

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

PROJETO PONTO DE PARTIDA

PARTE II

EDIÇÃO UFRGS
2022/2

Daniel Sergio Presta García
Laura Beatriz Silva Rössler
Emanuel Salvador Caldeira

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PORTO ALEGRE

UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL

2023

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CAPÍTULO II

JNMA - Engenharia de Transporte Ltda.

Augusto Pedro Stefanon

João Marcos Guarienti Dornelles

Maria Eduarda Rossini Angeli

Nícolas Augusto Antoniazzi Kaspary

Daniel Sergio Presta García

REPÚBLICA FEDERATIVA DO BRASIL
UNIVERSIDADE FEDERAL DO RIO GRANDE DO SUL – UFRGS
ESCOLA DE ENGENHARIA – EE
DEPARTAMENTO DE ENGENHARIA DE PRODUÇÃO E TRANSPORTES – DEPROT
LABORATÓRIO DE SISTEMAS DE TRANSPORTE – PROGRAMA ProINFRA – PROJETO PONTO DE PARTIDA

PROJETO BÁSICO PARA IMPLANTAÇÃO DE TRECHO RODOVIÁRIO
ENTRE AS CIDADES DE ROCA SALES E CORONEL PILAR

Rodovia: PPP-222
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: 16,6 km



VOLUME 2 – PROJETO EXECUTIVO

EQUIPE BB2 – JNMA Engenharia de Transporte Ltda.
MARÇO/2023

DADOS DE IDENTIFICAÇÃO

Instituição: **Universidade Federal do Rio Grande do Sul – UFRGS**

Unidade: **Escola de Engenharia – EE**

Departamento: **Departamento de Engenharia de Produção e Transportes – DEPROT**

Laboratório: **Laboratório de Sistemas de Transportes – LASTRAN**

Programa: **Programa de Desenvolvimento Tecnológico em Infraestrutura de Transportes – ProINFRA**

Projeto: **Ponto de Partida (Trabalho de Graduação da Disciplina de Rodovias)**

Edição: **2022/2**

Ano: **2022**

Semestre: **2**

Disciplina: **Rodovias**

Turma: **B**

Código da Equipe: **BB2**

Nome: **JNMA Engenharia de Transporte Ltda.**

Integrantes do grupo:

(assinatura)

Augusto Pedro Stefanon

(assinatura)

João Marcos Guarienti Dornelles

(assinatura)

Maria Eduarda Rossini Angeli

(assinatura)

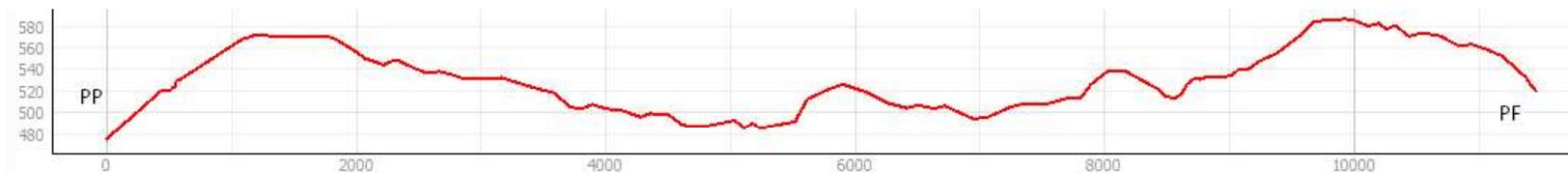
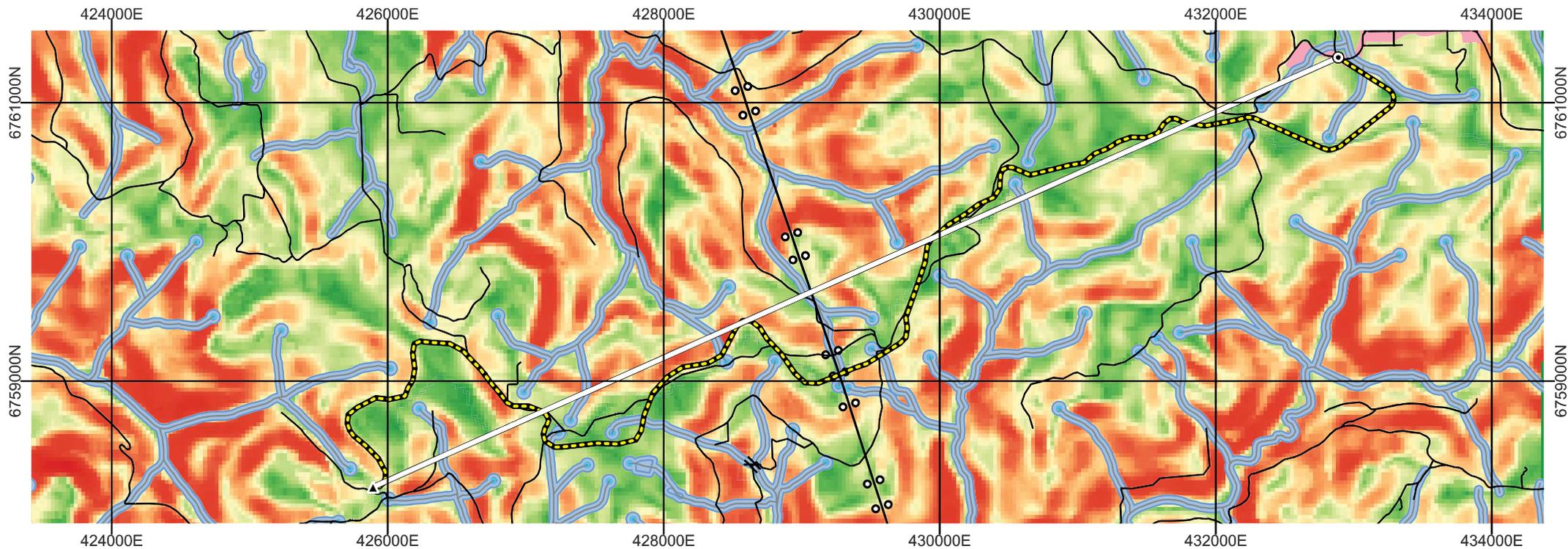
Nícolas Augusto Antoniazzi Kaspary

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APRESENTAÇÃO



CONVENÇÕES CARTOGRÁFICAS

Pontos de Partida

- ▲ PF
- ◎ PP
- Diretriz Lote 2
- Traçado 3

Sistemas de Transporte

- ≡ Obra de Arte
- Sistema Rodoviário
- ⊖ Rede de Alta Tensão

Hidrografia

- Cursos D'Água
- Nascentes
- APP
- Microbacias

Localidades

- Área Edificada
- Declividade 103%
- 0%



Processo Licitatório
Simulado PPP-
UFRGS-2022/2
Rodovia: PPP-222

Mapa de Apoio para
Estudos de Viabilidade
Técnica, Econômica e
Ambiental – EVTEA
Dezembro/2022

TRAÇADO 3 - BB2

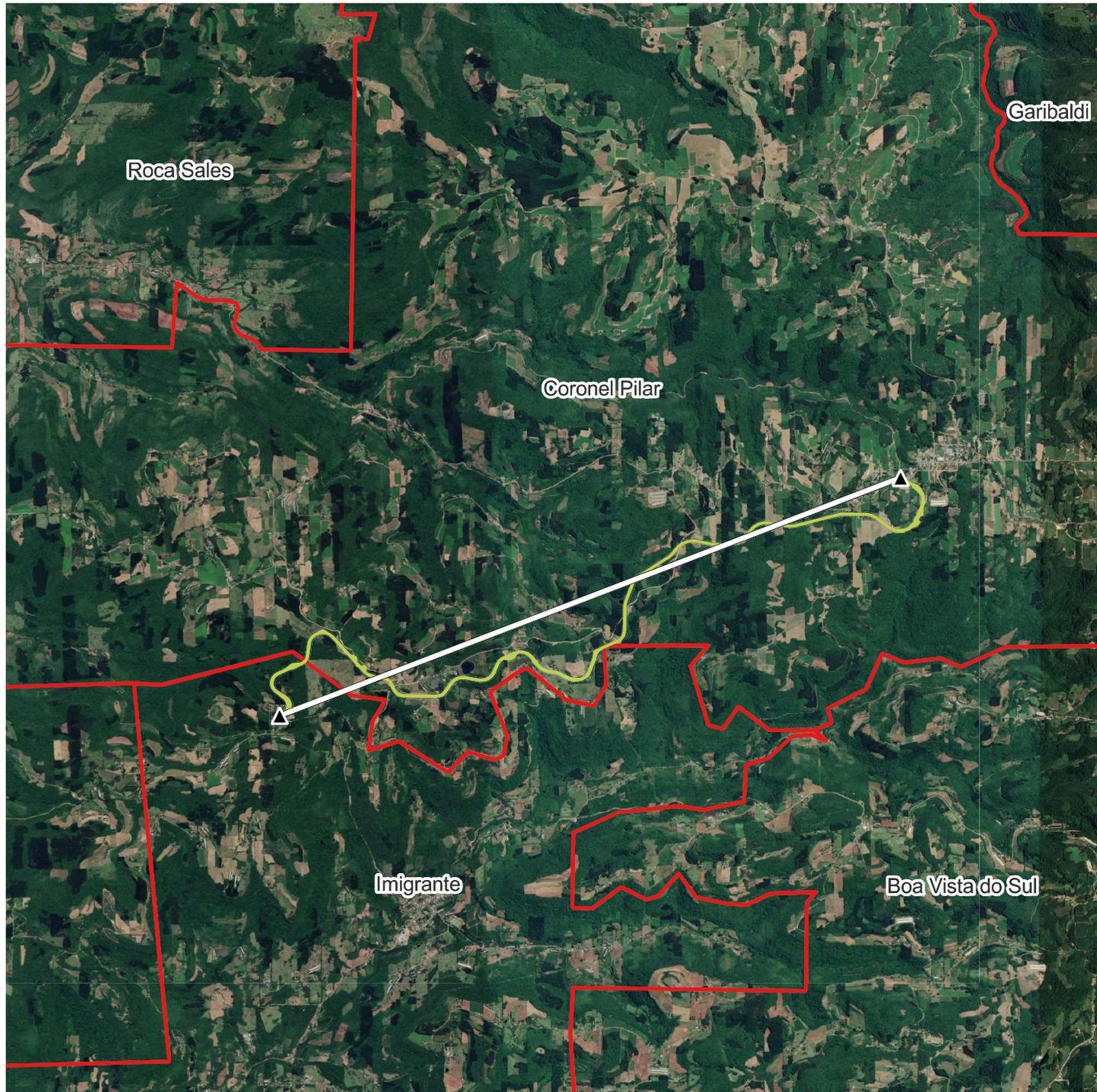
Sistema de
Referência SIRGAS
2000 UTM 22S

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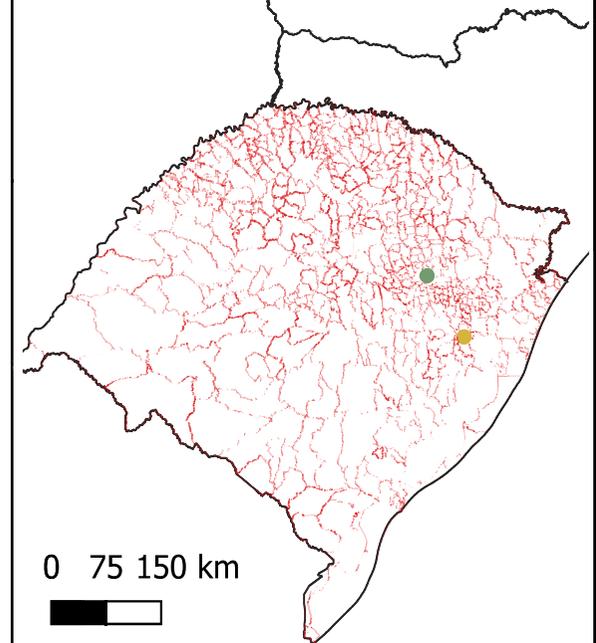
Responsáveis
Técnicos
Consórcio BB2





MAPA DE LOCALIZAÇÃO

Localização no Estado do RS



Convenções Cartográficas

- Capital
- Cidade
- Municípios - RS
- UF
- ▲ Pontos de Partida
- Diretriz Lote 2
- Faixa de Domínio de Projeto Maior

Google Satellite



CARACTERÍSTICAS TÉCNICAS

Rodovia: Roca Sales - Coronel Pilar - BB
 Trecho: Lote 2
 Segmento: km: 0+000,00 ao km: 10+973,80

CARACTERÍSTICAS GERAIS

DE PROJETO		PLANIALTIMÉTRICAS				SEÇÕES TRANSVERSAIS			
NORMA	DNIT	RAIO MIN. COM TRANS.	50,000	K MIN/DES CÔNCAVA	7 / 7	LARG. PISTA DE ROL.		PLATAFORMA ATERRO	
CLASSE DA RODOVIA	III	RAIO MIN. SIMPLES	300,000	K MIN/DES CONVEXA	5 / 5	LARG. ACOST. INT.		PLATAFORMA CORTE	
REGIÃO	Montanhosa	RAMPA MÁXIMA	10,000	DIST. VIS. PARADA		LARG. ACOST. EXT.		TALUDE ATERRO	
VELOCIDADE DIRETRIZ	40	RAMPA MÍNIMA	0,300	DIST. VIS. ULTRAP.		ABAUAMENTO		TALUDE CORTE 1ª CAT.	
		EXTENSÃO TOTAL	10973,805	FAIXA DOM. (LE/LD+OFF)	15 / 15 + 5	SUPERELEVÇÃO MÁX.		TALUDE CORTE 3ª CAT.	

PLANIMETRIA

DISTRIBUIÇÃO DE CURVAS

T R A N S I Ç Ã O	RAIOS (m)		FREQ.	Dc (m)	%	Lc1+Lc2 (m)	%
	R A M P A	R mínimo =	110,000	2	240,438	2,19	120,000
	110,000 < R ≤	100,000					
	100,000 < R ≤	200,000	18	2255,010	20,55	1360,000	12,39
	200,000 < R ≤	300,000	9	1289,941	11,75	640,000	5,83
	300,000 < R ≤	500,000					
	R >	500,000					
	TOTAL EM TRANSIÇÃO		29	3785,388	34,49	2120,000	19,32
S I M P L E S	RAIOS (m)		FREQ.	Dc (m)	%		
	R mínimo =	1000000,000					
	1000000,000 < R ≤	500,000					
	500,000 < R ≤	700,000					
	700,000 < R ≤	1000,000					
	1000,000 < R ≤	1500,000					
	R >	1500,000					
	TOTAL SIMPLES						
TOTAL EM CURVA			29	3785,388	34,49	9690,776	88,31

EXTENSÃO DAS INTERTANGENTES

MÍNIMA		MÁXIMA		TOTAL	
EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%
45,723	0,42	527,168	4,80	5068,417	46,19

PARÂMETROS PLANIMÉTRICOS

TORTUOSIDADE		DISTÂNCIA EM DIRETRIZ	
TOTAL (°/m)	MÉDIA (°/m.km)	EXTENSÃO (m)	ACRÉSCIMO (%)
9,374	0,854	7647,234	43,500

ALTIMETRIA

VARIAÇÃO ALTIMÉTRICA

ACLIVES			NÍVEL		DECLIVES		
INTERVALO	EXTENSÃO (m)	%	EXTENSÃO	%	INTERVALO	EXTENSÃO (m)	%
0 < i ≤ 1					0 < i ≤ 1		
1 < i ≤ 2	275,930	2,51			1 < i ≤ 2	1870,618	17,05
2 < i ≤ 3					2 < i ≤ 3	554,316	5,05
3 < i ≤ 4					3 < i ≤ 4	283,594	2,58
4 < i ≤ 5	870,324	7,93			4 < i ≤ 5	546,828	4,98
5 < i ≤ 6	123,482	1,13			5 < i ≤ 6		
6 < i ≤ 7	830,517	7,57			6 < i ≤ 7		
7 < i ≤ 8					7 < i ≤ 8	299,048	2,73
8 < i ≤ 9	295,769	2,70			8 < i ≤ 9	285,029	2,60
9 < i ≤ 10	950,000	8,66			9 < i ≤ 10	793,692	7,23
i > 10					i > 10	64,658	0,59
TOTAL	3346,022	30,49			TOTAL	4697,783	42,81

EXTENSÃO DOS ELEMENTOS VERTICAIS

RAMPA		CURVA CÔNCAVA		CURVA CONVEXA		CURVA TOTAL	
EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%
8043,805	73,30	1040,000	9,48	1890,000	17,22	2930,000	26,70

PARÂMETROS K MÍNIMOS ADOTADOS

EM CURVA CÔNCAVA	7,963	EM CURVA CONVEXA	6,375
------------------	-------	------------------	-------

PARÂMETROS ALTIMÉTRICOS

COMPRIMENTO VIRTUAL IDA		COMPRIMENTO VIRTUAL VOLTA		COMPRIMENTO VIRTUAL MÉDIO	
EXTENSÃO (m)	%	EXTENSÃO (m)	%	EXTENSÃO (m)	%
25755,725	234,70	23465,996	213,84	24610,861	224,27

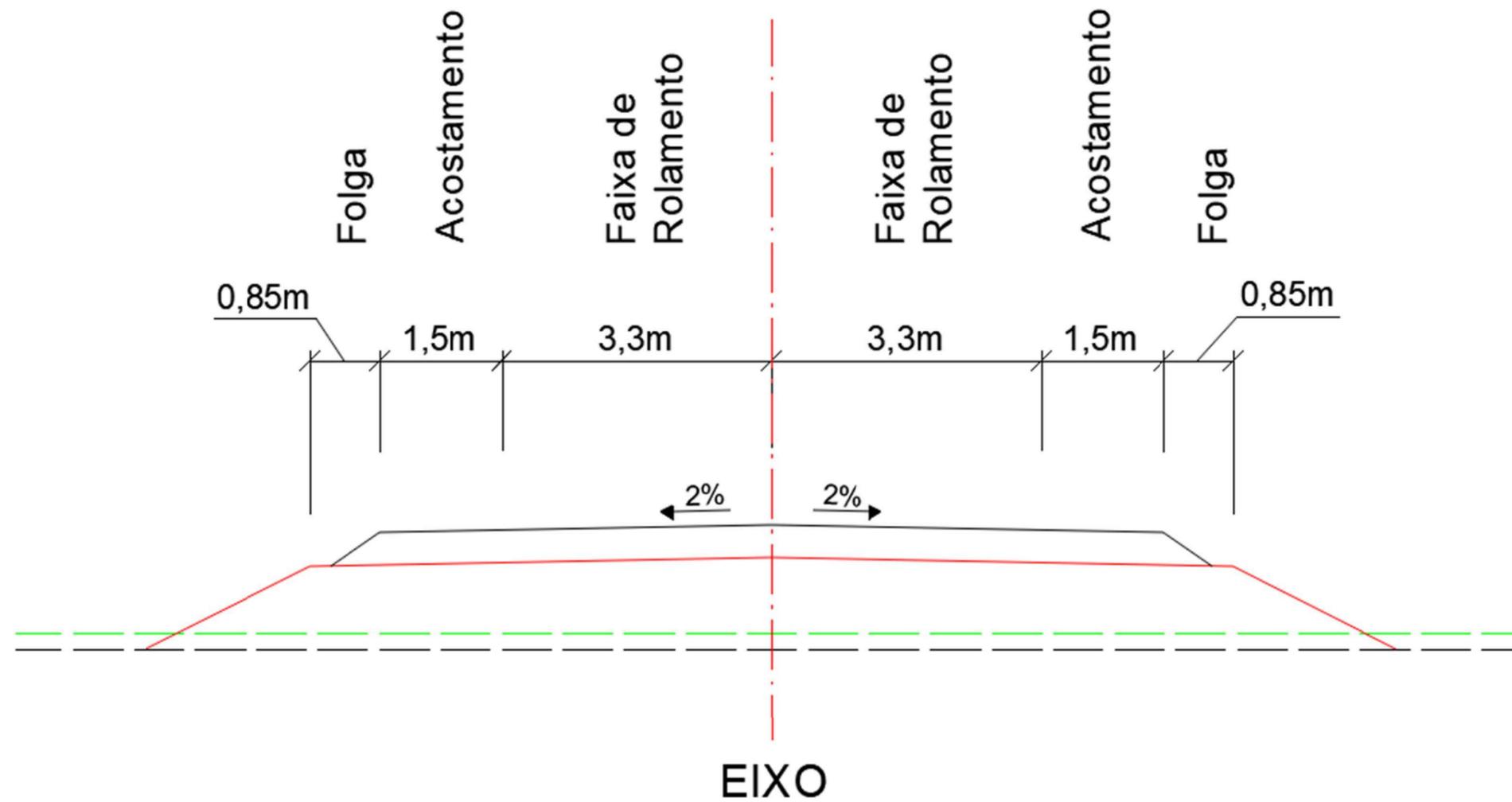
CARACTERÍSTICAS OPERACIONAIS

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

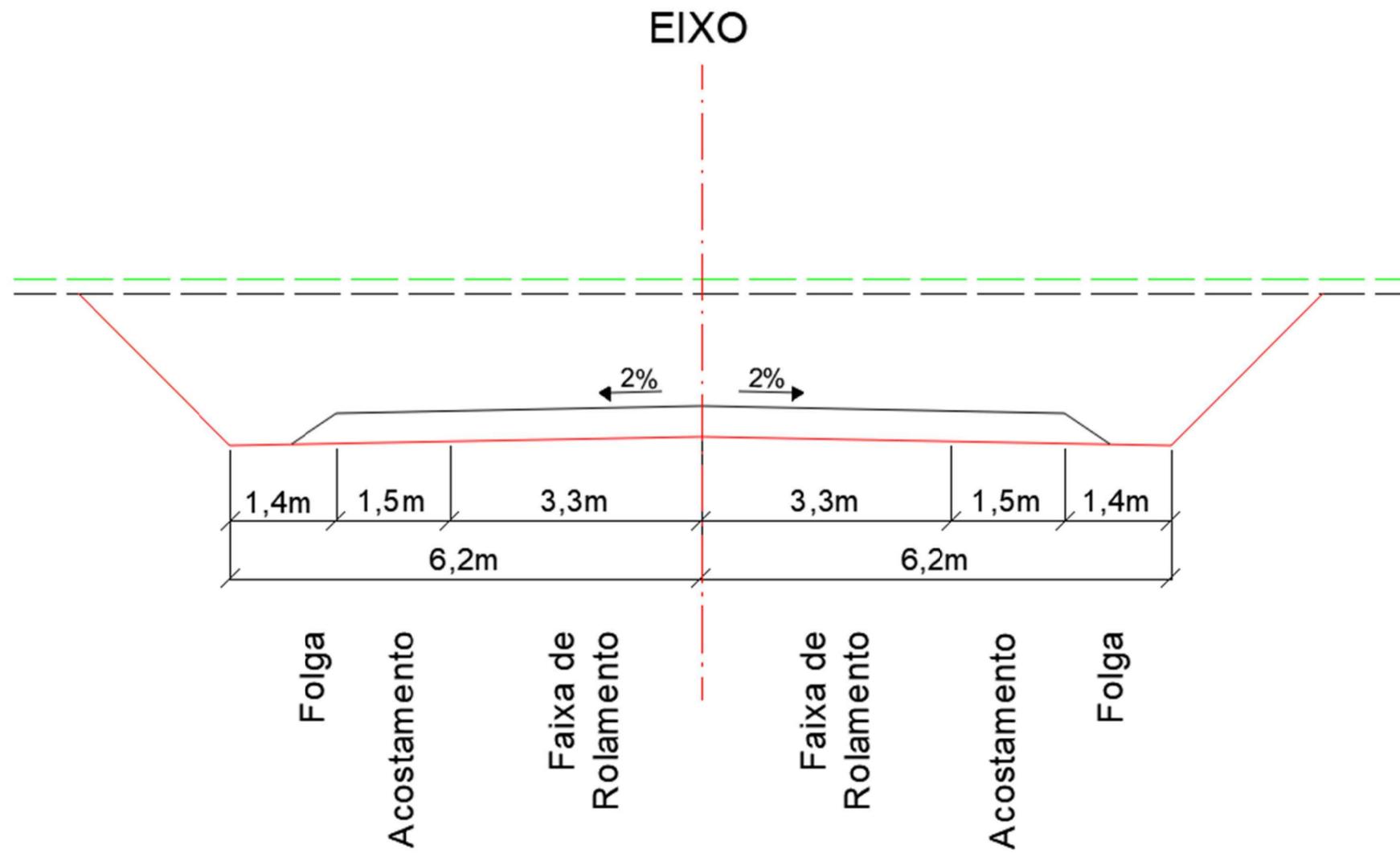
PROJETO GEOMÉTRICO

2 PROJETO GEOMÉTRICO

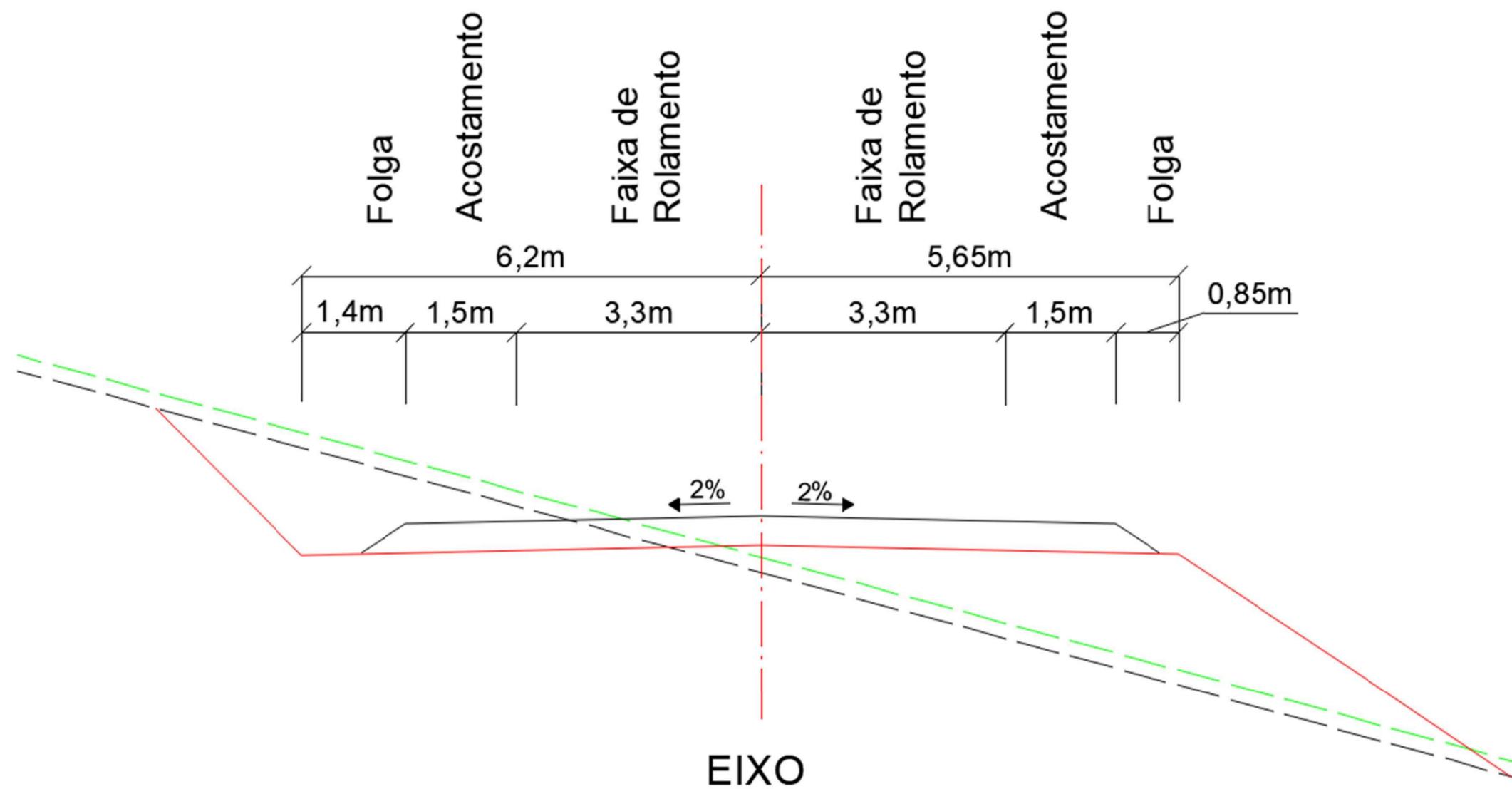
2.1 Seções Transversais Tipo



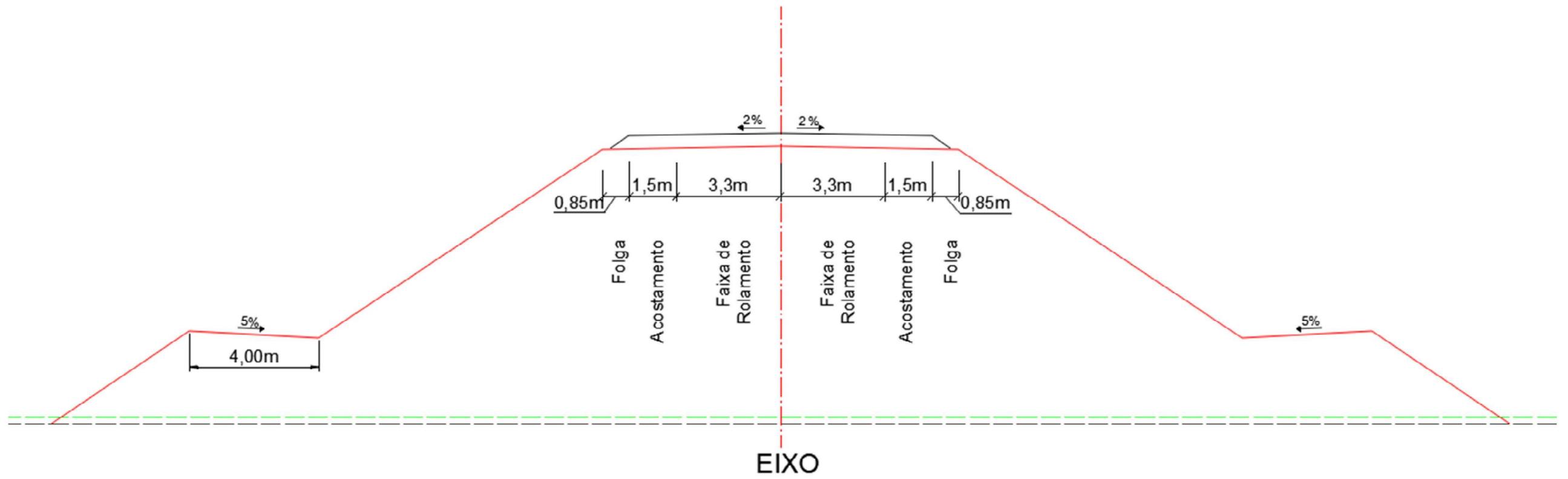
Seção Transversal em Aterro (Proporção 1:1,5)



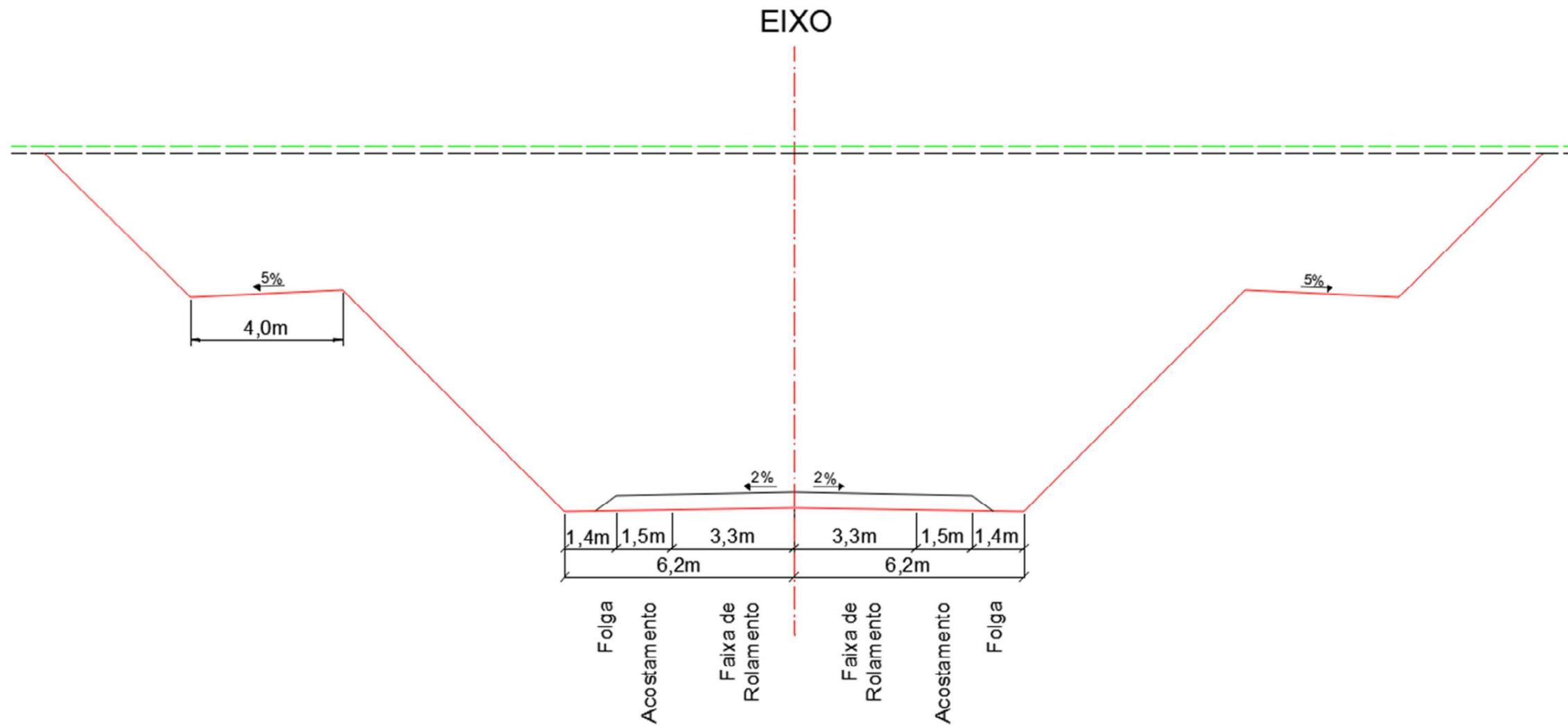
Seção Transversal em Corte (Proporção 1:1)



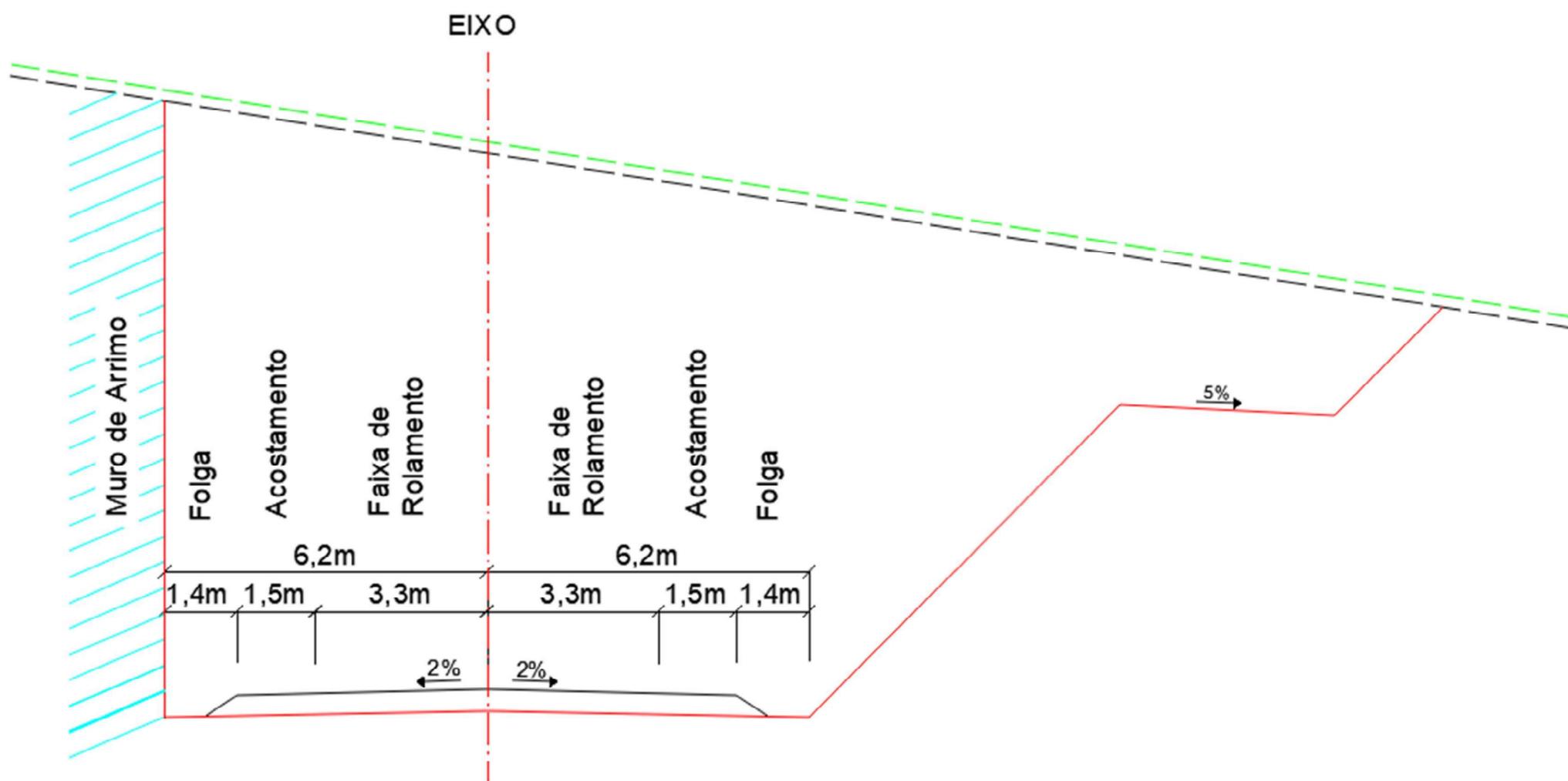
Seção Transversal Mista



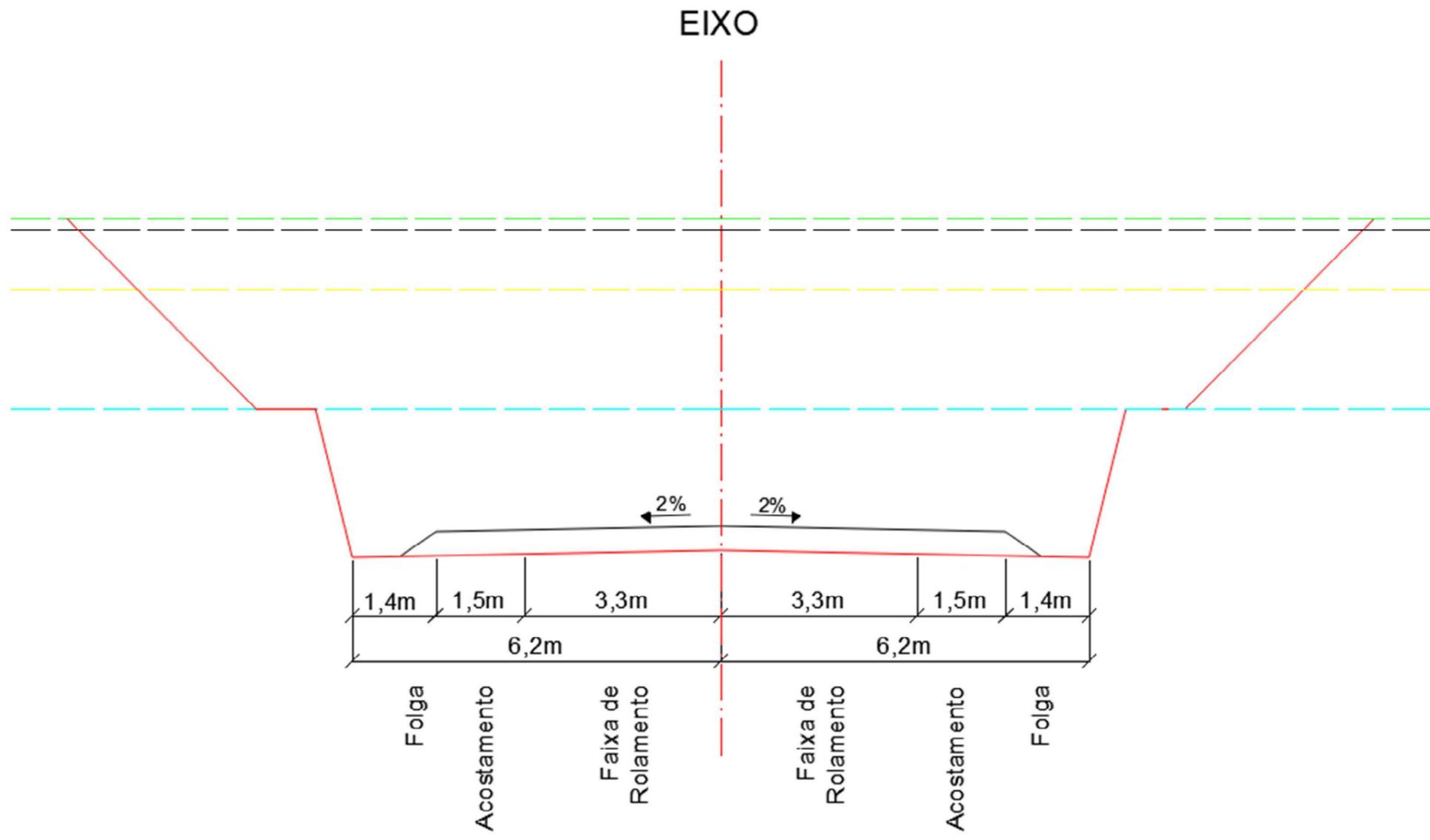
Seção com Bermas



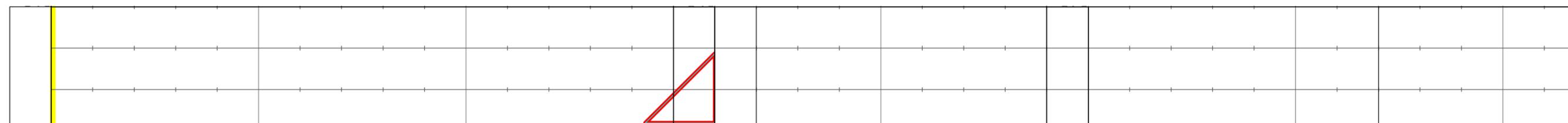
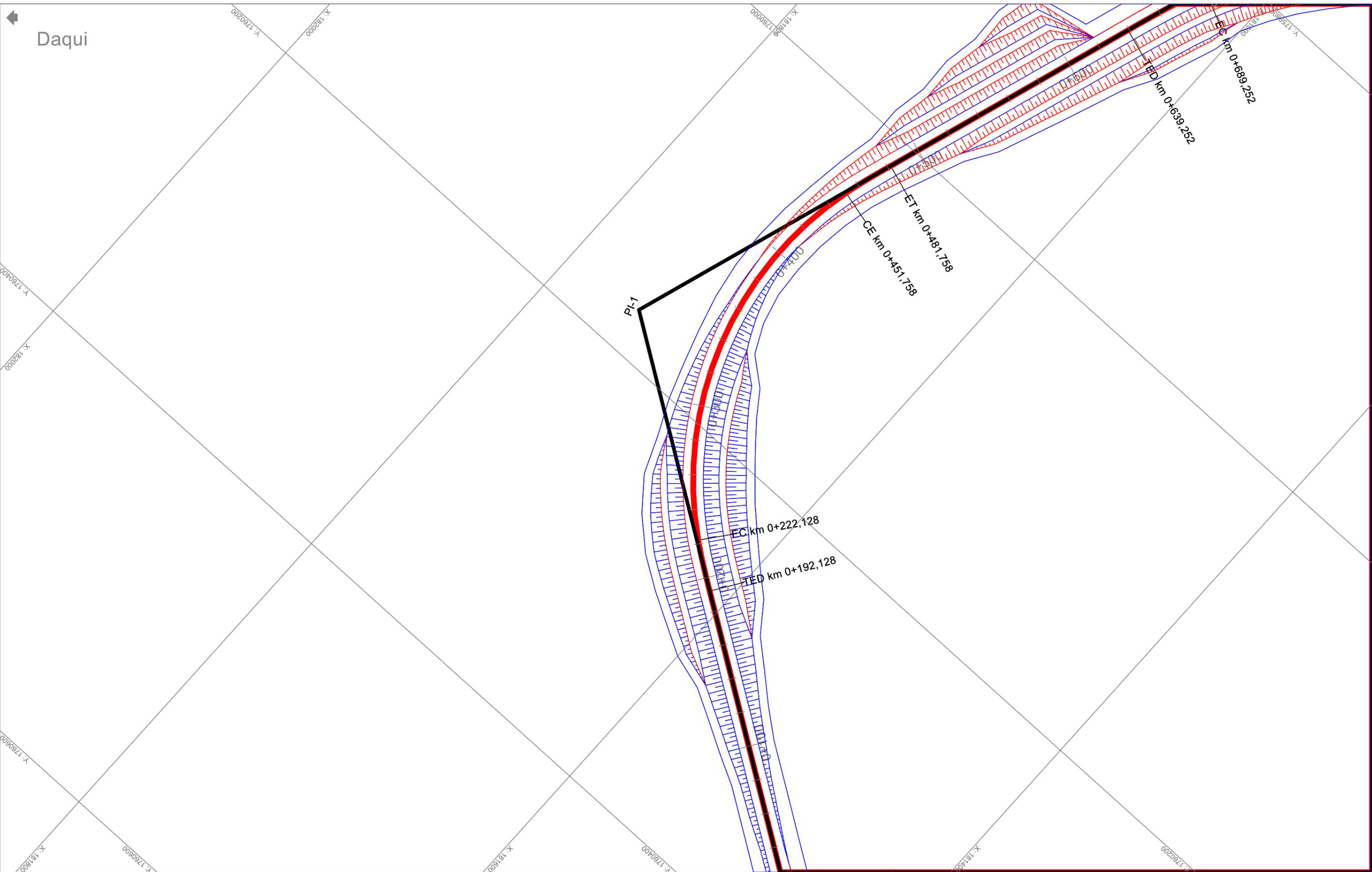
Seção com Bermas



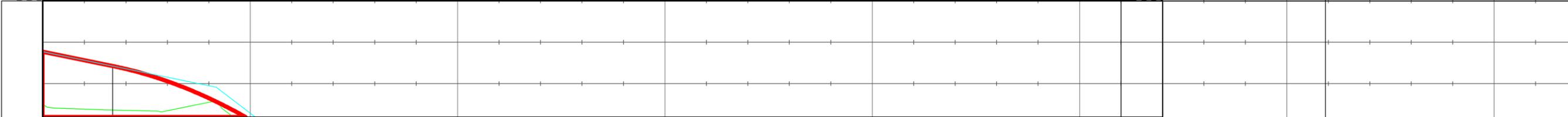
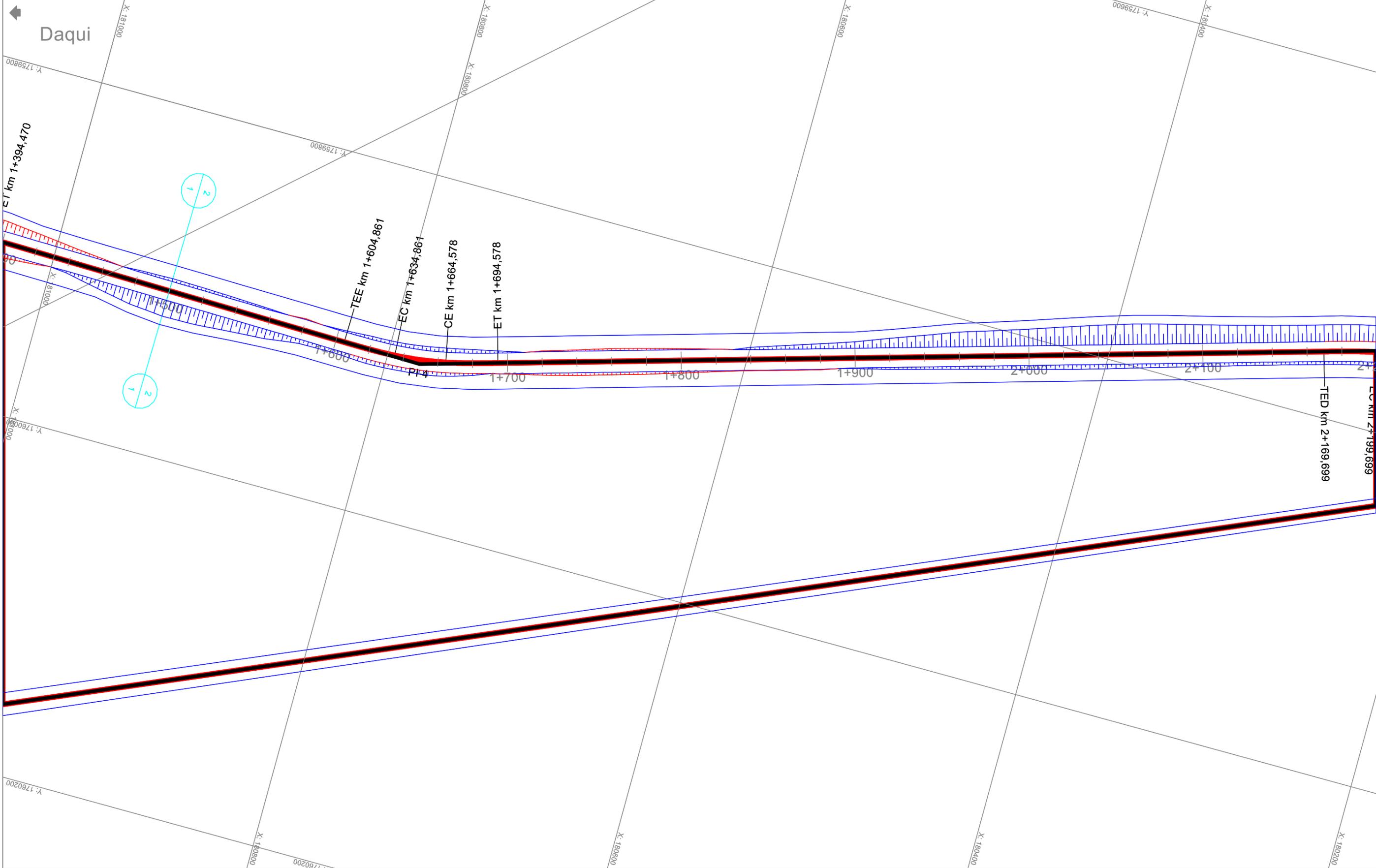
Seção com Muro de Arrimo no LE

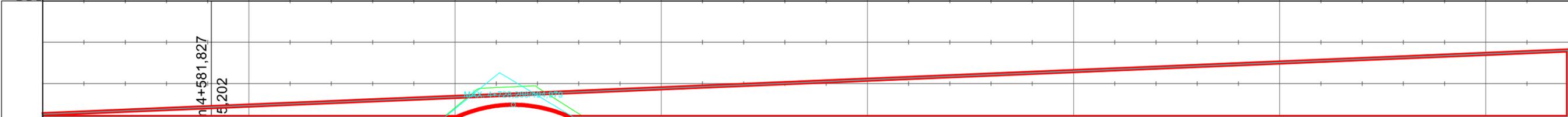
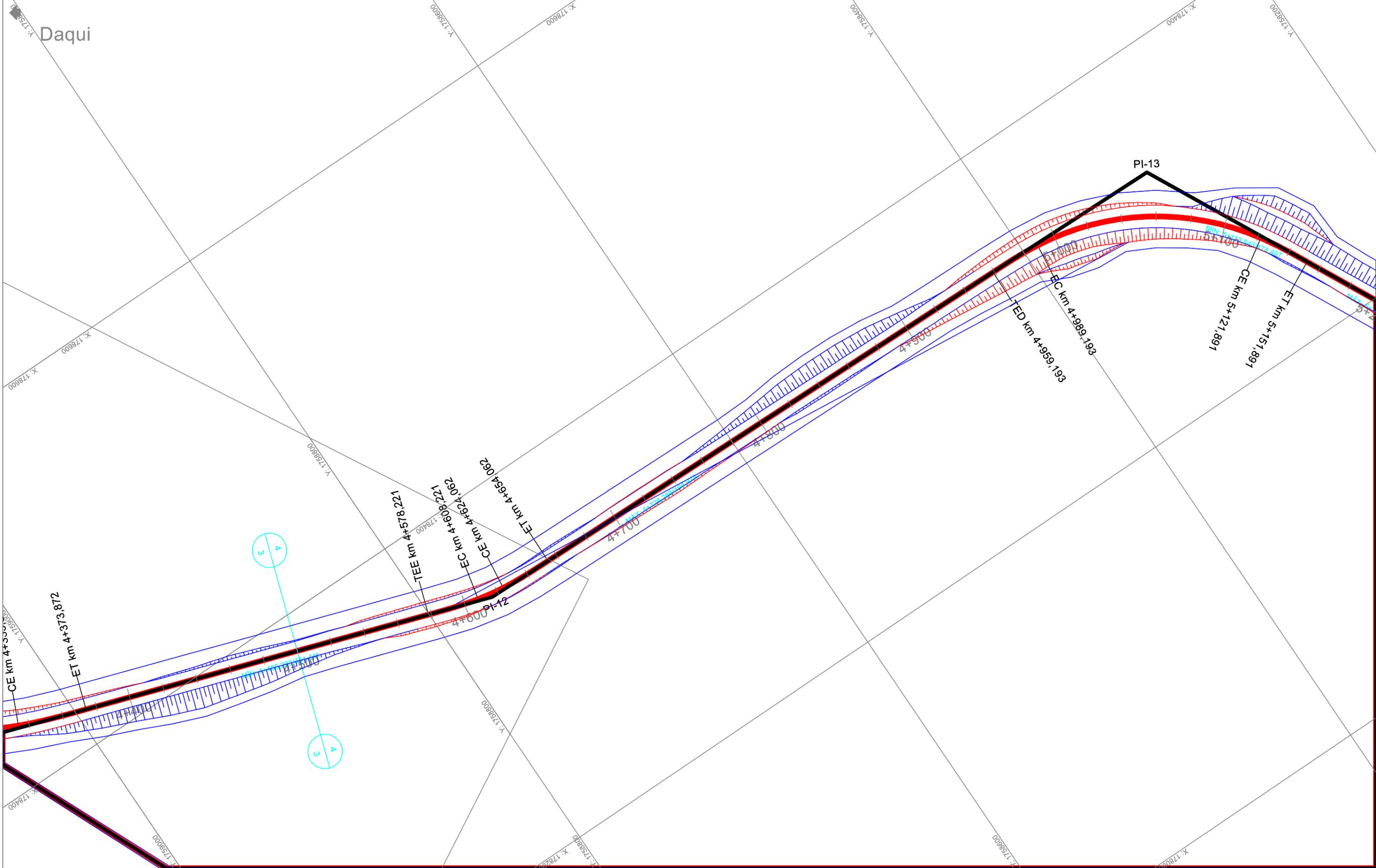


Seção com corte em rocha

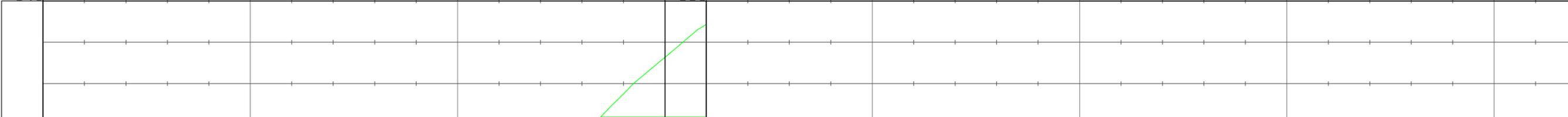
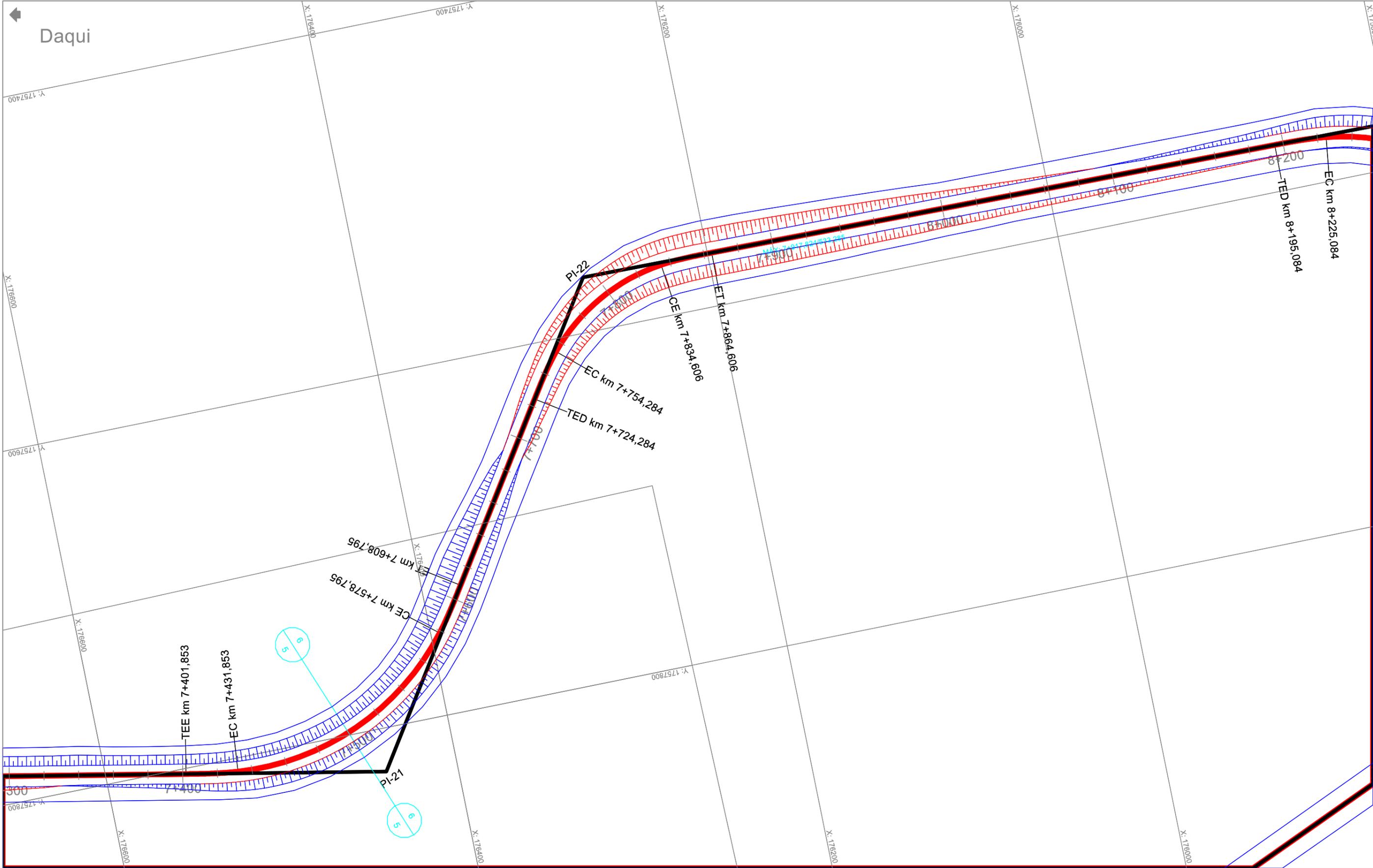


Daqui

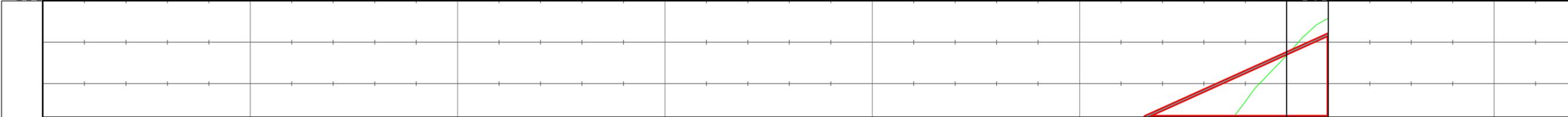
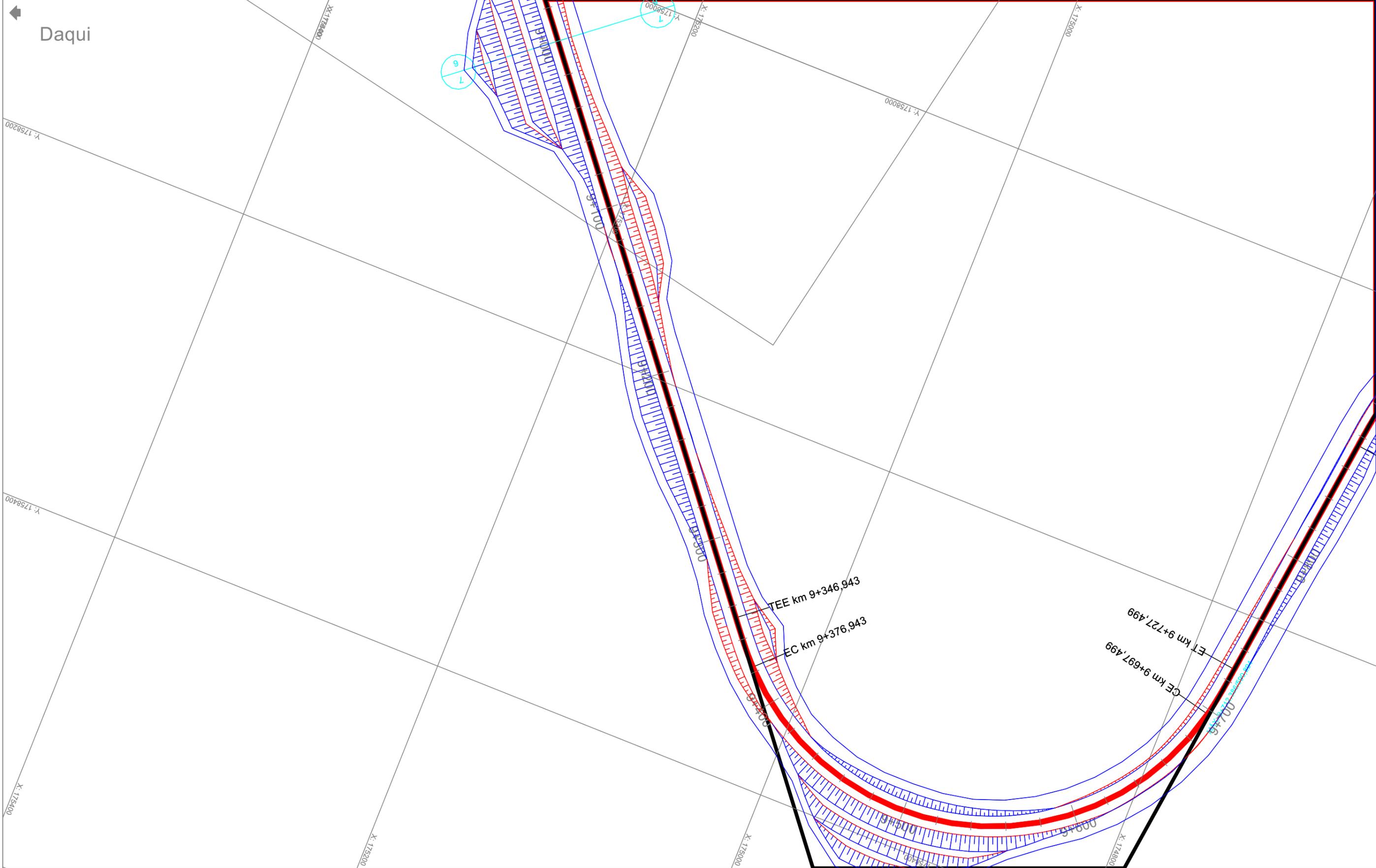


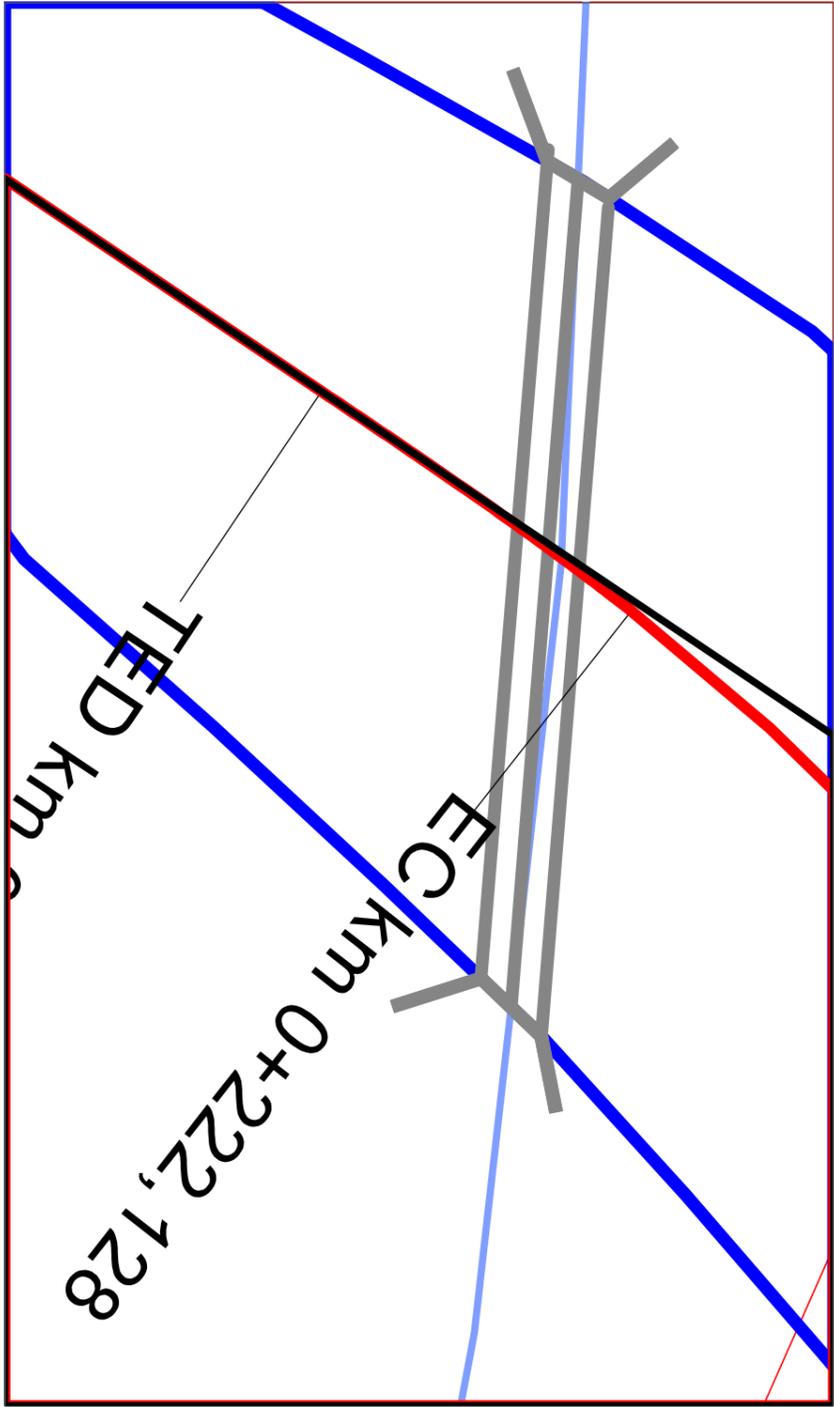


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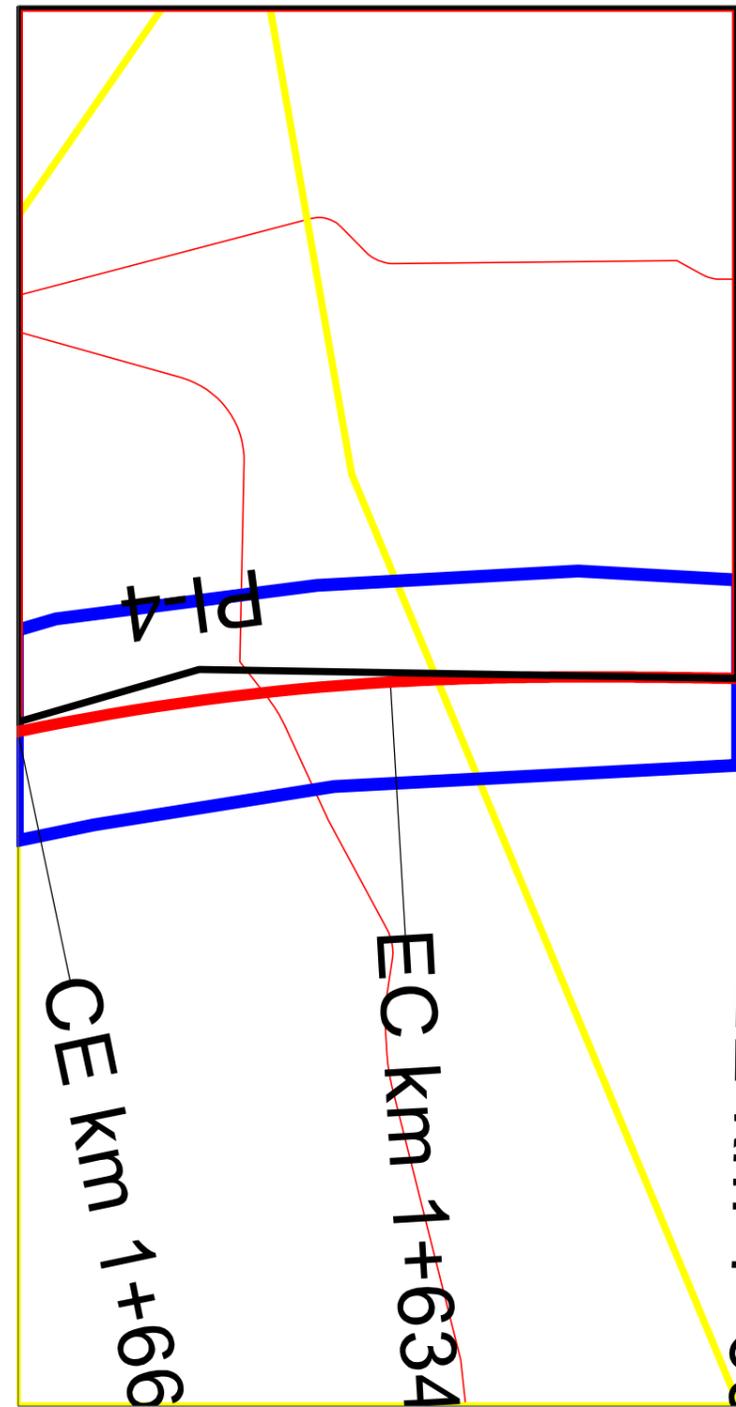
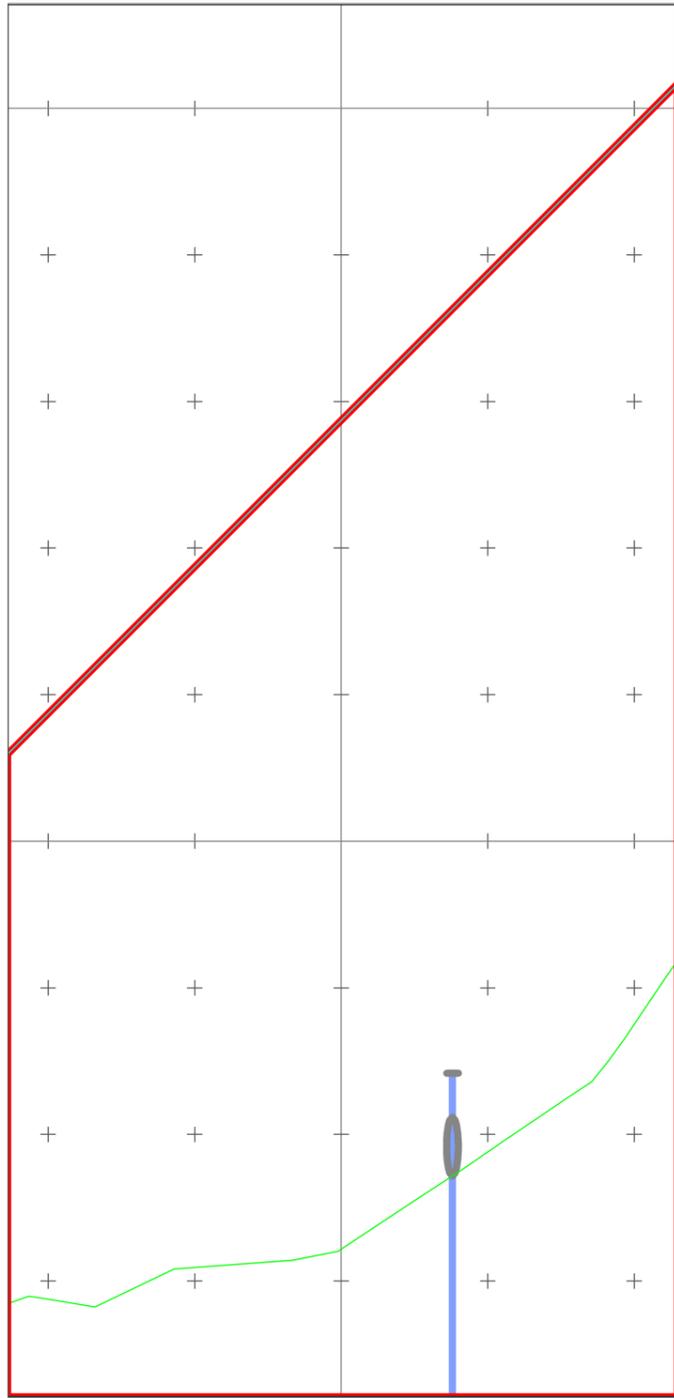


