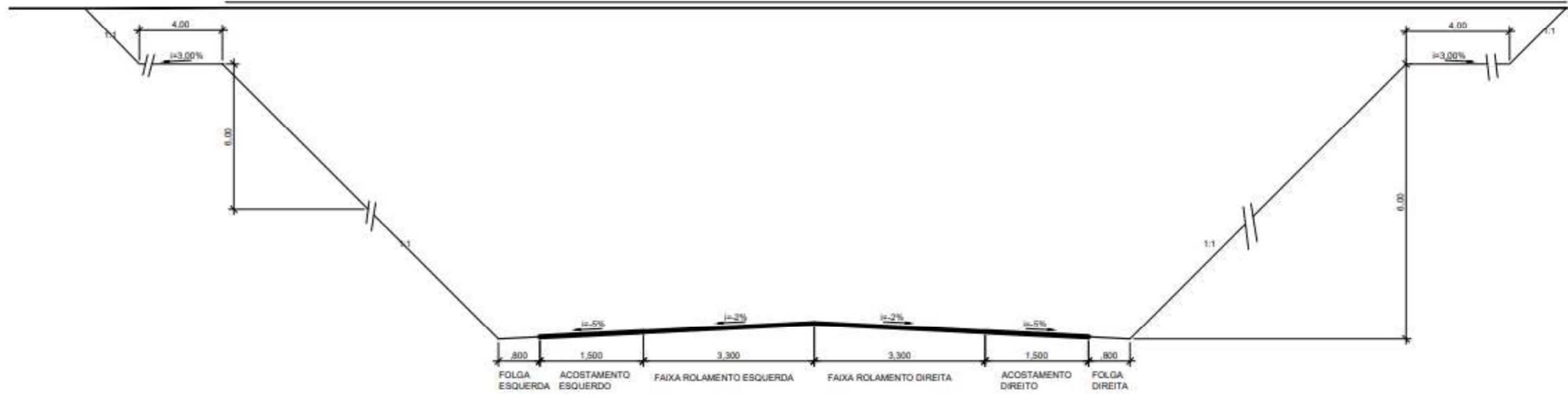
TIPO MISTA EM TANGENTE



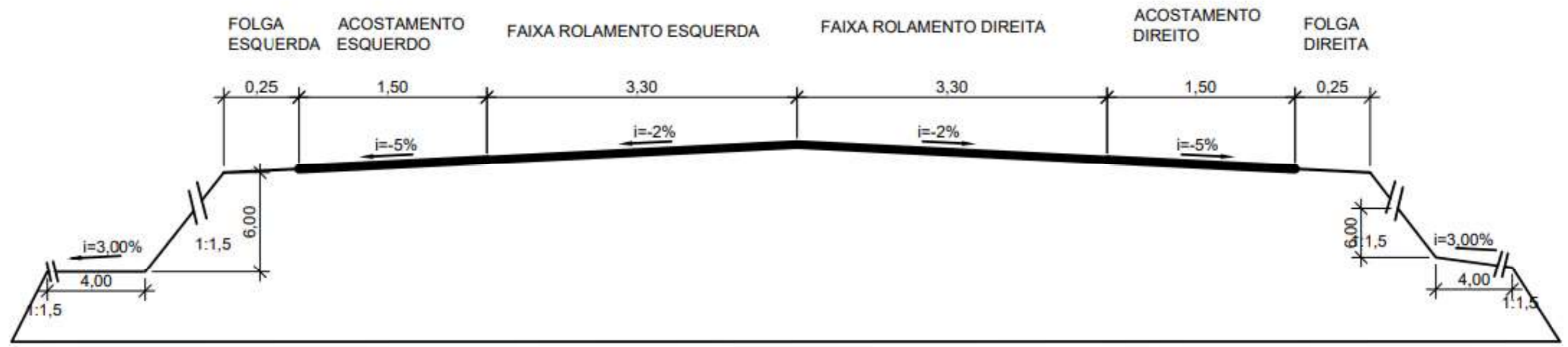
TIPO MISTA EM CURVA

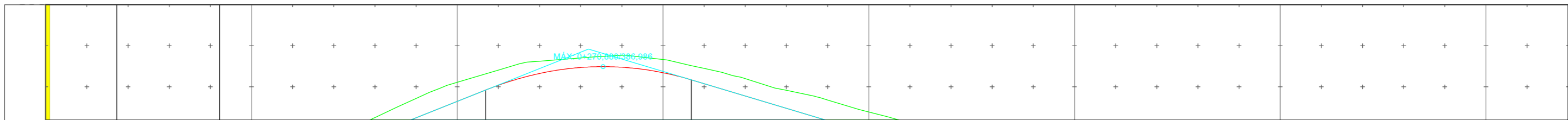
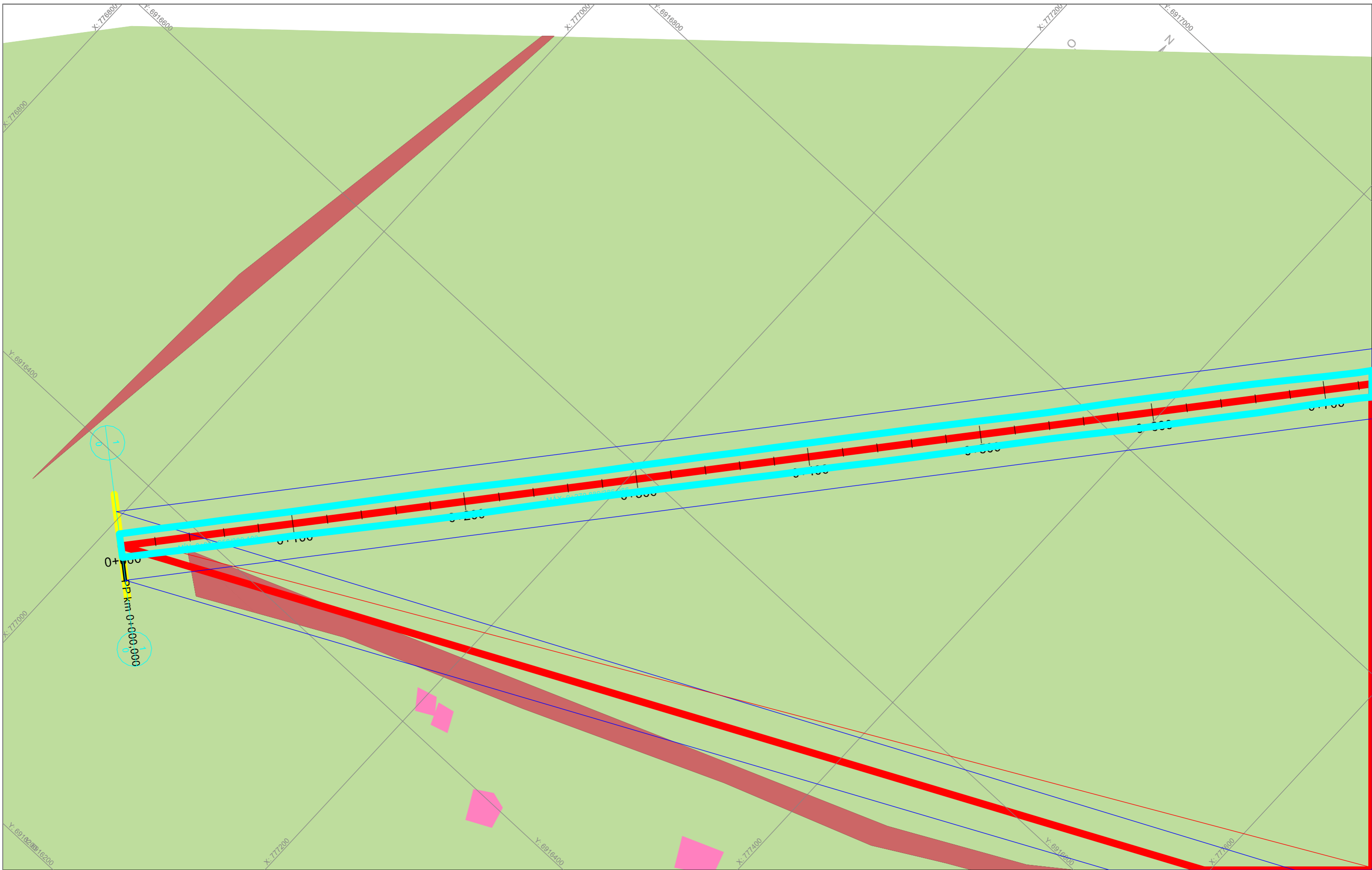


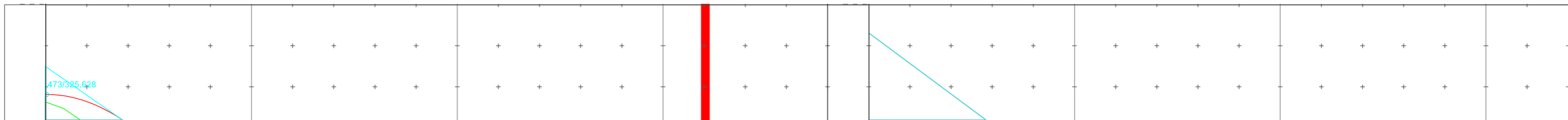
CORTE EM TANGENTE COM BANQUETAS

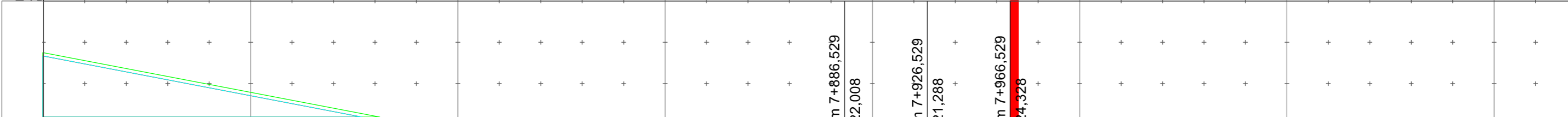


ATERRO COM BANQUETAS









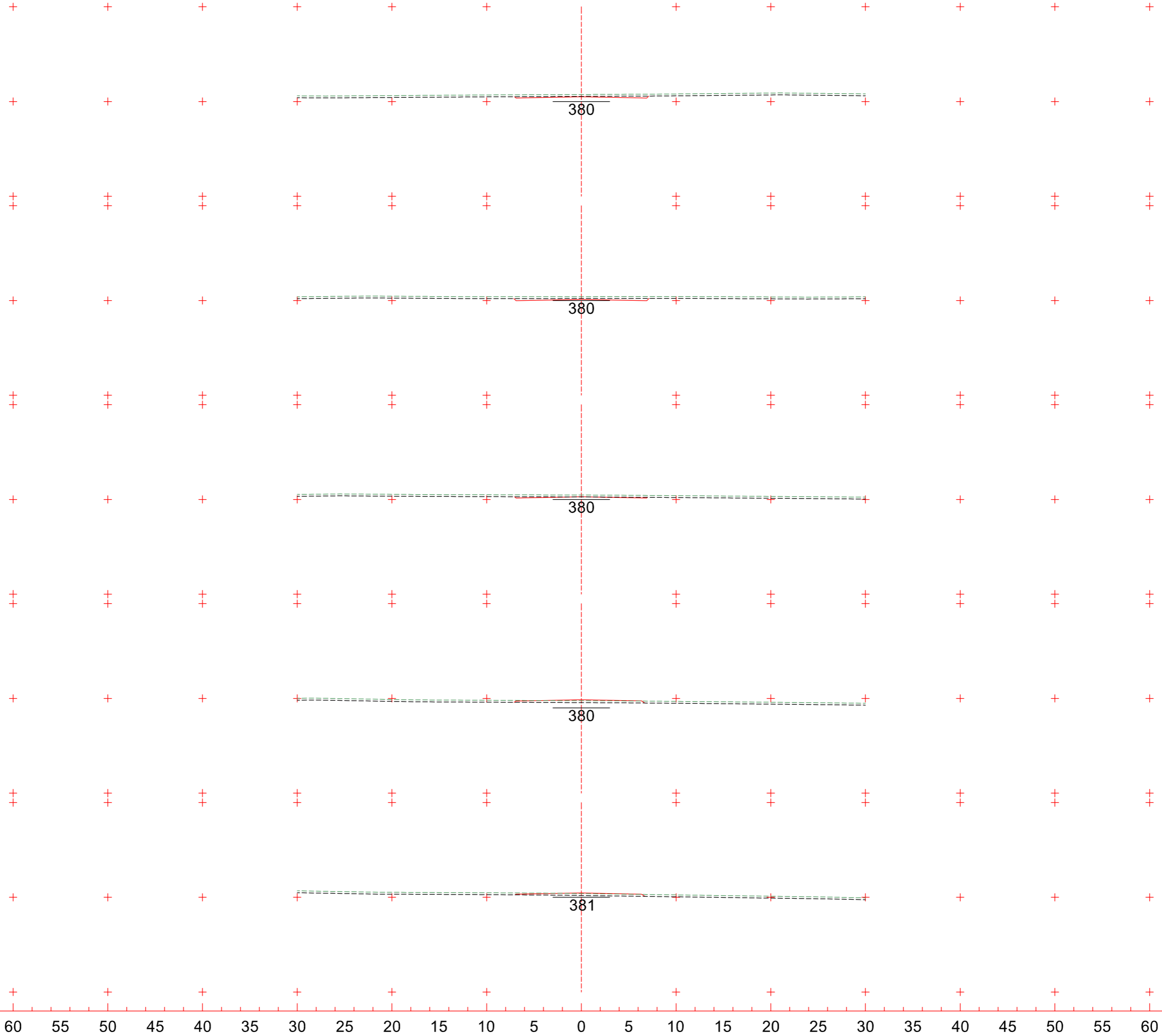
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0+080
CT 380,746 m
CP 380,508 m

0+060
CT 380,410 m
CP 380,114 m

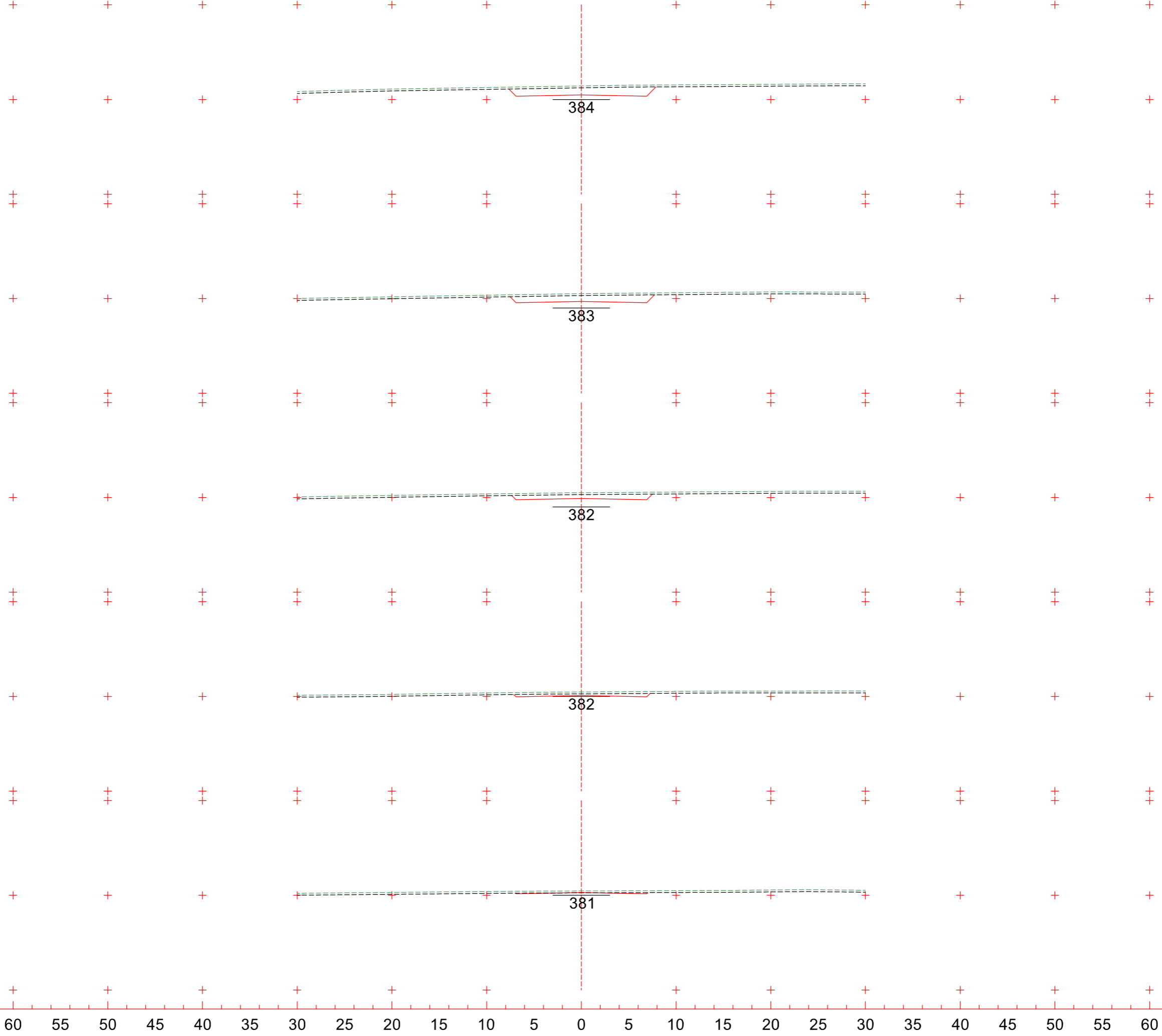
0+040
CT 380,464 m
CP 380,281 m

0+020
CT 380,751 m
CP 380,860 m

0+000
CT 381,396 m
CP 381,460 m

Eixo1
Escala 1:400

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0+180
CT 385,435 m
CP 384,493 m

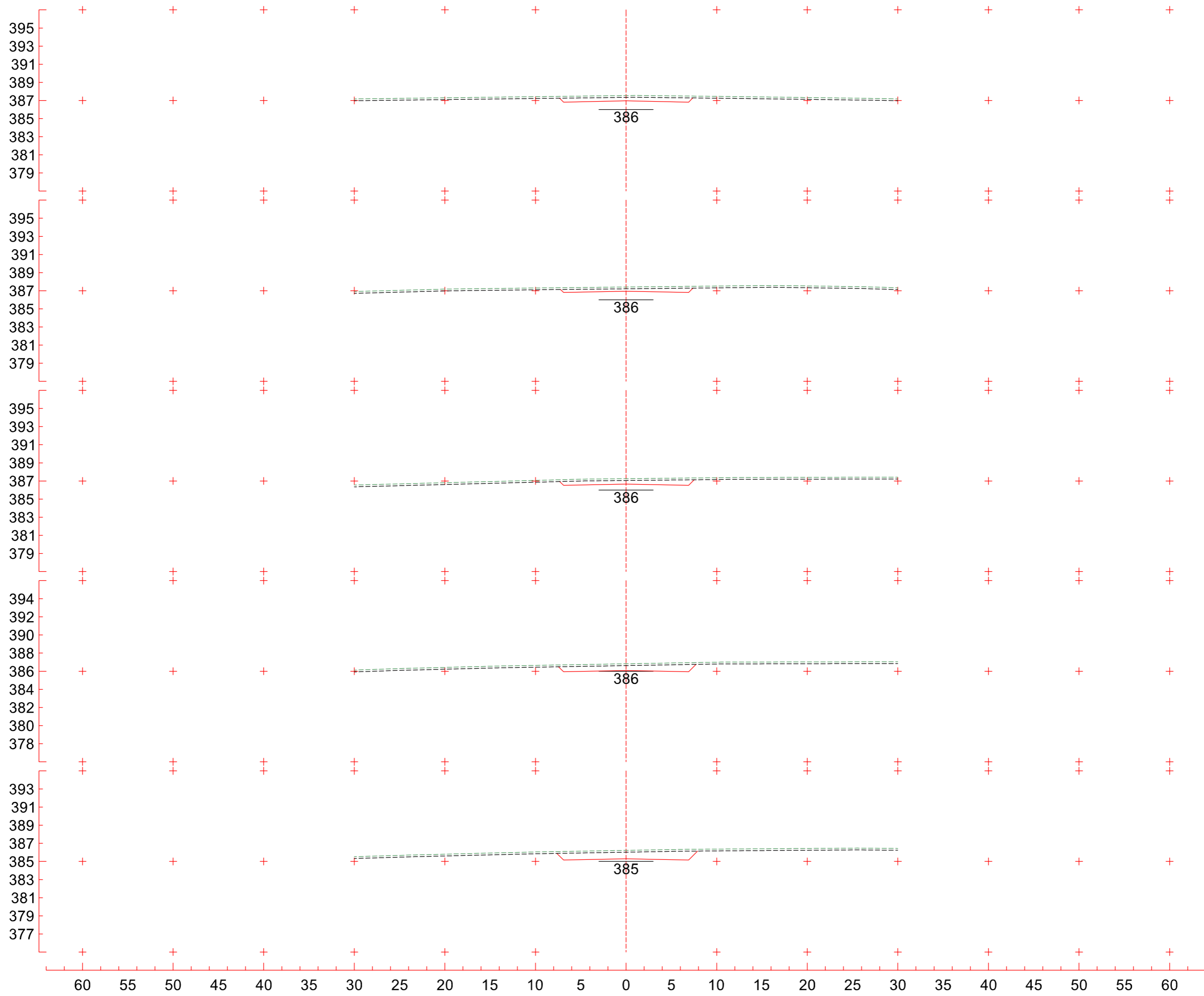
0+160
CT 384,509 m
CP 383,693 m

0+140
CT 383,497 m
CP 382,893 m

0+120
CT 382,463 m
CP 382,093 m

0+100
CT 381,459 m
CP 381,293 m

Eixo1
Escala 1:400



0+280
 CT 387,540 m
 CP 386,956 m

0+260
 CT 387,410 m
 CP 386,944 m

0+240
 CT 387,252 m
 CP 386,652 m

0+220
 CT 386,819 m
 CP 386,080 m

0+200
 CT 386,224 m
 CP 385,293 m

Eixo1
 Escala 1:400

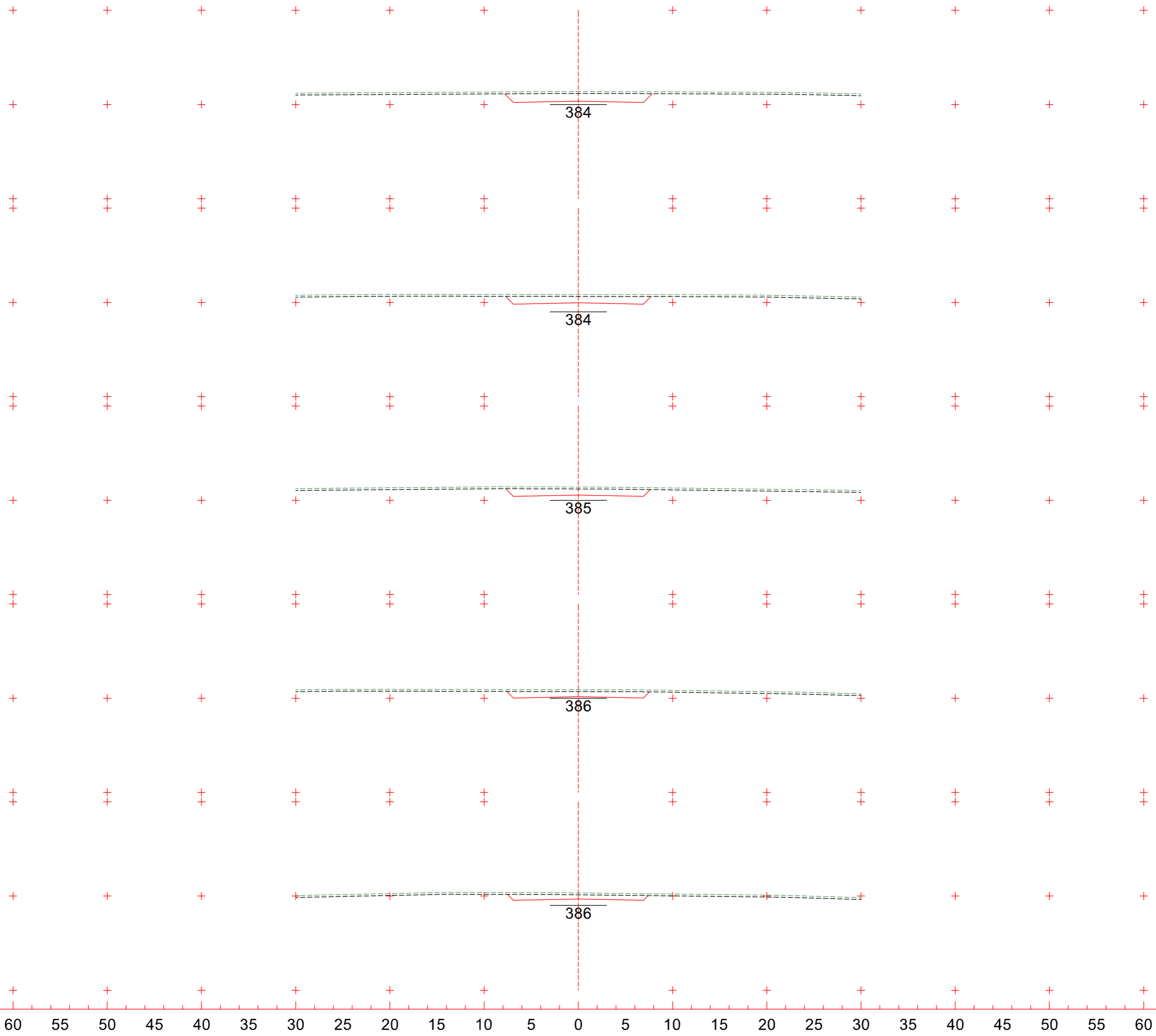
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0+380
CT 385,362 m
CP 384,355 m

0+360
CT 385,830 m
CP 384,955 m

0+340
CT 386,403 m
CP 385,555 m

0+320
CT 386,898 m
CP 386,155 m

0+300
CT 387,330 m
CP 386,689 m

Eixo1
Escala 1:400

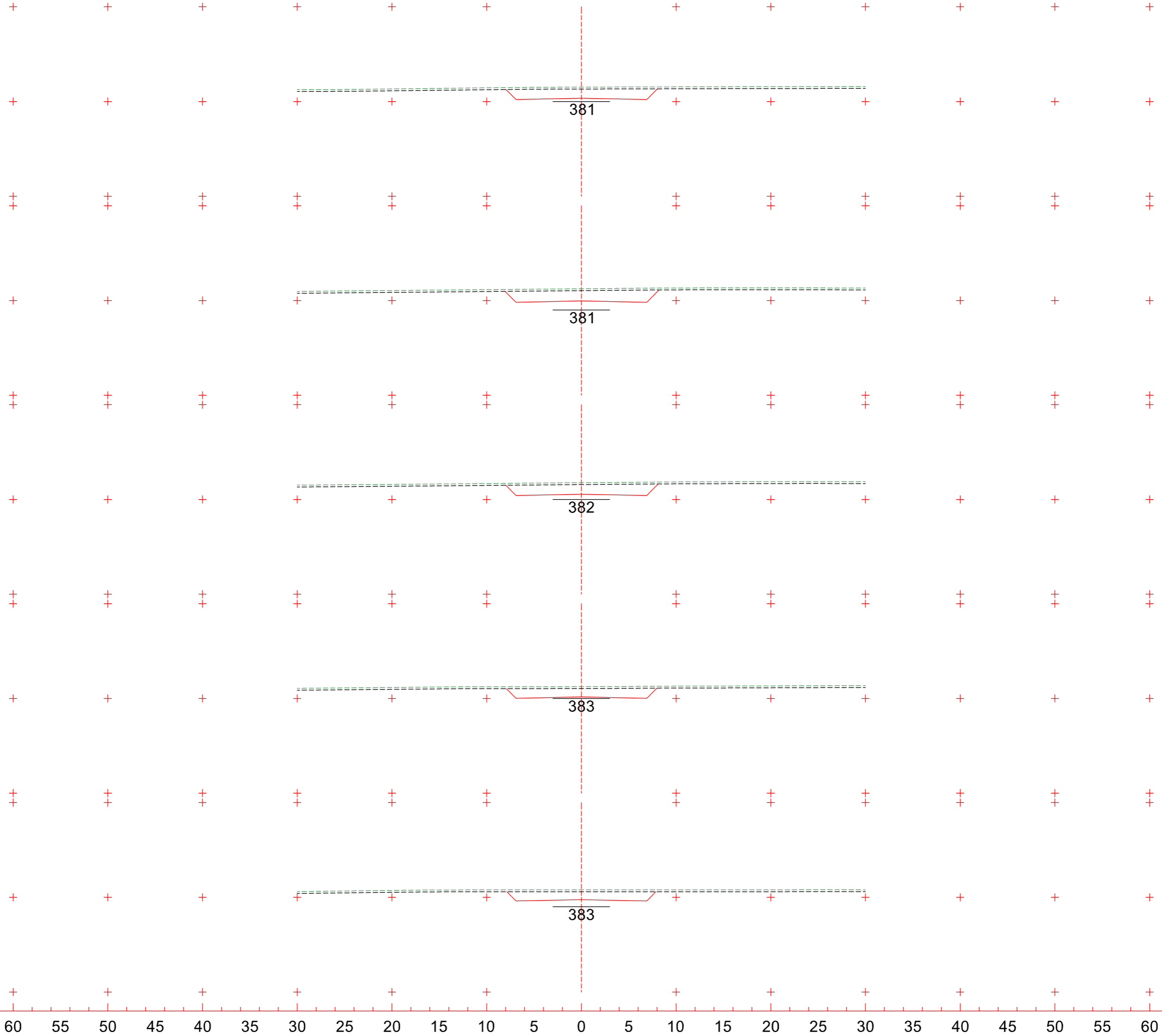
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0+480

CT 382,521 m
CP 381,355 m

0+460

CT 383,239 m
CP 381,955 m

0+440

CT 383,766 m
CP 382,555 m

0+420

CT 384,239 m
CP 383,155 m

0+400

CT 384,779 m
CP 383,755 m

Eixo1

Escala 1:400

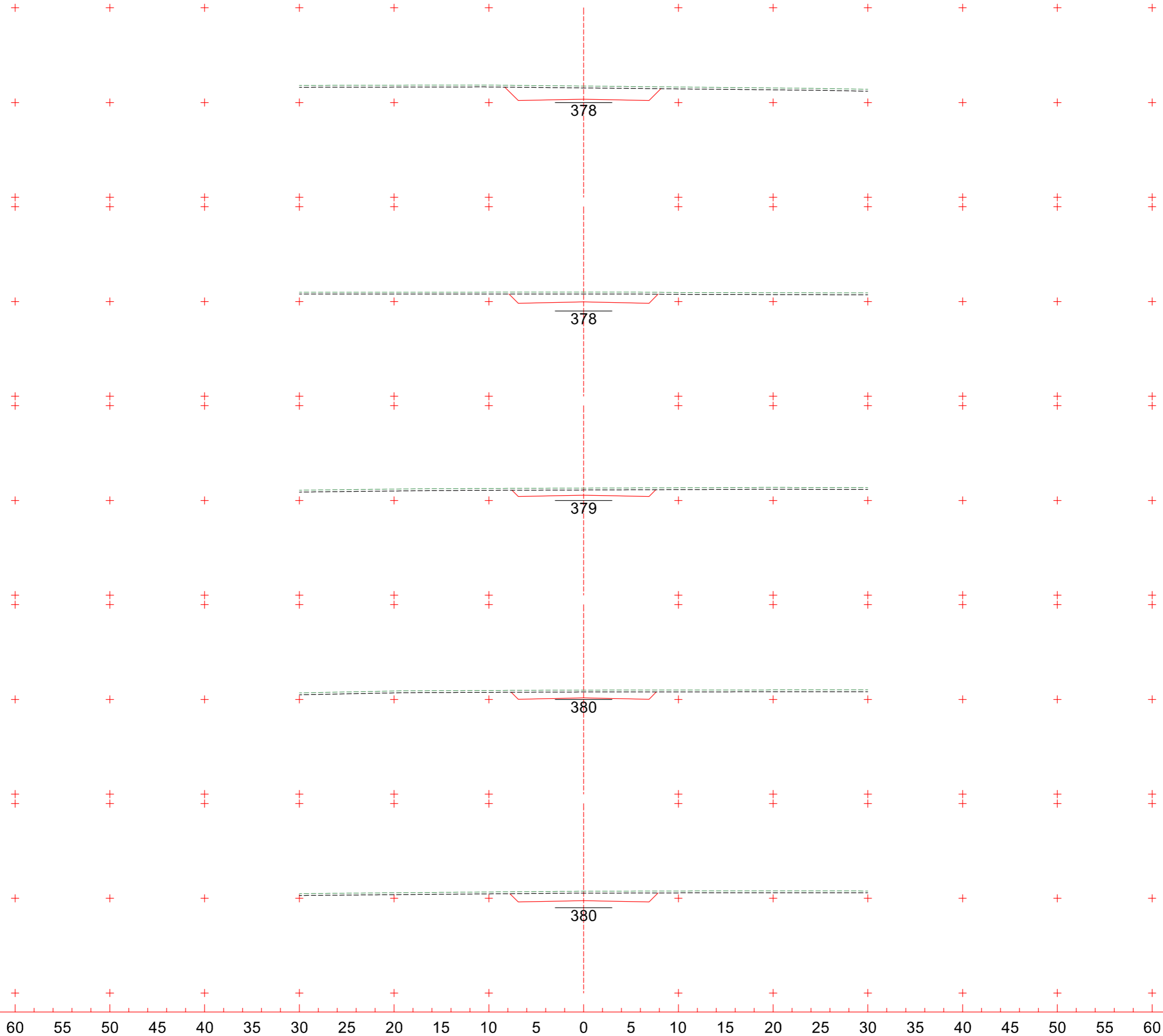
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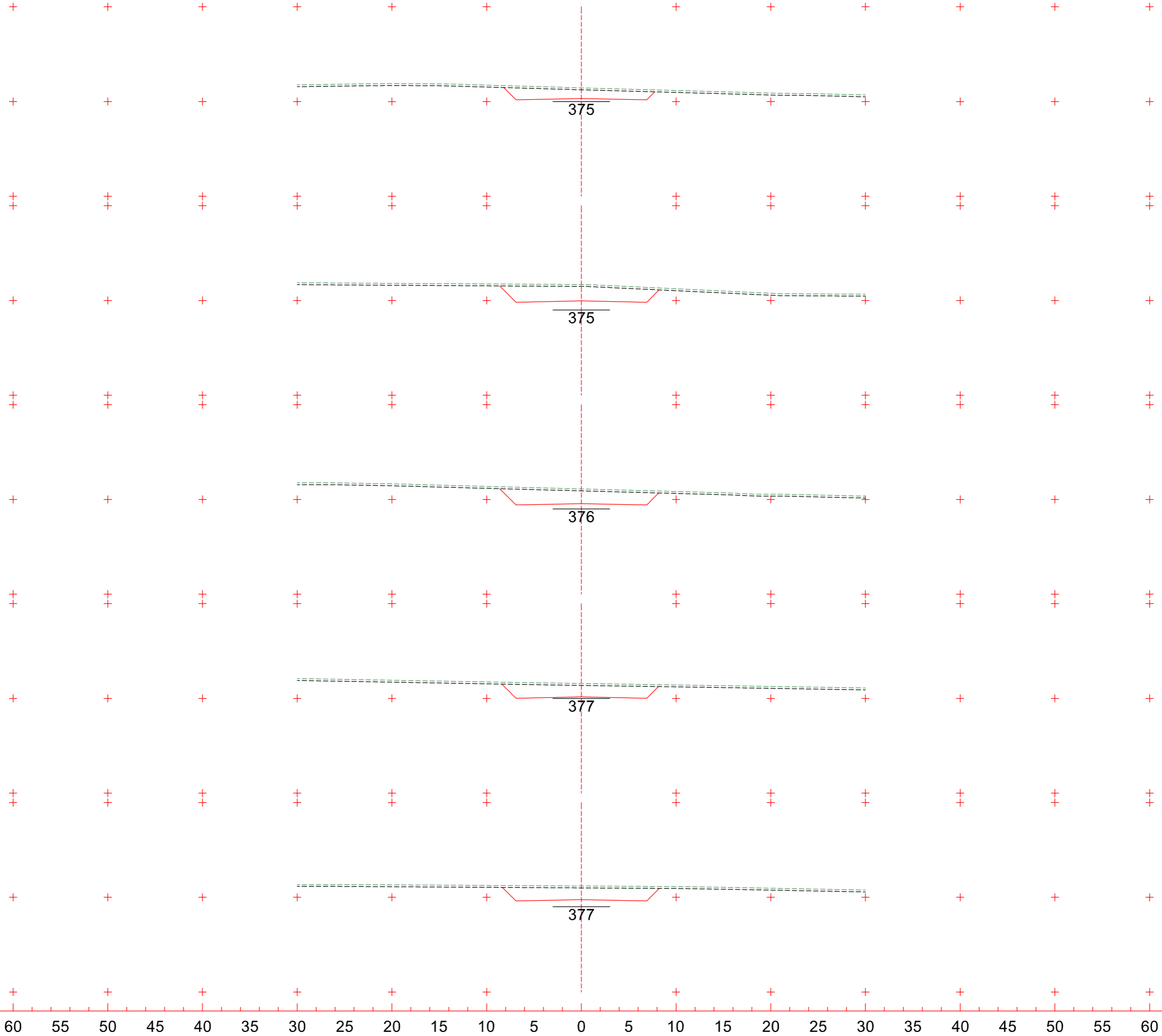
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0+680

CT 376,443 m
CP 375,317 m

0+660

CT 377,683 m
CP 375,955 m

0+640

CT 378,104 m
CP 376,555 m

0+620

CT 378,570 m
CP 377,155 m

0+600

CT 379,193 m
CP 377,755 m

Eixo1

Escala 1:400

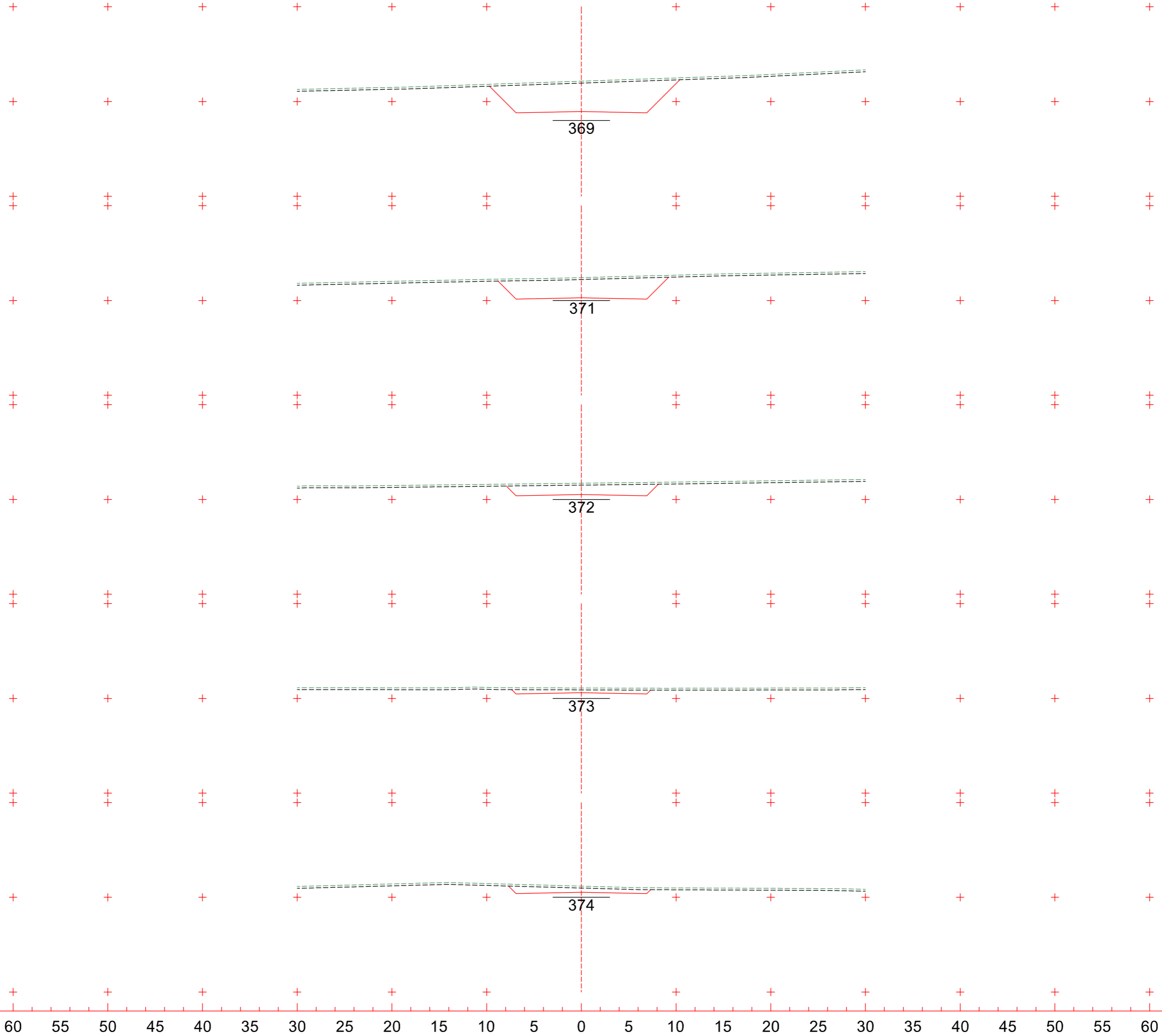
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0+780
CT 373,150 m
CP 369,947 m