Daqui

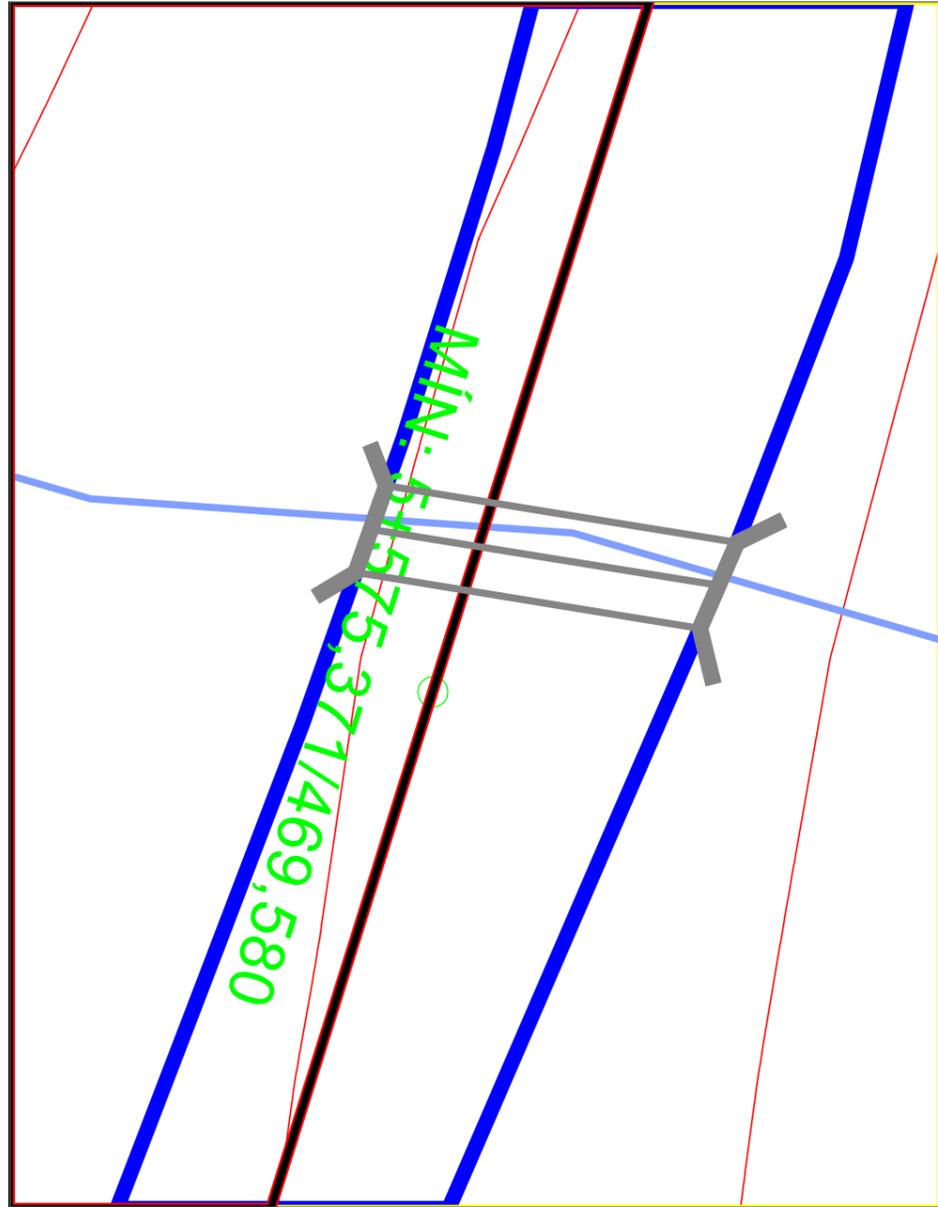




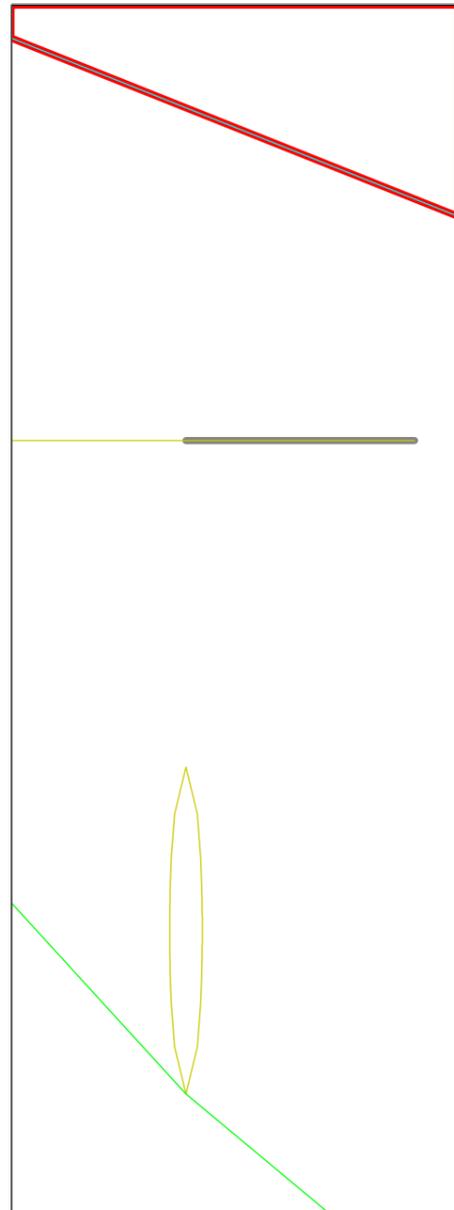
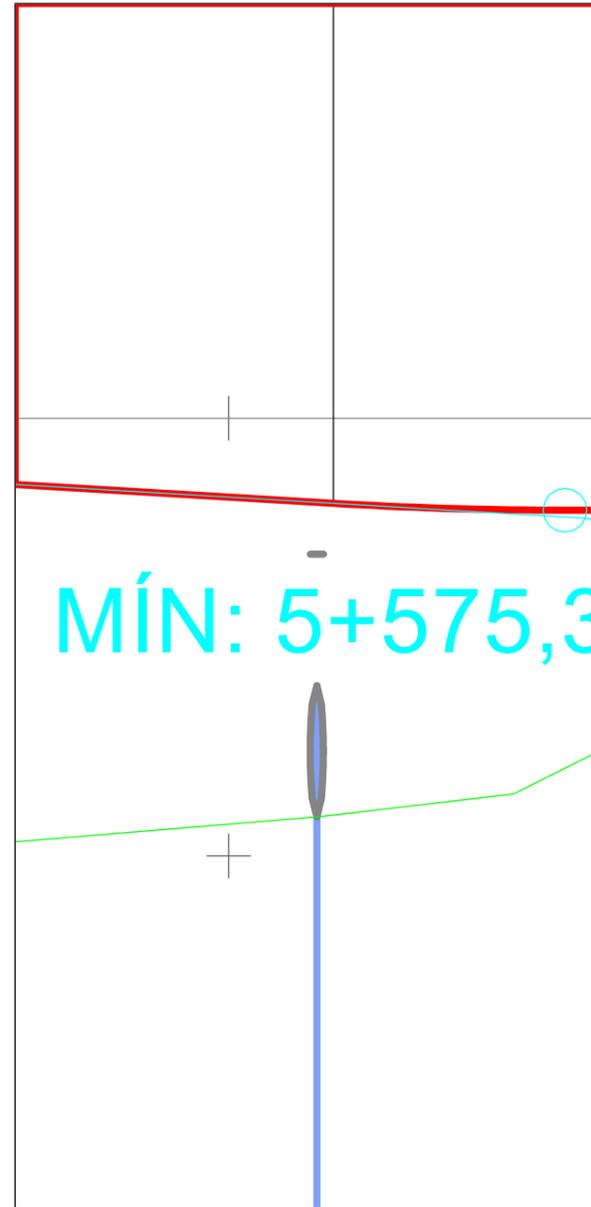
BUEIRO 1



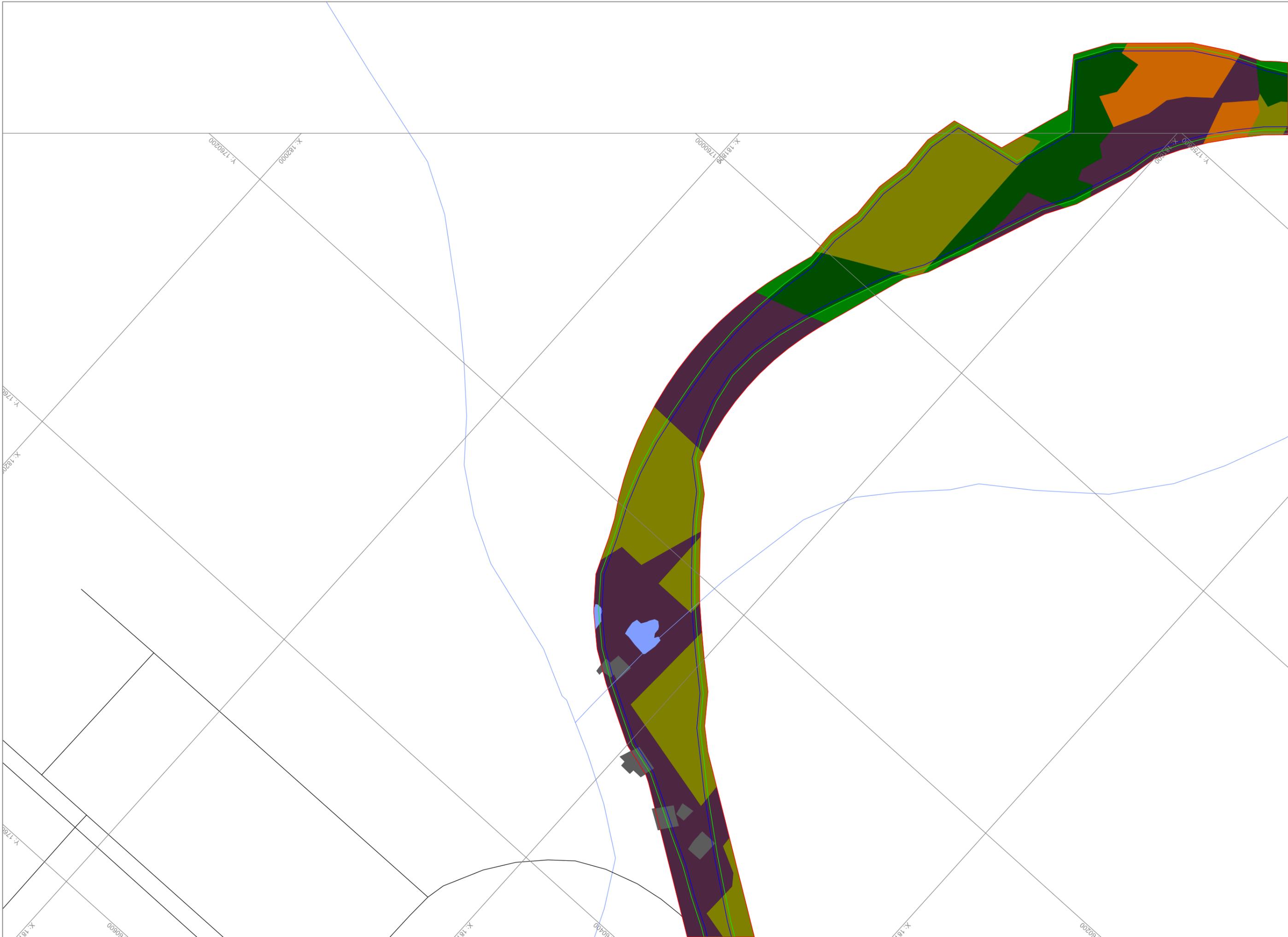
VIA EXISTENTE



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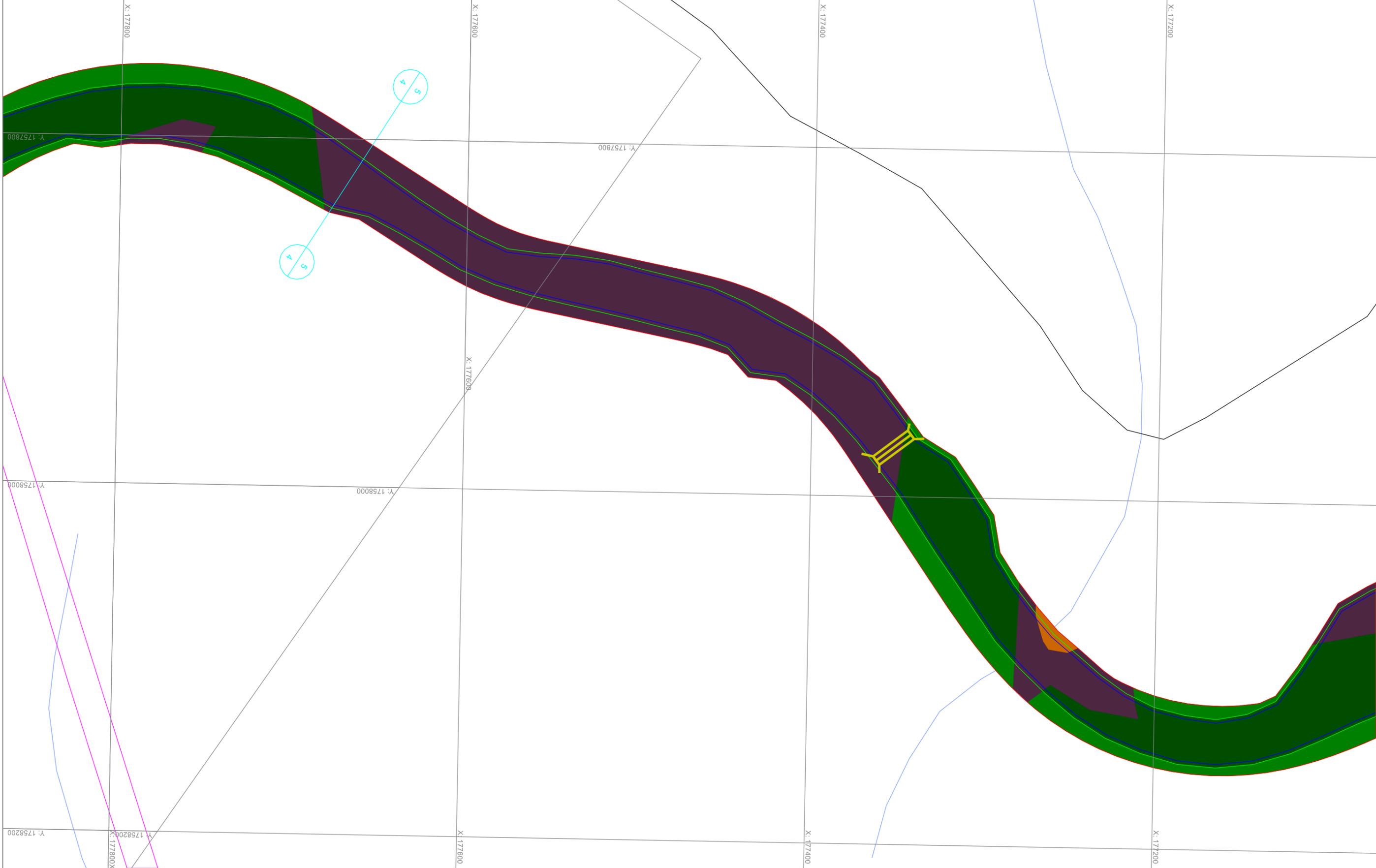


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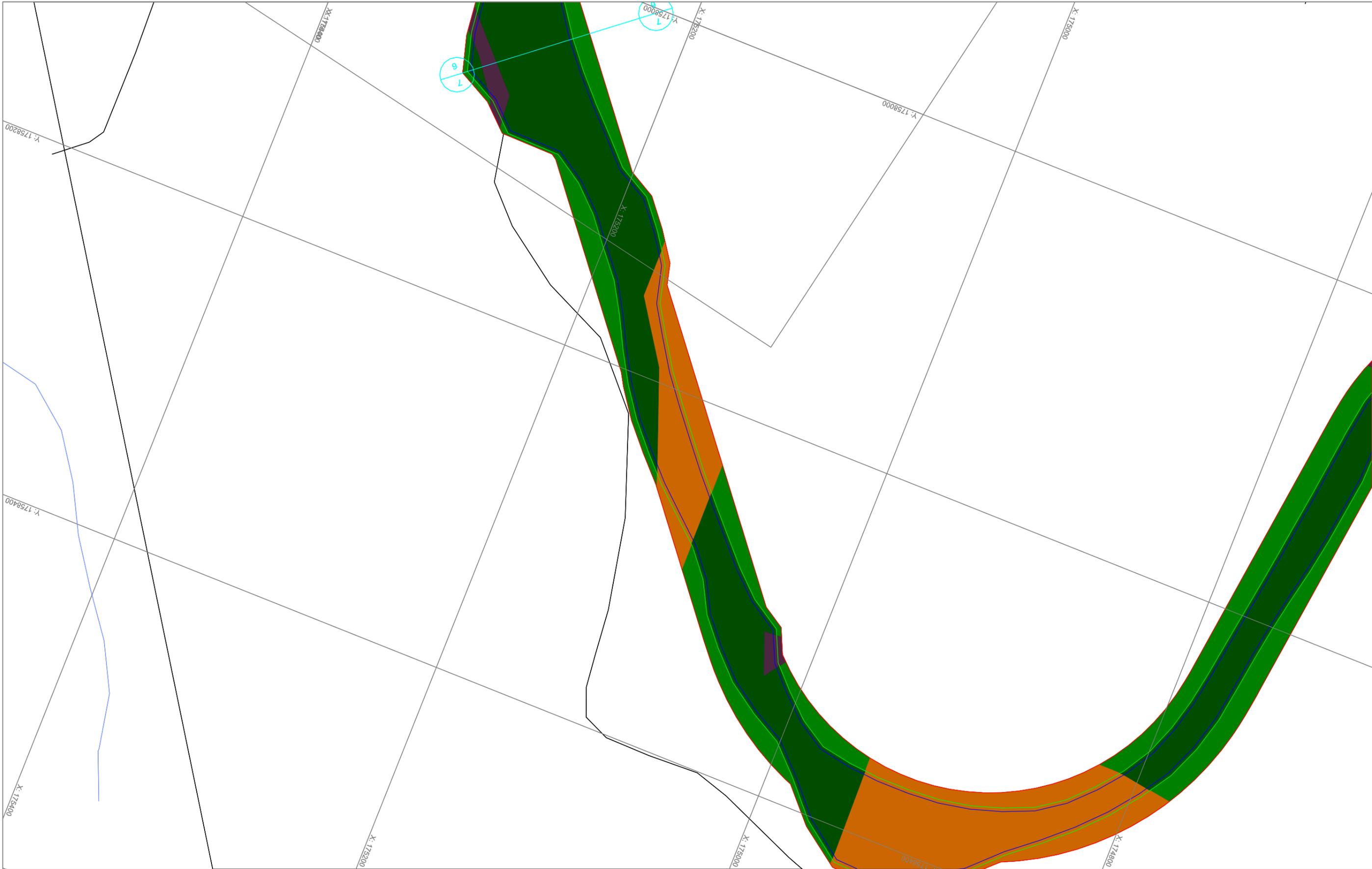




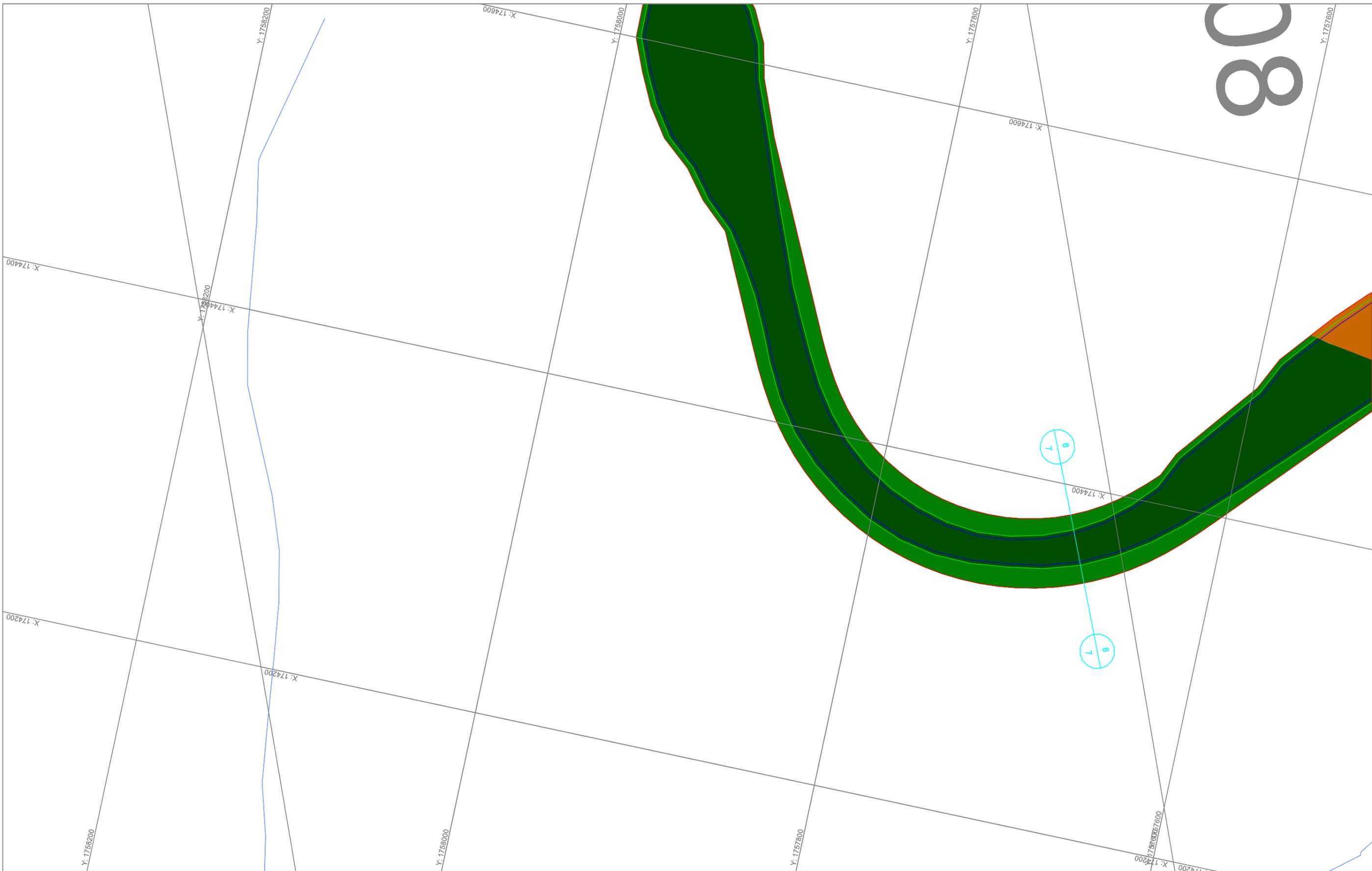


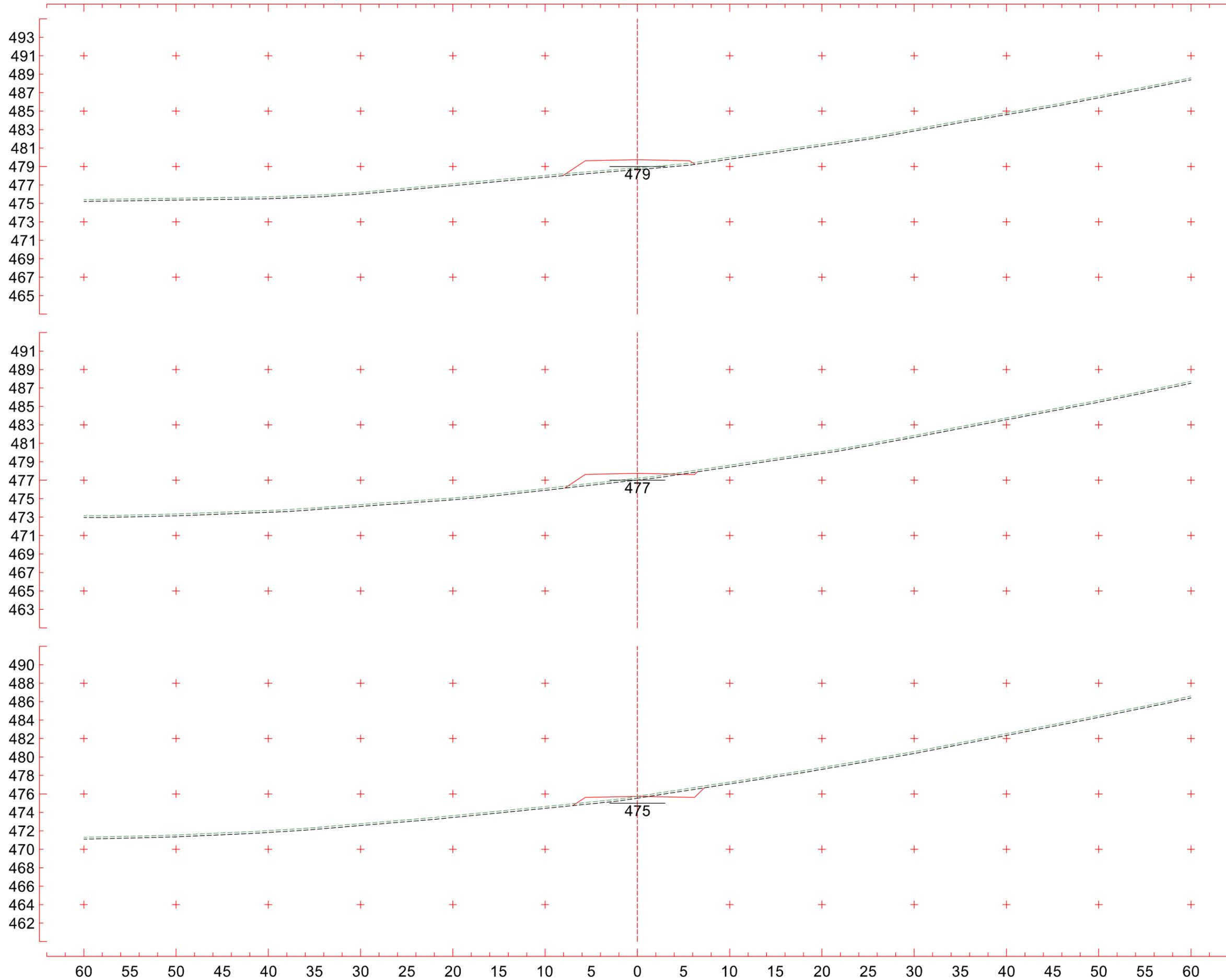






08



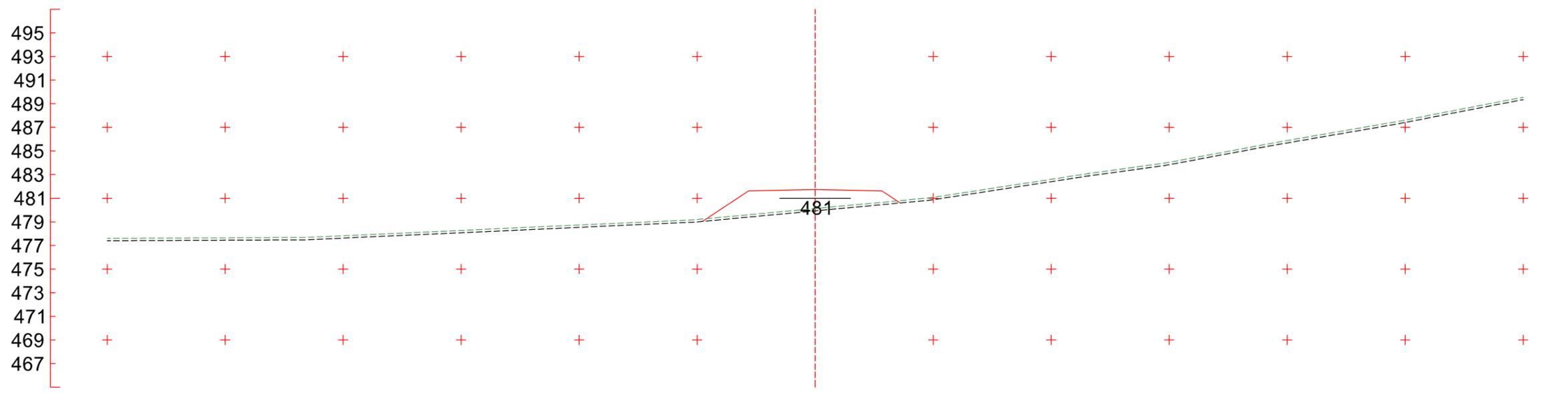
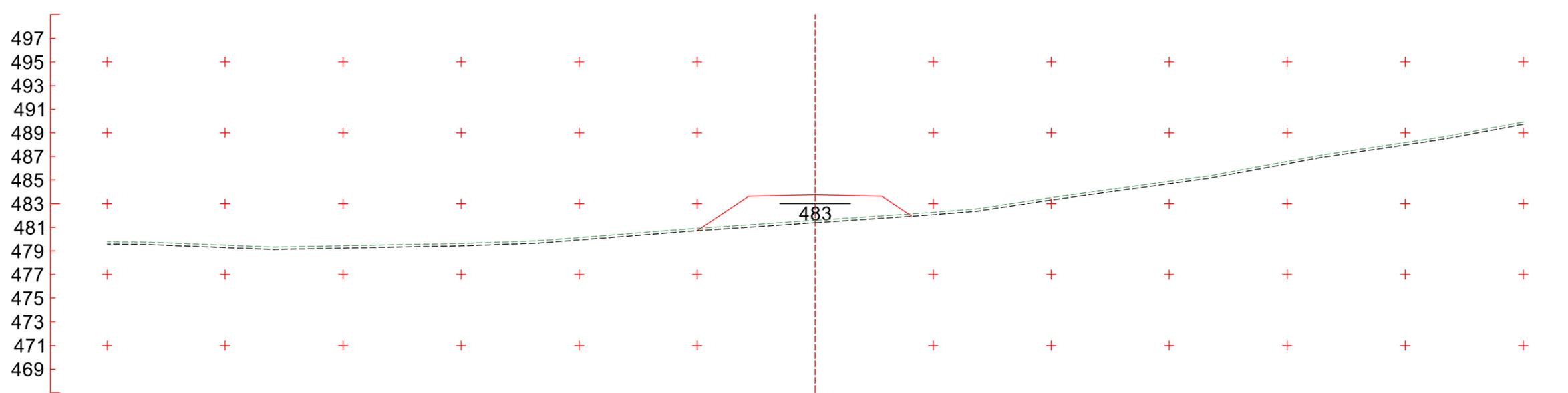
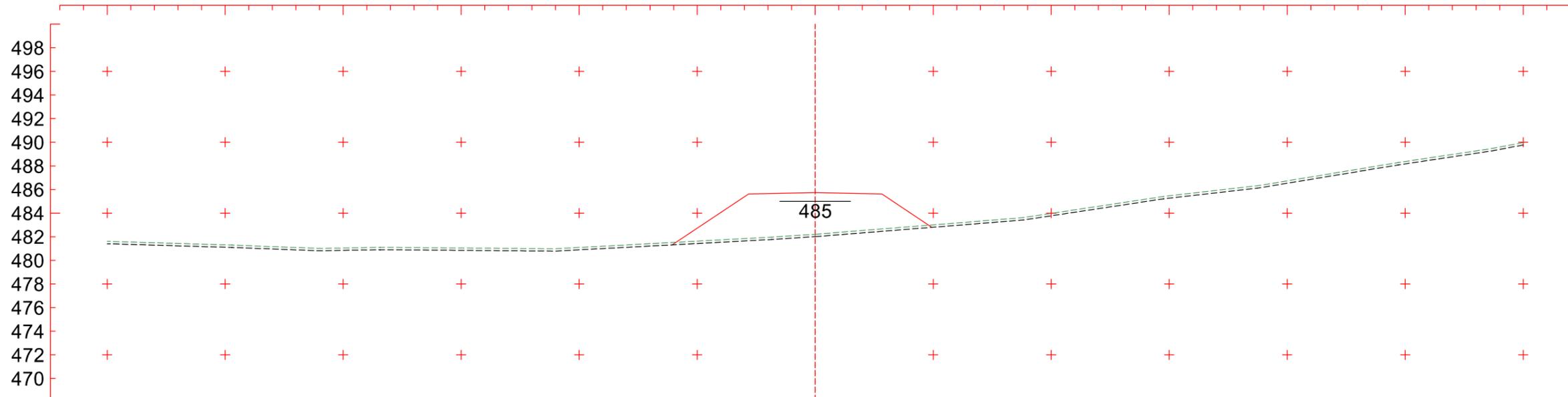


0+040
 CT 478,864 m
 CP 479,740 m

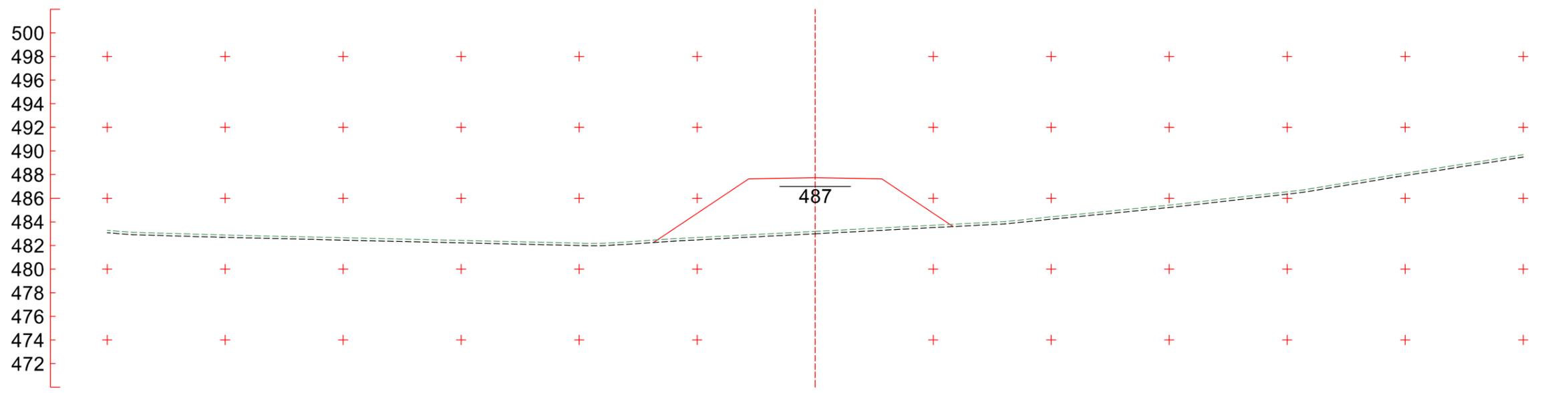
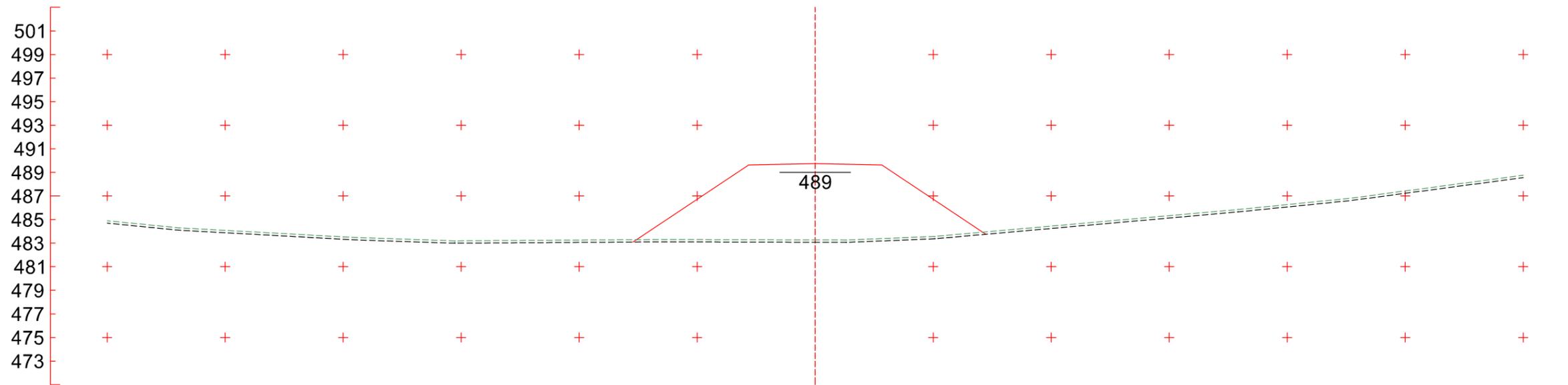
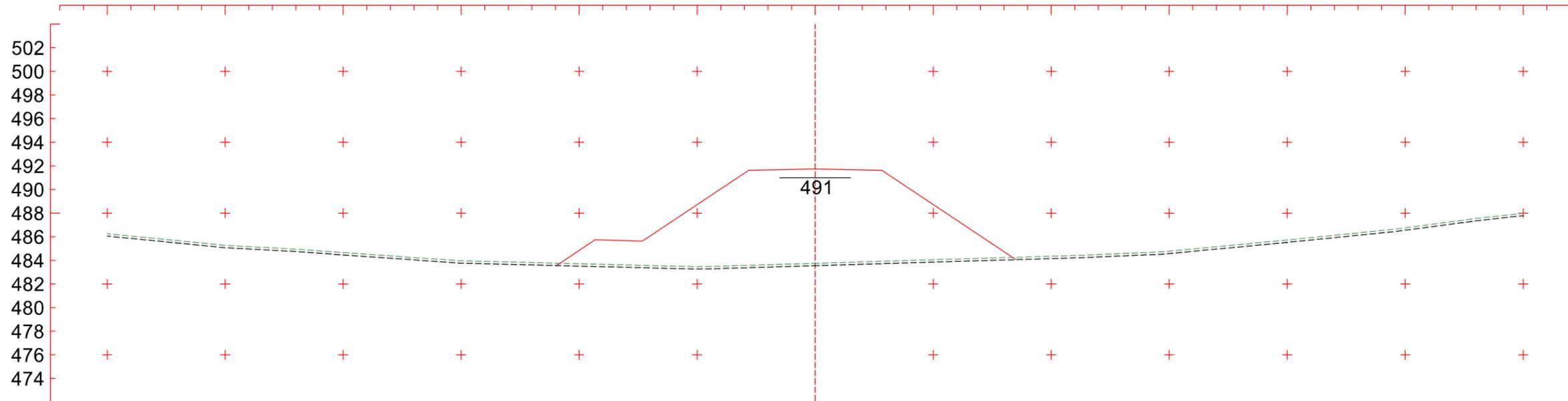
0+020
 CT 477,214 m
 CP 477,740 m

0+000
 CT 475,740 m
 CP 475,740 m

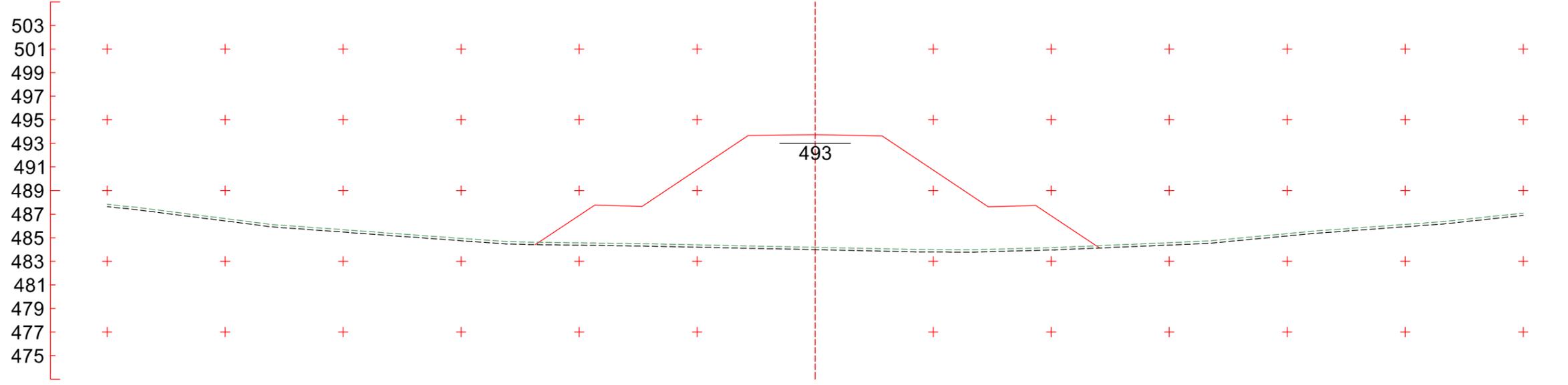
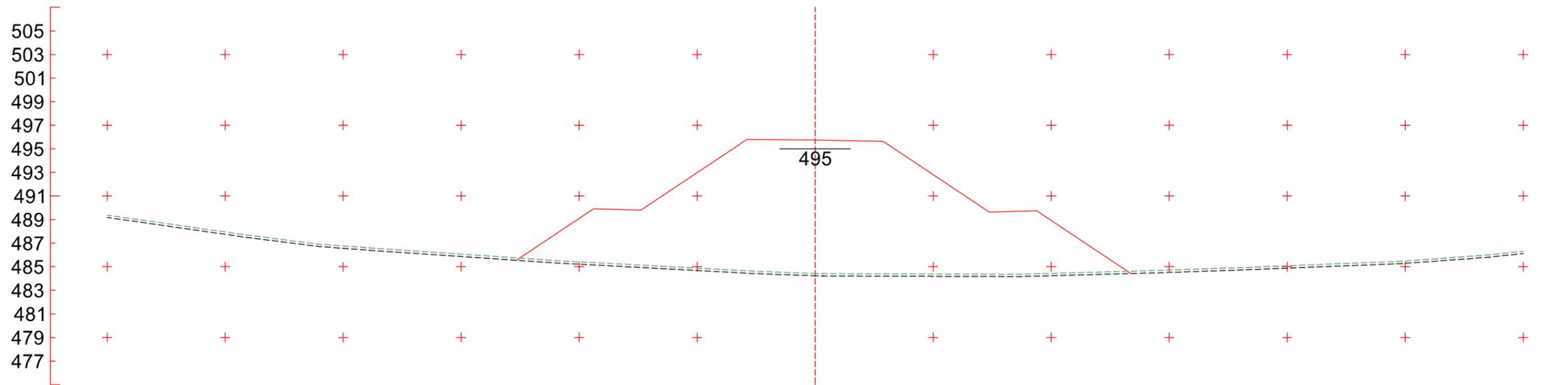
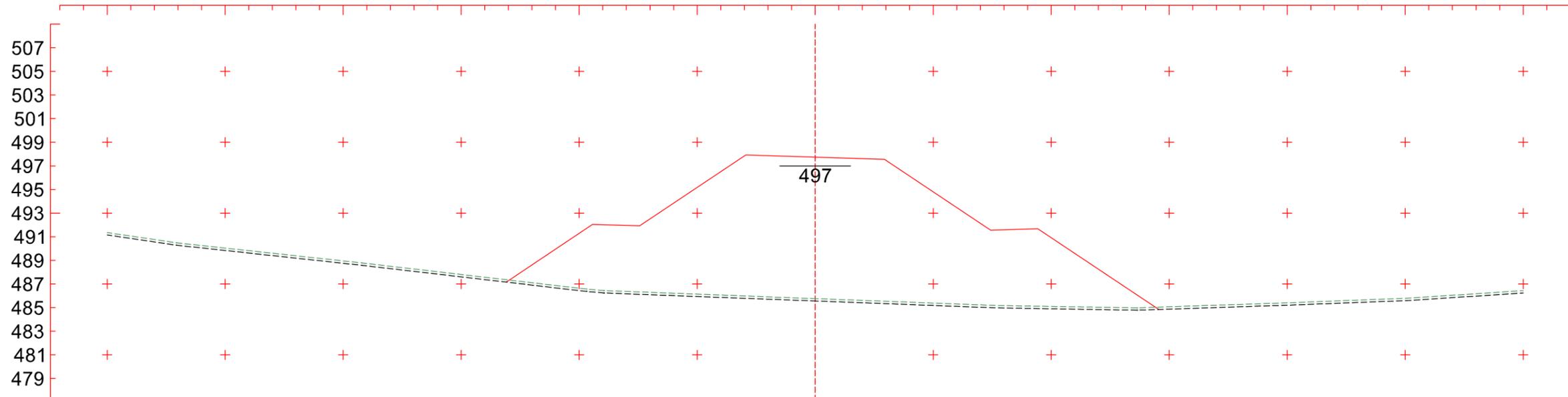
Lote 2
 Escala 1:400



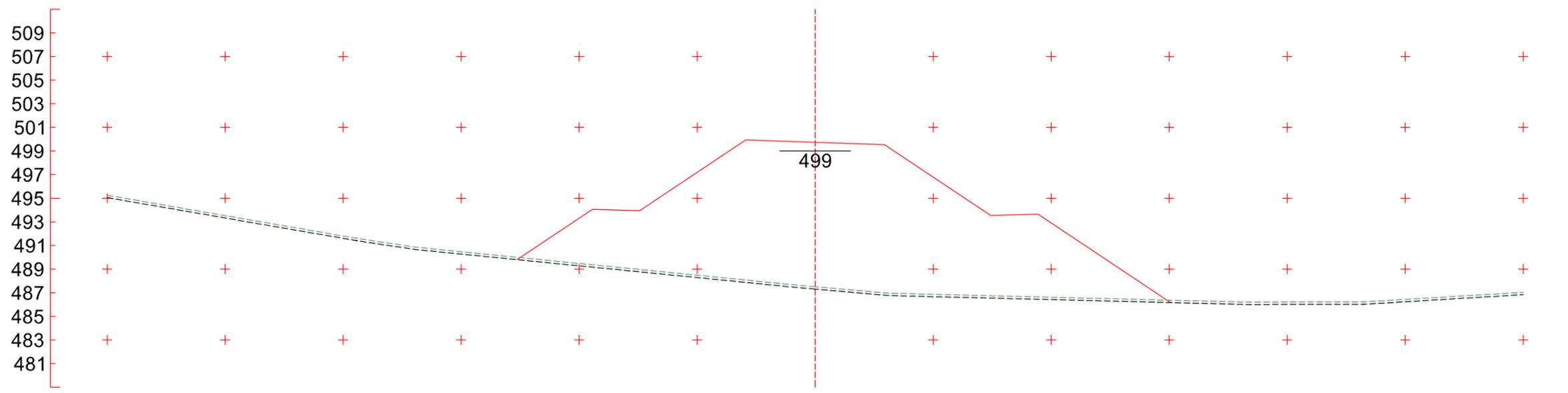
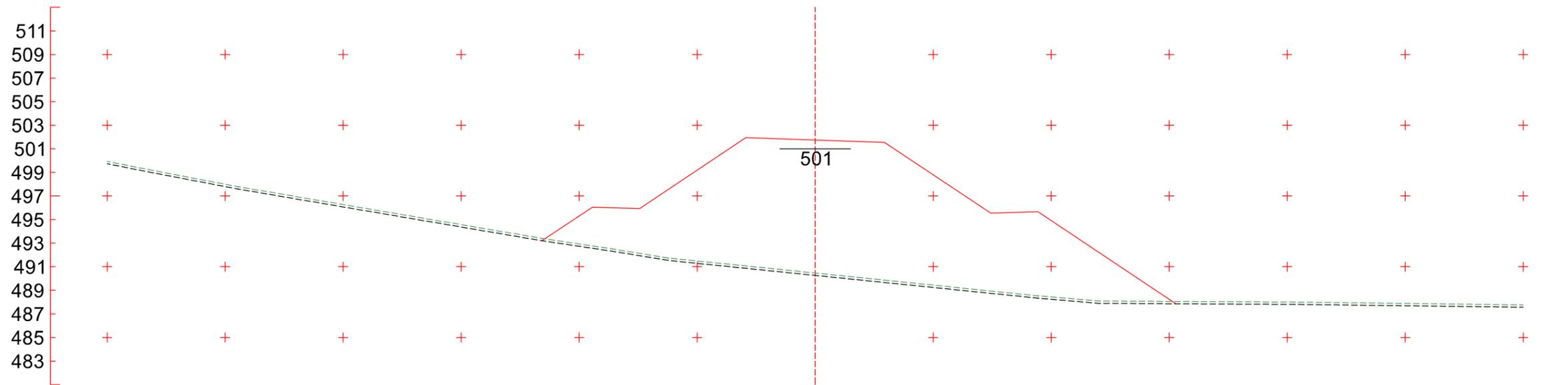
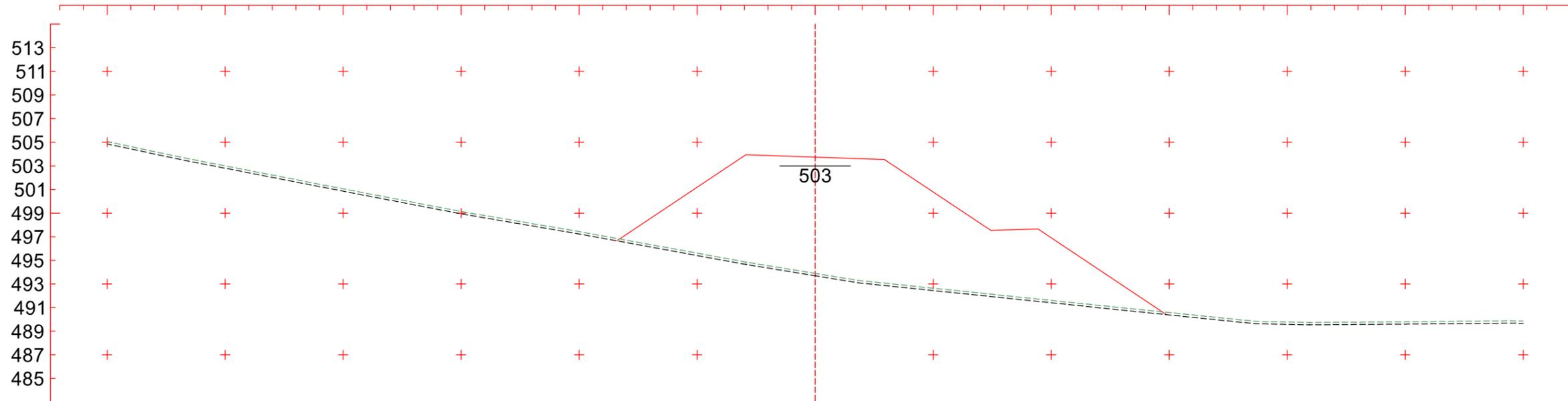
Lote 2
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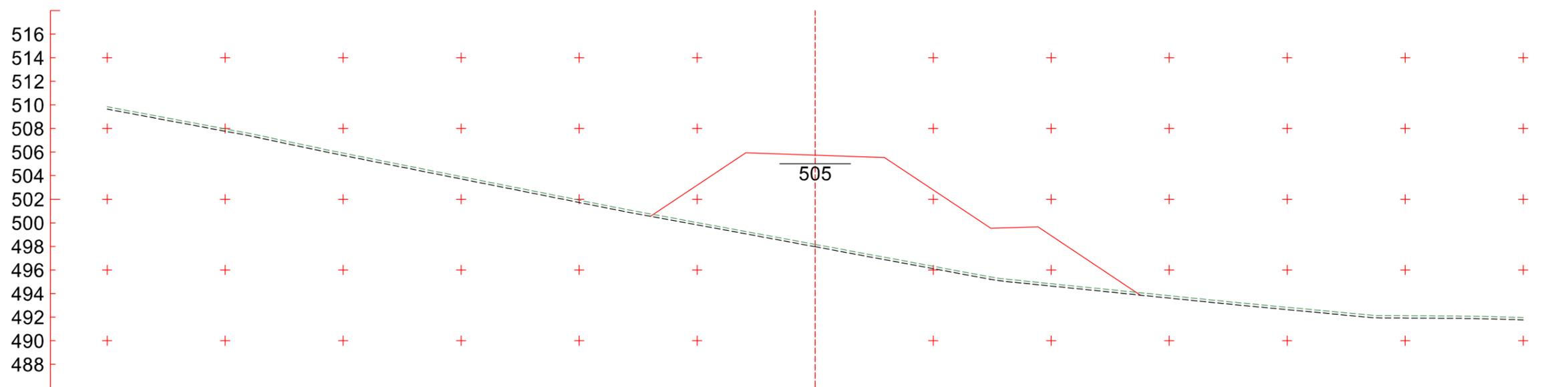
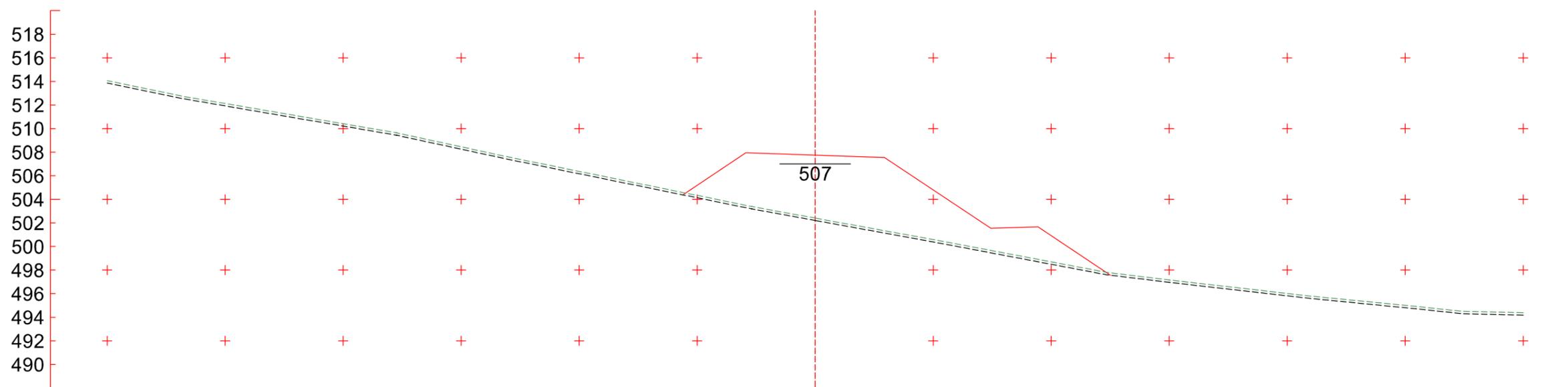
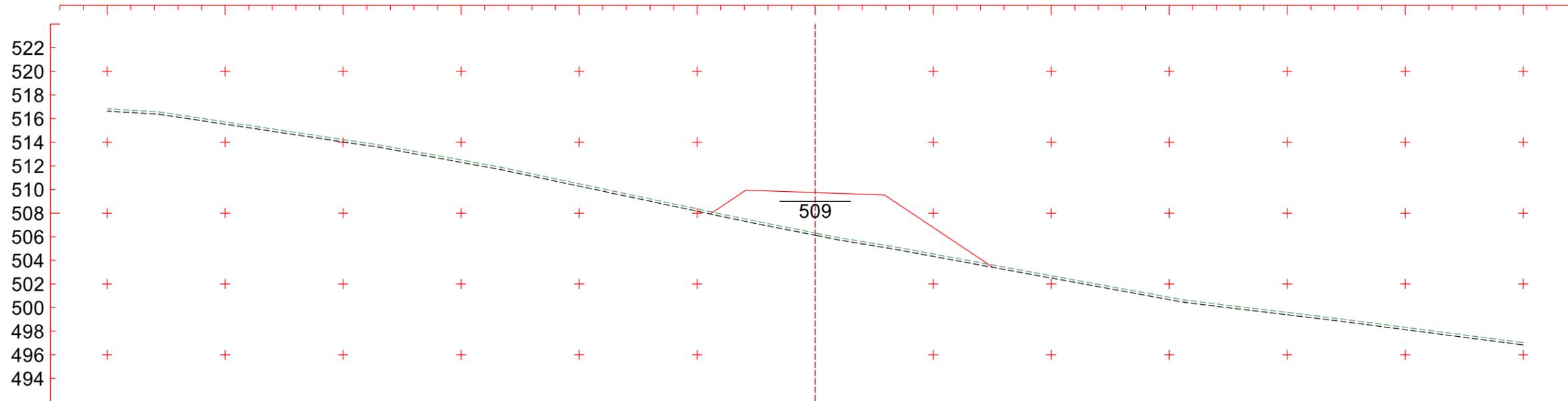
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 Escala 1:400



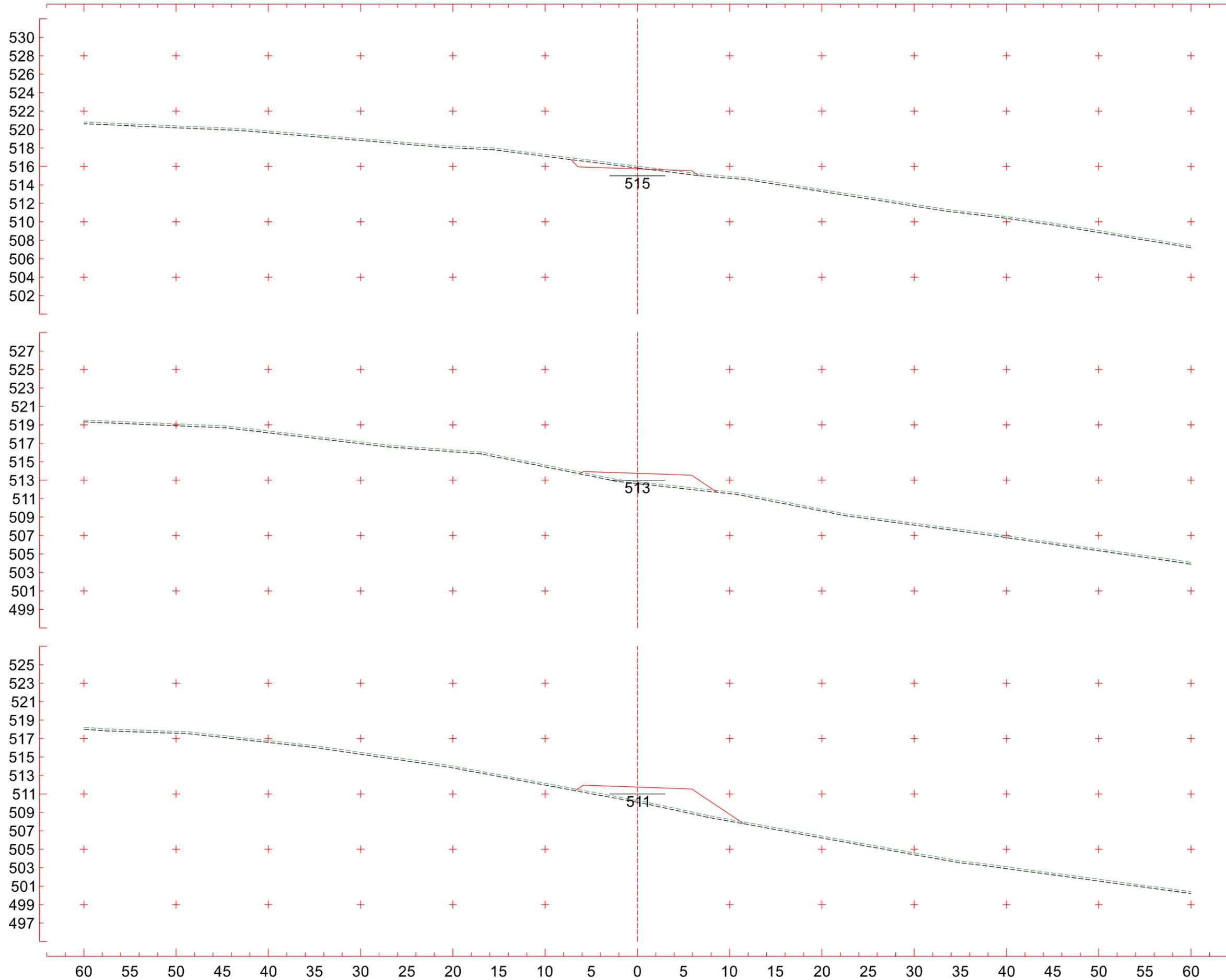
Lote 2
Escala 1:400



Lote 2
Escala 1:400



Lote 2
Escala 1:400



0+400

CT 516,042 m
CP 515,740 m

0+380

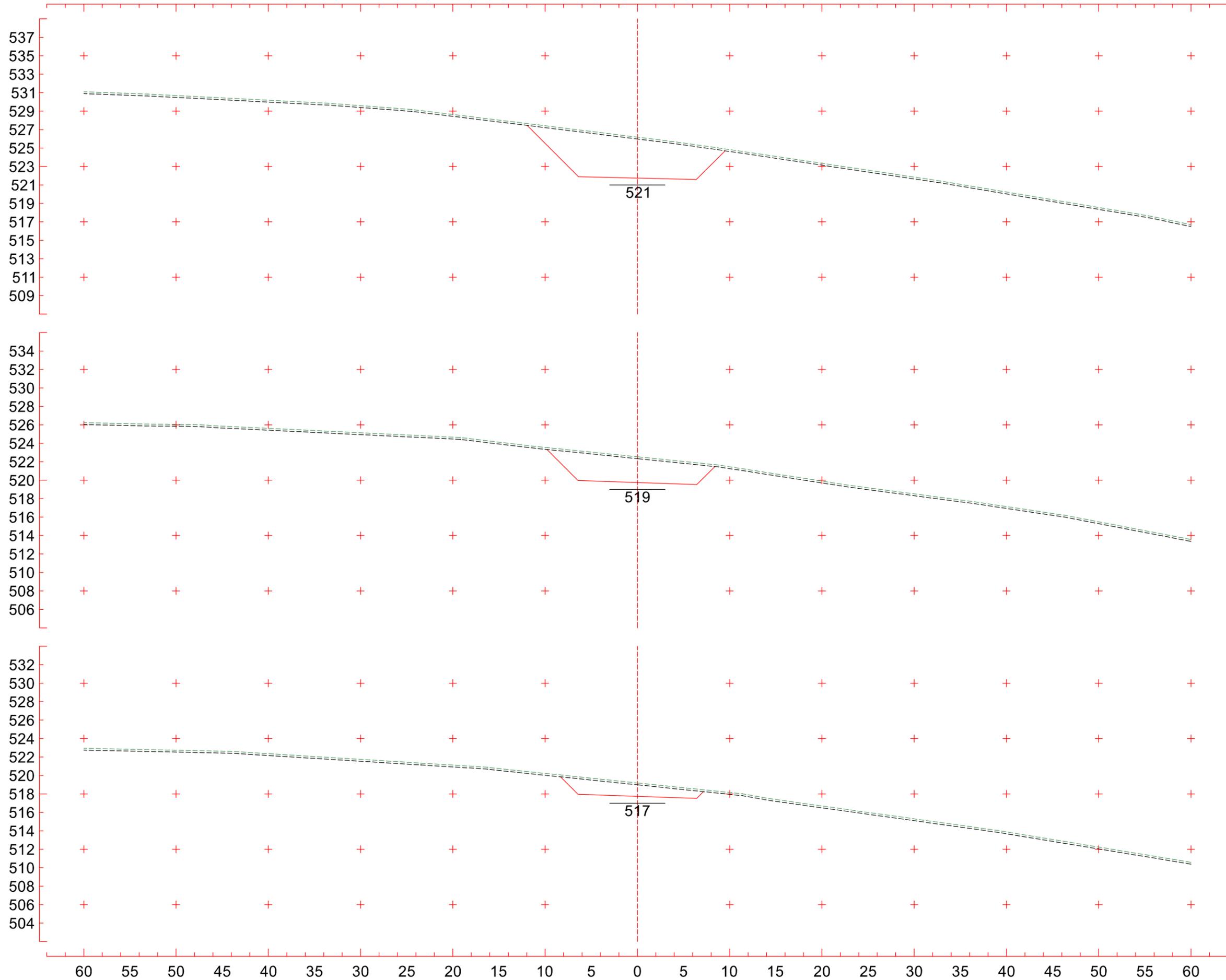
CT 512,831 m
CP 513,740 m

0+360

CT 510,290 m
CP 511,740 m

Lote 2

Escala 1:400



0+460

CT 526,177 m
CP 521,740 m

0+440

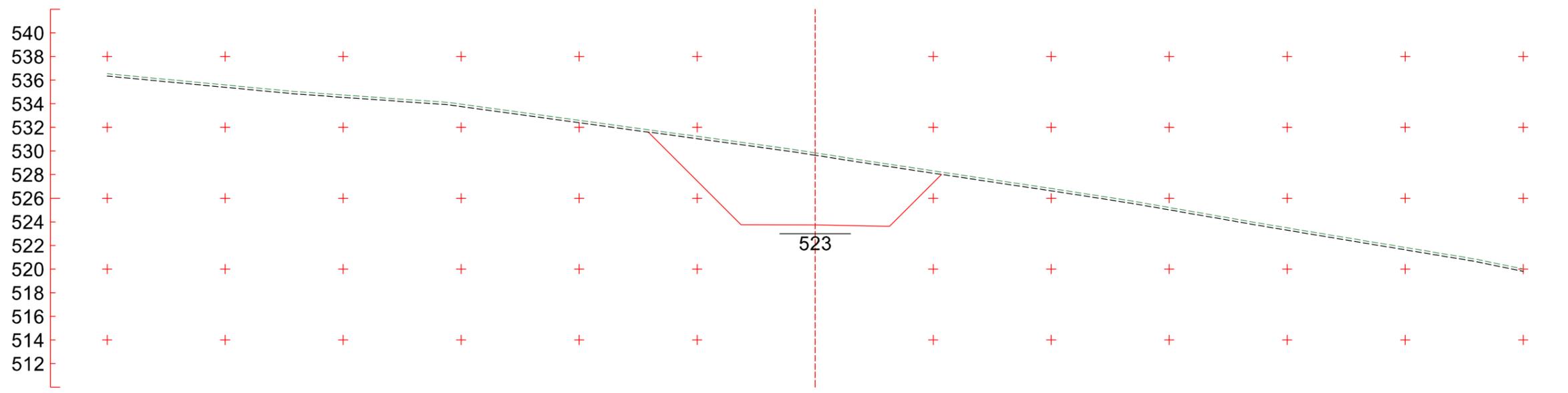
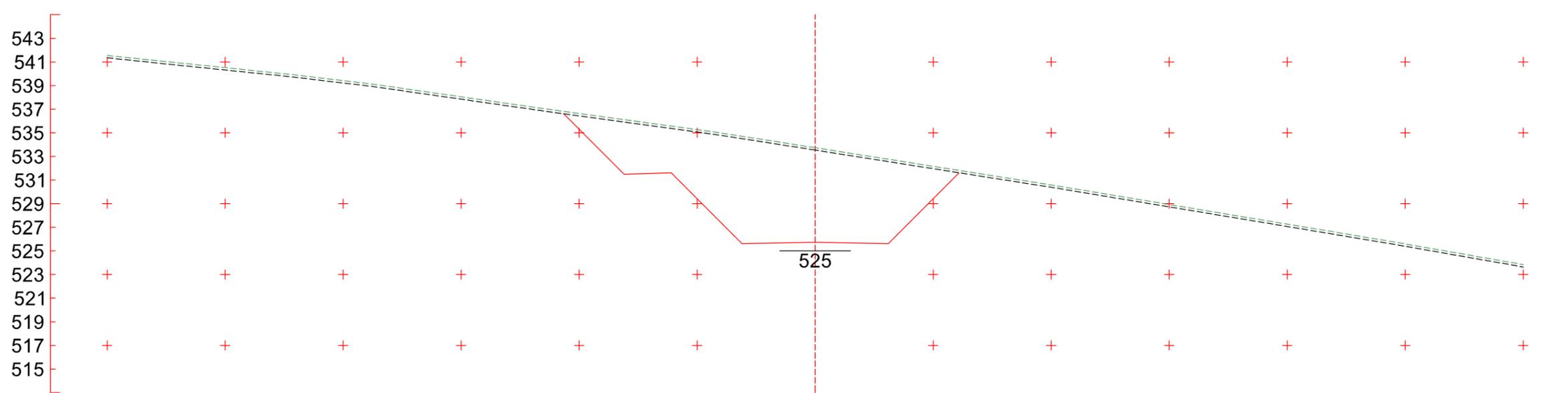
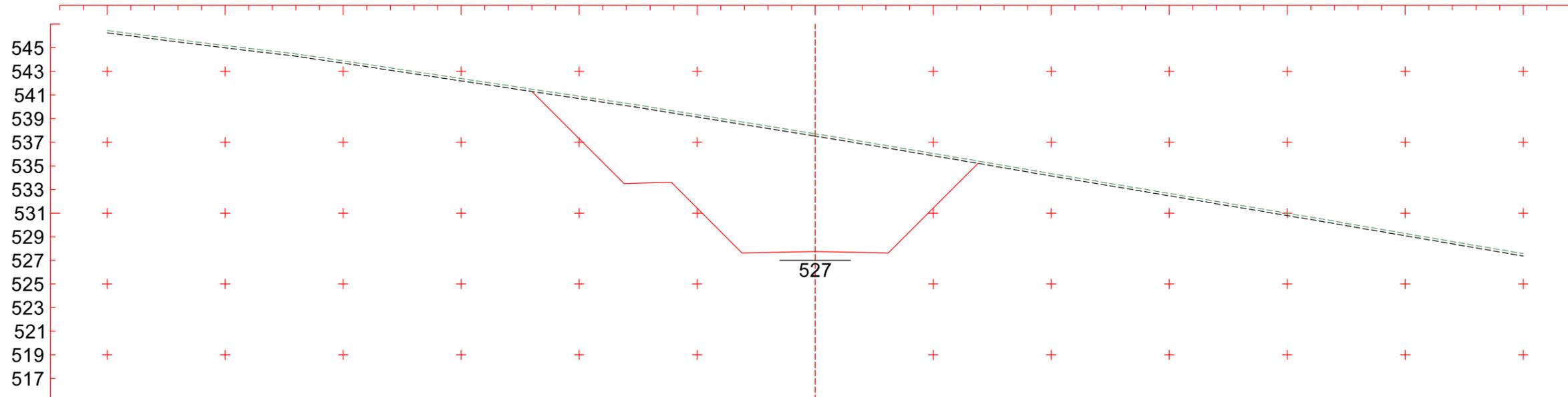
CT 522,536 m
CP 519,740 m

0+420

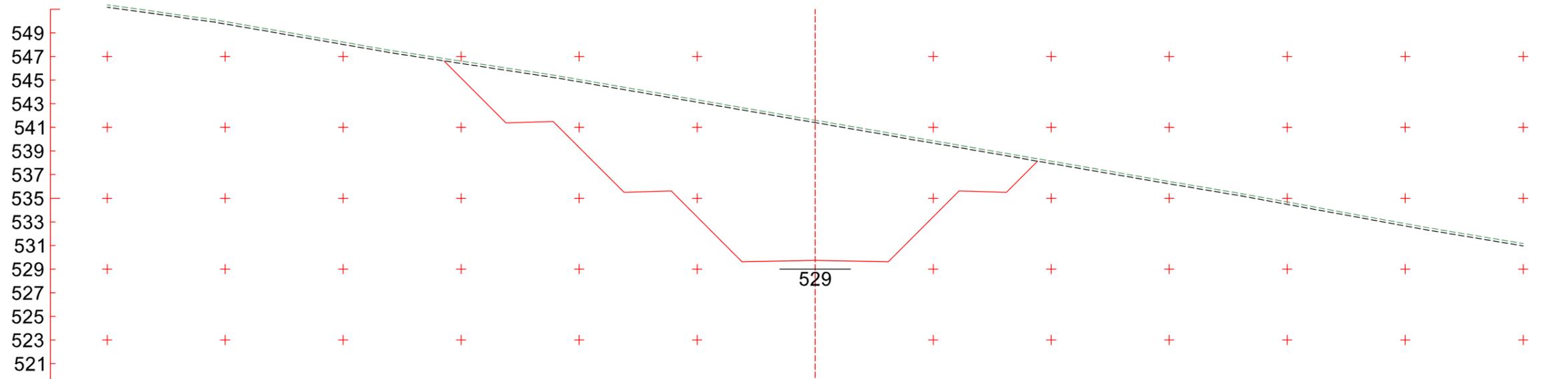
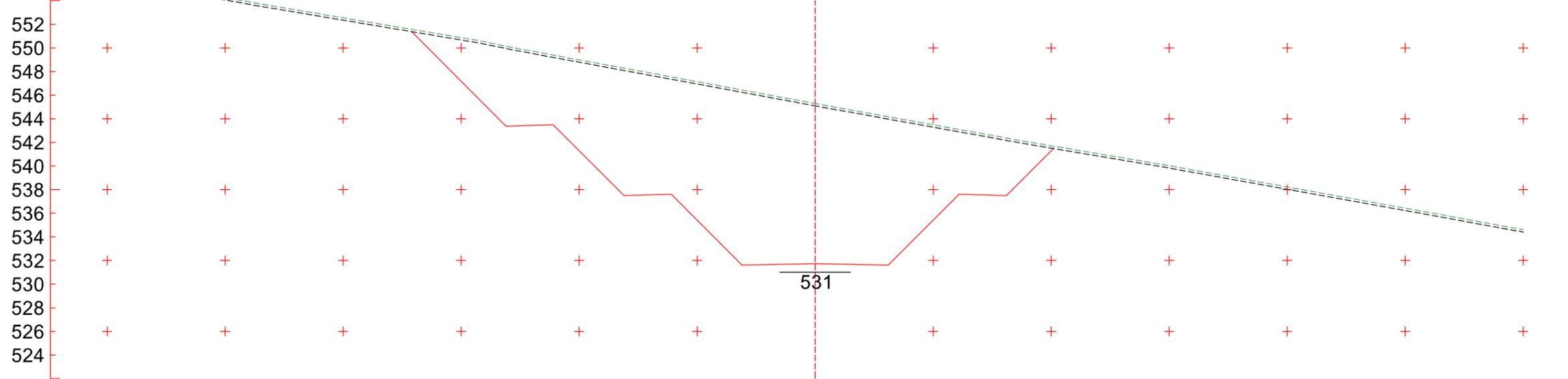
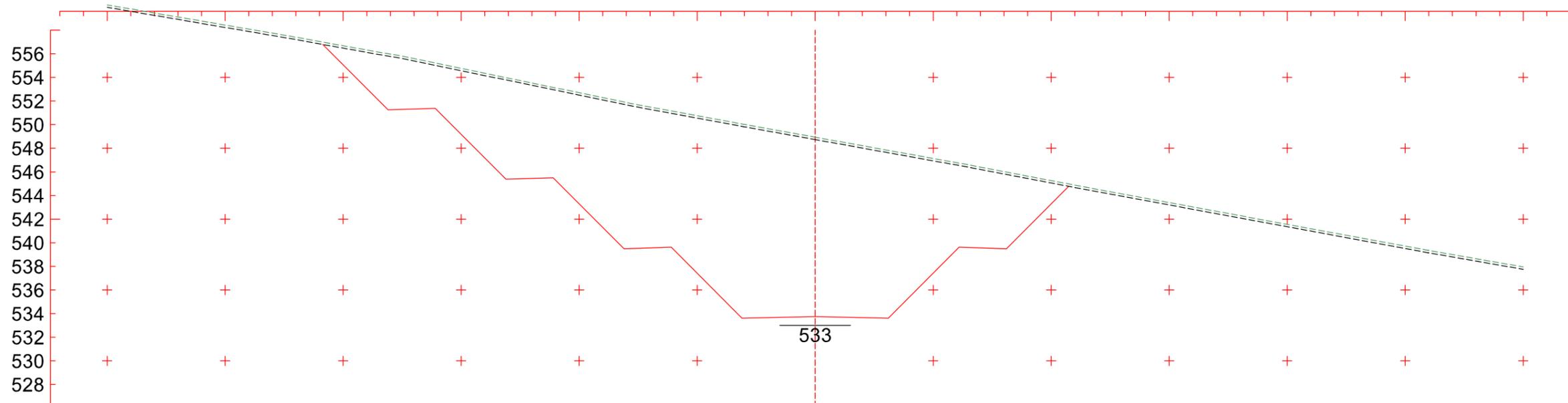
CT 519,186 m
CP 517,740 m

Lote 2

Escala 1:400



Lote 2
 Escala 1:400

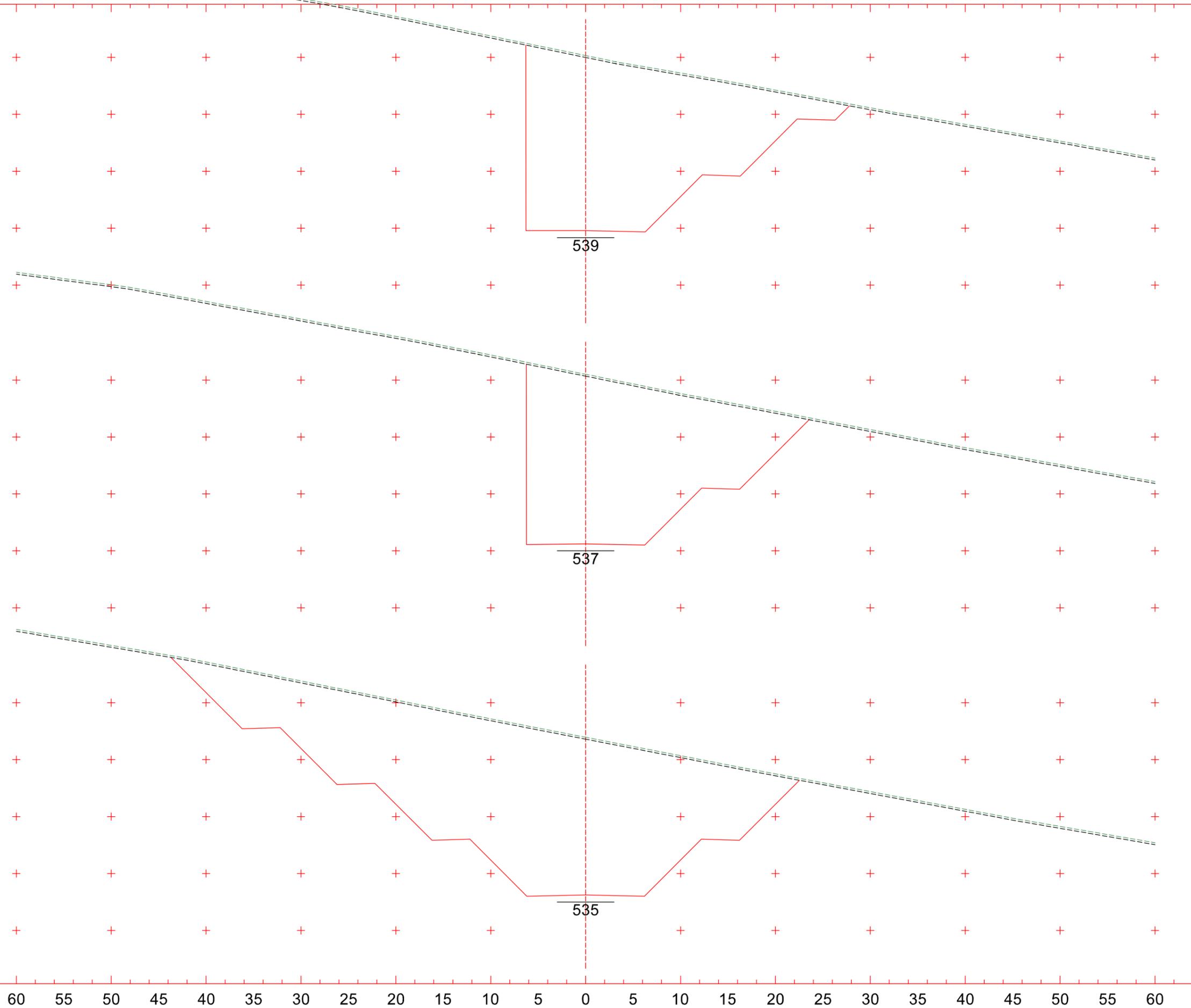


Lote 2
Escala 1:400

560
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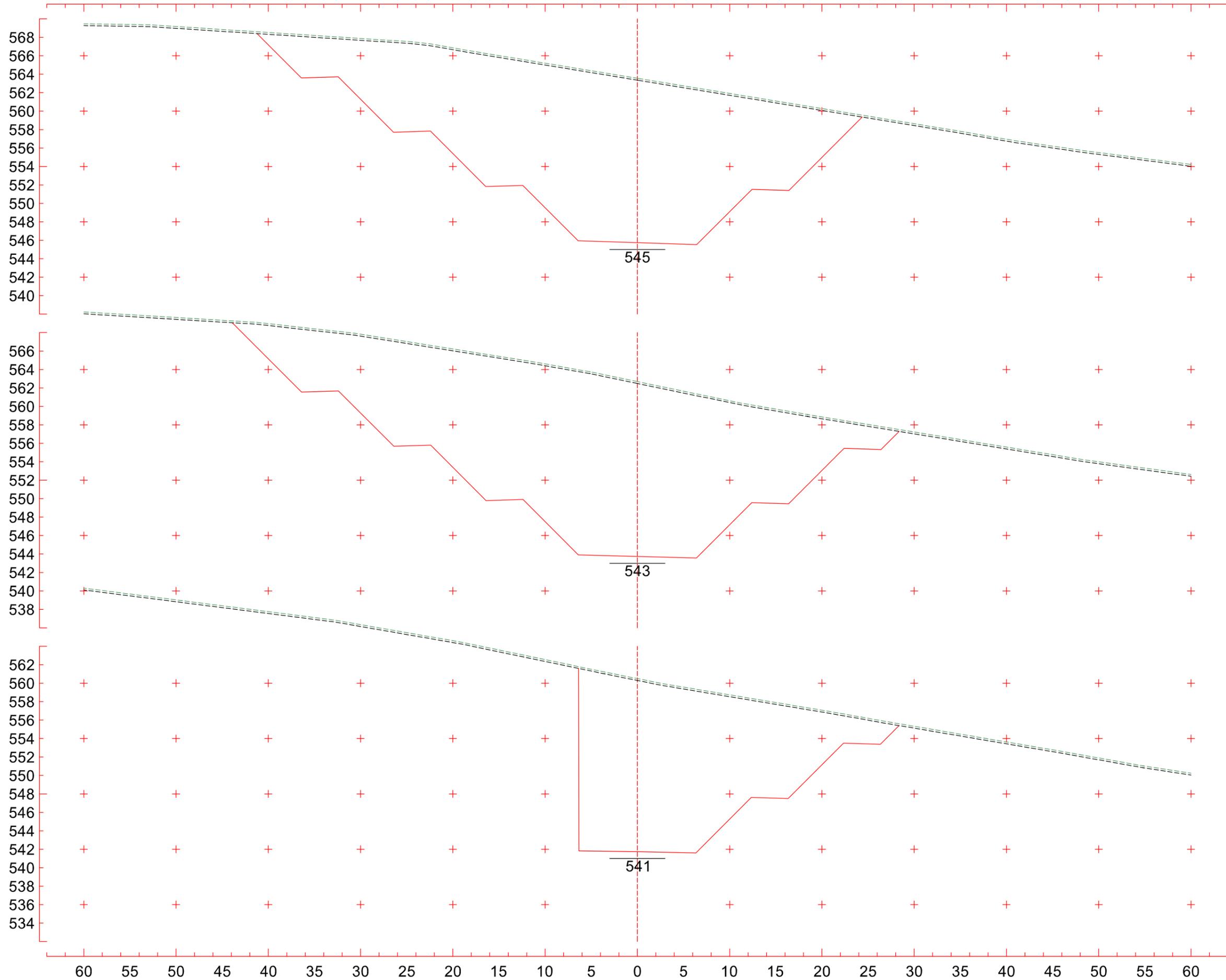


0+640
CT 558,186 m
CP 539,740 m

0+620
CT 555,607 m
CP 537,740 m

0+600
CT 552,358 m
CP 535,740 m

Lote 2
Escala 1:400



0+700

CT 563,557 m
CP 545,740 m

0+680

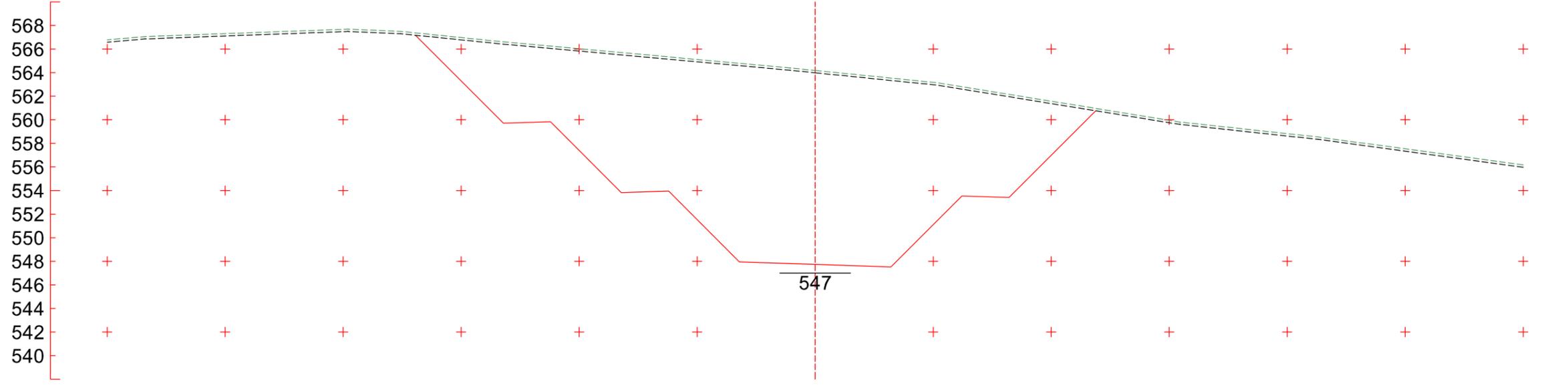
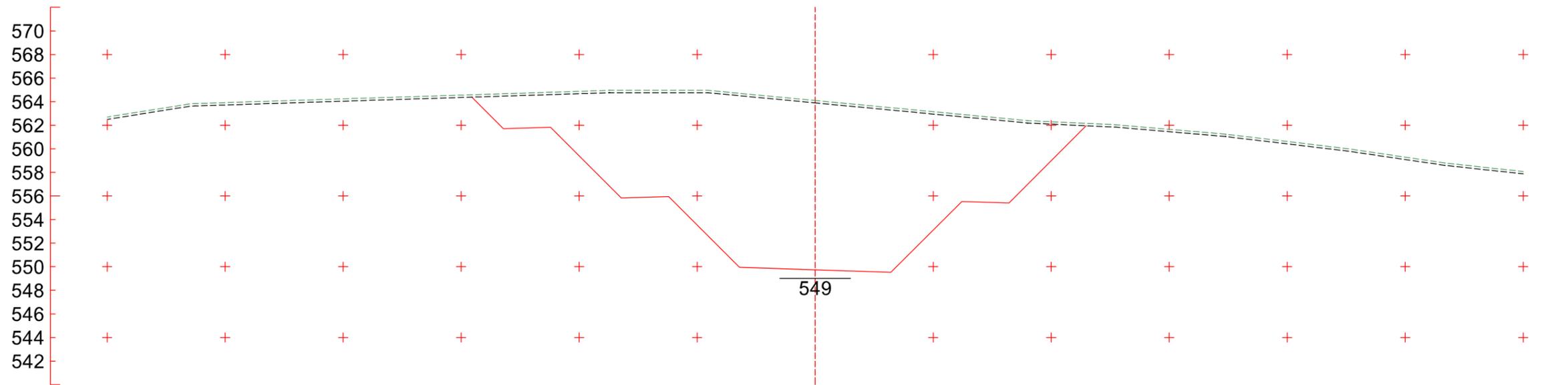
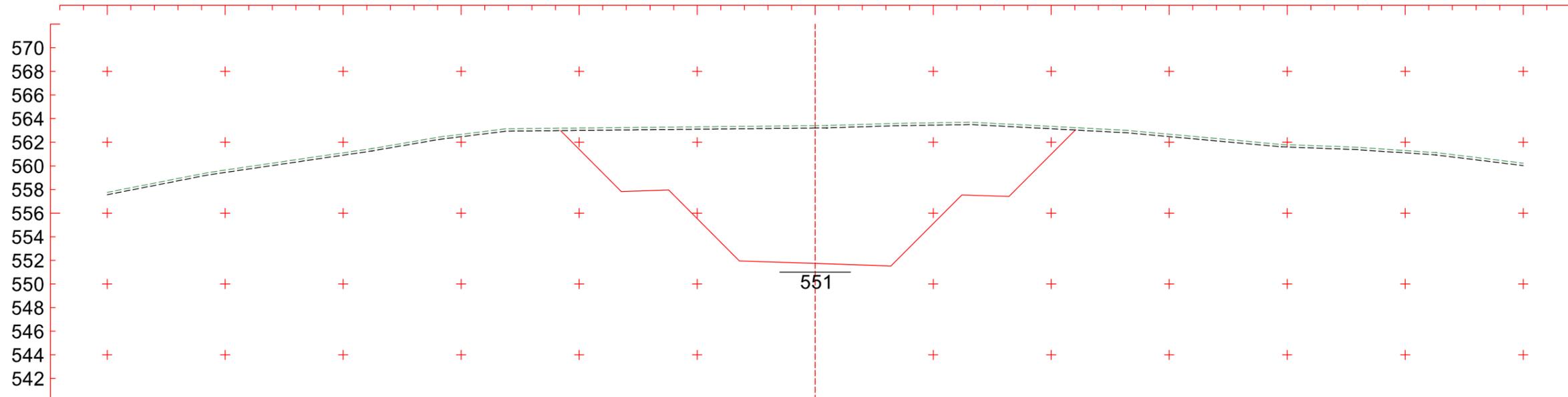
CT 562,683 m
CP 543,740 m

0+660

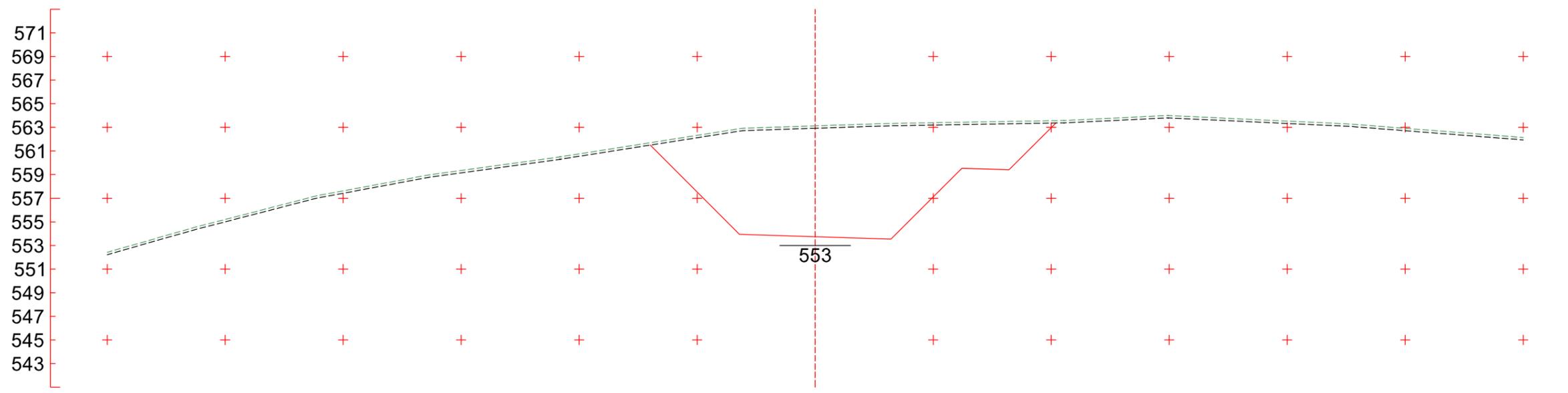
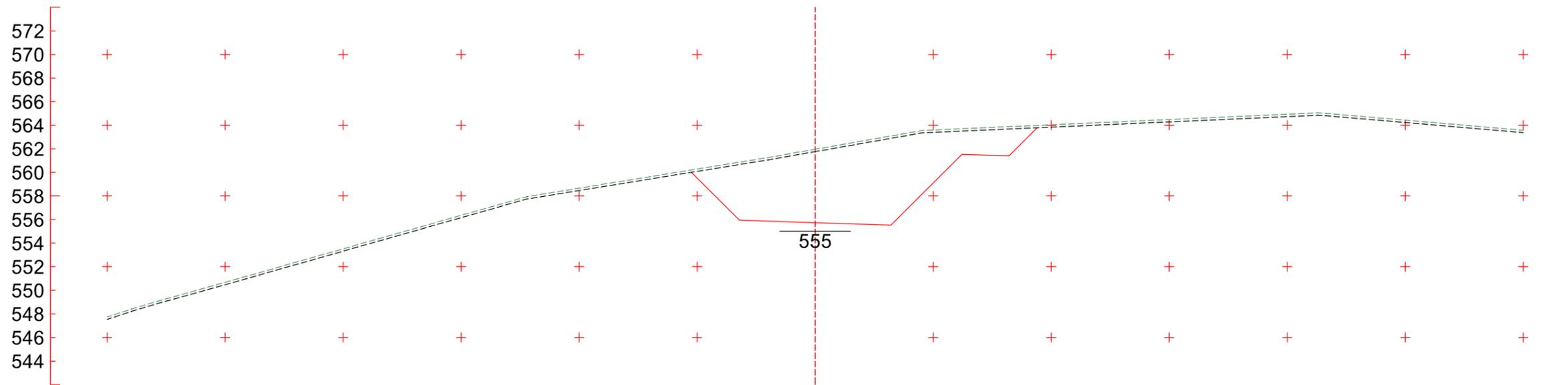
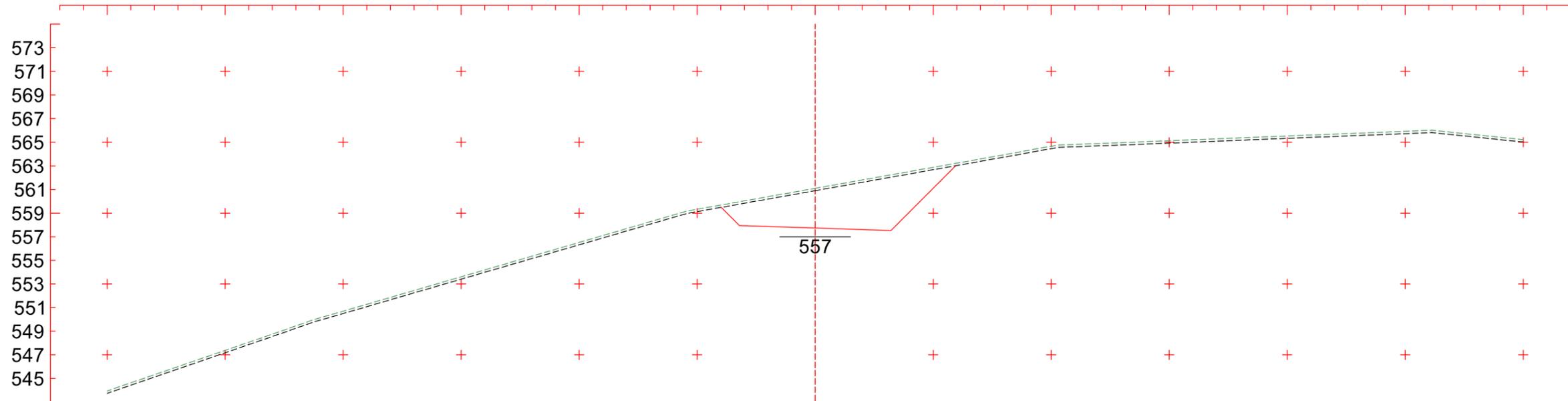
CT 560,496 m
CP 541,740 m

Lote 2

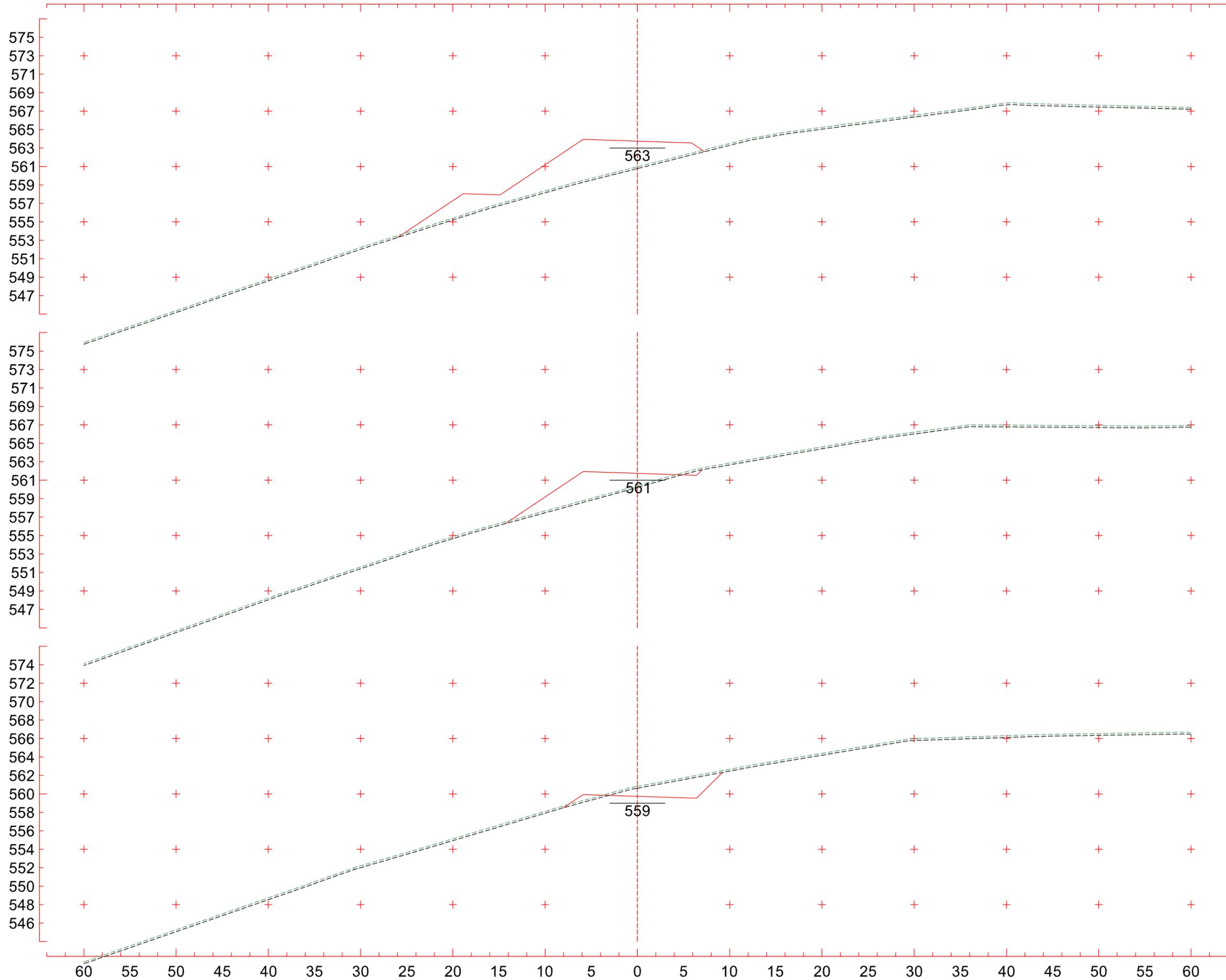
Escala 1:400



Lote 2
 Escala 1:400



Lote 2
Escala 1:400

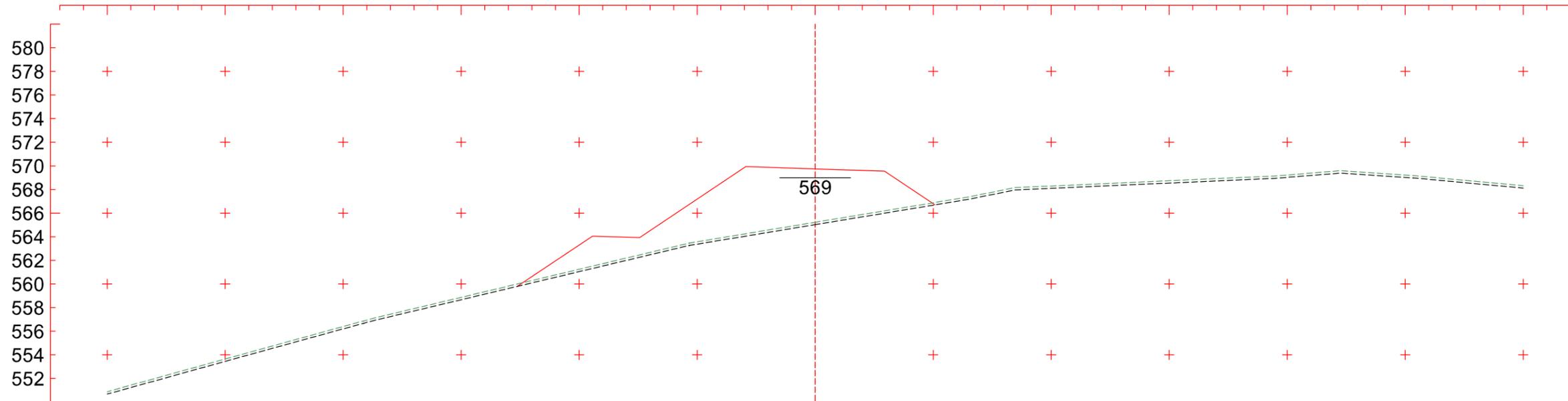


0+880
 CT 560,972 m
 CP 563,740 m

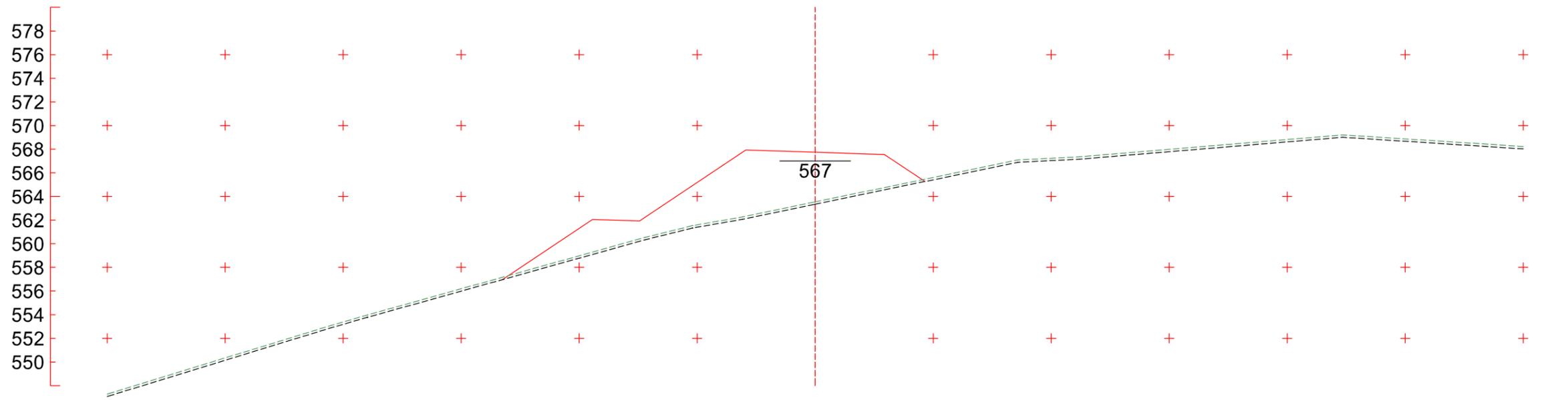
0+860
 CT 560,419 m
 CP 561,740 m

0+840
 CT 560,822 m
 CP 559,740 m

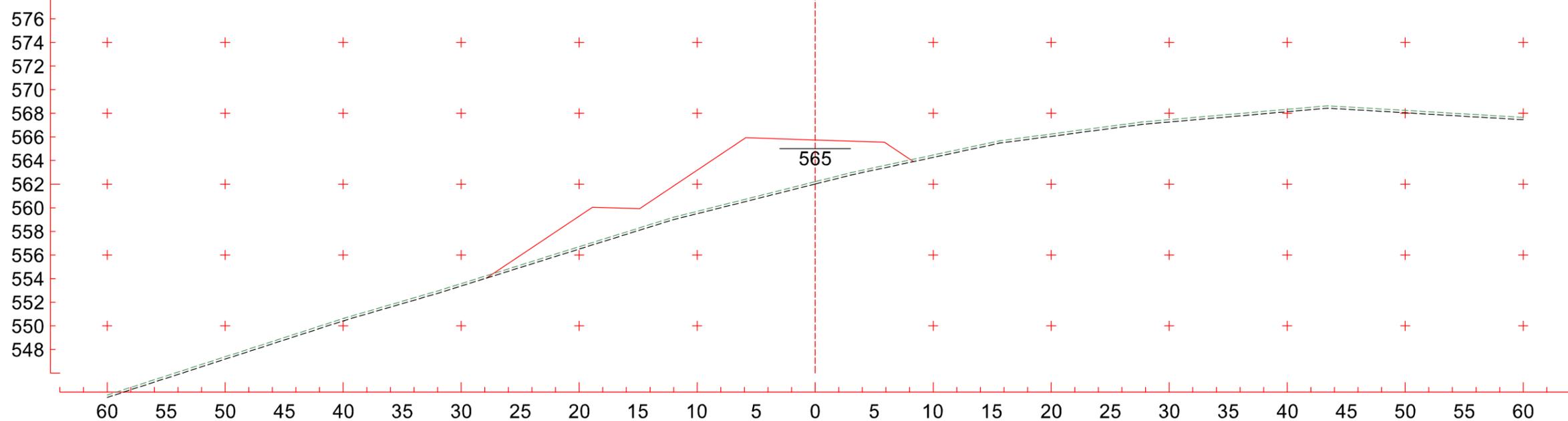
Lote 2
 Escala 1:400



0+940
 CT 565,224 m
 CP 569,740 m

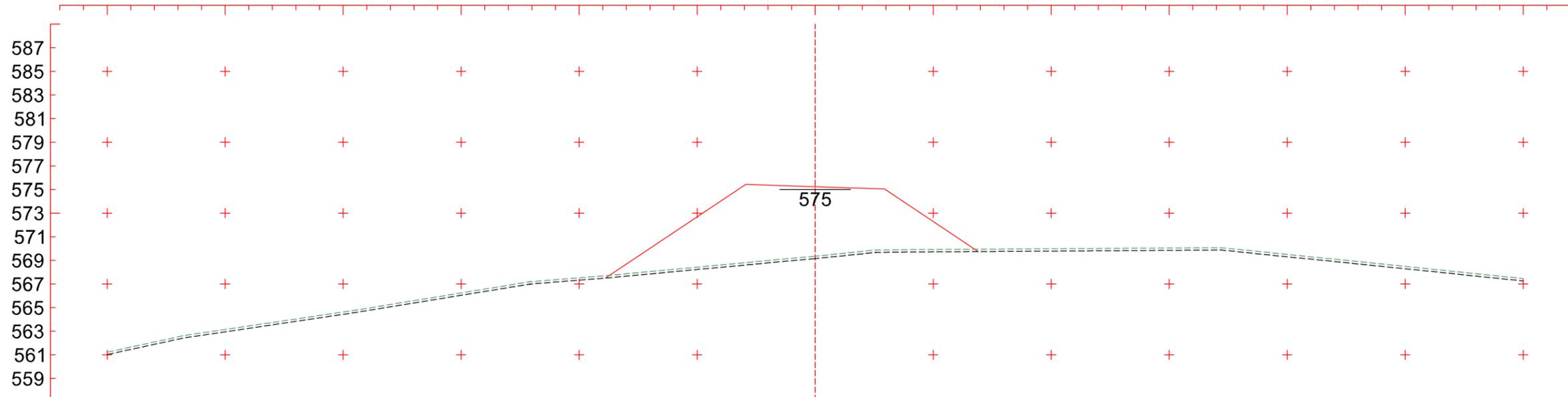


0+920
 CT 563,542 m
 CP 567,740 m

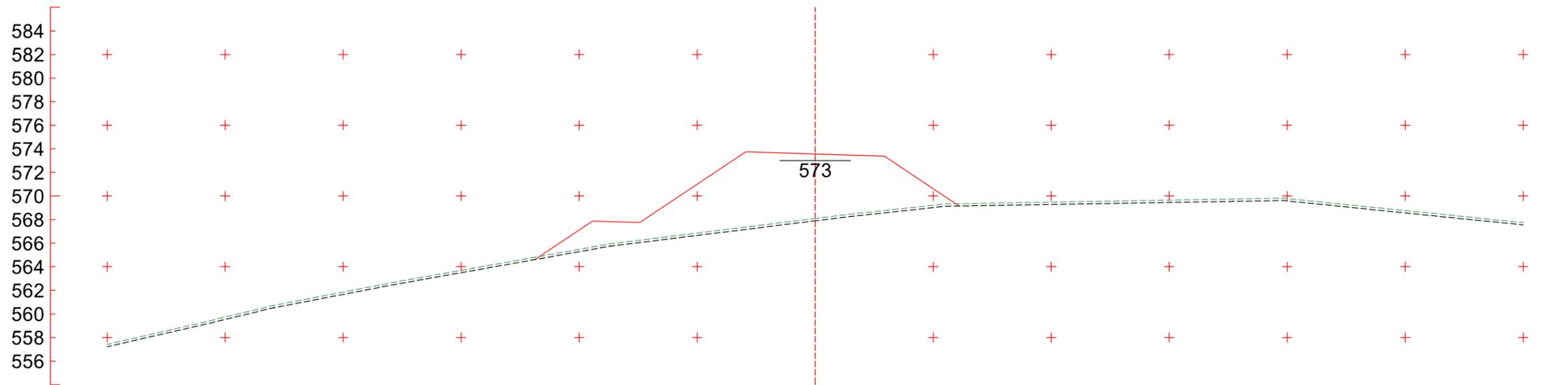


0+900
 CT 562,213 m
 CP 565,740 m

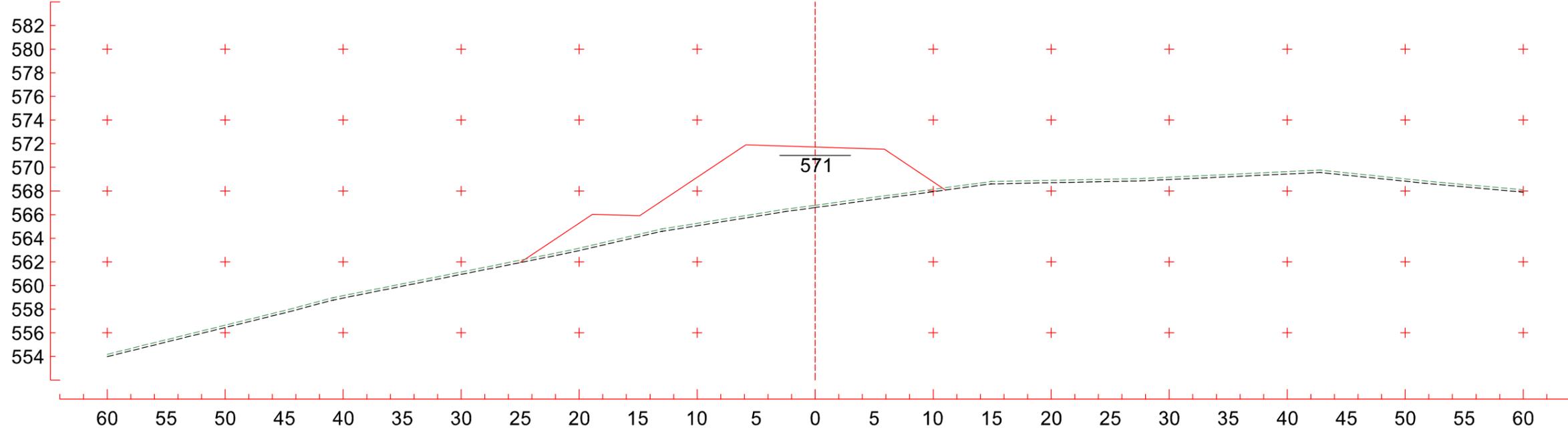
Lote 2
 Escala 1:400



1+000
 CT 569,358 m
 CP 575,238 m

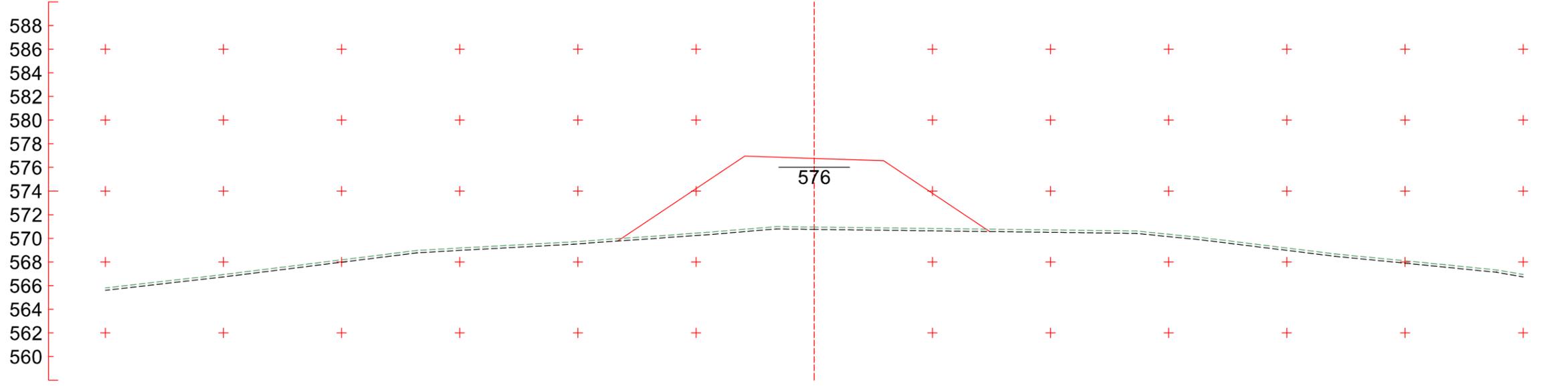
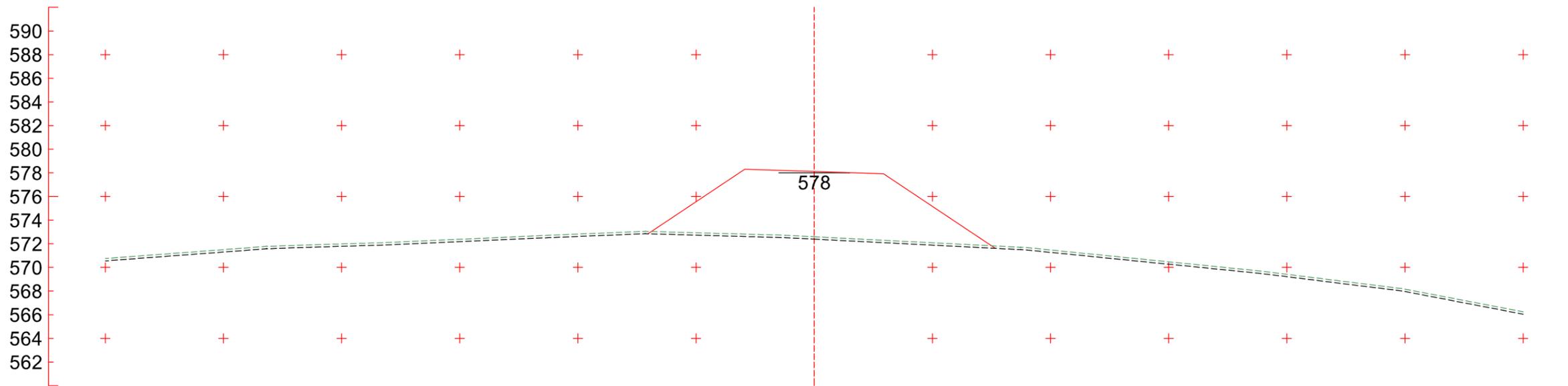
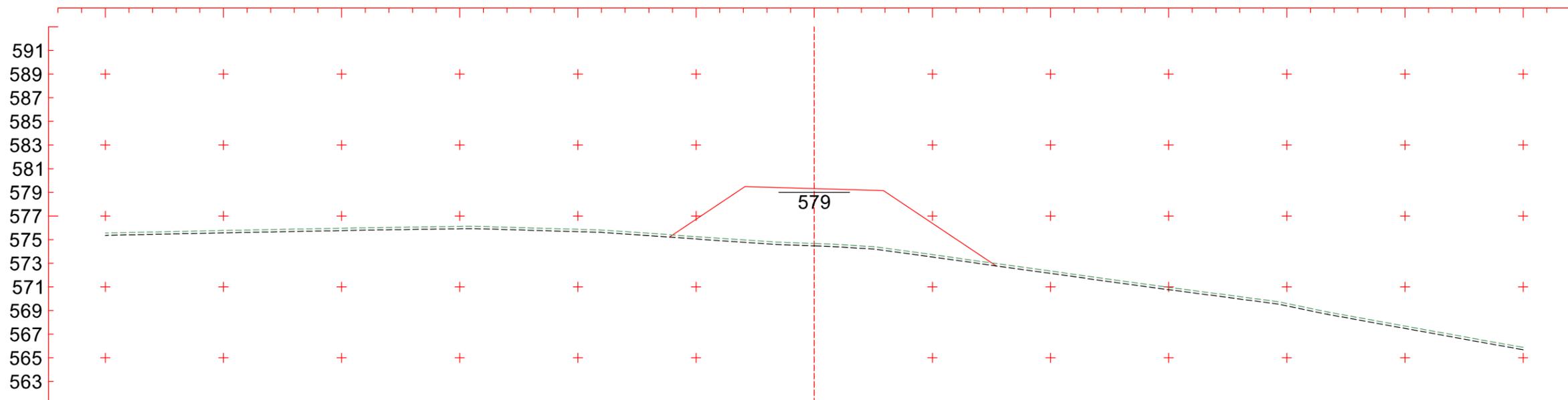


0+980
 CT 568,094 m
 CP 573,560 m

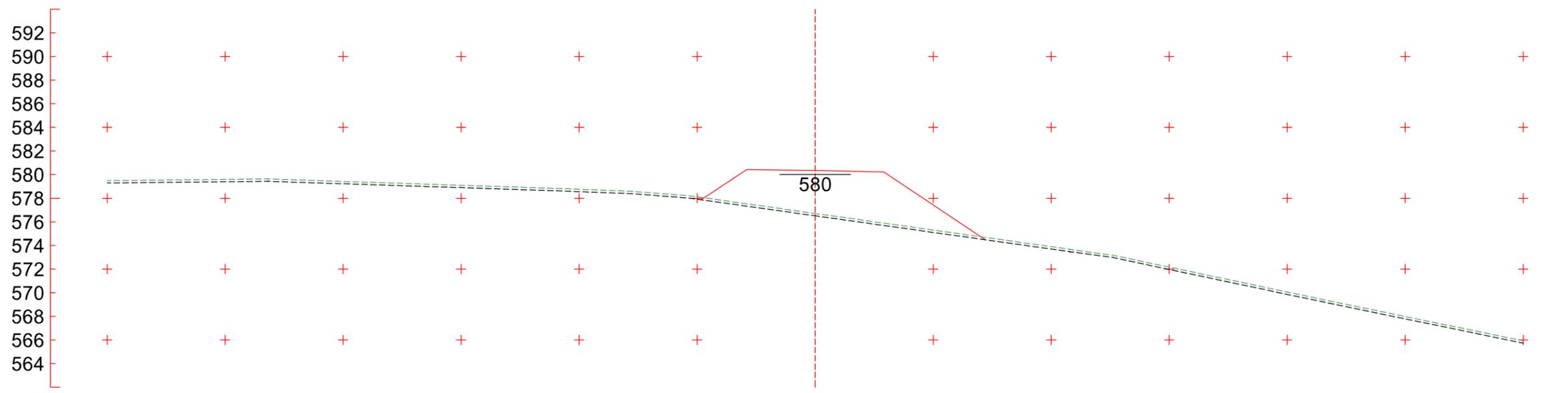
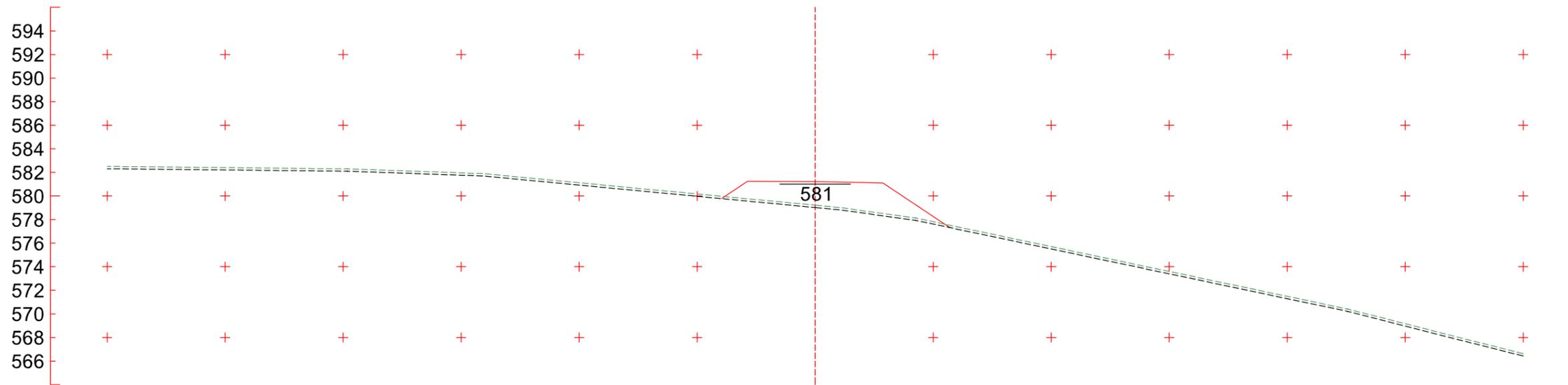
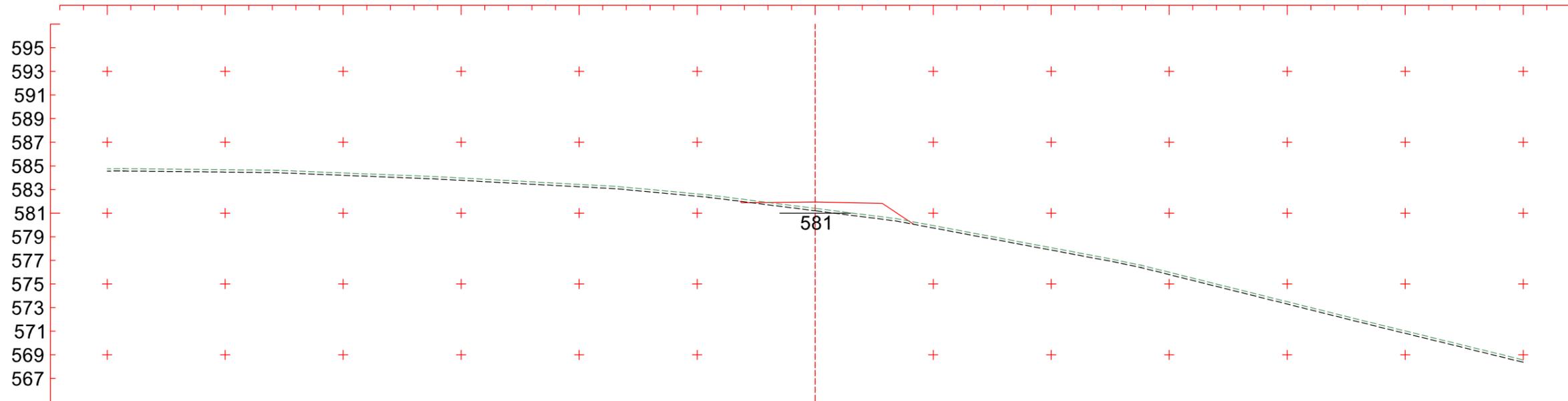


0+960
 CT 566,798 m
 CP 571,720 m

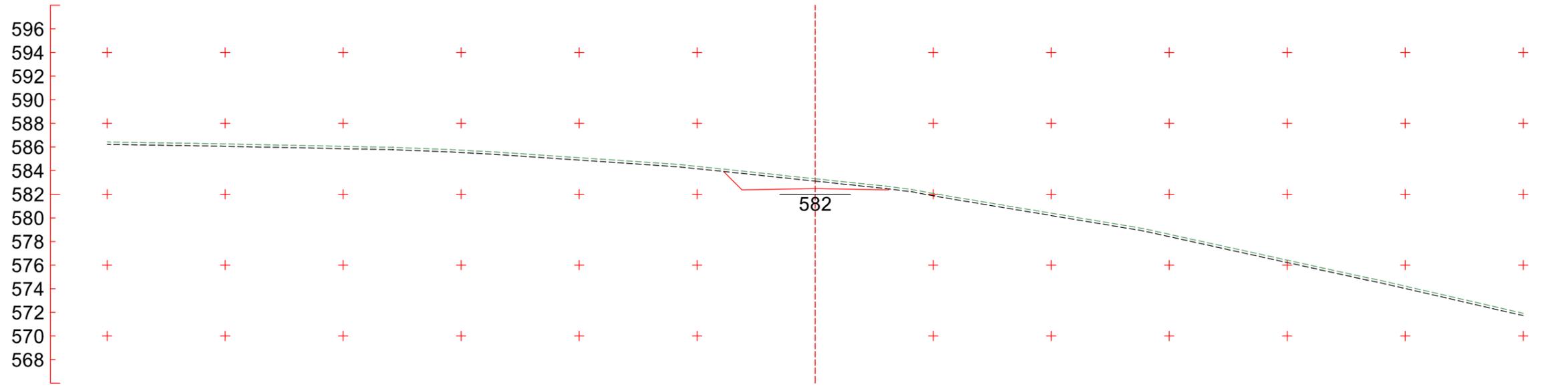
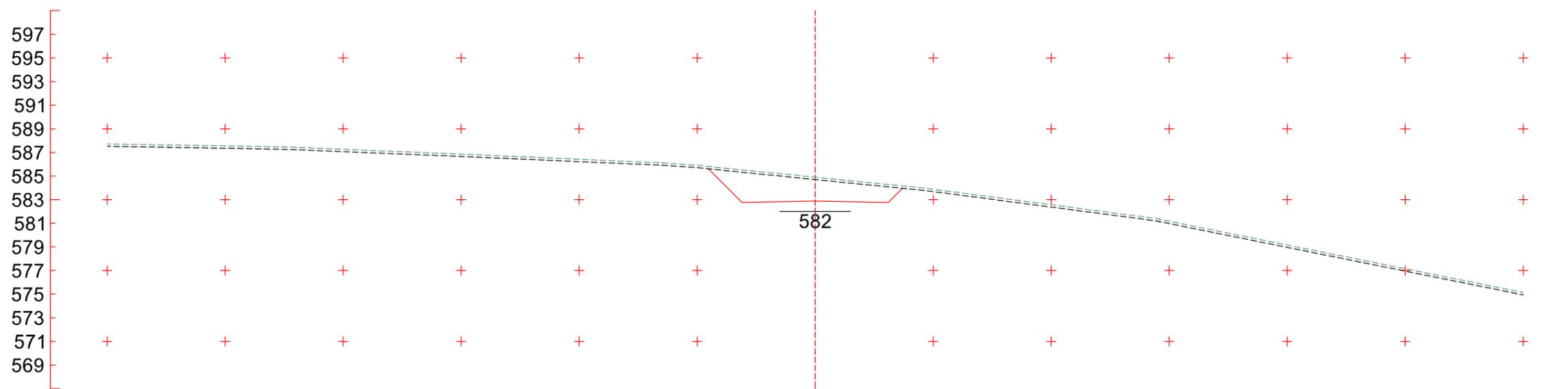
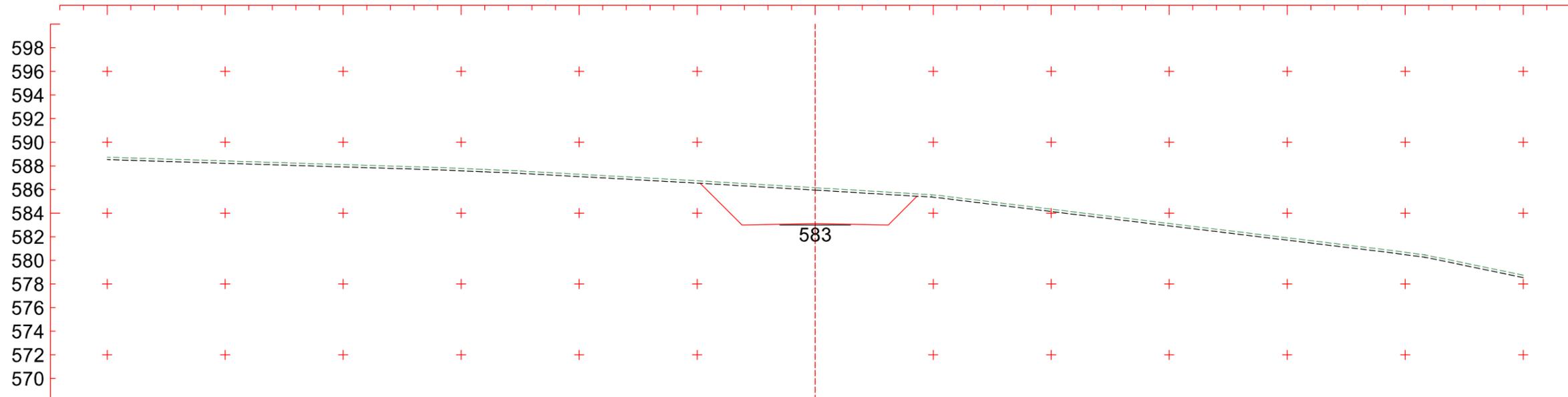
Lote 2
 Escala 1:400



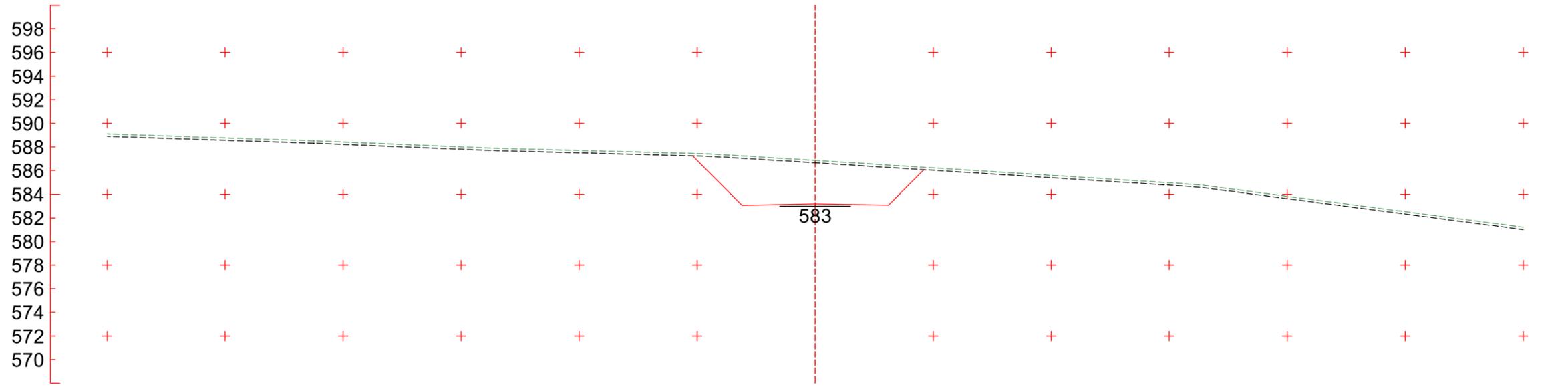
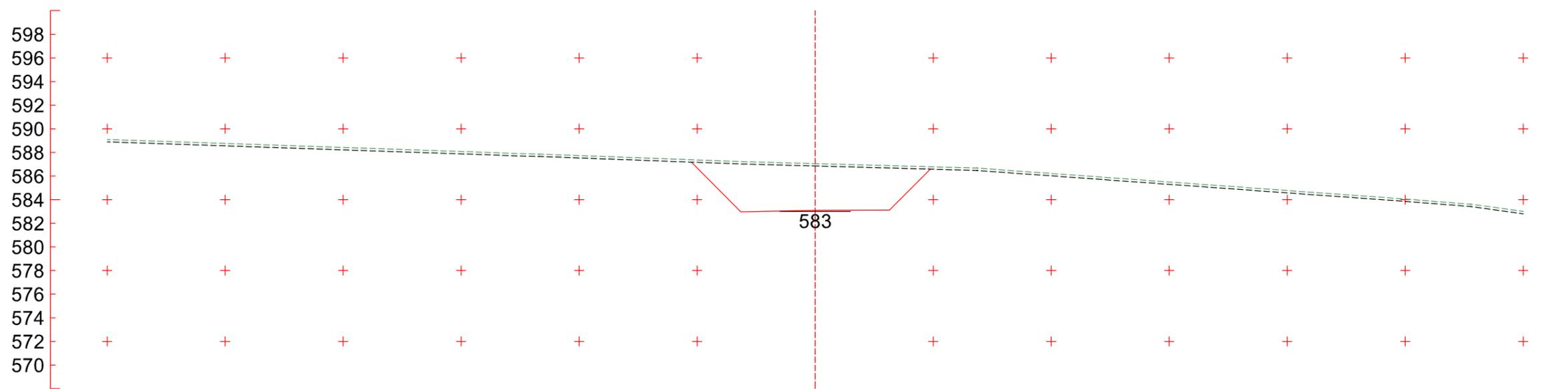
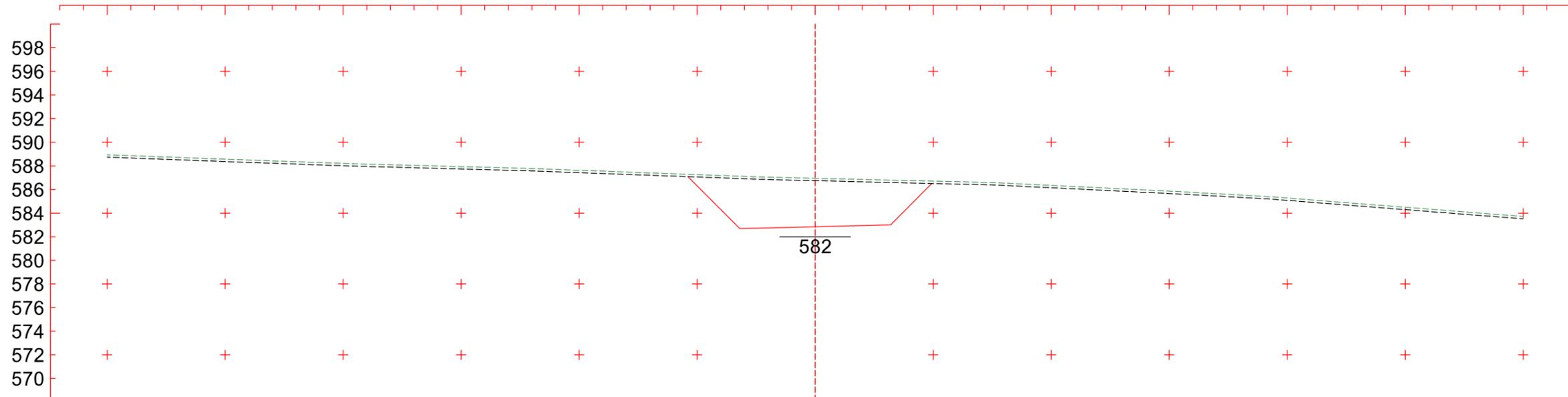
Lote 2
Escala 1:400



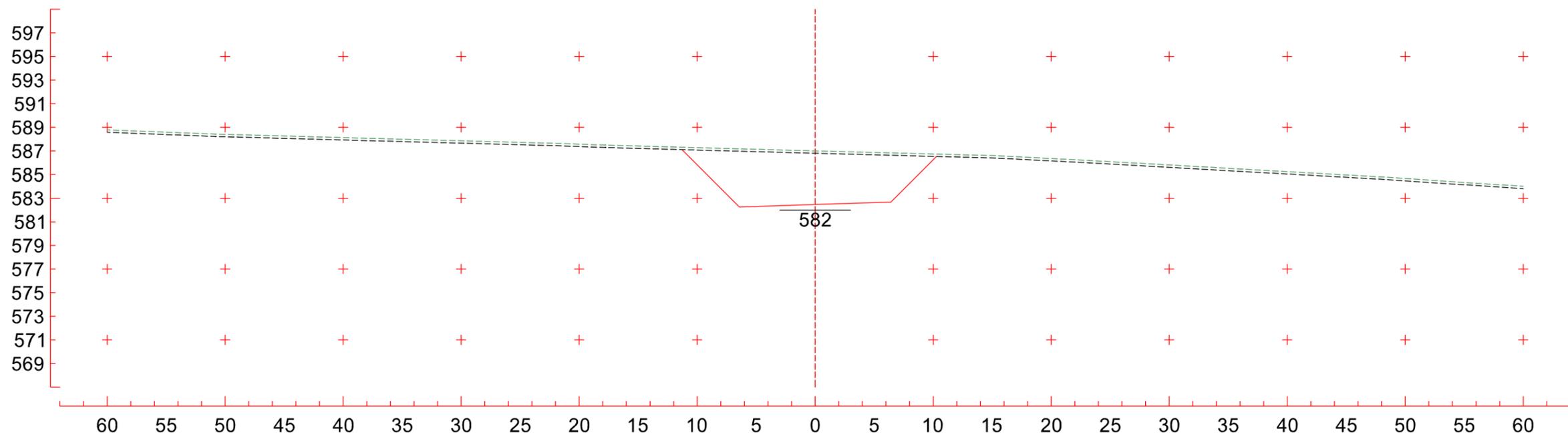
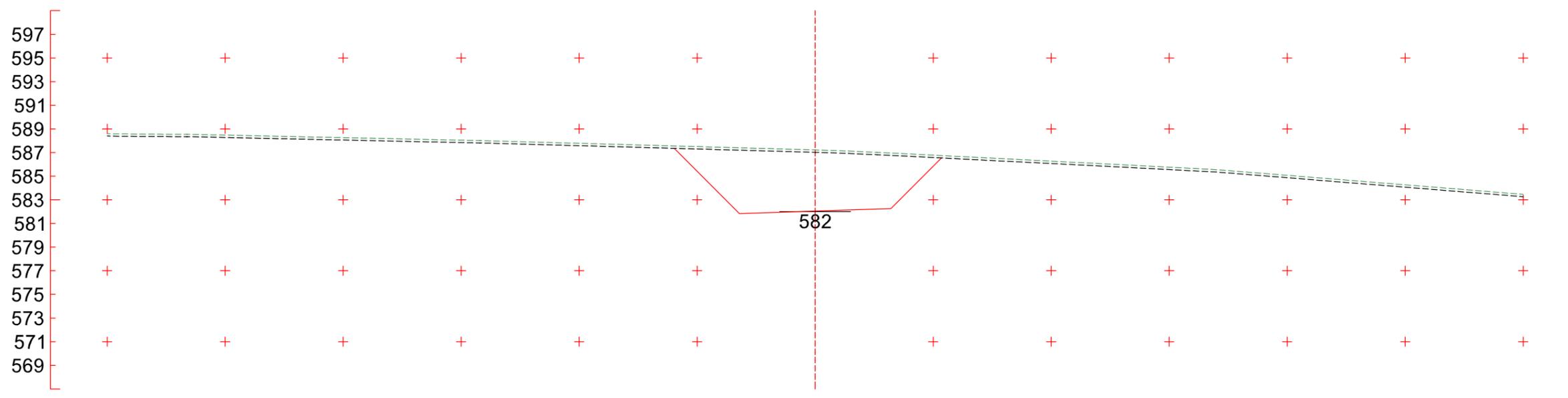
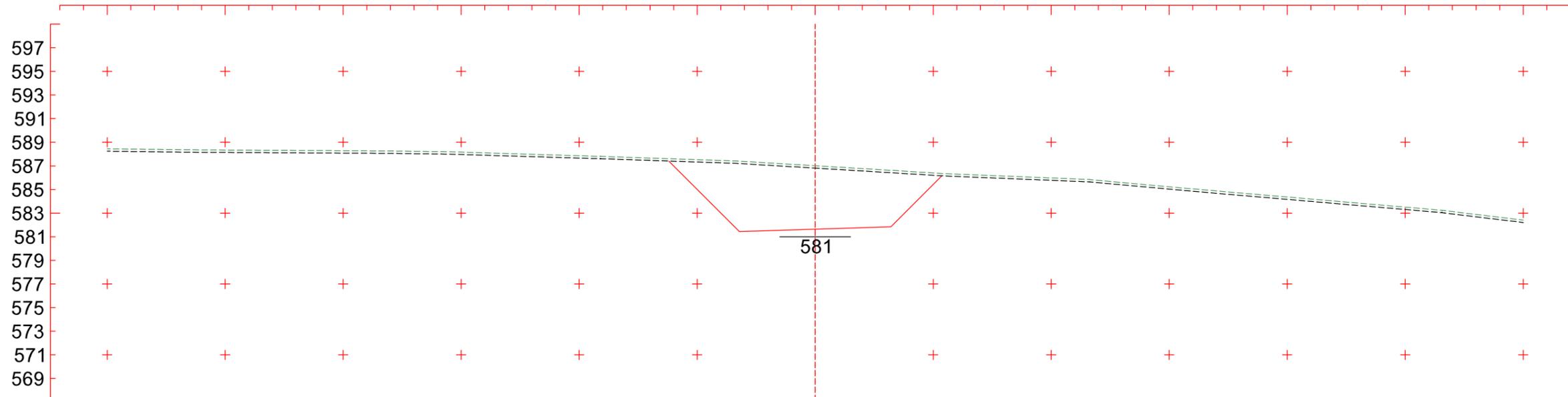
Lote 2
 Escala 1:400