0+760
CT 373,414 m
CP 371,290 m

0+740
CT 373,711 m
CP 372,521 m

0+720
CT 374,096 m
CP 373,603 m

0+700
CT 375,179 m
CP 374,535 m

Eixo1
Escala 1:400

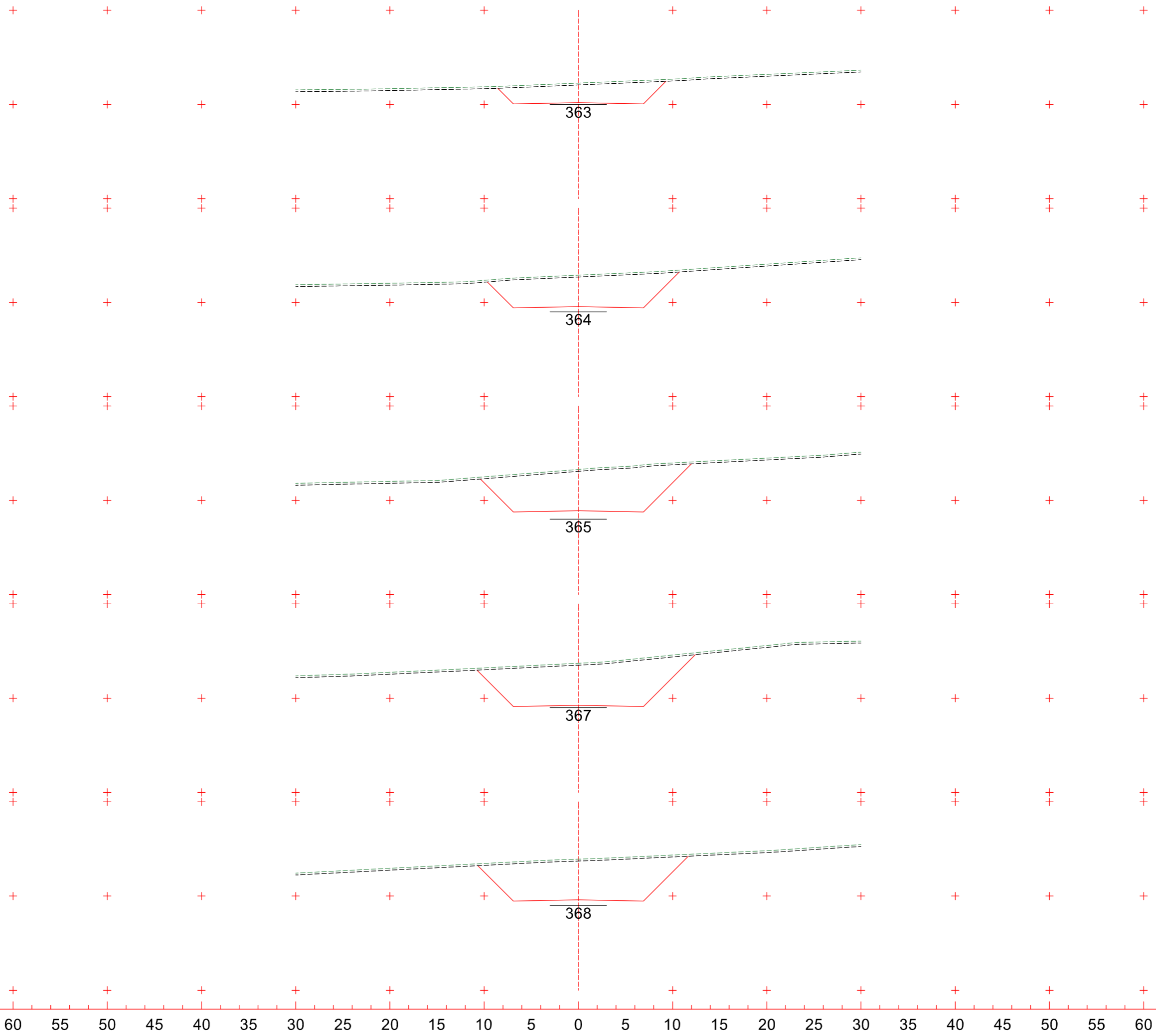
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0+880
CT 365,275 m
CP 363,201 m

0+860
CT 367,893 m
CP 364,550 m

0+840
CT 370,274 m
CP 365,899 m

0+820
CT 371,705 m
CP 367,249 m

0+800
CT 372,916 m
CP 368,598 m

Eixo1
Escala 1:400

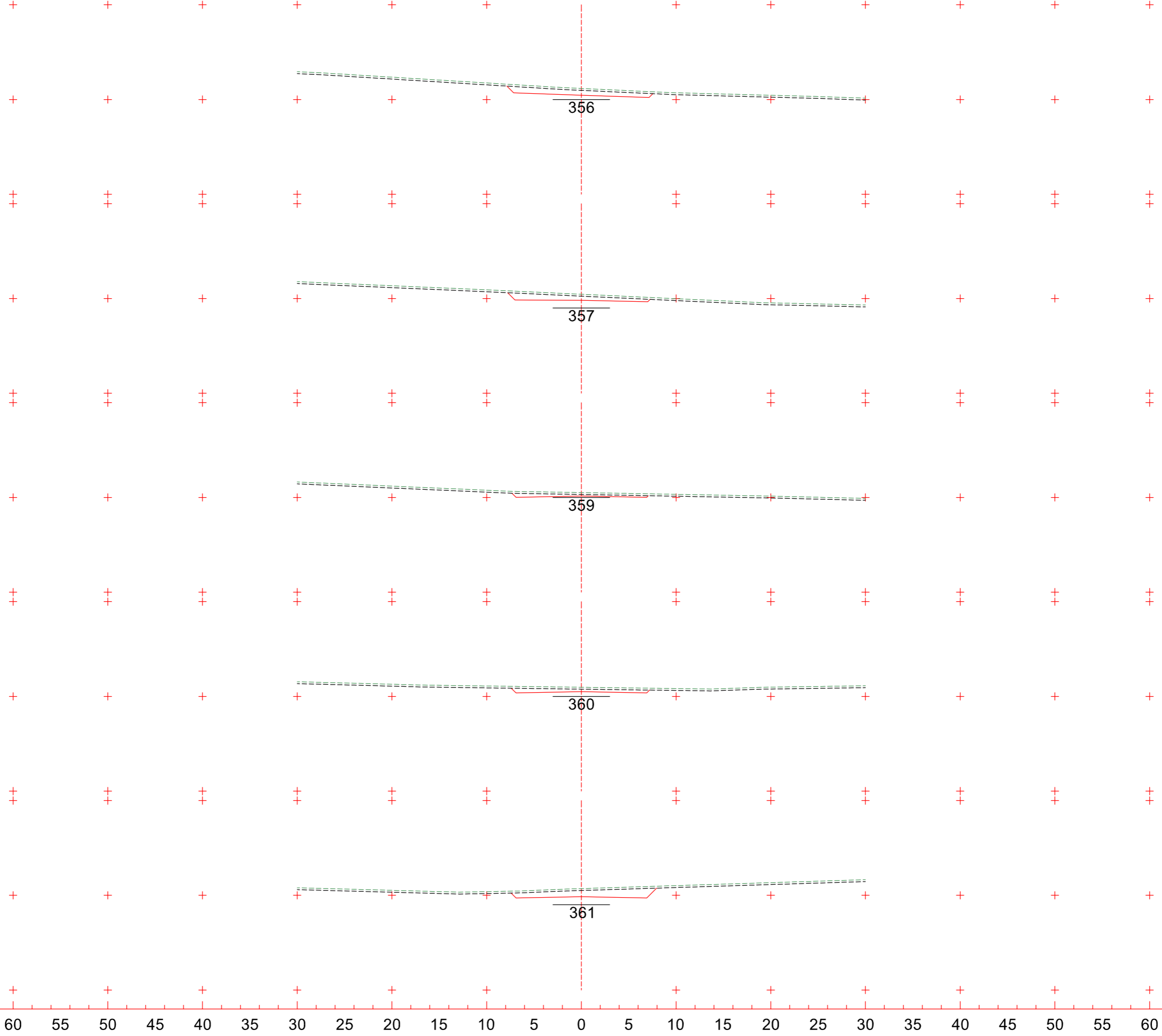
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0+980
CT 357,168 m
CP 356,457 m

0+960
CT 358,446 m
CP 357,805 m

0+940
CT 359,511 m
CP 359,154 m

0+920
CT 360,962 m
CP 360,503 m

0+900
CT 362,708 m
CP 361,852 m

356

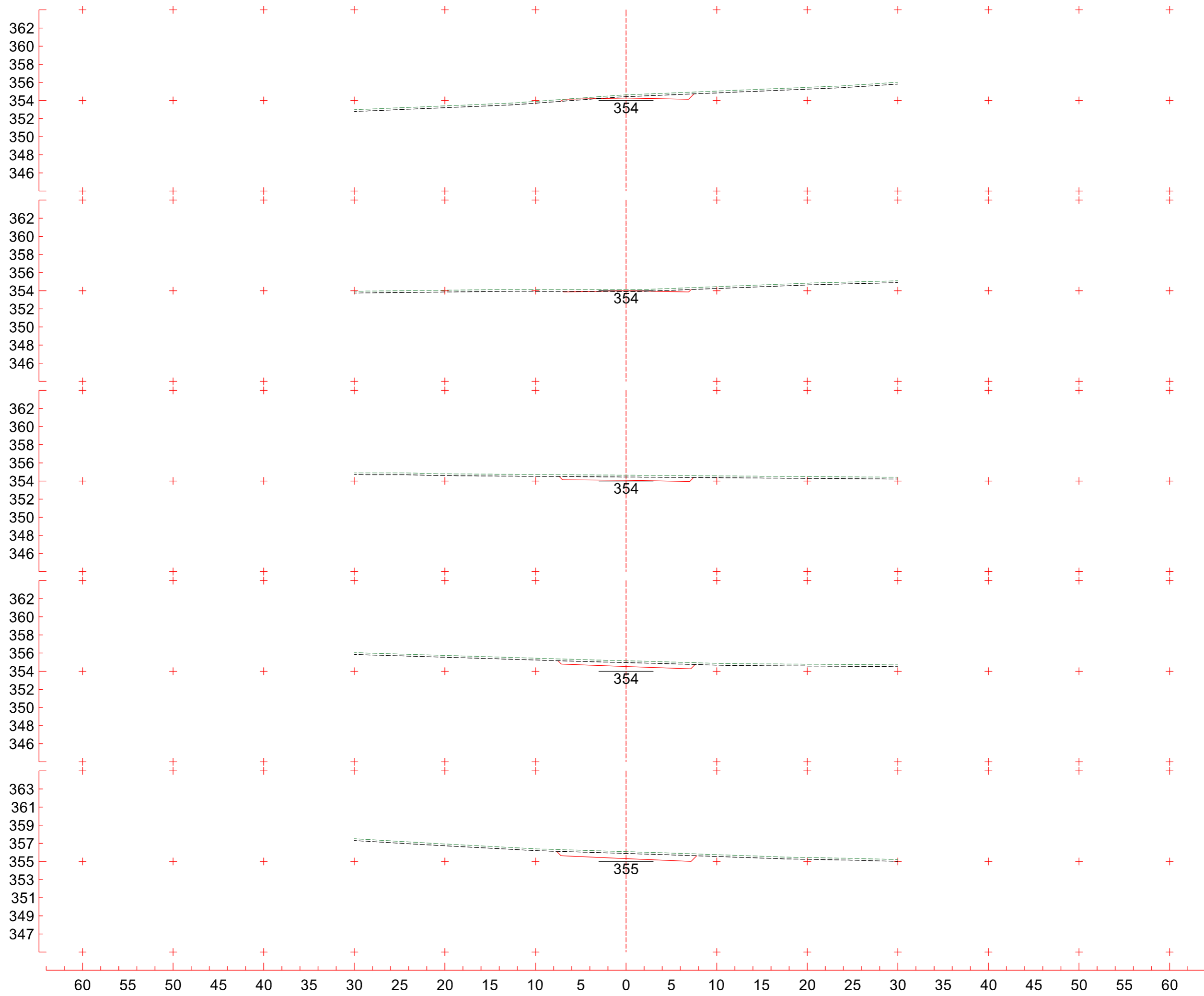
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Eixo1
Escala 1:400



1+080
 CT 354,619 m
 CP 354,266 m

1+060
 CT 354,117 m
 CP 354,000 m

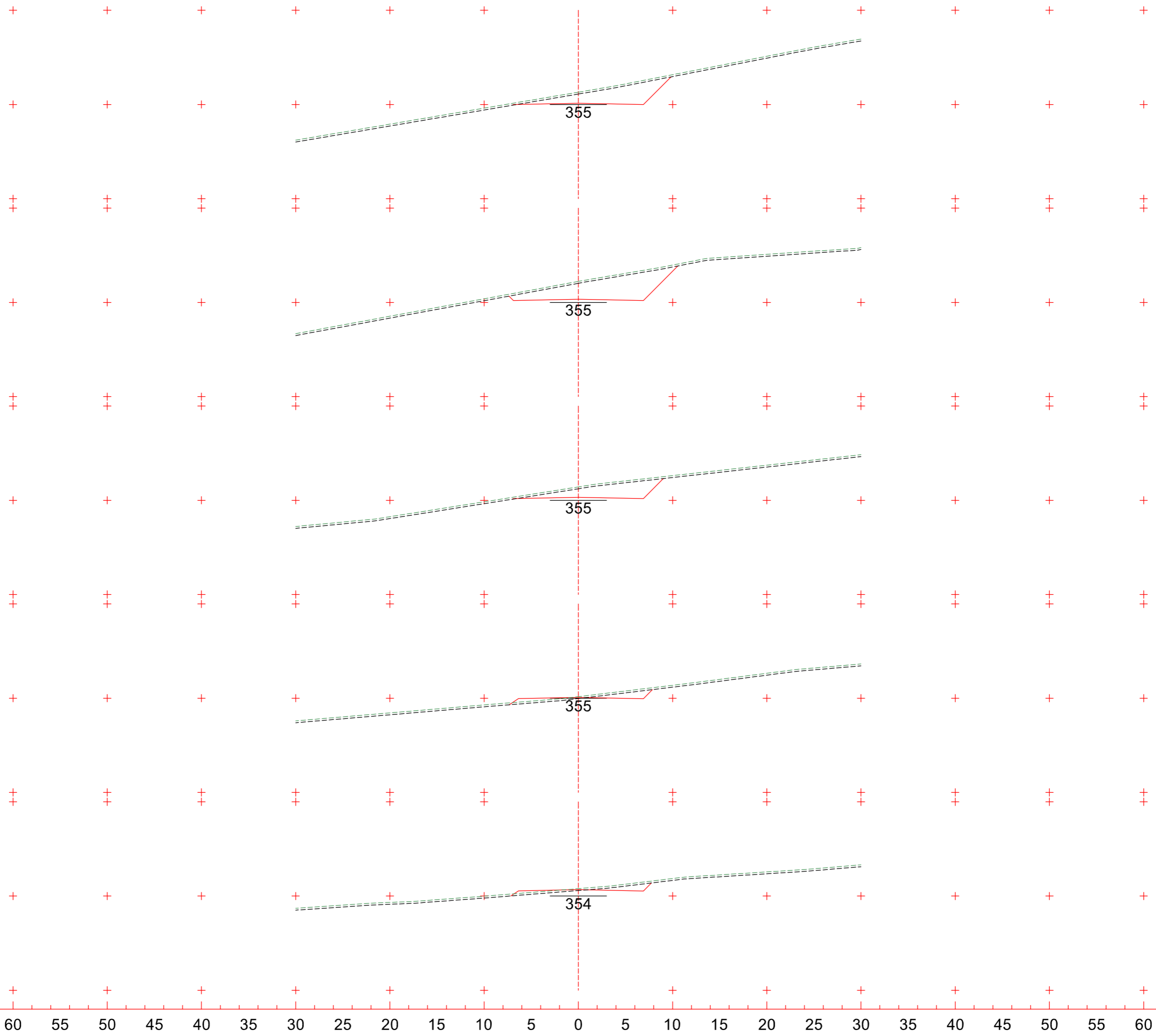
1+040
 CT 354,638 m
 CP 354,086 m

1+020
 CT 355,153 m
 CP 354,524 m

1+000
 CT 356,083 m
 CP 355,314 m

Eixo1
 Escala 1:400

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1+180
CT 356,308 m
CP 355,131 m

1+160
CT 357,226 m
CP 355,337 m

1+140
CT 356,420 m
CP 355,321 m

1+120
CT 355,159 m
CP 355,082 m

1+100
CT 354,787 m
CP 354,678 m

Eixo1
Escala 1:400

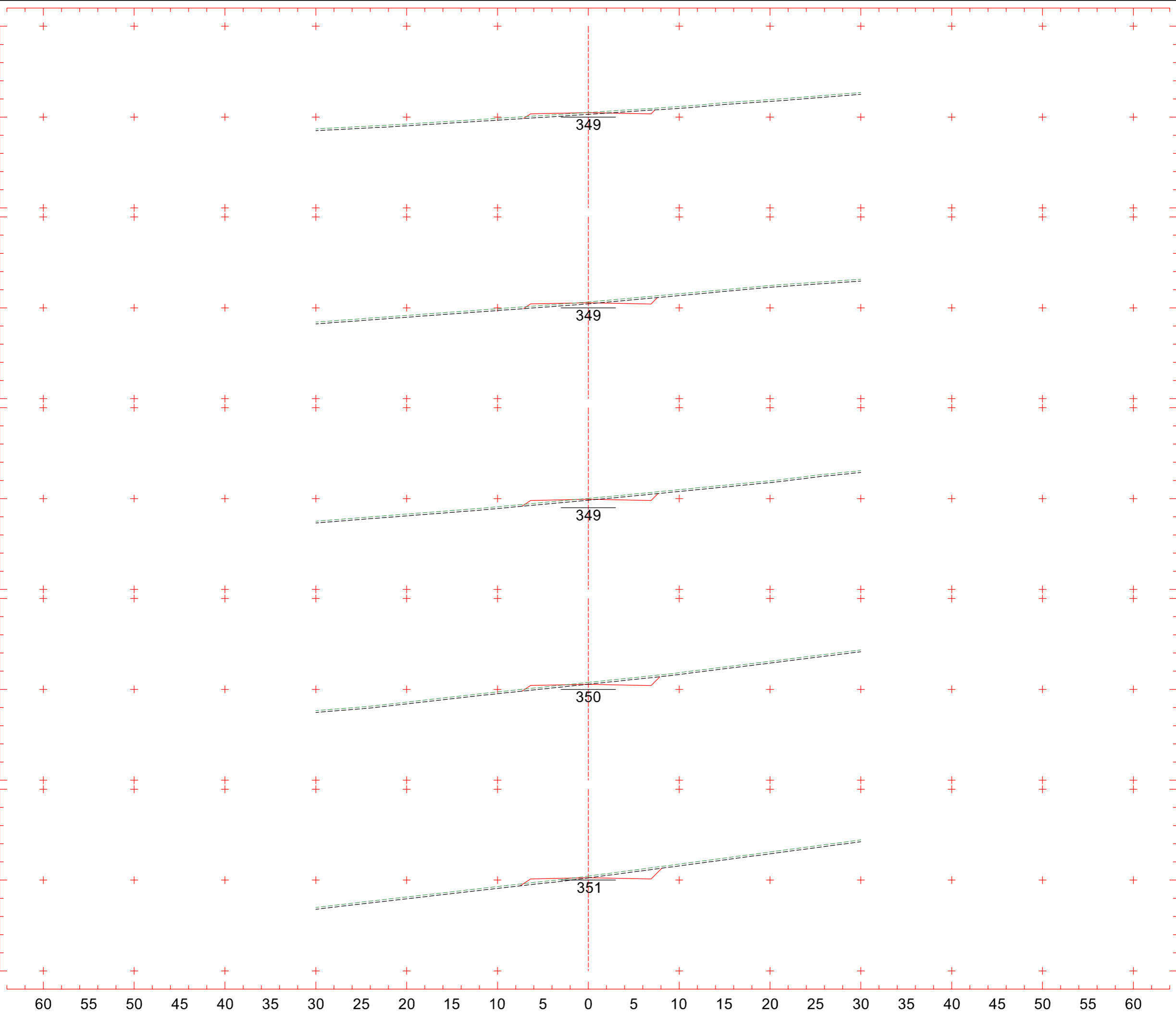
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1+380
CT 349,499 m
CP 349,489 m

1+360
CT 349,641 m
CP 349,563 m

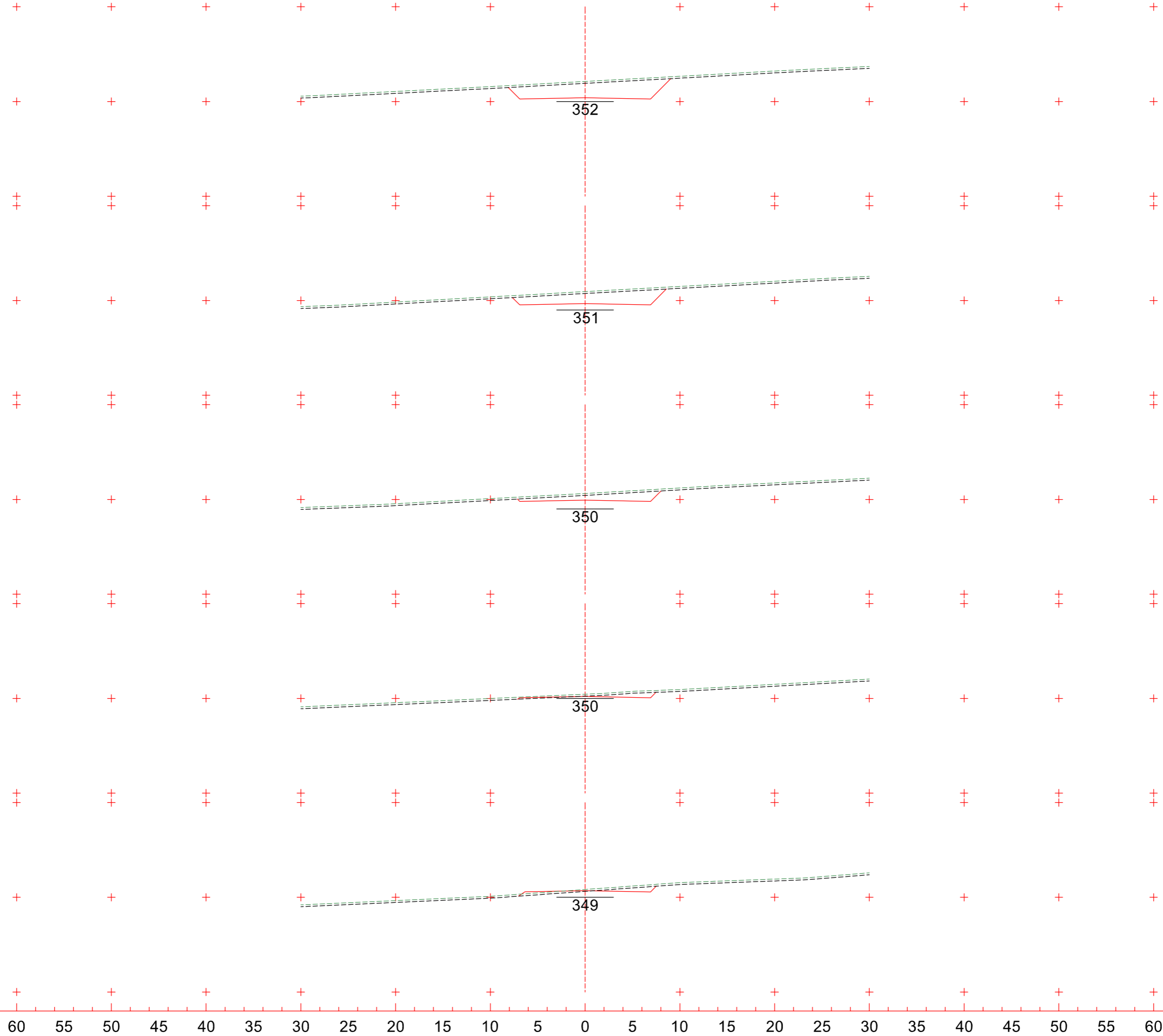
1+340
CT 350,026 m
CP 349,925 m

1+320
CT 350,765 m
CP 350,559 m

1+300
CT 351,446 m
CP 351,259 m

Eixo1
Escala 1:400

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1+480
CT 354,123 m
CP 352,409 m

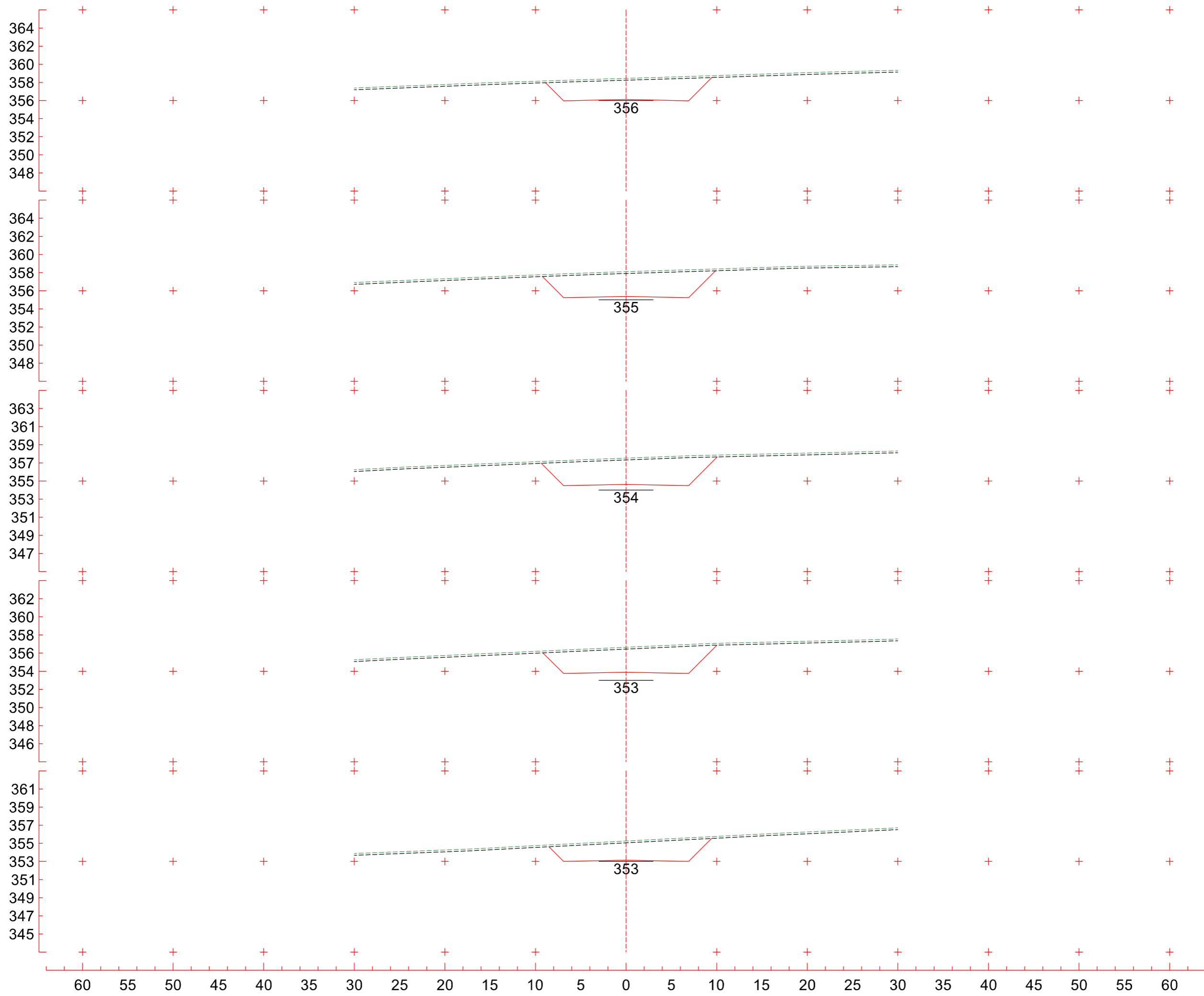
1+460
CT 352,941 m
CP 351,669 m

1+440
CT 351,626 m
CP 350,929 m

1+420
CT 350,438 m
CP 350,205 m

1+400
CT 349,829 m
CP 349,703 m

Eixo1
Escala 1:400



1+580
 CT 358,439 m
 CP 356,109 m

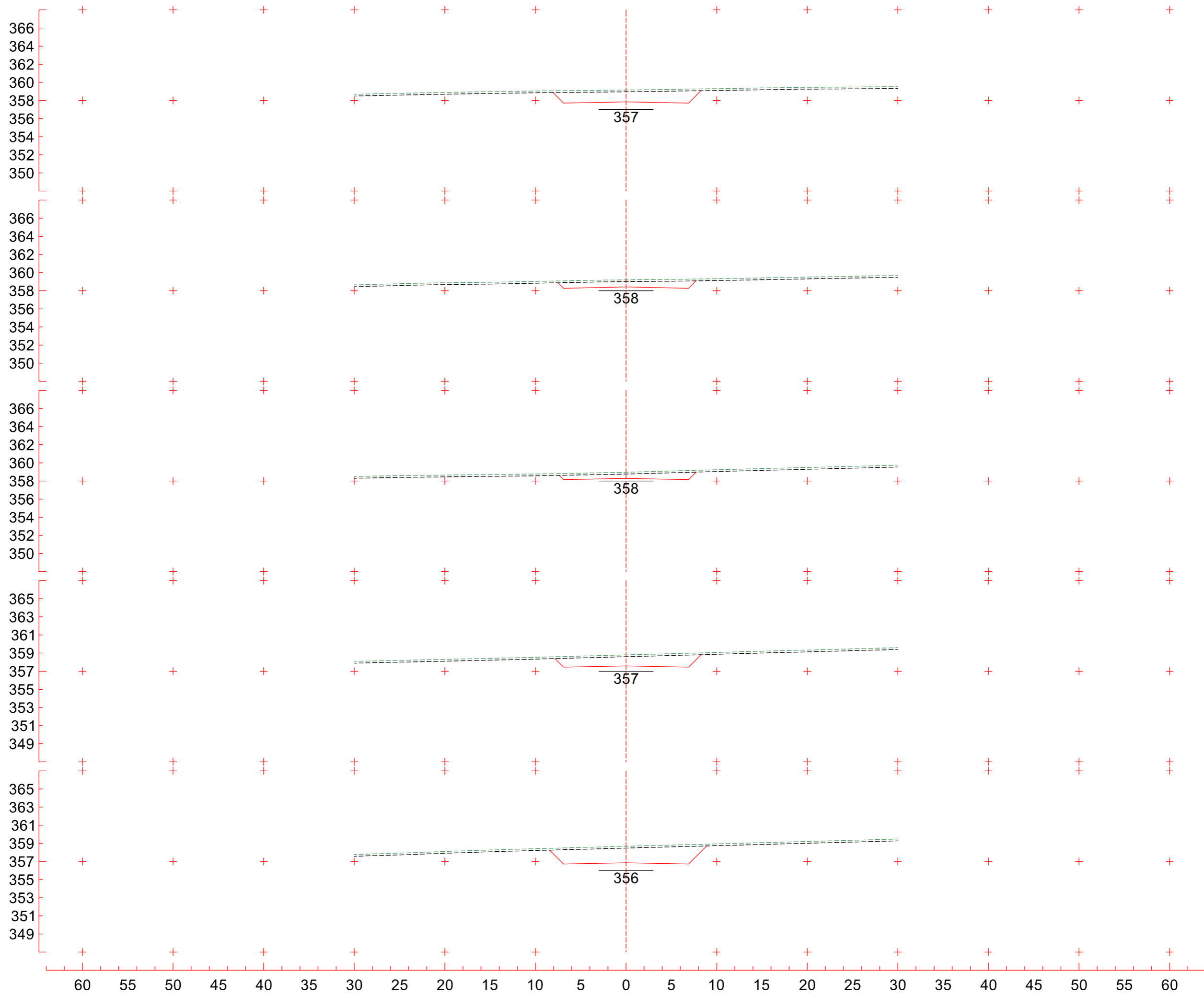
1+560
 CT 358,101 m
 CP 355,369 m

1+540
 CT 357,520 m
 CP 354,629 m

1+520
 CT 356,642 m
 CP 353,889 m

1+500
 CT 355,256 m
 CP 353,149 m

Eixo1
 Escala 1:400



1+680

CT 359,158 m
CP 357,849 m

1+660

CT 359,201 m
CP 358,413 m

1+640

CT 358,965 m
CP 358,281 m

1+620

CT 358,804 m
CP 357,589 m

1+600

CT 358,677 m
CP 356,849 m

Eixo1

Escala 1:400

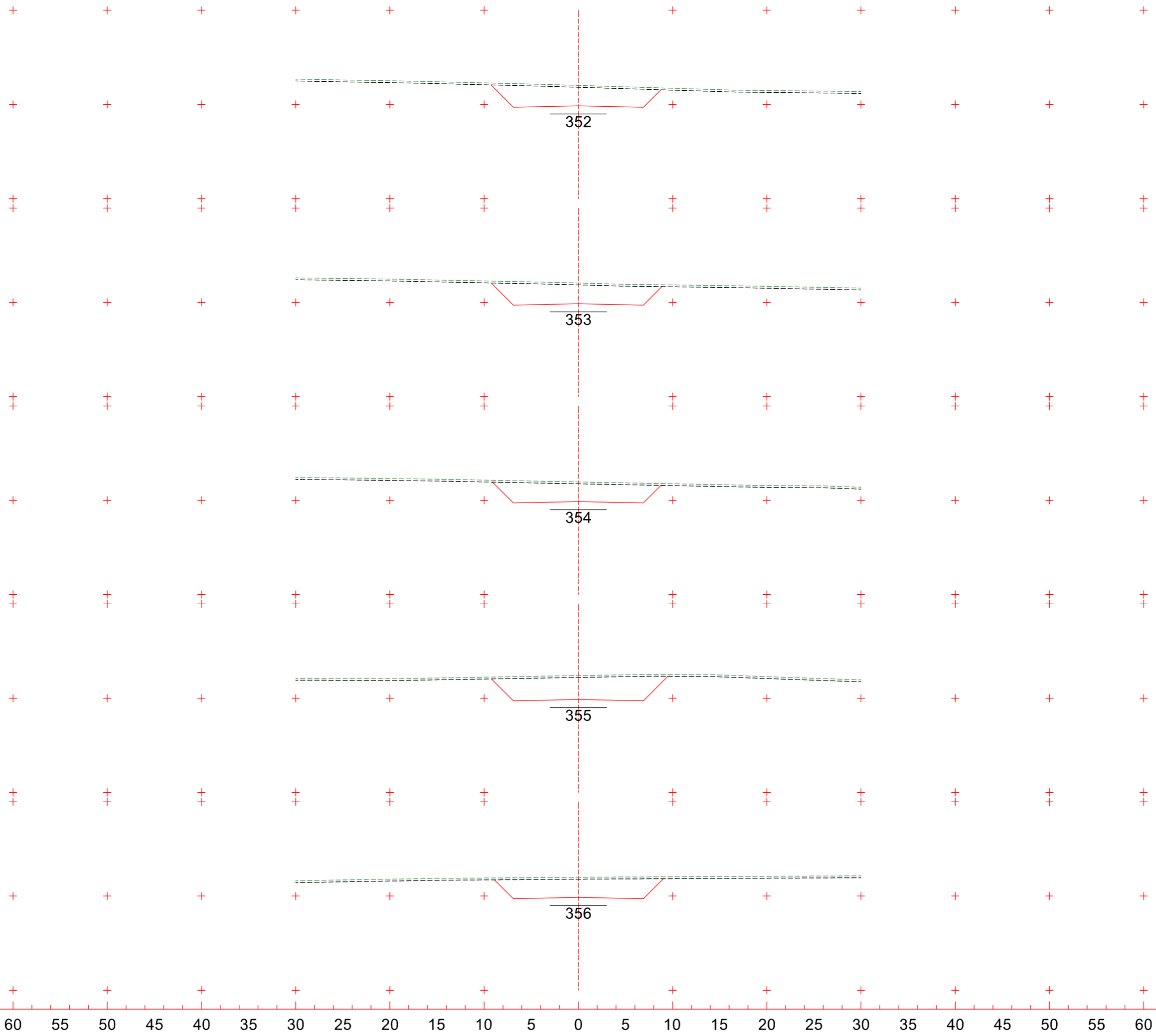
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1+780
CT 355,029 m
CP 352,854 m