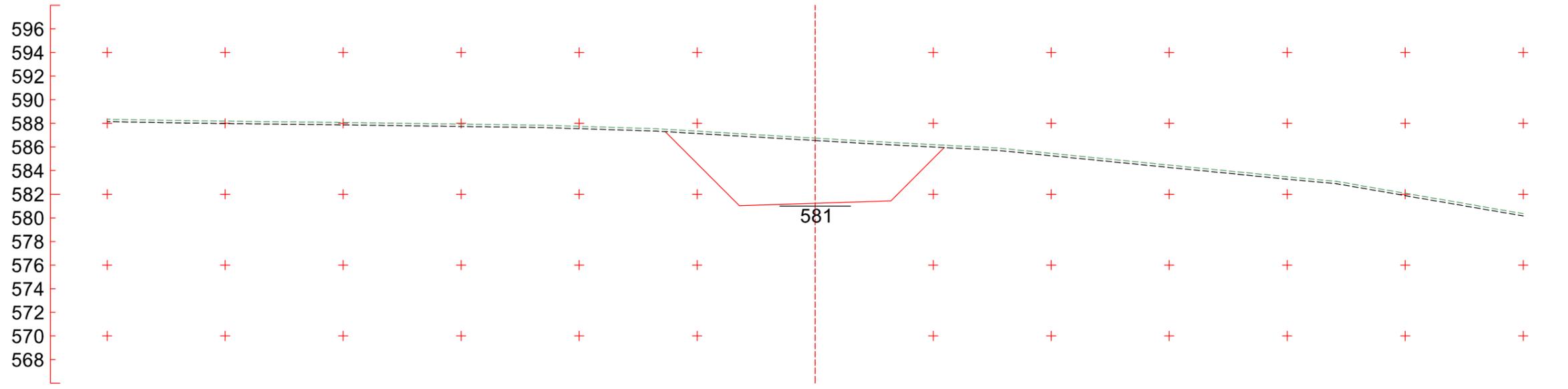
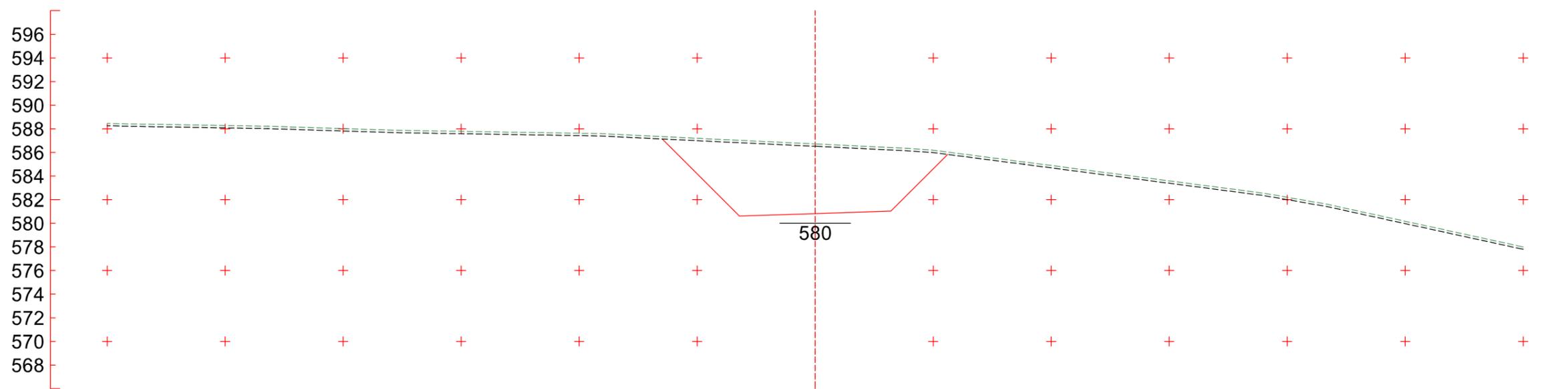
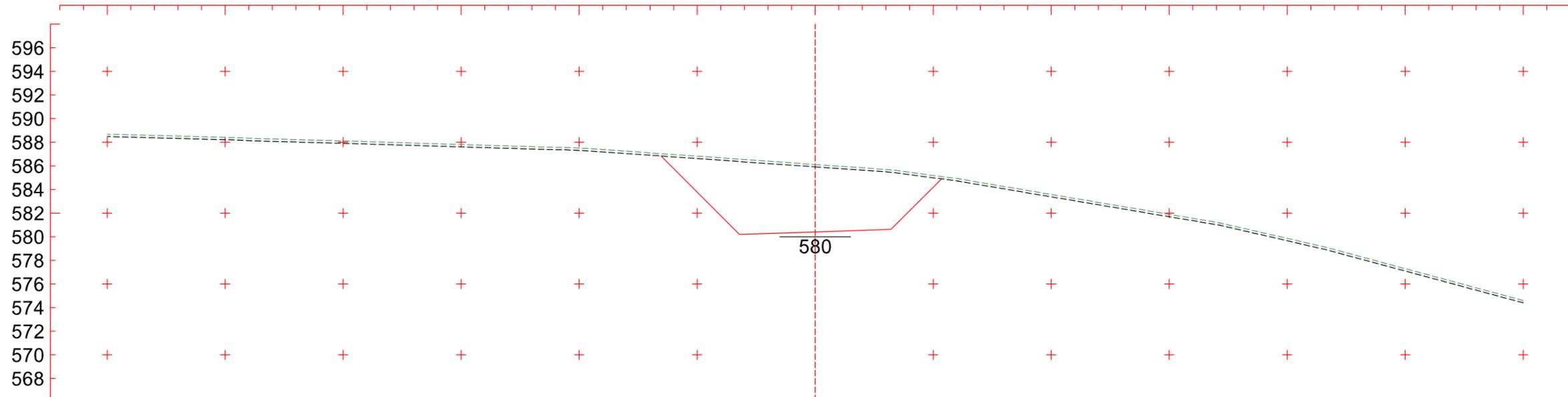
Lote 2
Escala 1:400



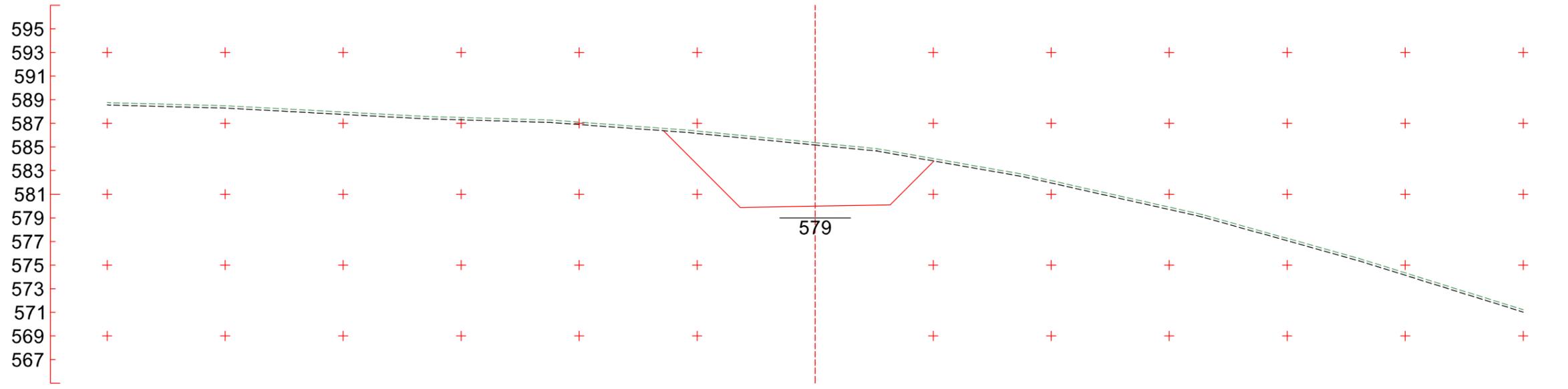
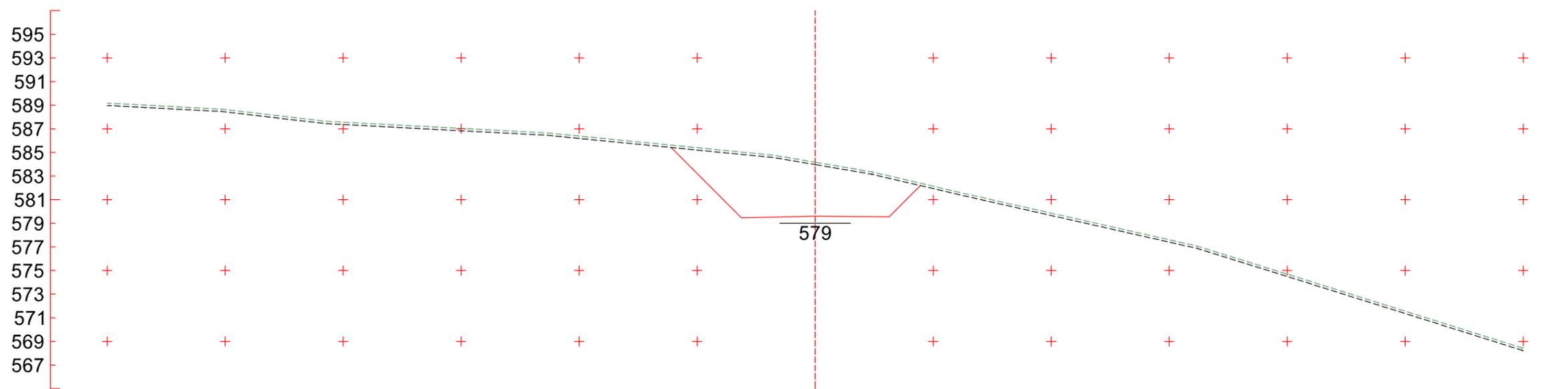
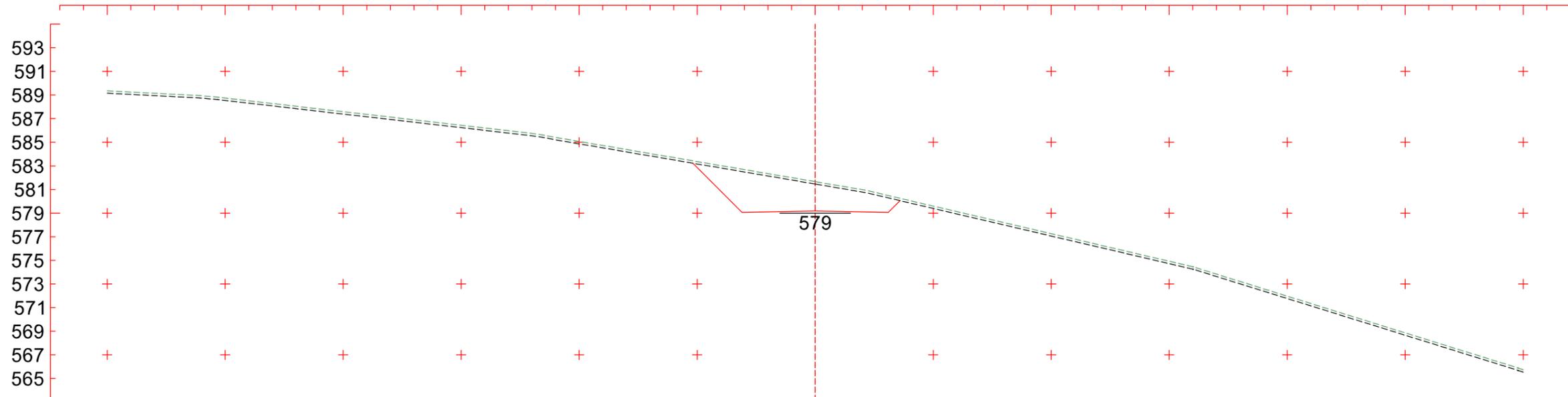
Lote 2
Escala 1:400



Lote 2
Escala 1:400

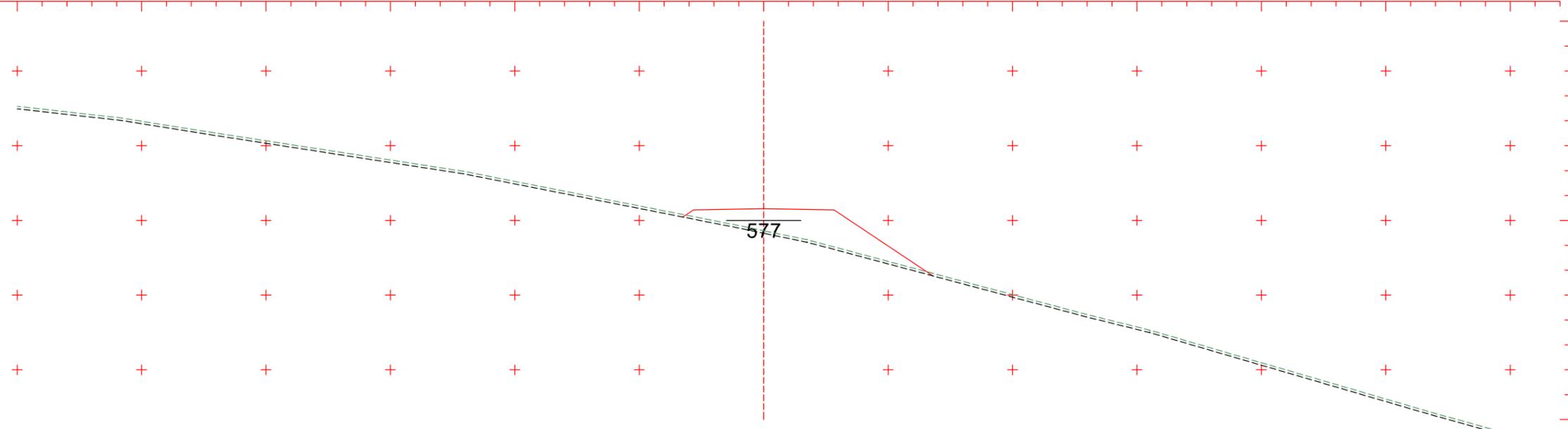


Lote 2
Escala 1:400



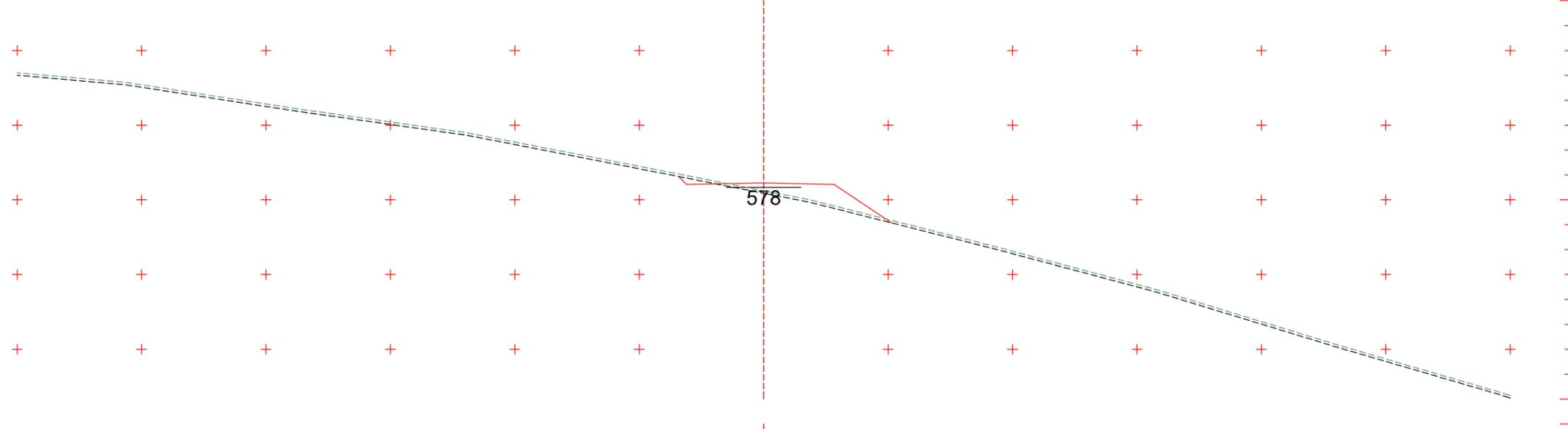
Lote 2
Escala 1:400

591
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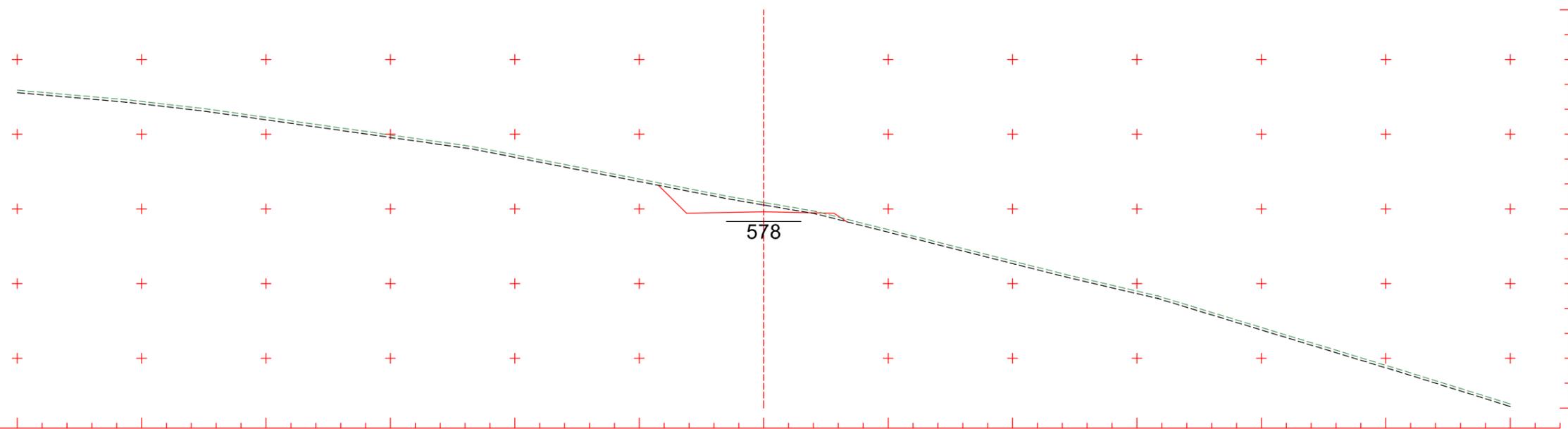
1+480
CT 576,170 m
CP 577,950 m

591
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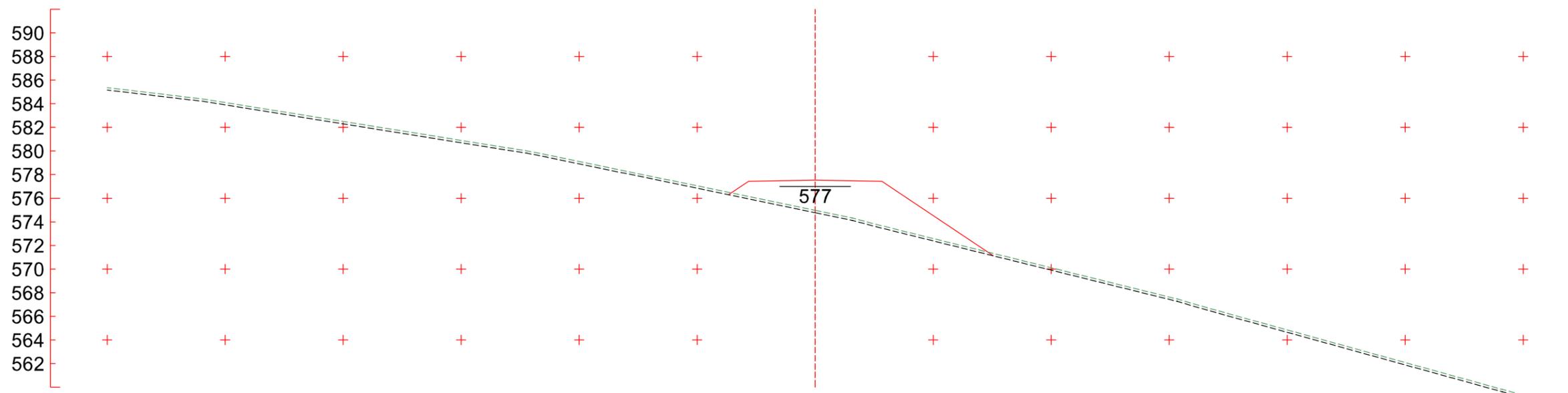
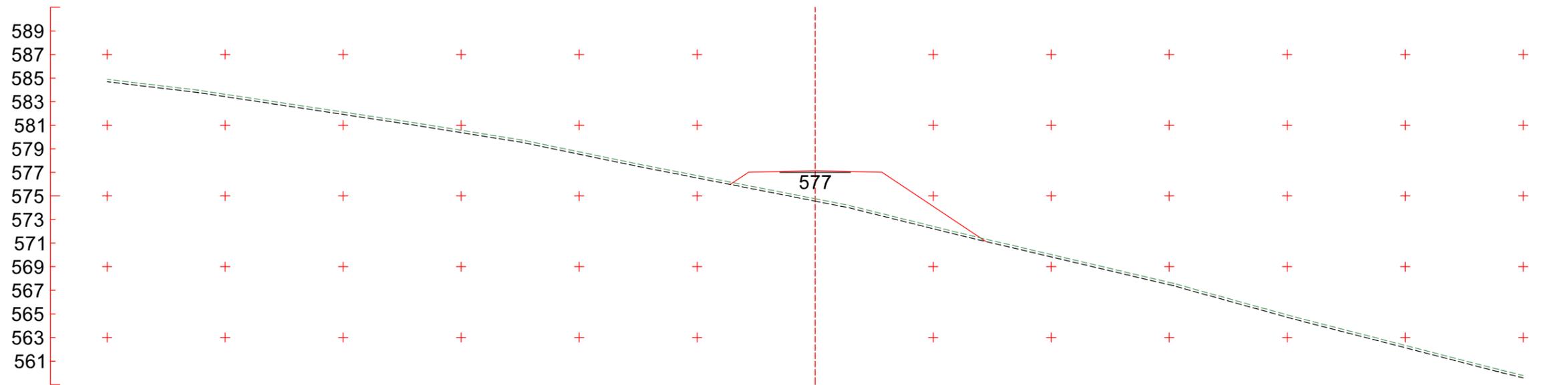
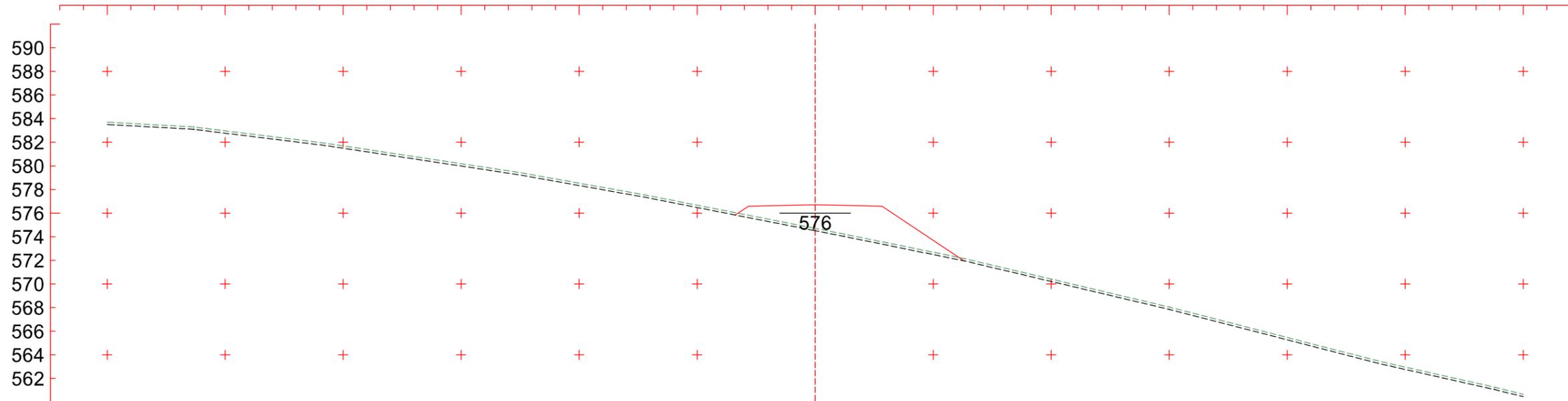
1+460
CT 577,733 m
CP 578,360 m

593
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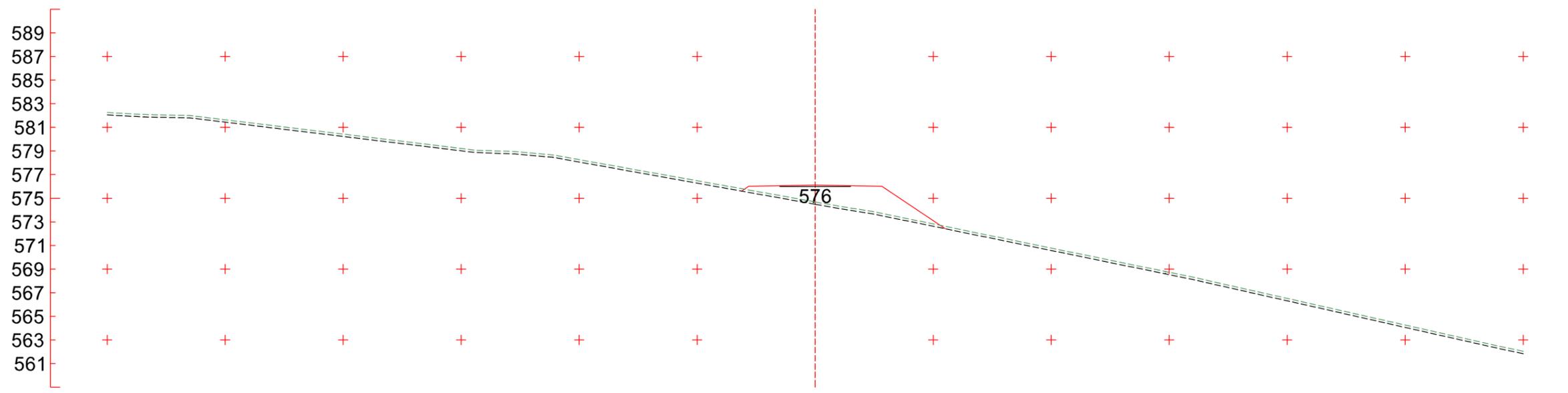
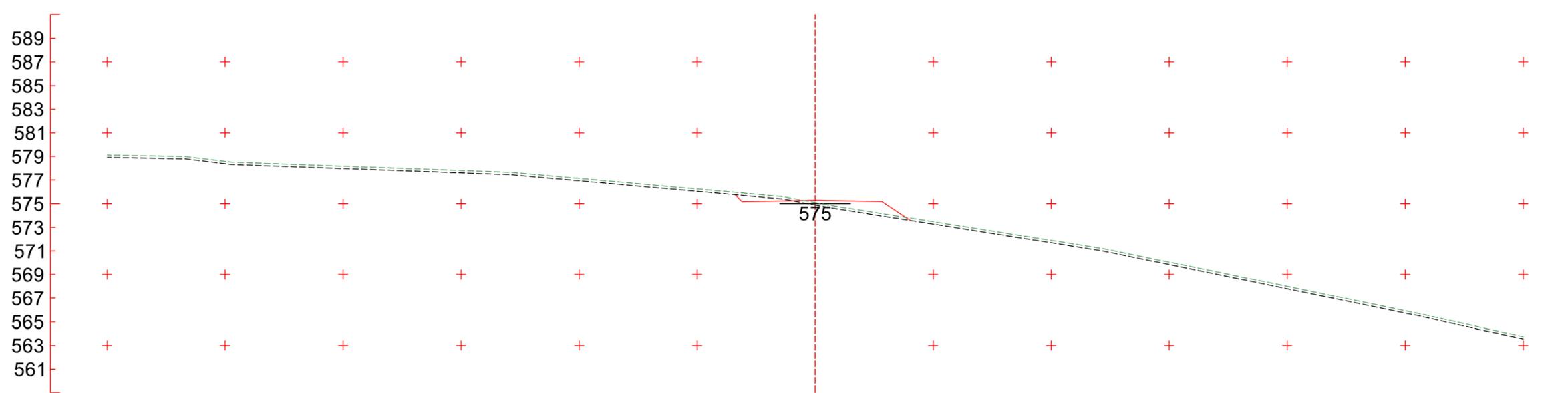
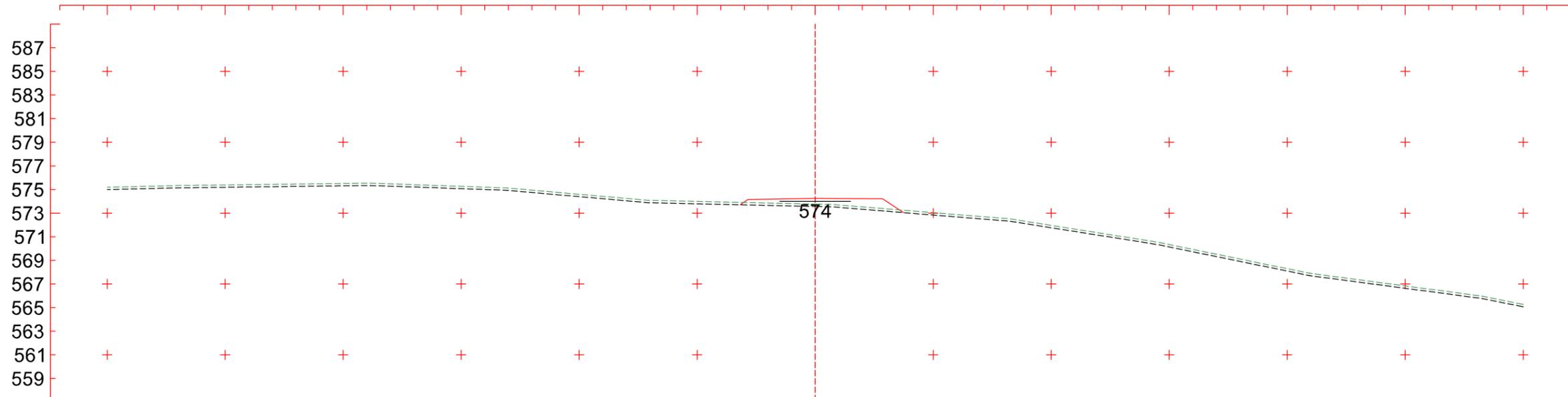


1+440
CT 579,518 m
CP 578,770 m

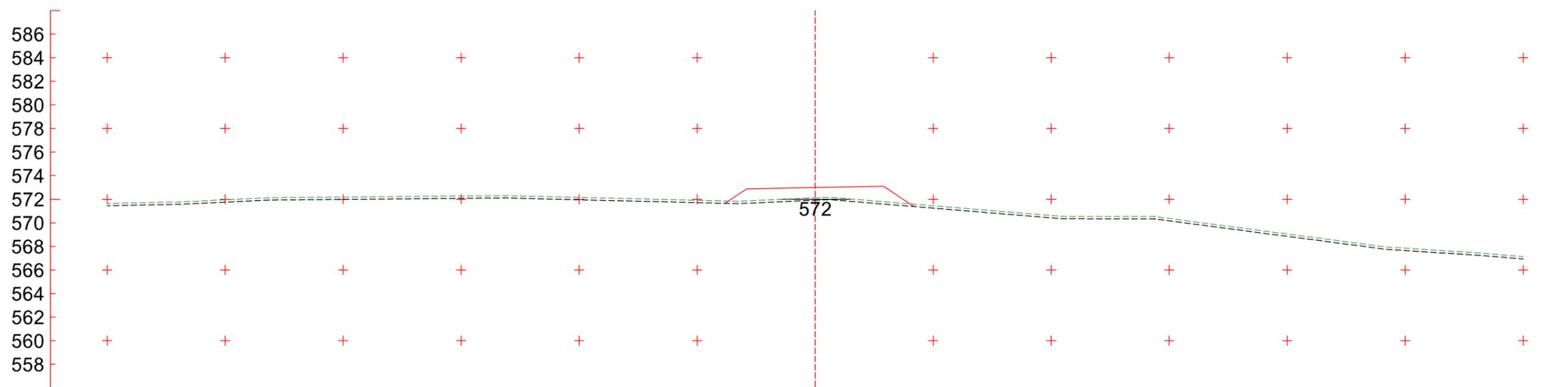
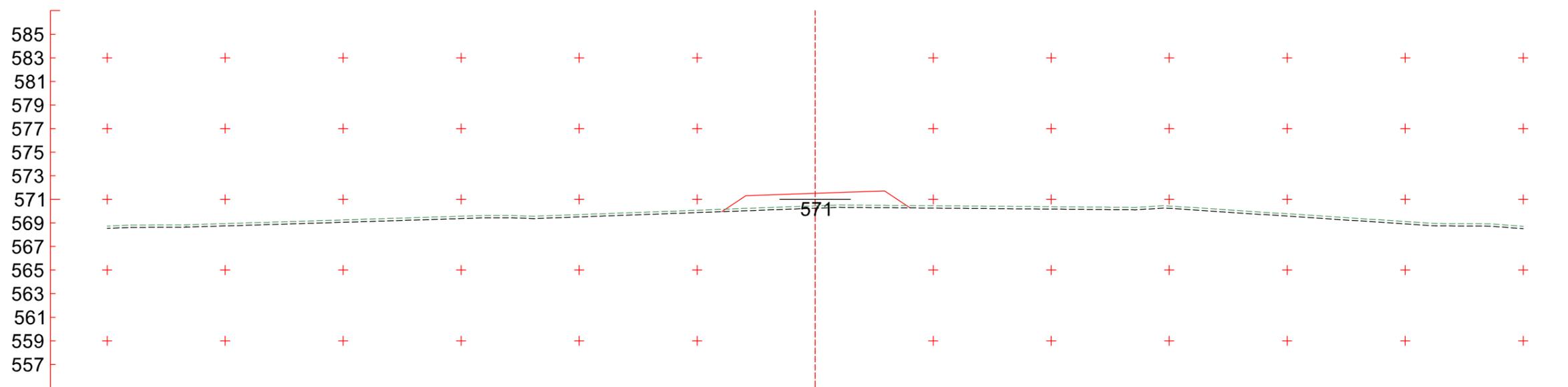
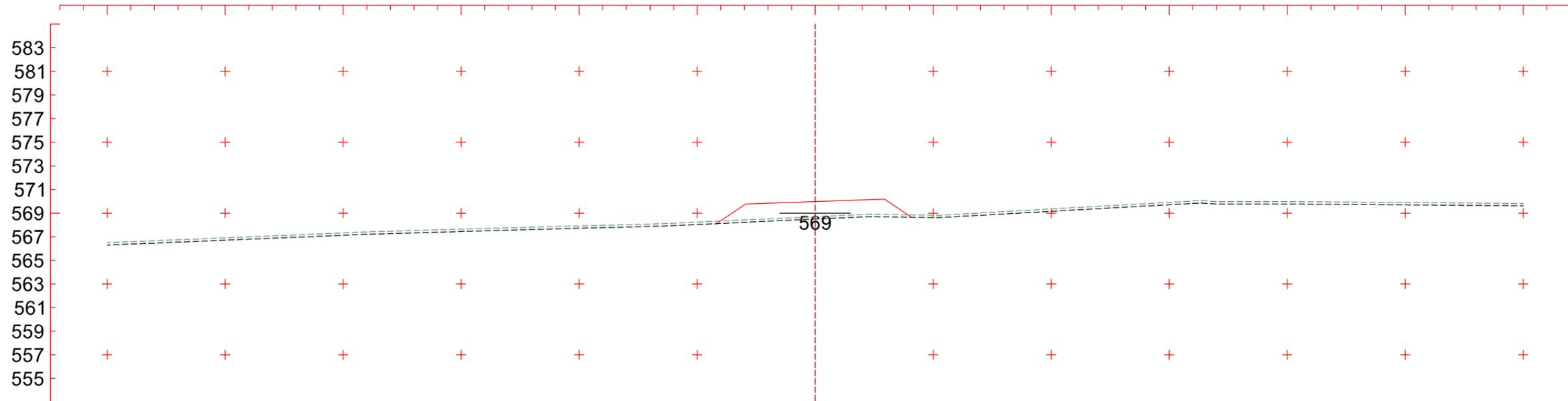
Lote 2
Escala 1:400



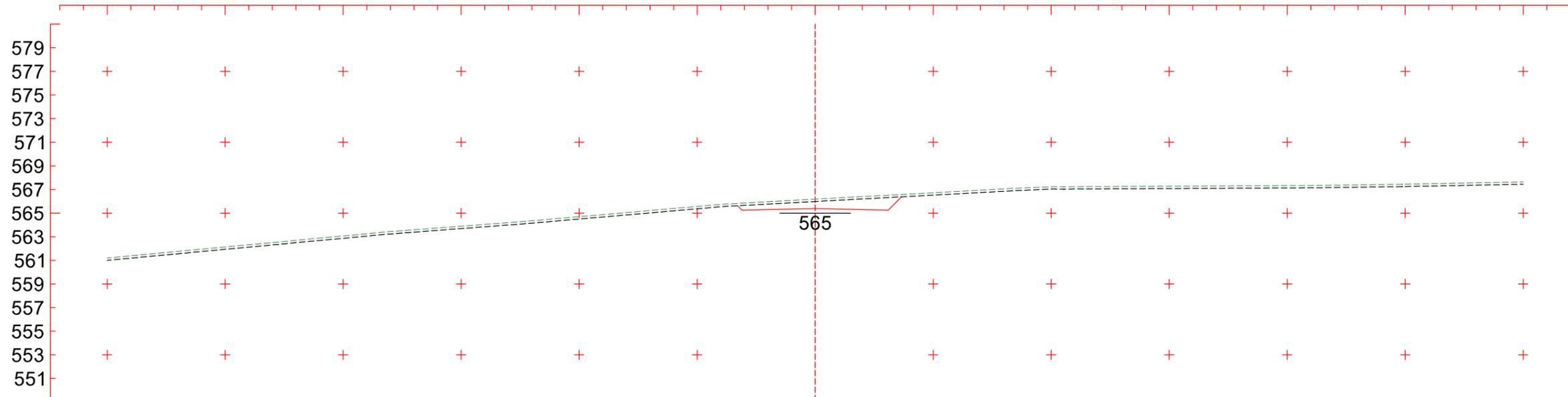
Lote 2
Escala 1:400



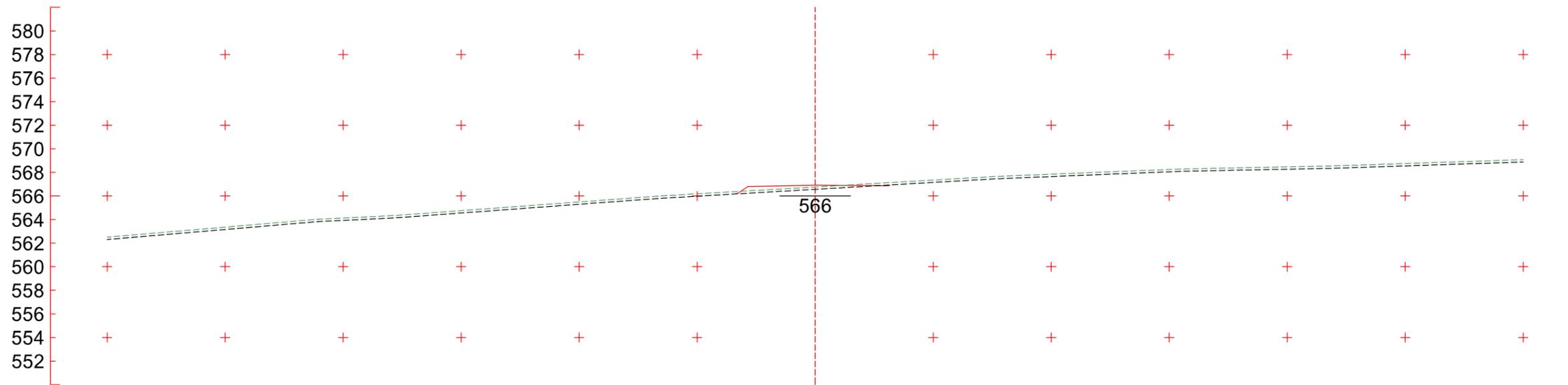
Lote 2
 Escala 1:400



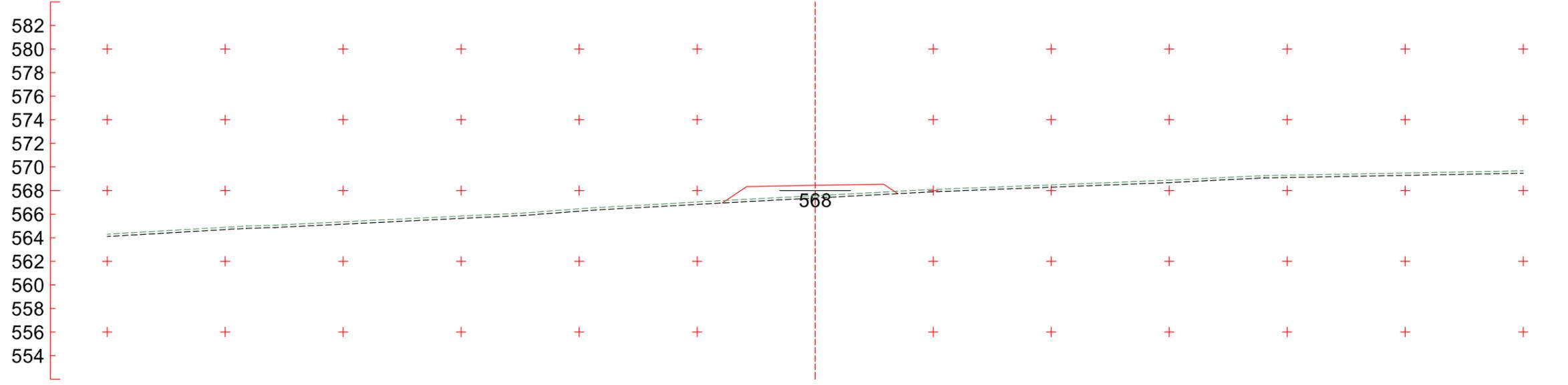
Lote 2
Escala 1:400



1+720
 CT 566,182 m
 CP 565,379 m

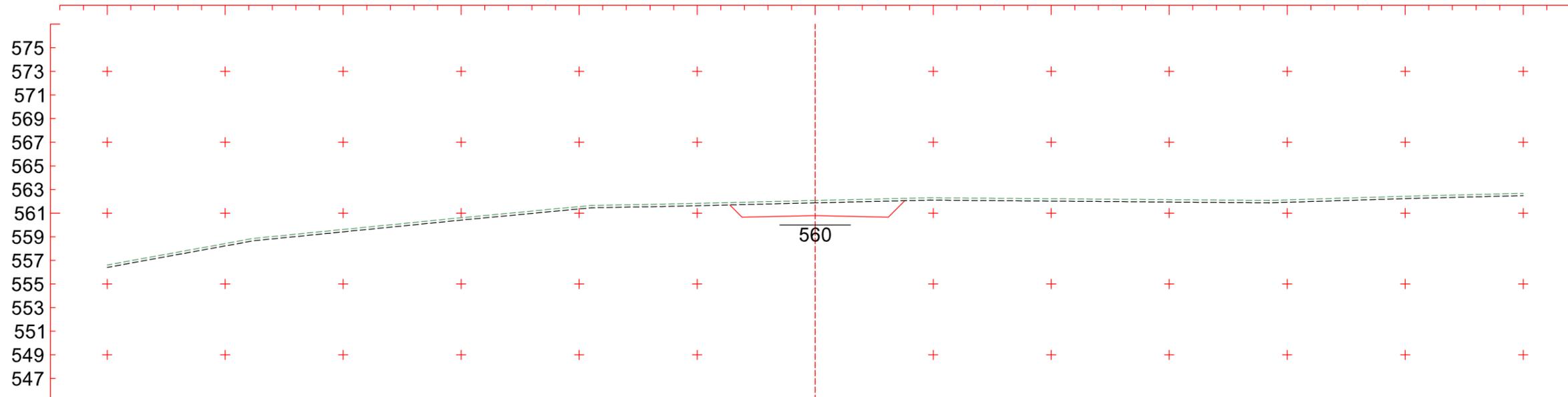


1+700
 CT 566,765 m
 CP 566,911 m

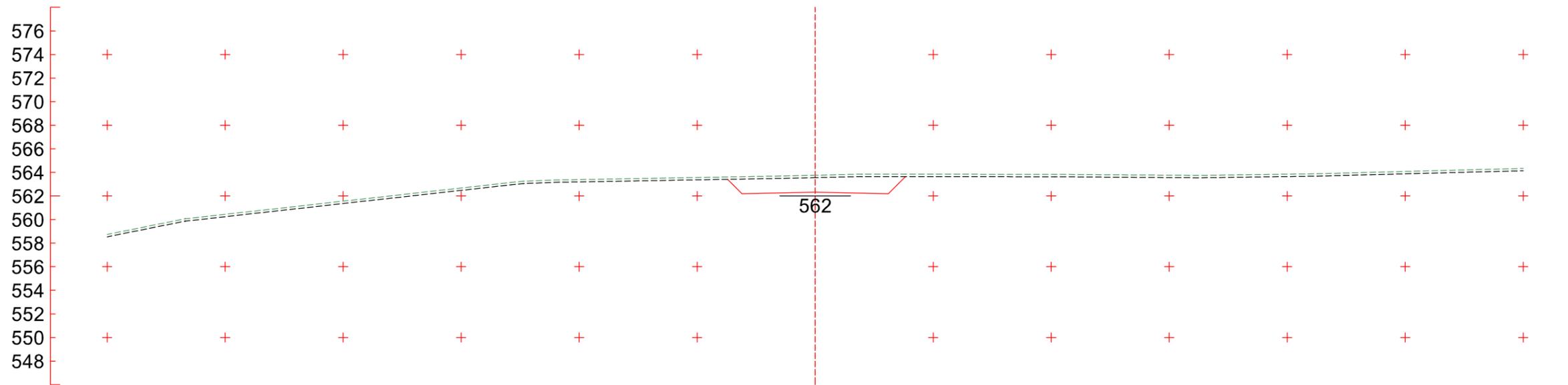


1+680
 CT 567,565 m
 CP 568,443 m

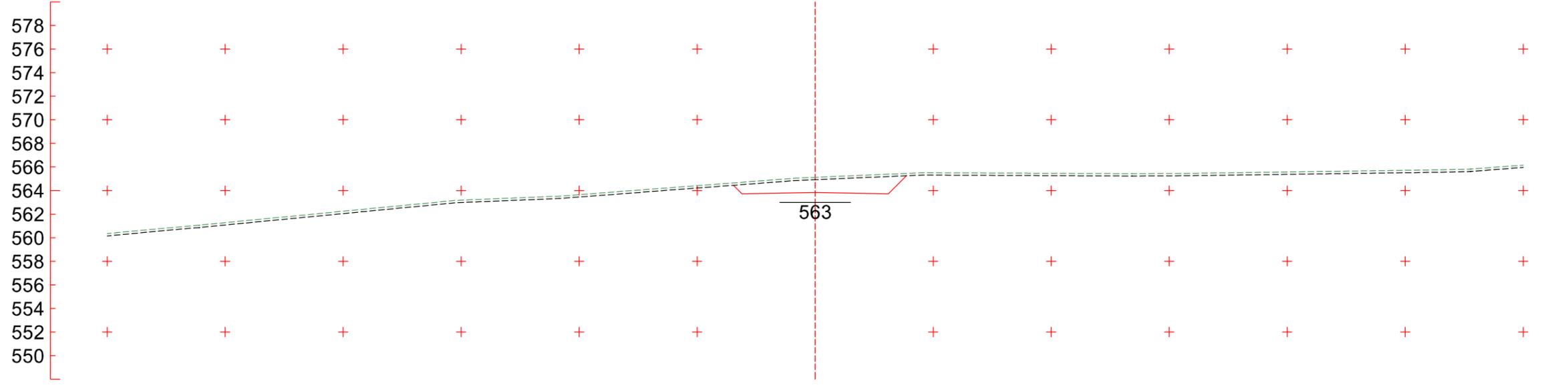
Lote 2
 Escala 1:400



1+780
 CT 562,069 m
 CP 560,784 m

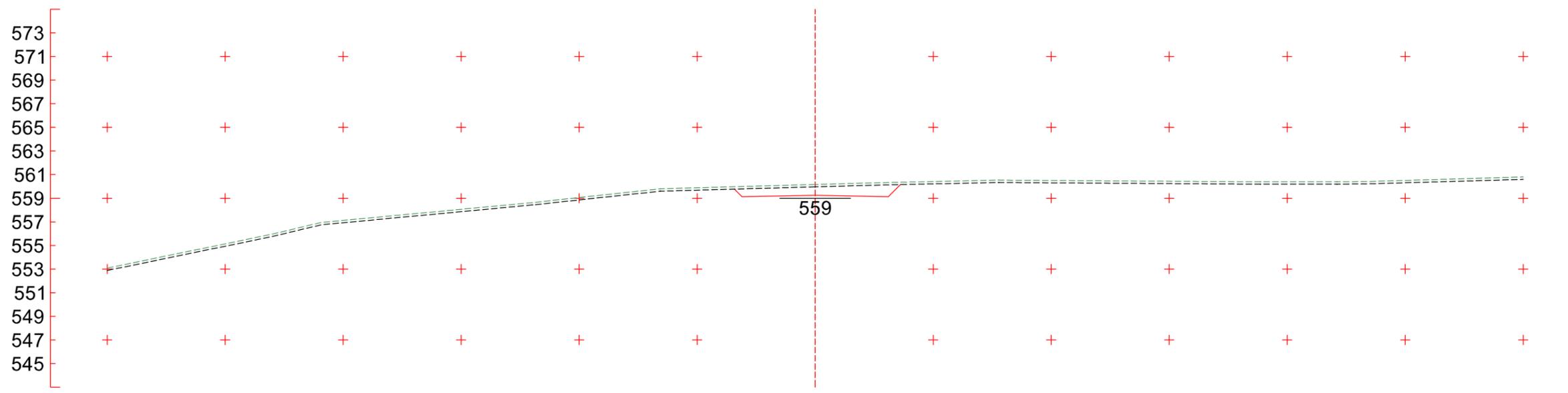
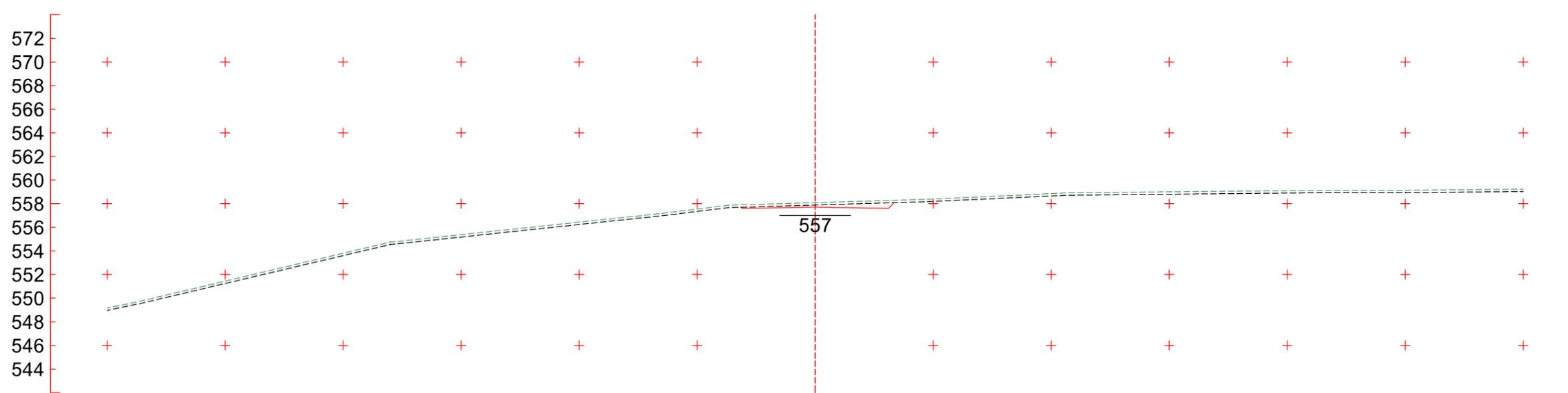
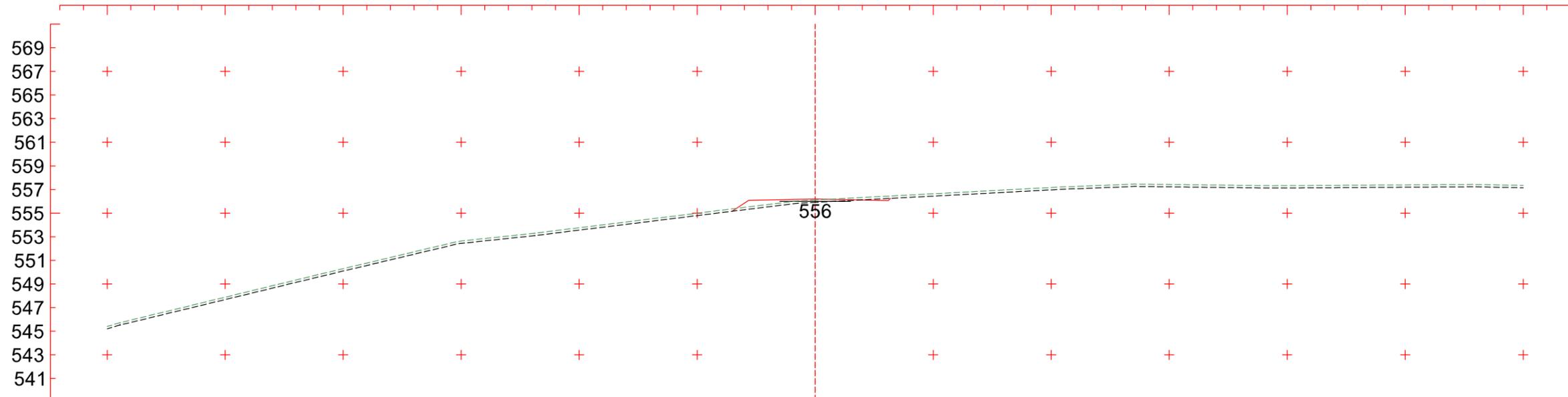


1+760
 CT 563,758 m
 CP 562,316 m

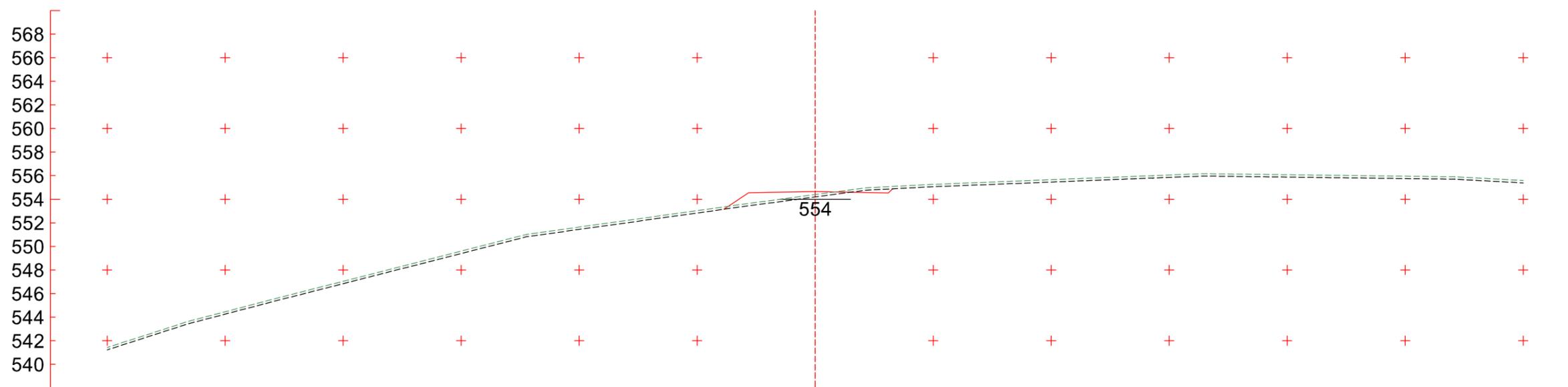
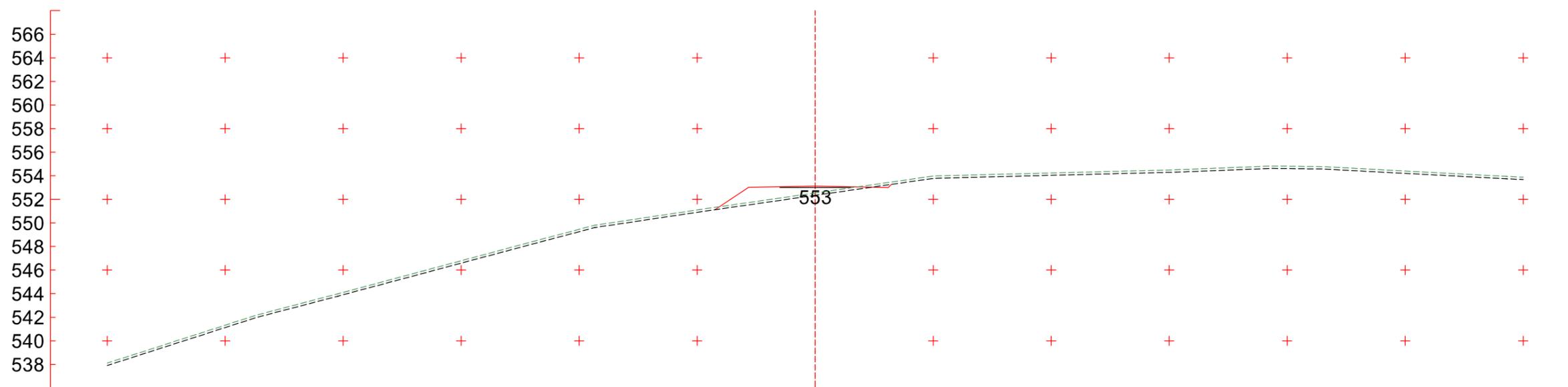
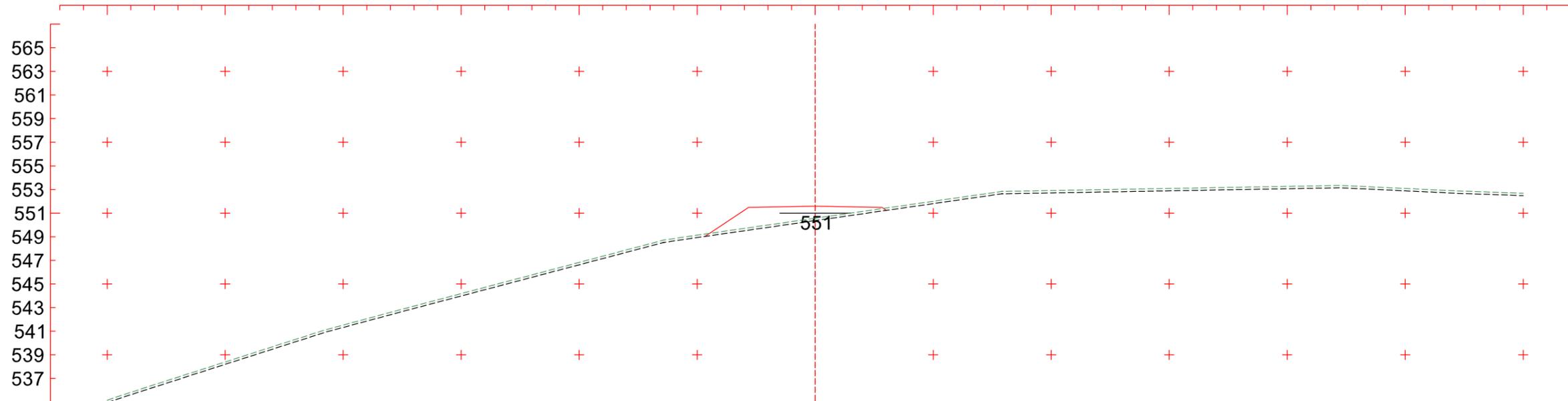


1+740
 CT 565,117 m
 CP 563,848 m

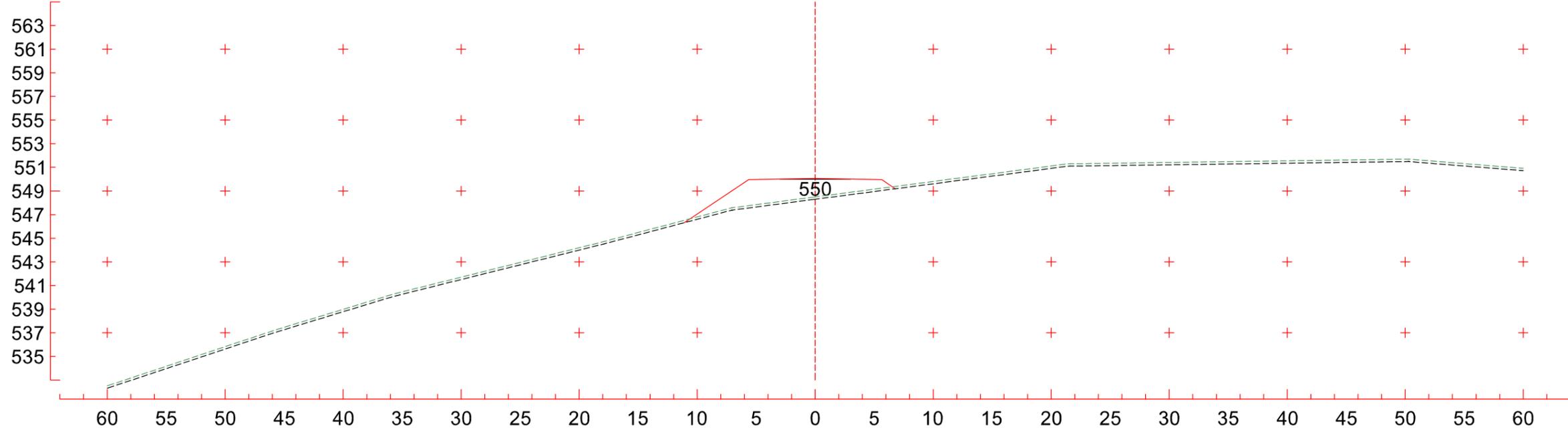
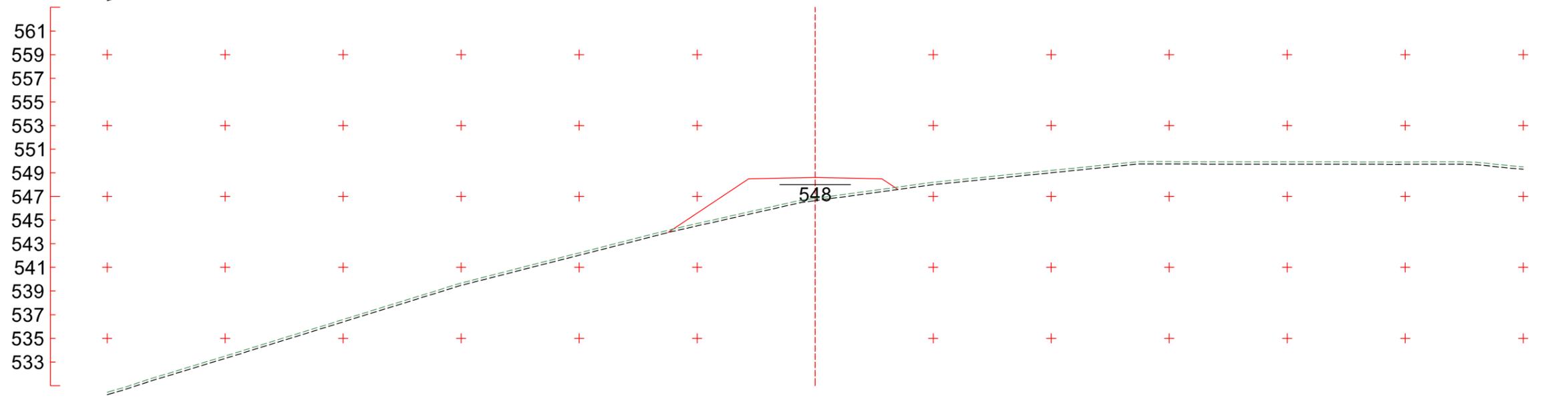
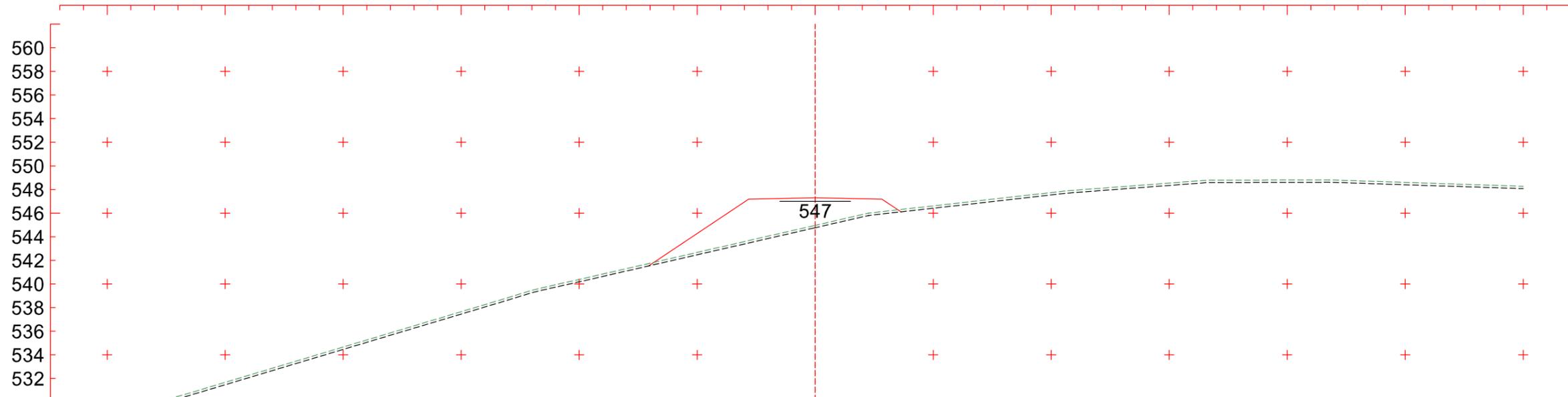
Lote 2
 Escala 1:400



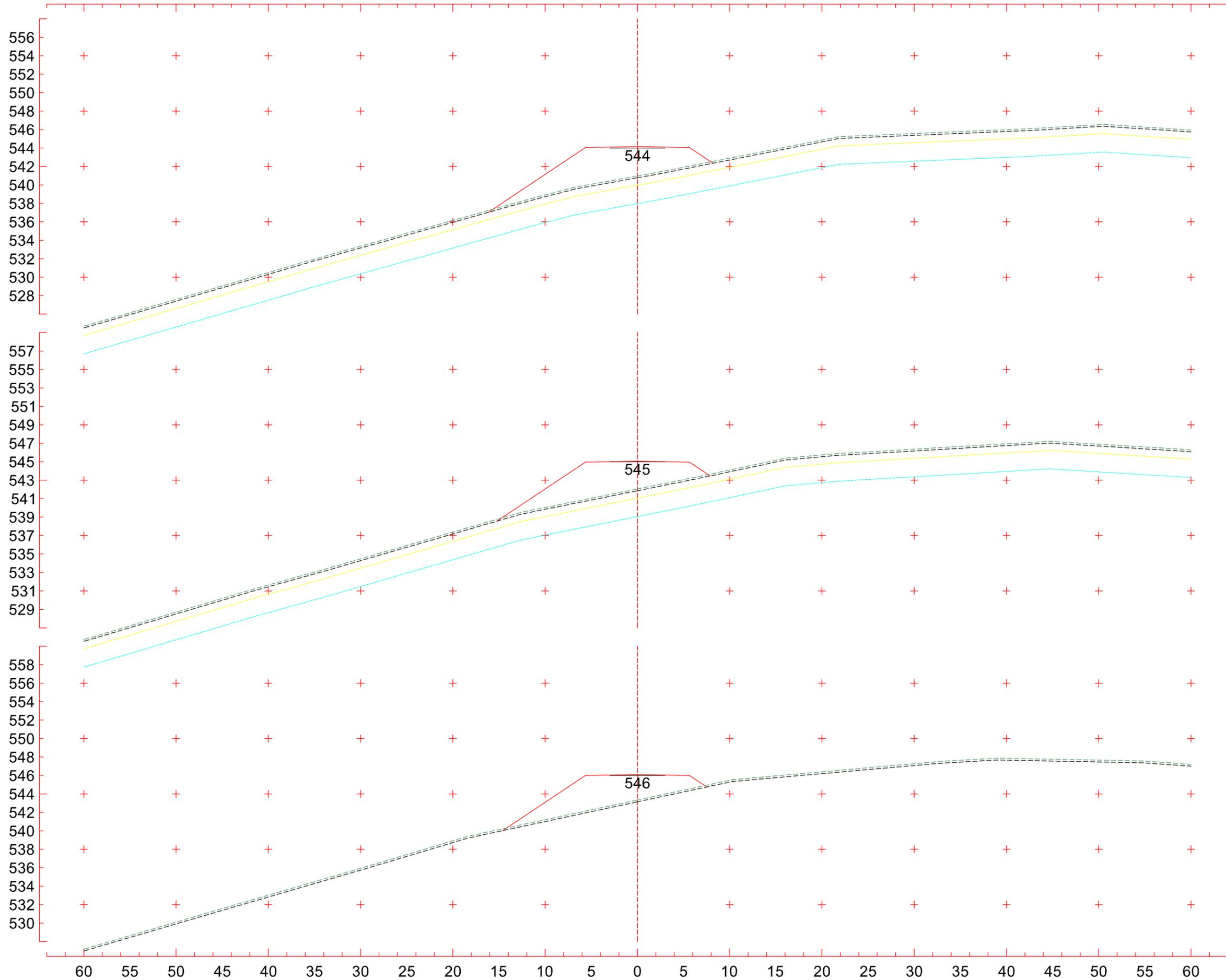
Lote 2
Escala 1:400



Lote 2
 Escala 1:400



Lote 2
Escala 1:400



2+020

CT 540,975 m
CP 544,154 m

544

2+000

CT 542,056 m
CP 545,063 m

545

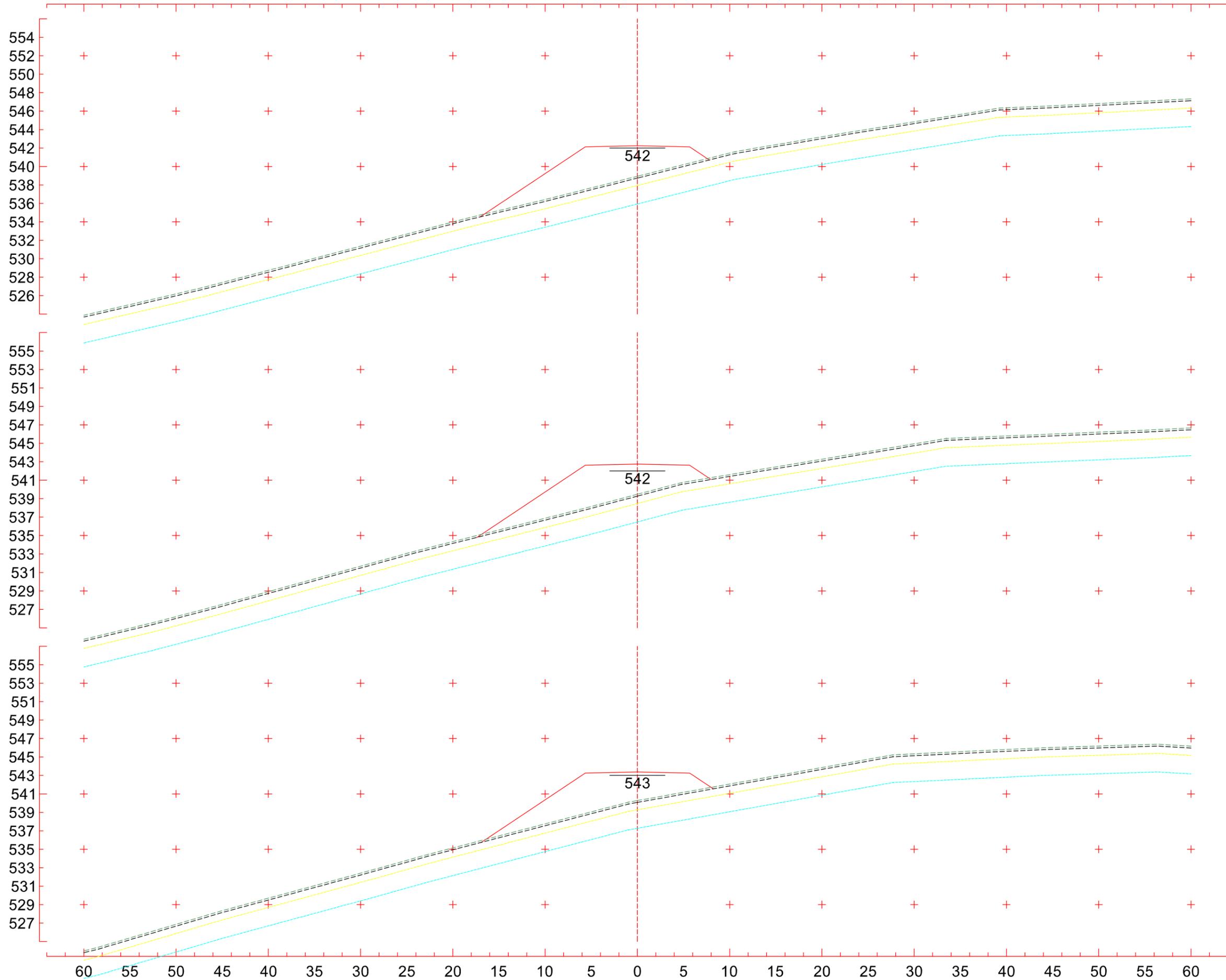
1+980

CT 543,341 m
CP 546,109 m

546

Lote 2

Escala 1:400



2+080

CT 538,938 m
CP 542,244 m

2+060

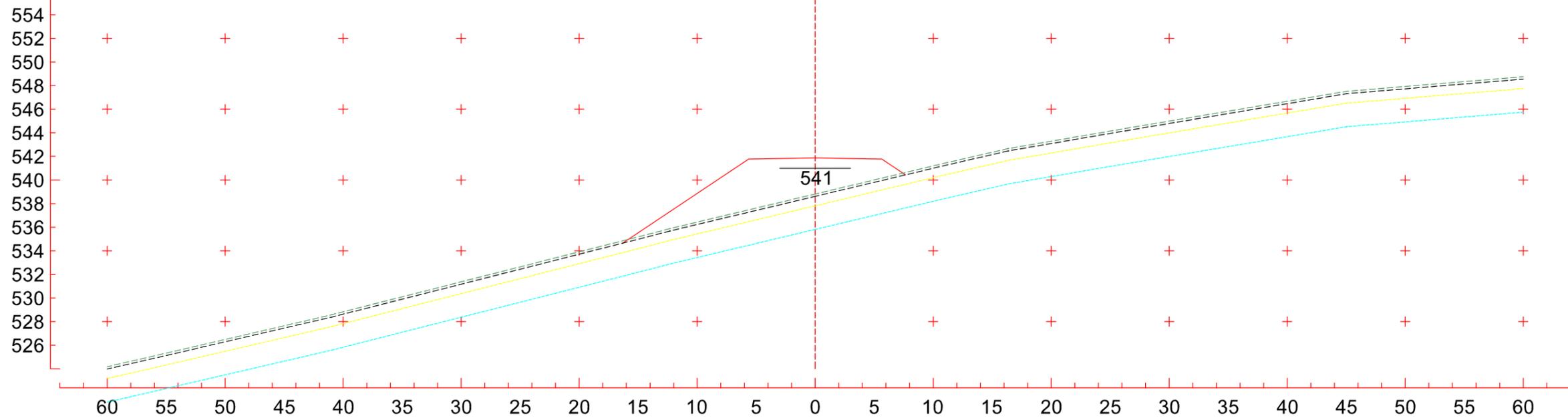
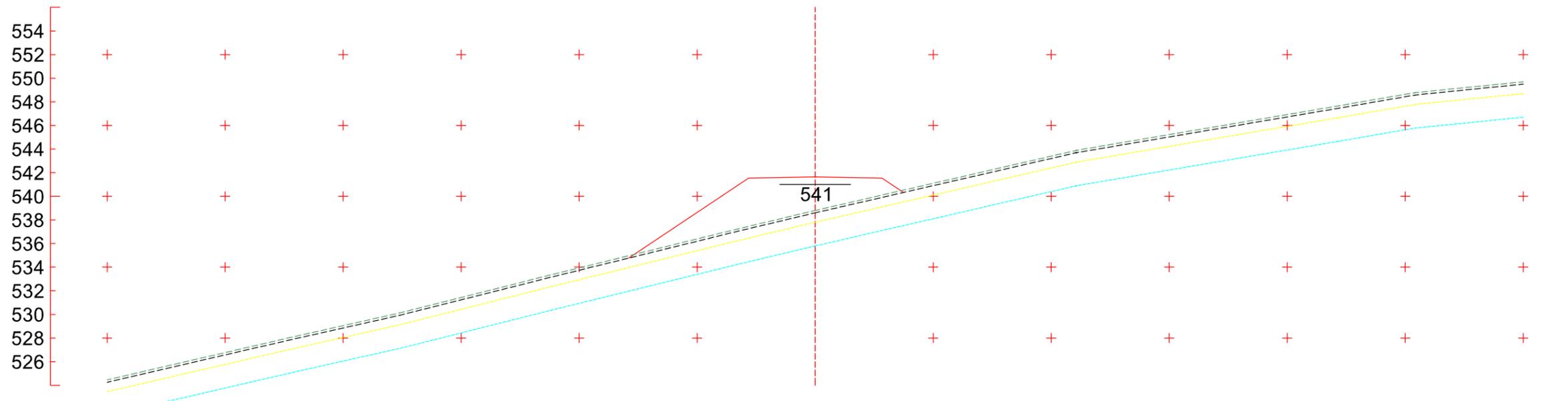
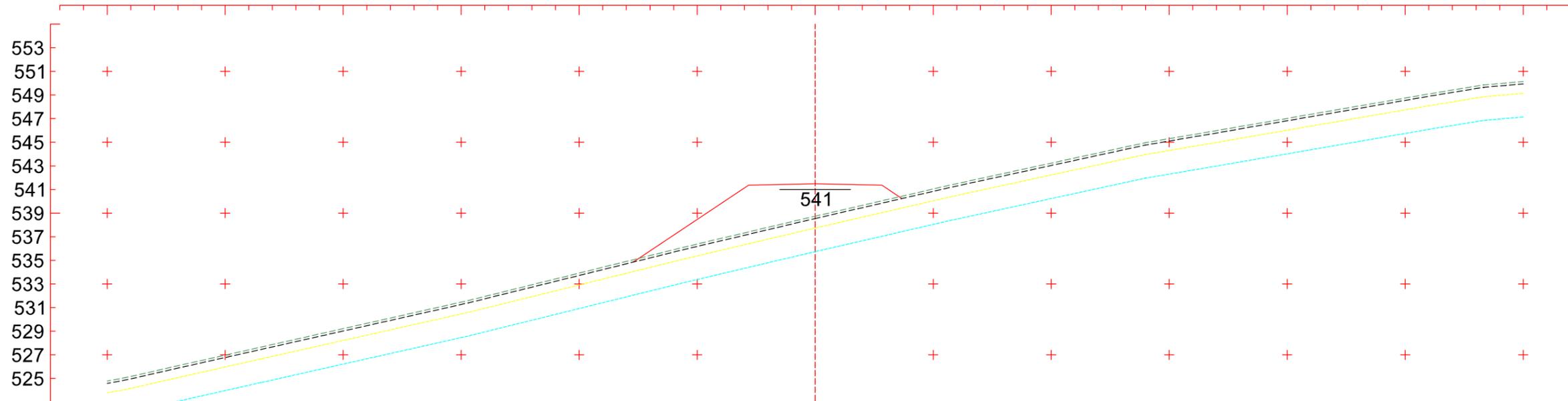
CT 539,474 m
CP 542,745 m

2+040

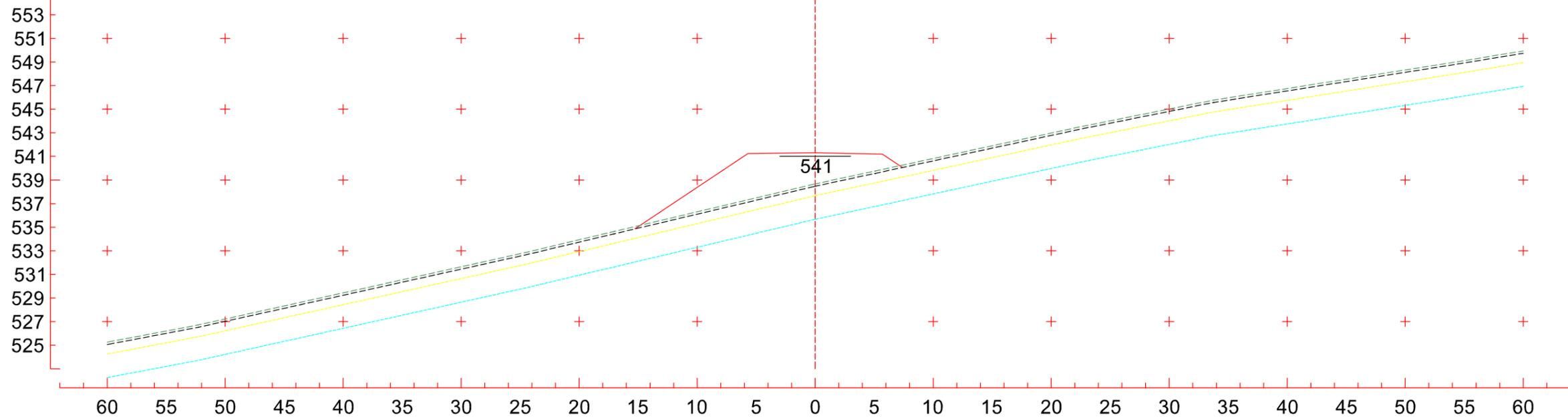
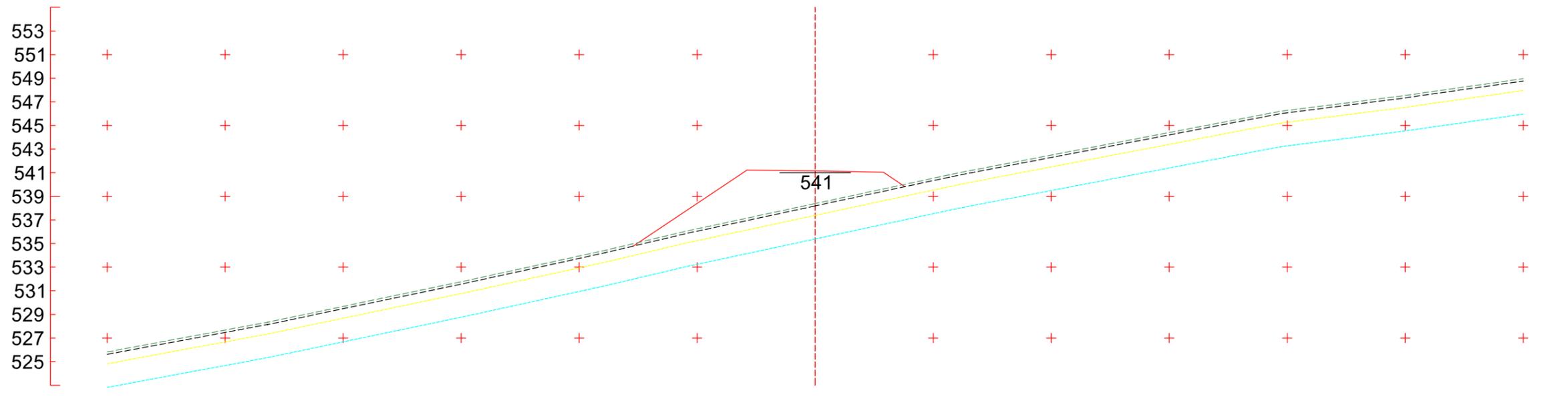
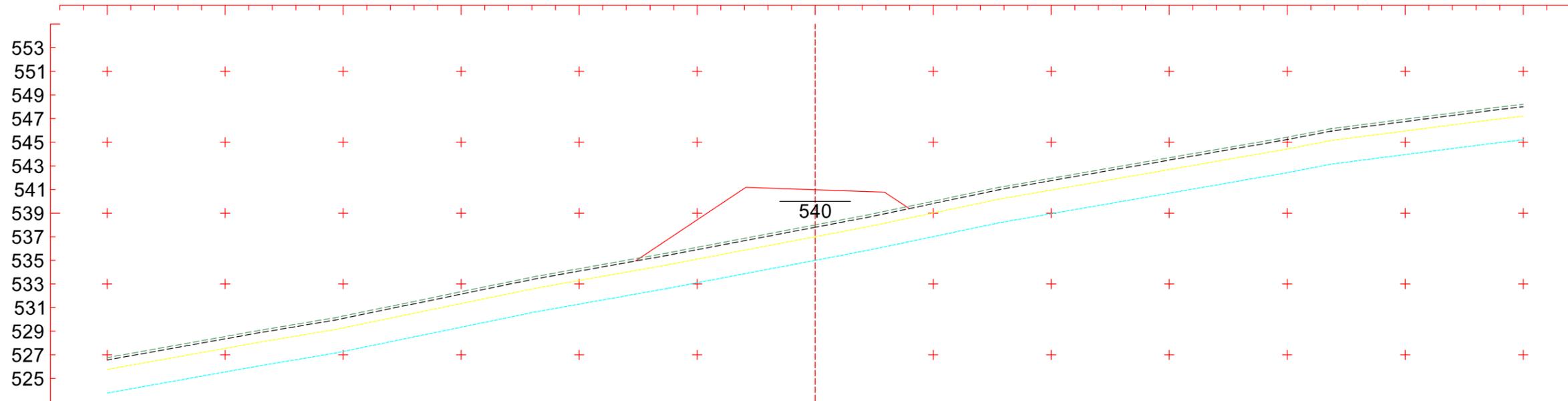
CT 540,275 m
CP 543,381 m

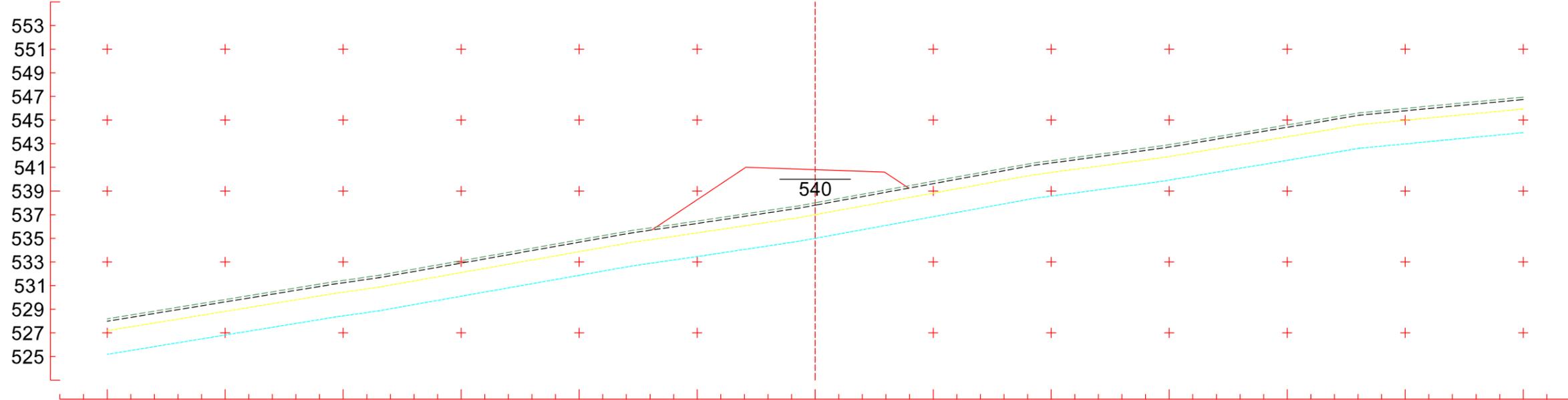
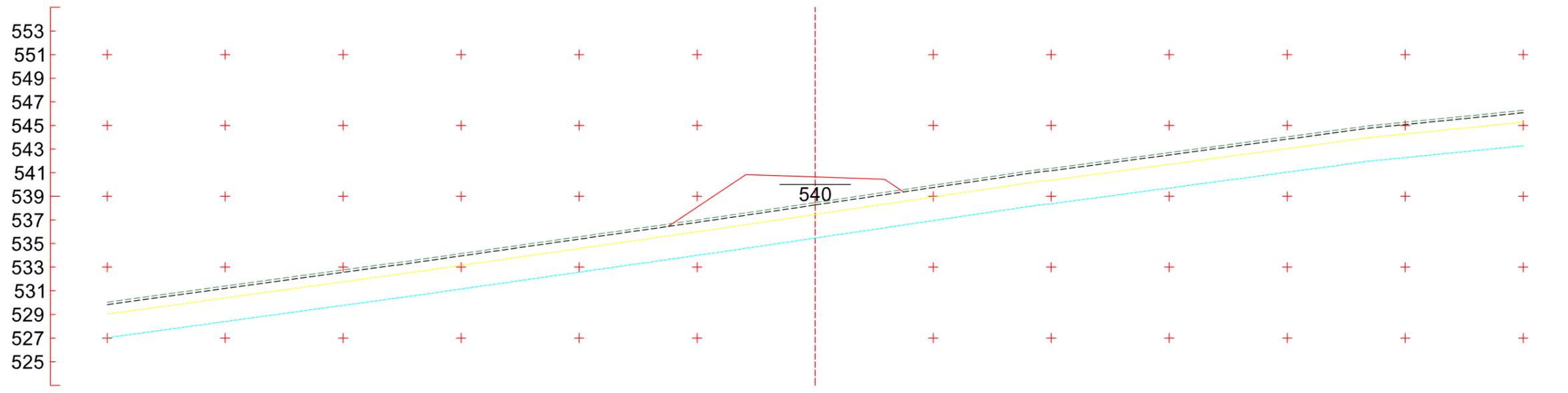
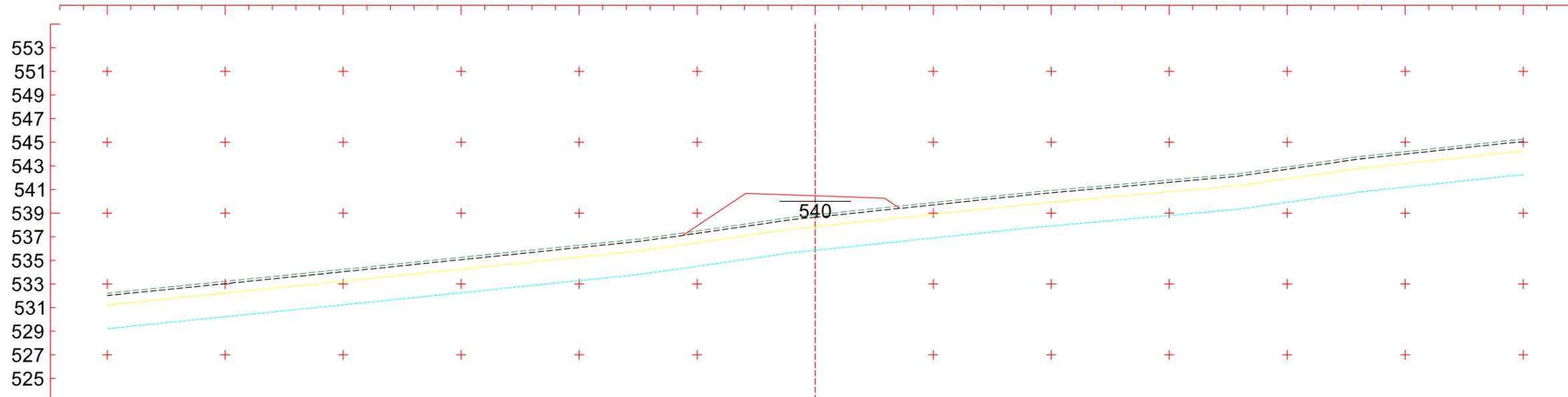
Lote 2

Escala 1:400

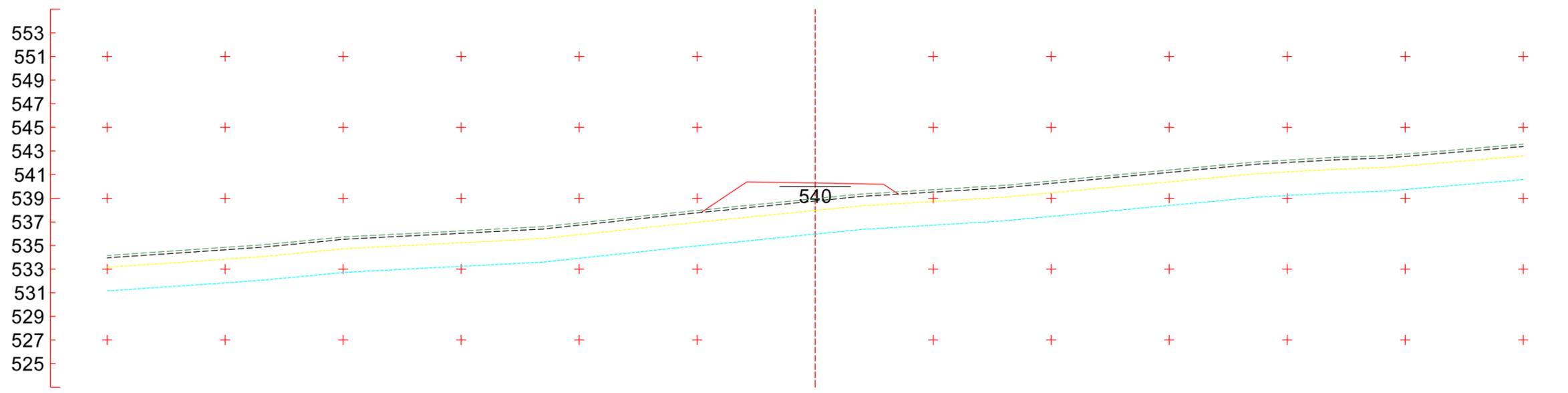
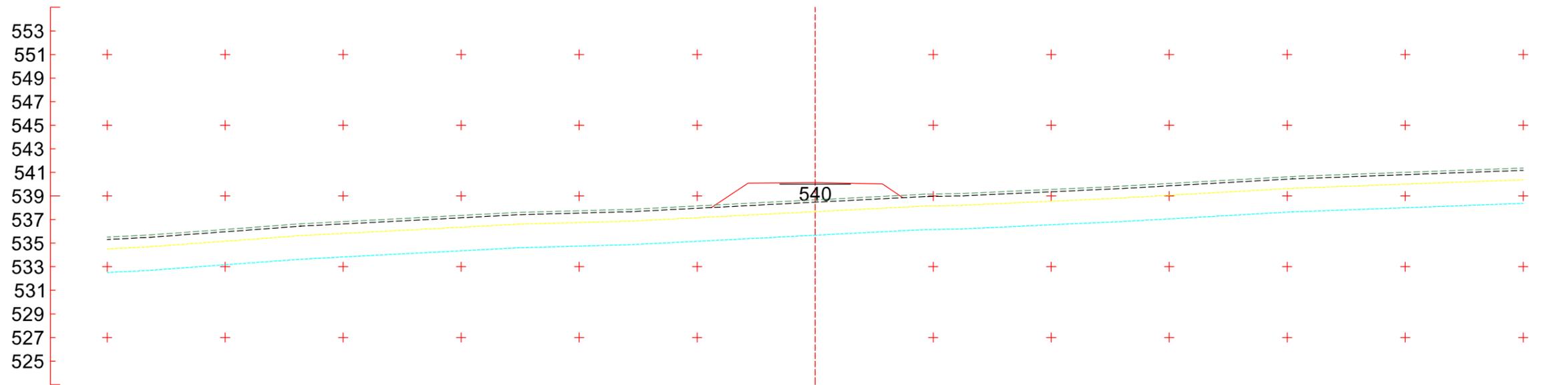
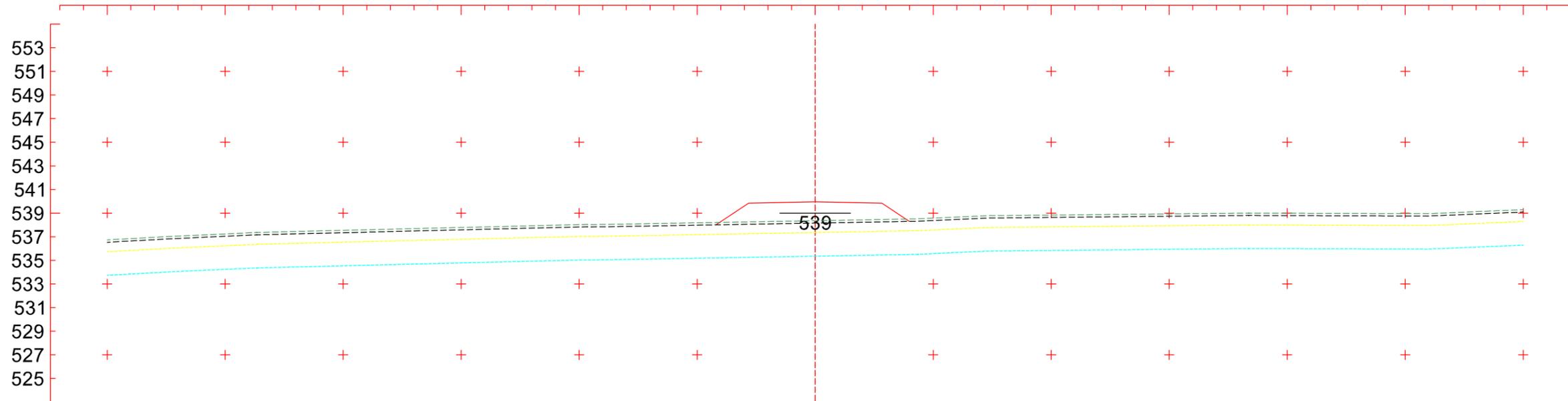


Lote 2
Escala 1:400

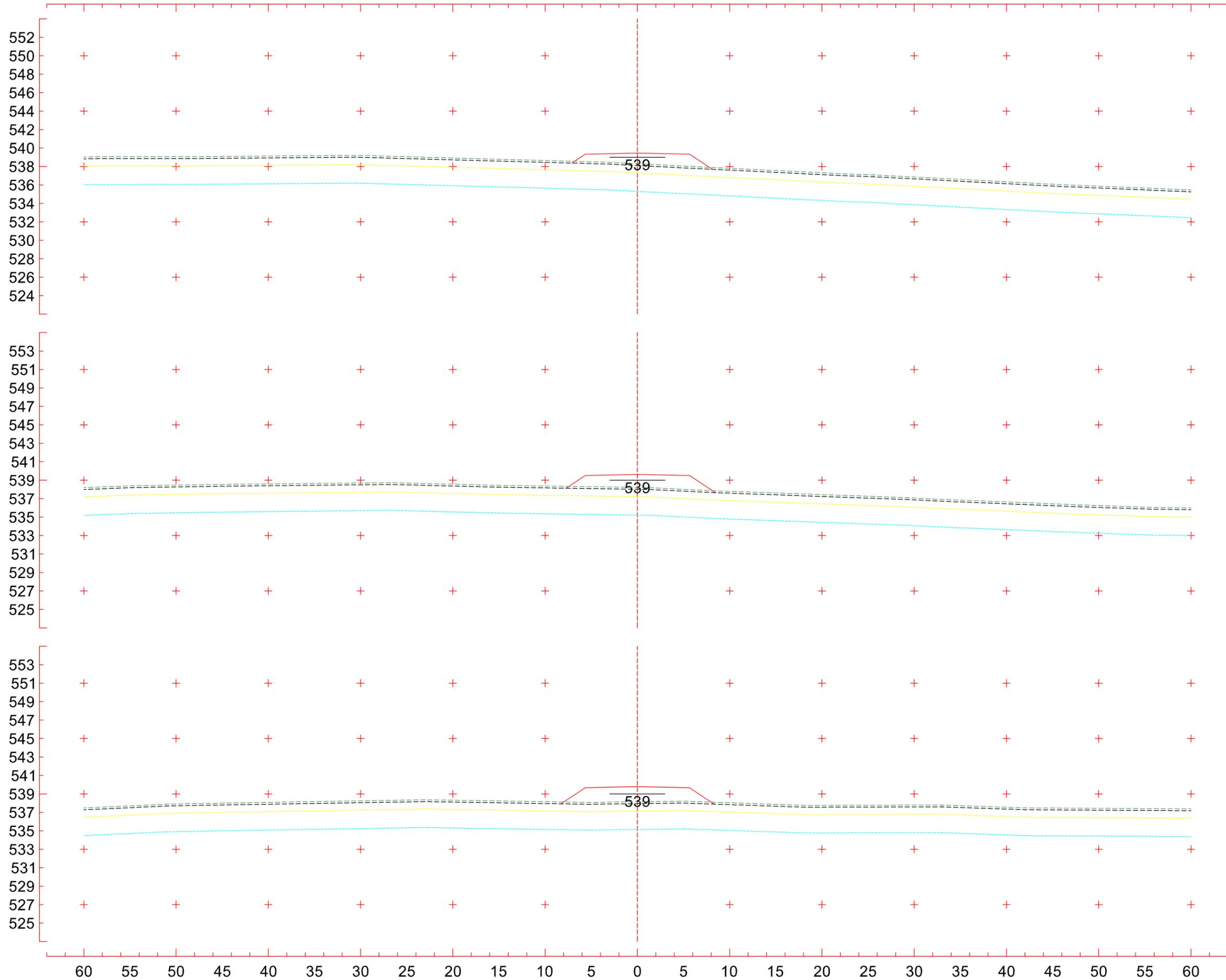




Lote 2
Escala 1:400



Lote 2
Escala 1:400



2+380

CT 538,300 m
CP 539,453 m

2+360

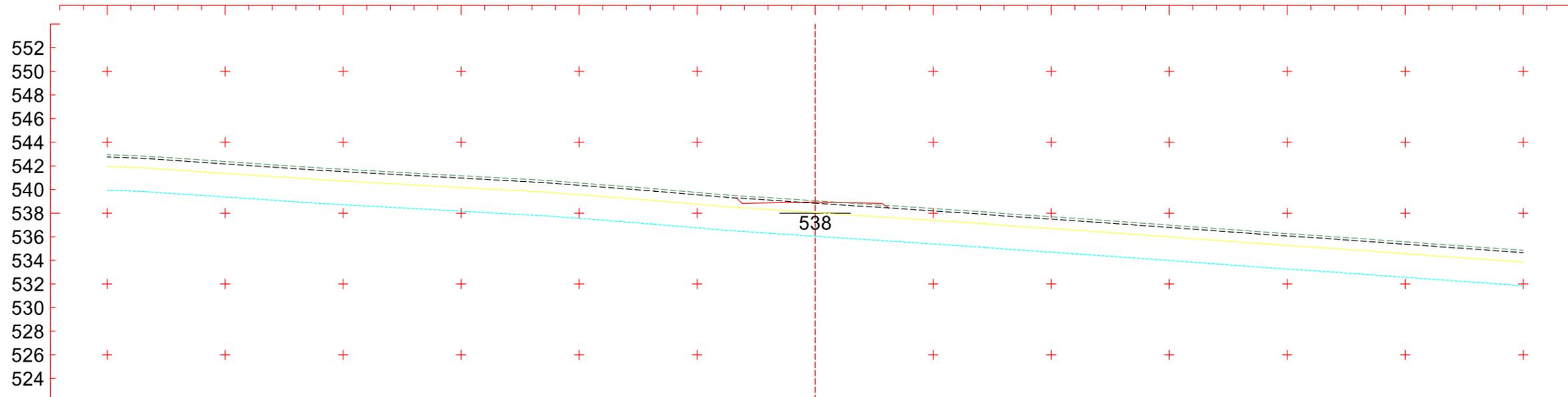
CT 538,216 m
CP 539,622 m

2+340

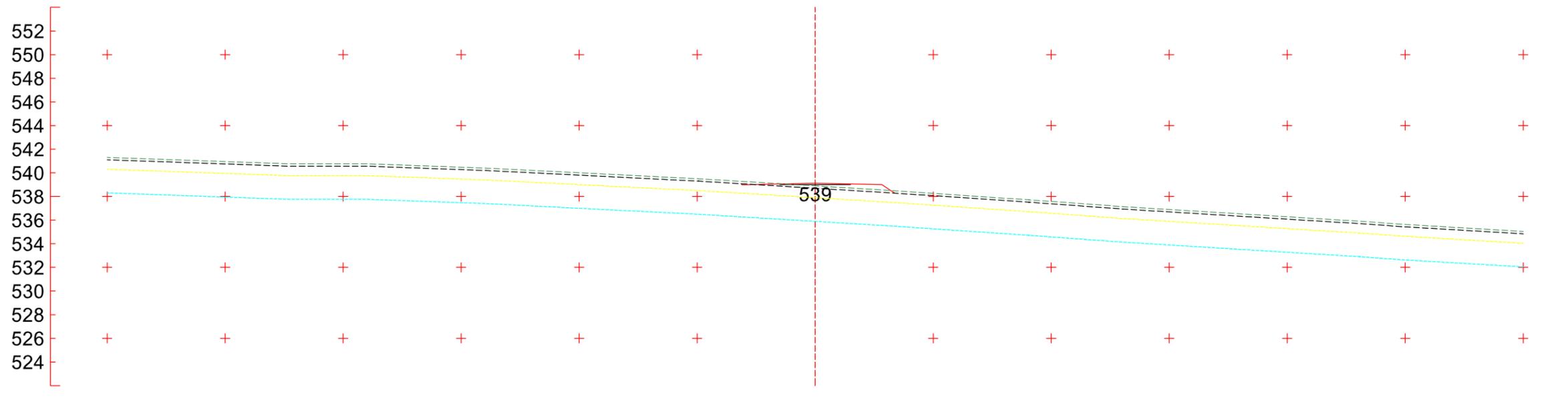
CT 538,147 m
CP 539,792 m

Lote 2

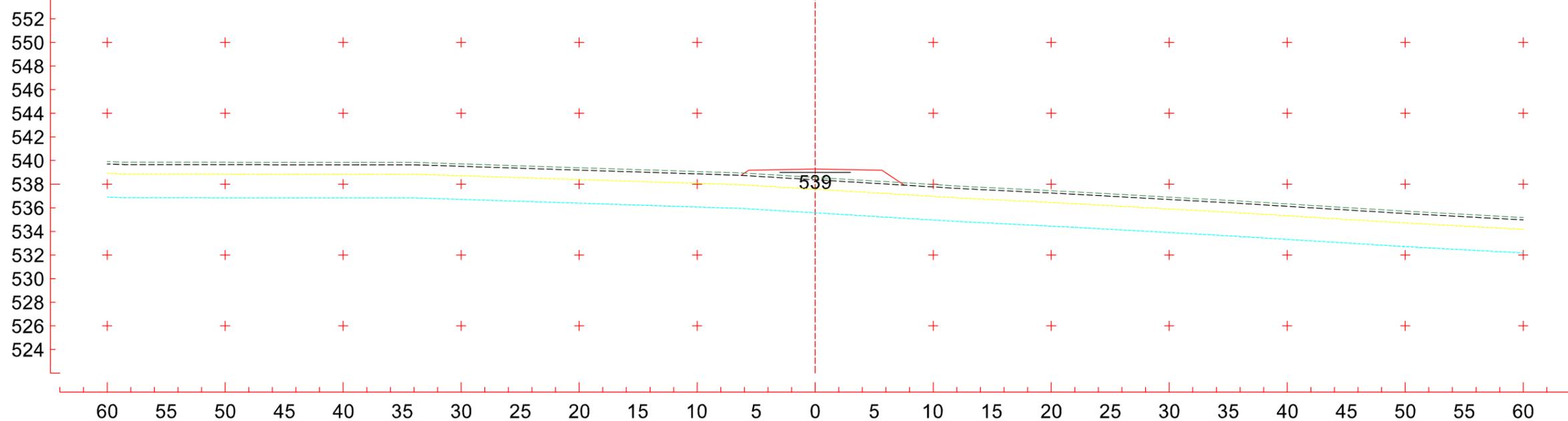
Escala 1:400



2+440
 CT 539,044 m
 CP 538,946 m

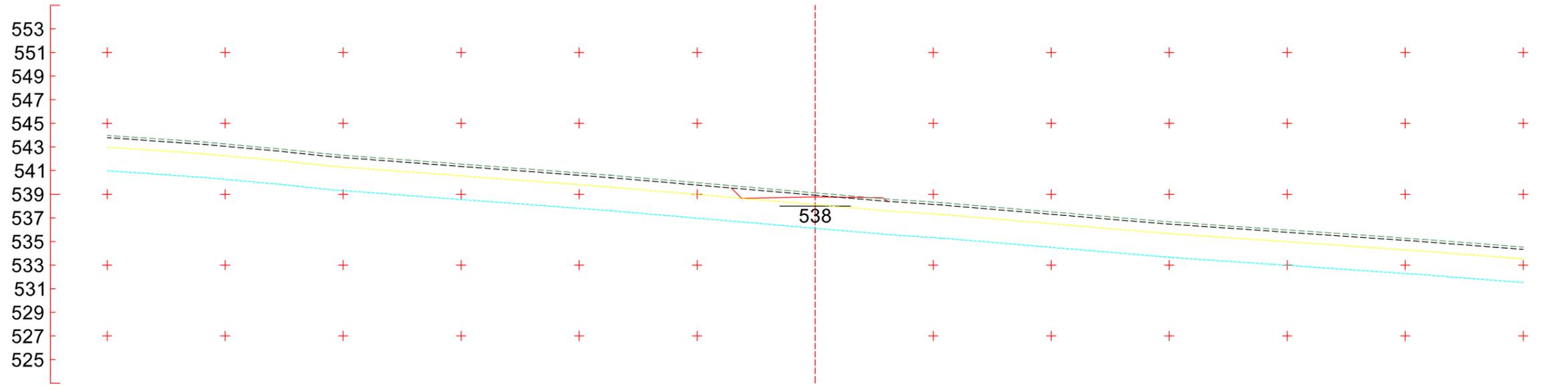
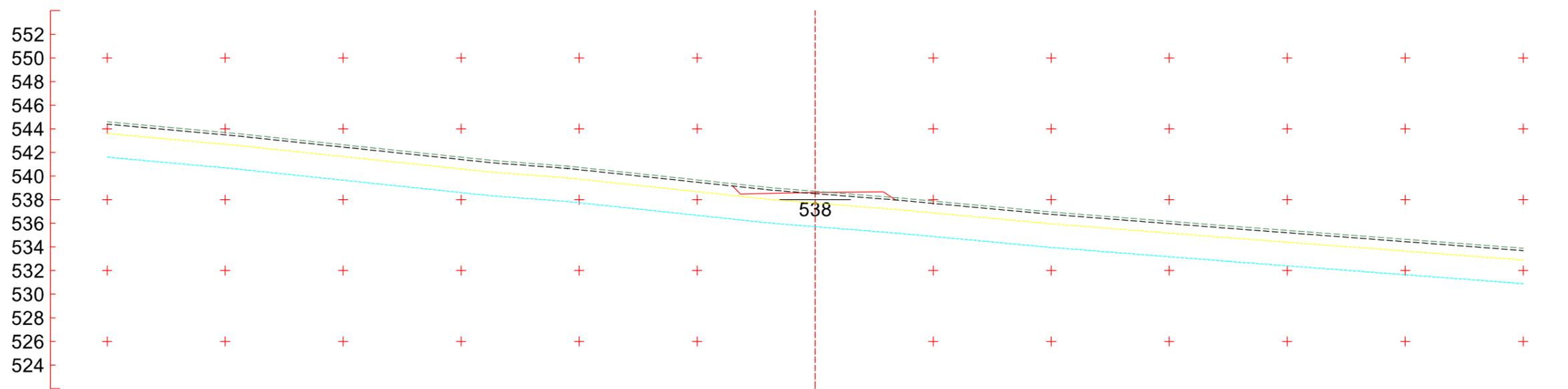
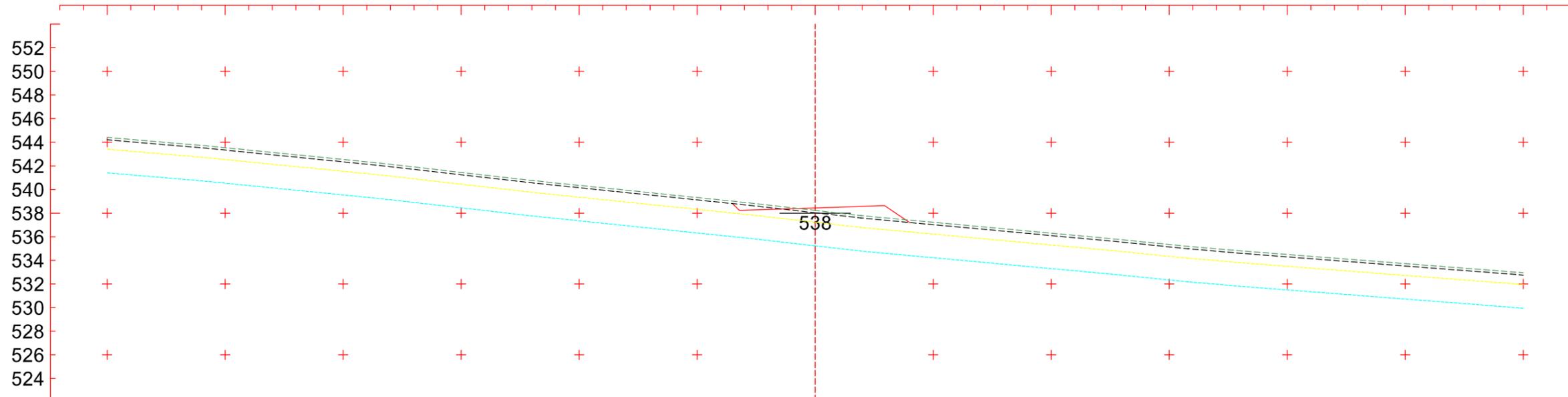


2+420
 CT 538,896 m
 CP 539,115 m

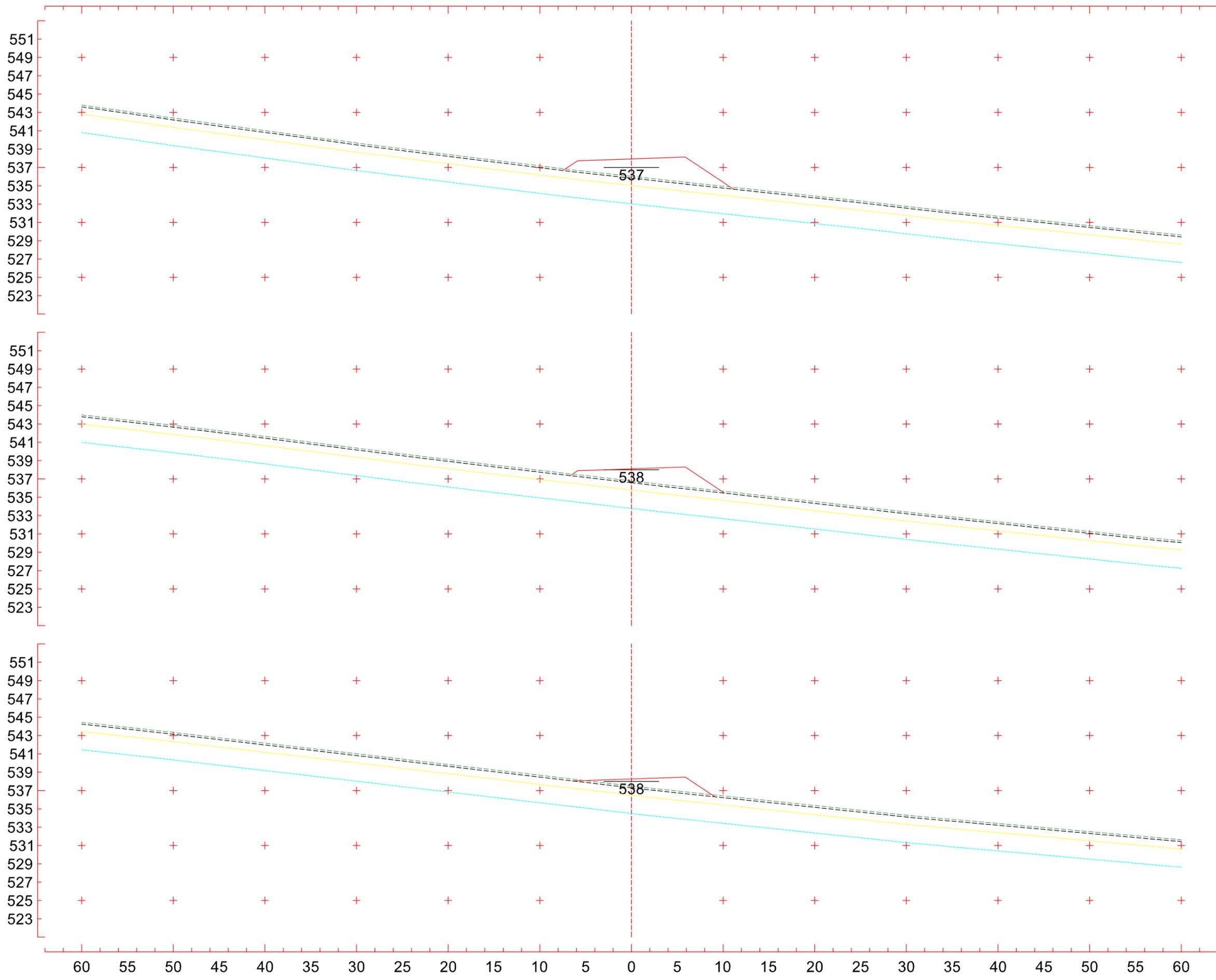


2+400
 CT 538,570 m
 CP 539,284 m

Lote 2
 Escala 1:400



Lote 2
Escala 1:400



2+560

CT 536,027 m
CP 537,931 m

537

2+540

CT 536,787 m
CP 538,100 m

538

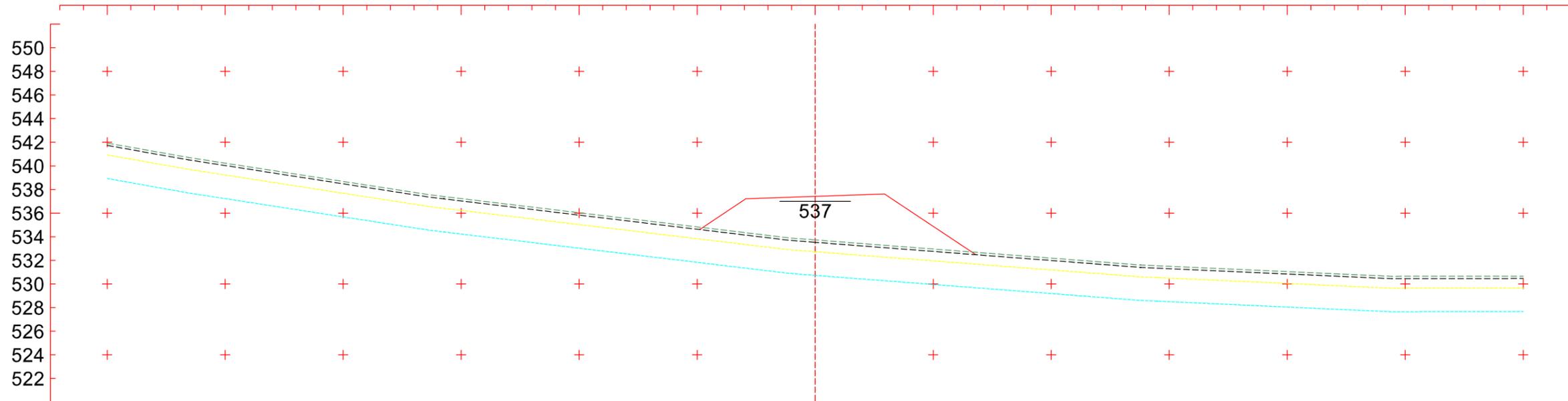
2+520

CT 537,497 m
CP 538,269 m

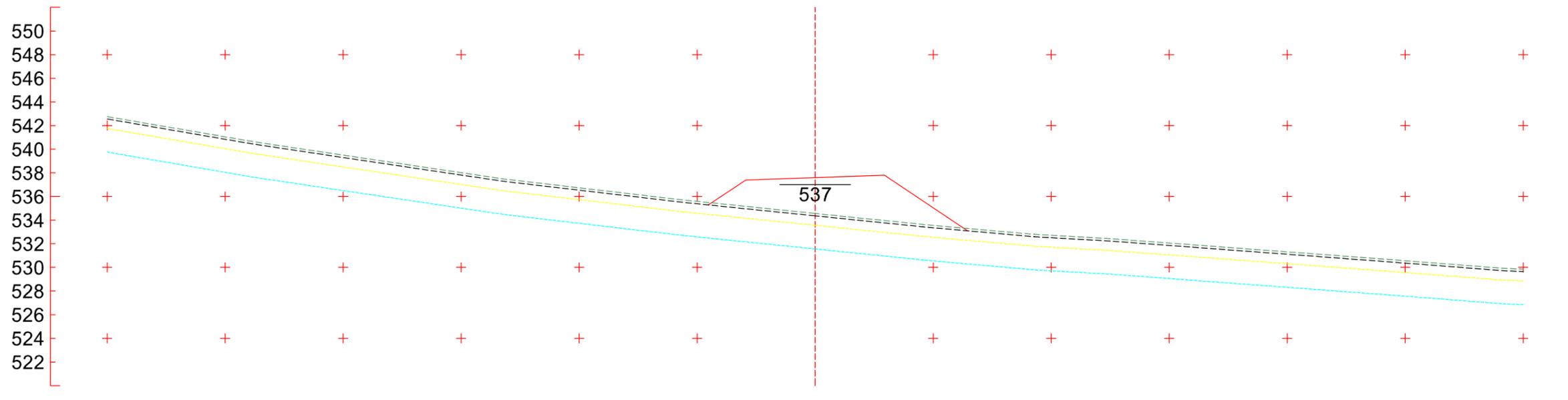
538

Lote 2

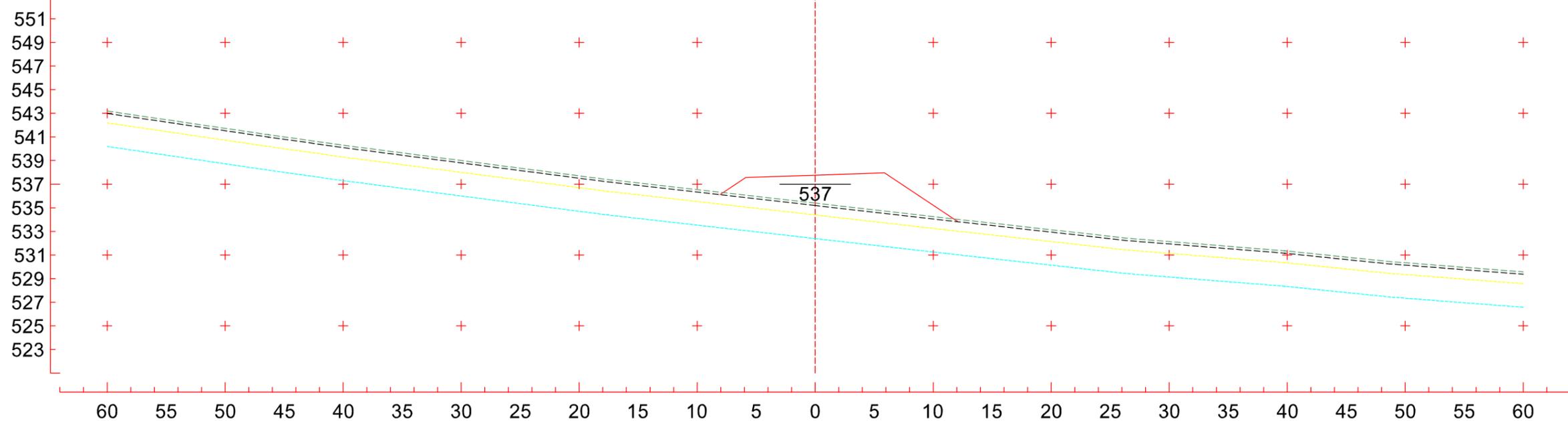
Escala 1:400



2+620
 CT 533,728 m
 CP 537,424 m

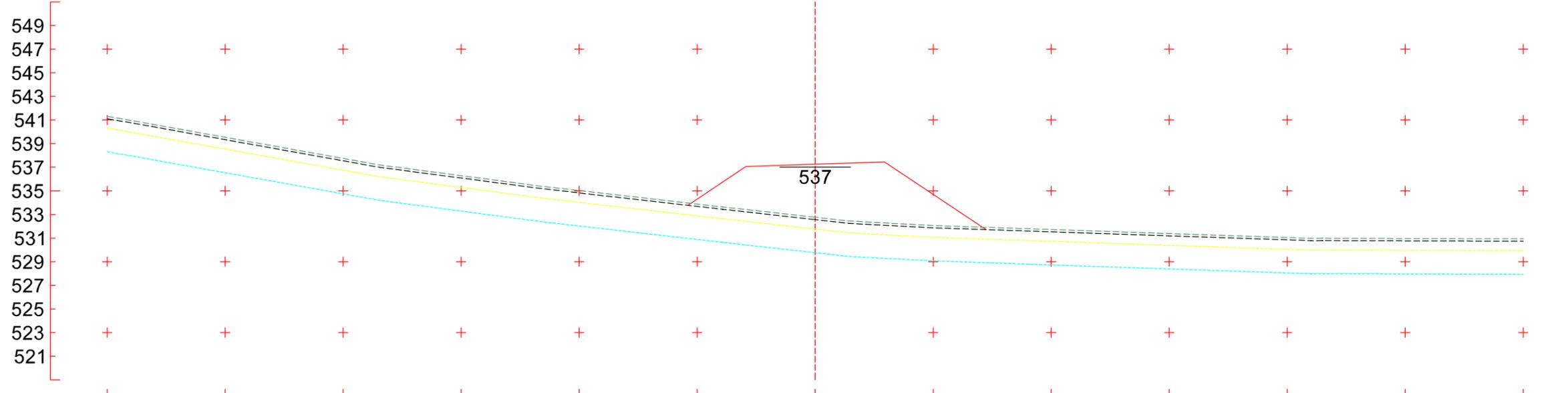
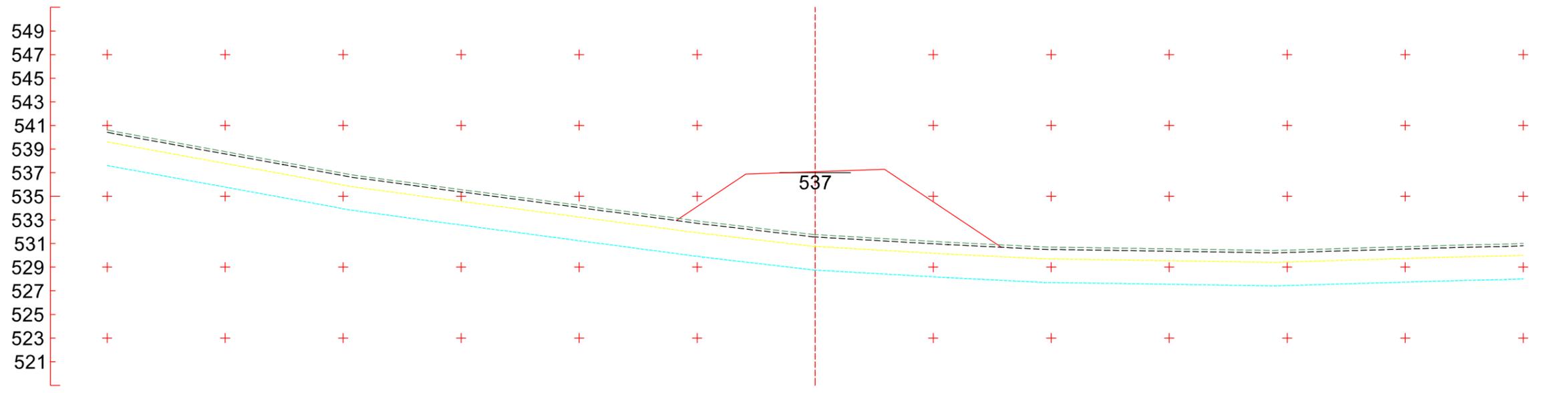
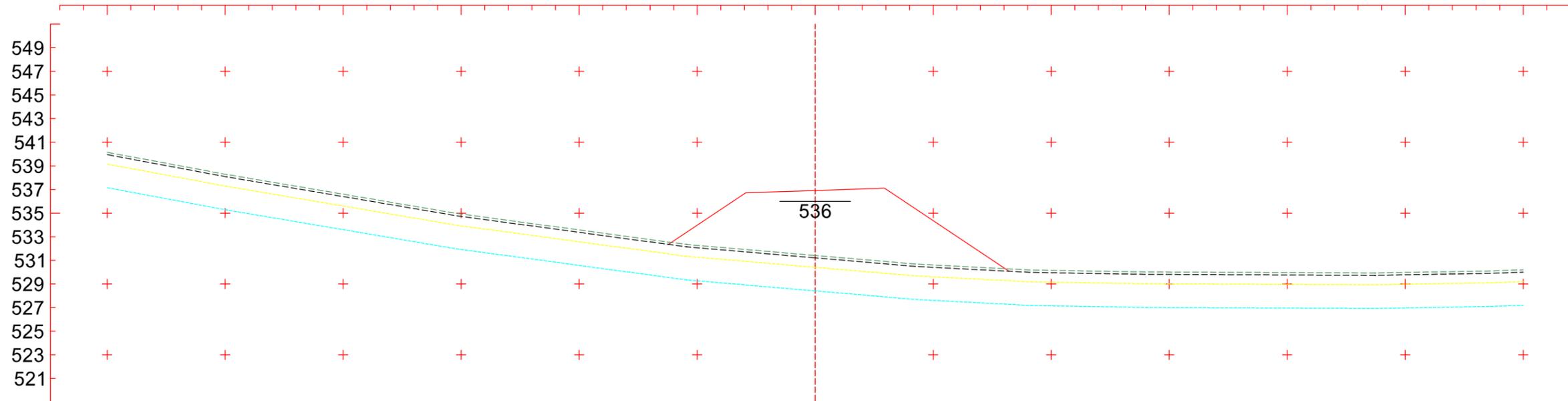


2+600
 CT 534,563 m
 CP 537,593 m

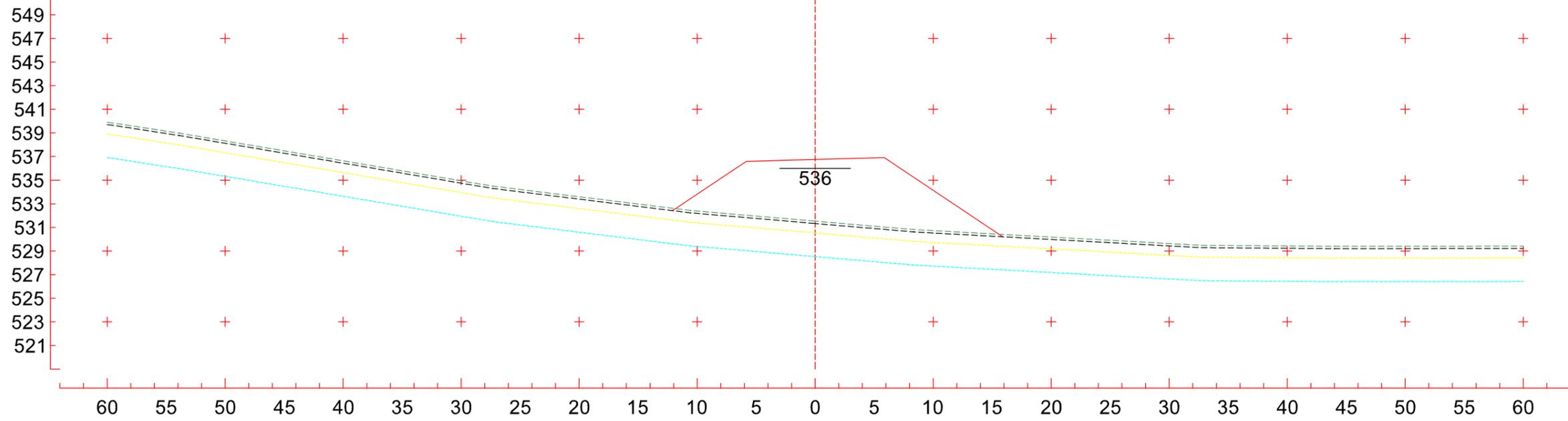
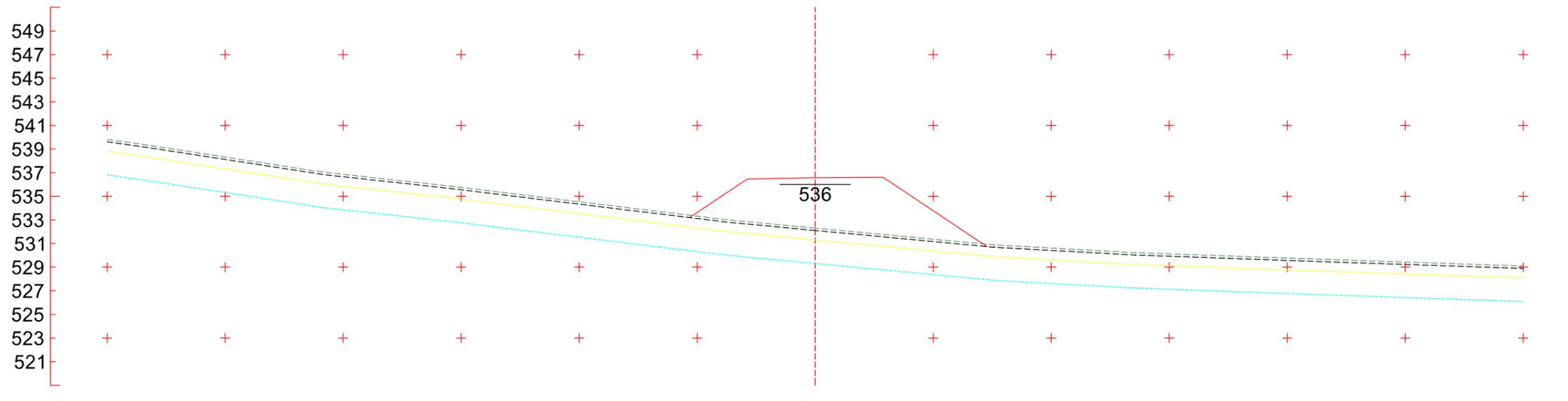
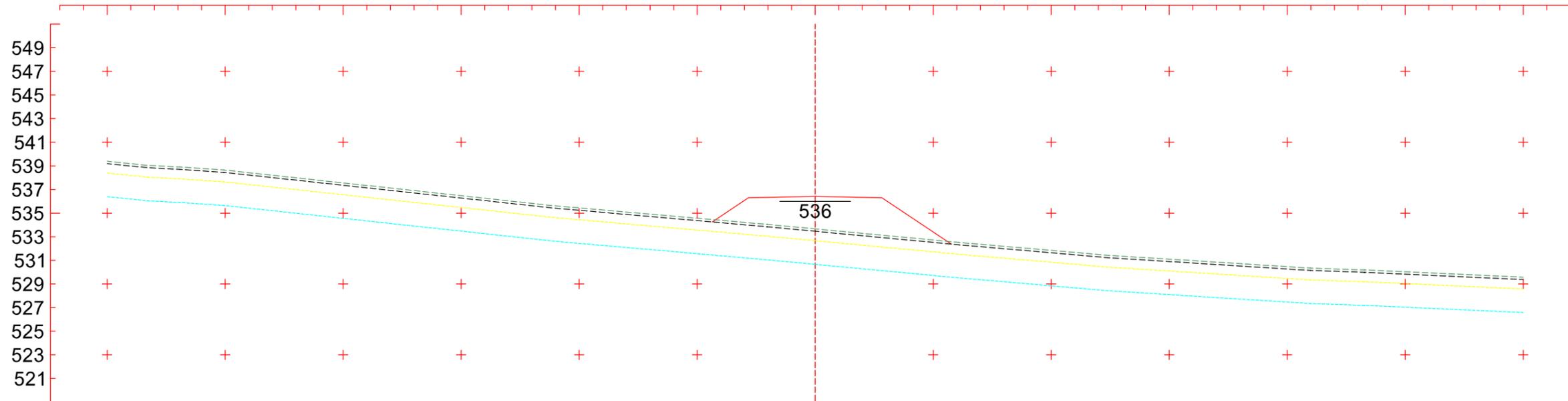


2+580
 CT 535,393 m
 CP 537,762 m

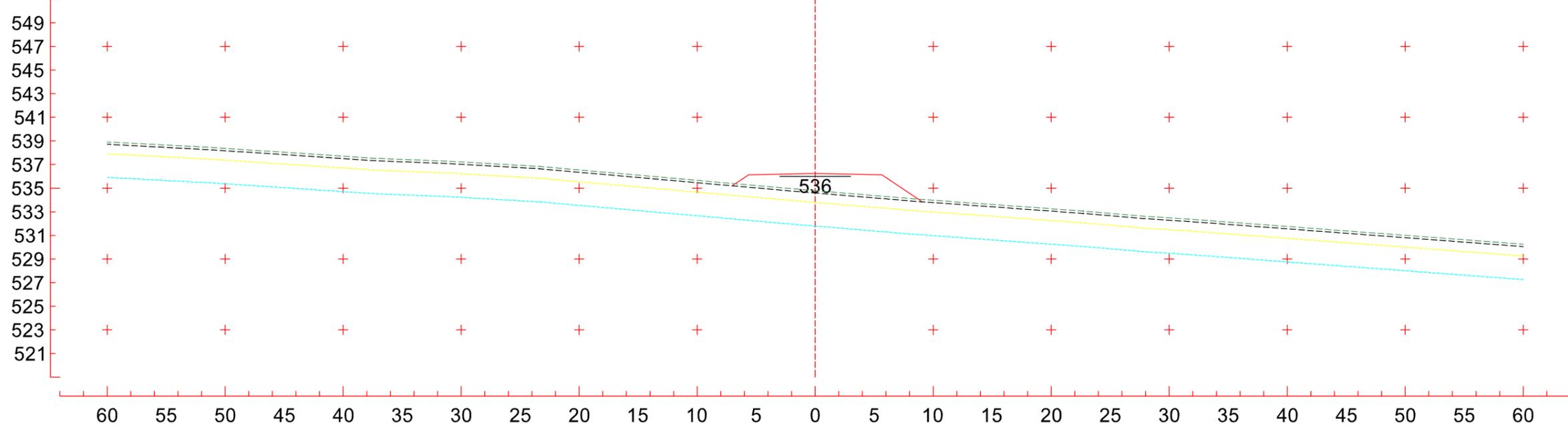
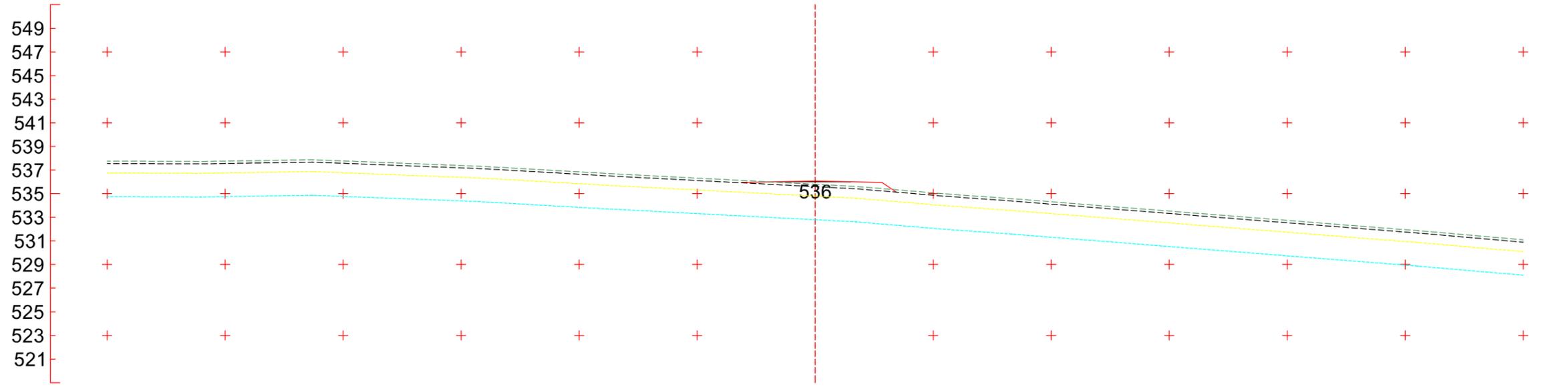
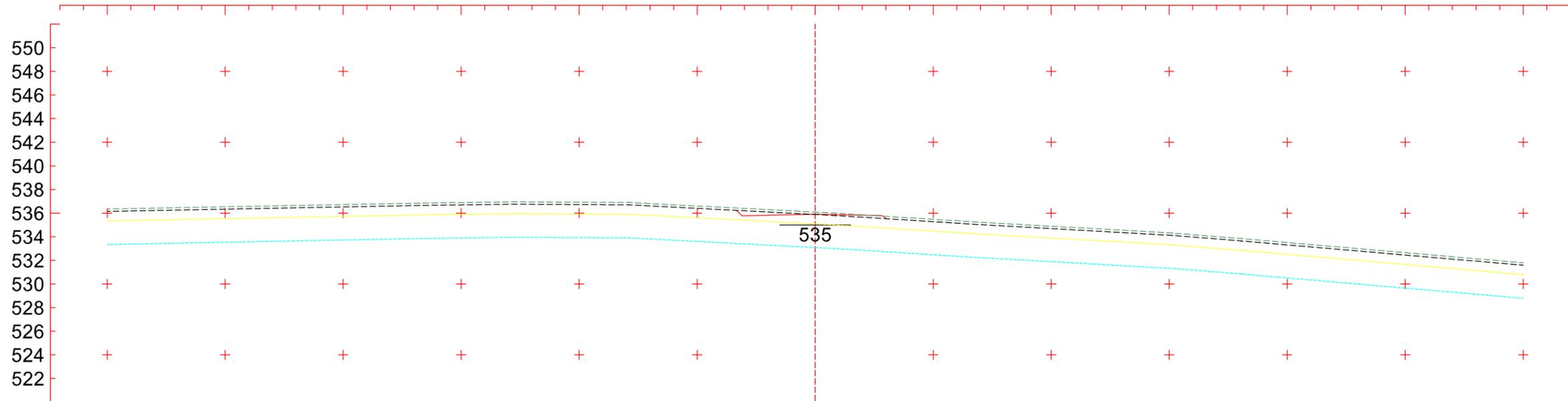
Lote 2
 Escala 1:400