1+760
CT 356,059 m
CP 353,854 m

1+740
CT 356,949 m
CP 354,854 m

1+720
CT 358,401 m
CP 355,854 m

1+700
CT 358,989 m
CP 356,854 m

Eixo1
Escala 1:400

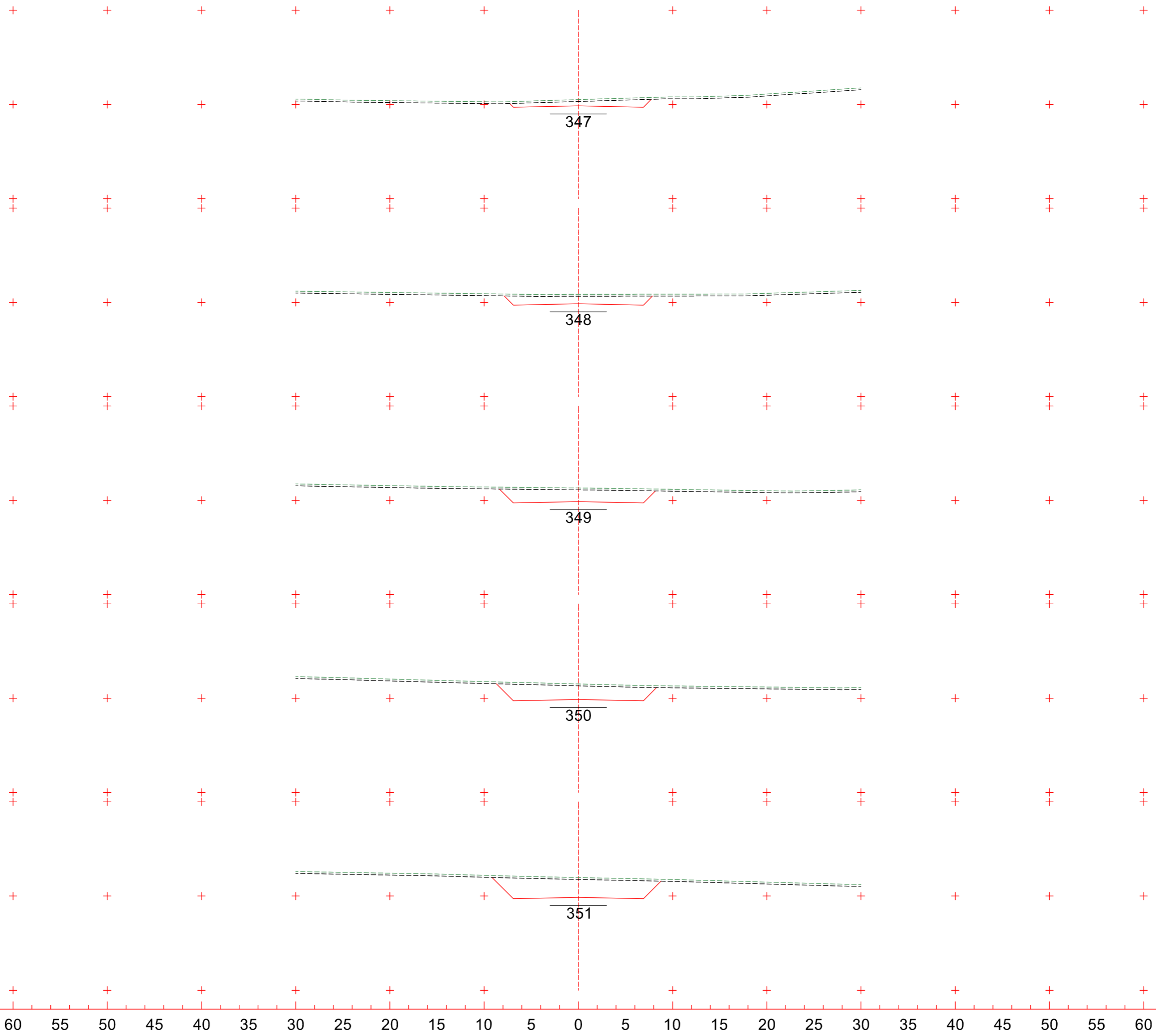
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1+880
CT 348,524 m
CP 347,854 m

1+860
CT 349,854 m
CP 348,854 m

1+840
CT 351,307 m
CP 349,854 m

1+820
CT 352,511 m
CP 350,854 m

1+800
CT 353,964 m
CP 351,854 m

Eixo1
Escala 1:400

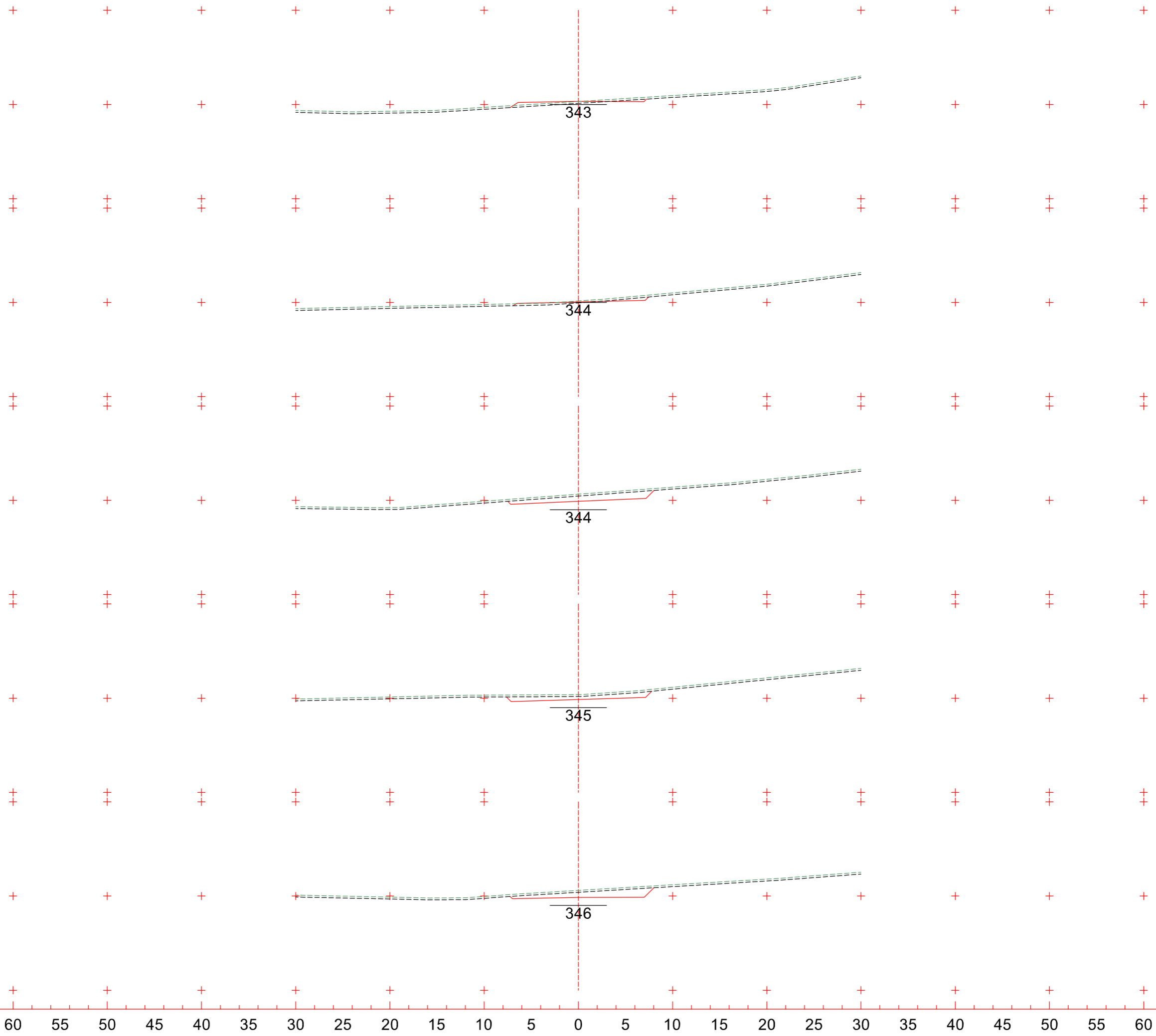
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1+980
CT 343,323 m
CP 343,343 m

1+960
CT 344,153 m
CP 344,050 m

1+940
CT 345,647 m
CP 344,889 m

1+920
CT 346,377 m
CP 345,854 m

1+900
CT 347,600 m
CP 346,854 m

Eixo1
Escala 1:400

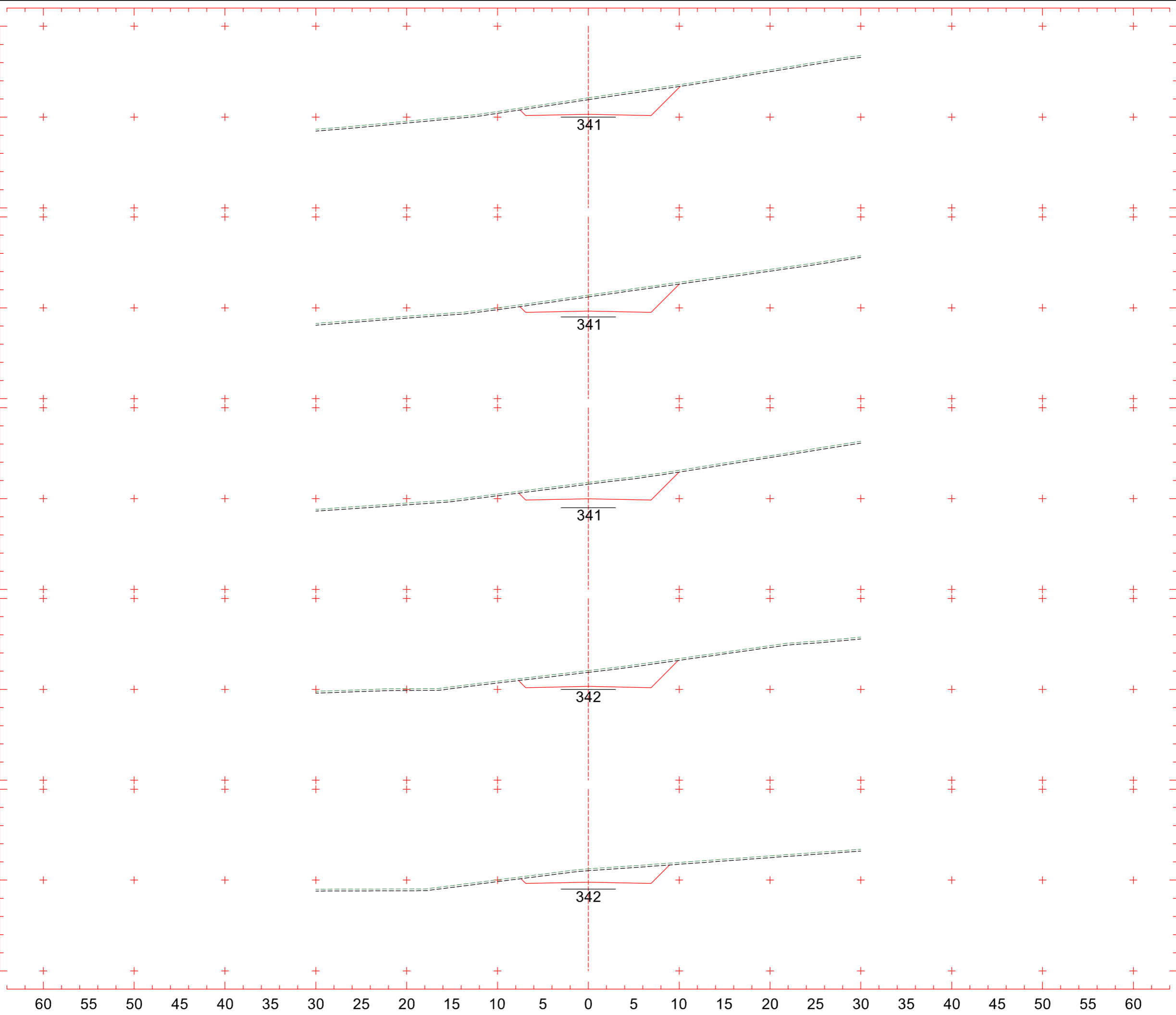
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2+080
CT 343,117 m
CP 341,298 m

2+060
CT 343,401 m
CP 341,639 m

2+040
CT 343,782 m
CP 341,979 m

2+020
CT 344,070 m
CP 342,325 m

2+000
CT 344,236 m
CP 342,768 m

Eixo1
Escala 1:400

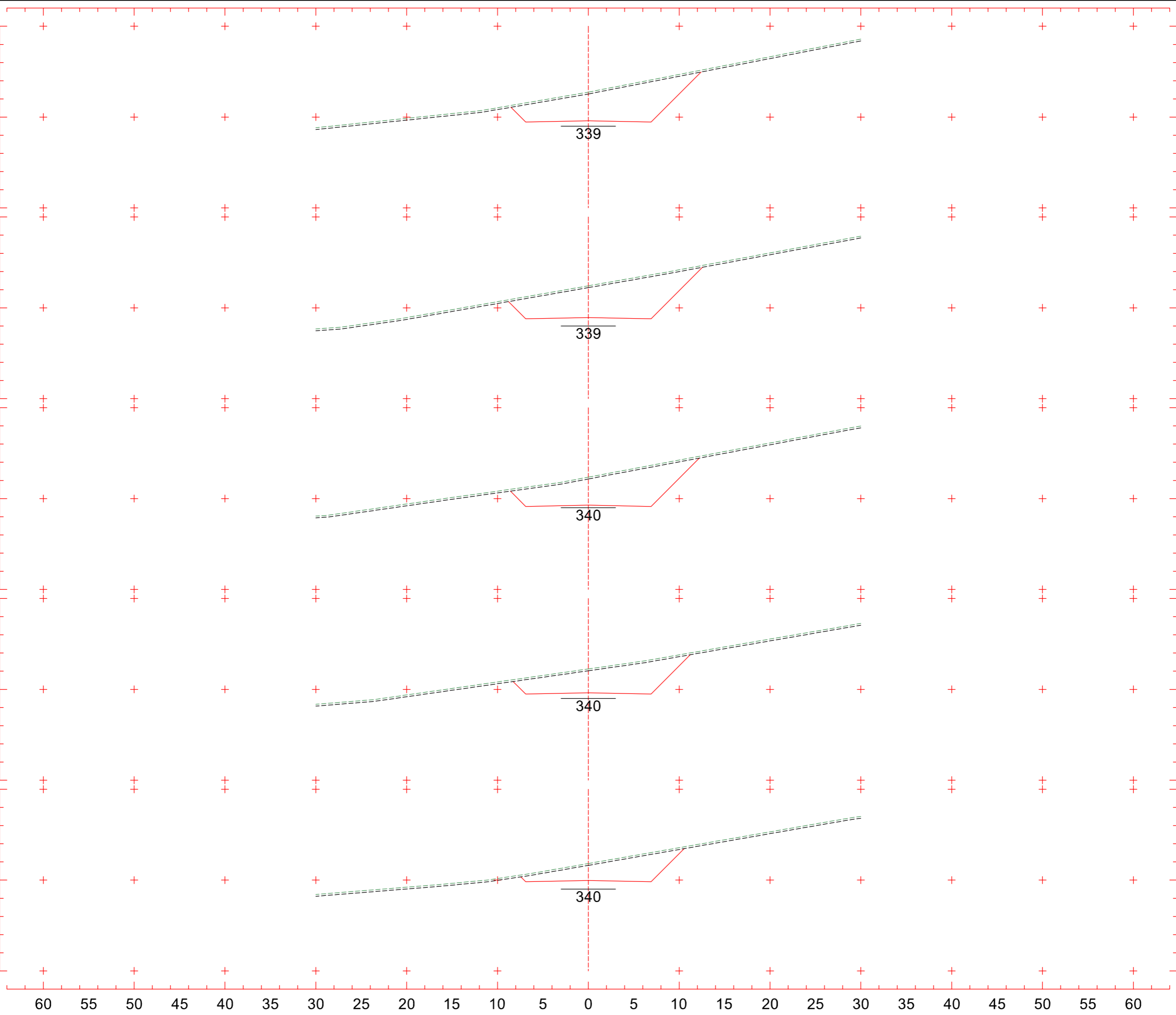
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2+180
CT 342,746 m
CP 339,594 m

2+160
CT 343,425 m
CP 339,935 m

2+140
CT 343,361 m
CP 340,275 m

2+120
CT 343,245 m
CP 340,616 m

2+100
CT 342,824 m
CP 340,957 m

Eixo1
Escala 1:400

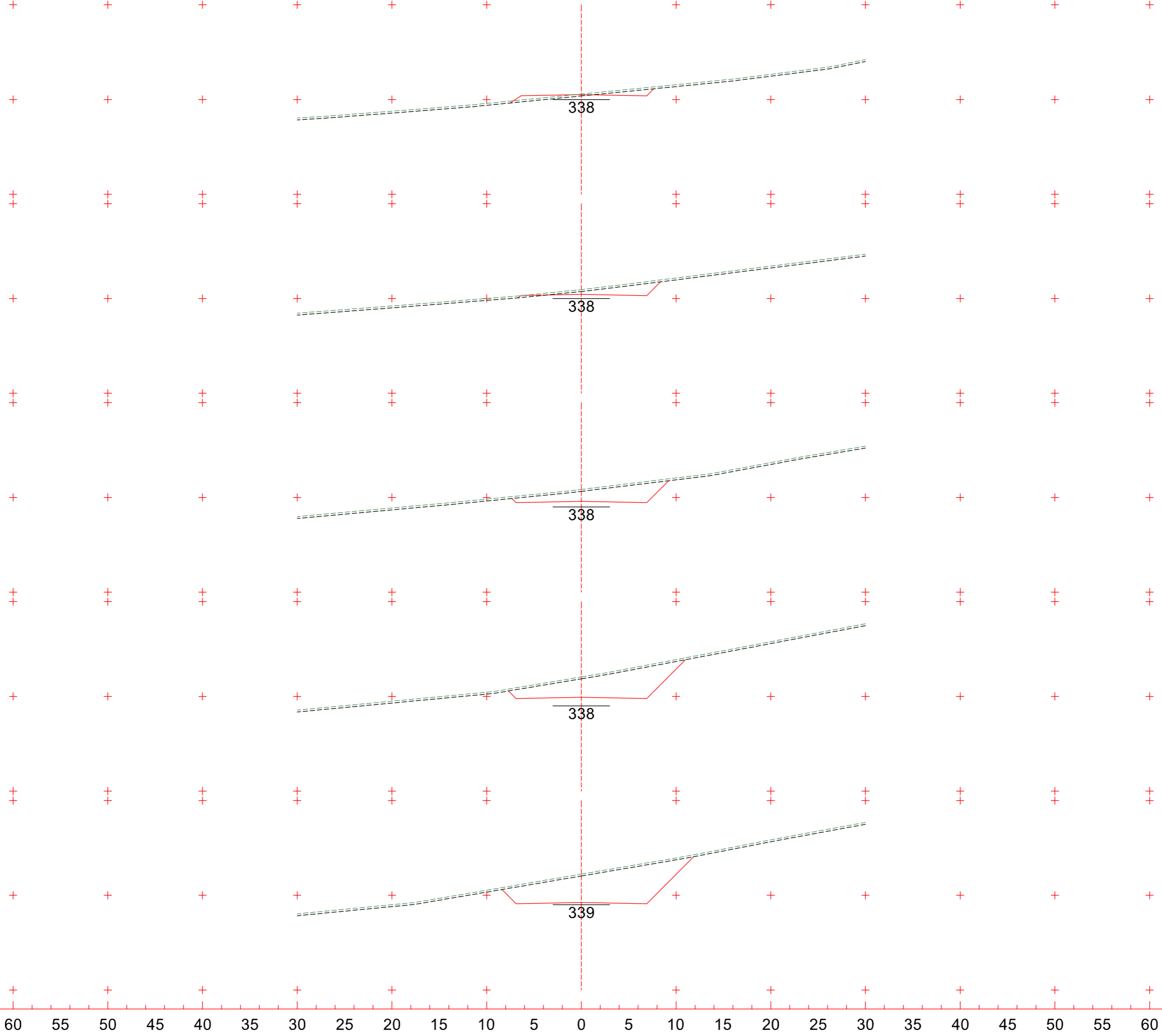
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2+280
CT 338,579 m
CP 338,531 m

2+260
CT 338,932 m
CP 338,439 m

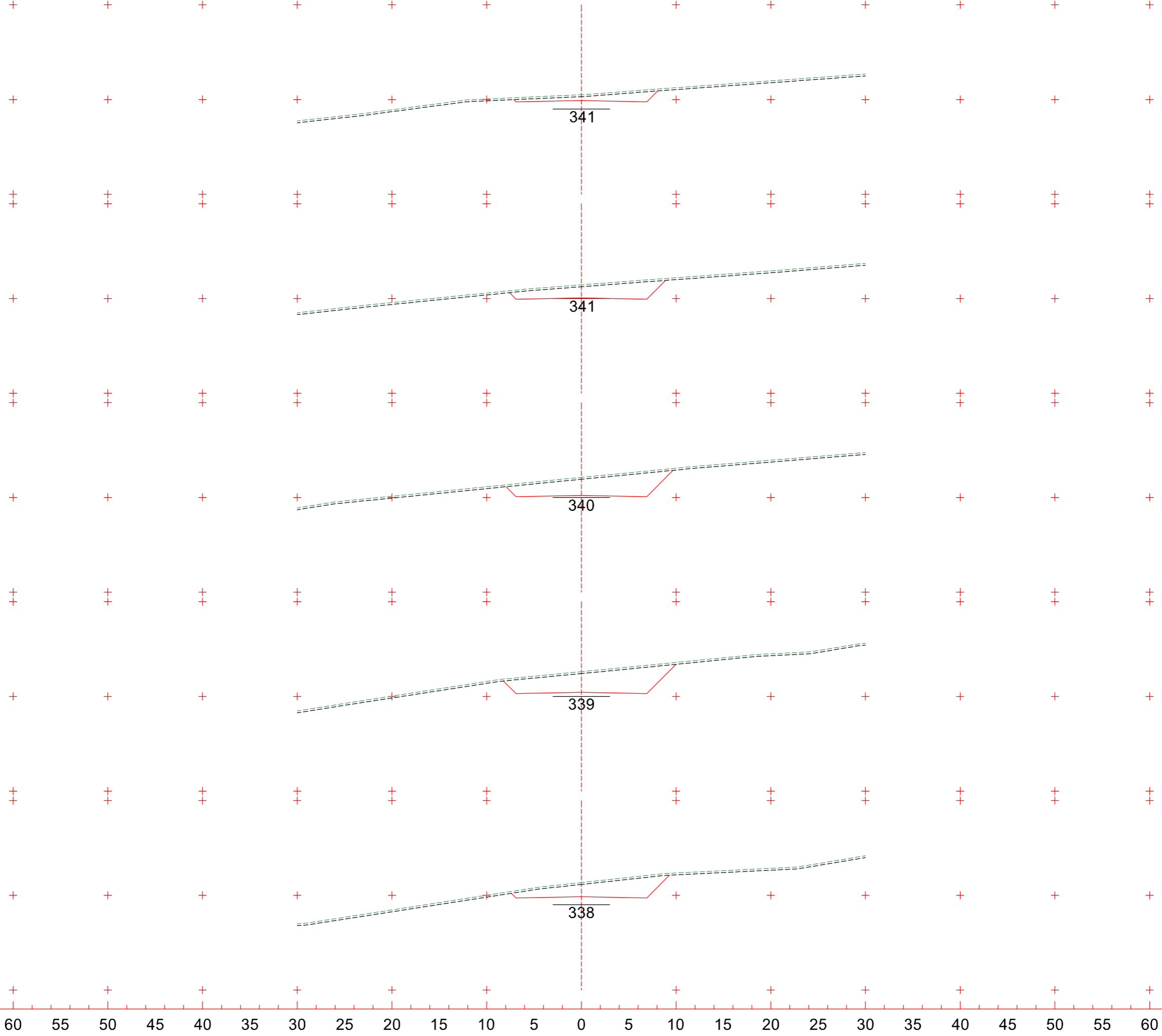
2+240
CT 339,844 m
CP 338,584 m

2+220
CT 341,052 m
CP 338,912 m

2+200
CT 342,239 m
CP 339,253 m

Eixo1
Escala 1:400

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Eixo1
Escala 1:400

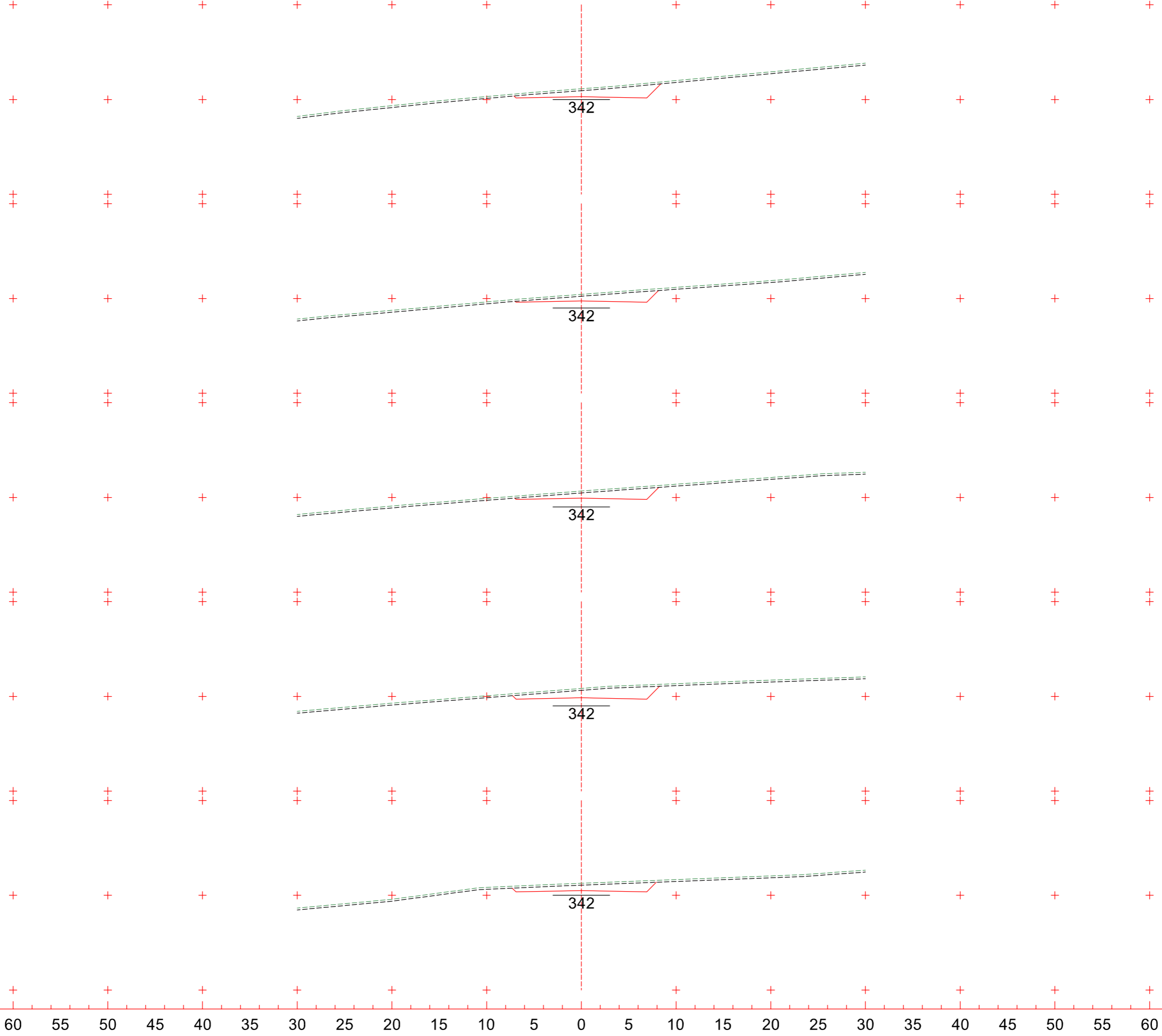
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2+480
CT 343,138 m
CP 342,301 m

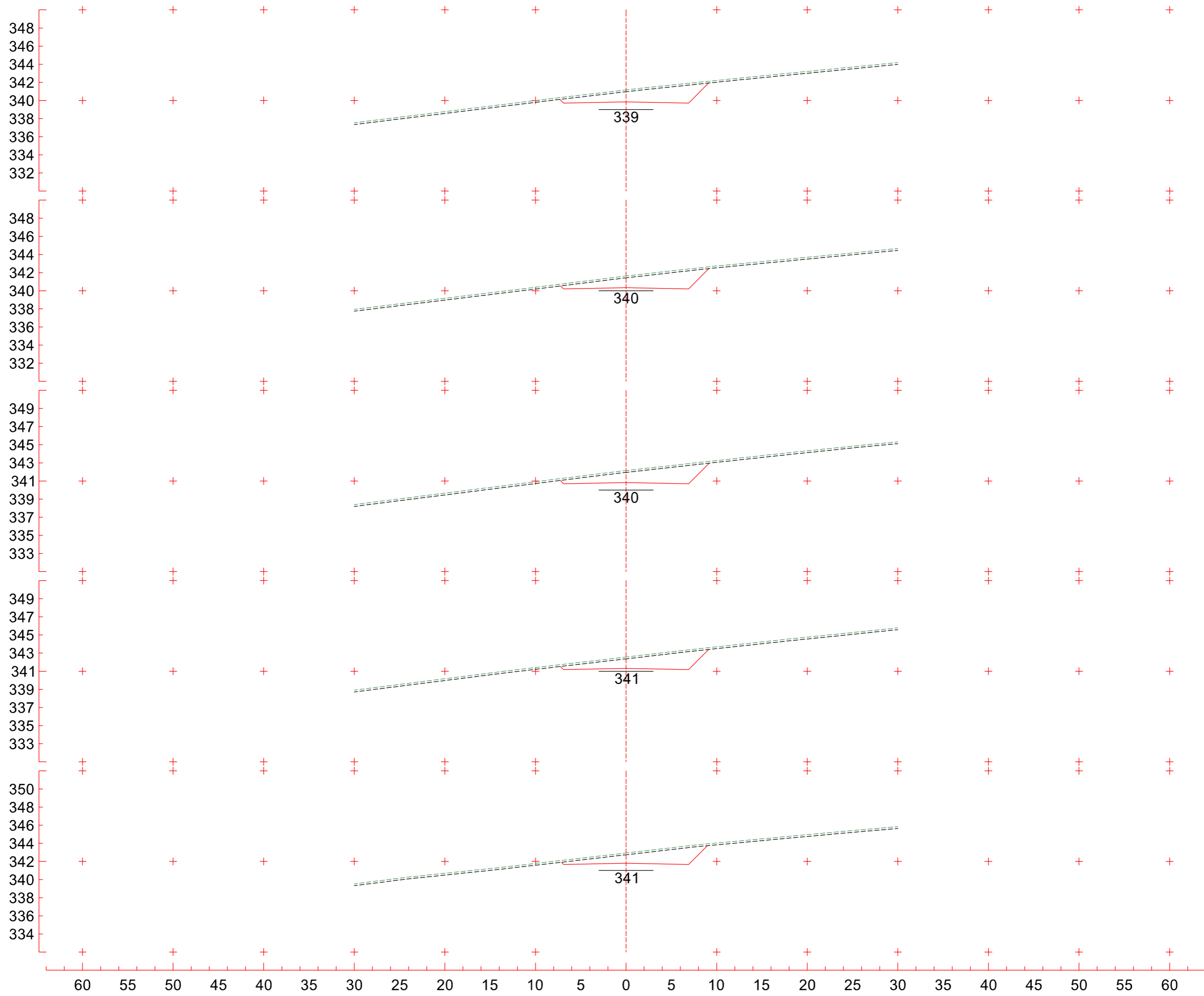
2+460
CT 343,436 m
CP 342,739 m

2+440
CT 343,677 m
CP 342,928 m

2+420
CT 343,838 m
CP 342,850 m

2+400
CT 343,271 m
CP 342,505 m

Eixo1
Escala 1:400



2+580

CT 341,165 m
CP 339,848 m

339

2+560

CT 341,626 m
CP 340,339 m

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2+540

CT 342,144 m
CP 340,829 m

340

2+520

CT 342,564 m
CP 341,320 m

341

2+500

CT 342,936 m
CP 341,810 m

341

Eixo1

Escala 1:400

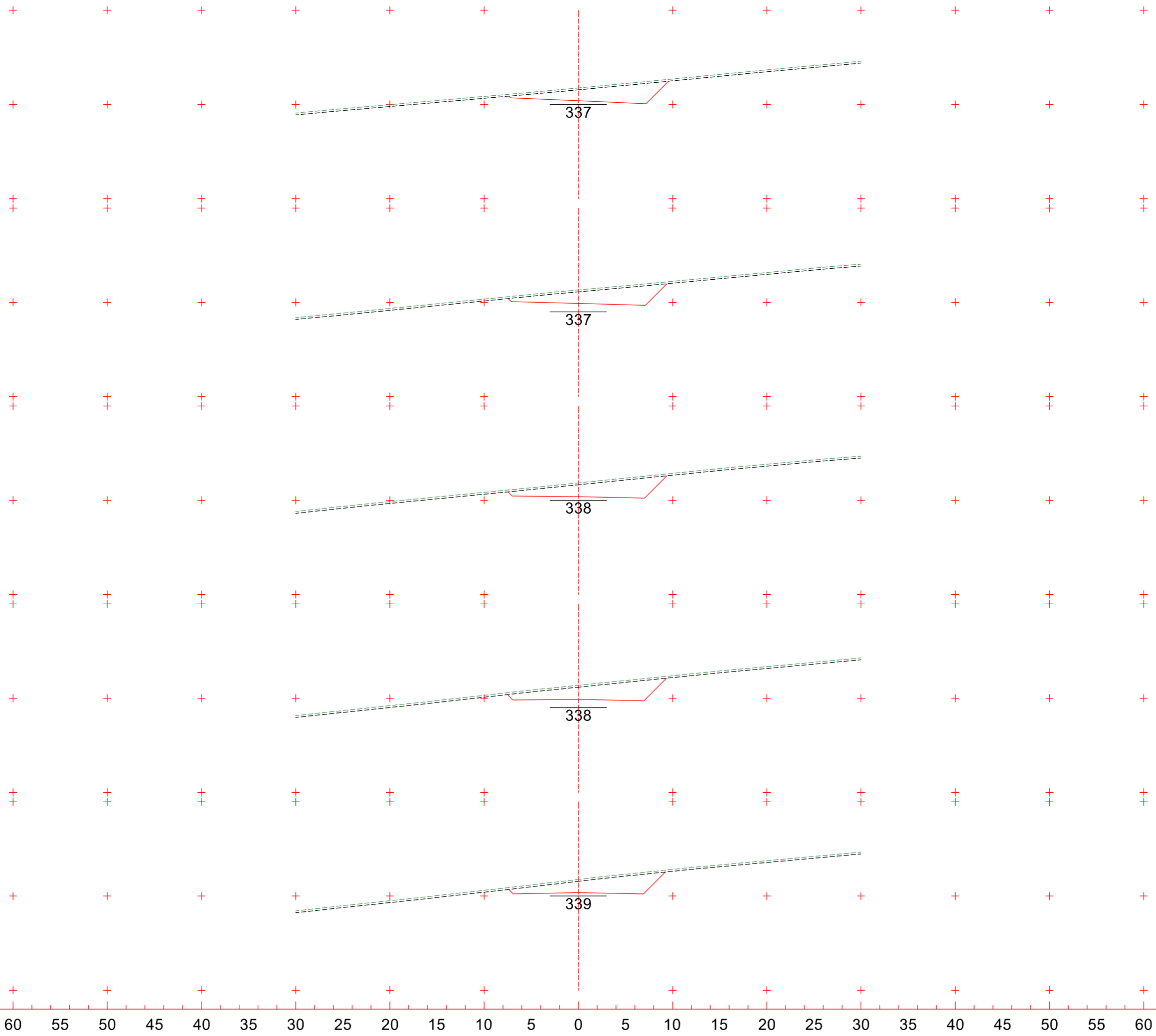
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2+680
CT 338,762 m
CP 337,396 m

2+660
CT 339,321 m
CP 337,887 m

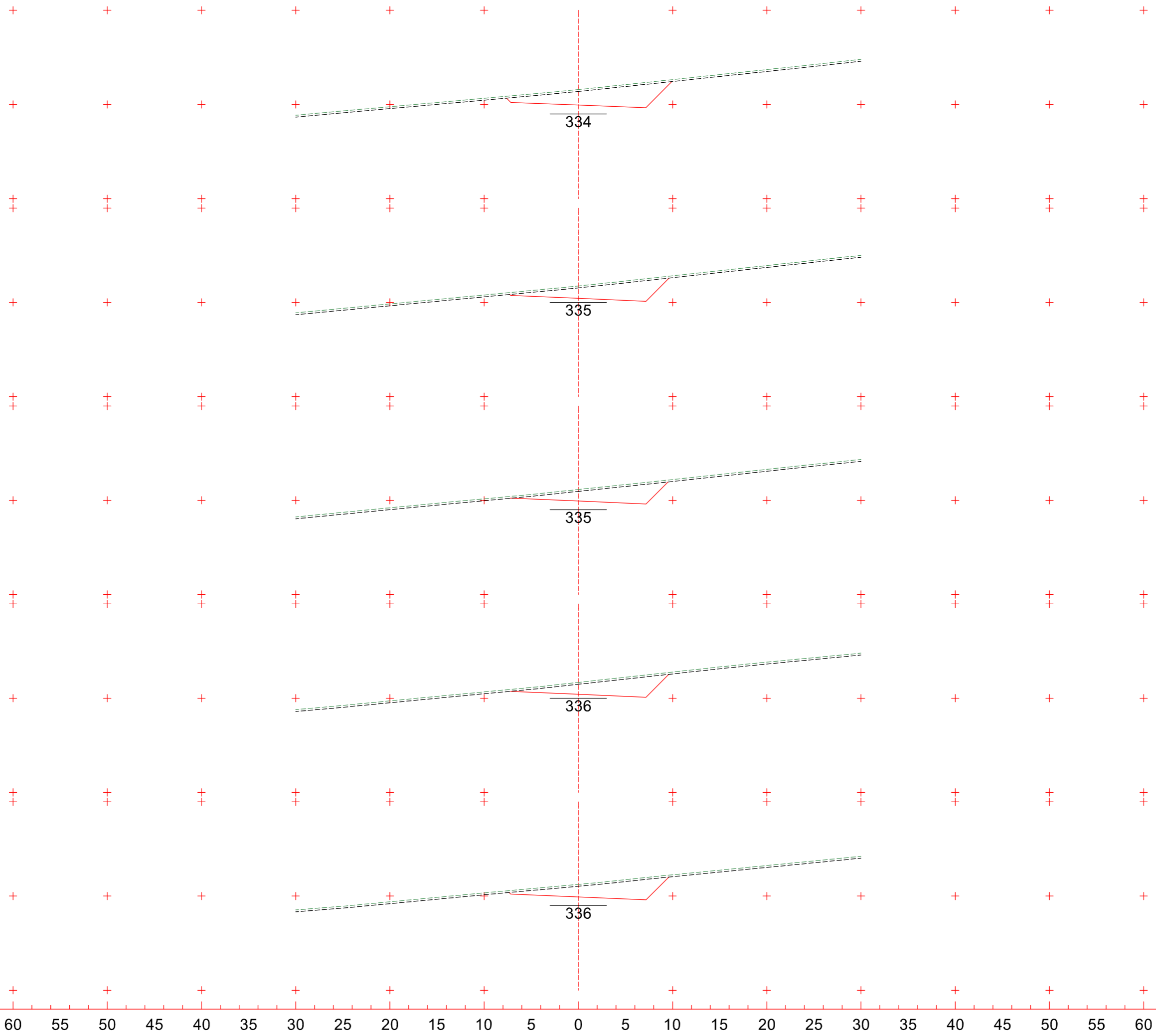
2+640
CT 339,845 m
CP 338,377 m

2+620
CT 340,368 m
CP 338,868 m

2+600
CT 340,761 m
CP 339,358 m

Eixo1
Escala 1:400

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2+780
CT 336,586 m
CP 334,944 m