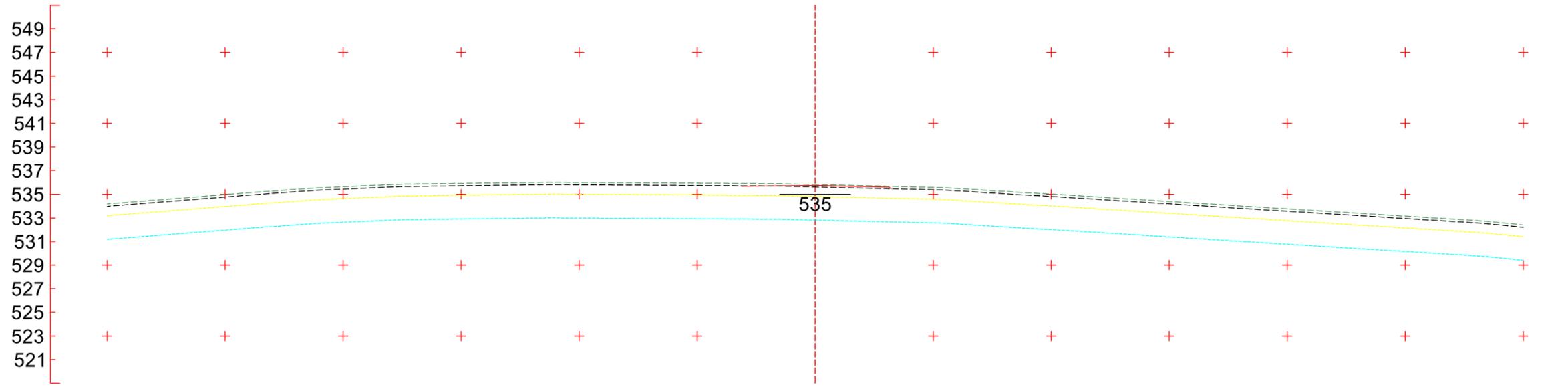
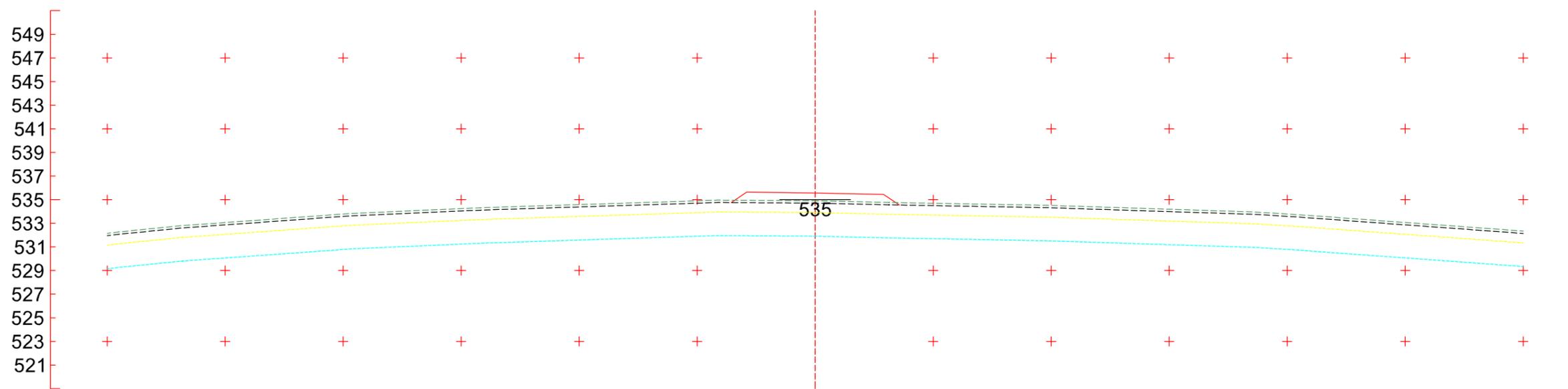
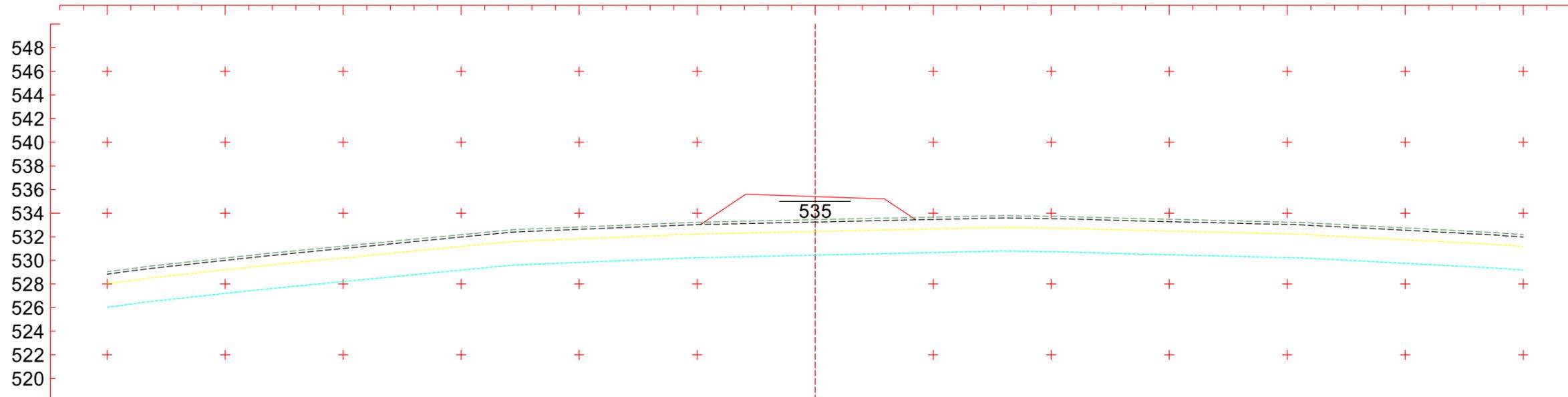
Lote 2
Escala 1:400



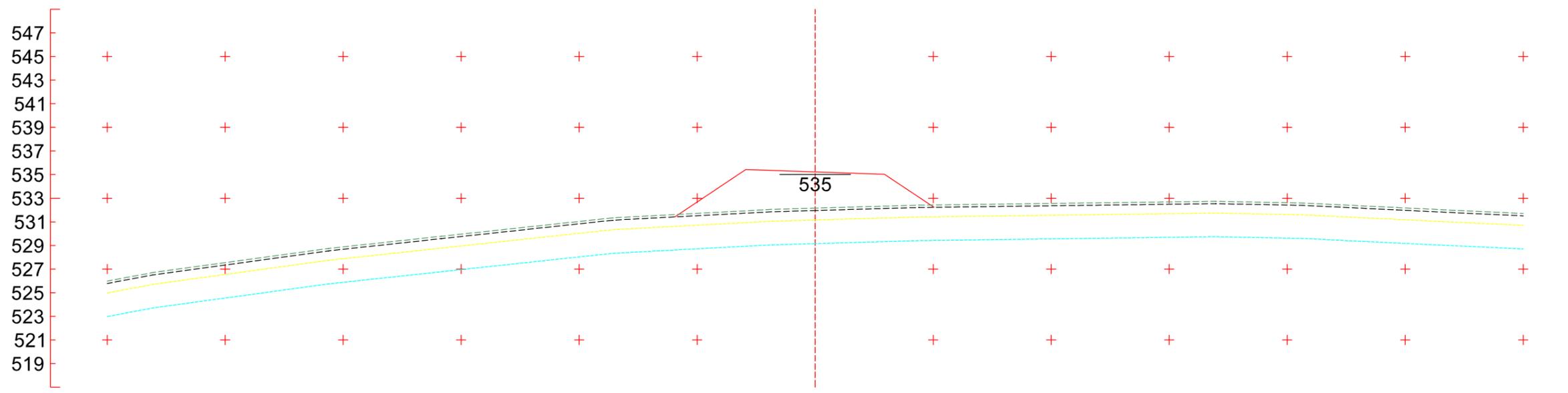
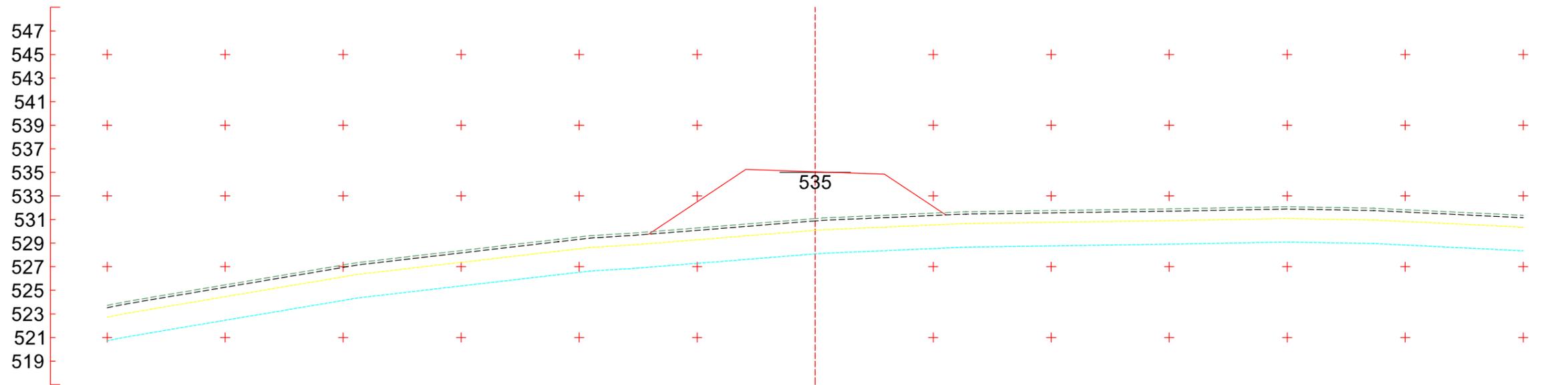
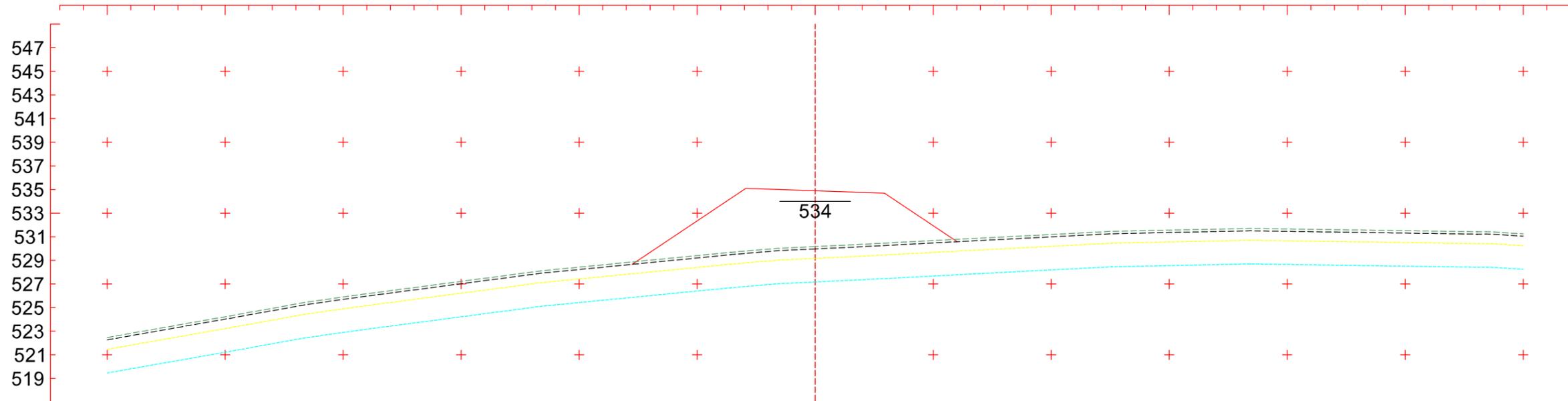
Lote 2
 Escala 1:400



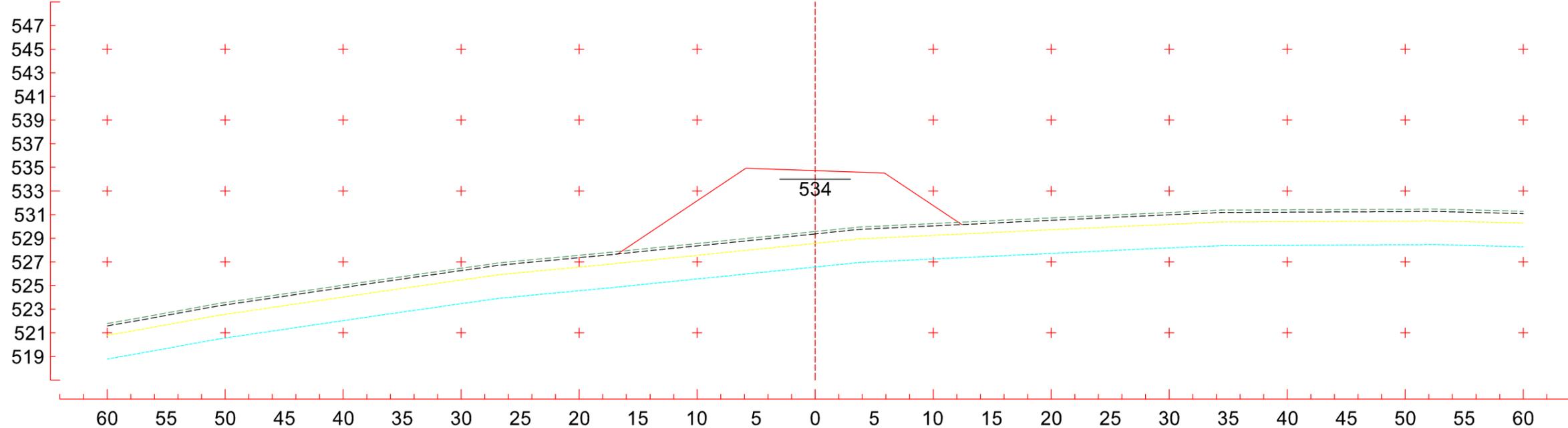
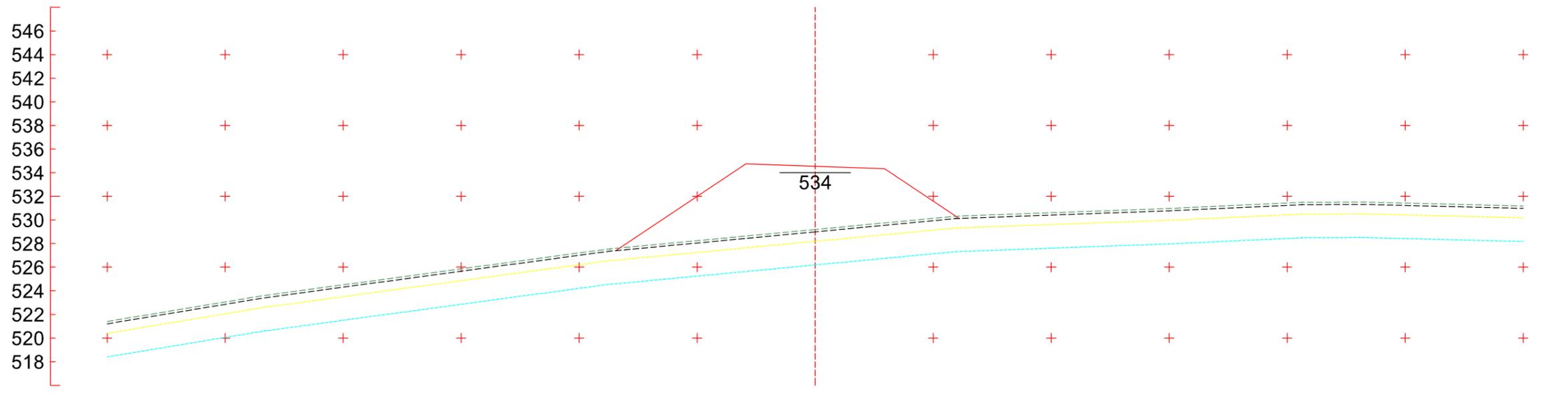
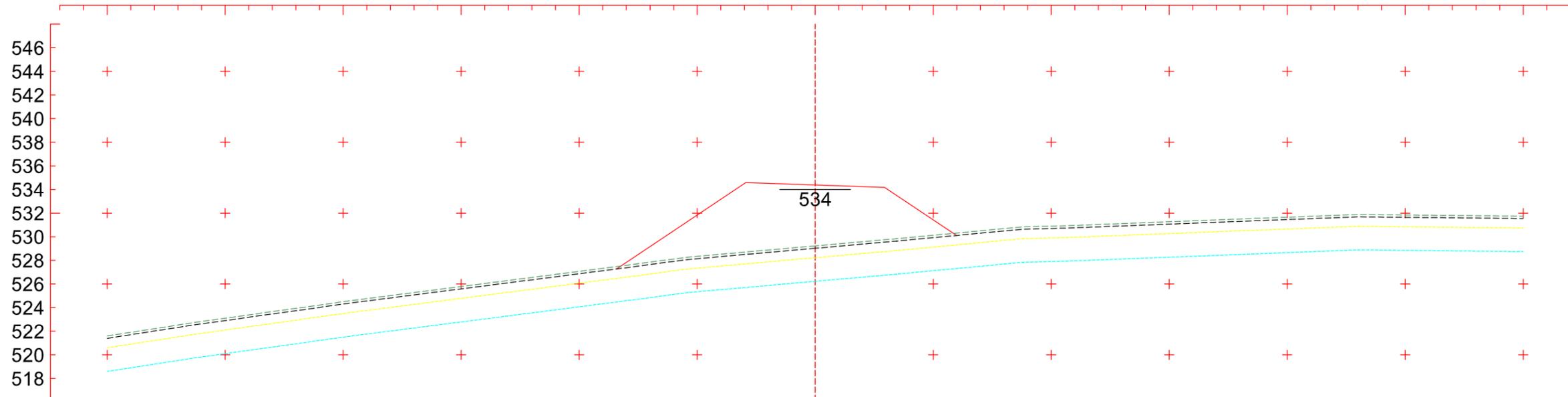
Lote 2
 Escala 1:400

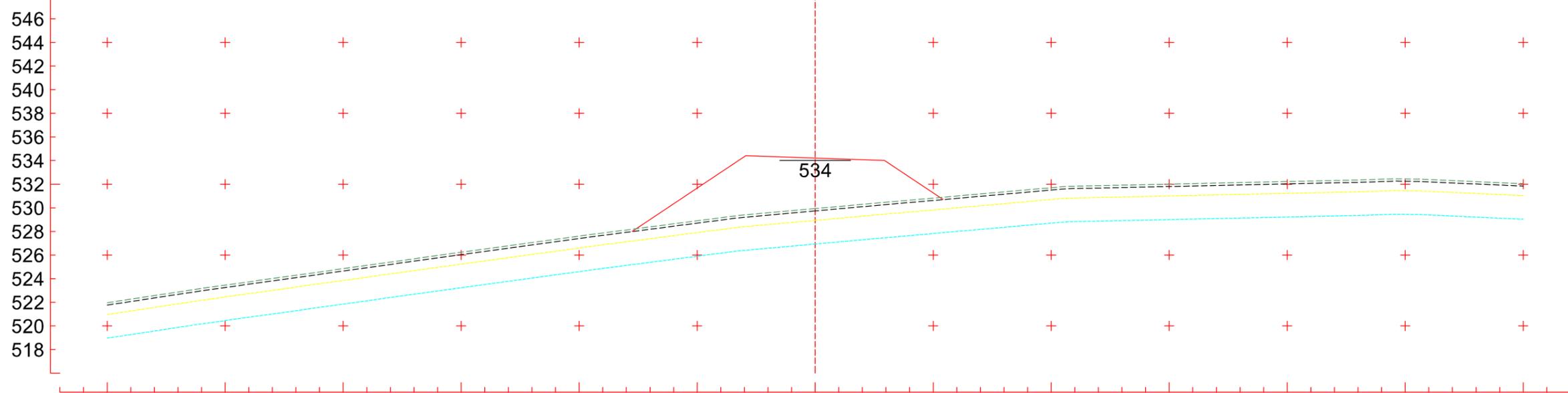
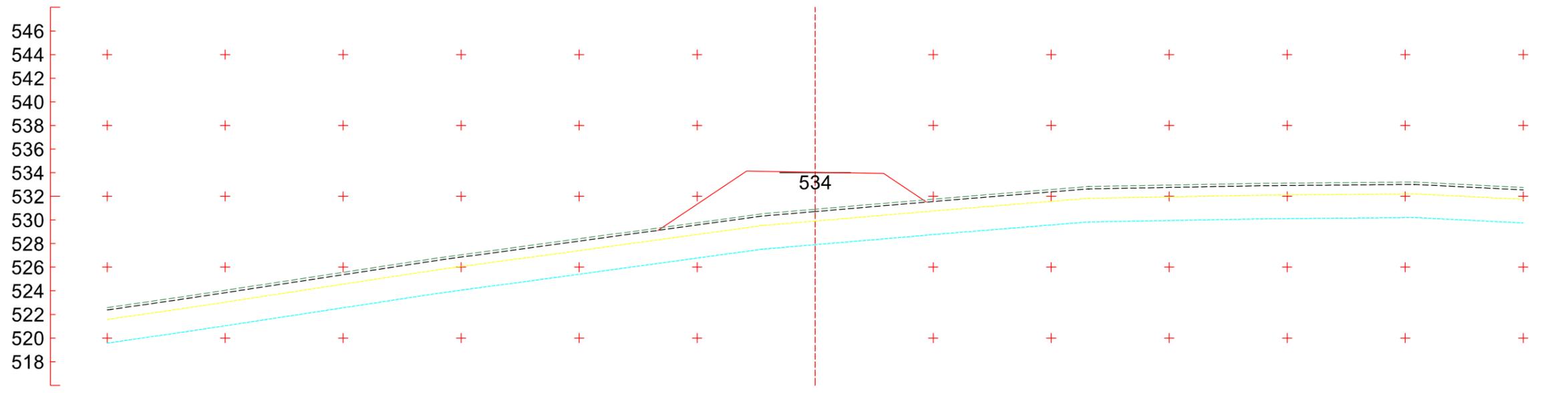
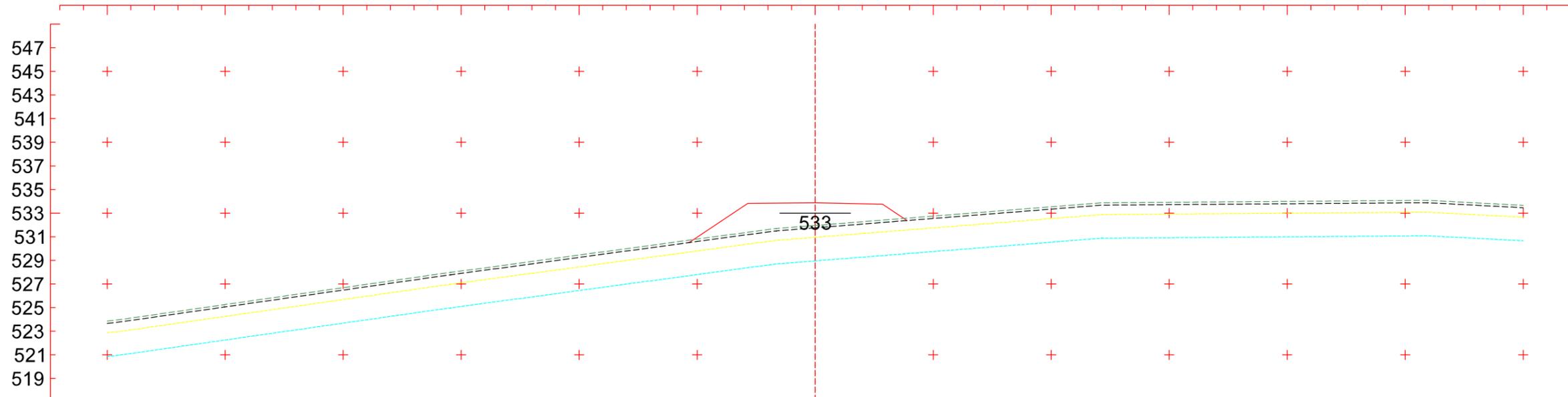


Lote 2
 Escala 1:400

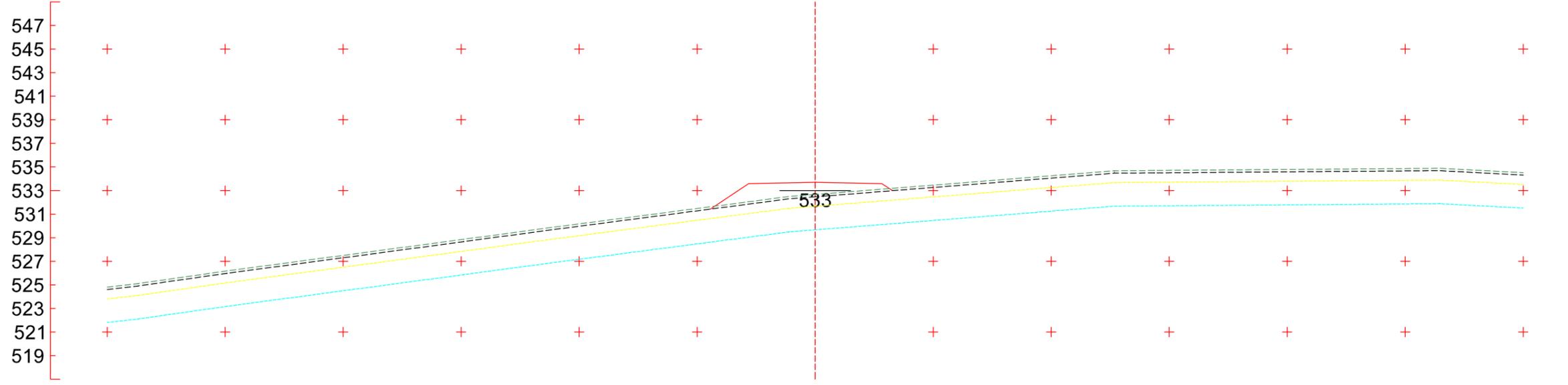
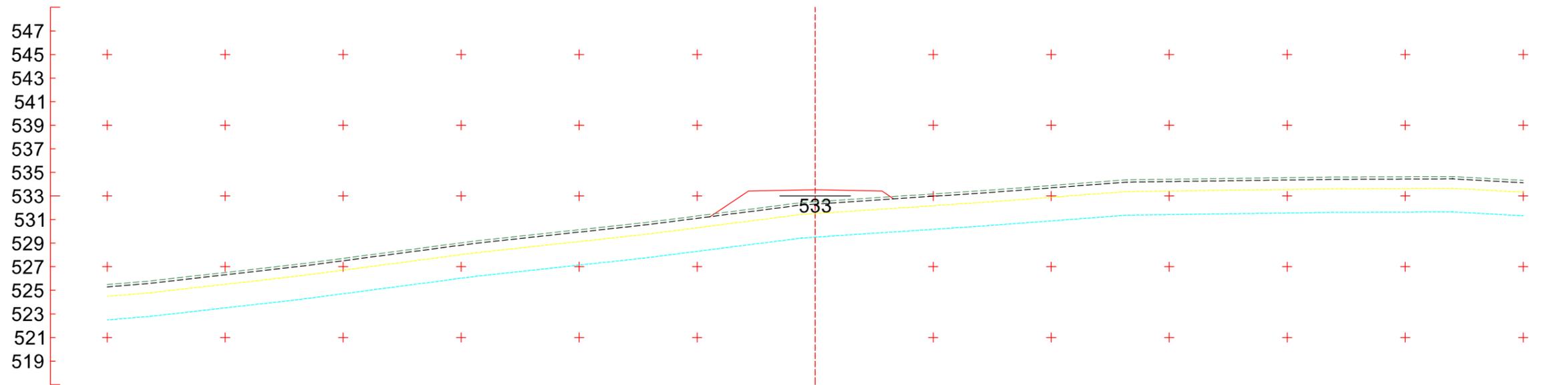
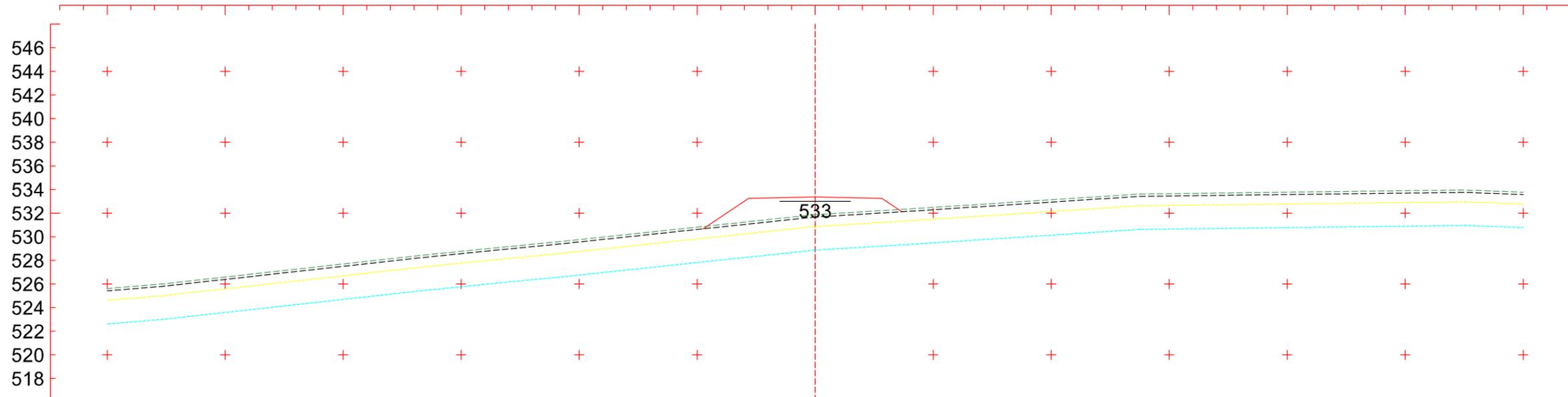


Lote 2
Escala 1:400

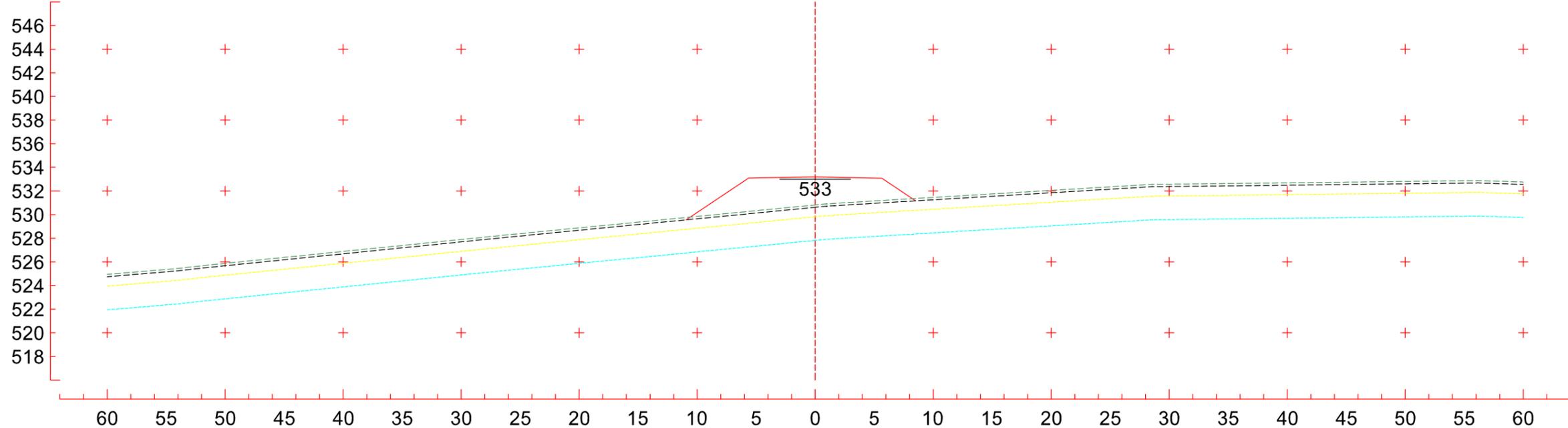
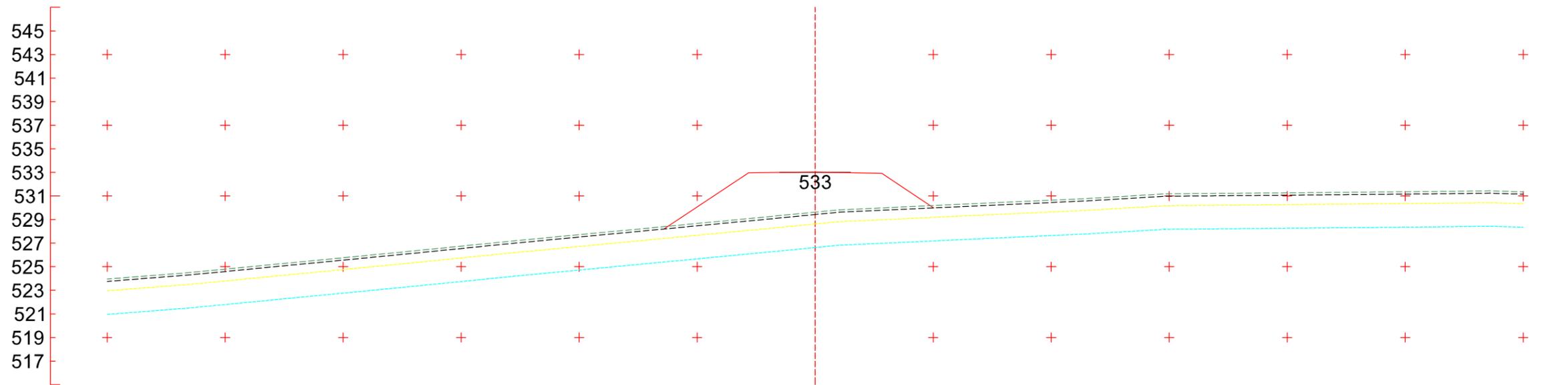
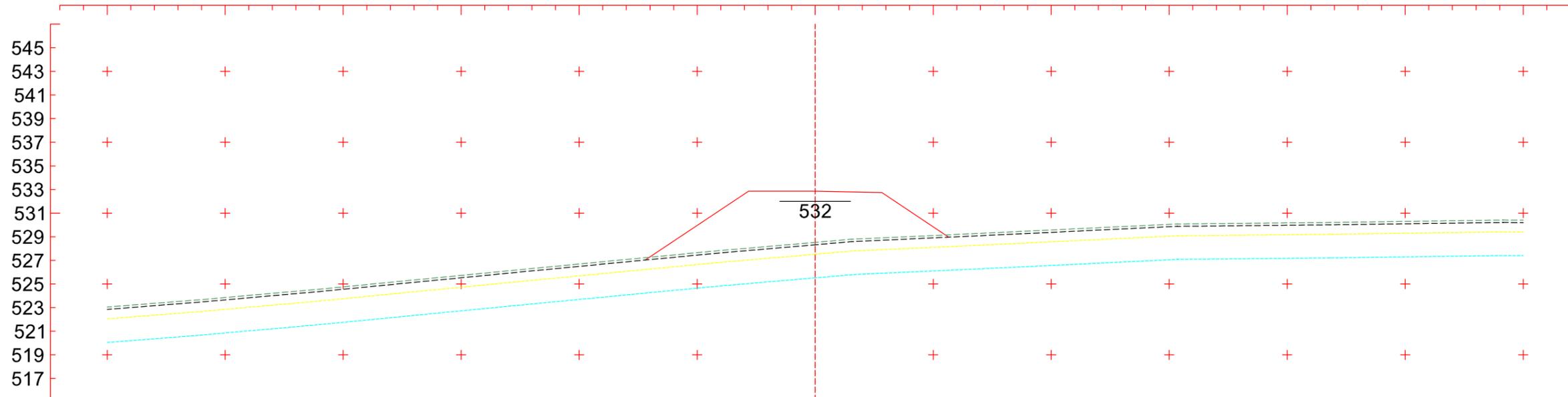




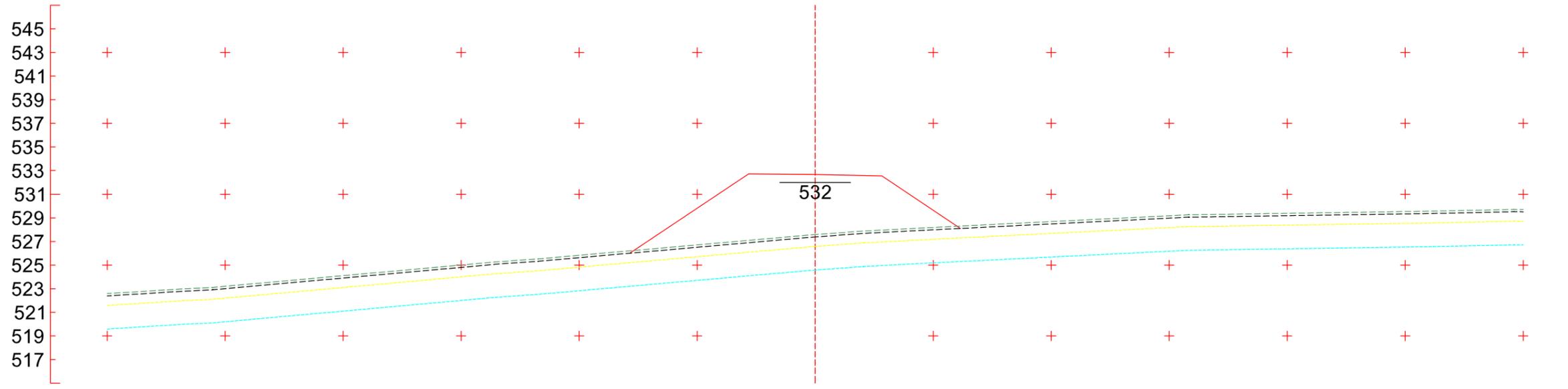
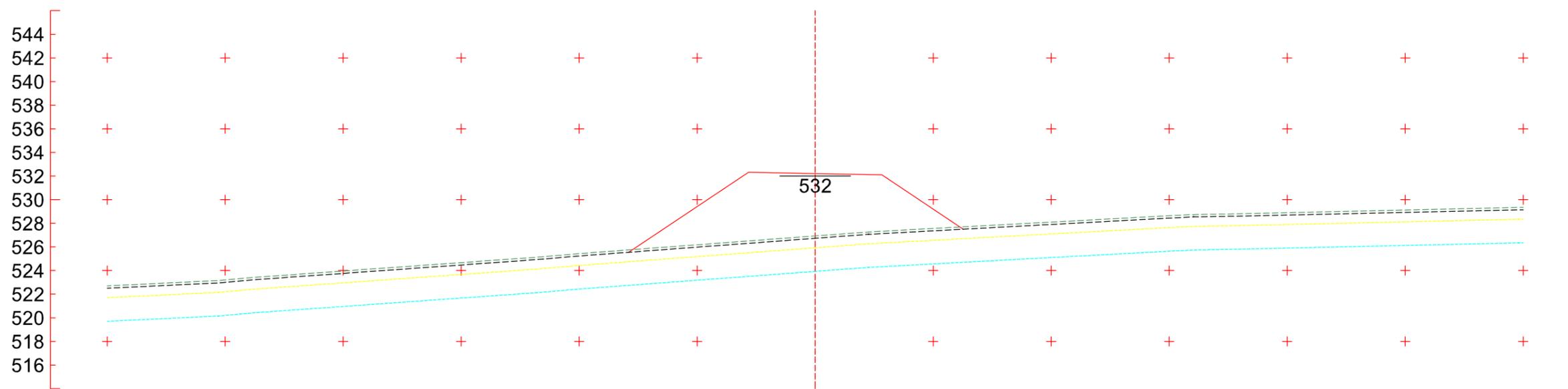
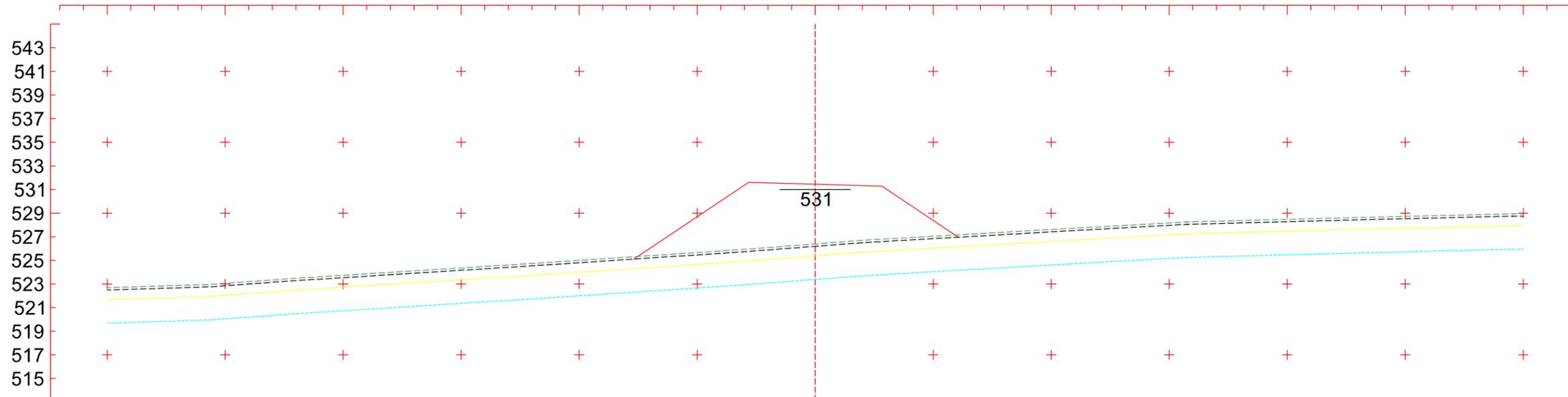
Lote 2
 Escala 1:400



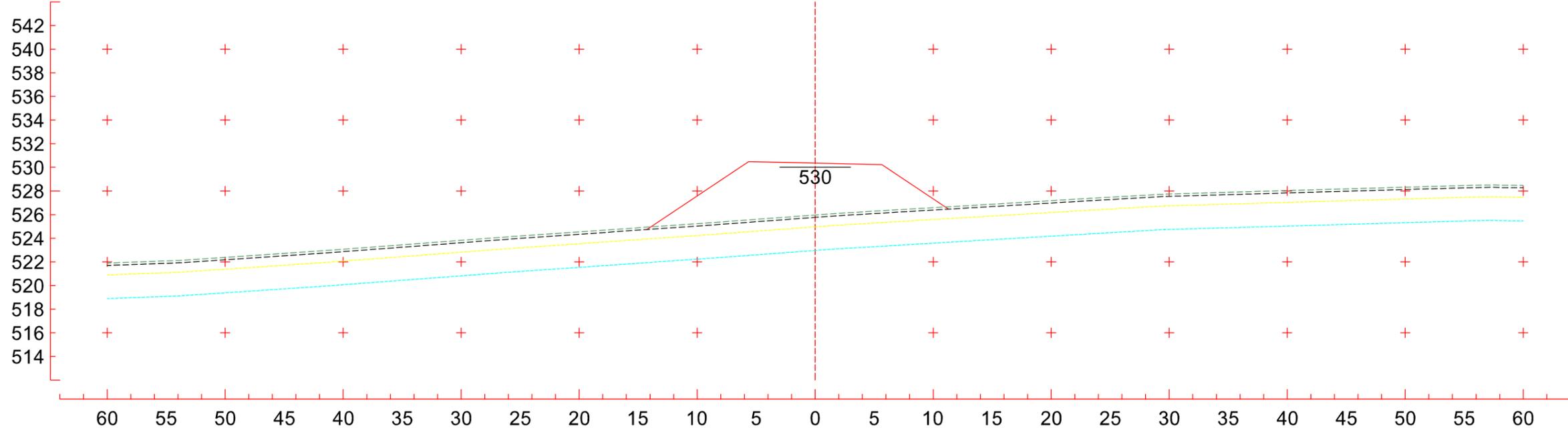
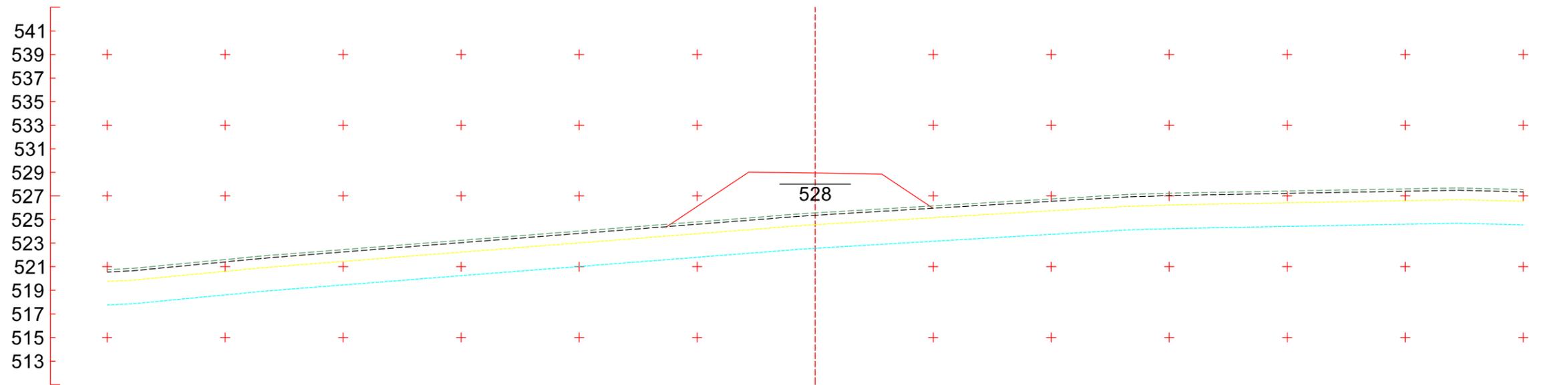
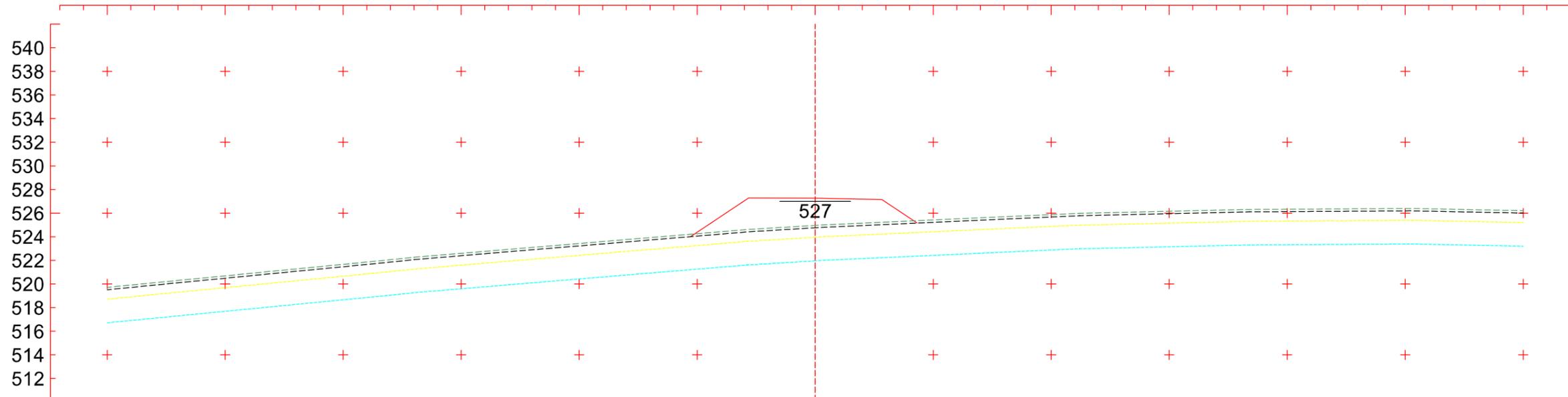
Lote 2
Escala 1:400



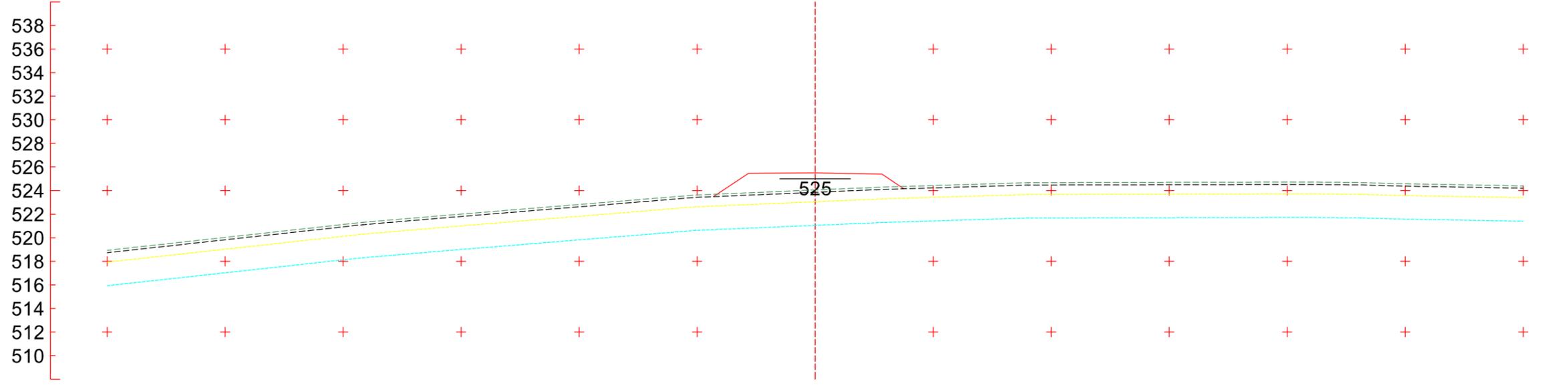
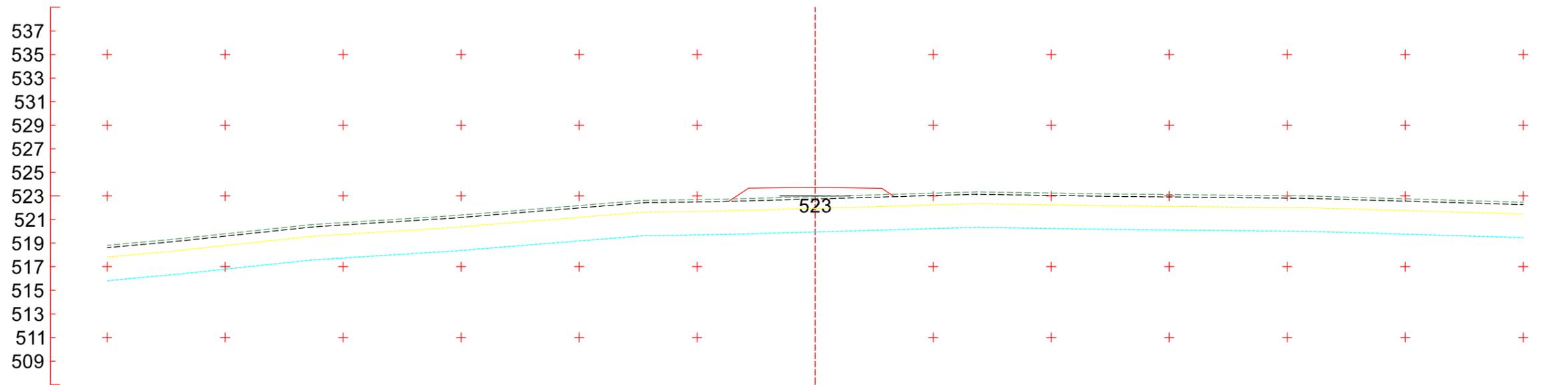
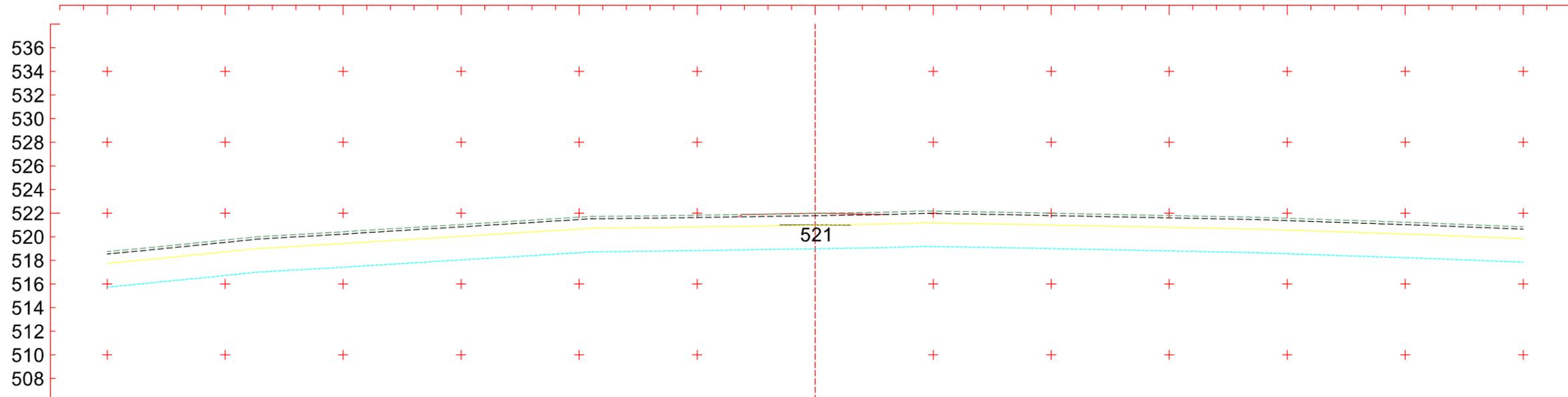
Lote 2
Escala 1:400



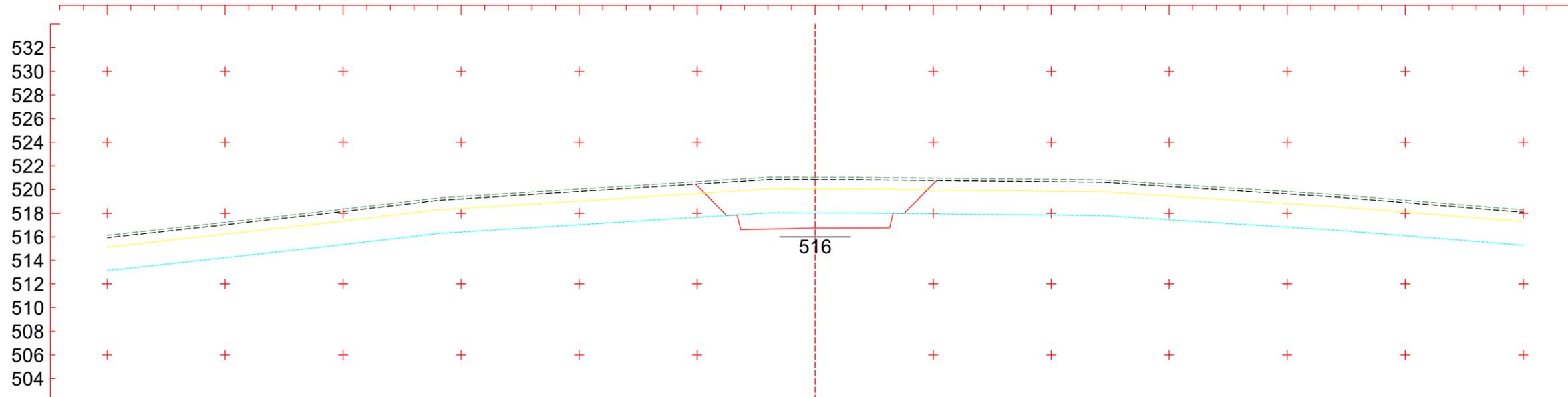
Lote 2
Escala 1:400



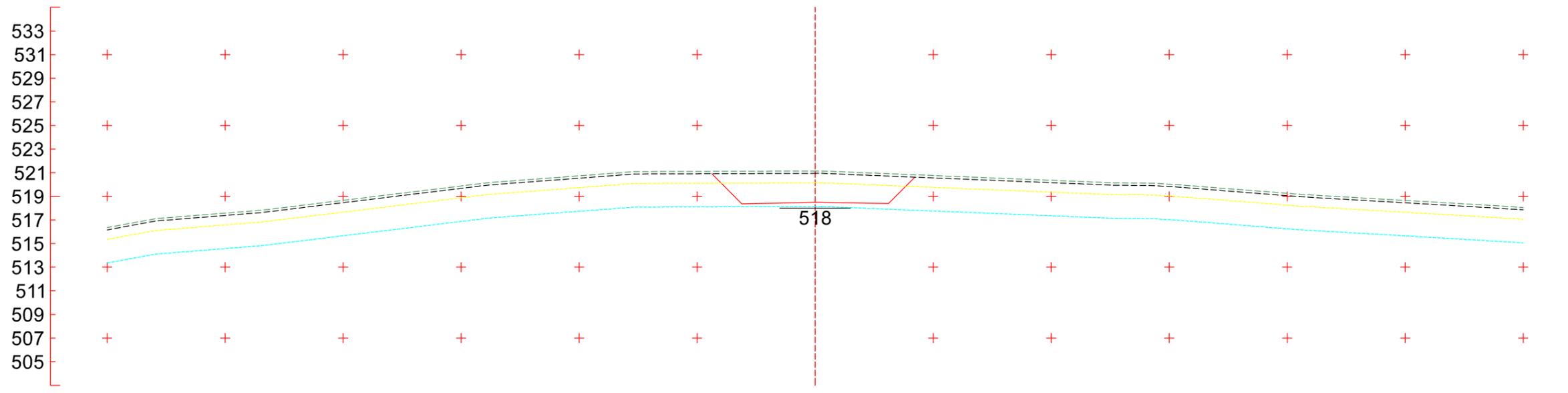
Lote 2
 Escala 1:400



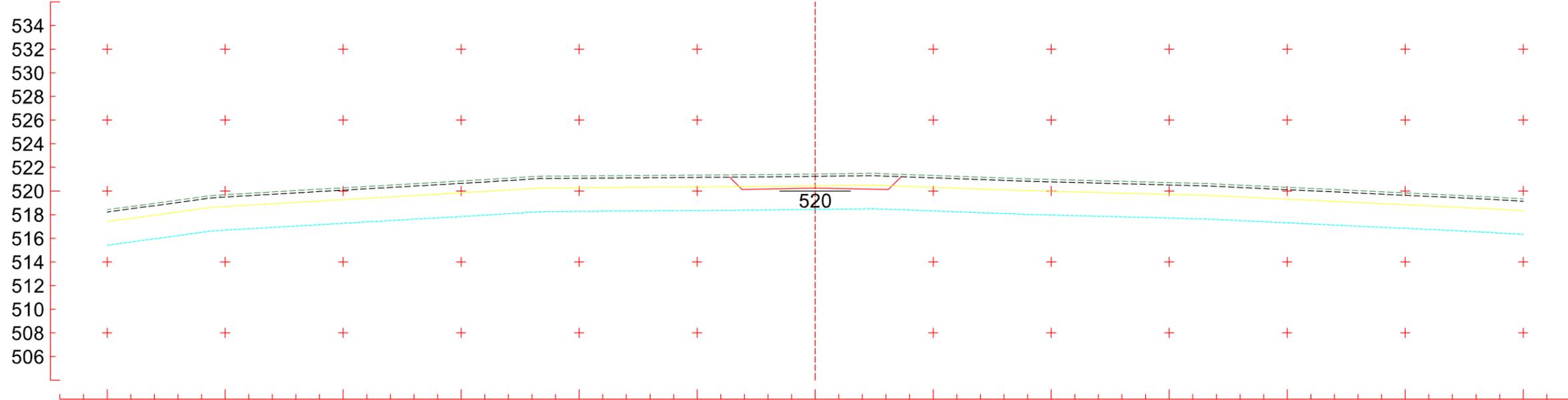
Lote 2
 Escala 1:400



3+400
 CT 521,032 m
 CP 516,737 m

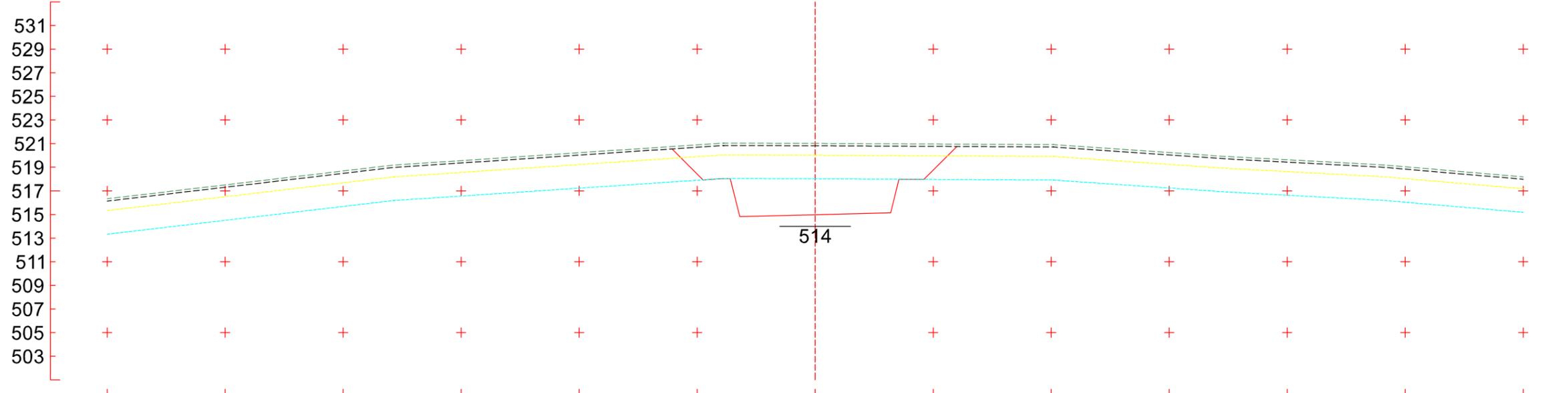
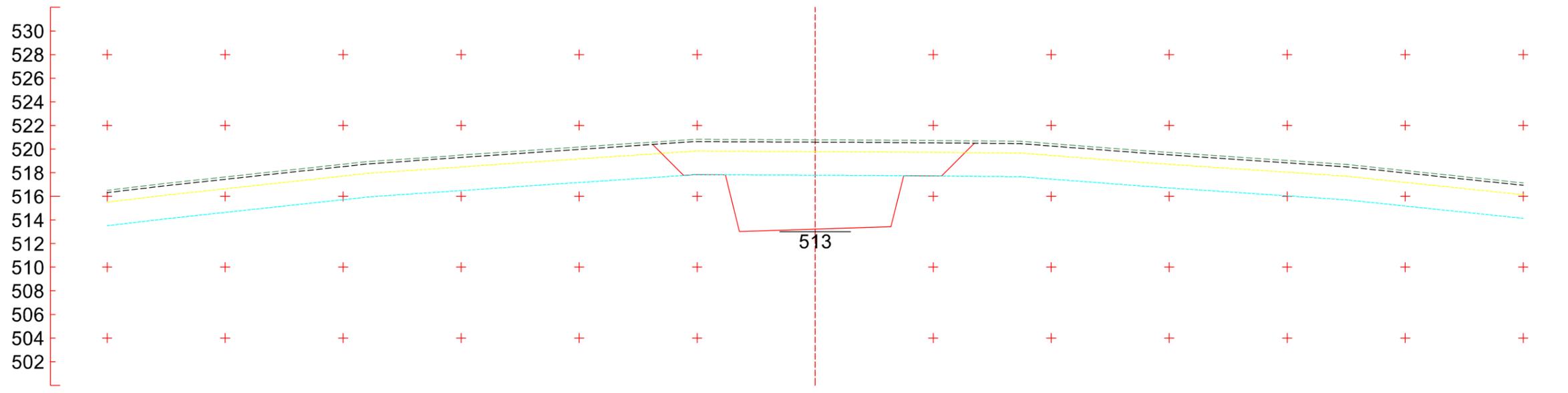
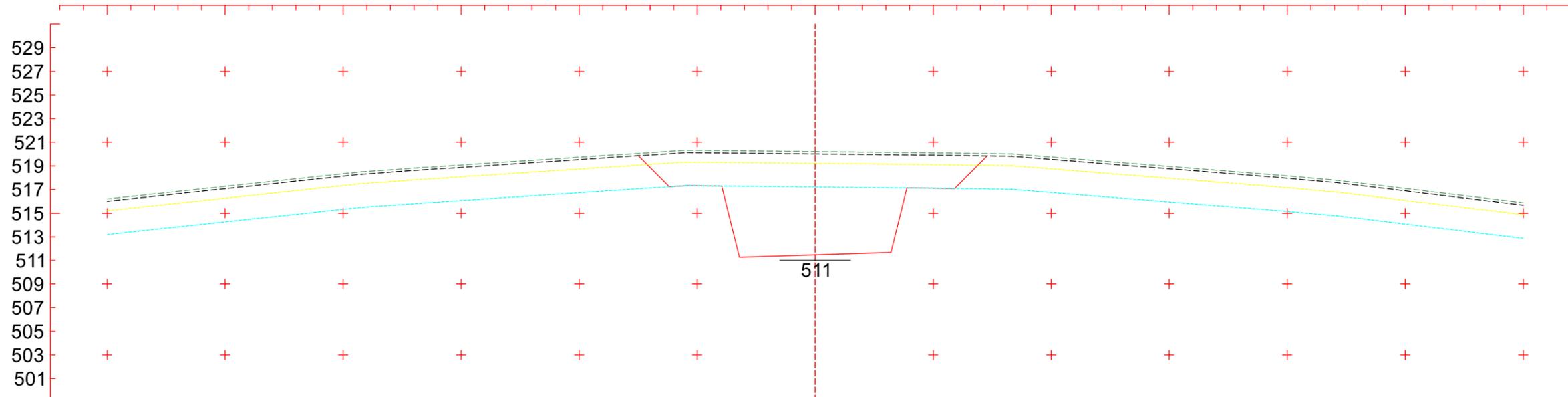


3+380
 CT 521,142 m
 CP 518,491 m

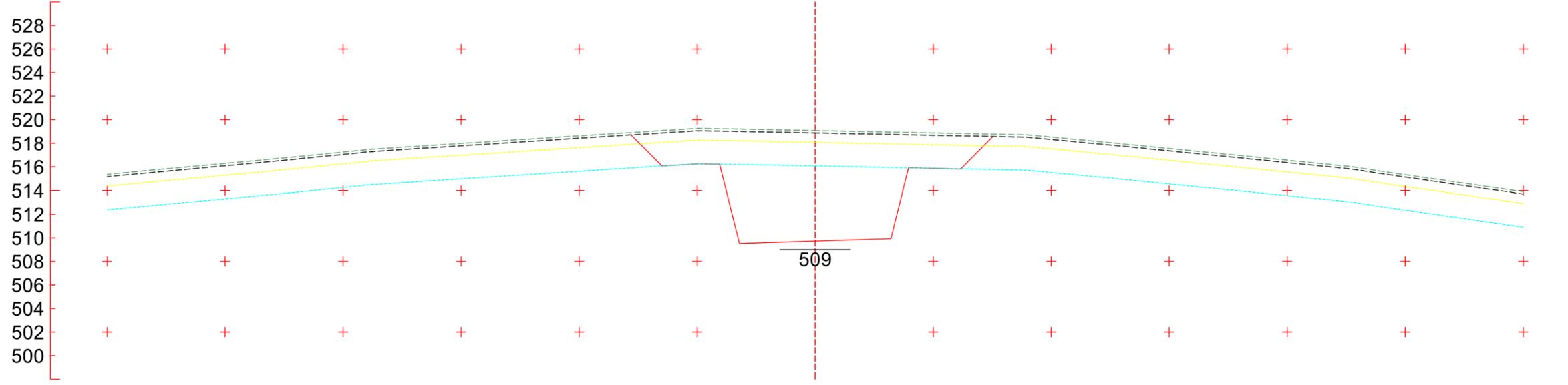
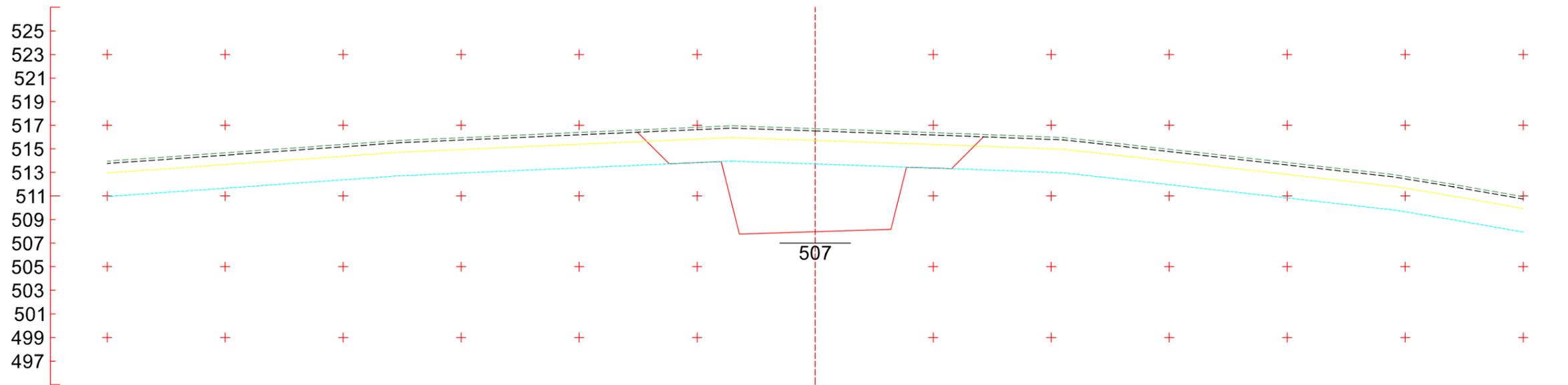
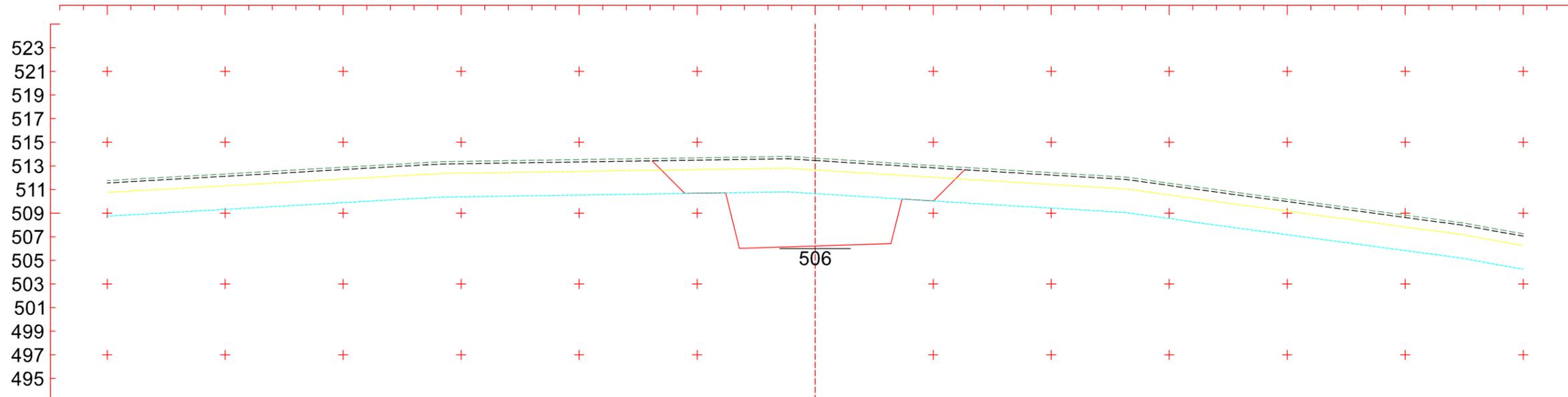


3+360
 CT 521,443 m
 CP 520,245 m

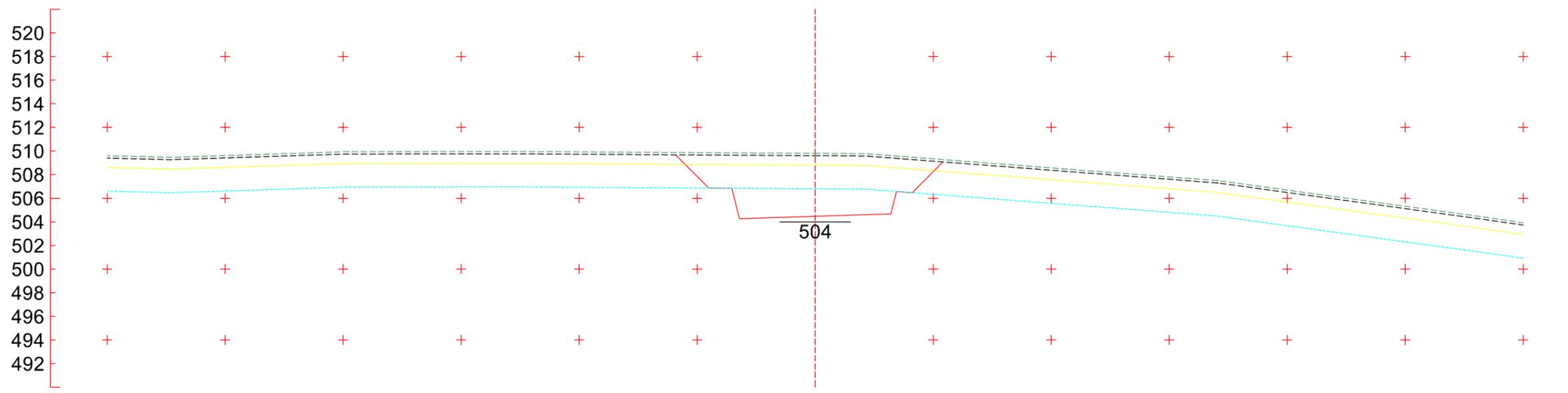
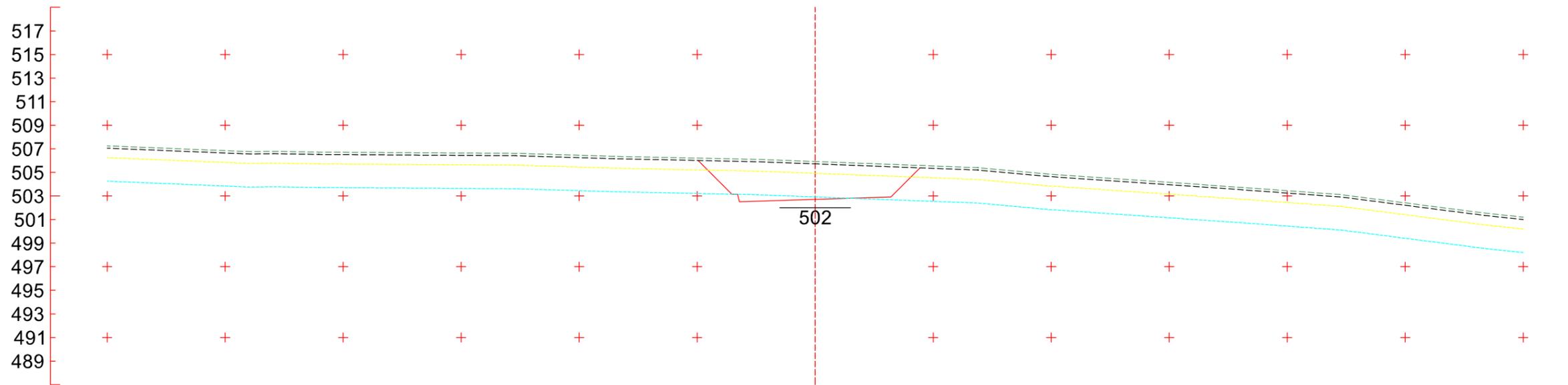
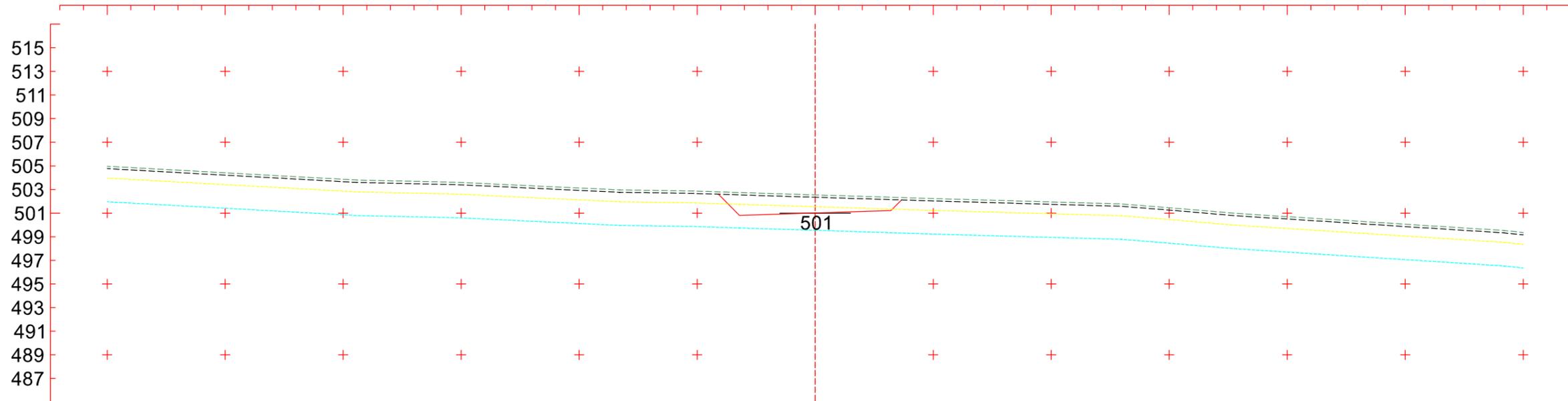
Lote 2
 Escala 1:400



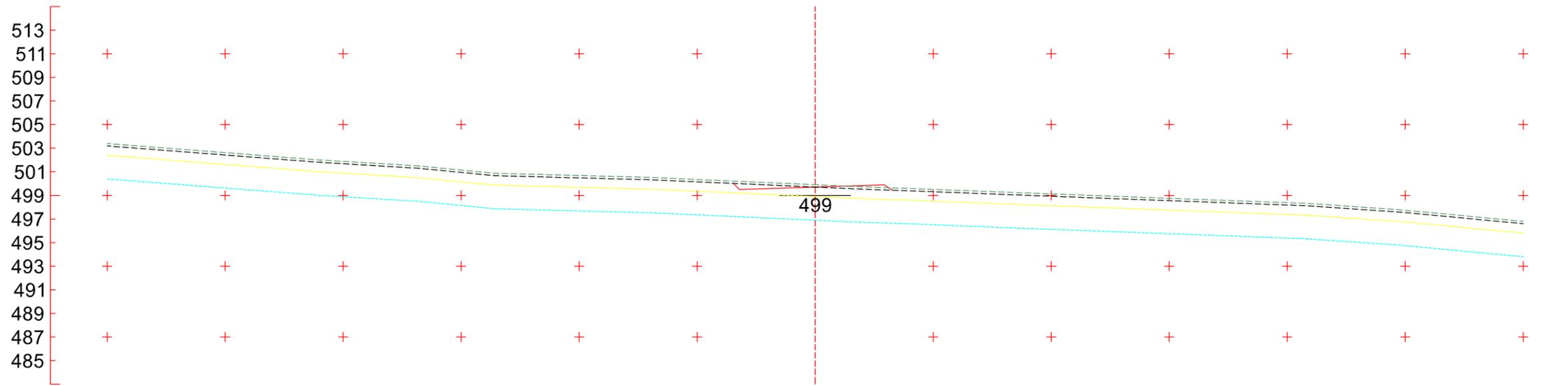
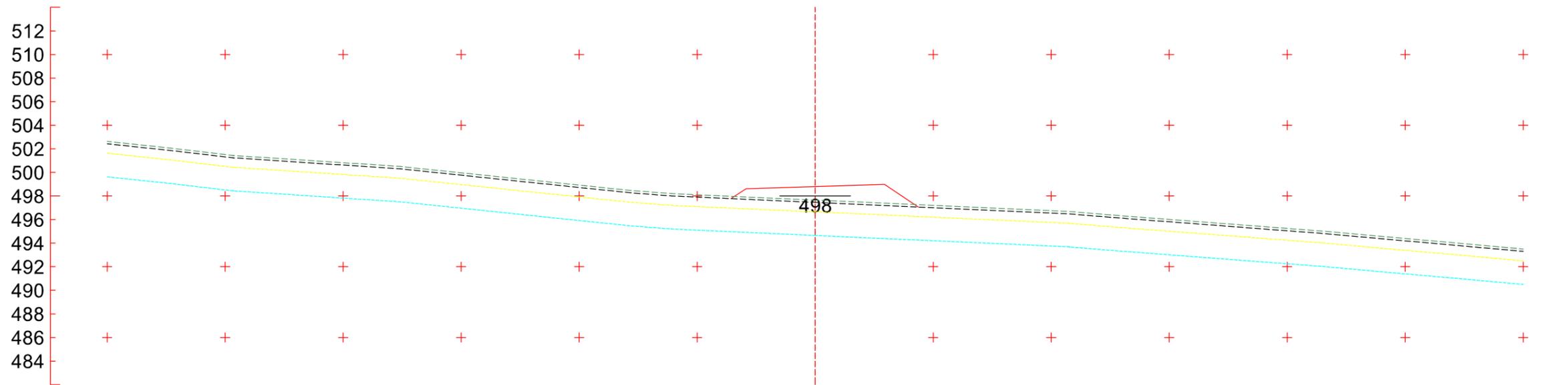
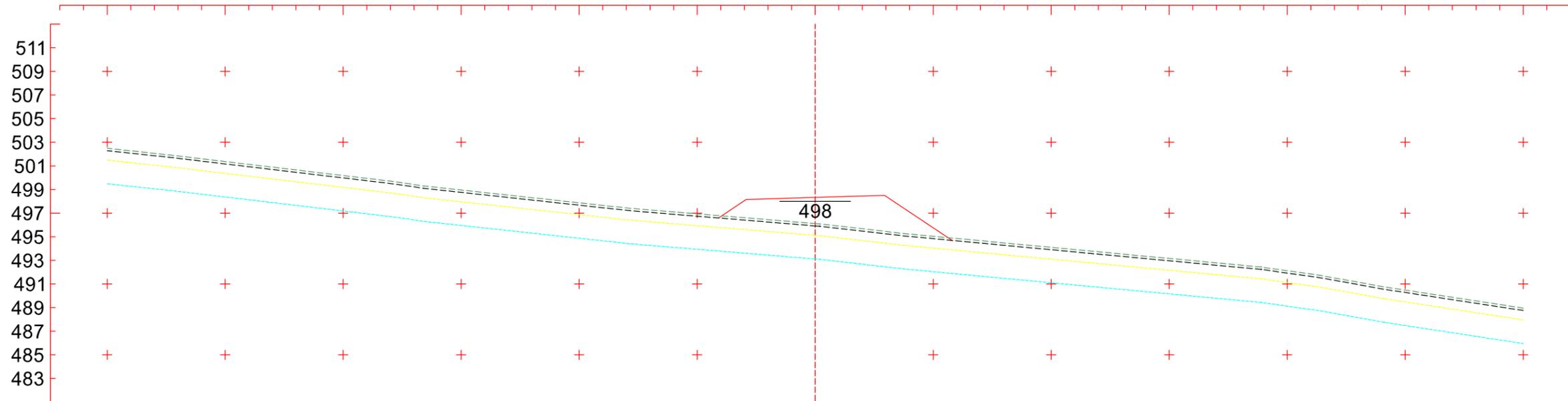
Lote 2
Escala 1:400



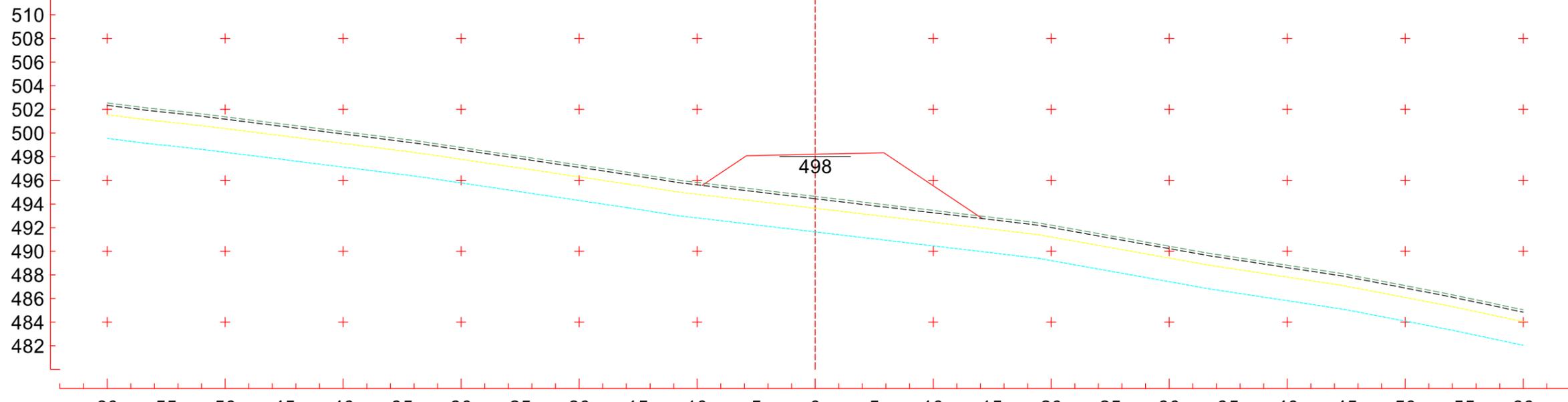
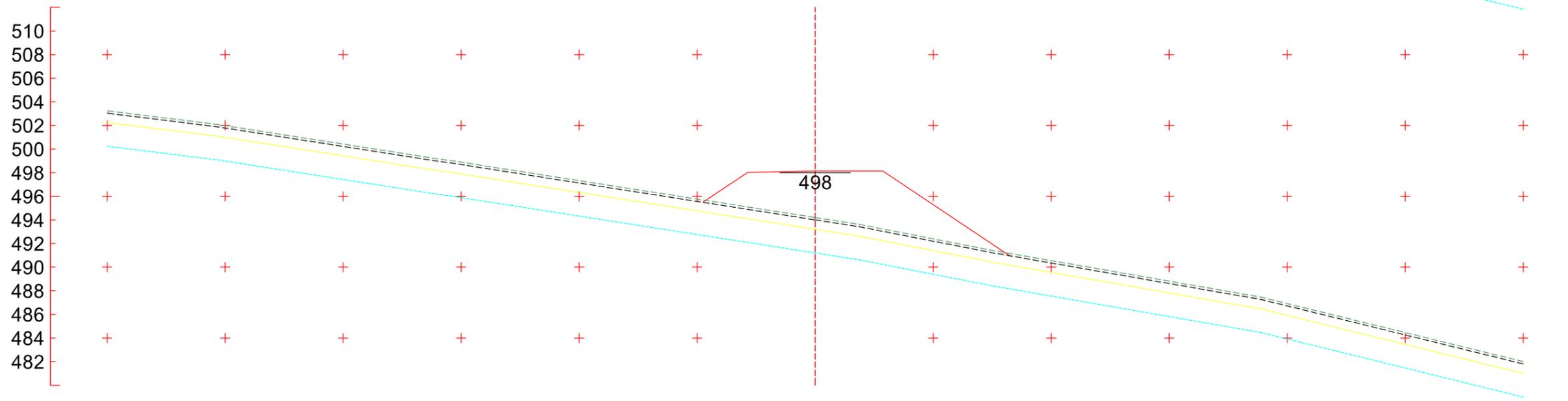
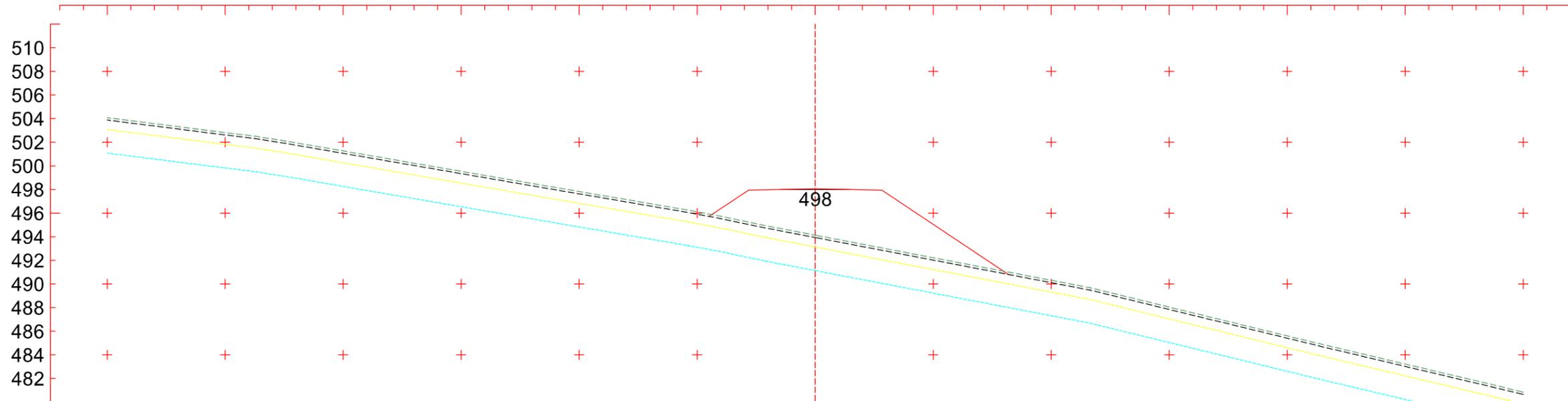
Lote 2
 Escala 1:400



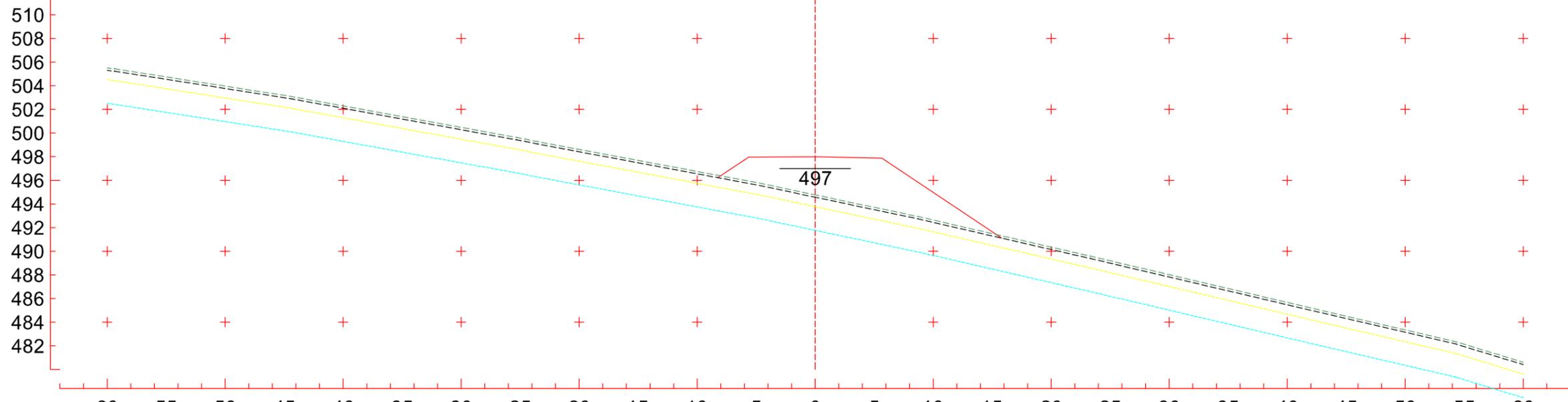
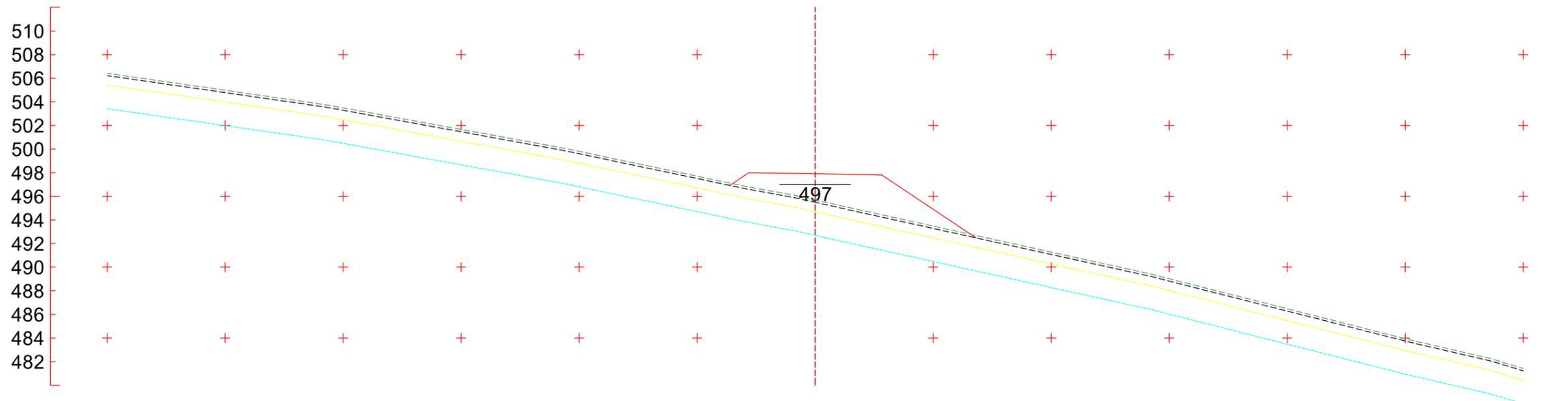
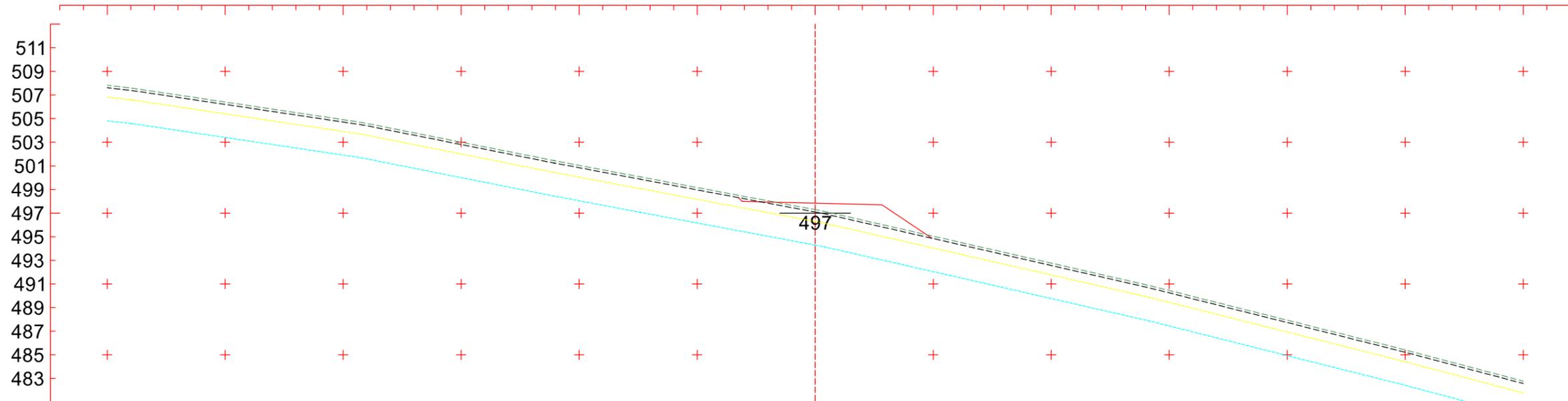
Lote 2
 Escala 1:400



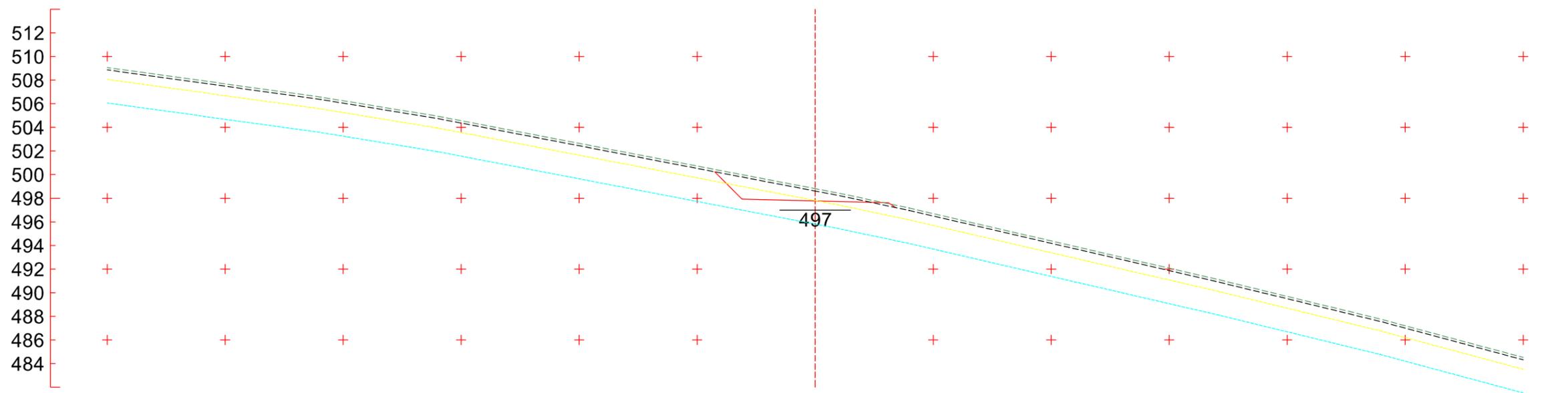
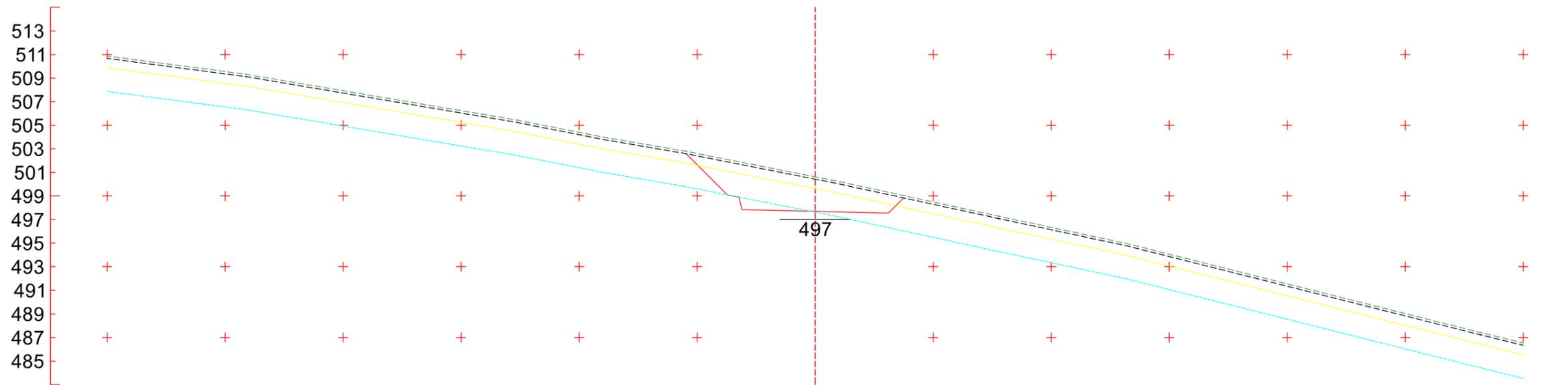
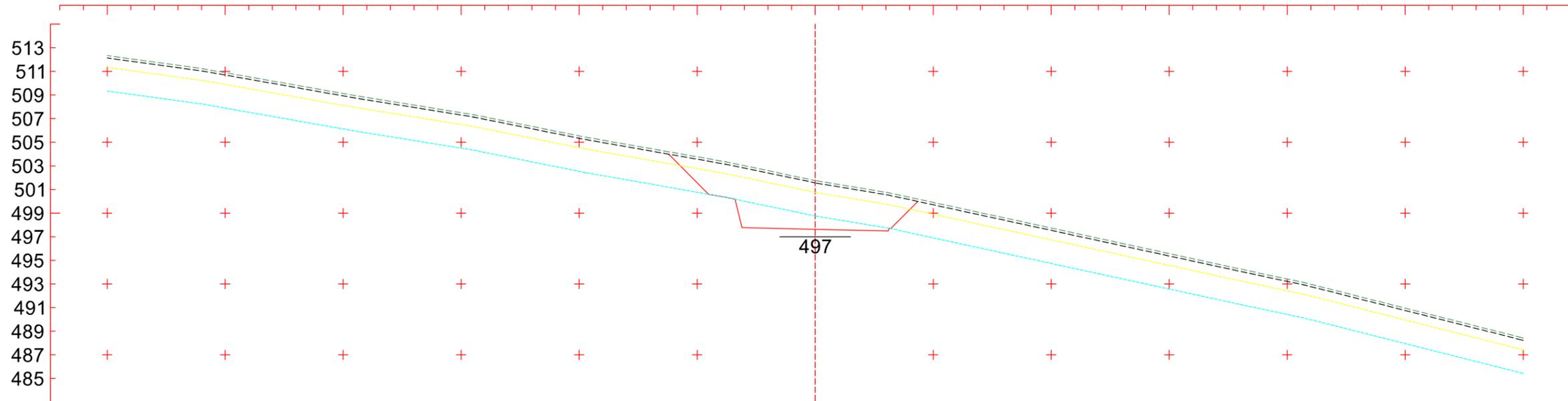
Lote 2
 Escala 1:400



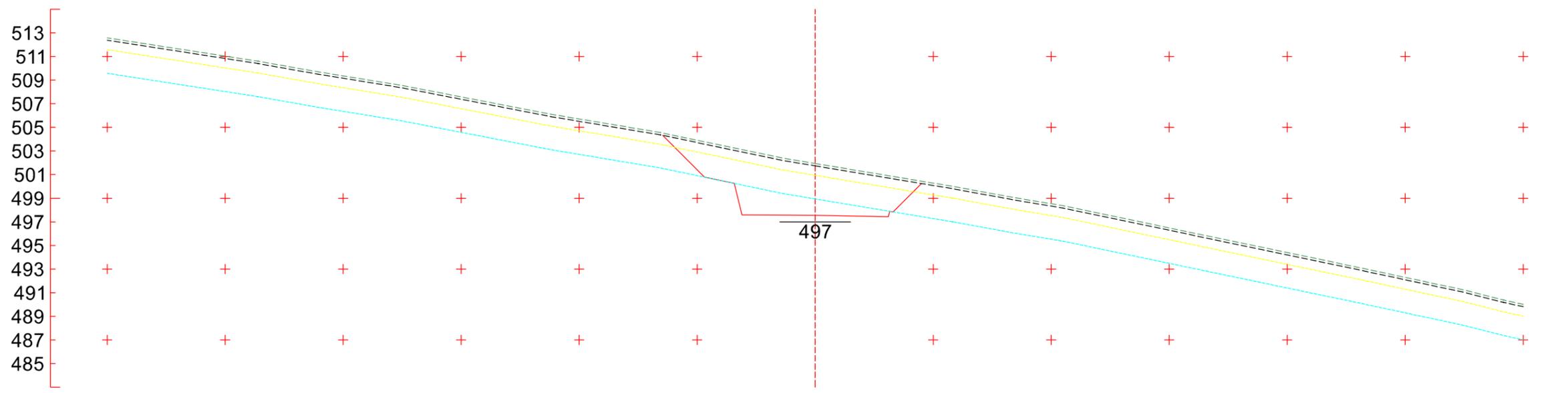
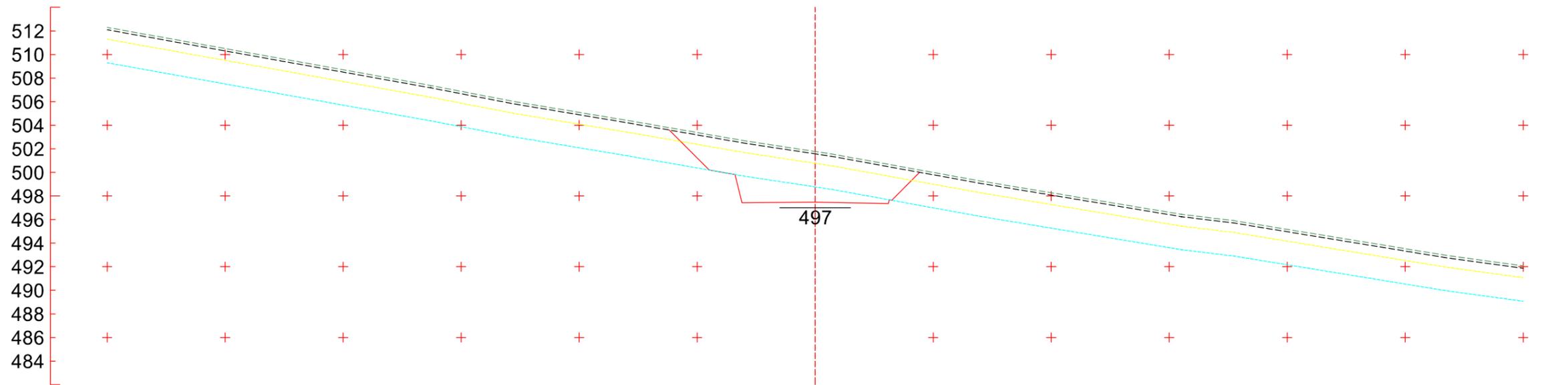
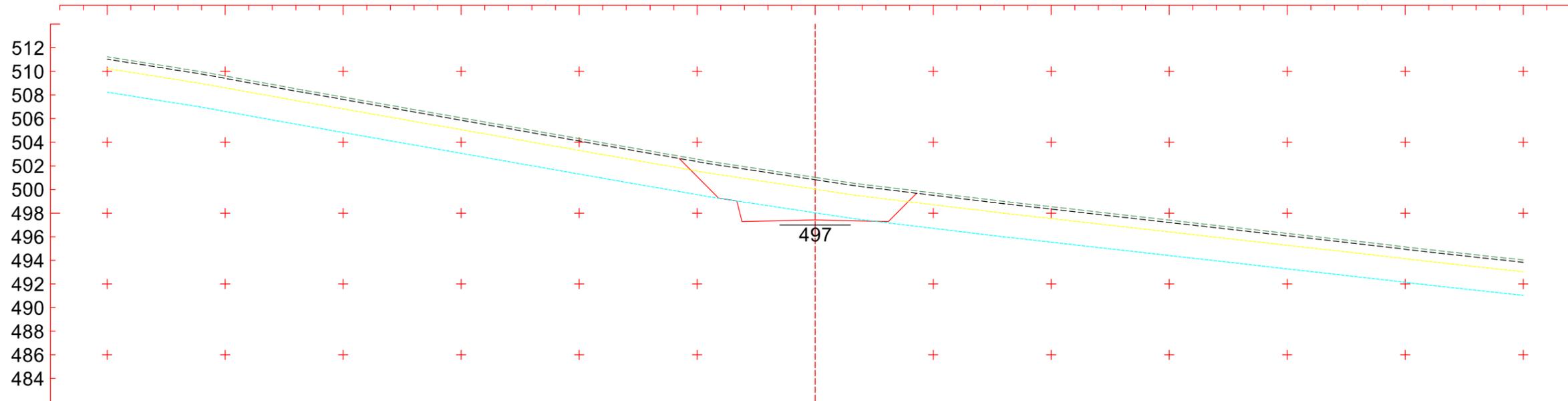
Lote 2
 Escala 1:400



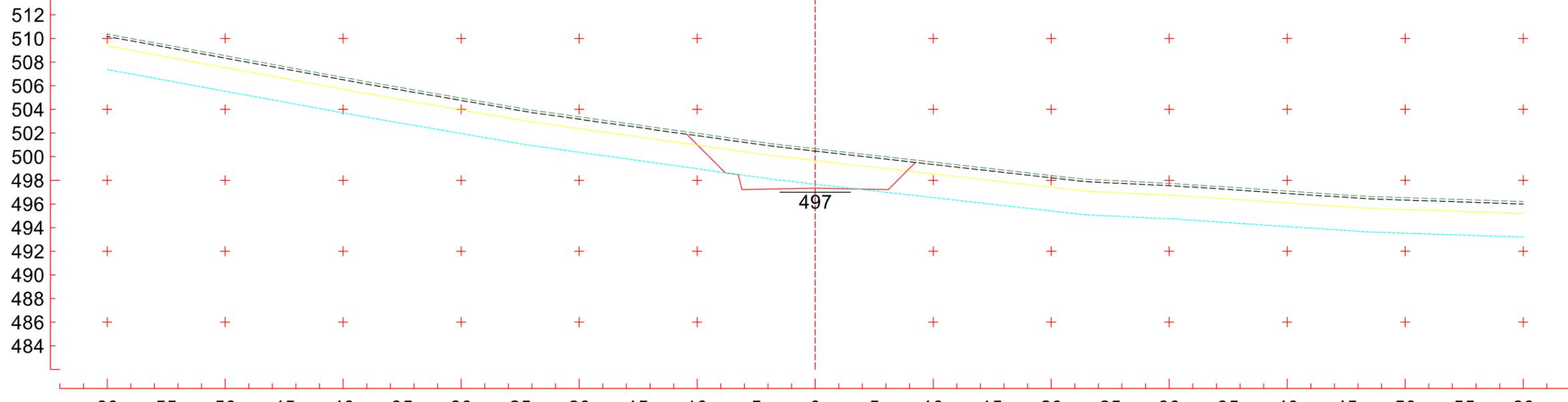
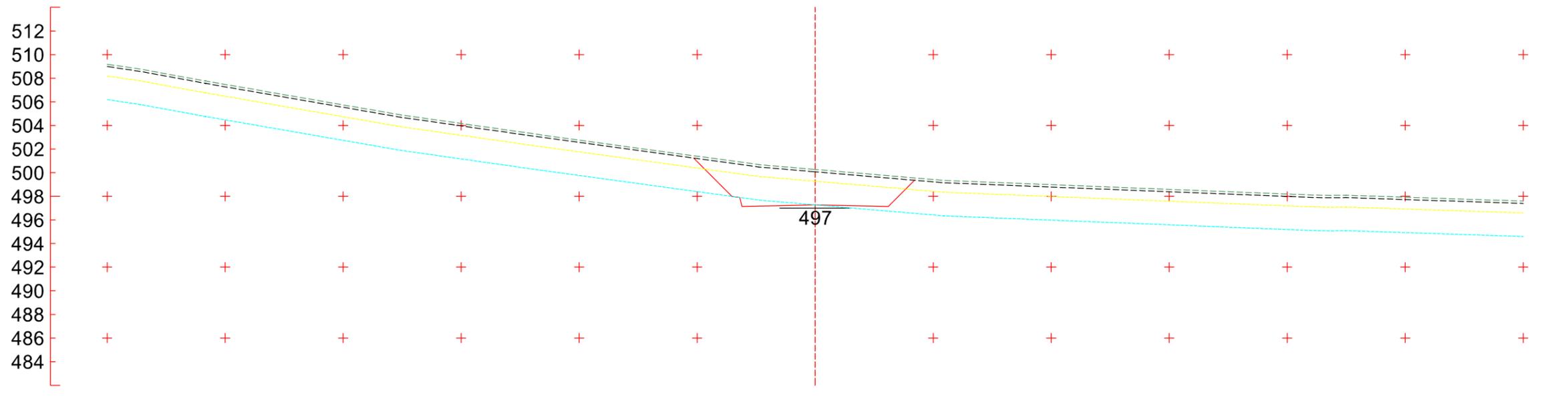
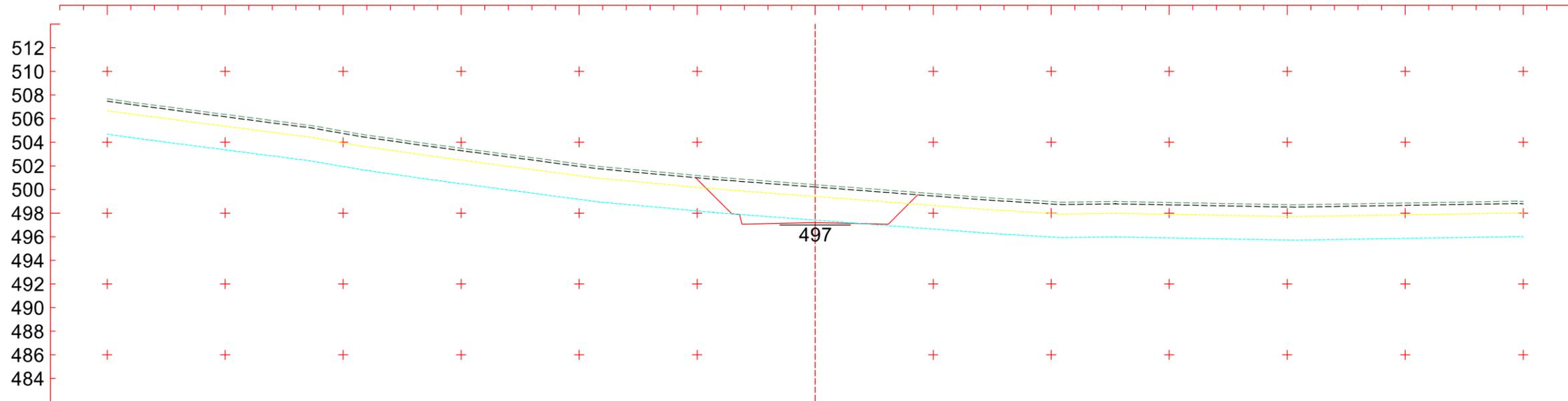
Lote 2
 Escala 1:400



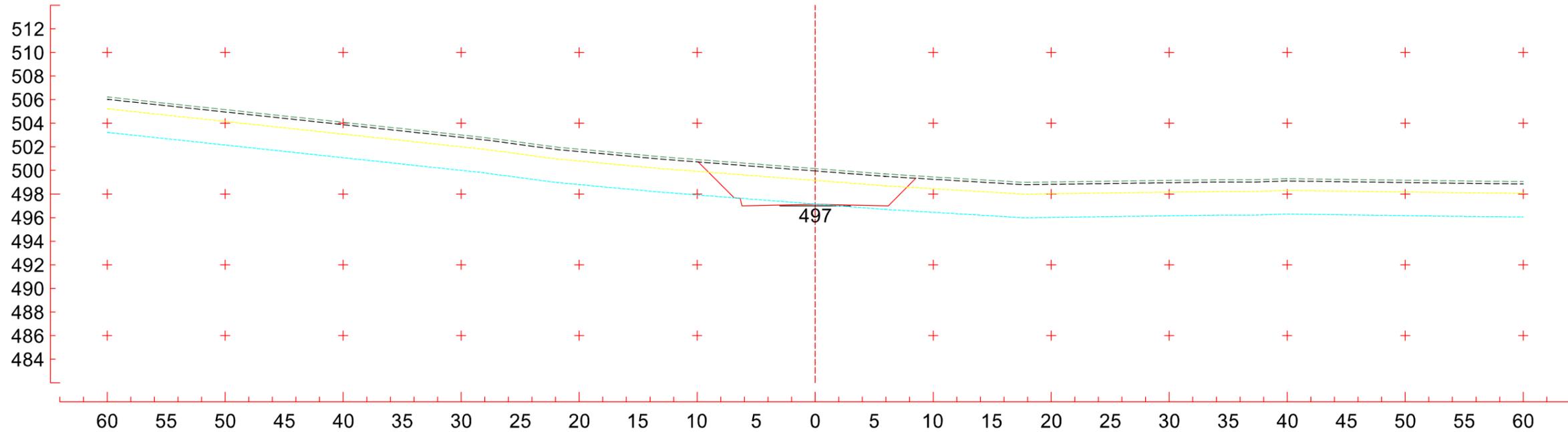
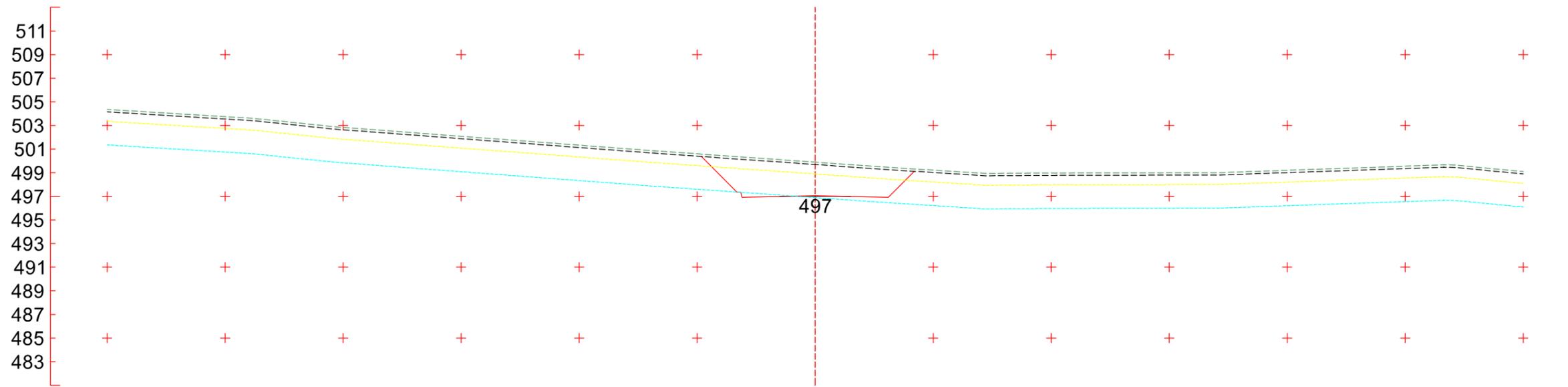
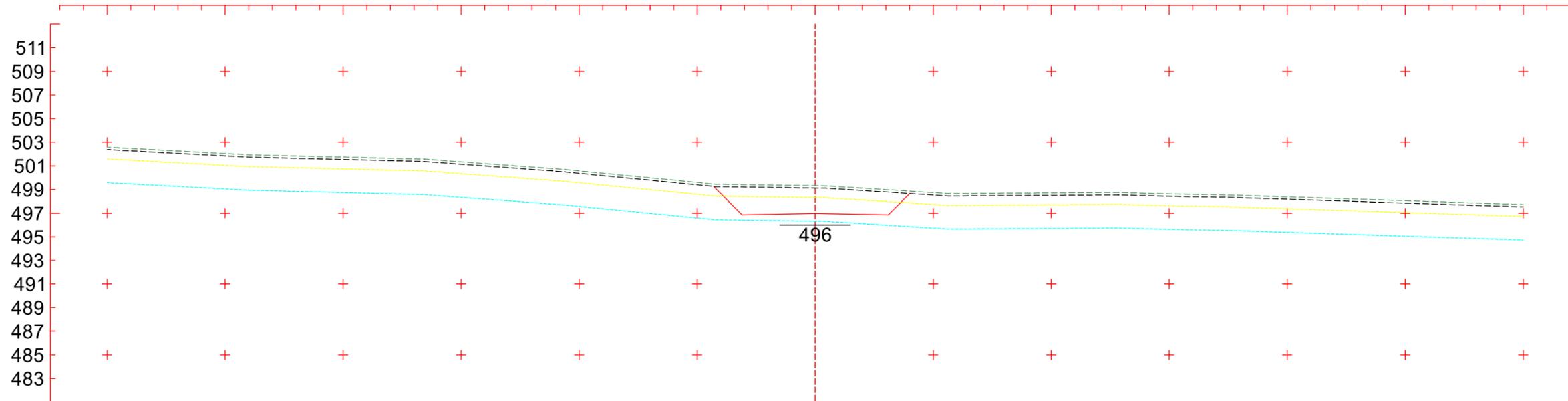
Lote 2
 Escala 1:400



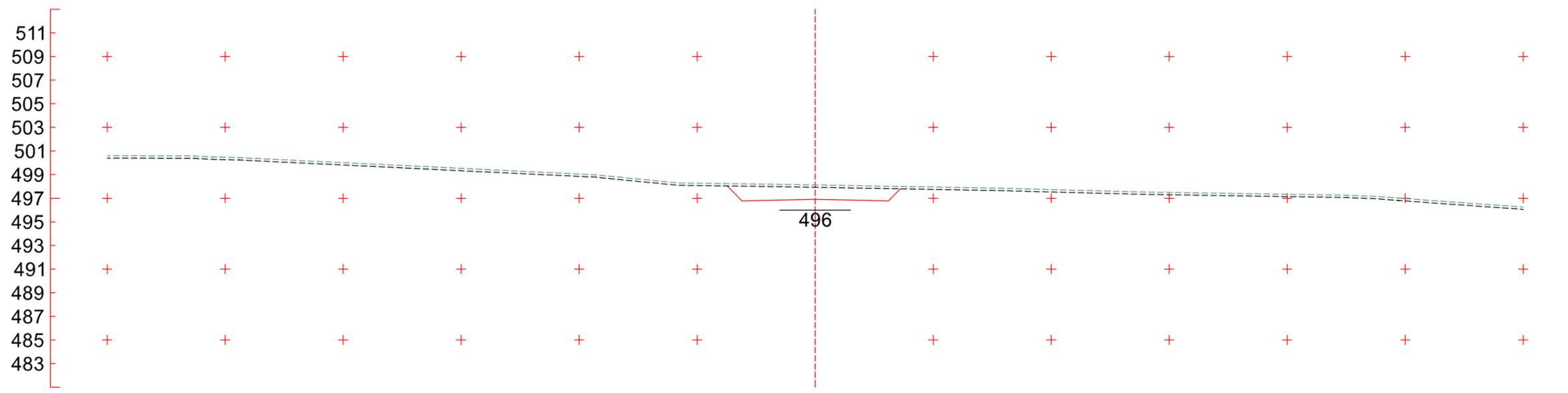
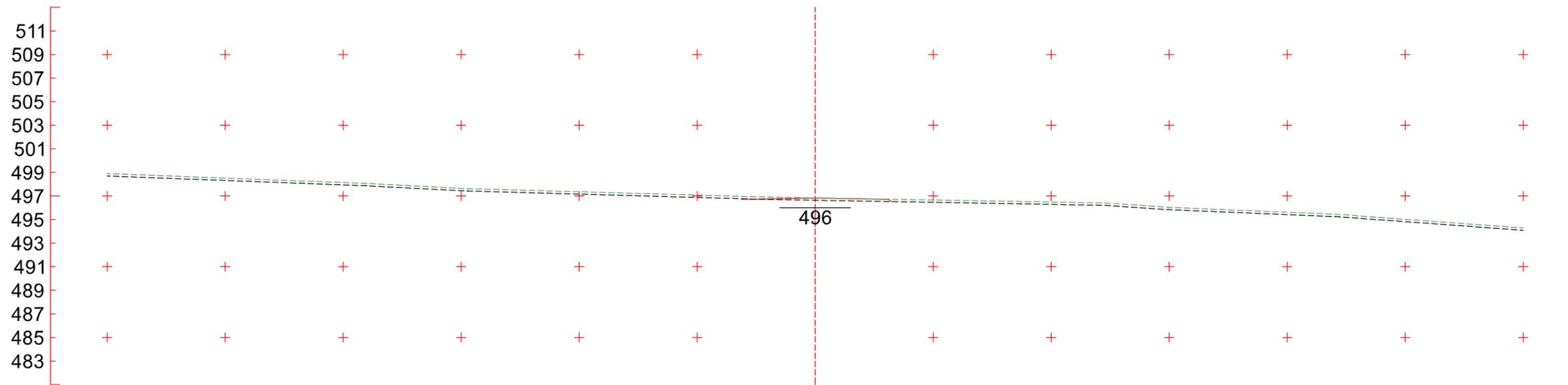
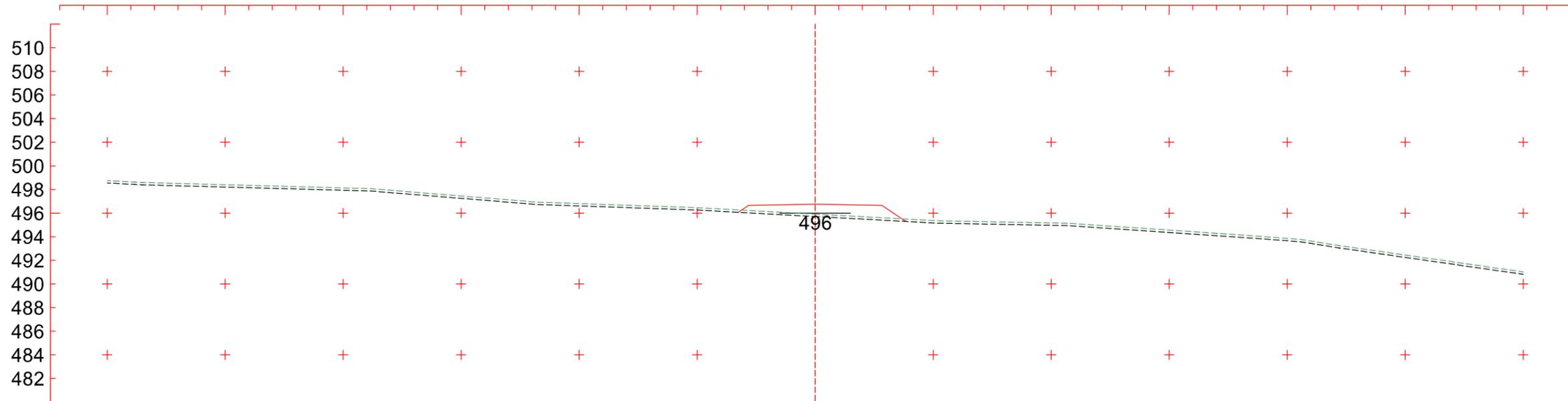
Lote 2
 Escala 1:400



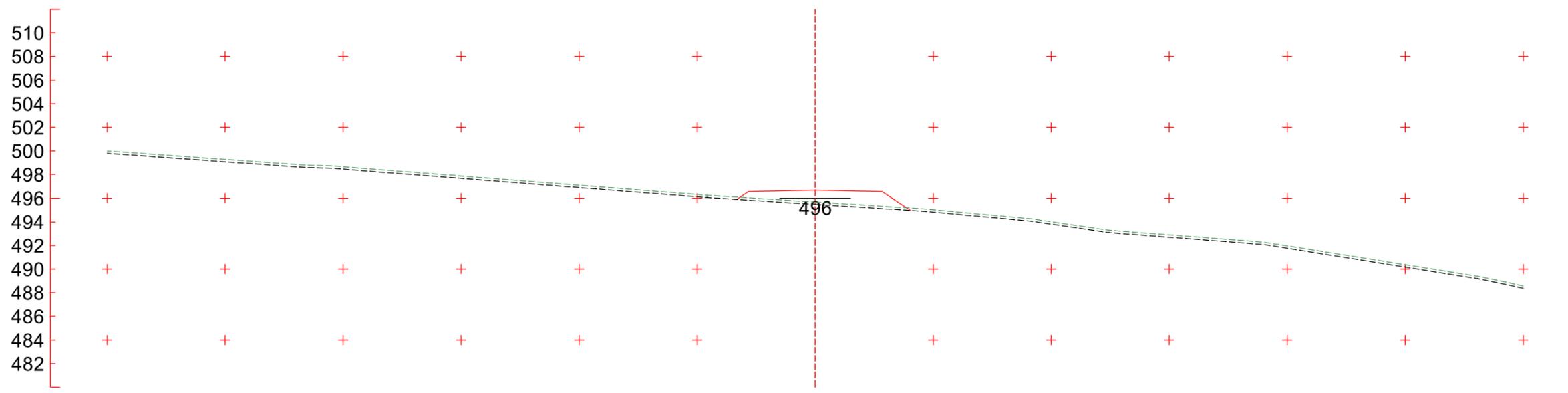
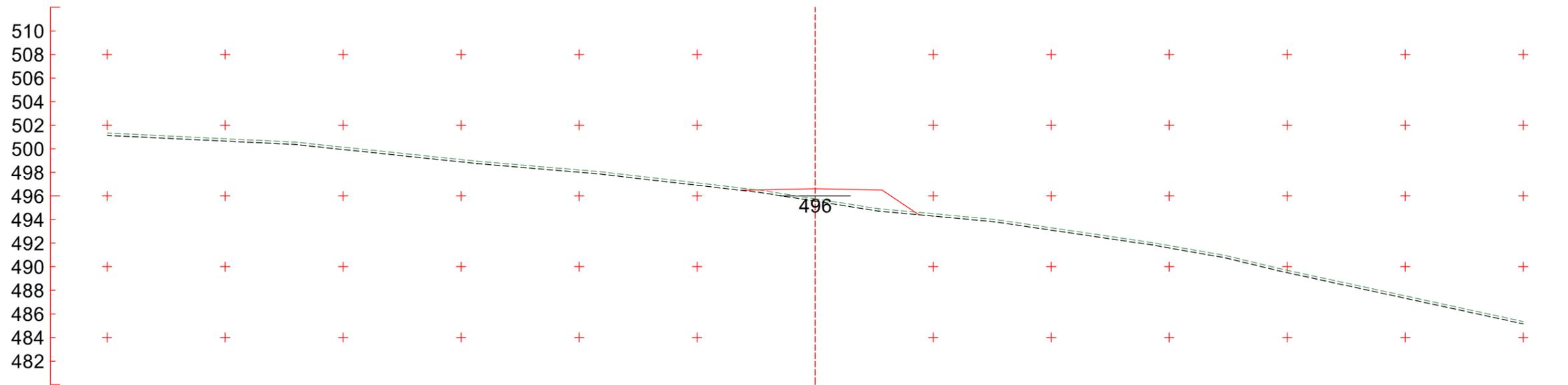
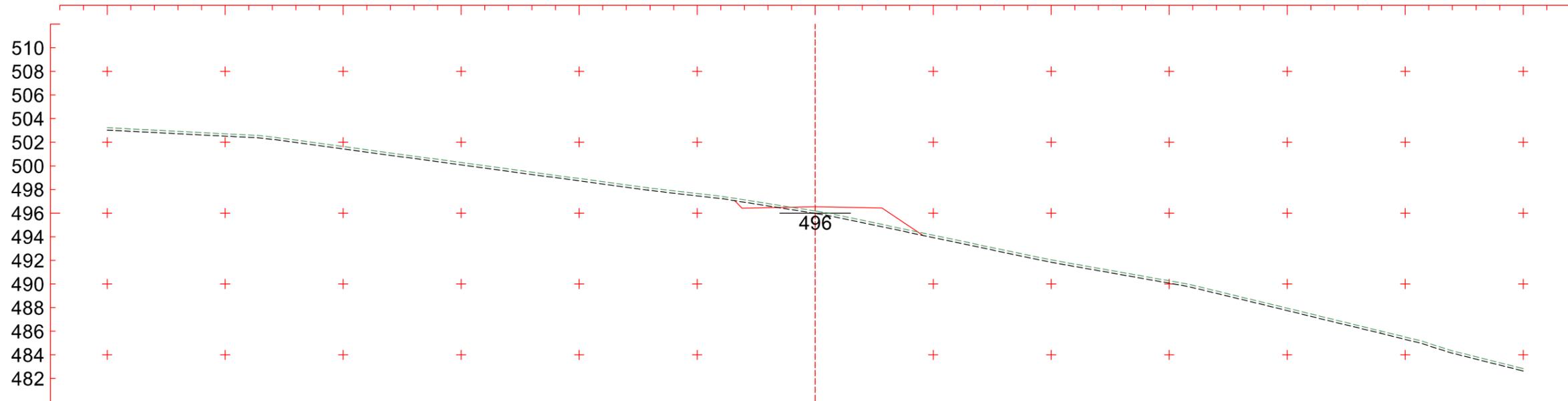
Lote 2
 Escala 1:400



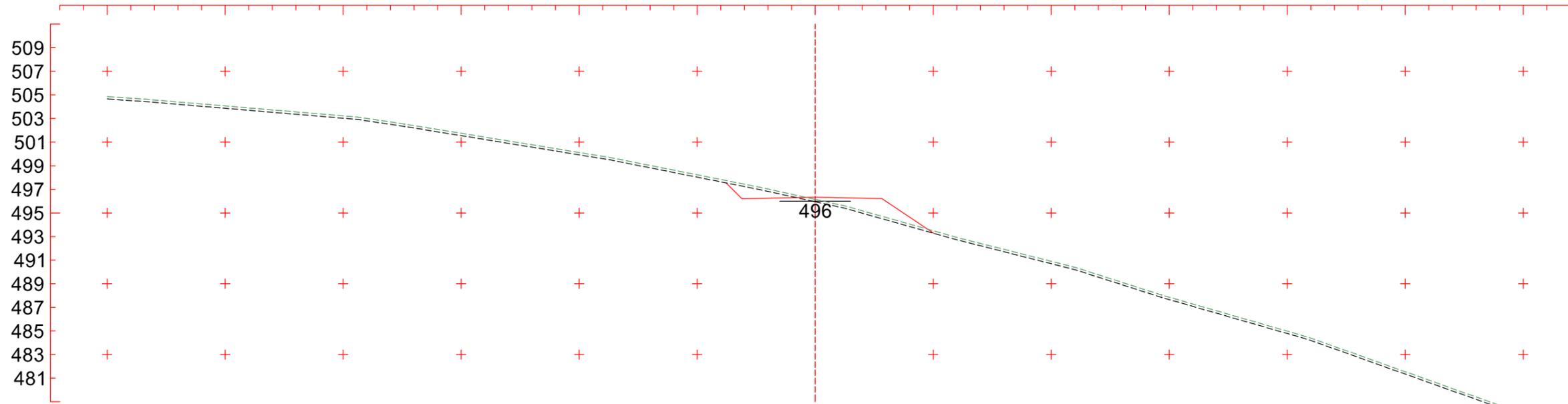
Lote 2
Escala 1:400



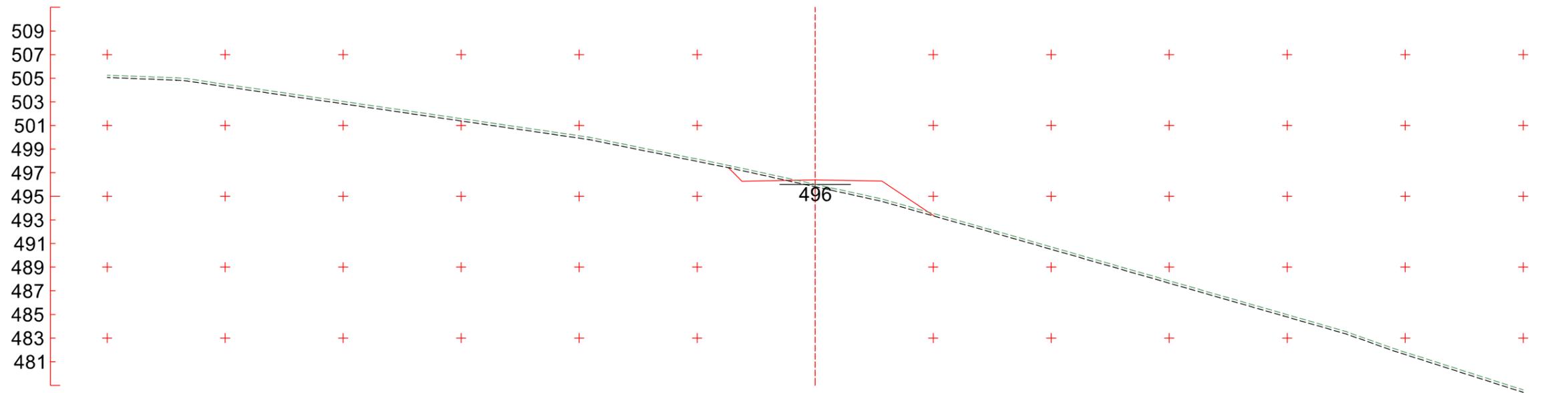
Lote 2
 Escala 1:400



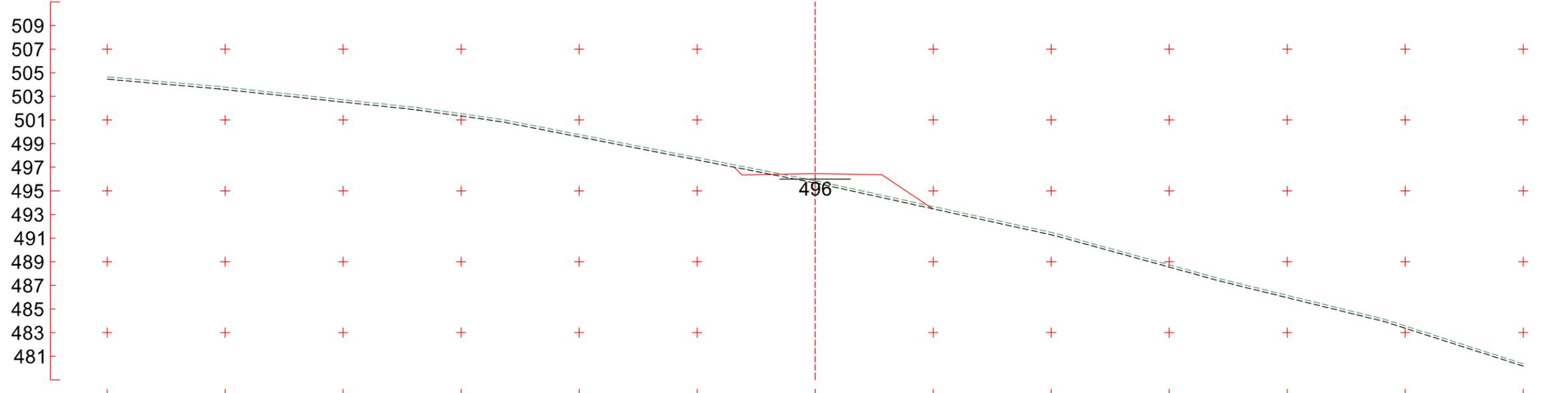
Lote 2
 Escala 1:400



4+180
 CT 496,149 m
 CP 496,326 m

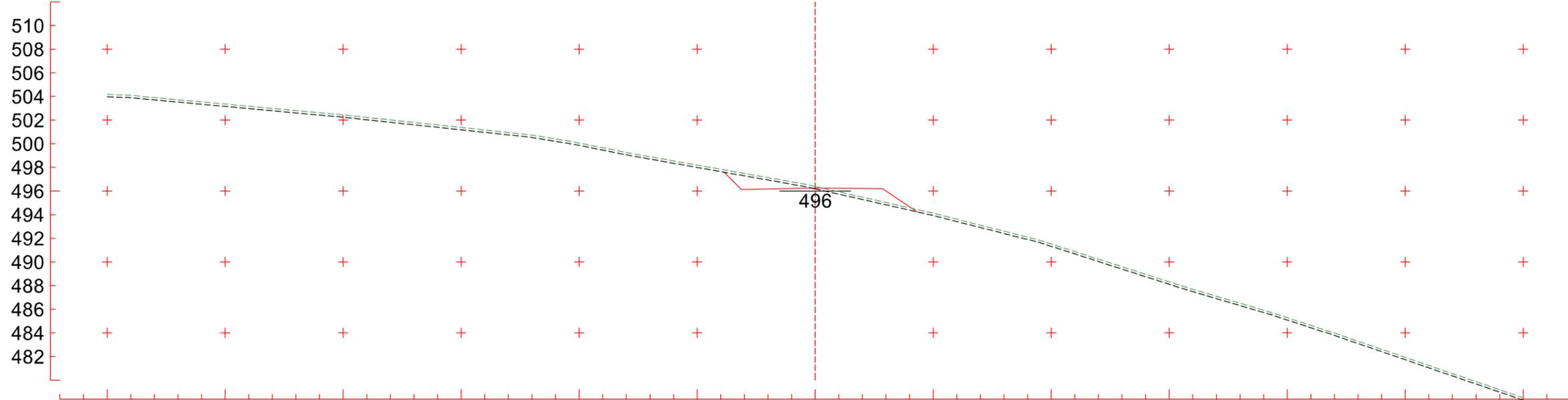
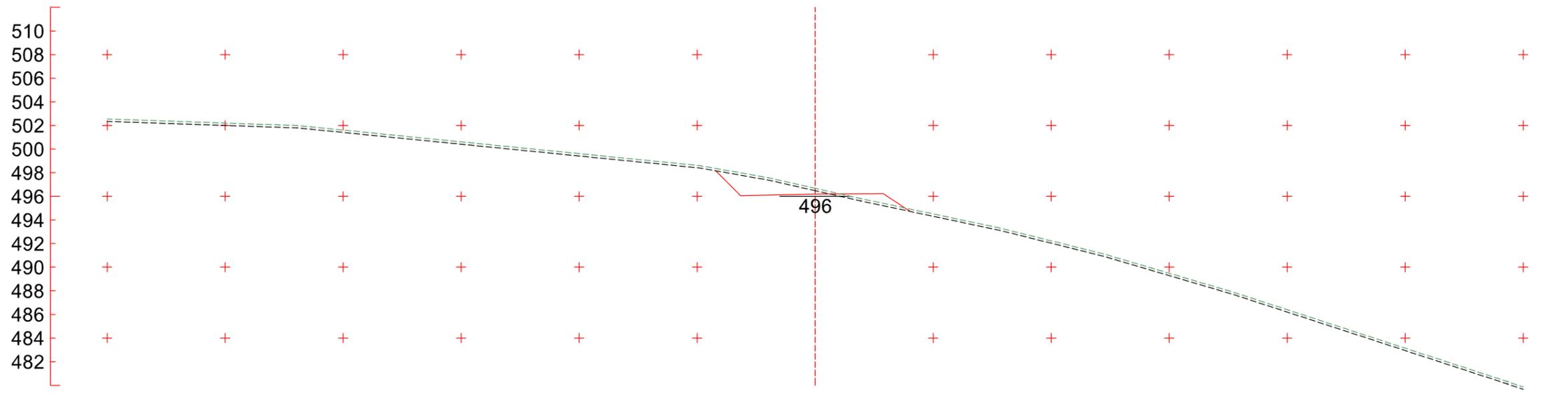
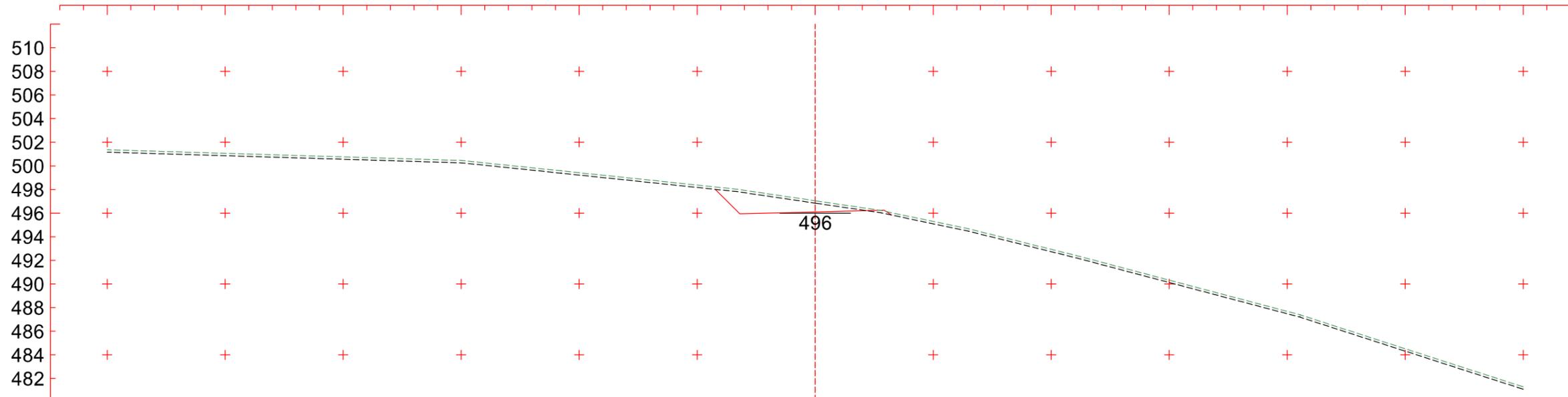