2+760
CT 336,741 m
CP 335,435 m

2+740
CT 337,145 m
CP 335,925 m

2+720
CT 337,675 m
CP 336,416 m

2+700
CT 338,240 m
CP 336,906 m

Eixo1
Escala 1:400

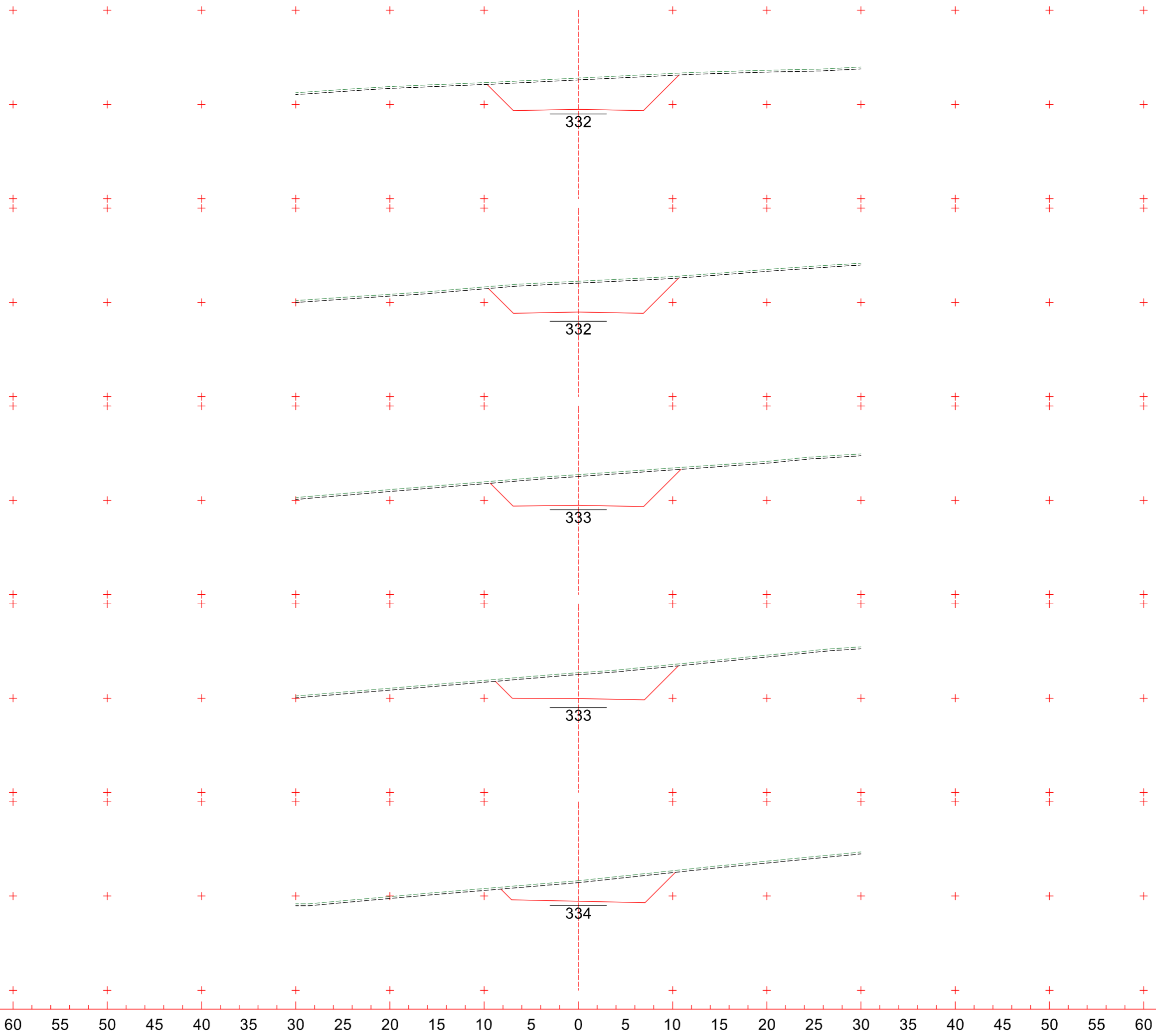
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2+880
CT 335,807 m
CP 332,492 m

2+860
CT 336,247 m
CP 332,983 m

2+840
CT 336,725 m
CP 333,473 m

2+820
CT 336,699 m
CP 333,963 m

2+800
CT 336,627 m
CP 334,454 m

Eixo1
Escala 1:400

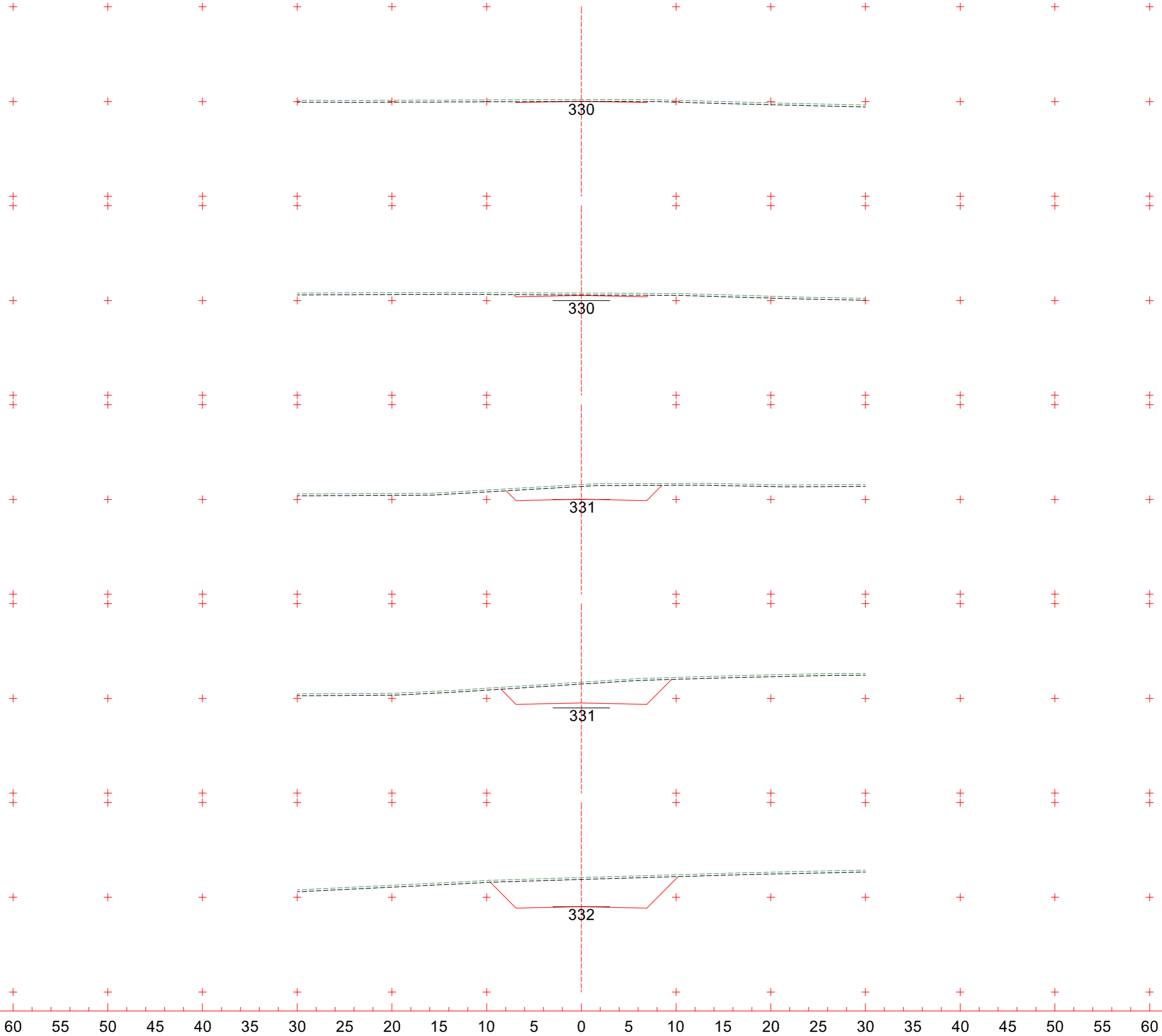
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2+980
CT 330,215 m
CP 330,040 m

2+960
CT 330,784 m
CP 330,531 m

2+940
CT 332,574 m
CP 331,021 m

2+920
CT 333,711 m
CP 331,511 m

2+900
CT 335,087 m
CP 332,002 m

Eixo1
Escala 1:400

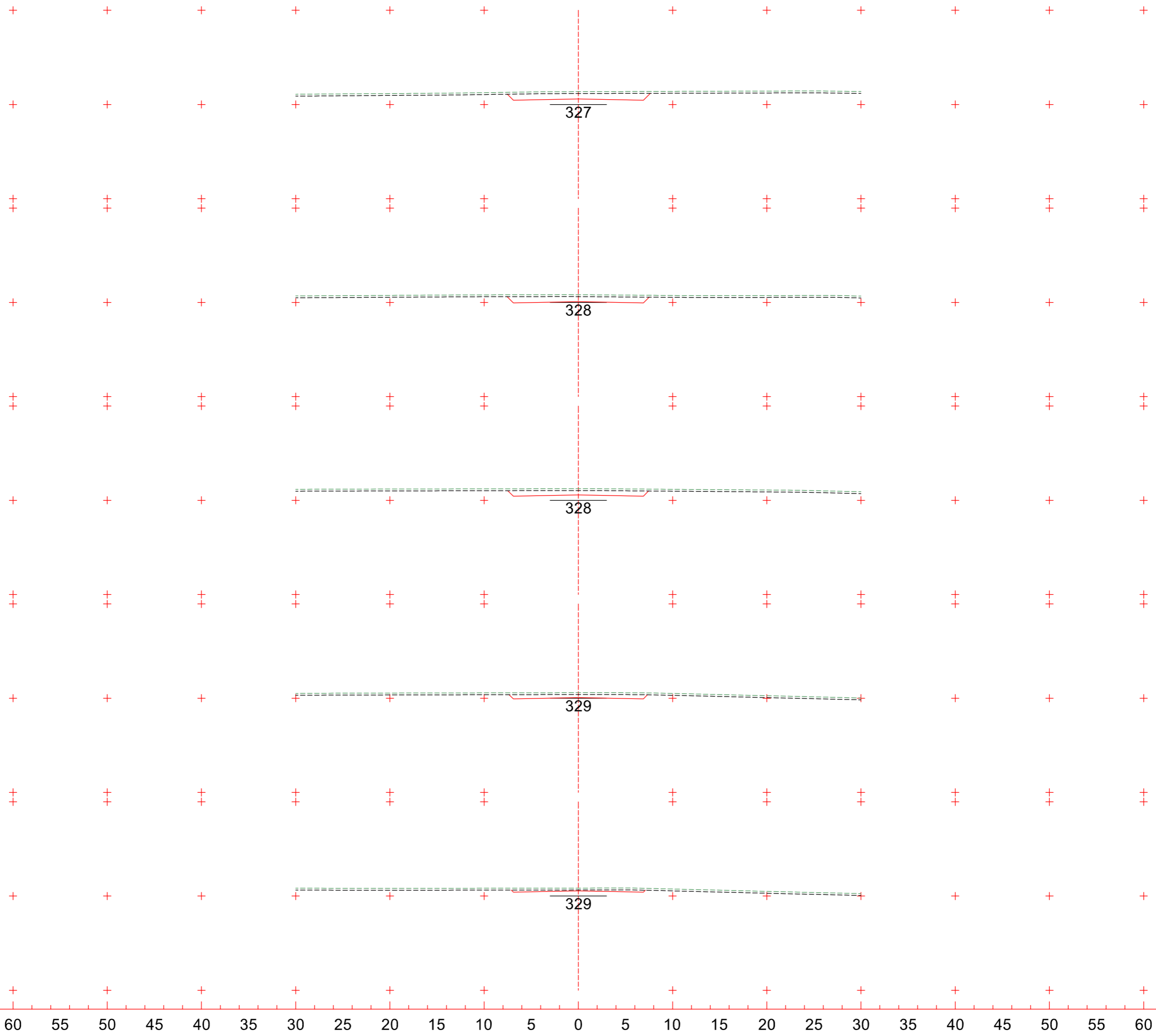
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3+080
CT 328,364 m
CP 327,588 m

3+060
CT 328,811 m
CP 328,078 m

3+040
CT 329,232 m
CP 328,569 m

3+020
CT 329,582 m
CP 329,059 m

3+000
CT 329,844 m
CP 329,550 m

Eixo1
Escala 1:400

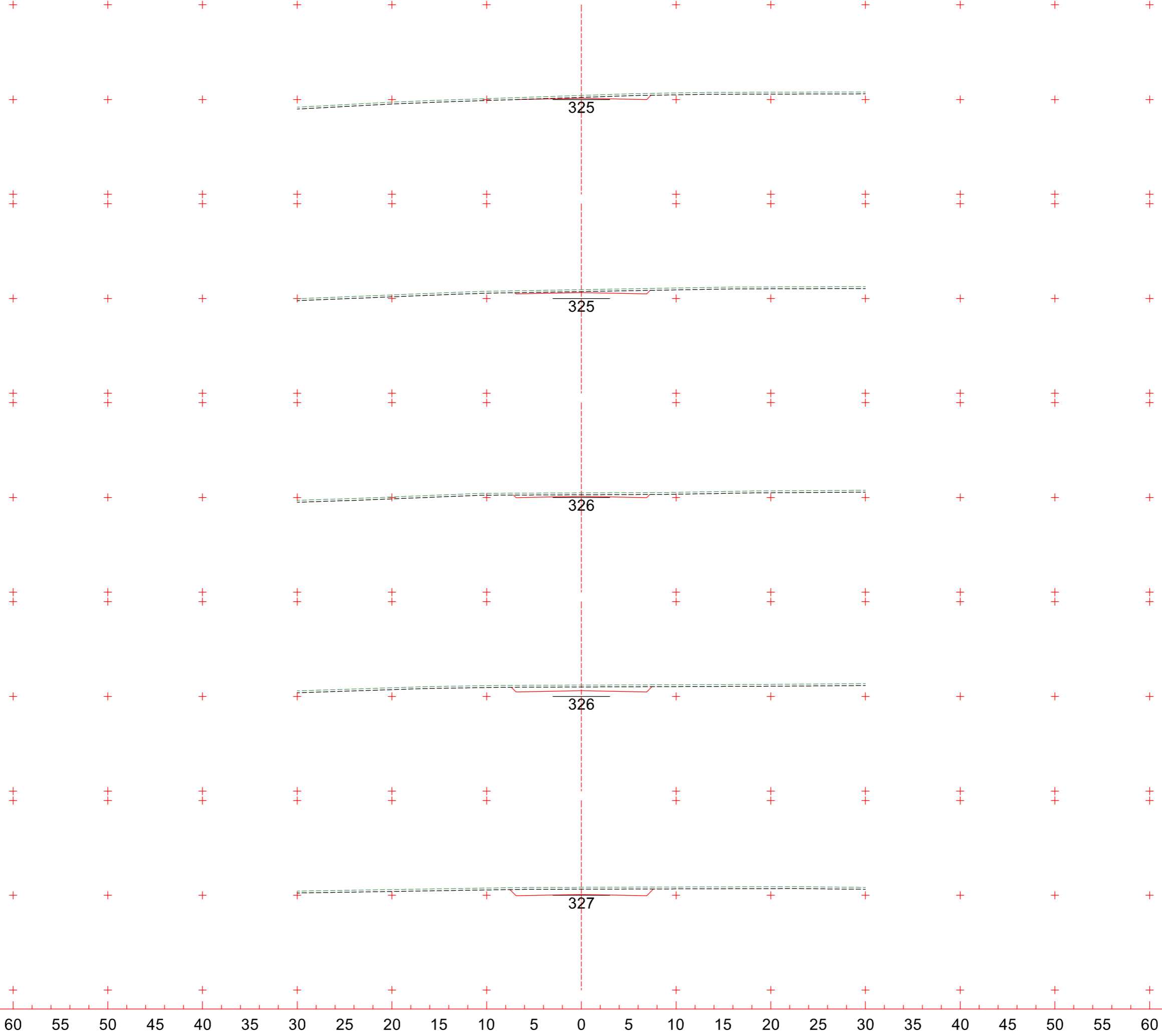
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3+180
CT 325,433 m
CP 325,136 m

3+160
CT 325,933 m
CP 325,626 m

3+140
CT 326,480 m
CP 326,117 m

3+120
CT 327,193 m
CP 326,607 m

3+100
CT 327,847 m
CP 327,098 m

Eixo1
Escala 1:400

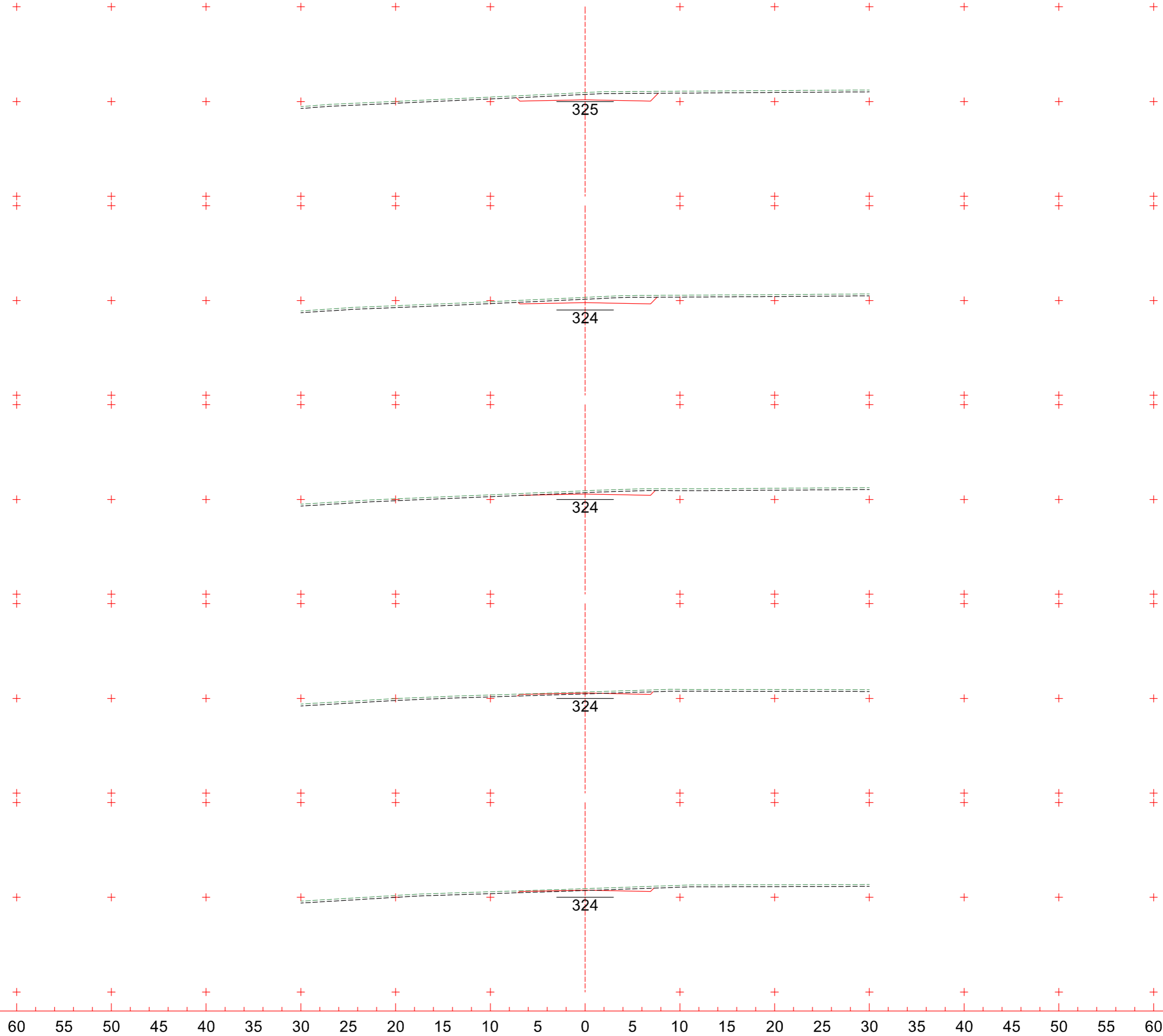
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3+280

CT 325,951 m
CP 325,190 m

3+260

CT 325,333 m
CP 324,782 m

3+240

CT 324,915 m
CP 324,573 m

3+220

CT 324,673 m
CP 324,562 m

3+200

CT 324,915 m
CP 324,750 m

Eixo1

Escala 1:400

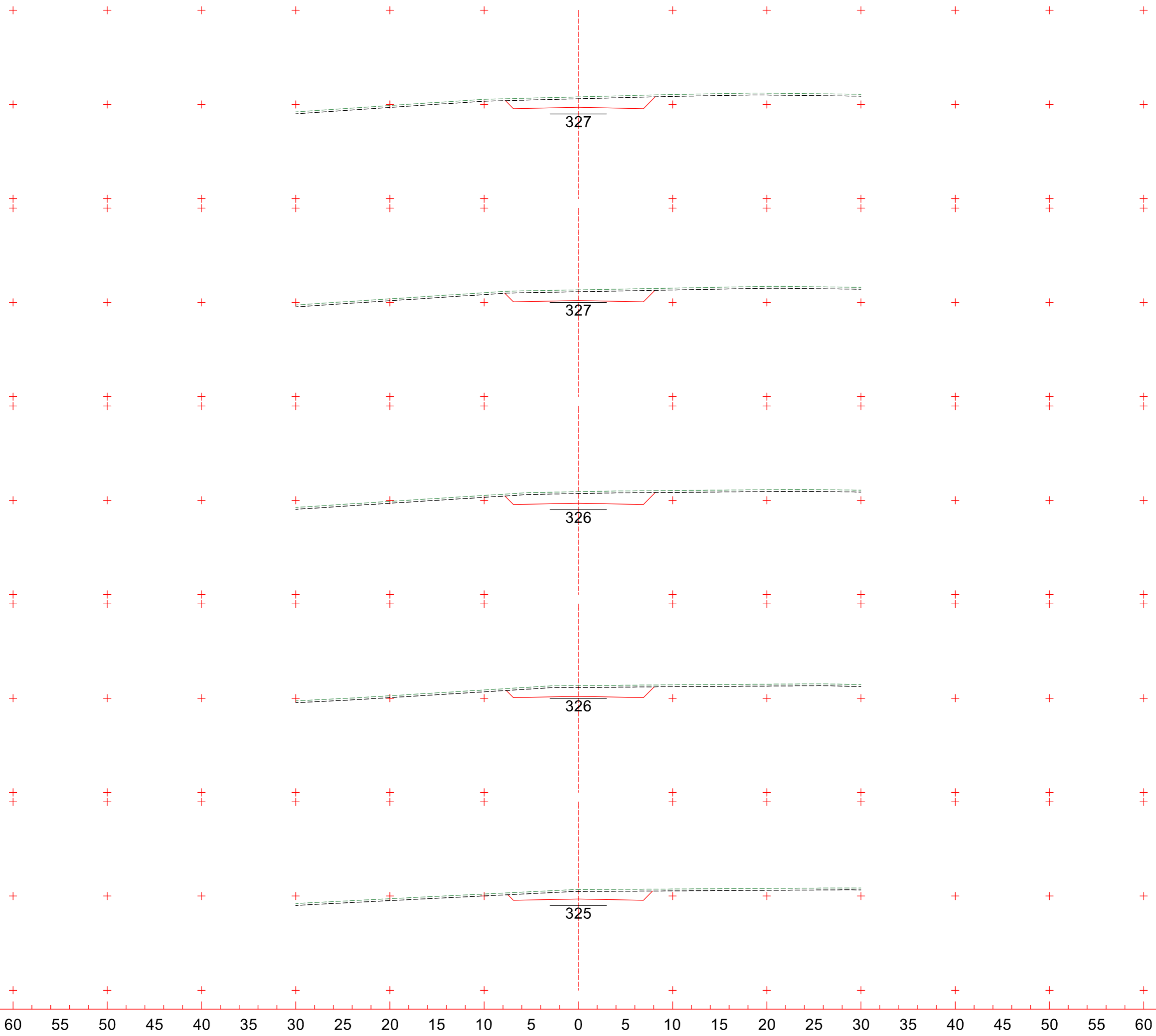
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3+380
CT 328,812 m
CP 327,703 m

3+360
CT 328,333 m
CP 327,200 m

3+340
CT 327,915 m
CP 326,698 m

3+320
CT 327,336 m
CP 326,195 m

3+300
CT 326,685 m
CP 325,692 m

Eixo1
Escala 1:400

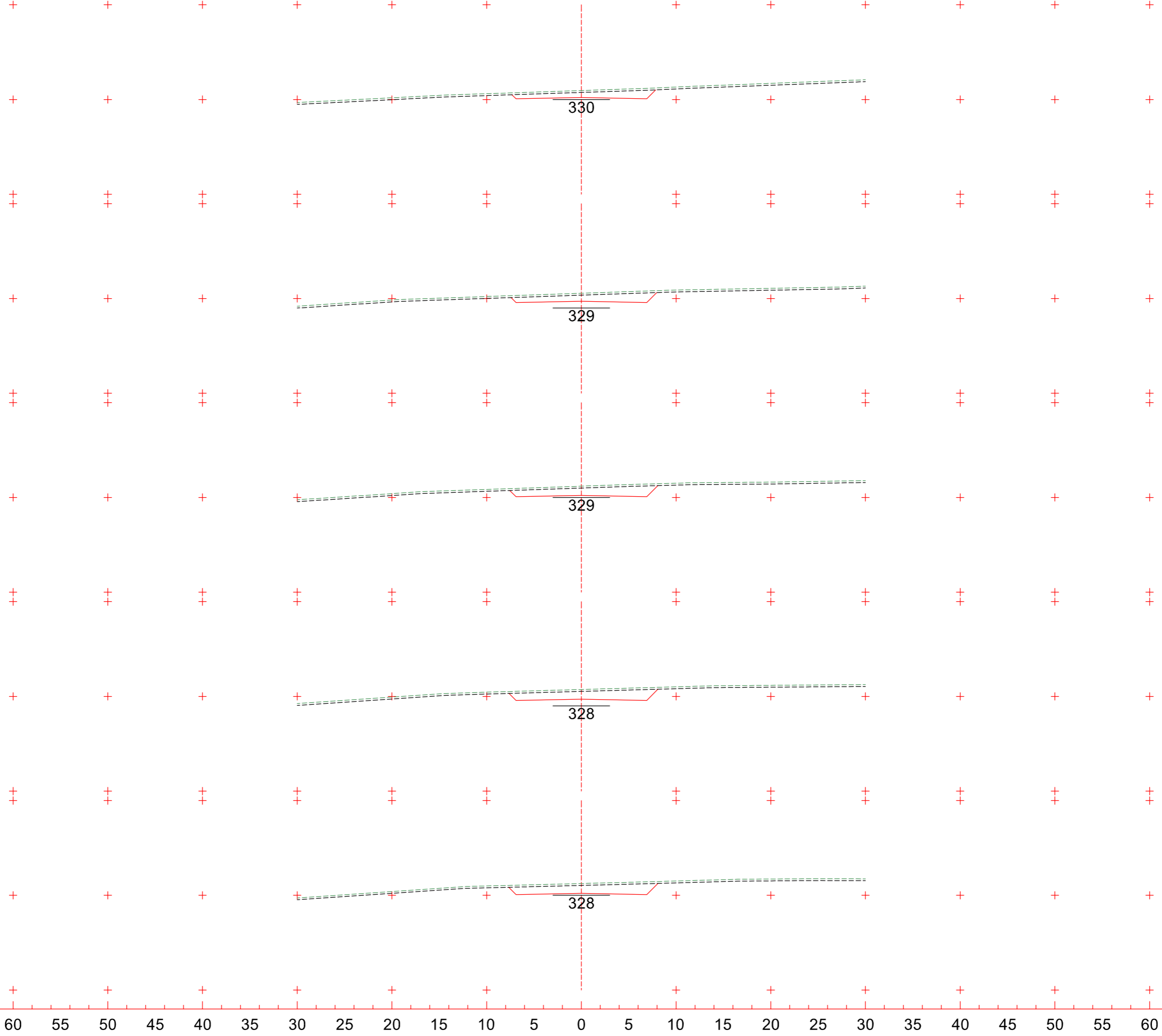
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3+480
CT 330,952 m
CP 330,216 m

3+460
CT 330,553 m
CP 329,713 m

3+440
CT 330,189 m
CP 329,210 m

3+420
CT 329,727 m
CP 328,708 m

3+400
CT 329,244 m
CP 328,205 m

Eixo1
Escala 1:400

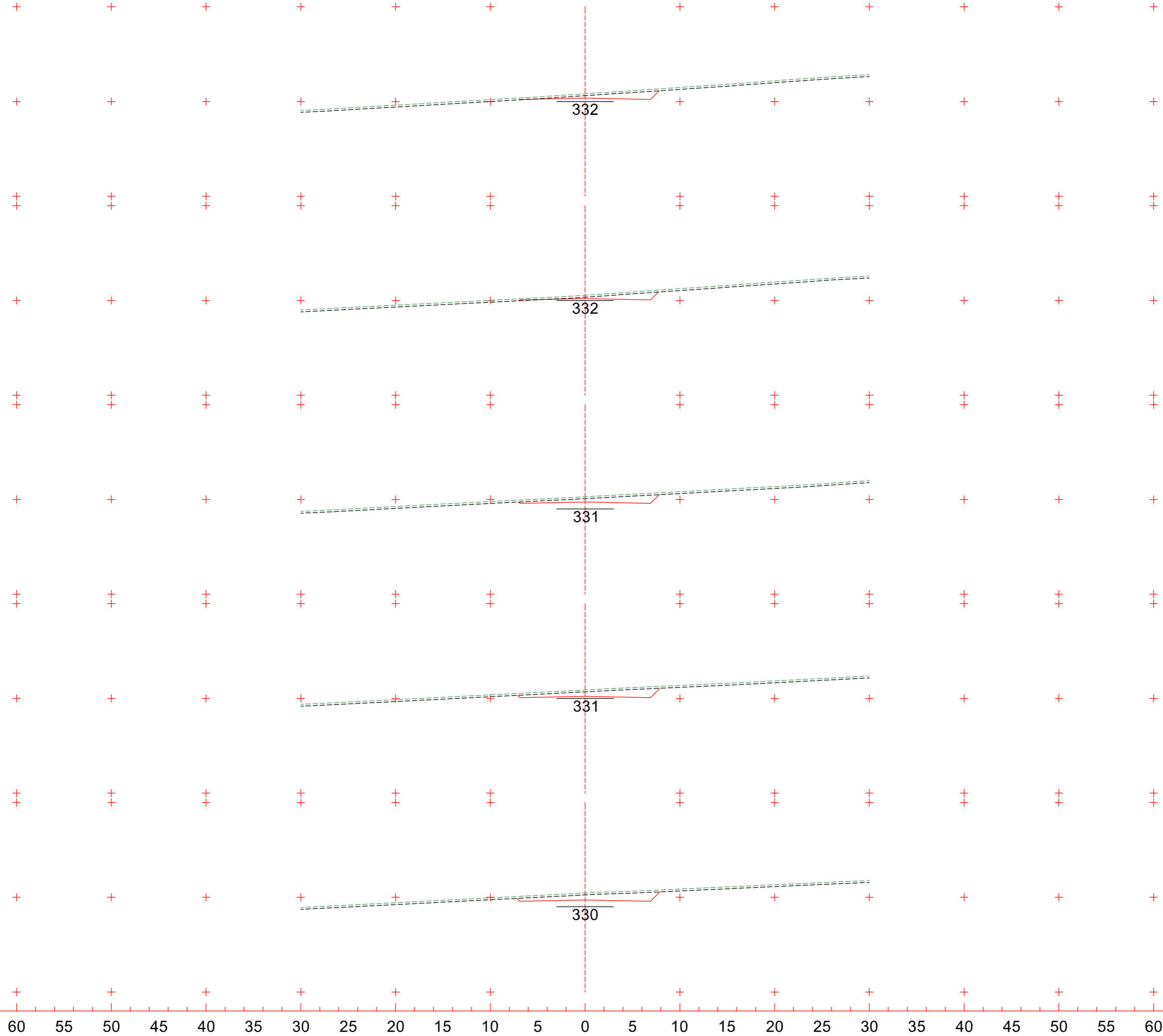
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3+580
CT 332,819 m
CP 332,363 m

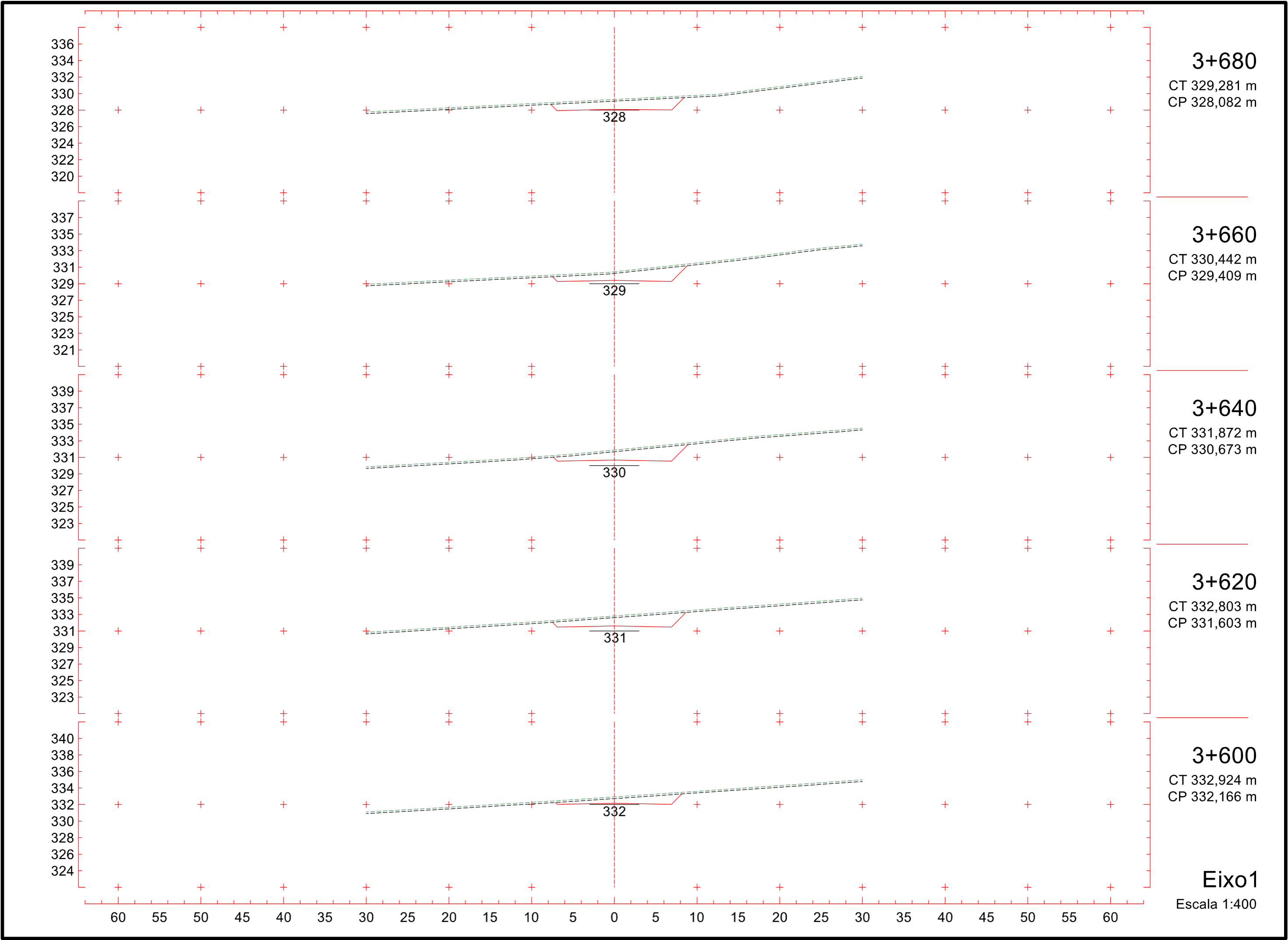
3+560
CT 332,552 m
CP 332,195 m

3+540
CT 332,281 m
CP 331,723 m

3+520
CT 331,890 m
CP 331,221 m

3+500
CT 331,454 m
CP 330,718 m

Eixo1
Escala 1:400



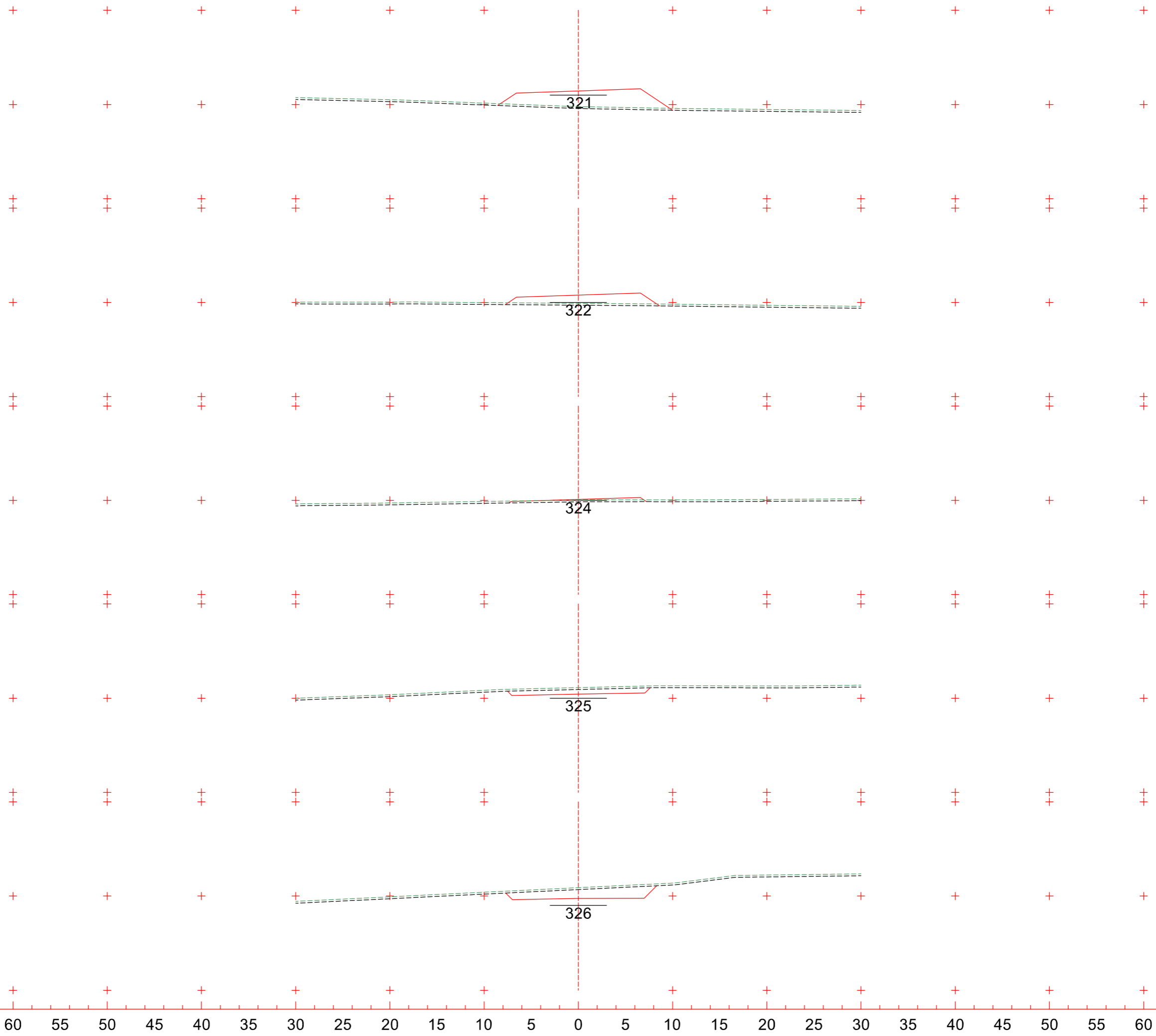
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3+780
CT 319,777 m
CP 321,445 m

3+760
CT 321,901 m
CP 322,773 m

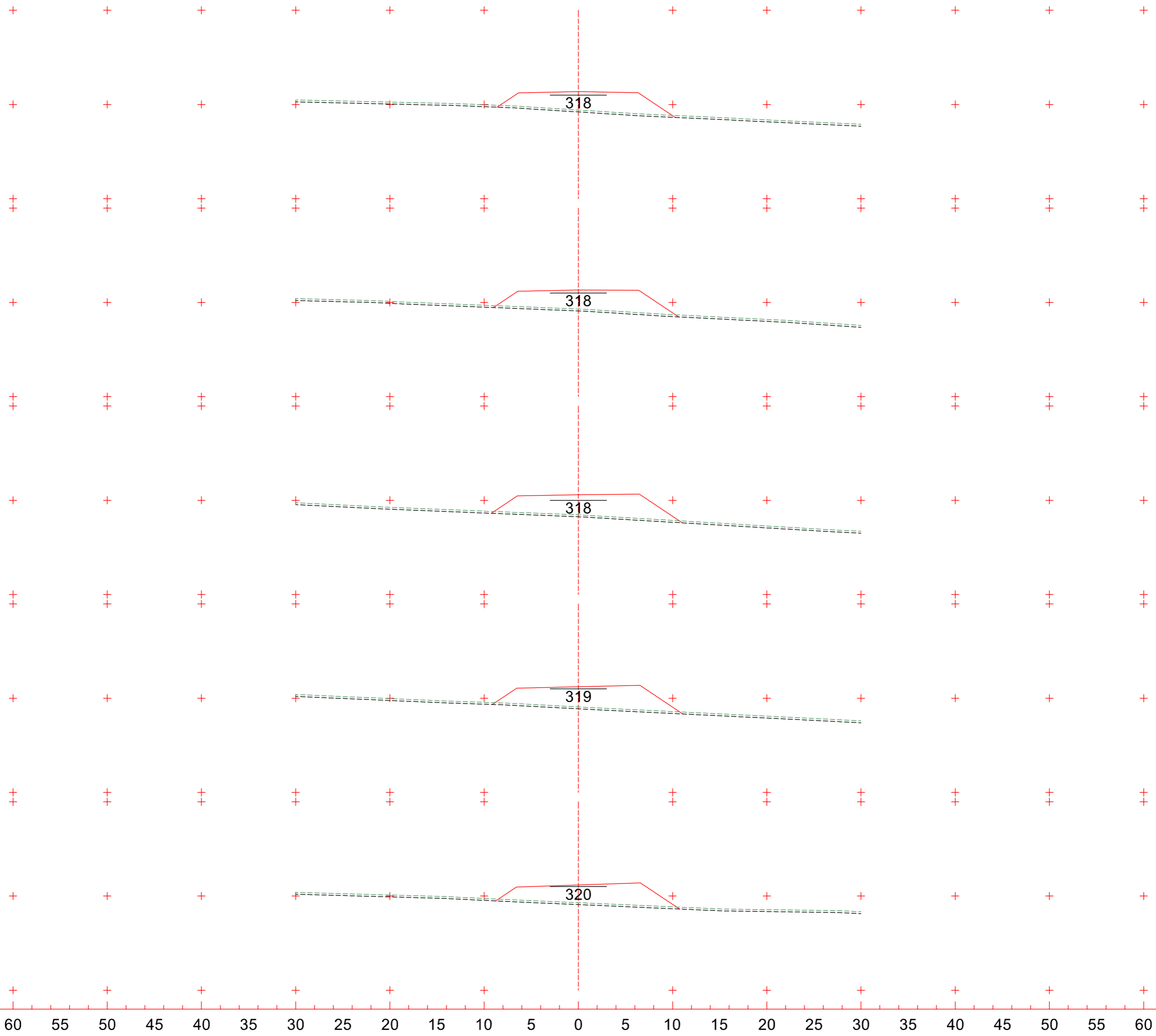
3+740
CT 324,033 m
CP 324,100 m

3+720
CT 326,120 m
CP 325,427 m

3+700
CT 327,889 m
CP 326,755 m

Eixo1
Escala 1:400

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3+880
CT 316,411 m
CP 318,365 m

3+860
CT 316,296 m
CP 318,309 m

3+840
CT 316,451 m
CP 318,593 m

3+820
CT 317,070 m
CP 319,214 m

3+800
CT 318,294 m
CP 320,175 m

Eixo1
Escala 1:400

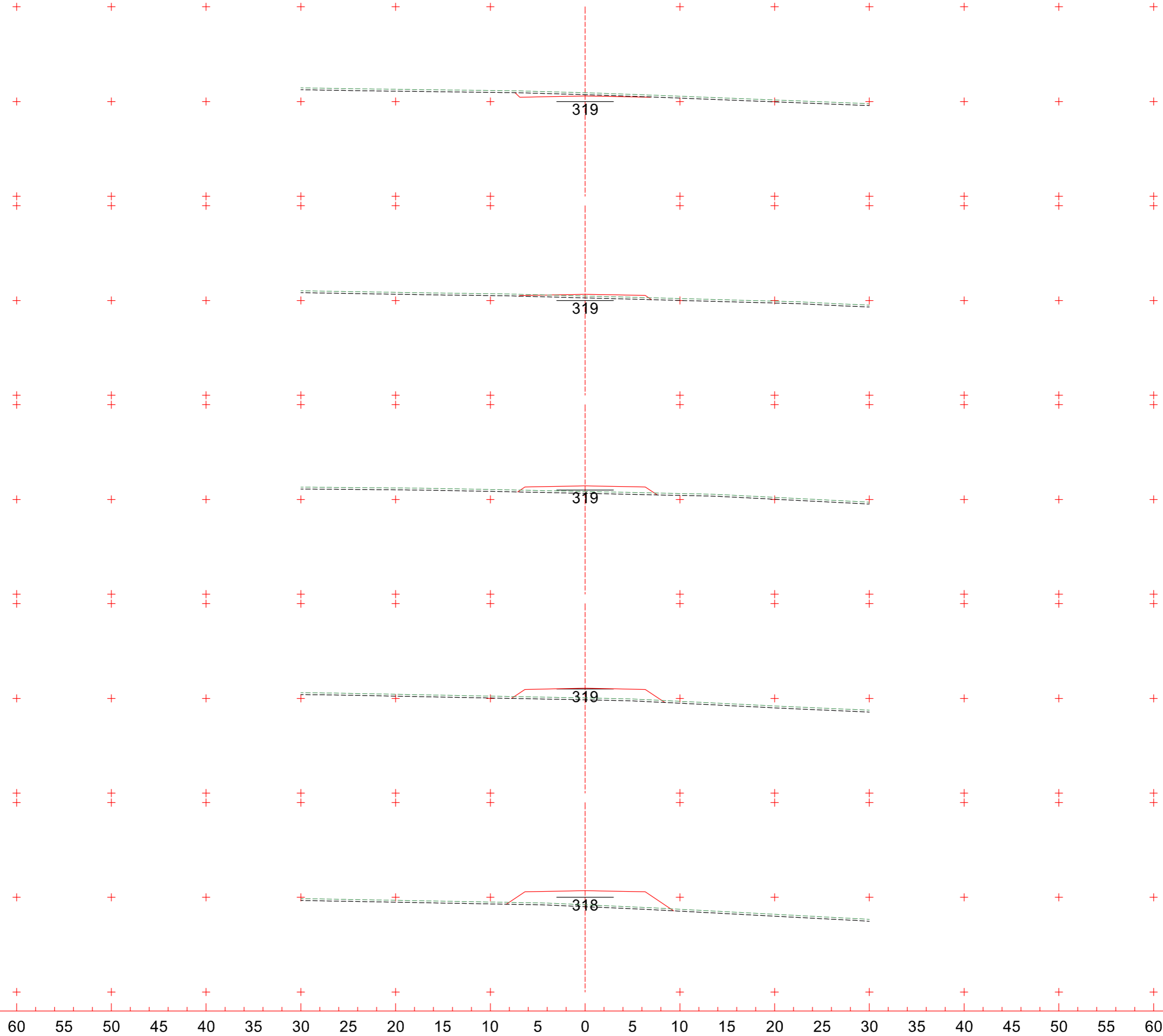
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3+980

CT 319,930 m
CP 319,591 m

3+960

CT 319,474 m
CP 319,660 m

3+940

CT 318,841 m
CP 319,436 m

3+920

CT 318,048 m
CP 319,069 m

3+900

CT 317,211 m
CP 318,702 m

Eixo1

Escala 1:400

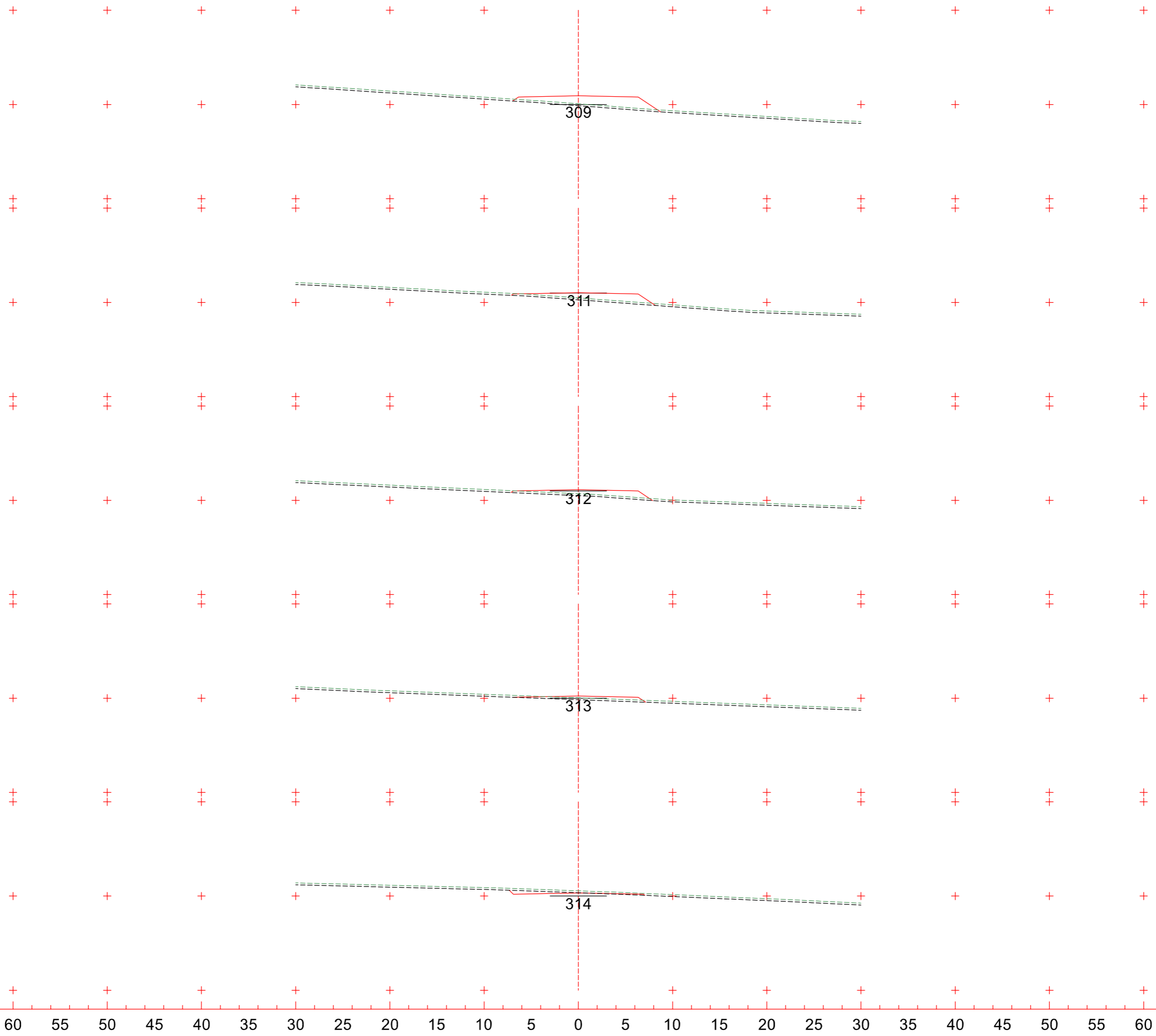
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4+180
CT 309,074 m
CP 309,924 m

4+160
CT 310,472 m
CP 311,024 m

4+140
CT 311,693 m
CP 312,124 m

4+120
CT 313,036 m
CP 313,224 m

4+100
CT 314,552 m
CP 314,324 m

Eixo1
Escala 1:400

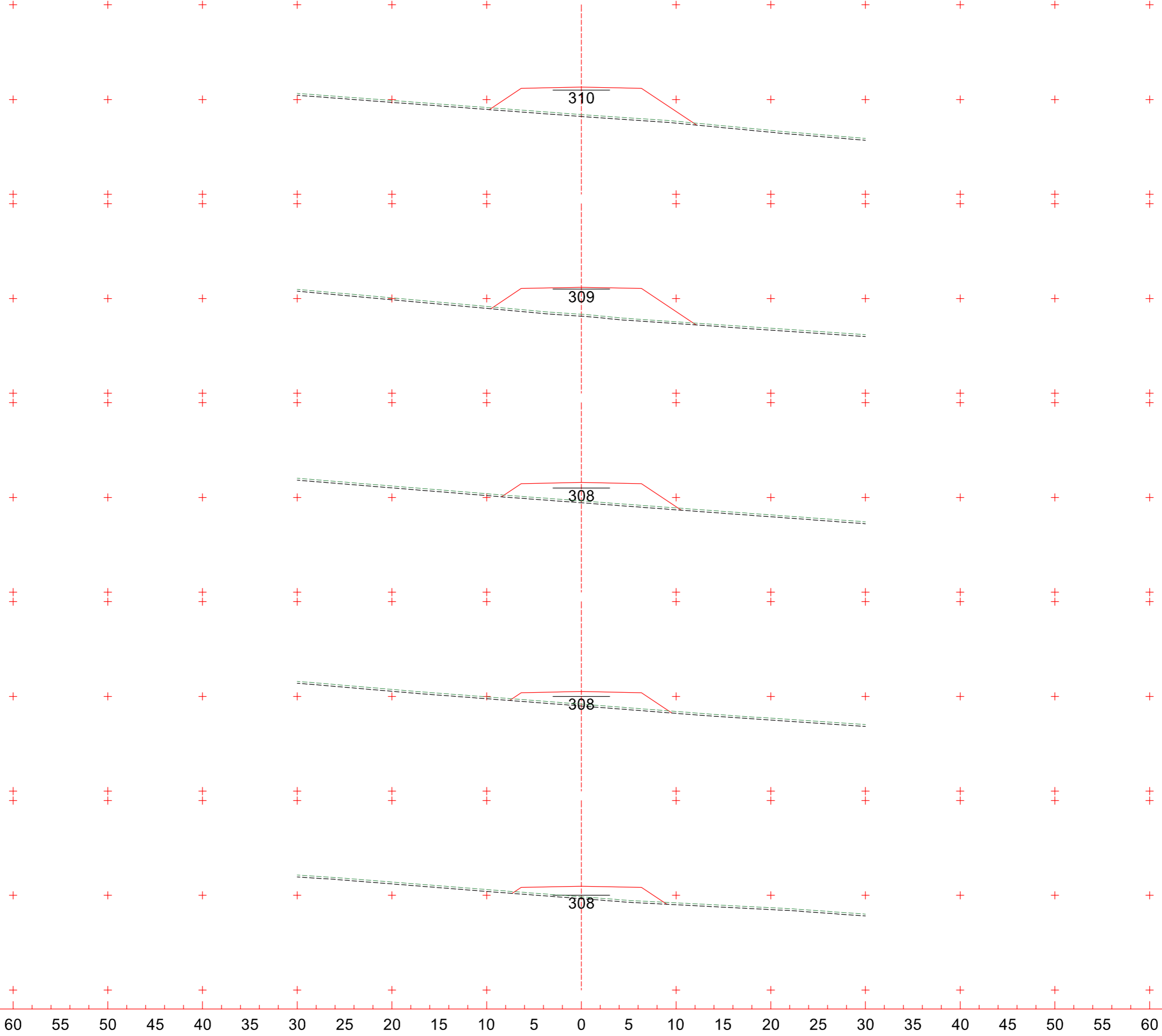
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4+280
CT 307,413 m
CP 310,315 m

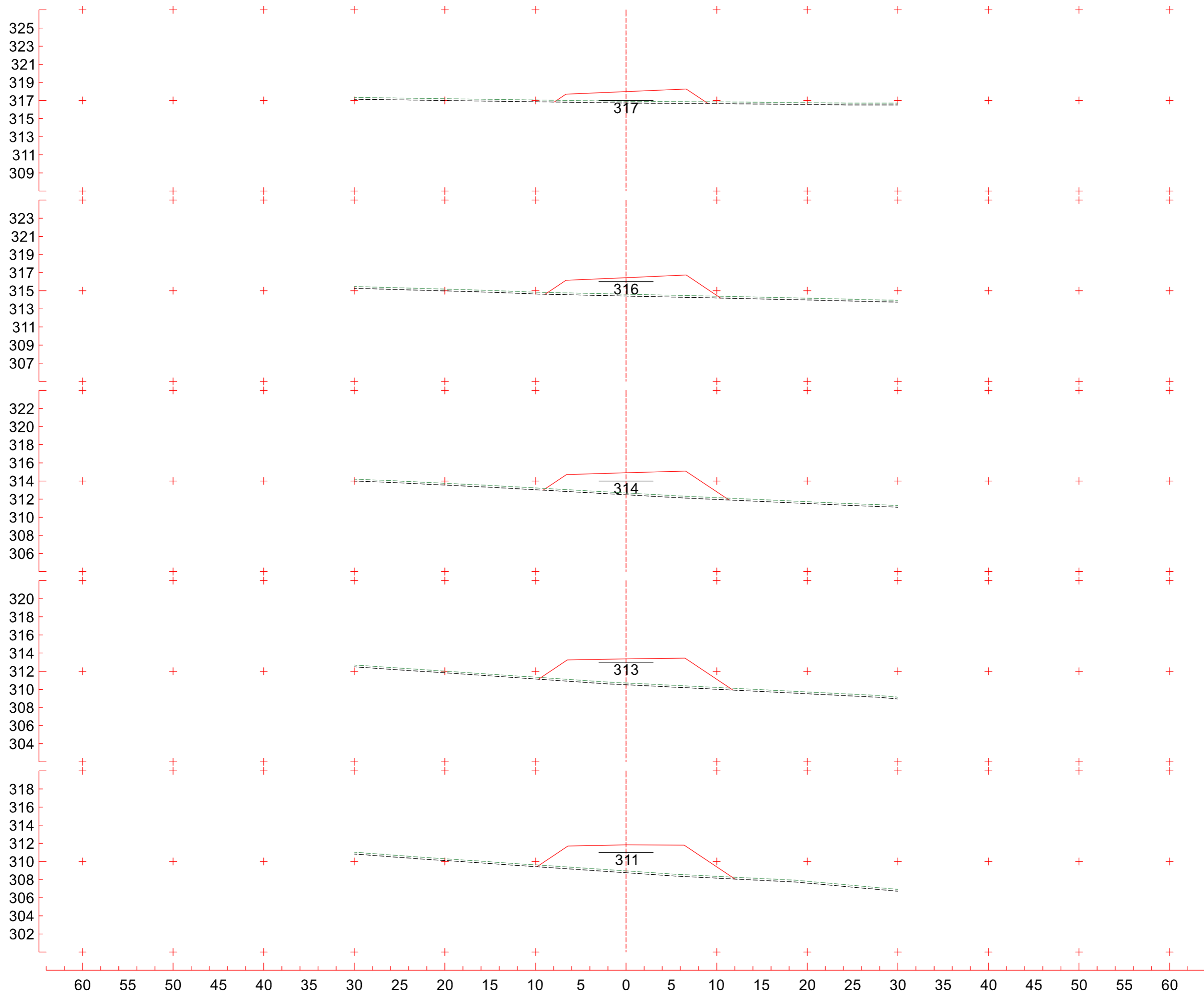
4+260
CT 306,333 m
CP 309,185 m

4+240
CT 306,638 m
CP 308,584 m

4+220
CT 307,182 m
CP 308,509 m

4+200
CT 307,849 m
CP 308,963 m

Eixo1
Escala 1:400



4+380

CT 316,919 m
CP 317,981 m

4+360

CT 314,616 m
CP 316,443 m

4+340

CT 312,676 m
CP 314,906 m

4+320

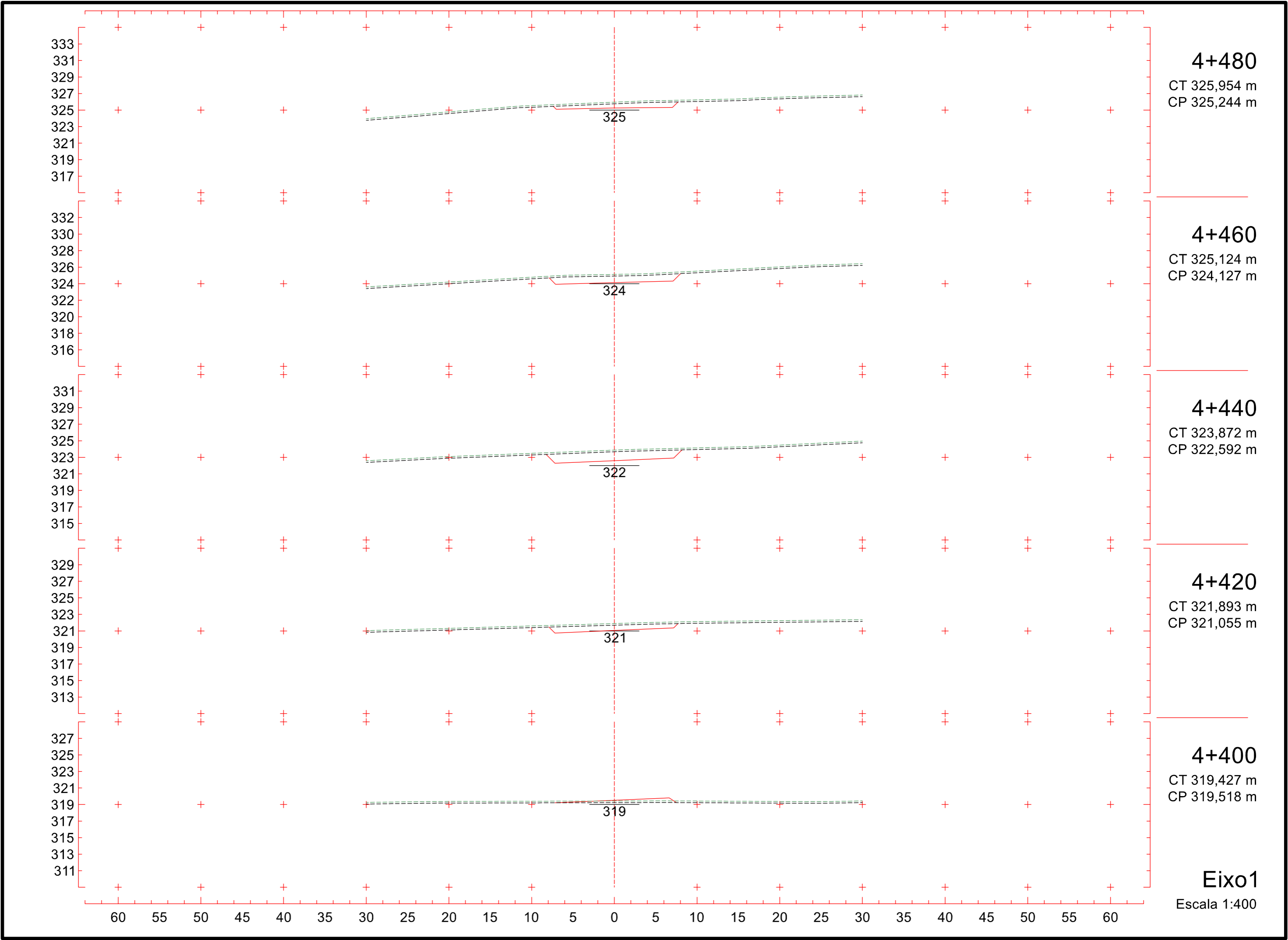
CT 310,703 m
CP 313,369 m

4+300

CT 308,958 m
CP 311,832 m

Eixo1

Escala 1:400



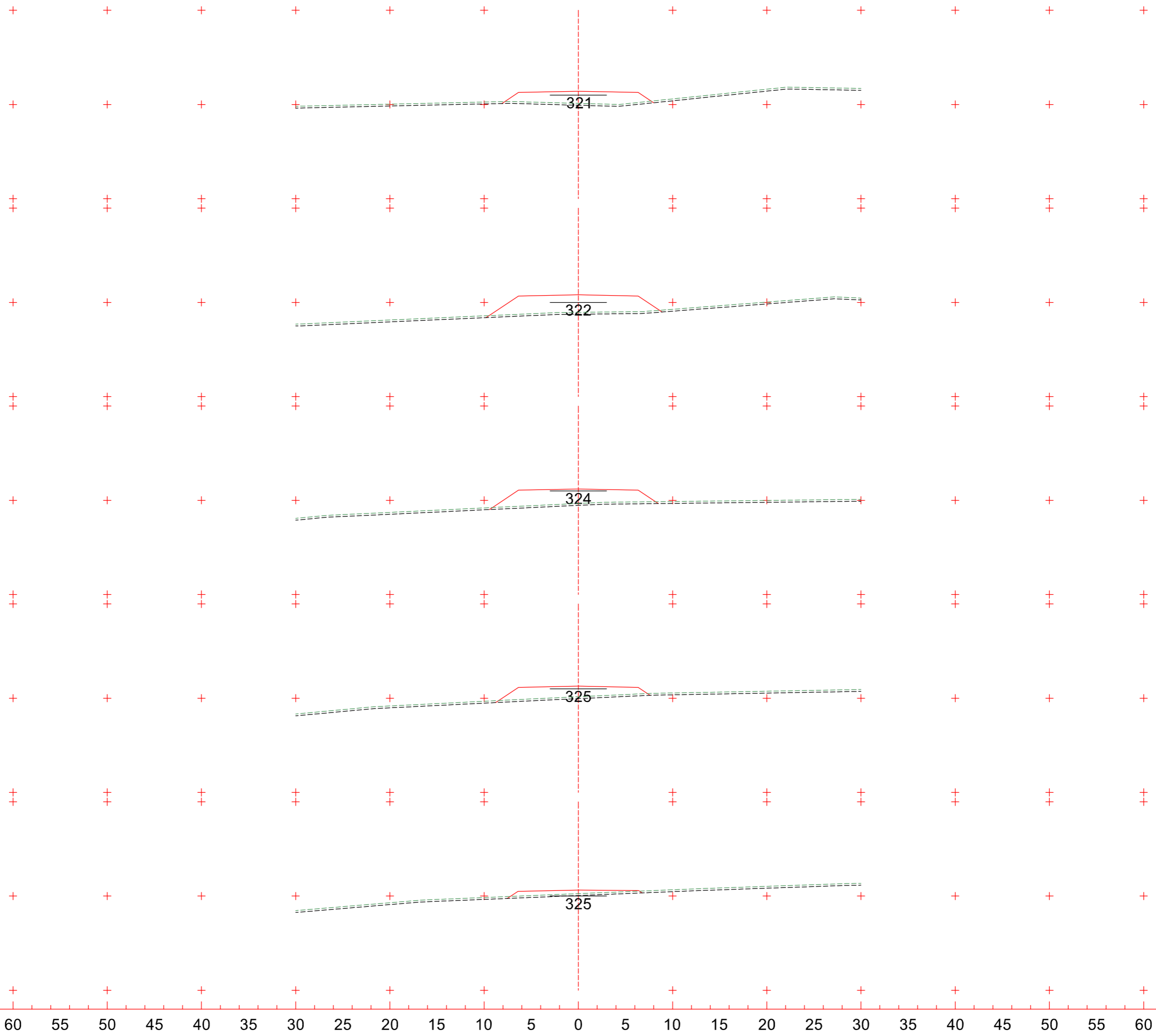
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4+580
CT 320,120 m
CP 321,409 m

4+560
CT 320,946 m
CP 322,804 m

4+540
CT 322,662 m
CP 324,199 m

4+520
CT 324,151 m
CP 325,279 m

4+500
CT 325,256 m
CP 325,628 m

Eixo1
Escala 1:400

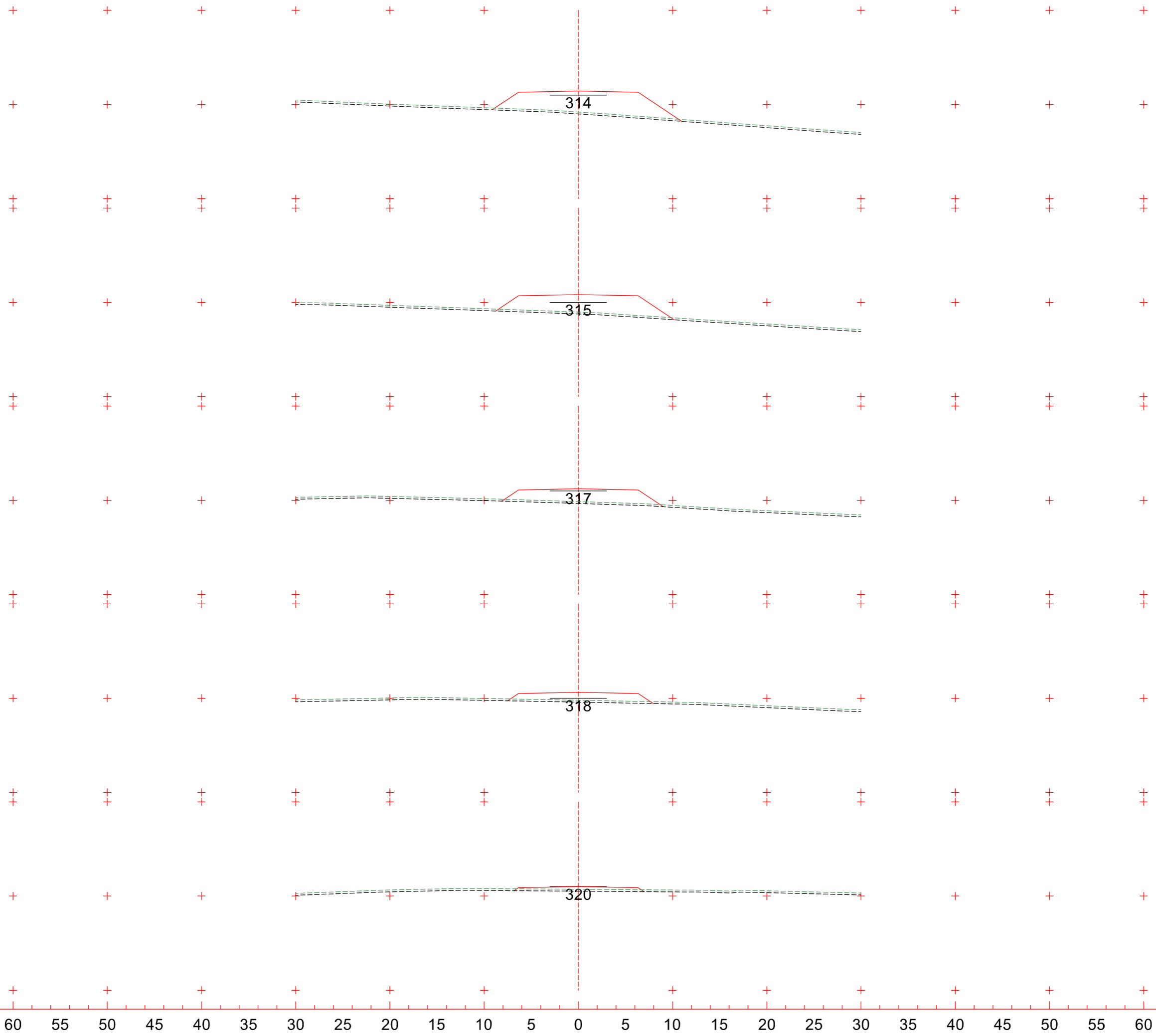
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4+680
CT 312,201 m
CP 314,436 m

4+660
CT 313,970 m
CP 315,830 m

4+640
CT 315,860 m
CP 317,225 m

4+620
CT 317,780 m
CP 318,620 m

4+600
CT 319,719 m
CP 320,015 m

Eixo1
Escala 1:400

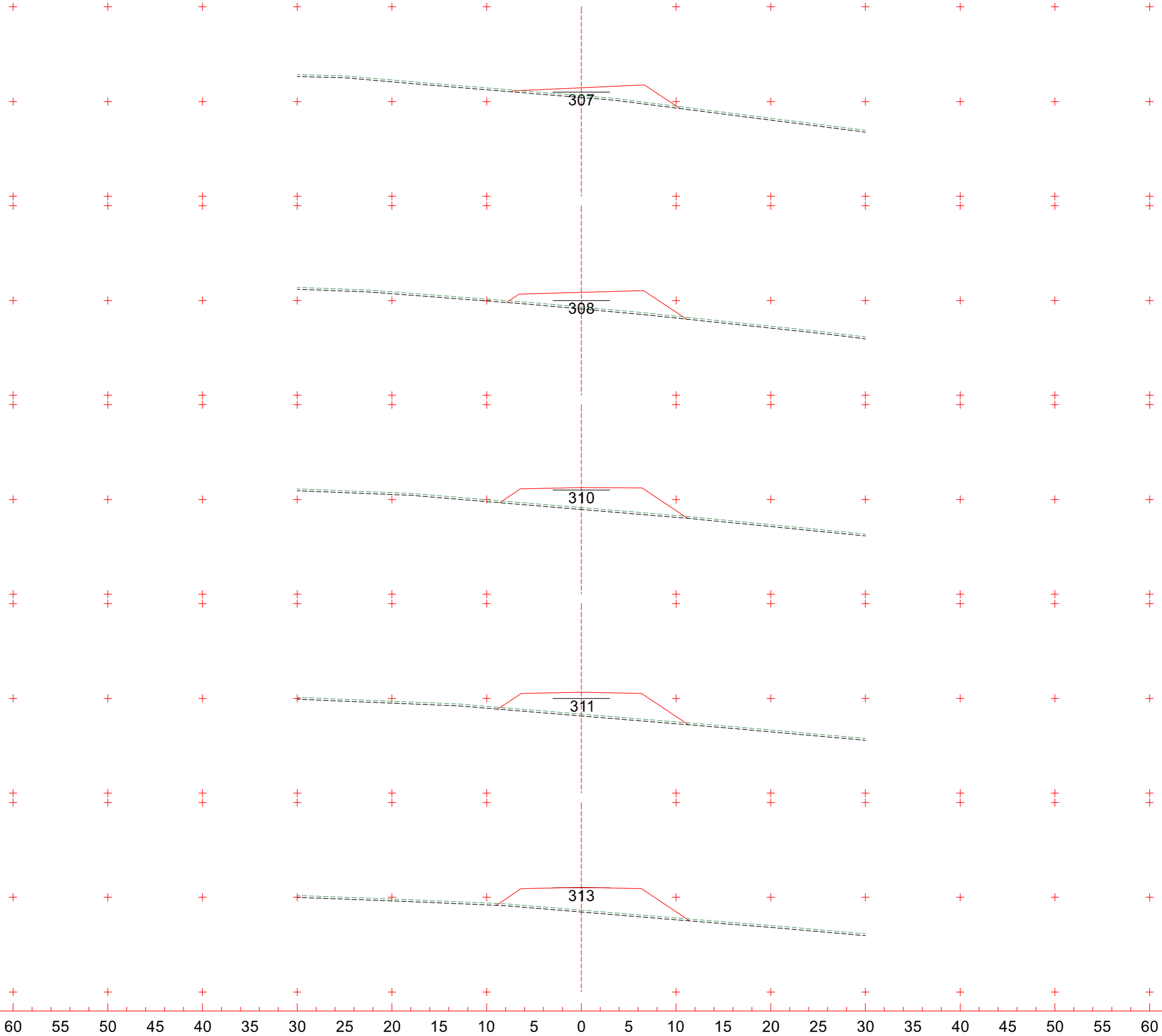
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4+780
CT 306,624 m
CP 307,460 m

4+760
CT 307,306 m
CP 308,857 m

4+740
CT 308,139 m
CP 310,252 m

4+720
CT 309,341 m
CP 311,646 m

4+700
CT 310,649 m
CP 313,041 m

Eixo1
Escala 1:400

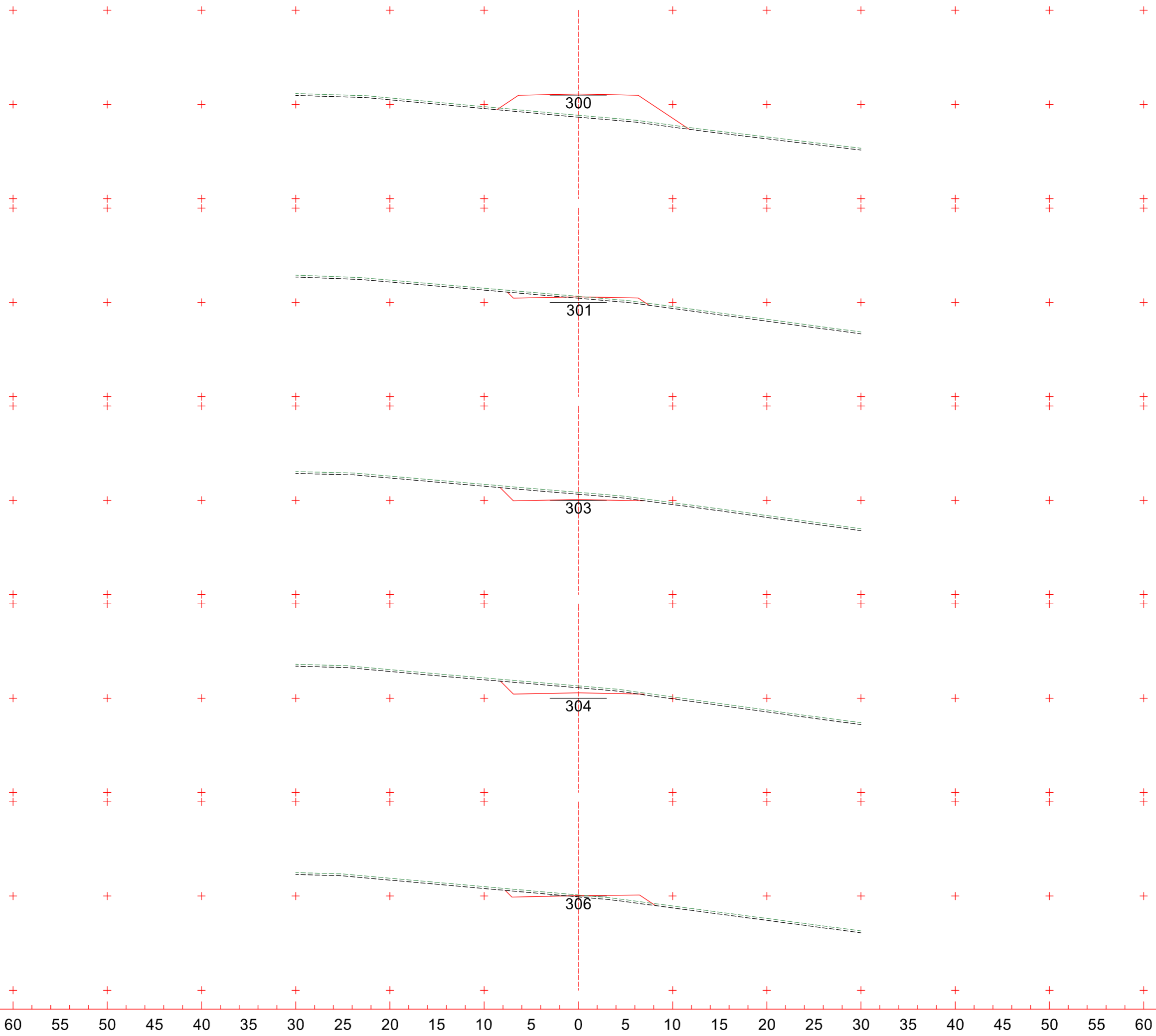
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4+880
CT 297,858 m
CP 300,110 m

4+860
CT 301,645 m
CP 301,597 m

4+840
CT 303,842 m
CP 303,083 m

4+820
CT 305,304 m
CP 304,569 m

4+800
CT 306,111 m
CP 306,033 m

Eixo1
Escala 1:400

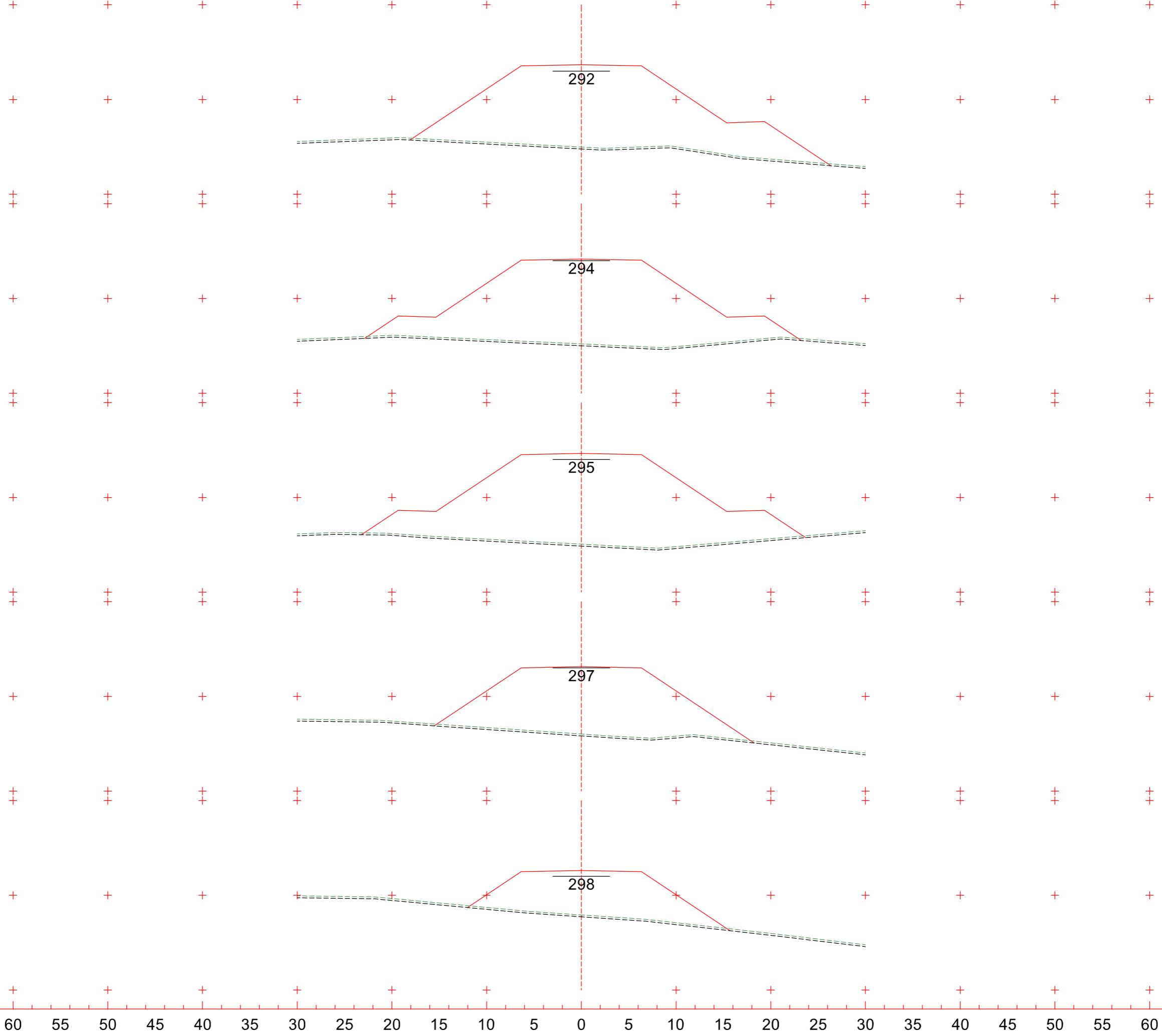
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4+980
CT 283,982 m
CP 292,677 m

4+960
CT 285,207 m
CP 294,164 m

4+940
CT 286,066 m
CP 295,650 m

4+920
CT 290,026 m
CP 297,137 m

4+900
CT 293,930 m
CP 298,623 m

Eixo1
Escala 1:400

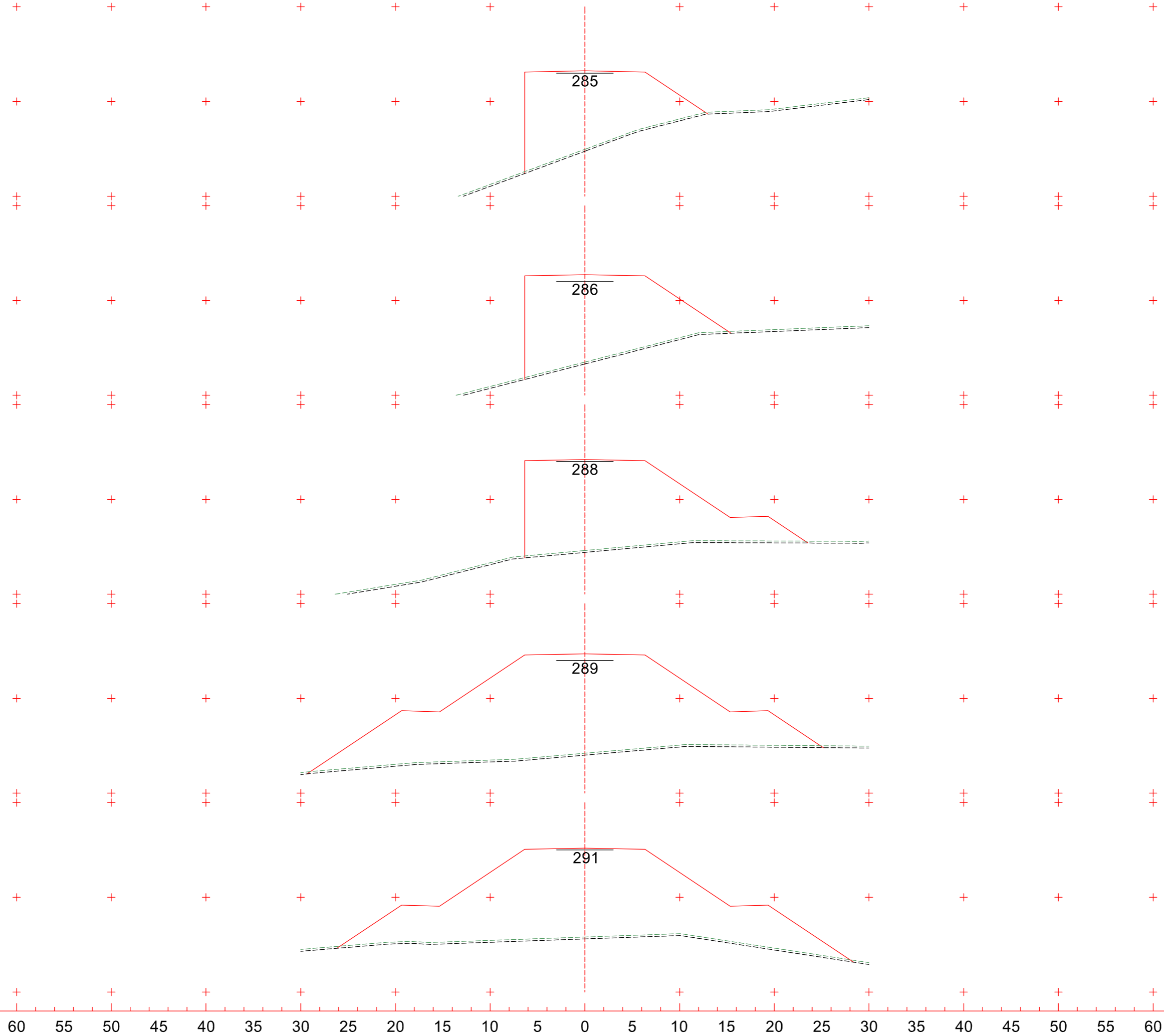
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5+080

CT 276,956 m
CP 285,244 m

5+060

CT 277,499 m
CP 286,731 m

5+040

CT 278,608 m
CP 288,217 m

5+020

CT 279,209 m
CP 289,704 m

5+000

CT 281,809 m
CP 291,191 m

Eixo1

Escala 1:400

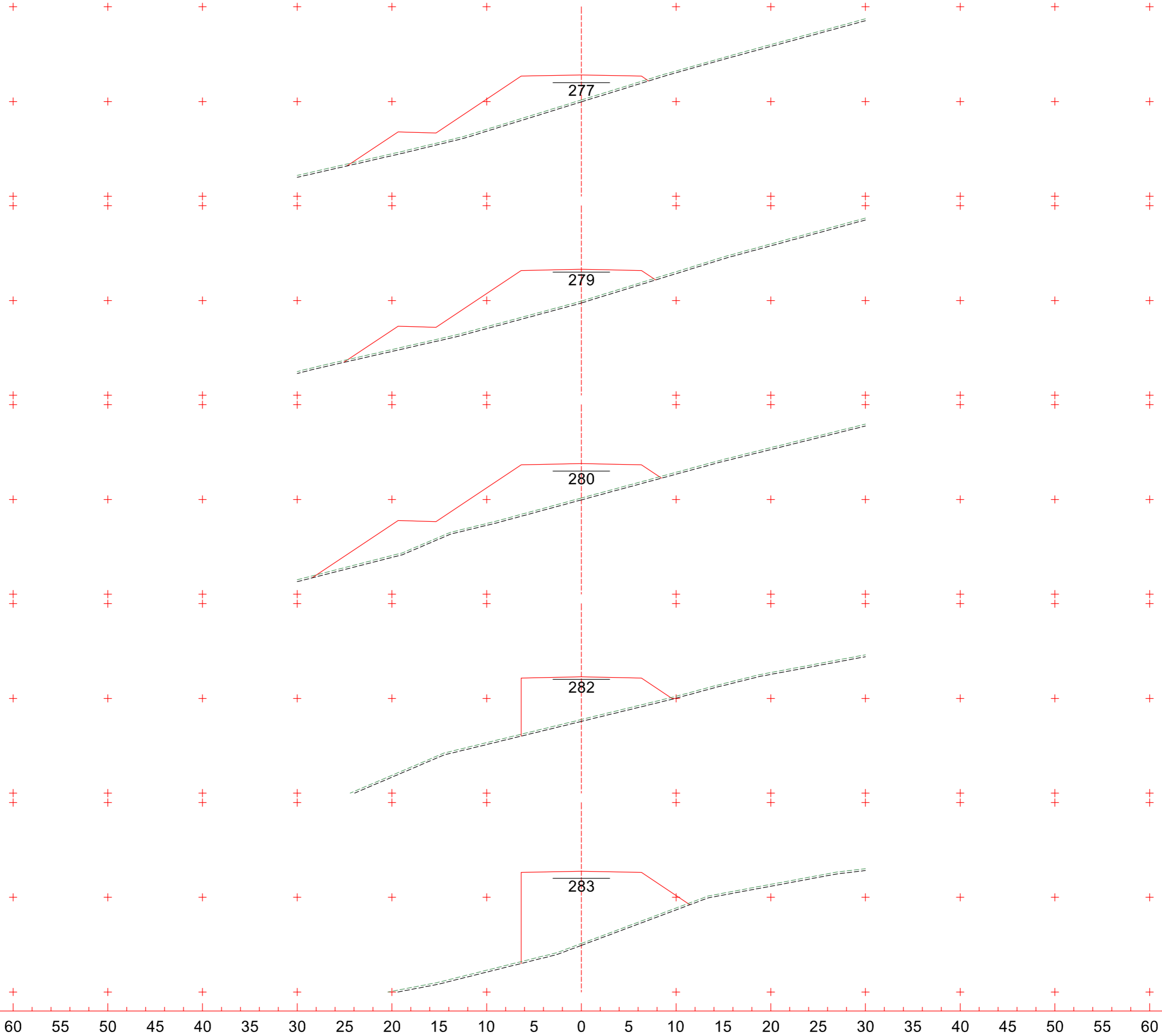
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5+180
CT 275,168 m
CP 277,811 m

5+160
CT 275,934 m
CP 279,298 m

5+140
CT 277,151 m
CP 280,785 m

5+120
CT 277,770 m
CP 282,271 m

5+100
CT 276,124 m
CP 283,758 m

Eixo1
Escala 1:400

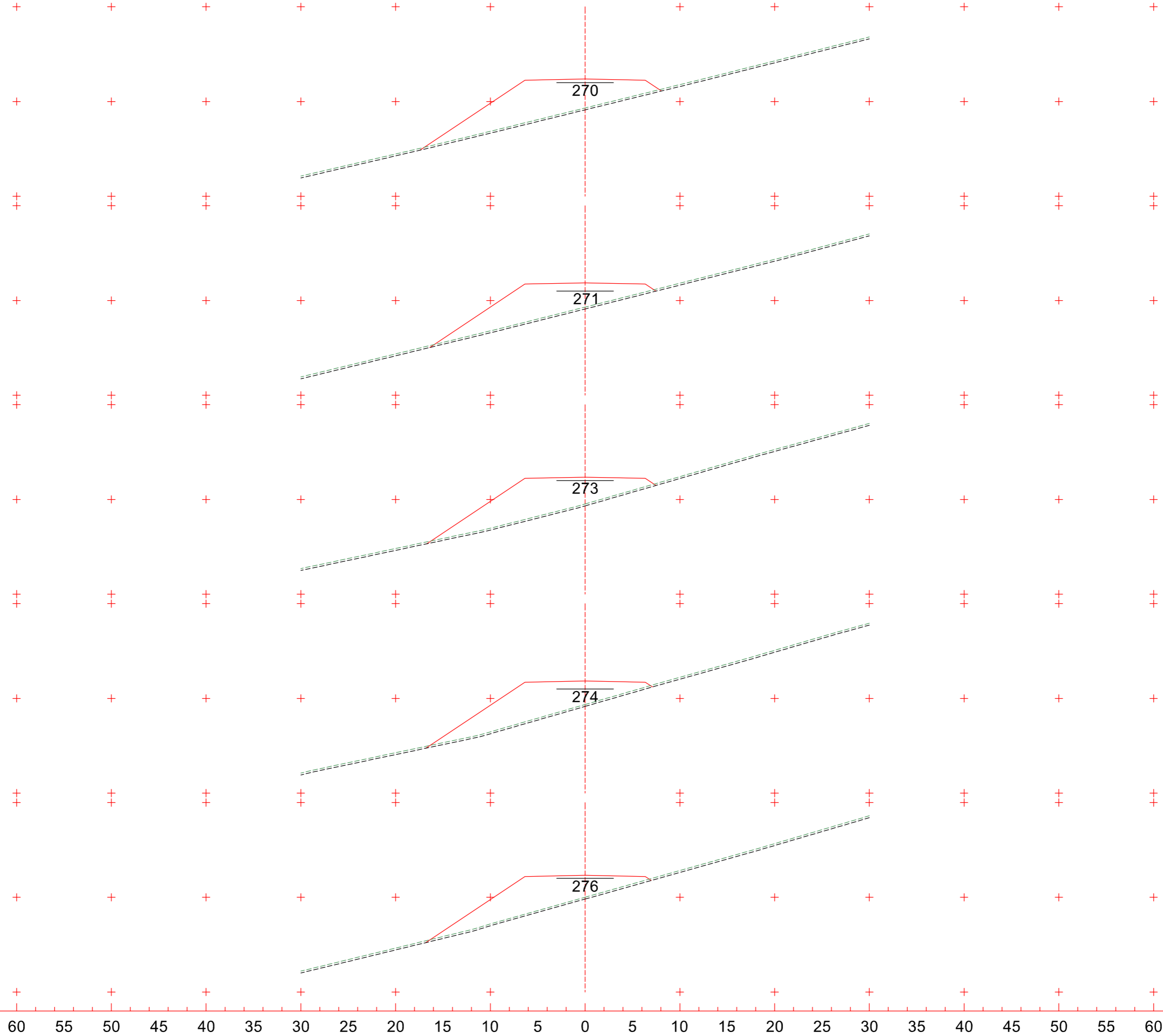
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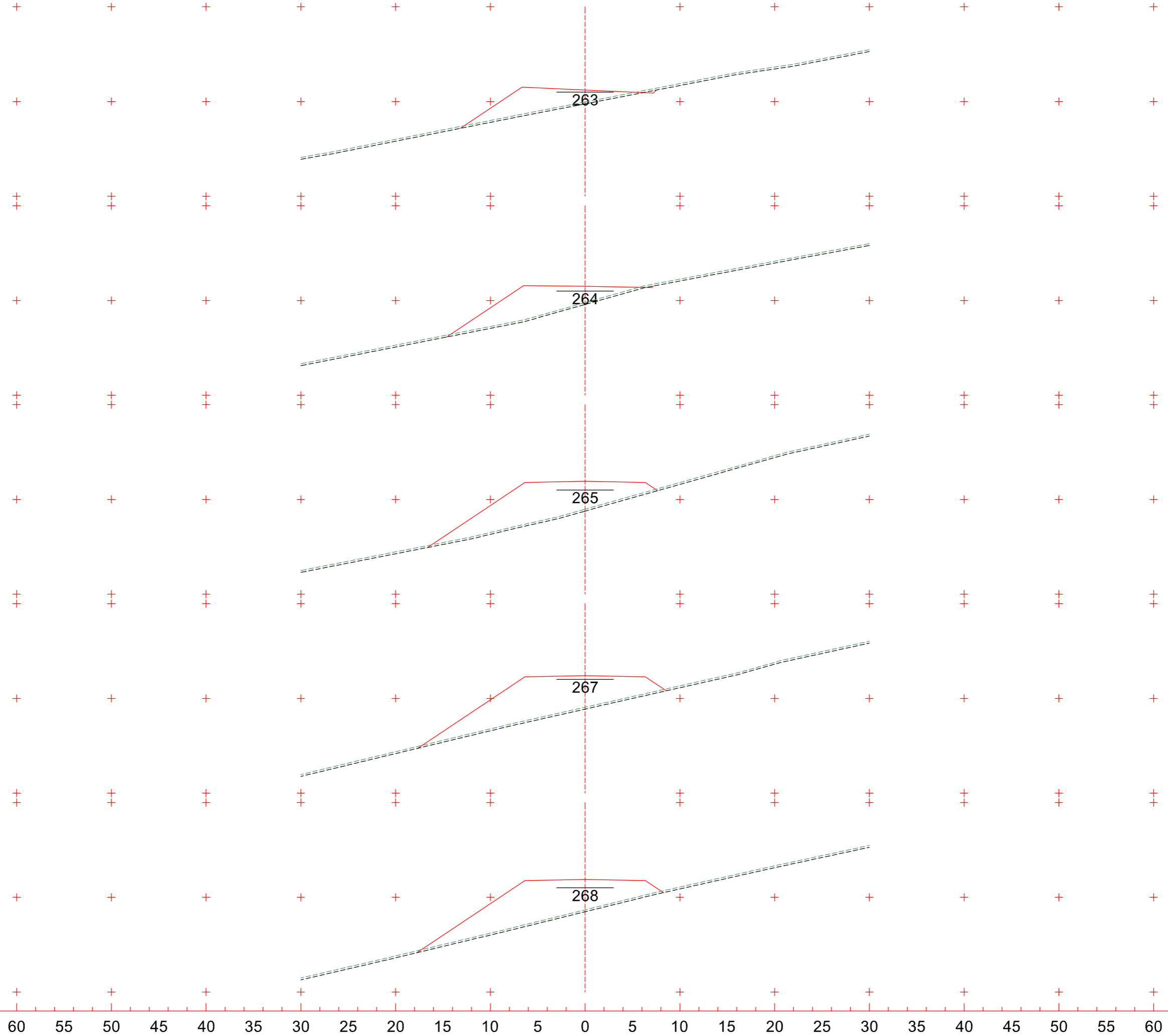
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5+380

CT 261,955 m
CP 263,222 m

5+360

CT 262,780 m
CP 264,503 m

5+340

CT 262,965 m
CP 265,919 m

5+320

CT 264,065 m
CP 267,405 m

5+300

CT 265,676 m
CP 268,892 m

Eixo1

Escala 1:400

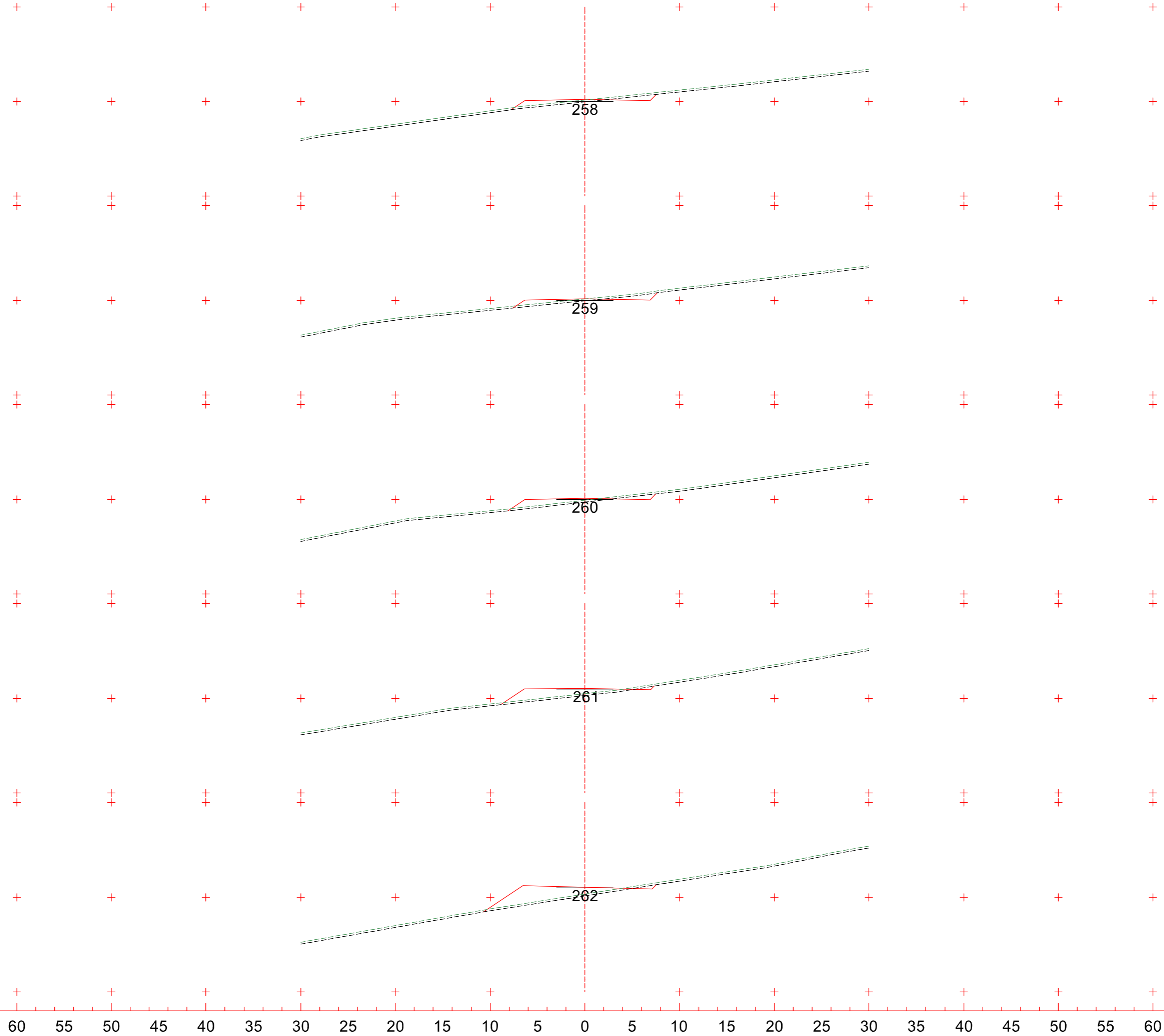
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5+480
CT 258,164 m
CP 258,234 m

5+460
CT 259,170 m
CP 259,178 m

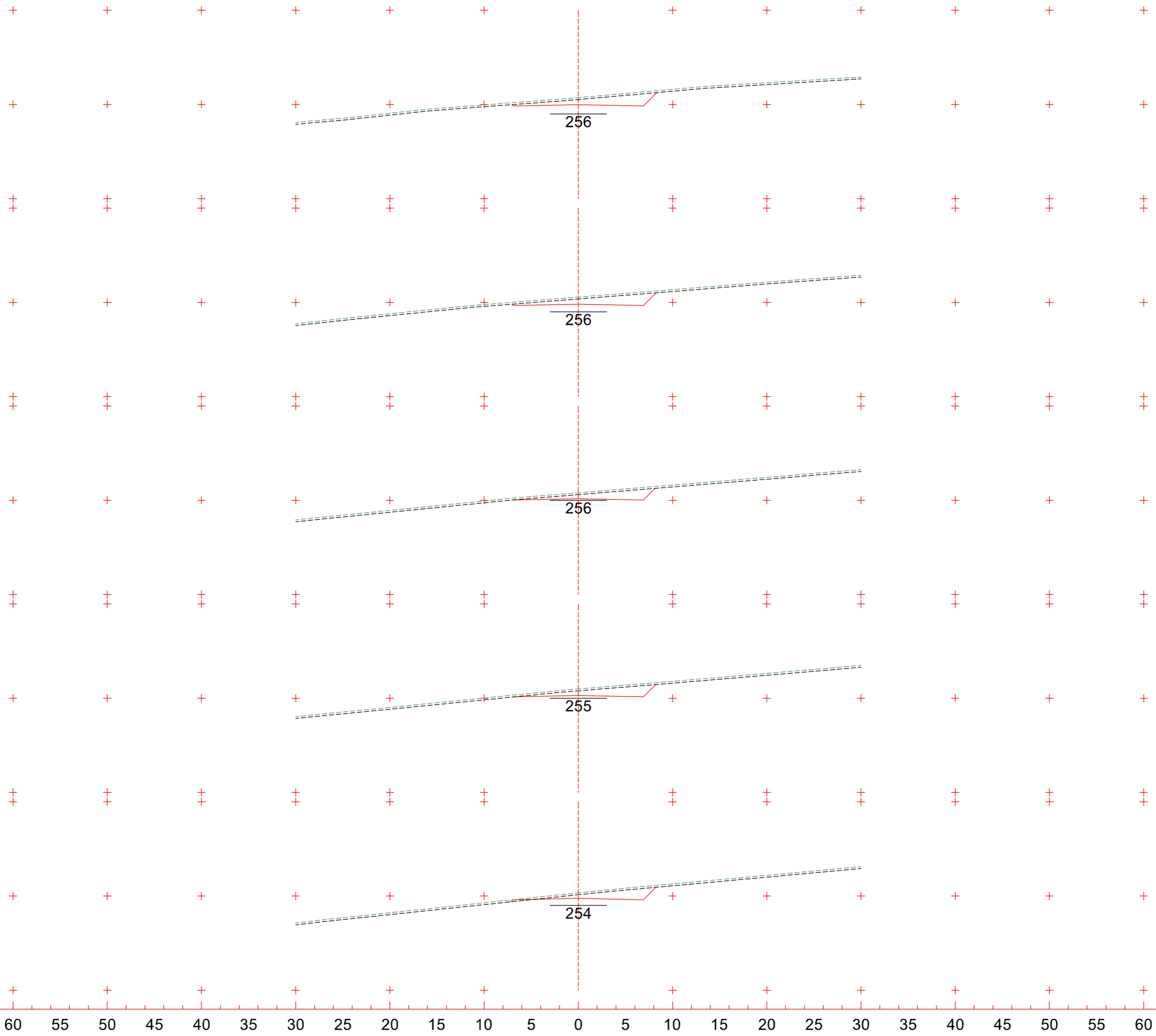
5+440
CT 259,925 m
CP 260,123 m

5+420
CT 260,507 m
CP 261,068 m

5+400
CT 261,354 m
CP 262,077 m

Eixo1
Escala 1:400

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5+680
CT 257,728 m
CP 256,978 m

5+660
CT 257,565 m
CP 256,805 m

5+640
CT 256,798 m
CP 256,169 m

5+620
CT 255,979 m
CP 255,285 m

5+600
CT 255,340 m
CP 254,745 m

Eixo1
Escala 1:400

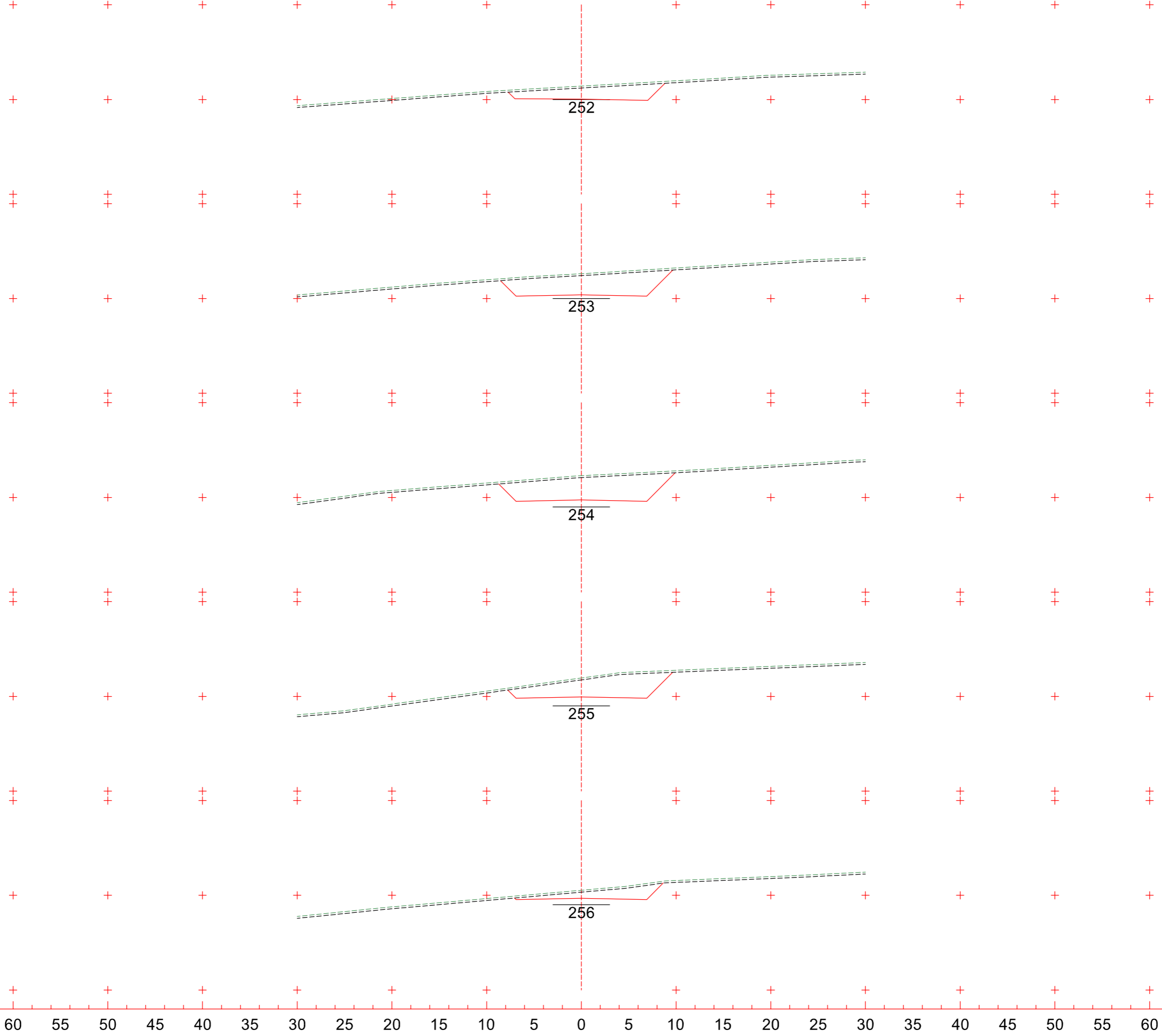
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5+780
CT 253,420 m
CP 252,046 m

5+760
CT 255,616 m
CP 253,389 m

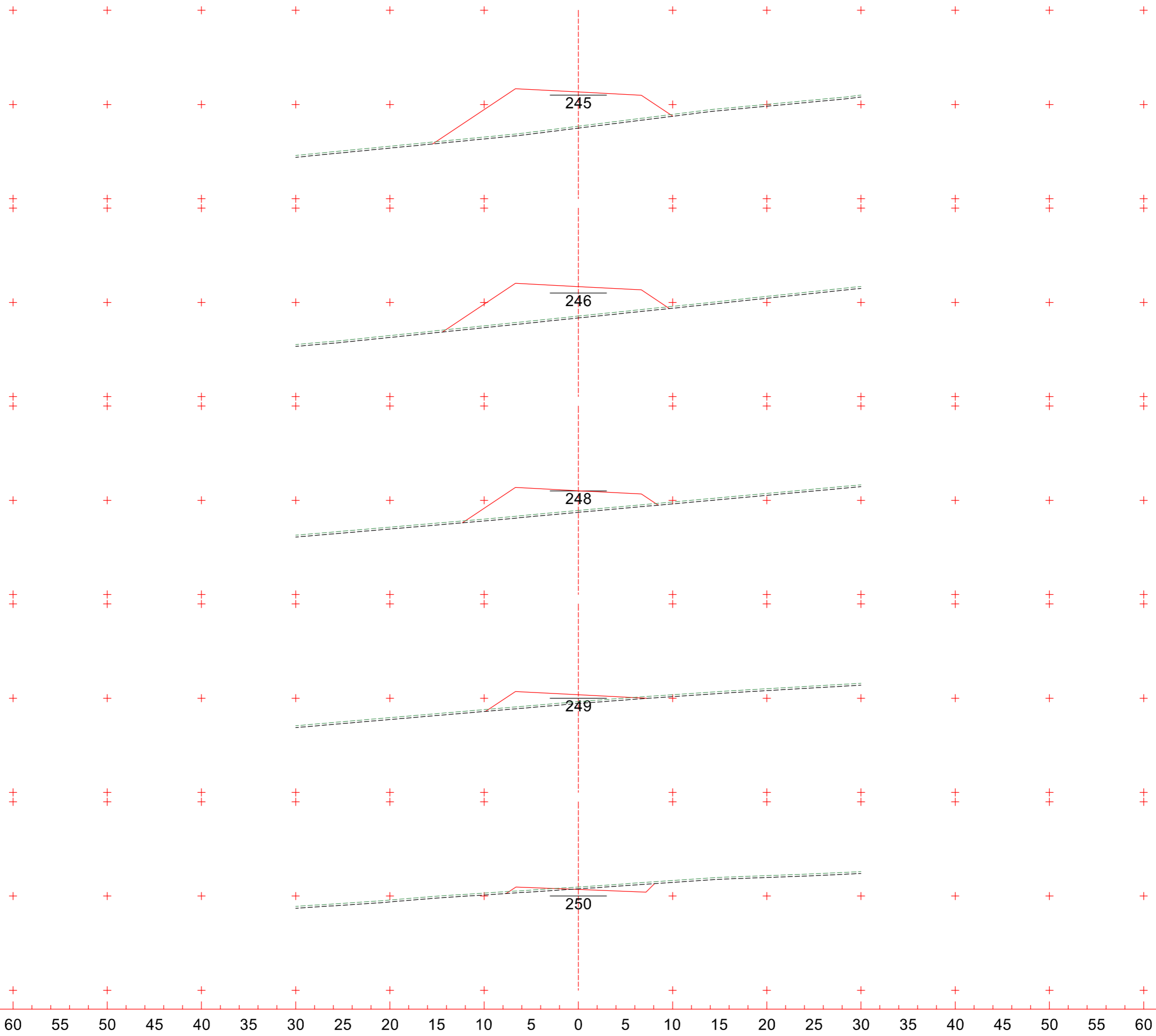
5+740
CT 257,293 m
CP 254,732 m

5+720
CT 257,940 m
CP 255,936 m

5+700
CT 257,532 m
CP 256,688 m

Eixo1
Escala 1:400

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5+880
CT 241,698 m
CP 245,330 m

5+860
CT 243,548 m
CP 246,674 m

5+840
CT 245,922 m
CP 248,017 m

5+820
CT 248,634 m
CP 249,360 m

5+800
CT 250,964 m
CP 250,703 m

Eixo1
Escala 1:400

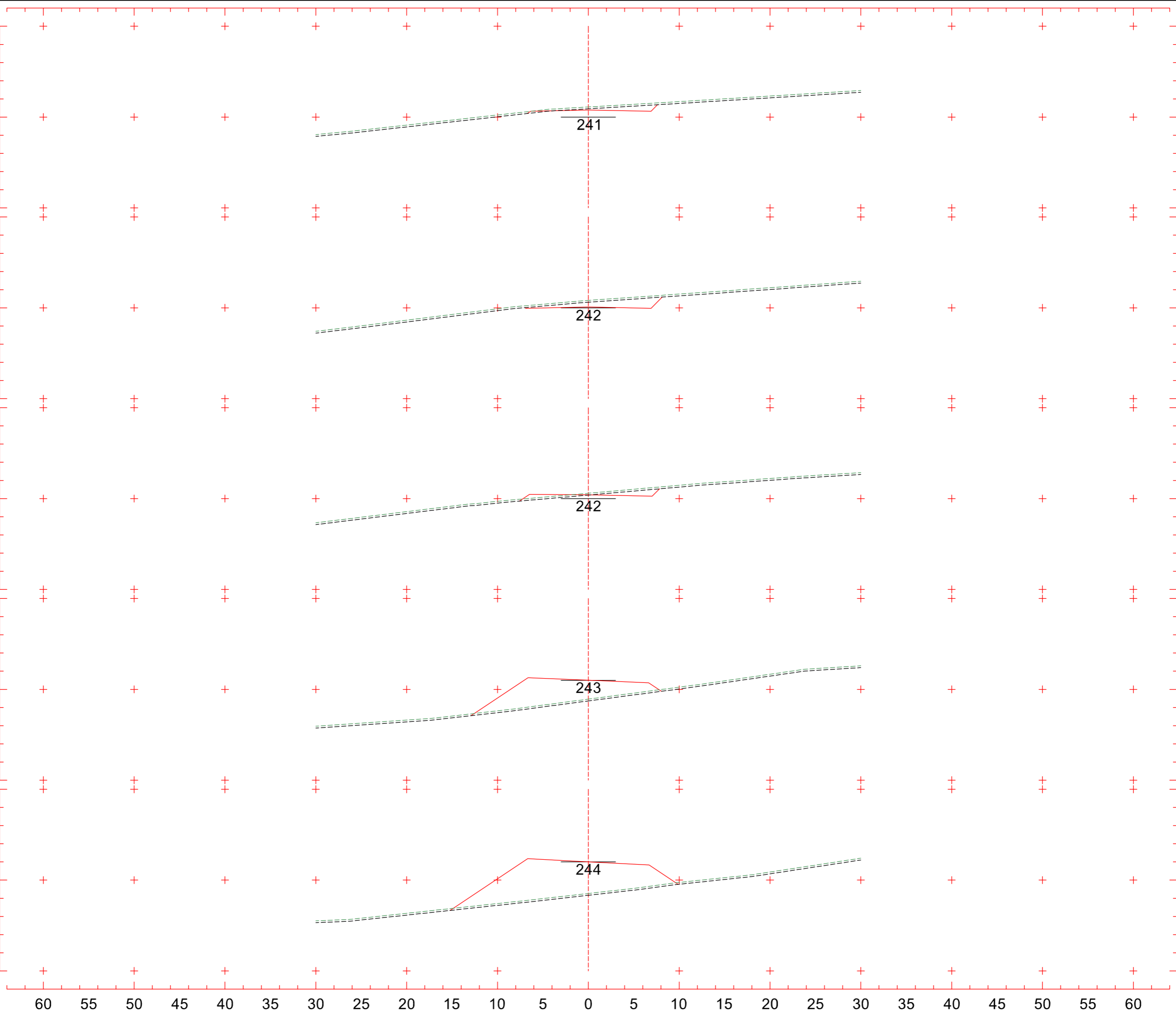
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5+980
CT 242,113 m
CP 241,775 m

5+960
CT 242,816 m
CP 242,090 m

5+940
CT 242,588 m
CP 242,412 m

5+920
CT 240,922 m
CP 243,005 m

5+900
CT 240,525 m
CP 244,009 m

Eixo1
Escala 1:400

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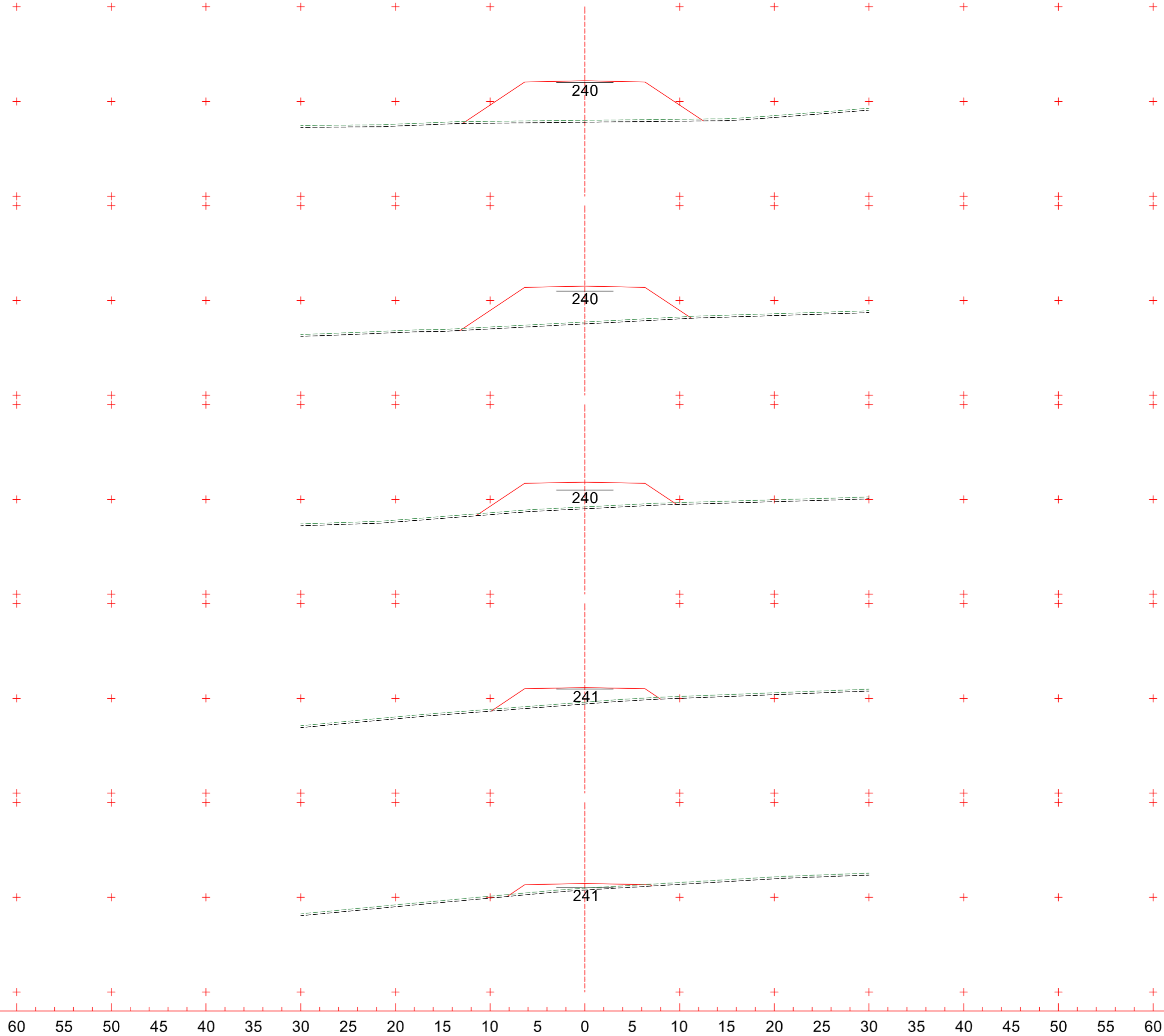
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6+080
CT 236,021 m
CP 240,199 m

6+060
CT 236,730 m
CP 240,514 m

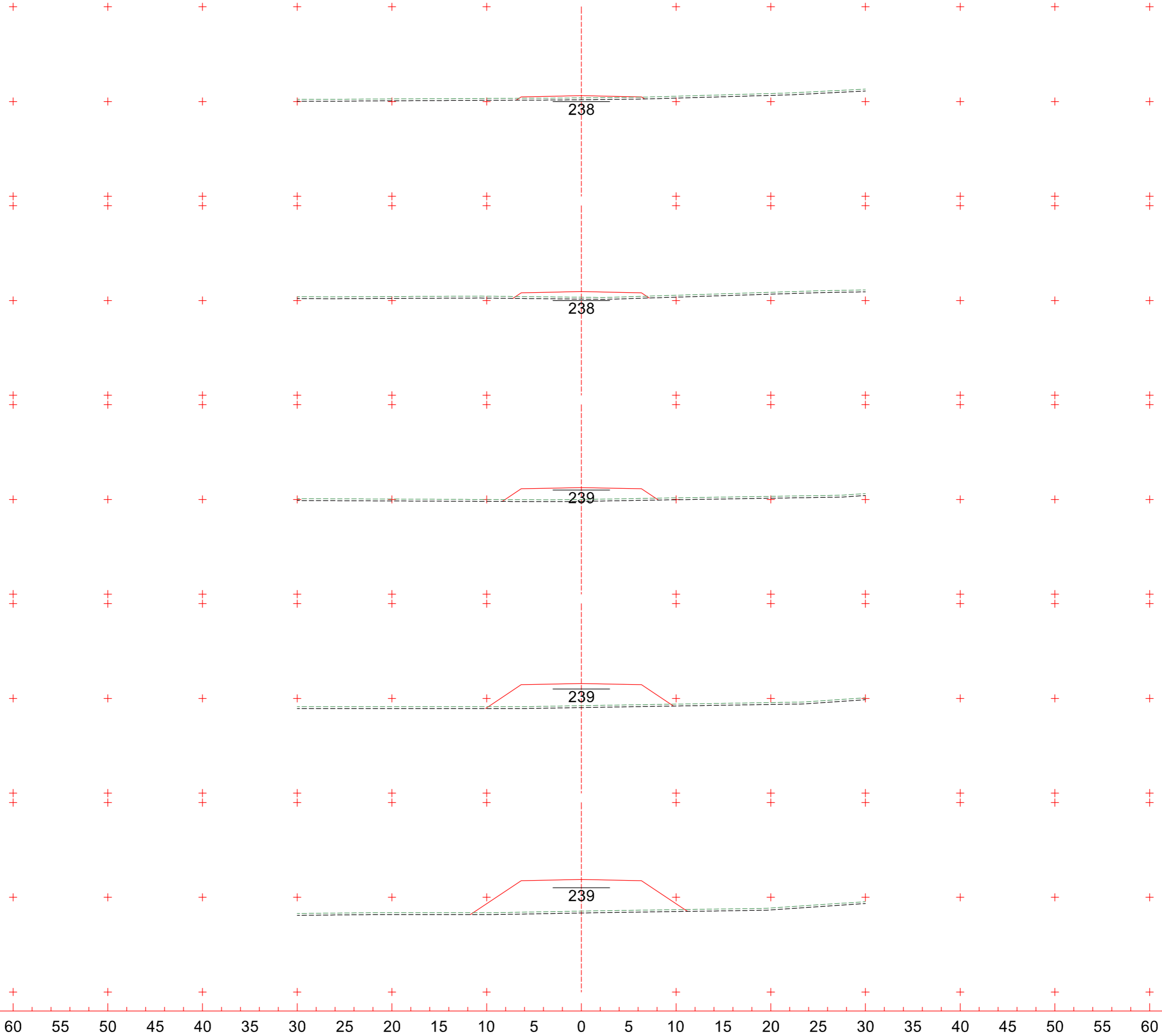
6+040
CT 238,215 m
CP 240,830 m

6+020
CT 239,605 m
CP 241,145 m

6+000
CT 240,974 m
CP 241,460 m

Eixo1
Escala 1:400

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6+180

CT 238,391 m
CP 238,623 m

6+160

CT 238,344 m
CP 238,938 m

6+140

CT 237,996 m
CP 239,254 m

6+120

CT 237,230 m
CP 239,569 m

6+100

CT 236,545 m
CP 239,884 m

Eixo1

Escala 1:400

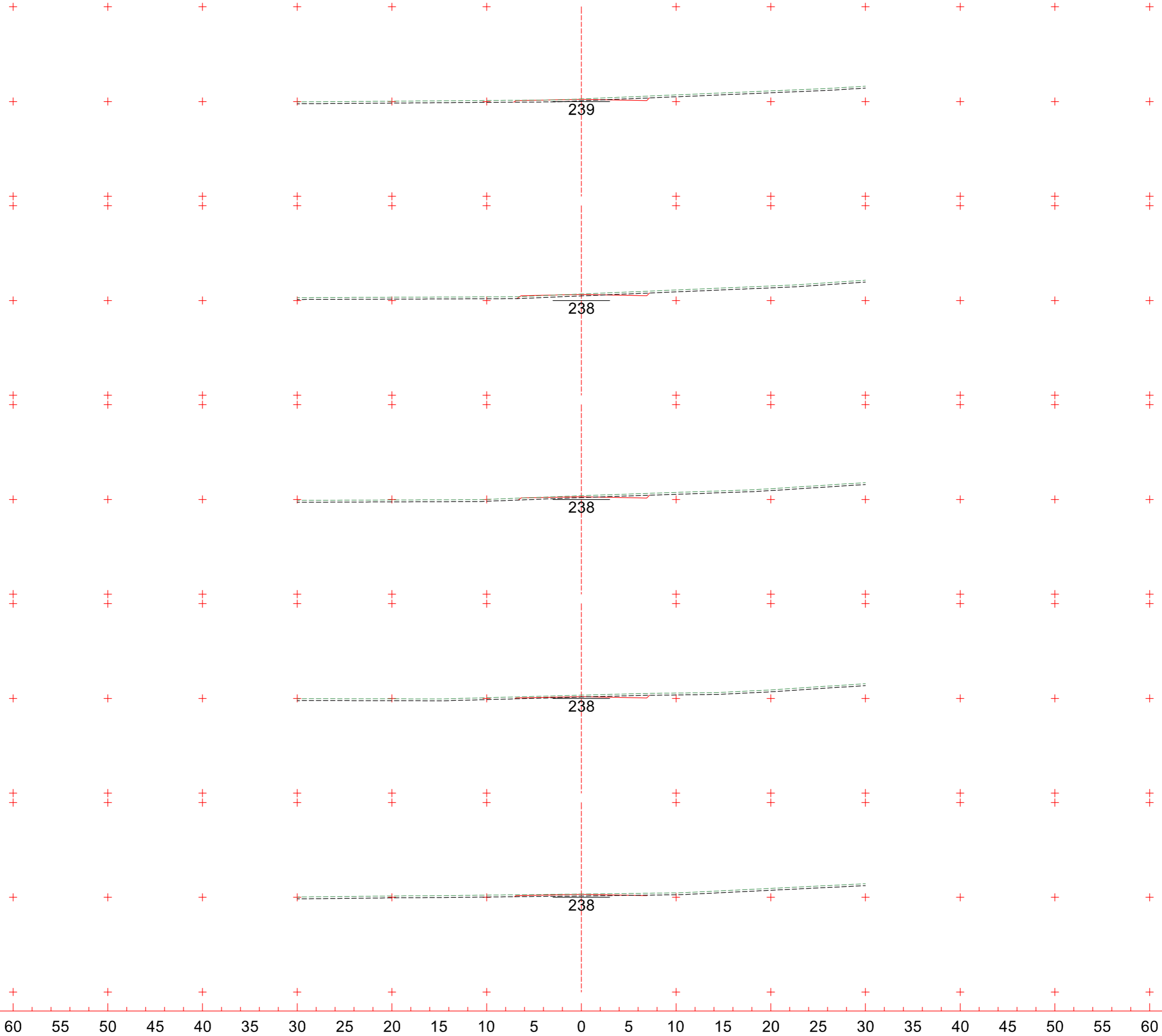
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6+280

CT 239,280 m
CP 239,236 m

6+260

CT 238,686 m
CP 238,637 m

6+240

CT 238,396 m
CP 238,284 m

6+220

CT 238,341 m
CP 238,177 m

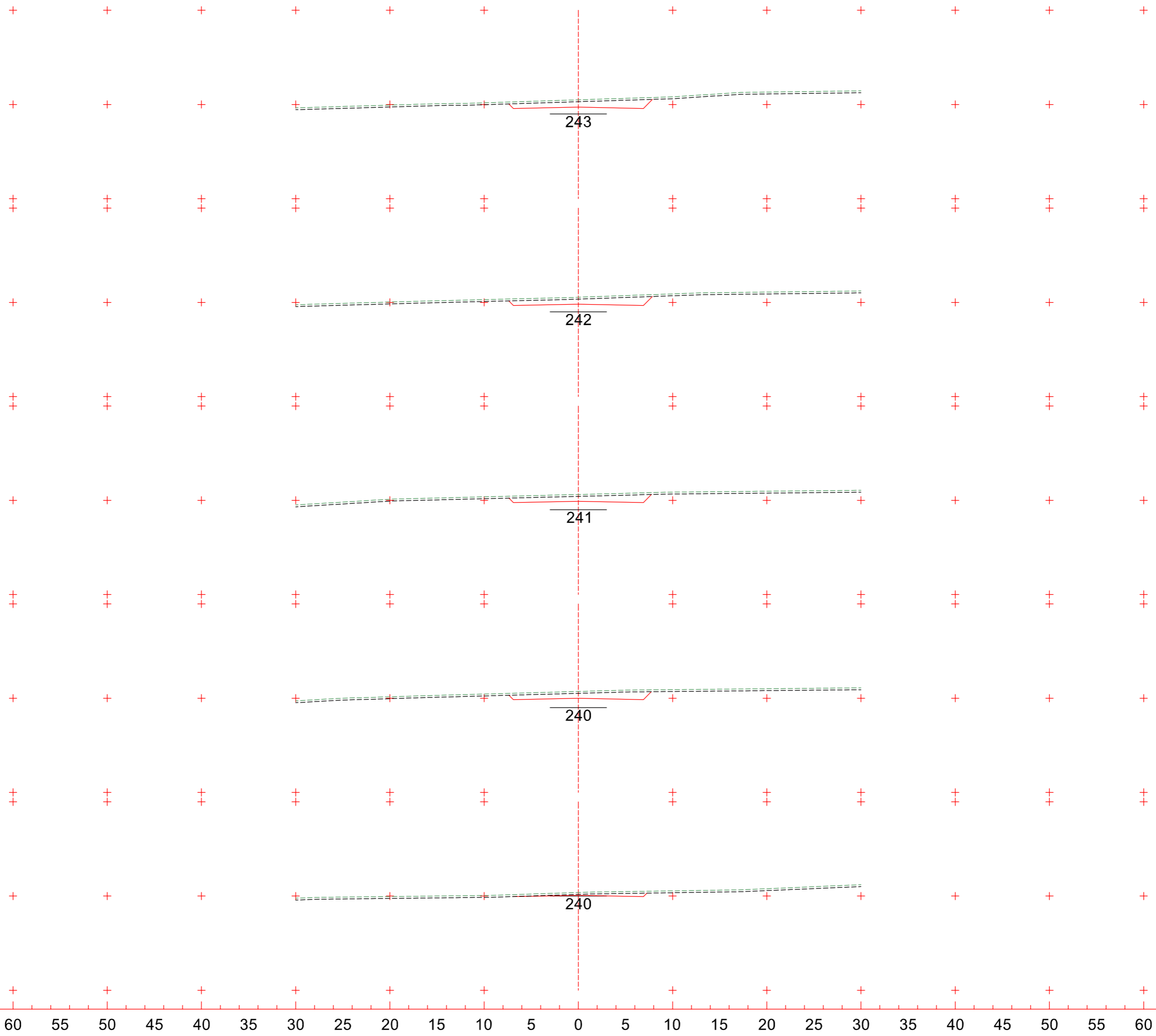
6+200

CT 238,344 m
CP 238,314 m

Eixo1

Escala 1:400

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6+380
CT 244,497 m
CP 243,719 m

6+360
CT 243,546 m
CP 242,808 m

6+340
CT 242,615 m
CP 241,896 m

6+320
CT 241,713 m
CP 240,985 m

6+300
CT 240,378 m
CP 240,073 m

Eixo1
Escala 1:400

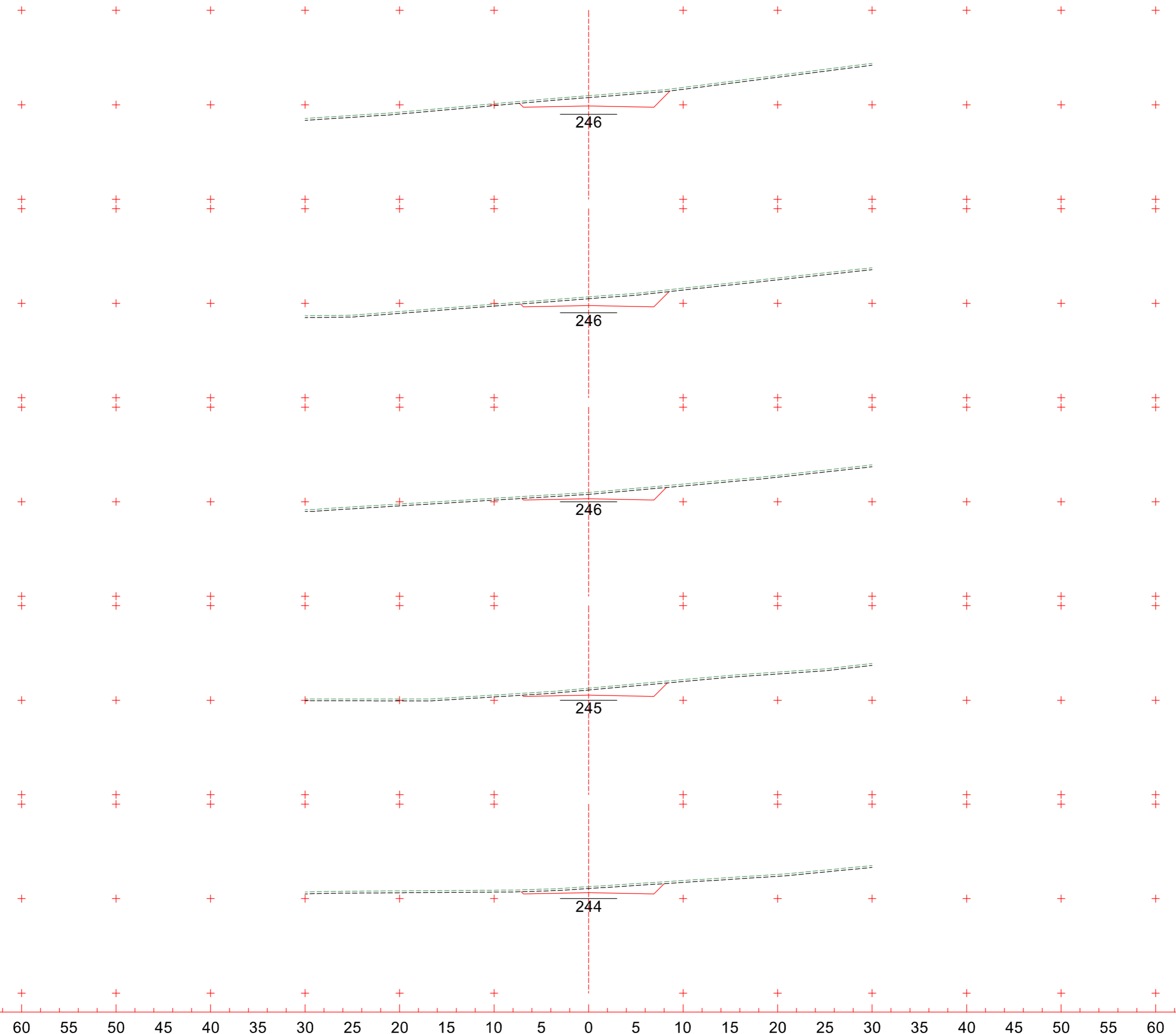
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6+480
CT 247,967 m
CP 246,877 m

6+460
CT 247,681 m
CP 246,759 m

6+440
CT 246,978 m
CP 246,314 m

6+420
CT 246,275 m
CP 245,542 m

6+400
CT 245,268 m
CP 244,631 m

Eixo1
Escala 1:400

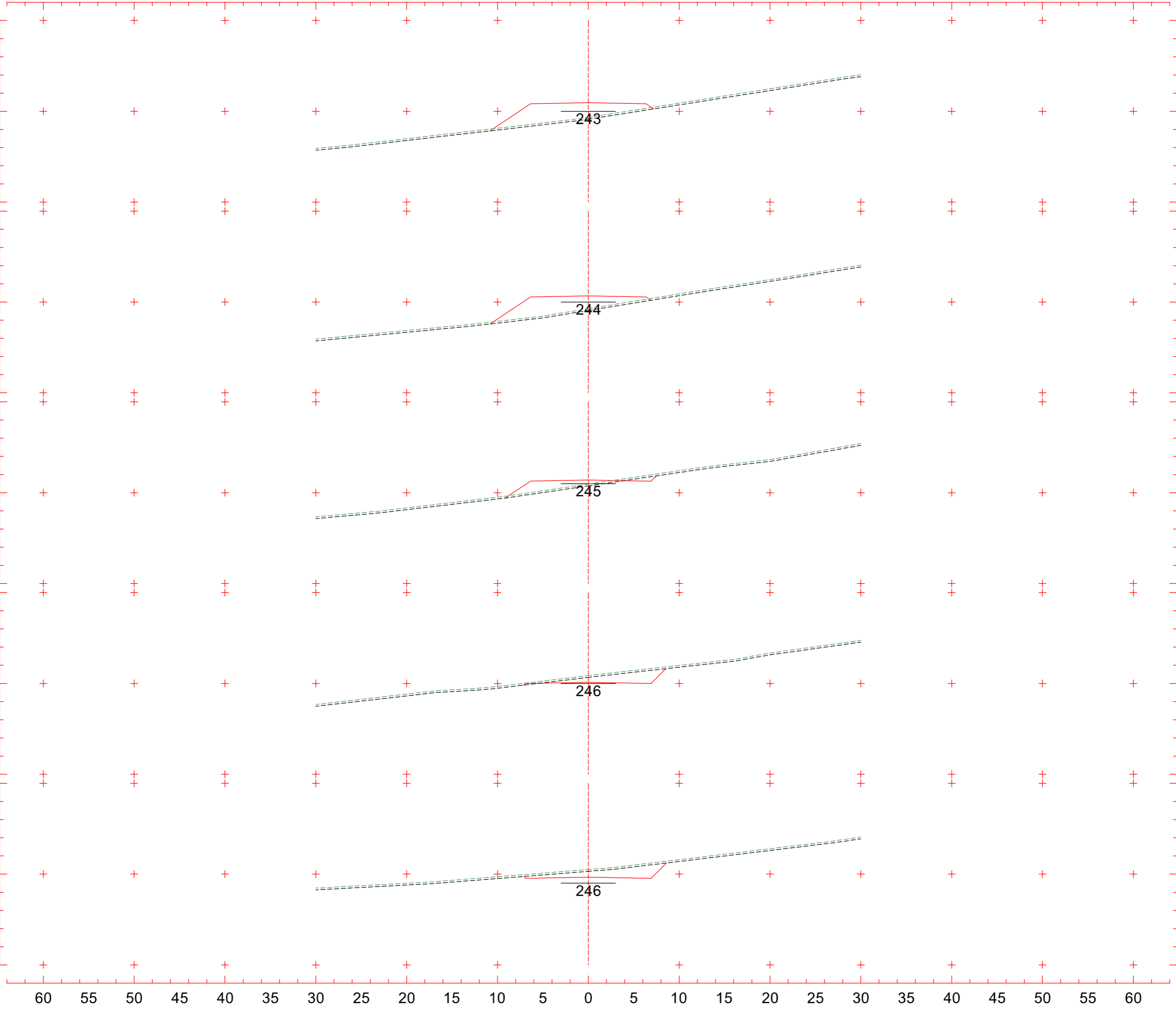
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6+580
CT 242,332 m
CP 243,953 m

6+560
CT 243,266 m
CP 244,679 m

6+540
CT 244,951 m
CP 245,405 m

6+520
CT 246,863 m
CP 246,130 m

6+500
CT 247,508 m
CP 246,667 m

Eixo1
Escala 1:400

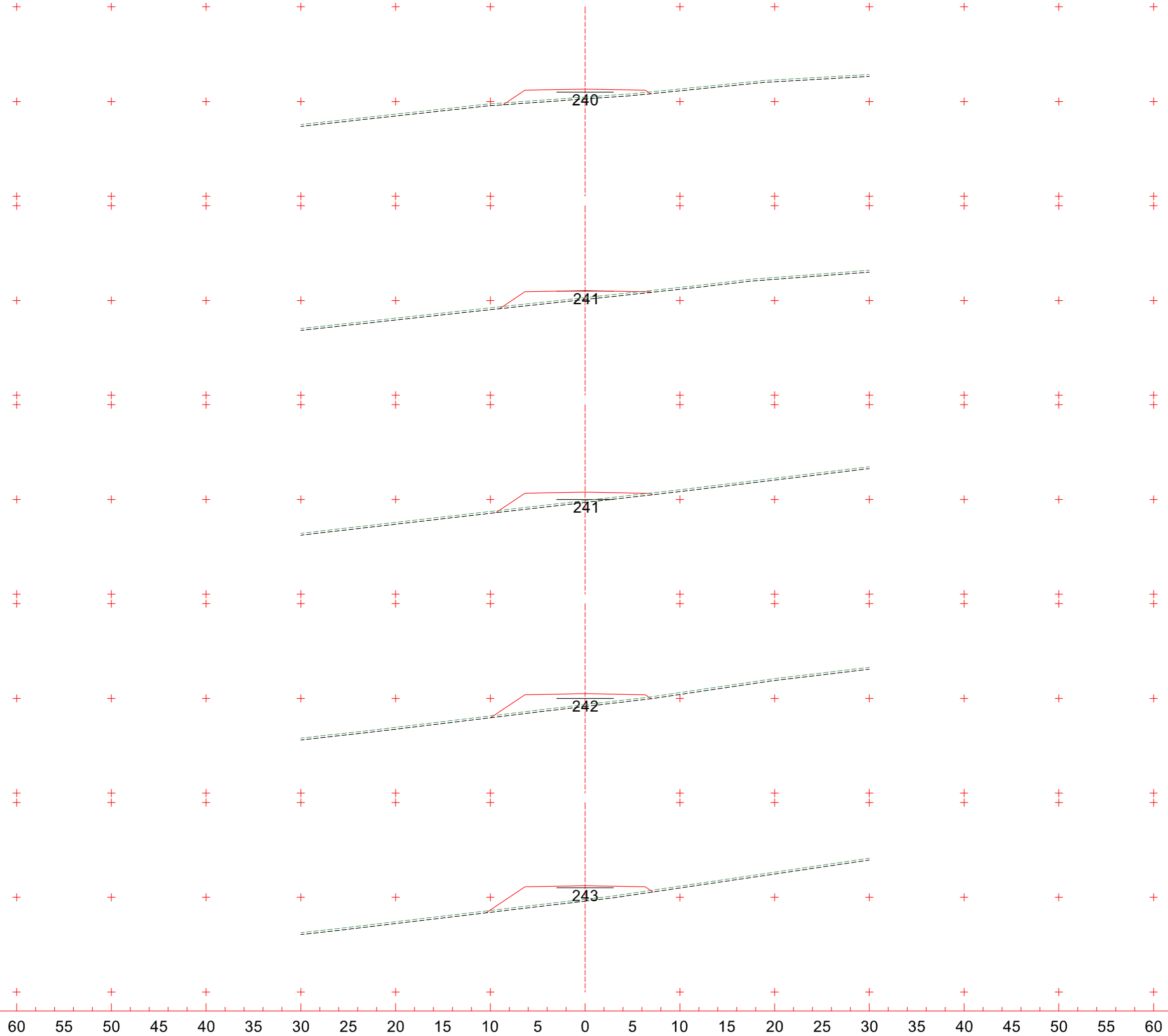
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6+680

CT 239,473 m
CP 240,324 m

6+660

CT 240,306 m
CP 241,050 m

6+640

CT 240,882 m
CP 241,776 m

6+620

CT 241,345 m
CP 242,502 m

6+600

CT 241,797 m
CP 243,228 m

Eixo1

Escala 1:400

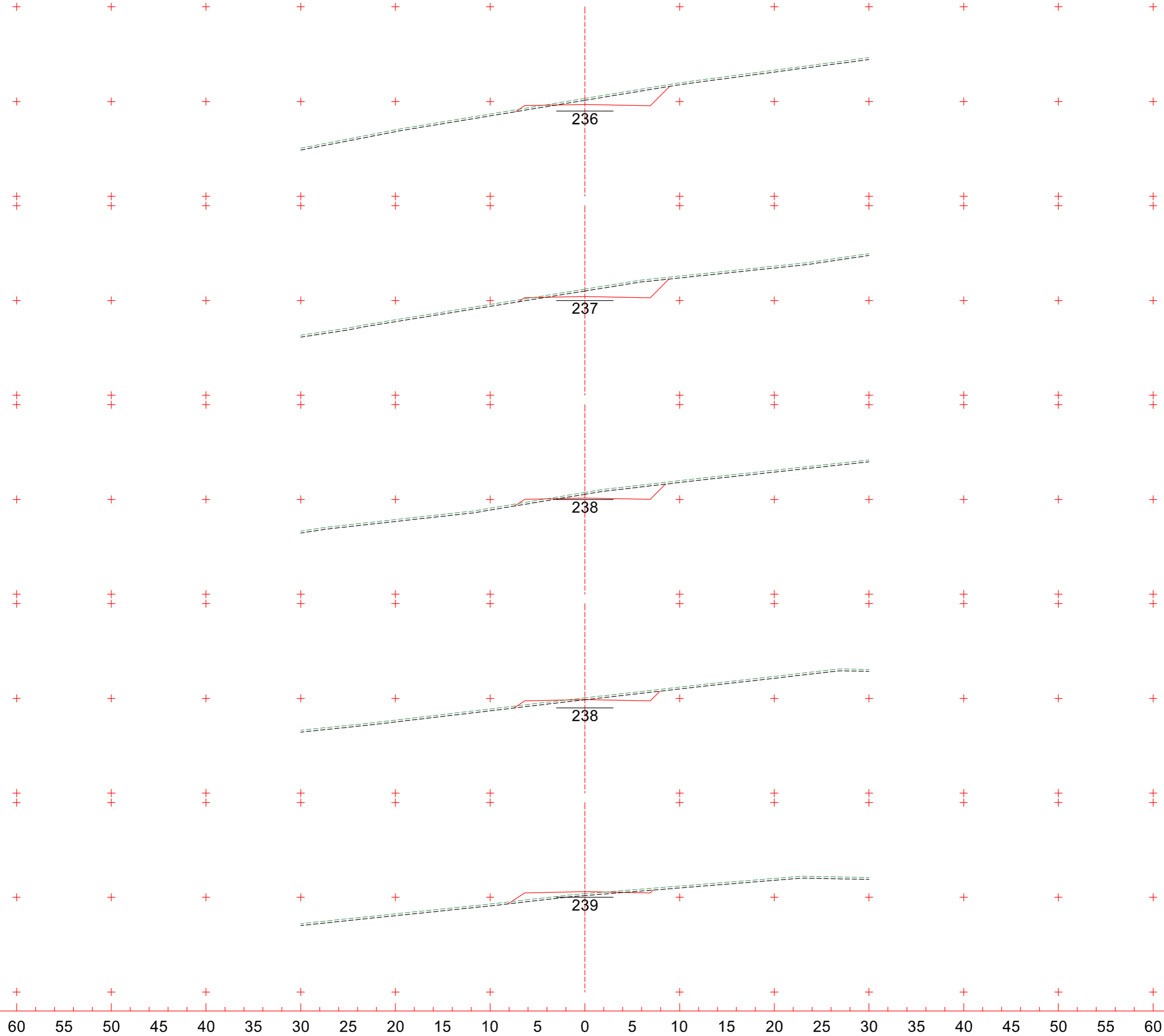
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6+780
CT 237,333 m
CP 236,694 m

6+760
CT 238,201 m
CP 237,420 m

6+740
CT 238,741 m
CP 238,146 m

6+720
CT 239,053 m
CP 238,872 m

6+700
CT 239,384 m
CP 239,598 m

Eixo1
Escala 1:400

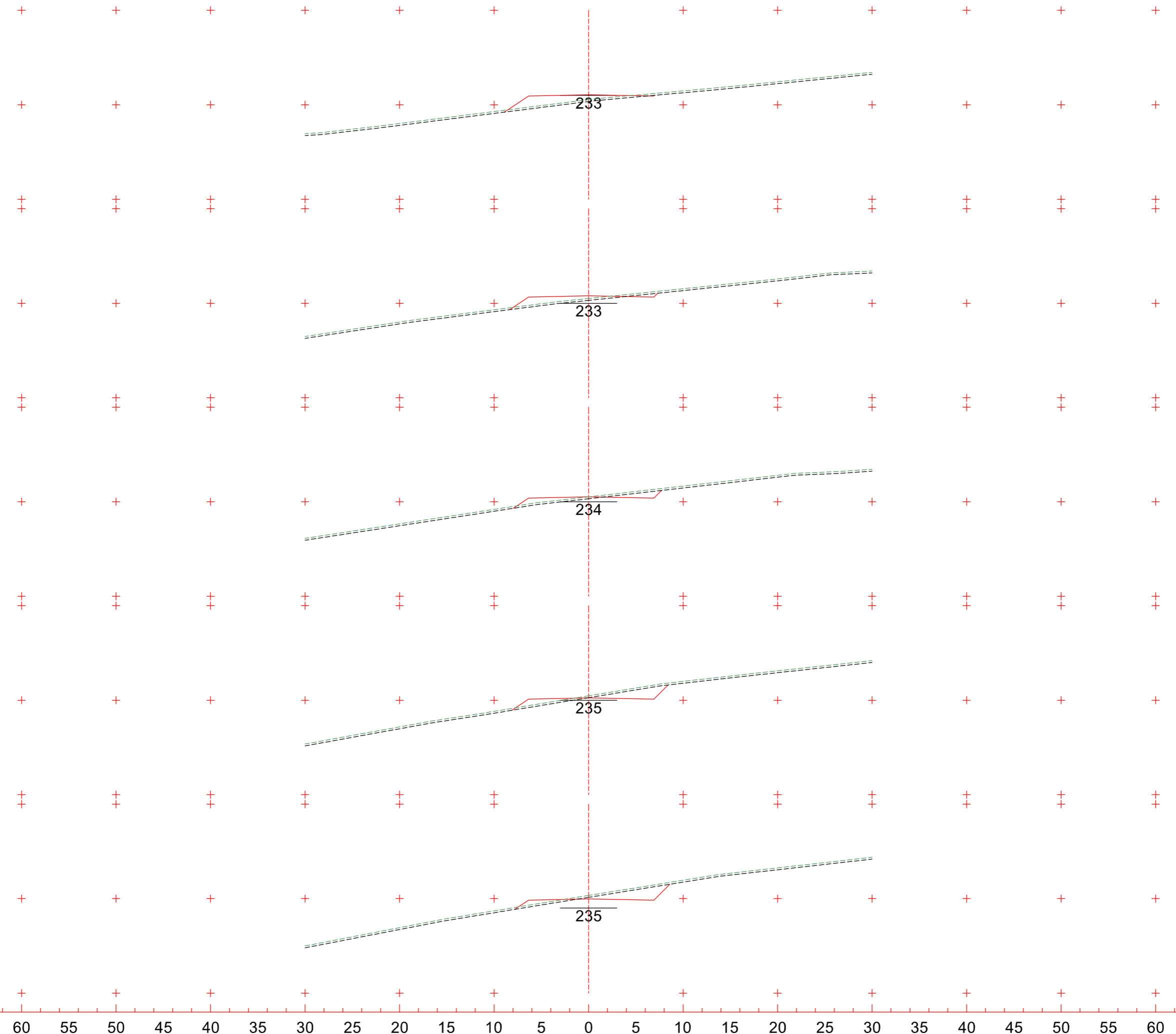
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6+880
CT 232,551 m
CP 233,065 m

6+860
CT 233,506 m
CP 233,791 m

6+840
CT 234,514 m
CP 234,517 m

6+820
CT 235,465 m
CP 235,242 m

6+800
CT 236,338 m
CP 235,968 m

Eixo1
Escala 1:400

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6+980

CT 229,645 m
CP 232,332 m

6+960

CT 229,737 m
CP 231,829 m

6+940

CT 229,980 m
CP 231,662 m

6+920

CT 230,629 m
CP 231,833 m

6+900

CT 231,557 m
CP 232,342 m

Eixo1

Escala 1:400

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7+080

CT 233,895 m
CP 233,411 m

7+060

CT 235,265 m
CP 233,810 m

7+040

CT 234,075 m
CP 233,859 m

7+020

CT 232,425 m
CP 233,556 m

7+000

CT 230,724 m
CP 232,959 m

Eixo1

Escala 1:400

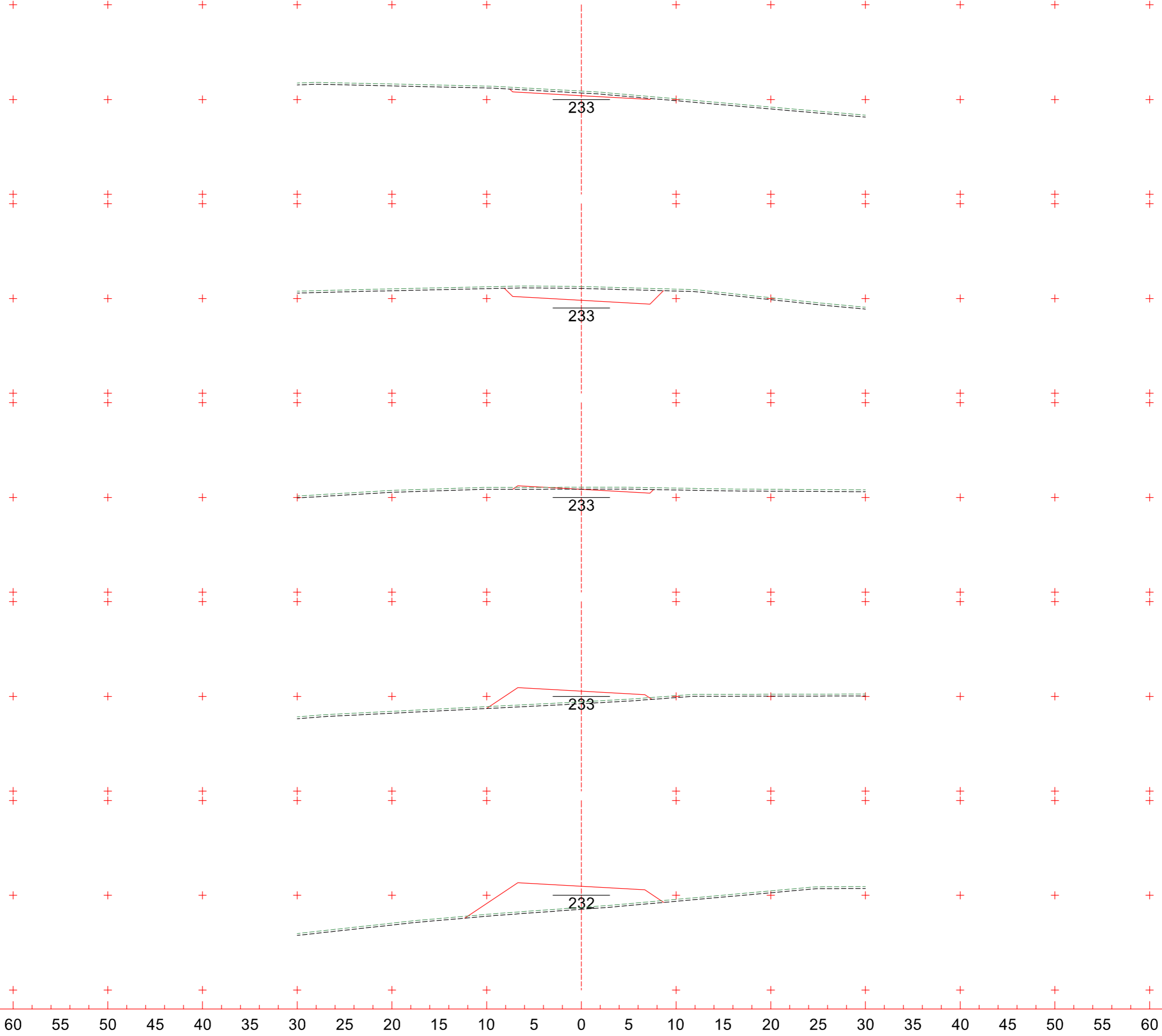
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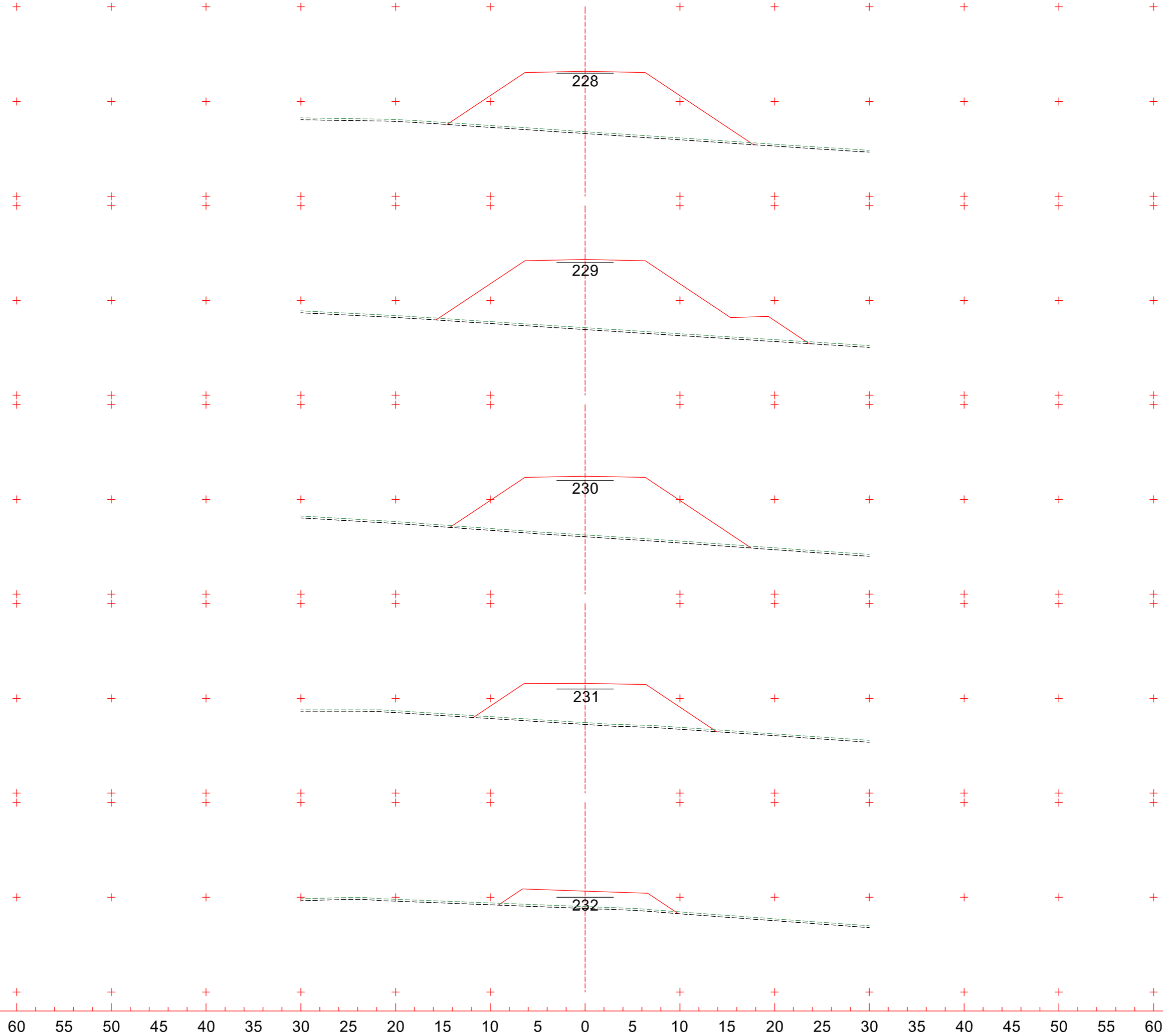
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7+180

CT 221,820 m
CP 228,199 m

7+160

CT 222,132 m
CP 229,329 m

7+140

CT 224,257 m
CP 230,458 m

7+120

CT 227,447 m
CP 231,588 m

7+100

CT 231,027 m
CP 232,659 m

Eixo1

Escala 1:400

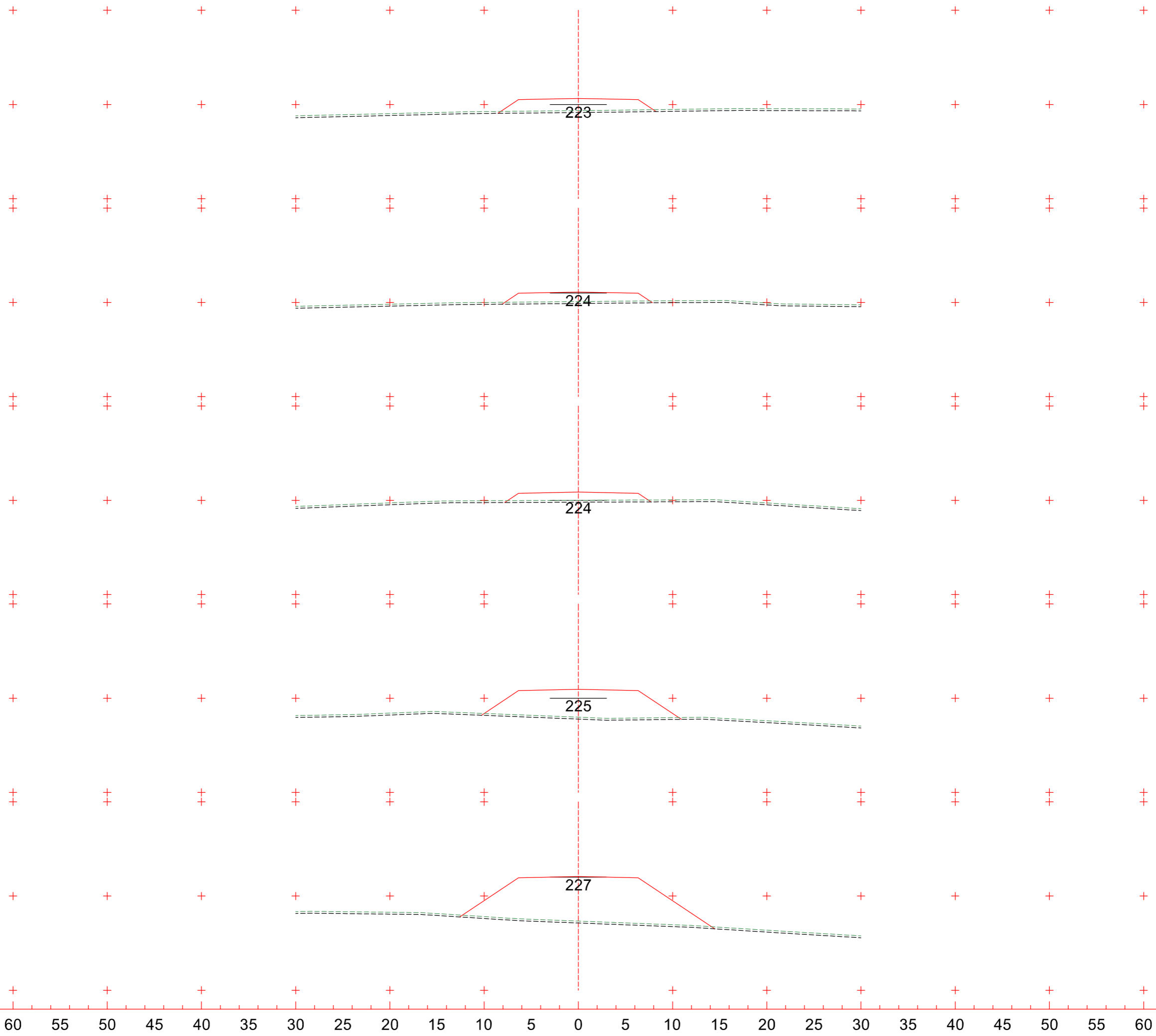
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7+280
CT 222,351 m
CP 223,648 m

7+260
CT 223,085 m
CP 224,101 m

7+240
CT 223,995 m
CP 224,872 m

7+220
CT 222,979 m
CP 225,940 m

7+200
CT 222,341 m
CP 227,069 m

Eixo1
Escala 1:400

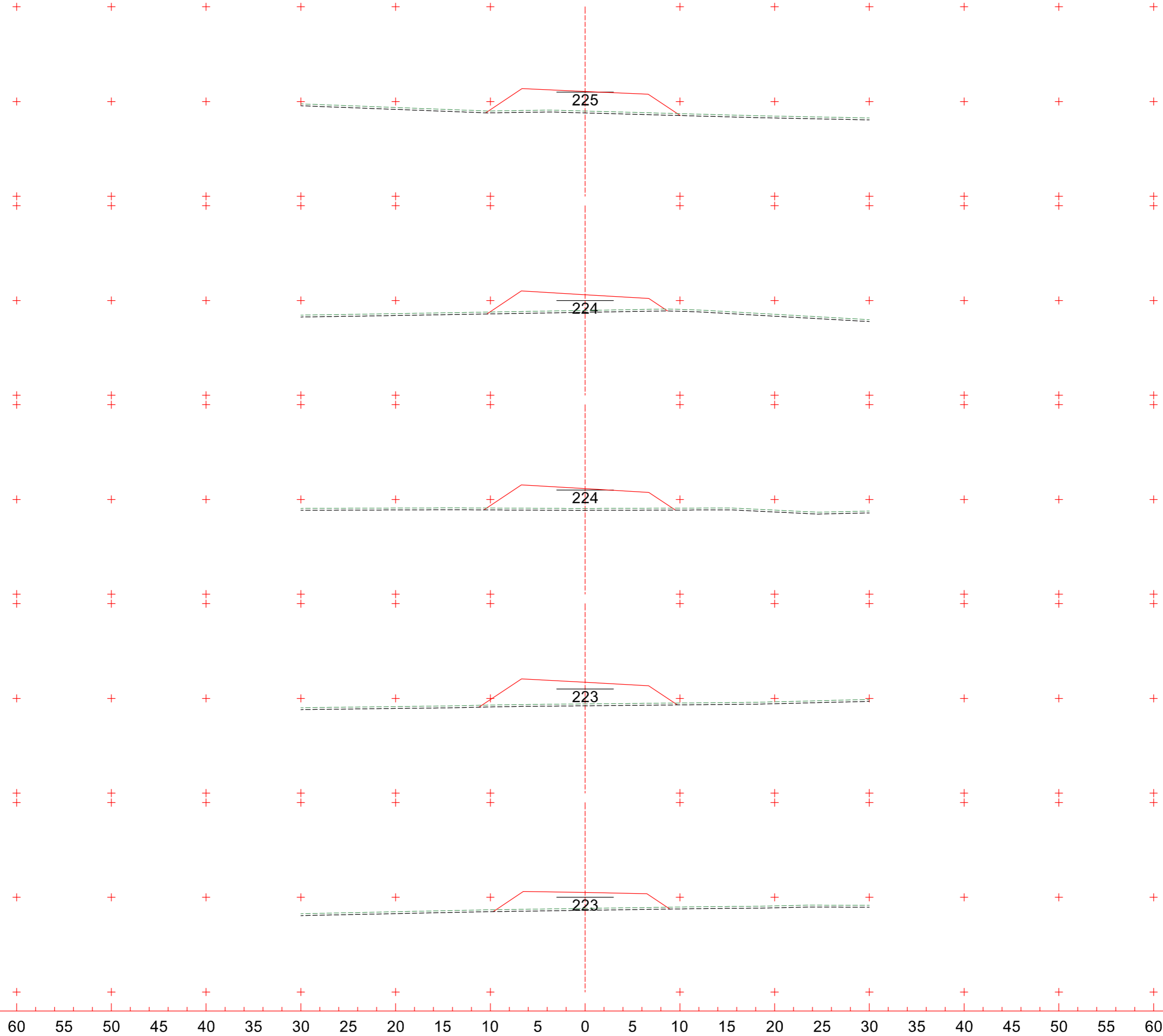
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7+380

CT 222,999 m
CP 225,073 m

7+360

CT 222,954 m
CP 224,608 m

7+340

CT 222,049 m
CP 224,143 m

7+320

CT 221,417 m
CP 223,700 m

7+300

CT 221,831 m
CP 223,515 m

Eixo1

Escala 1:400

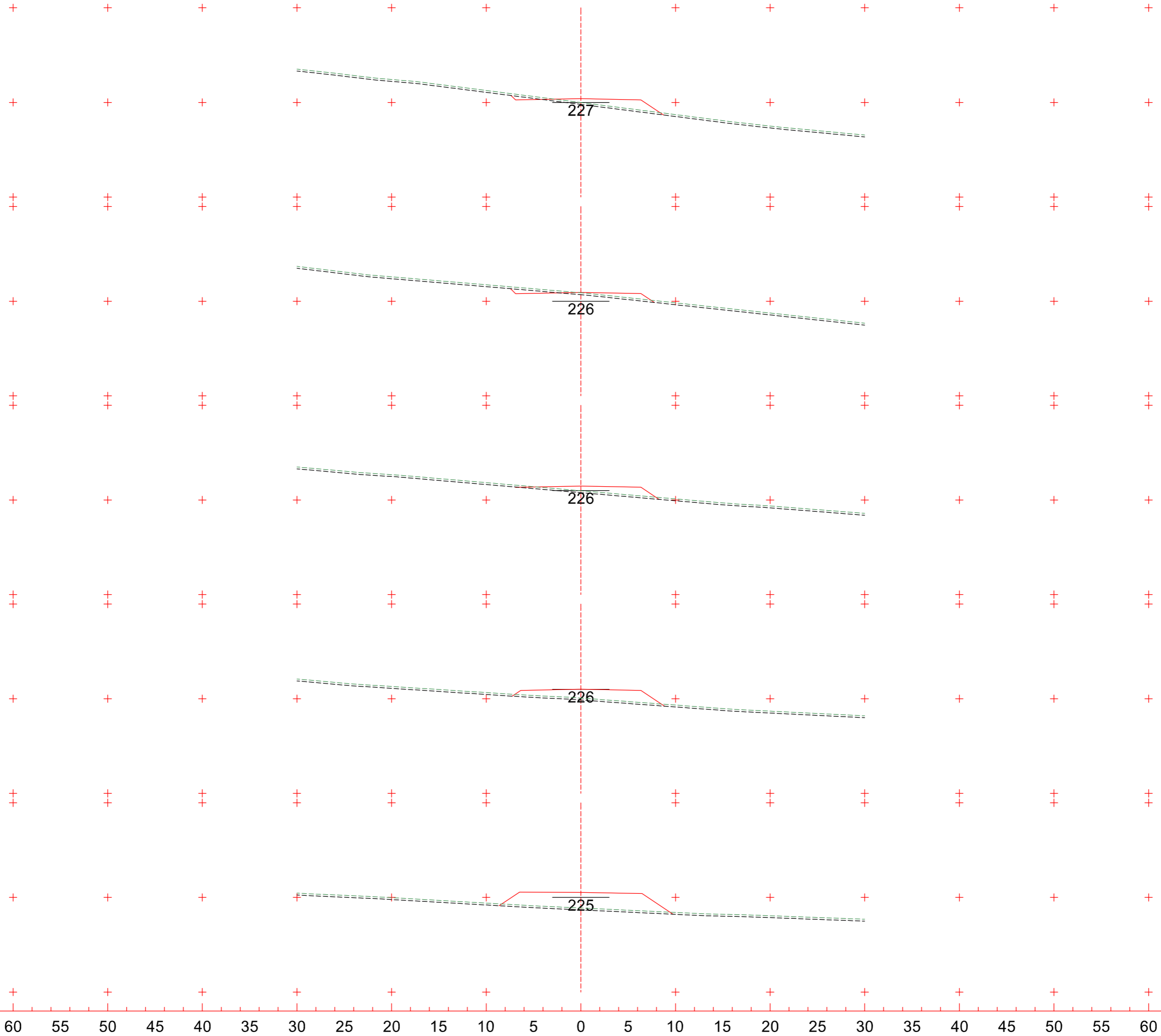
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7+480
CT 226,992 m
CP 227,399 m

7+460
CT 226,885 m
CP 226,934 m

7+440
CT 225,971 m
CP 226,469 m

7+420
CT 225,064 m
CP 226,003 m

7+400
CT 223,883 m
CP 225,538 m

Eixo1
Escala 1:400

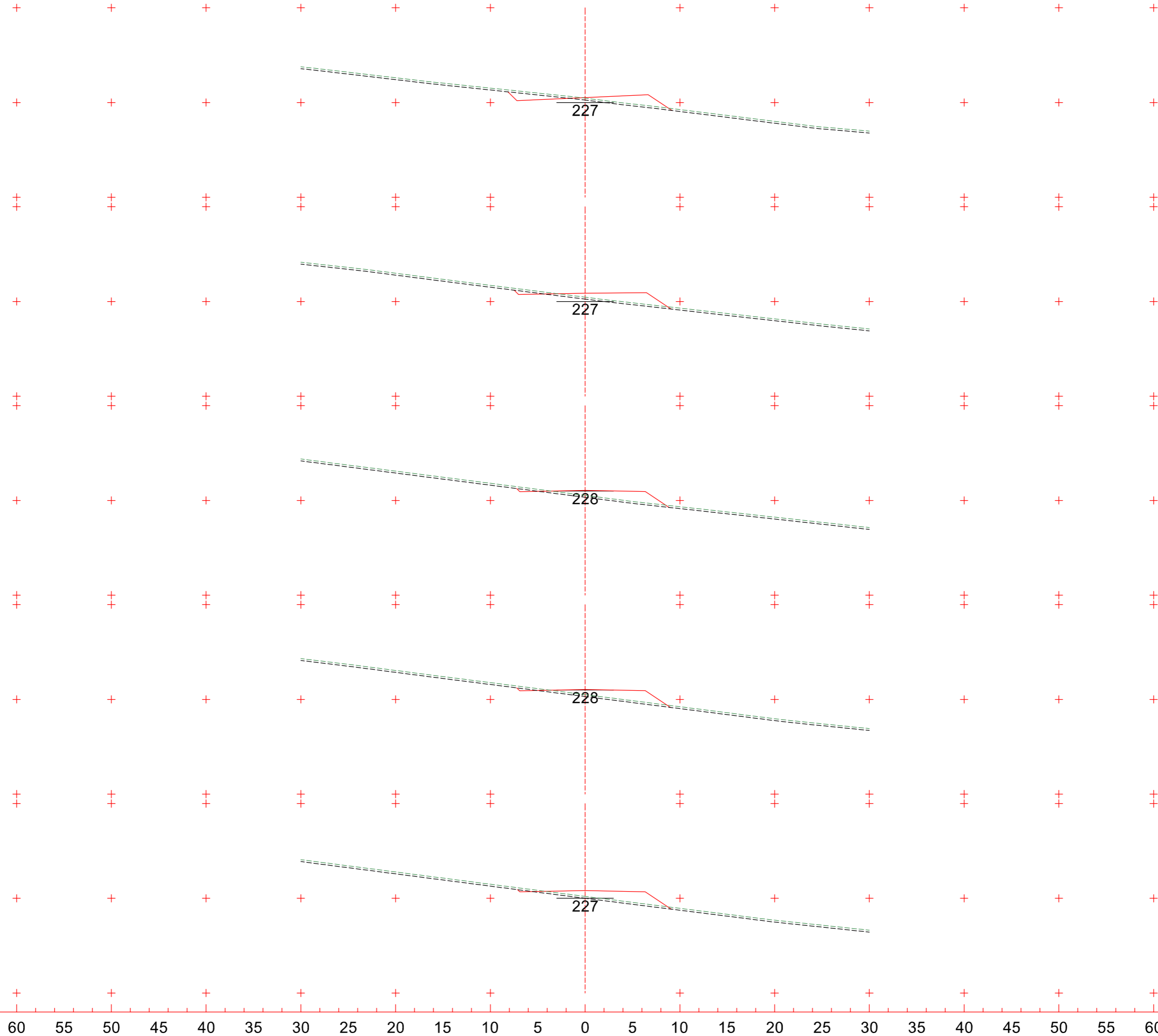
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7+580
CT 227,464 m
CP 227,526 m

7+560
CT 227,454 m
CP 227,874 m

7+540
CT 227,532 m
CP 228,062 m

7+520
CT 227,499 m
CP 228,043 m

7+500
CT 227,204 m
CP 227,818 m

Eixo1
Escala 1:400

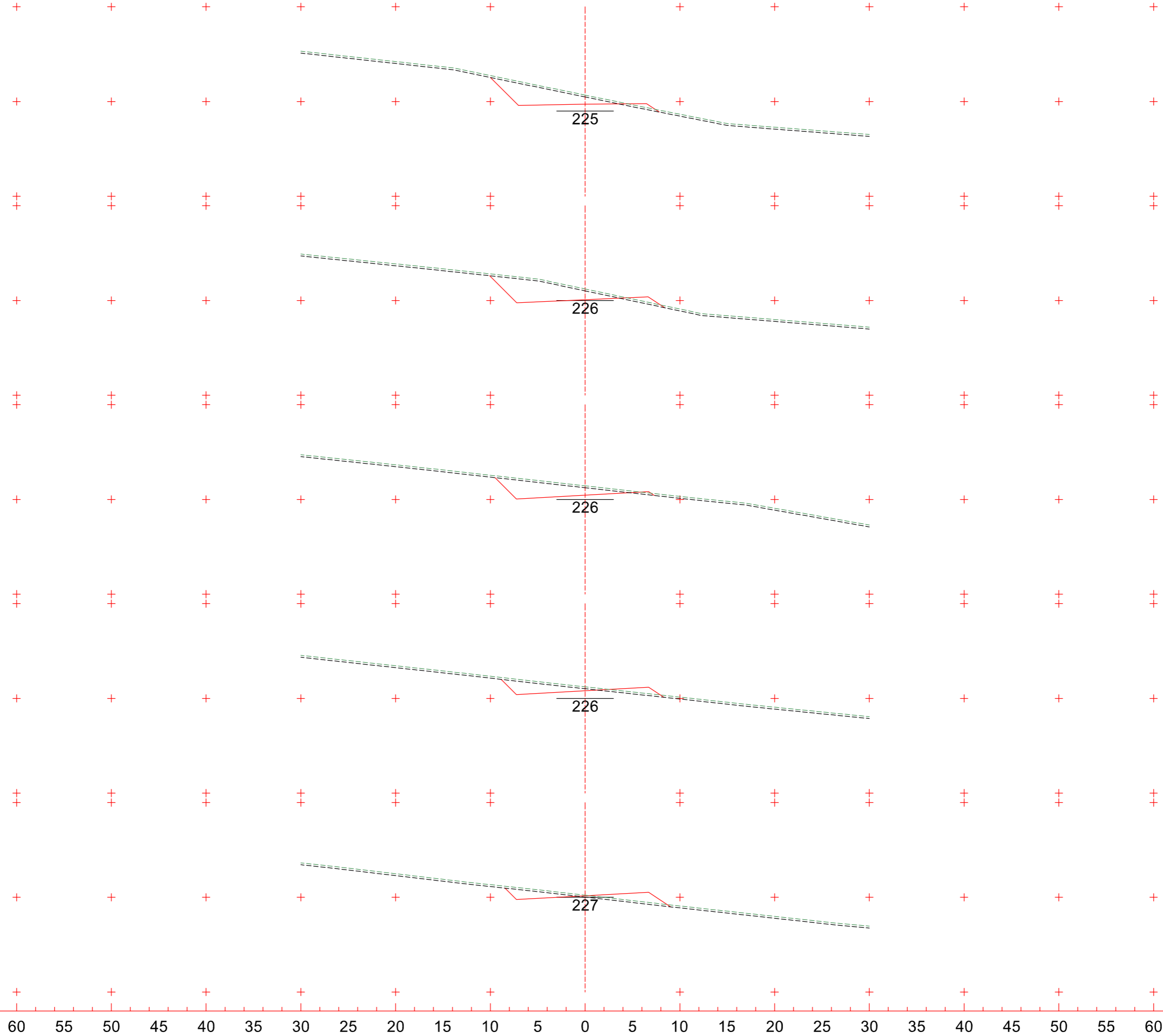
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7+680
CT 226,683 m
CP 225,726 m

7+660
CT 227,218 m
CP 226,086 m

7+640
CT 227,437 m
CP 226,446 m

7+620
CT 227,220 m
CP 226,806 m

7+600
CT 227,227 m
CP 227,166 m

Eixo1
Escala 1:400

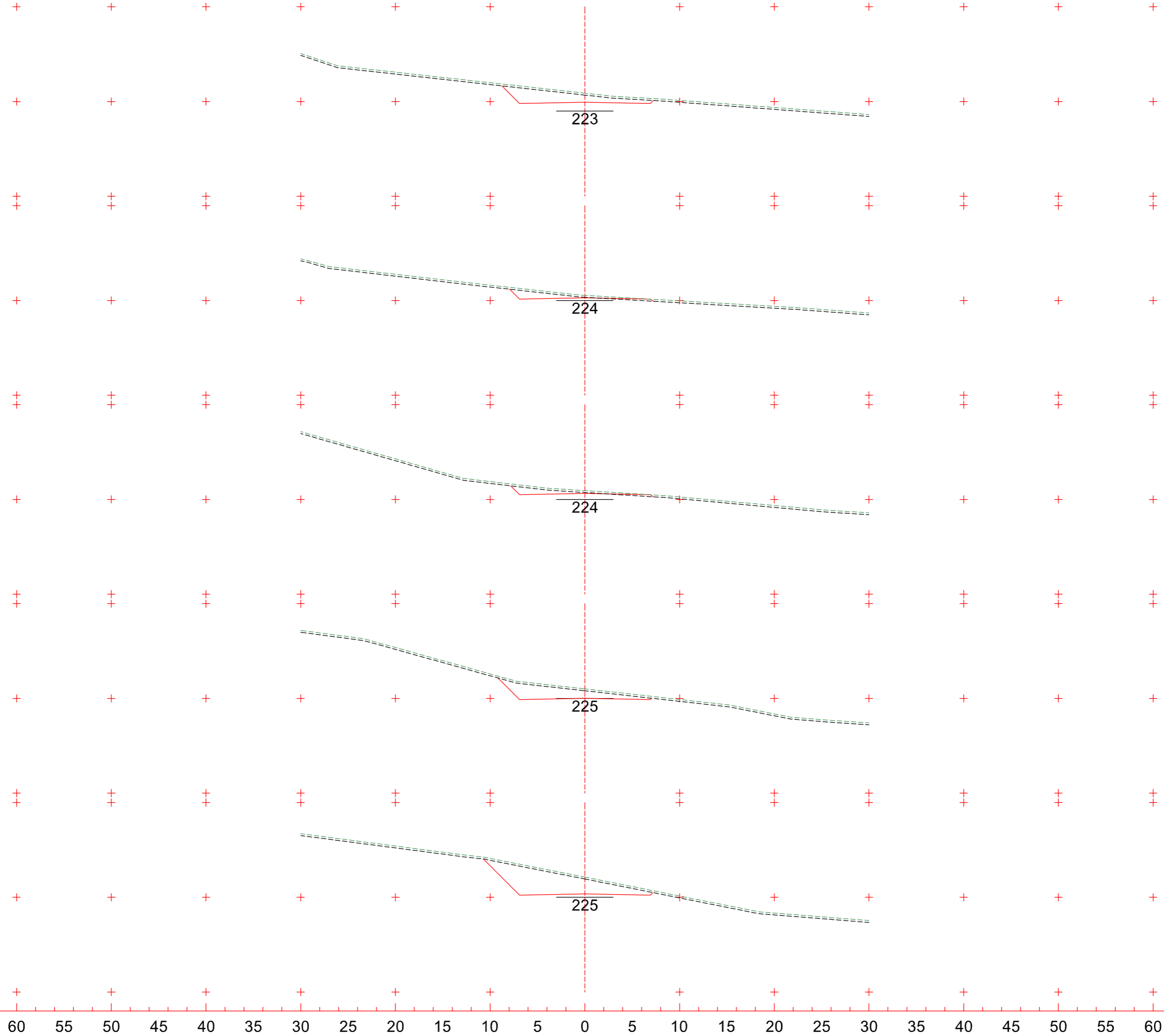
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7+780

CT 224,882 m
CP 223,926 m

7+760

CT 224,539 m
CP 224,286 m

7+740

CT 224,932 m
CP 224,646 m

7+720

CT 226,003 m
CP 225,006 m

7+700

CT 227,134 m
CP 225,366 m

Eixo1

Escala 1:400

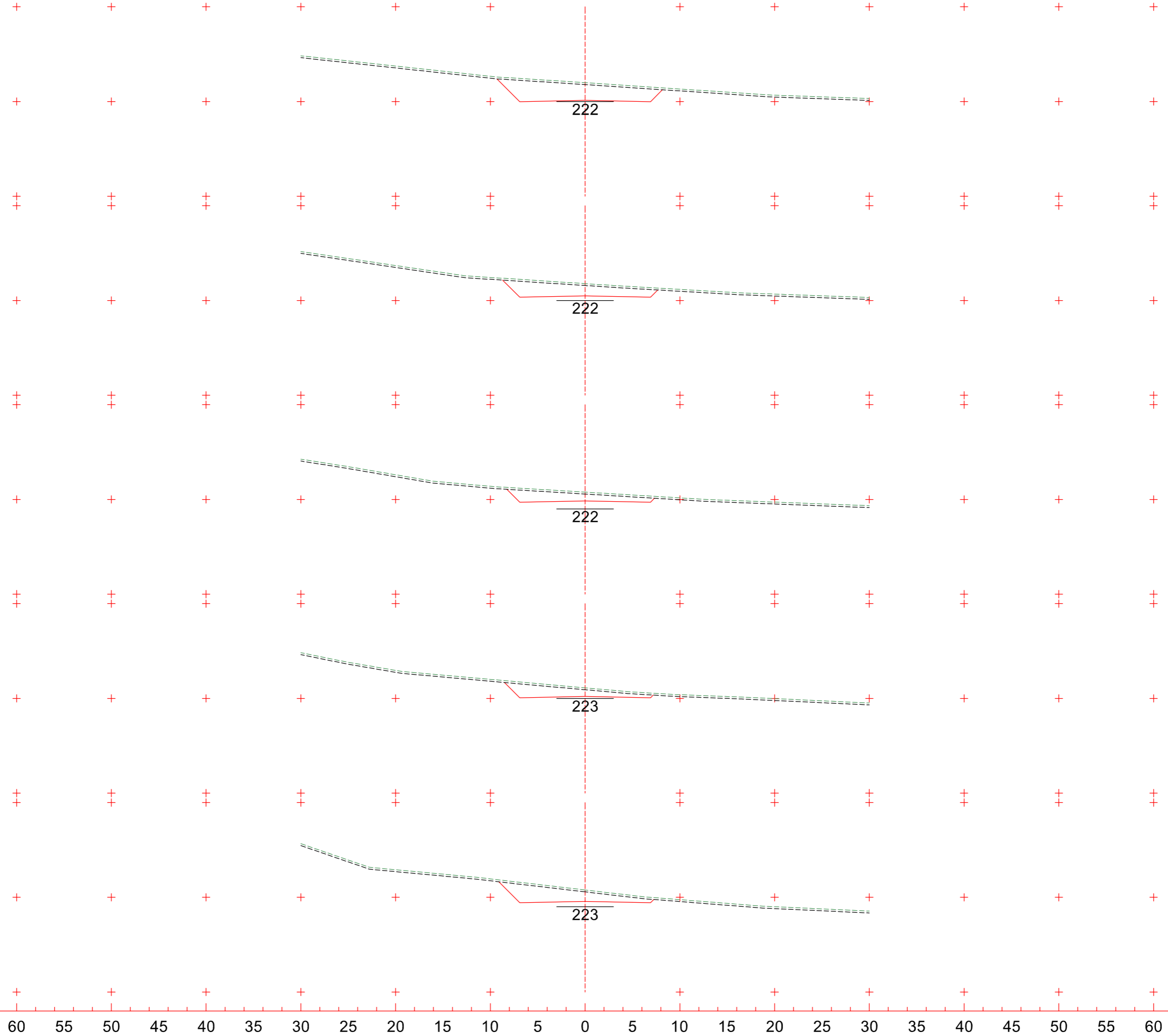
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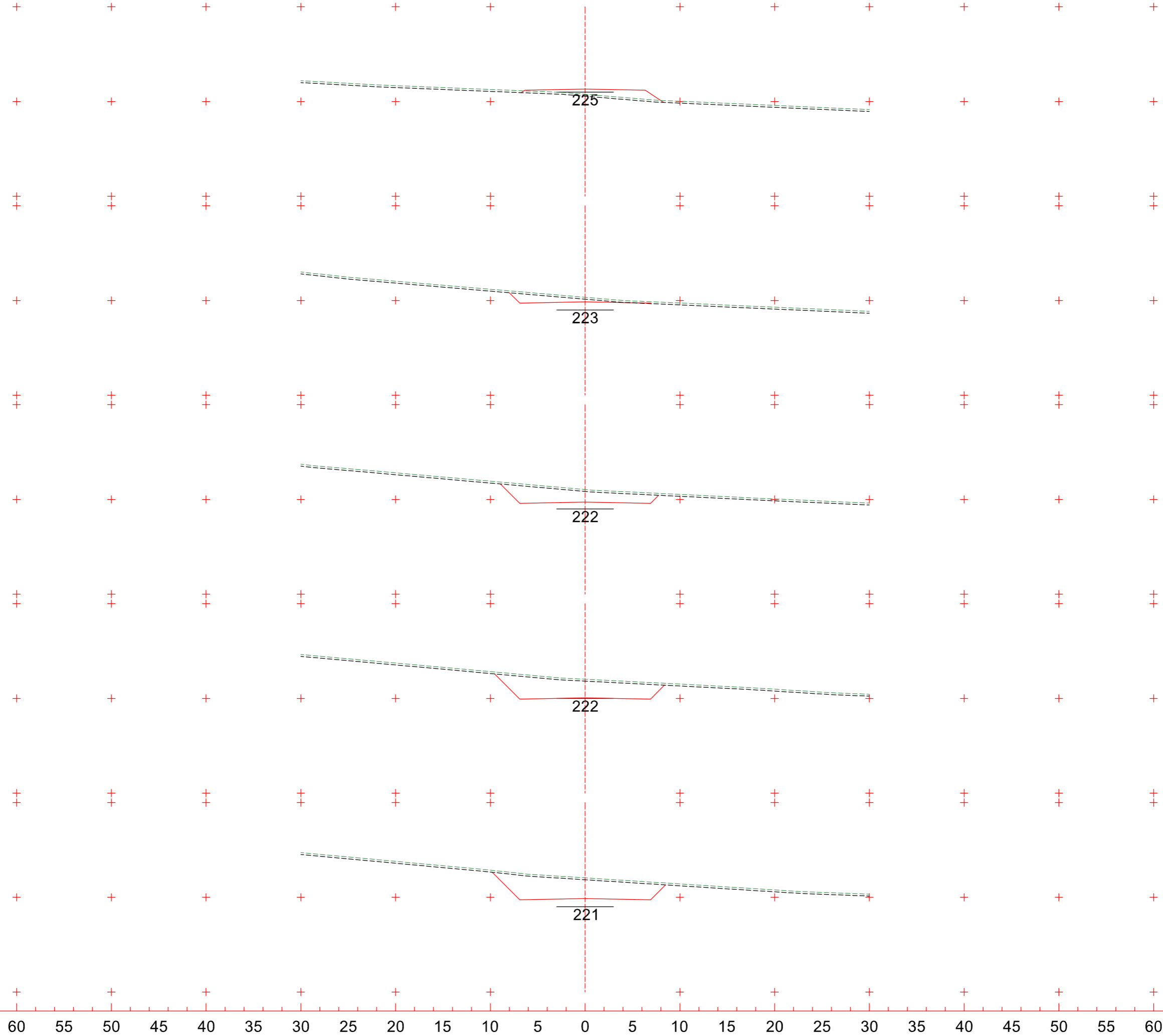
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7+980

CT 224,765 m
CP 225,327 m

7+960

CT 224,337 m
CP 223,857 m

7+940

CT 224,044 m
CP 222,726 m

7+920

CT 224,020 m
CP 222,064 m

7+900

CT 224,053 m
CP 221,873 m

Eixo1

Escala 1:400

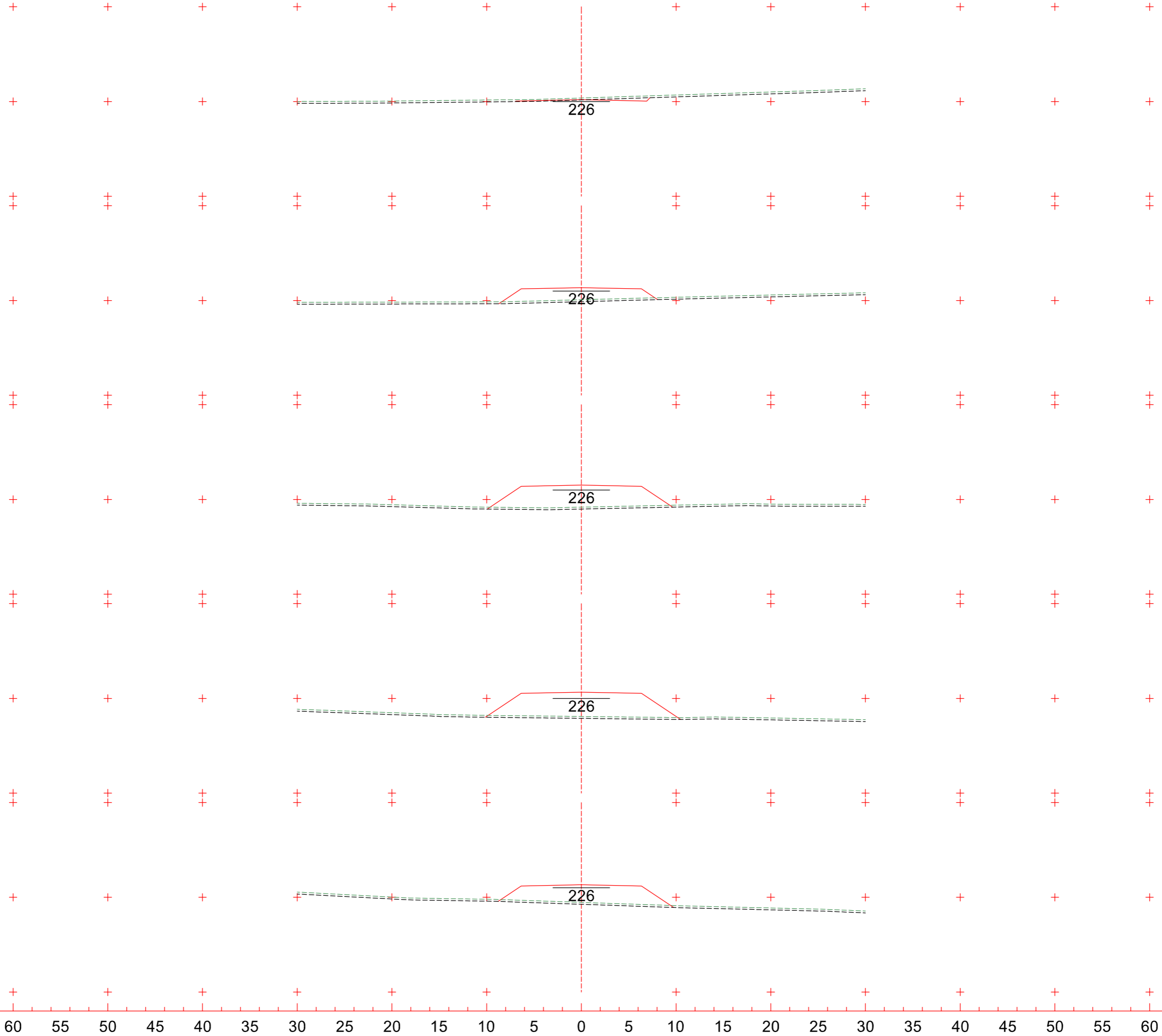
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8+080

CT 226,373 m
CP 226,193 m

8+060

CT 225,078 m
CP 226,353 m

8+040

CT 224,186 m
CP 226,513 m

8+020

CT 224,089 m
CP 226,655 m

8+000

CT 224,466 m
CP 226,327 m

Eixo1

Escala 1:400