4+160
 CT 496,014 m
 CP 496,398 m

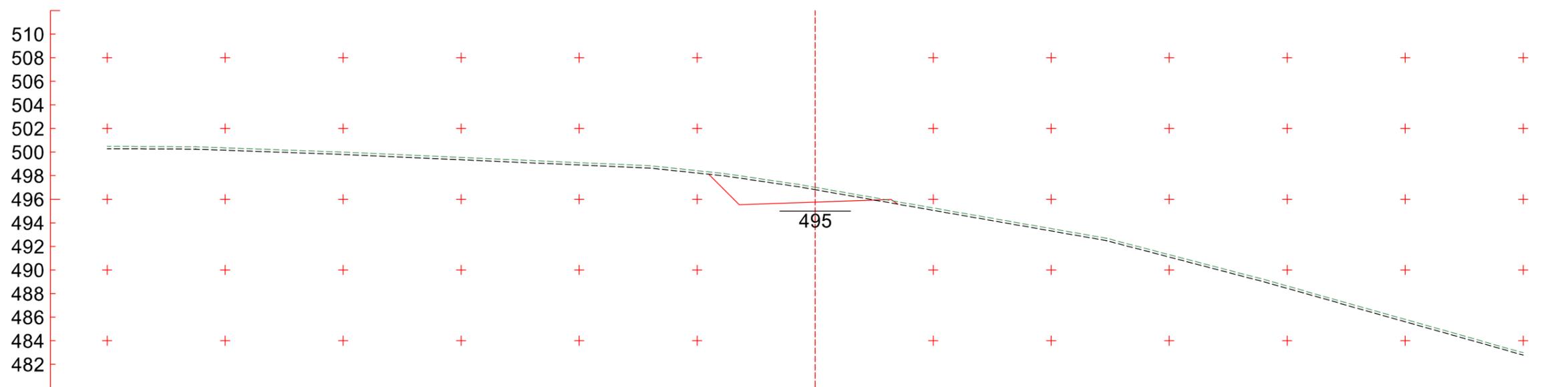
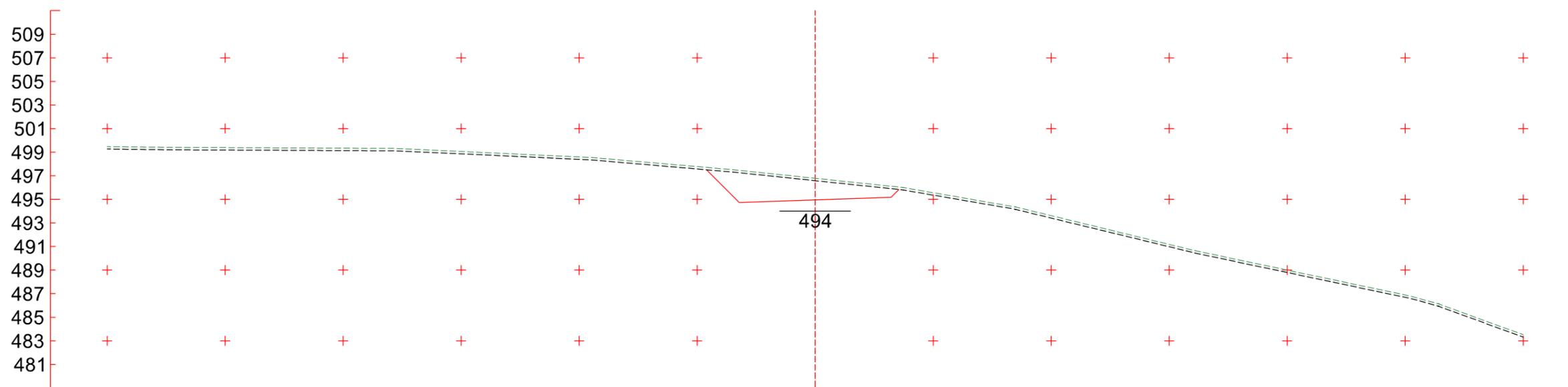
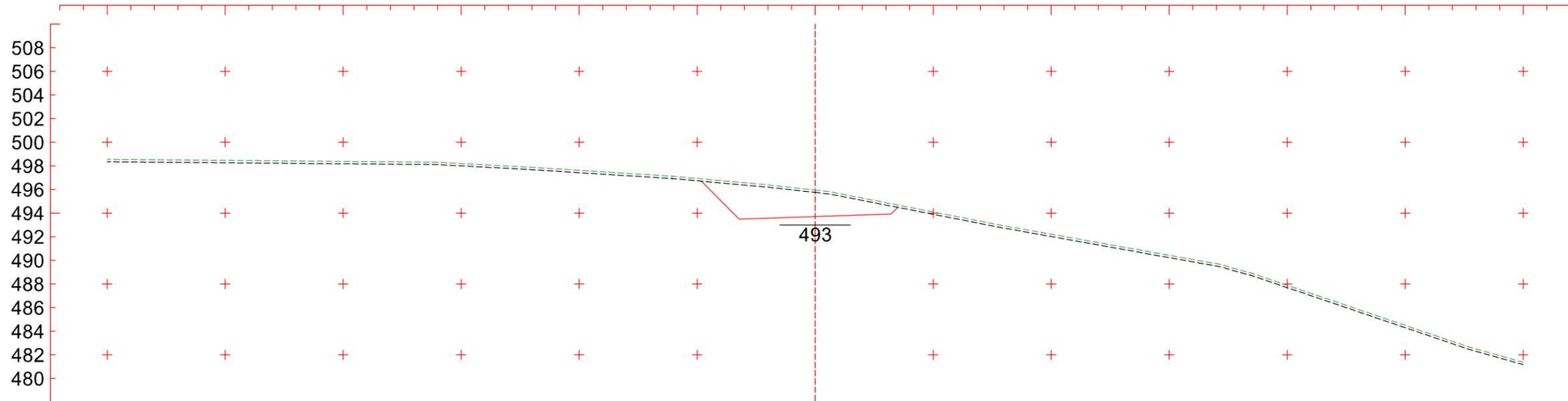


4+140
 CT 495,865 m
 CP 496,471 m

Lote 2
 Escala 1:400



Lote 2
 Escala 1:400

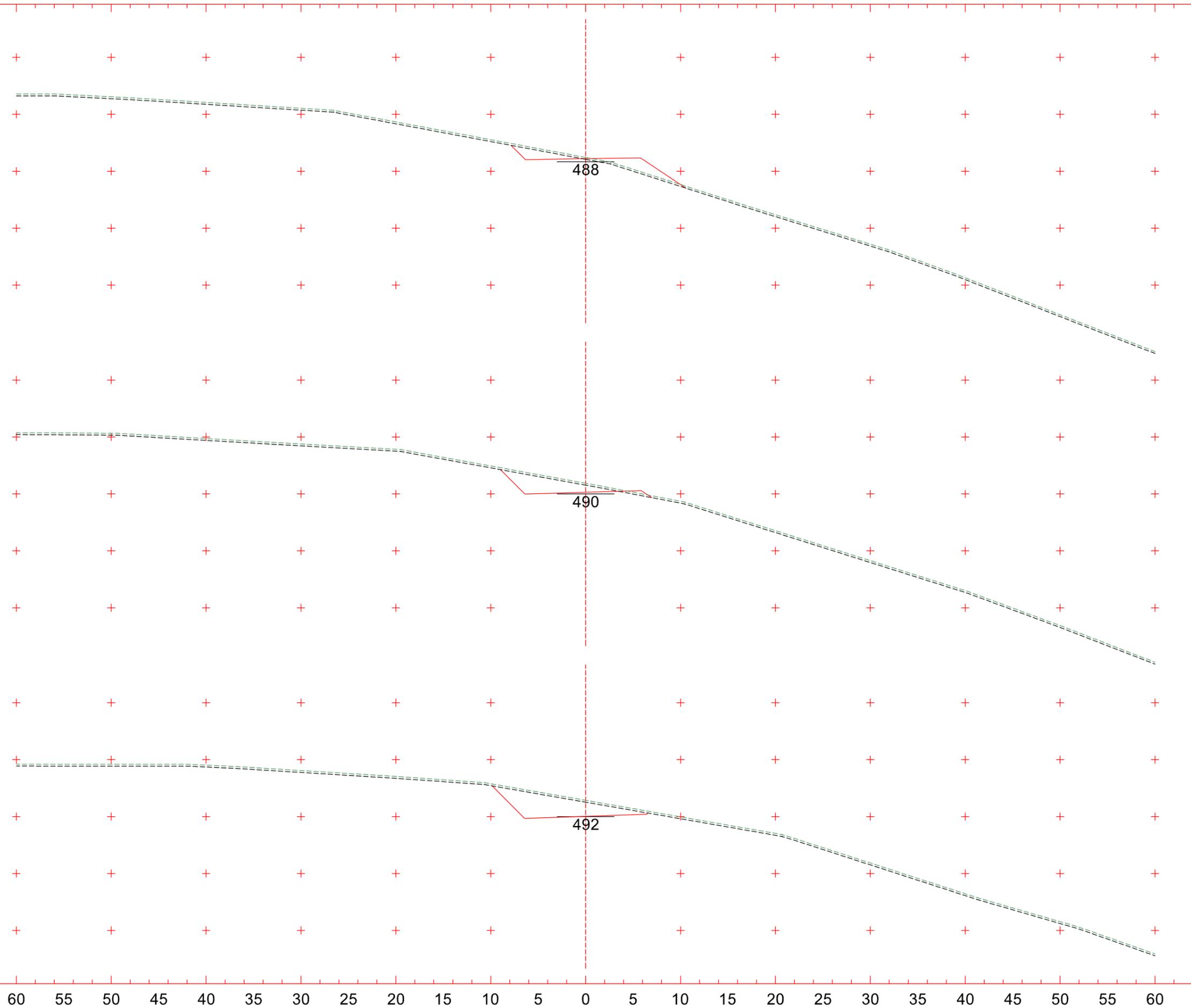


Lote 2
 Escala 1:400

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4+360

CT 488,456 m
CP 488,334 m

4+340

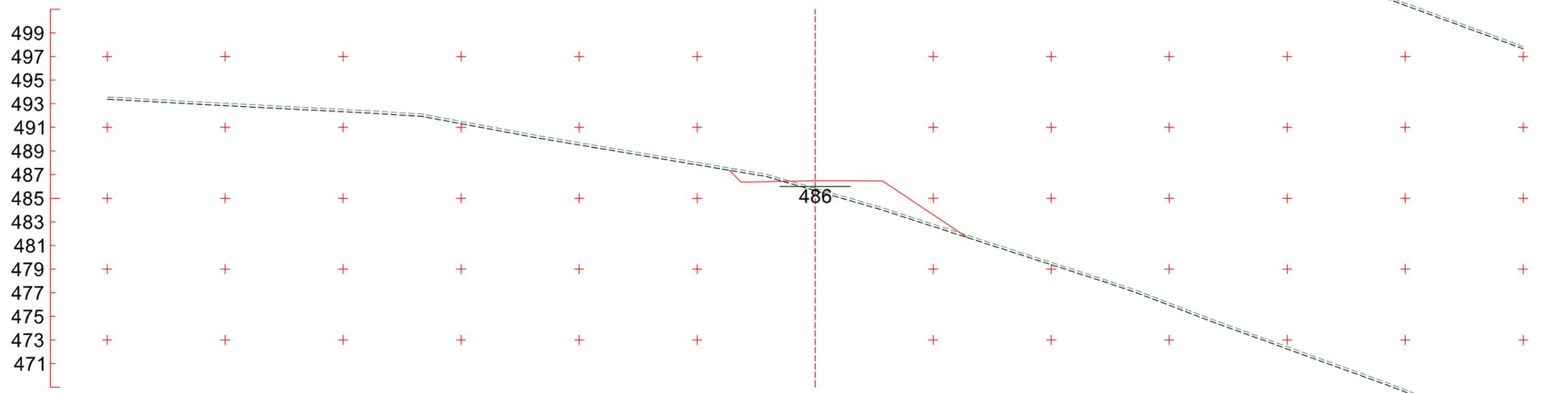
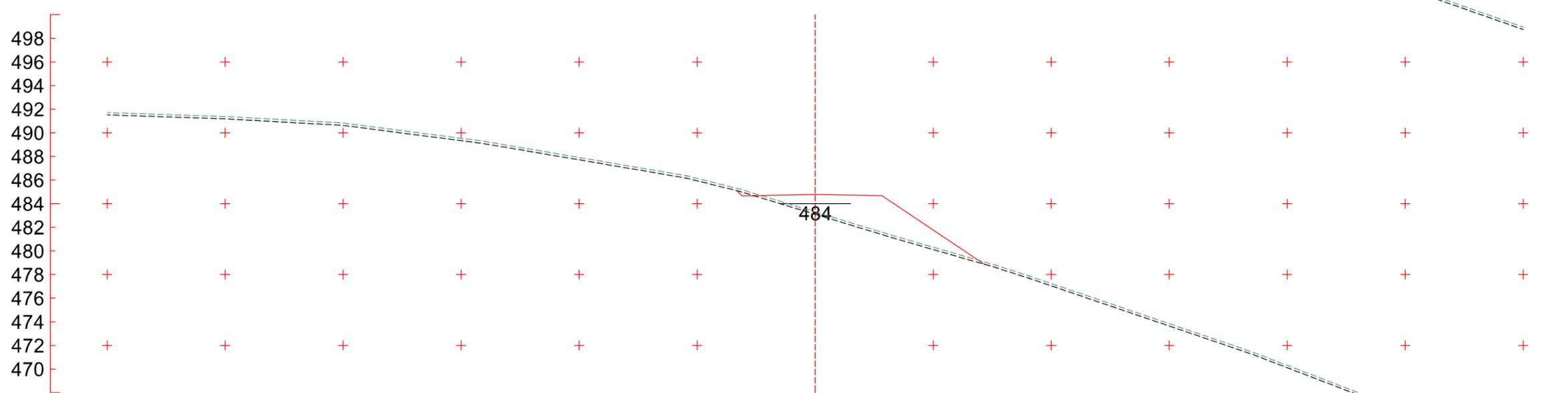
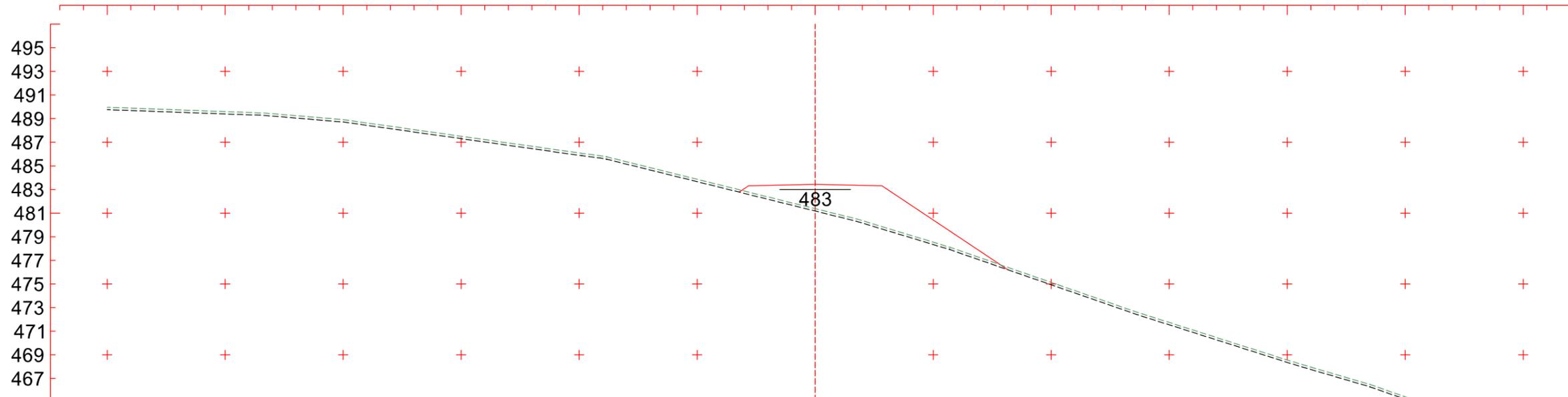
CT 491,121 m
CP 490,179 m

4+320

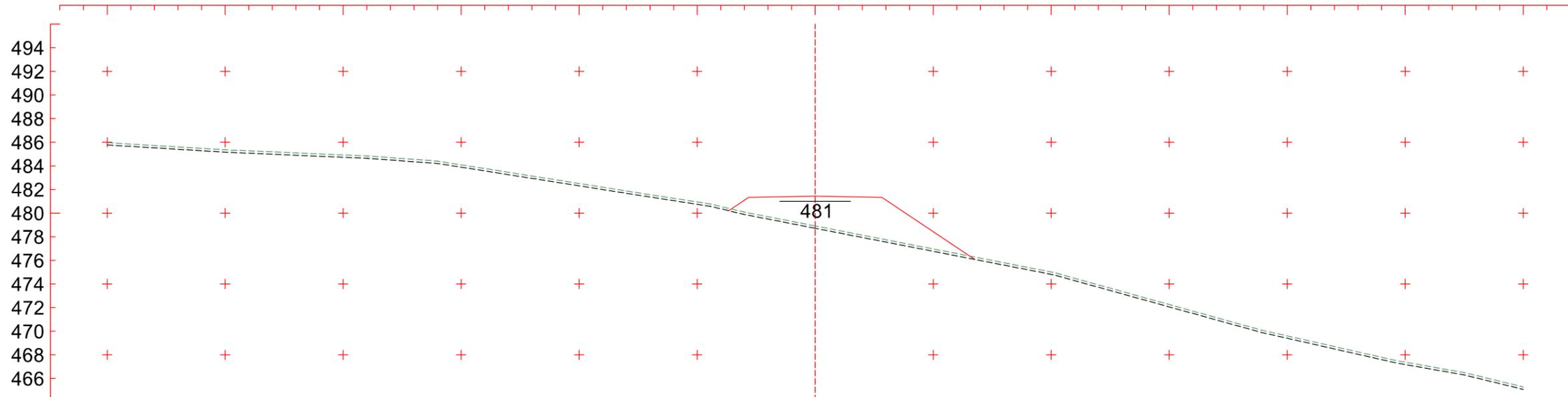
CT 493,717 m
CP 492,024 m

Lote 2

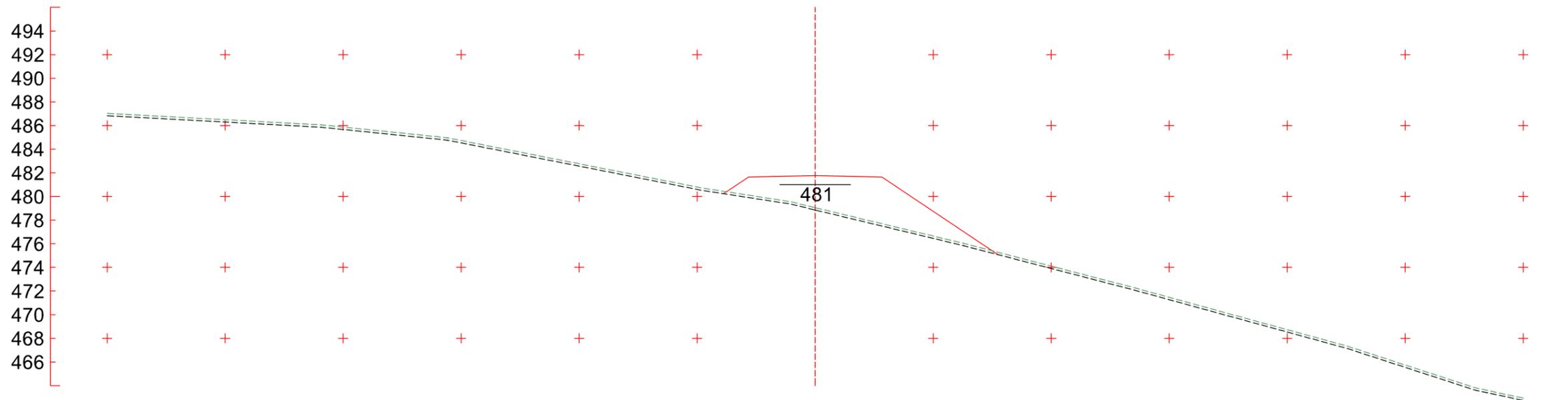
Escala 1:400



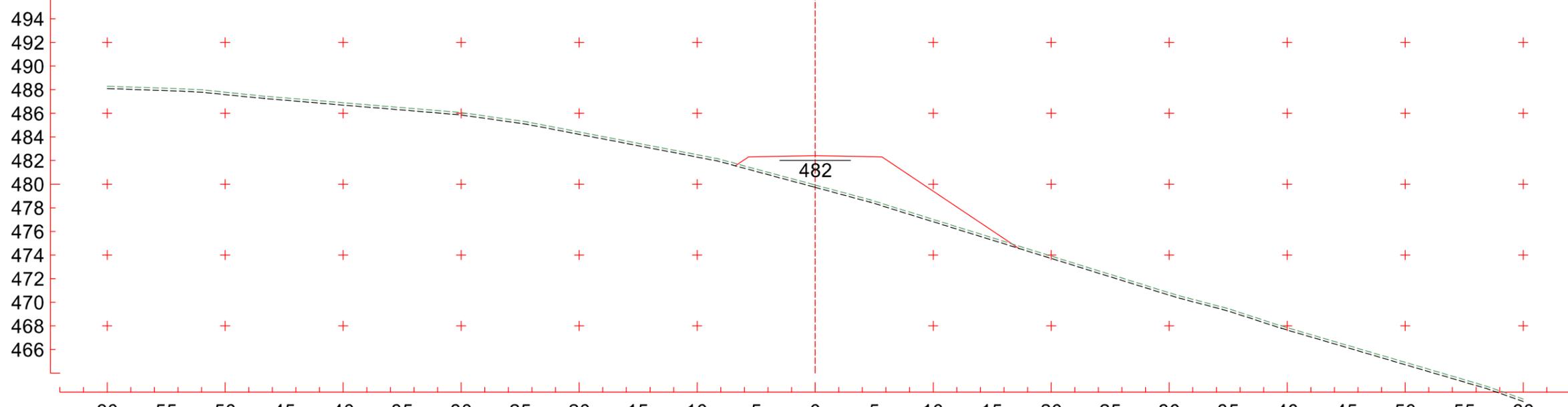
Lote 2
 Escala 1:400



4+480
 CT 478,916 m
 CP 481,441 m

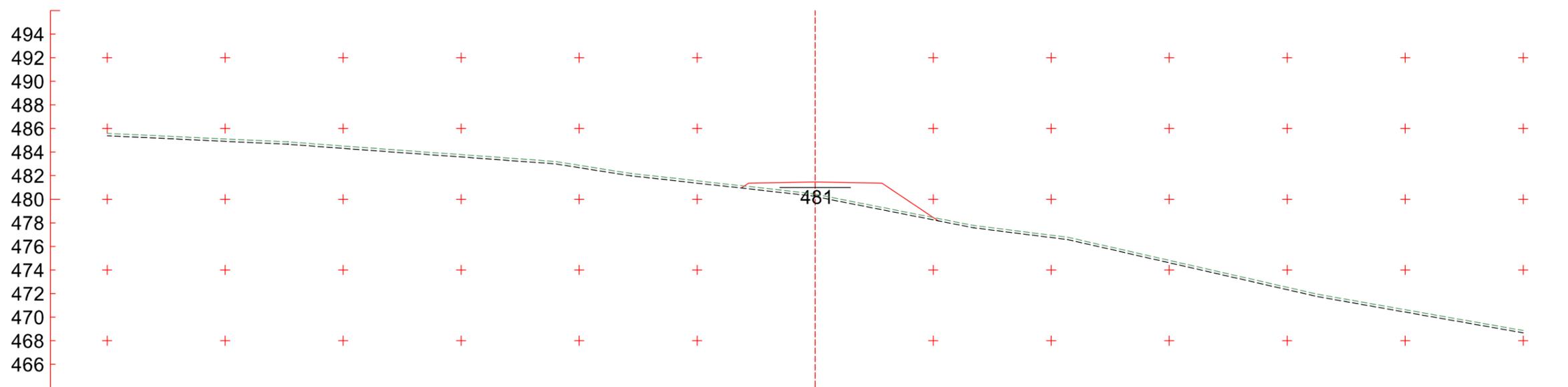
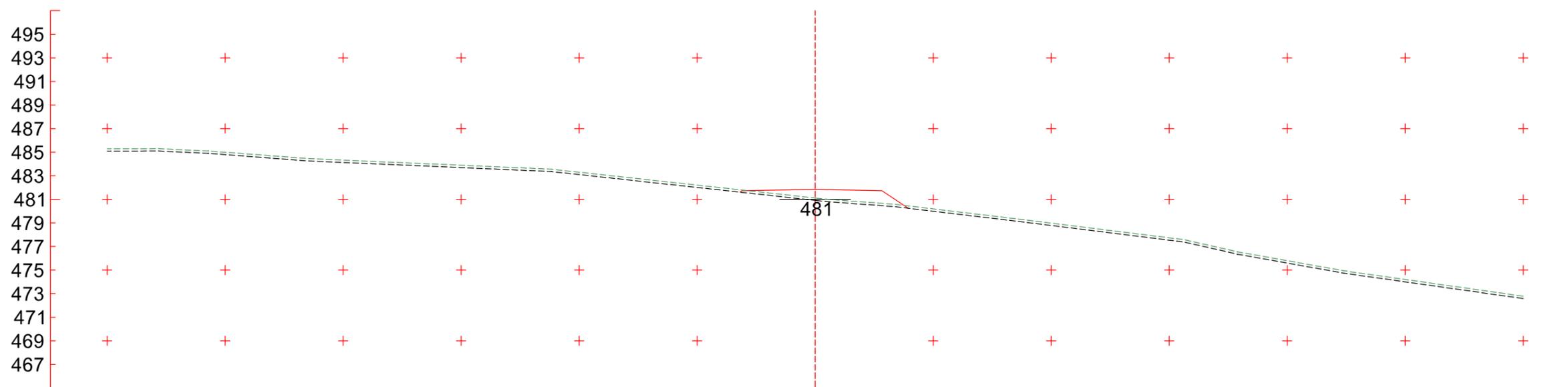
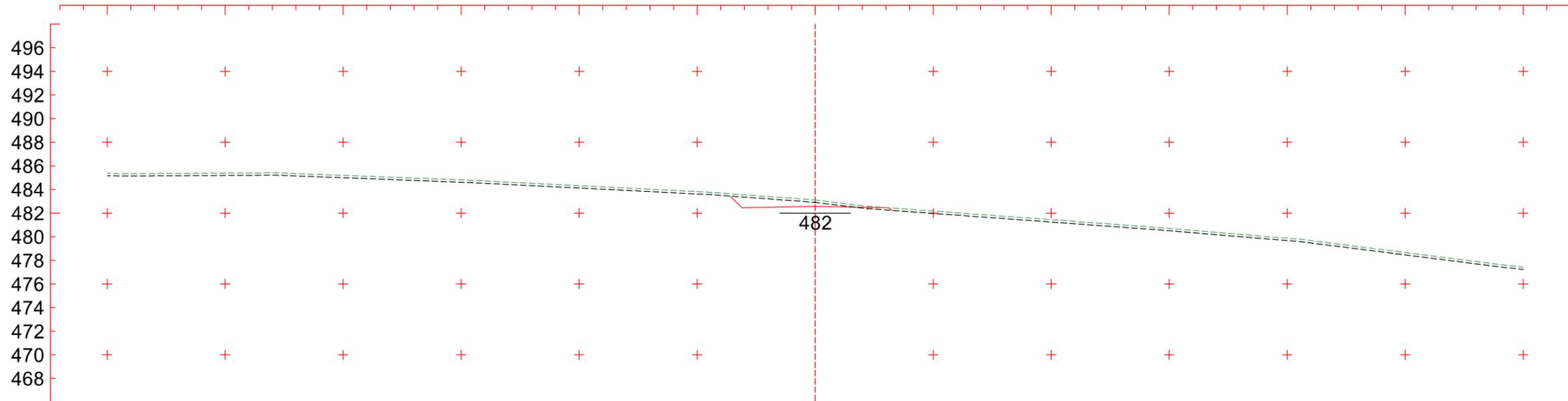


4+460
 CT 479,056 m
 CP 481,758 m



4+440
 CT 479,931 m
 CP 482,421 m

Lote 2
 Escala 1:400

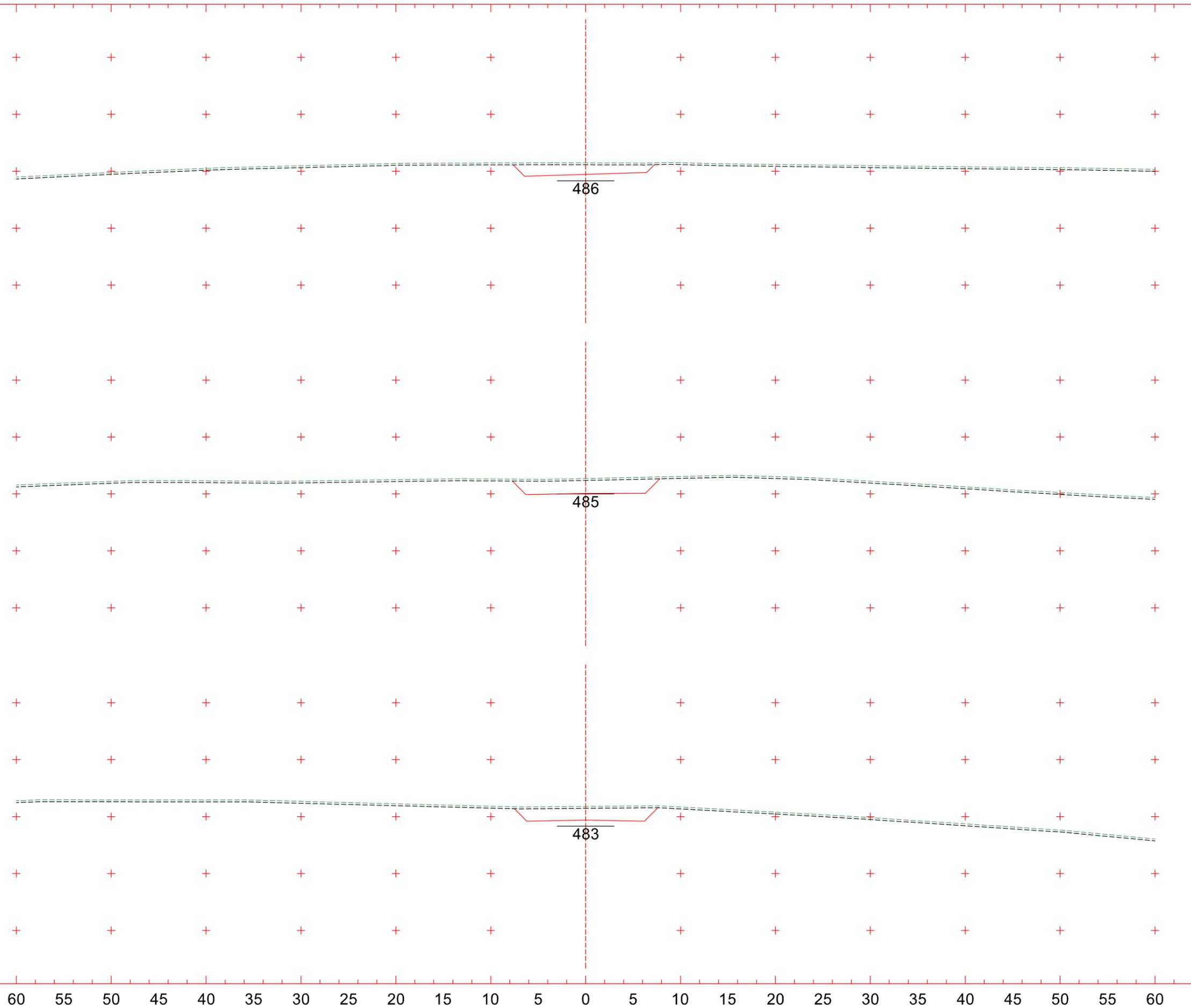


Lote 2
 Escala 1:400

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4+600

CT 487,882 m
CP 486,675 m

4+580

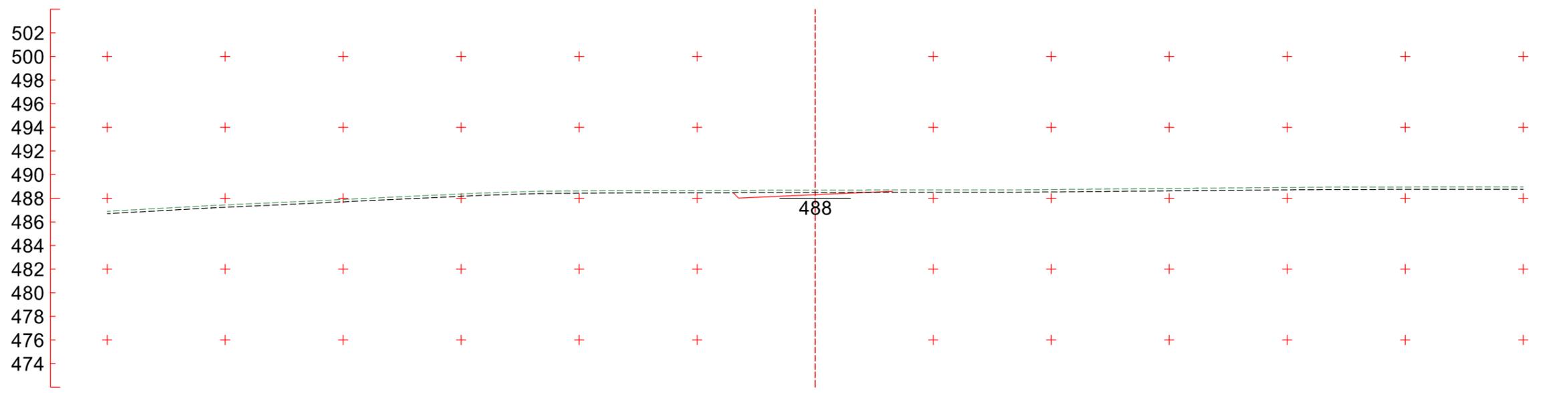
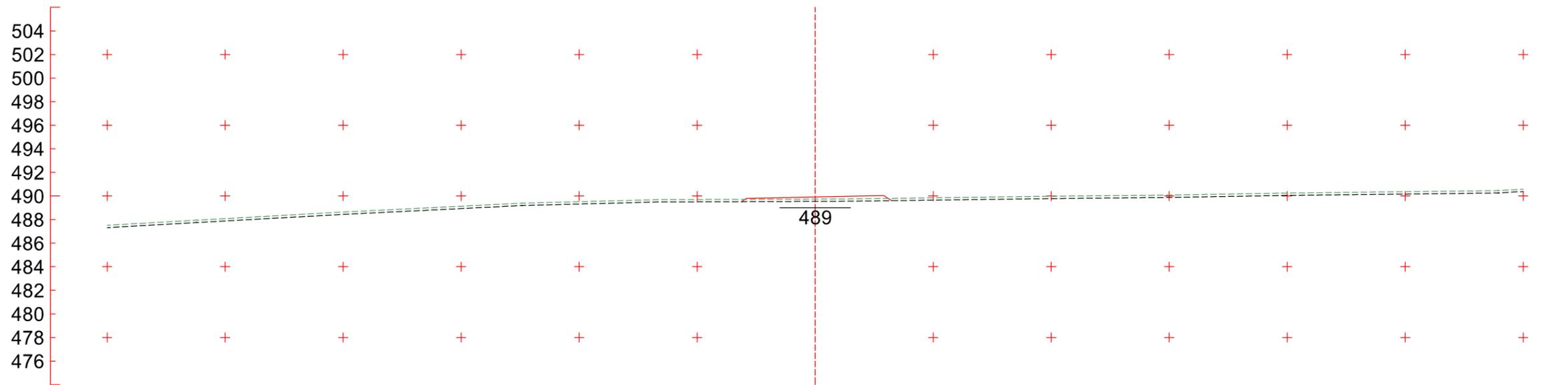
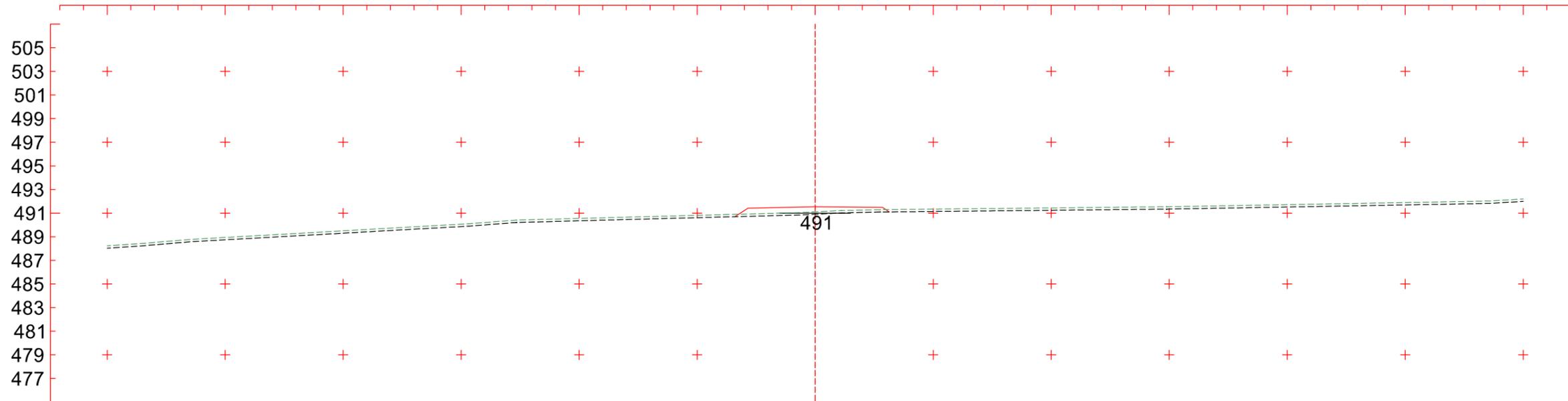
CT 486,622 m
CP 485,055 m

4+560

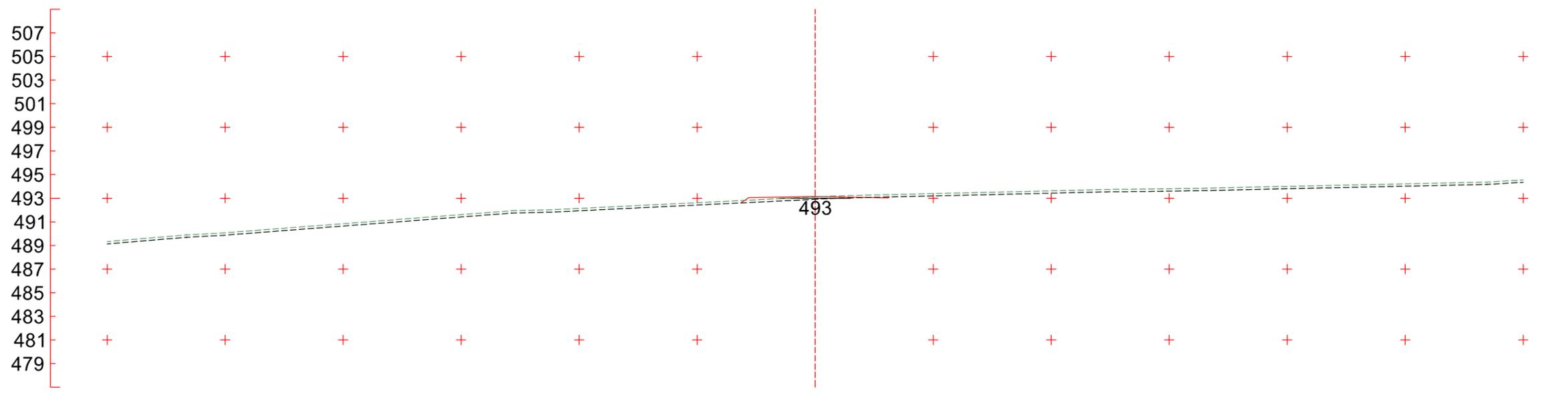
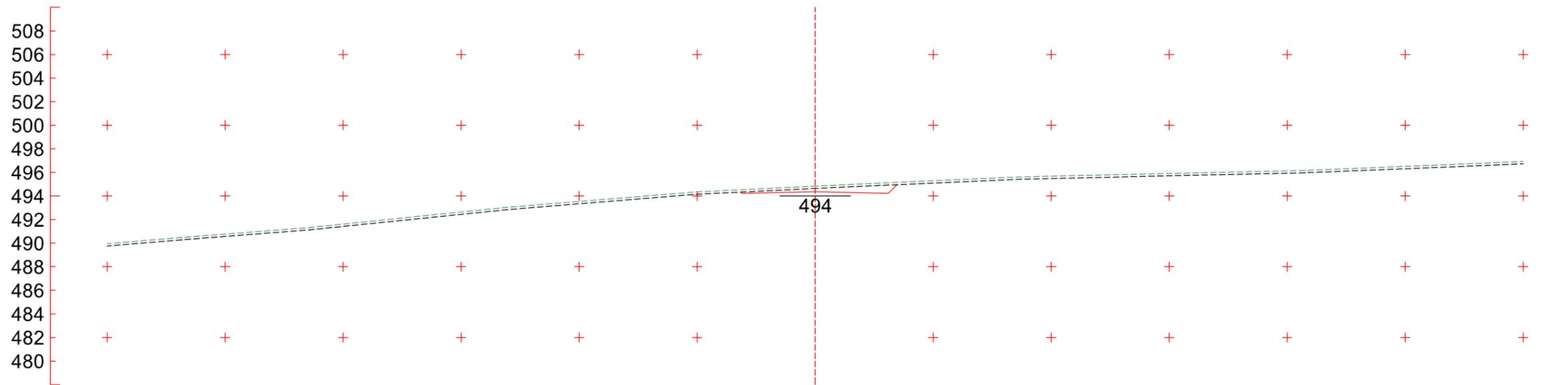
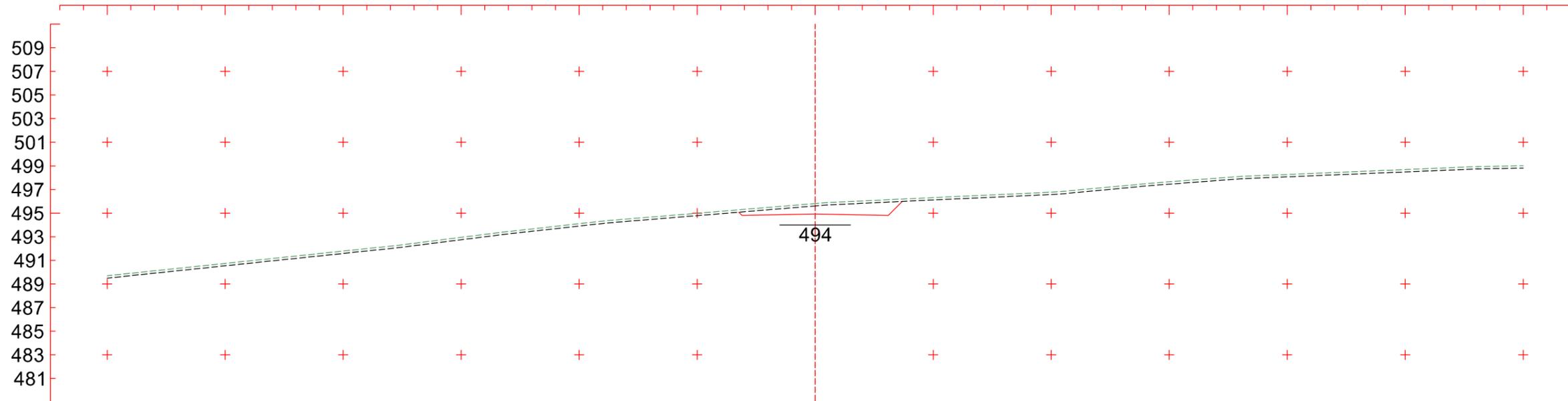
CT 485,068 m
CP 483,639 m

Lote 2

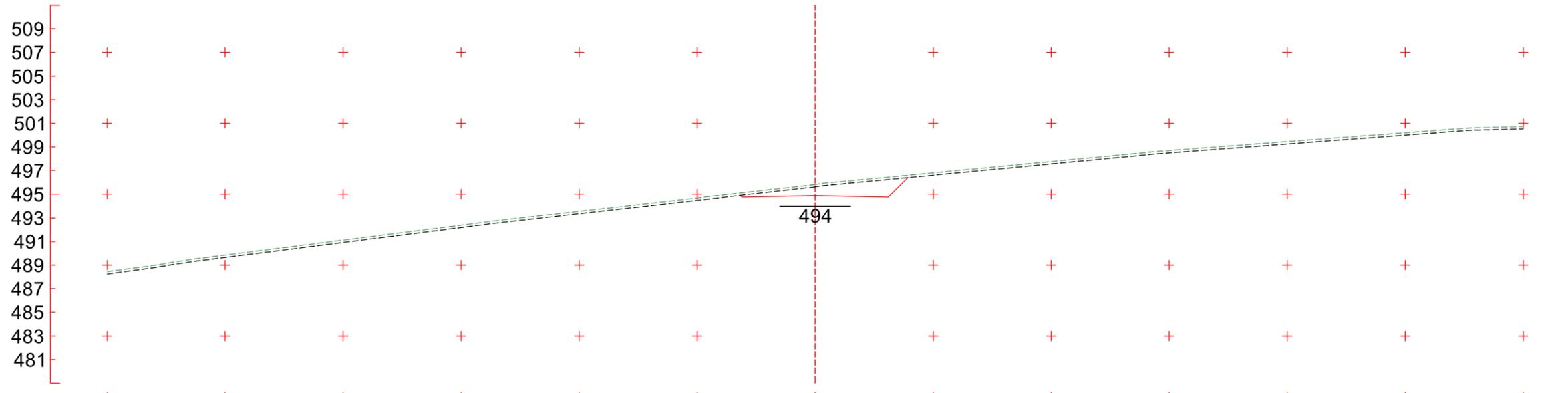
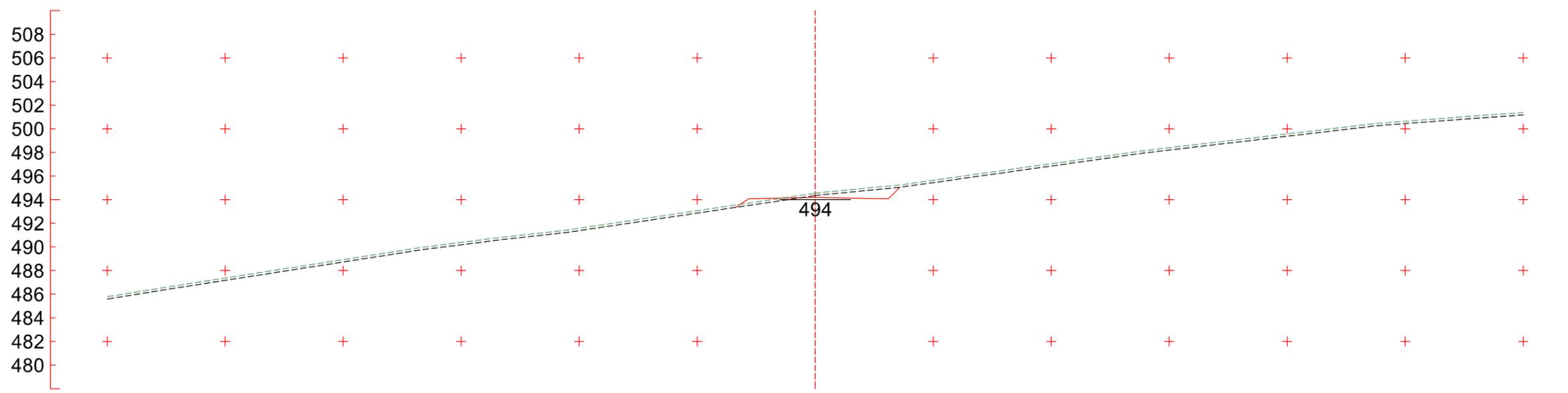
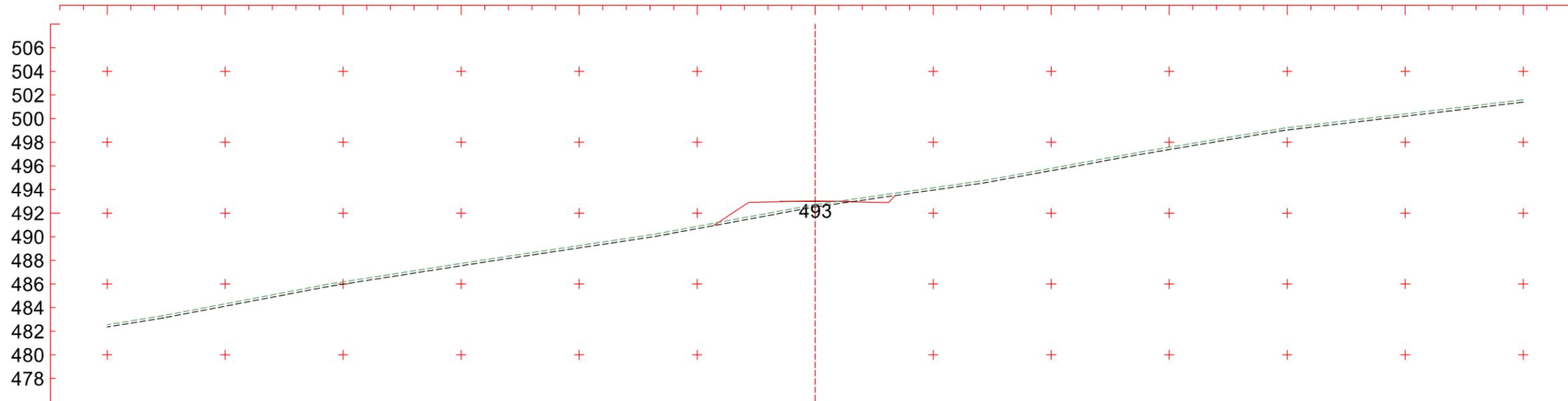
Escala 1:400



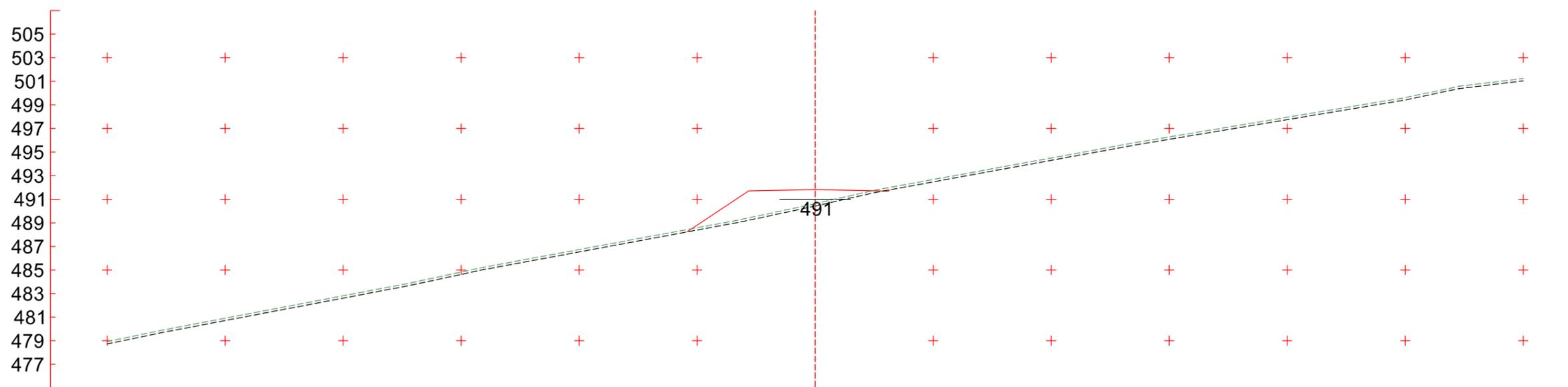
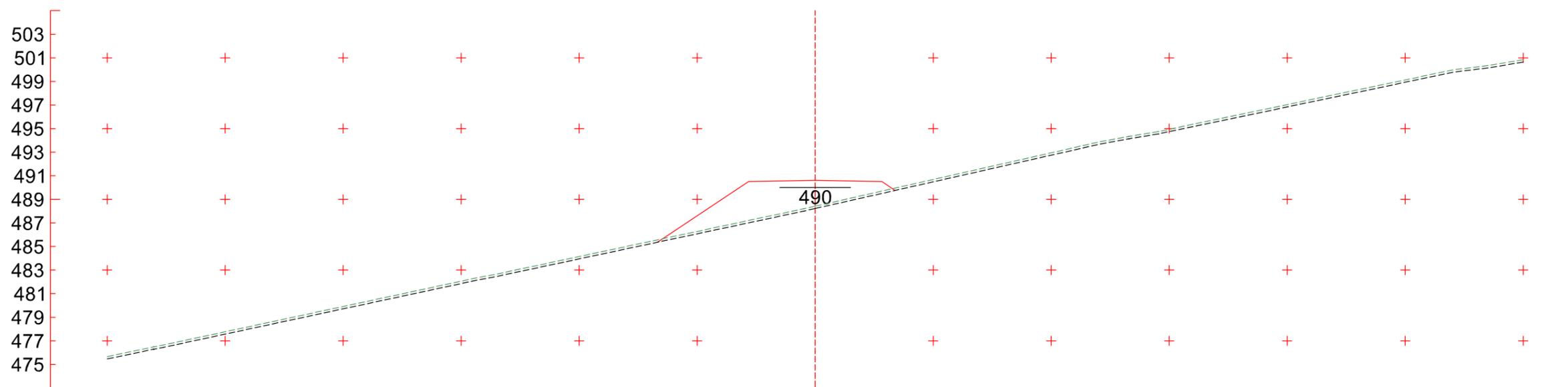
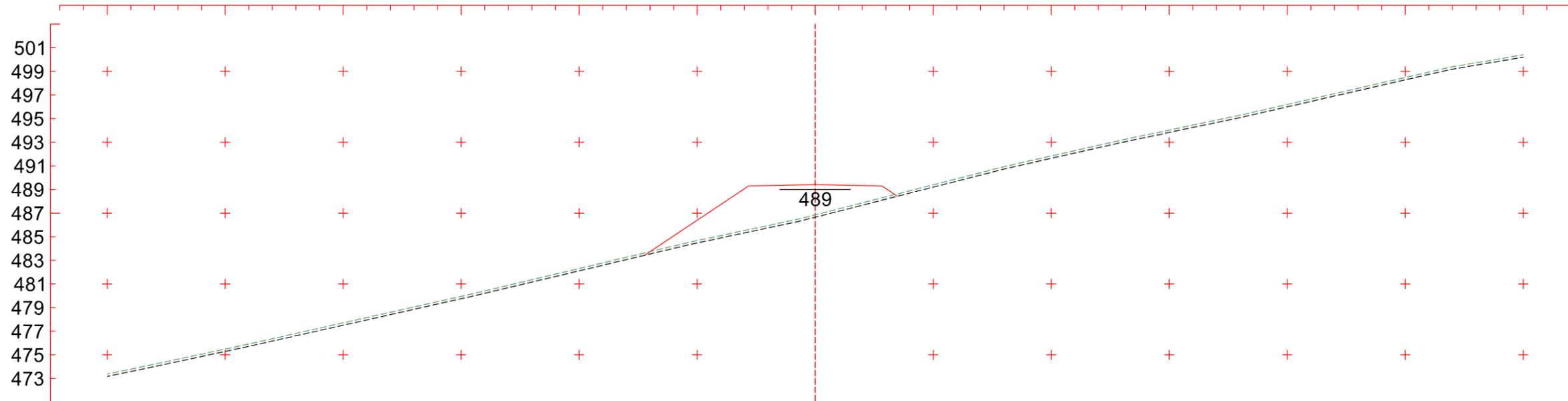
Lote 2
 Escala 1:400



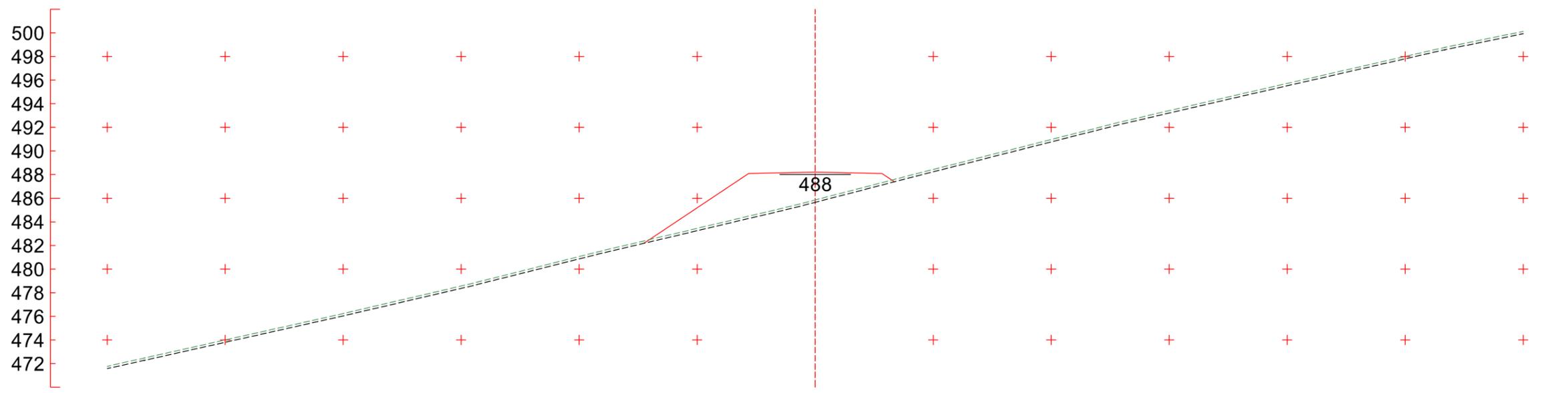
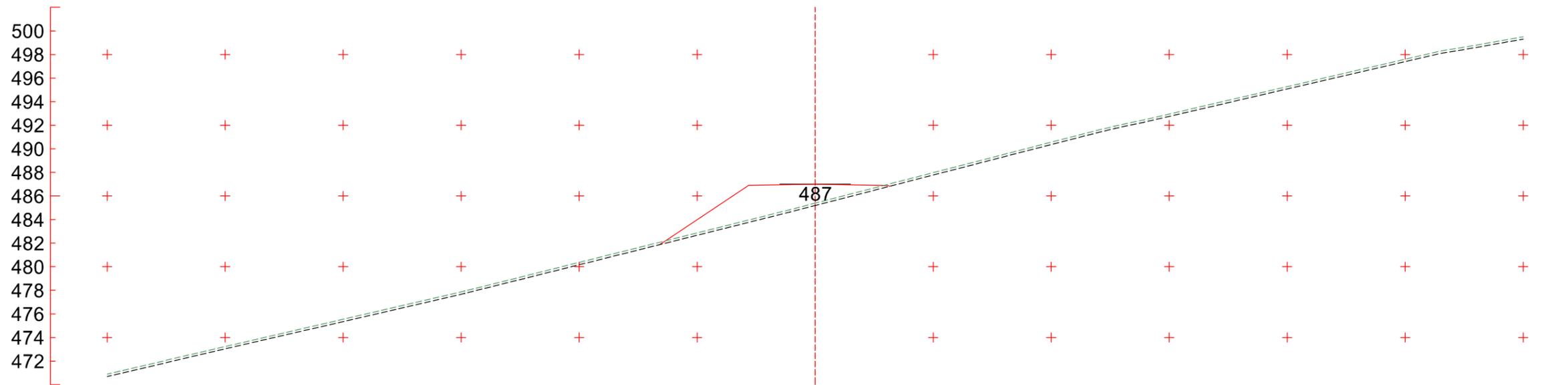
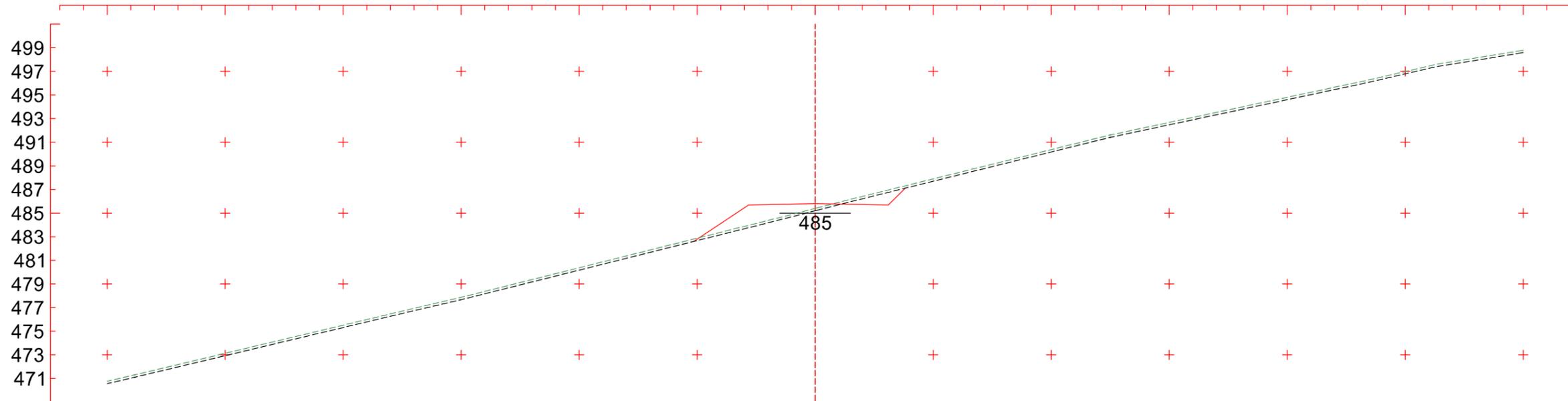
Lote 2
 Escala 1:400



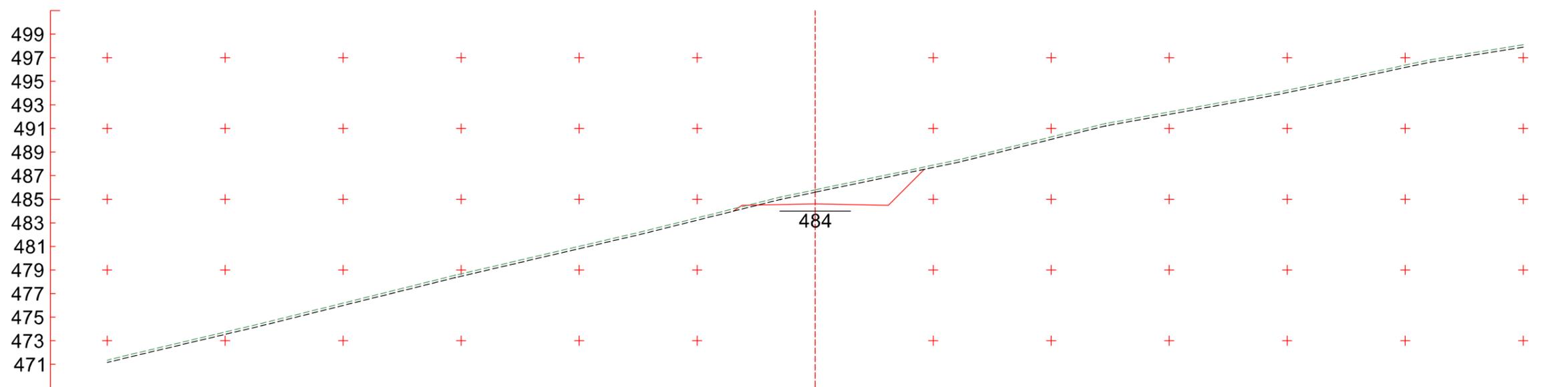
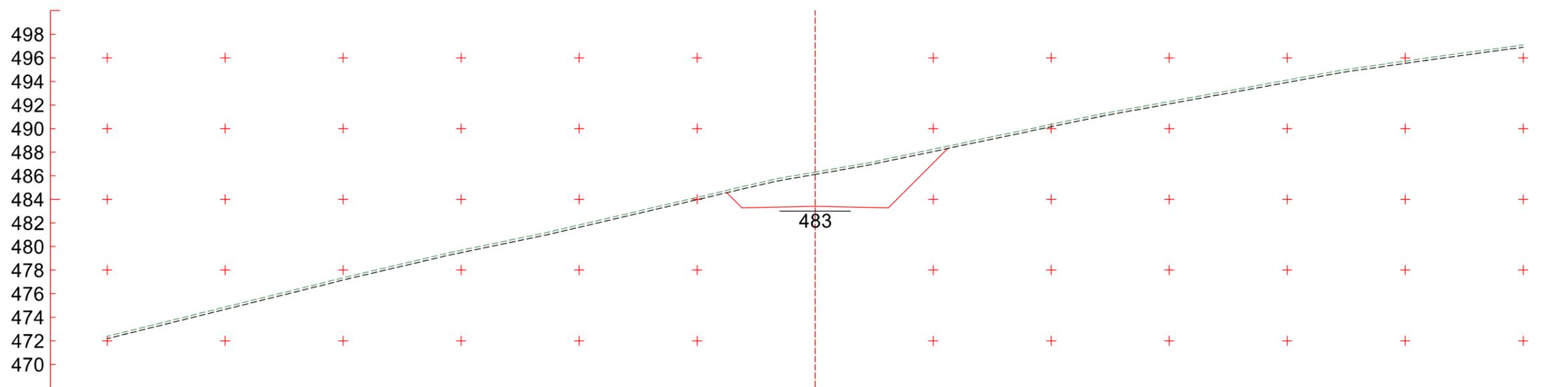
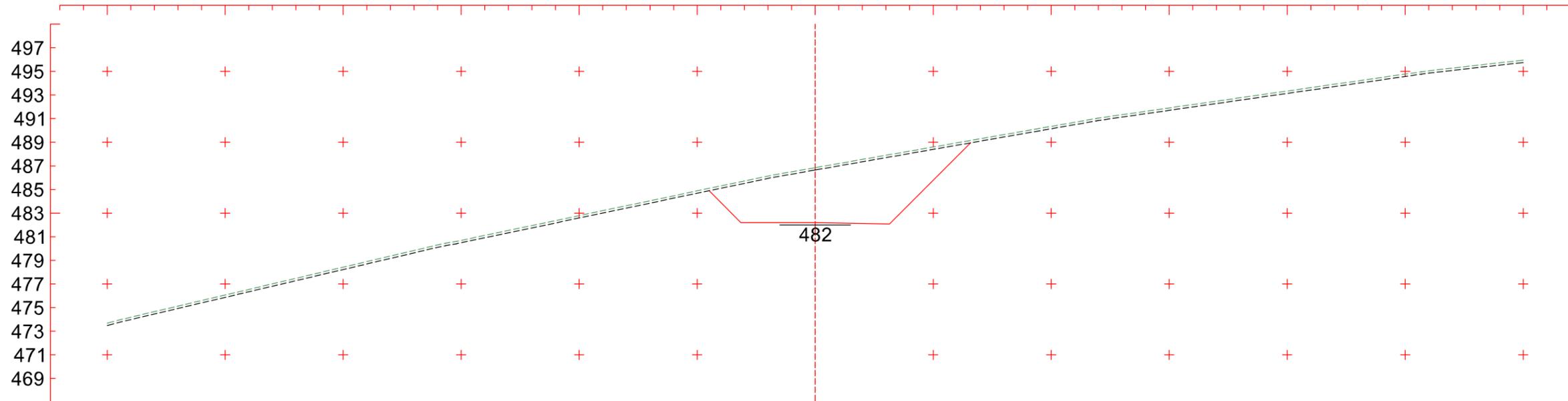
Lote 2
 Escala 1:400



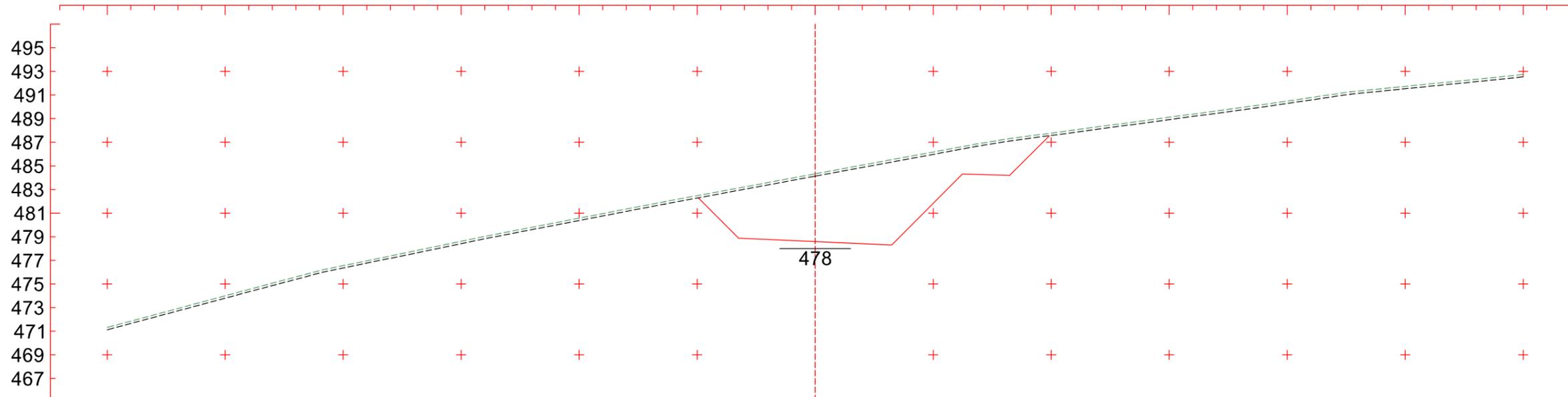
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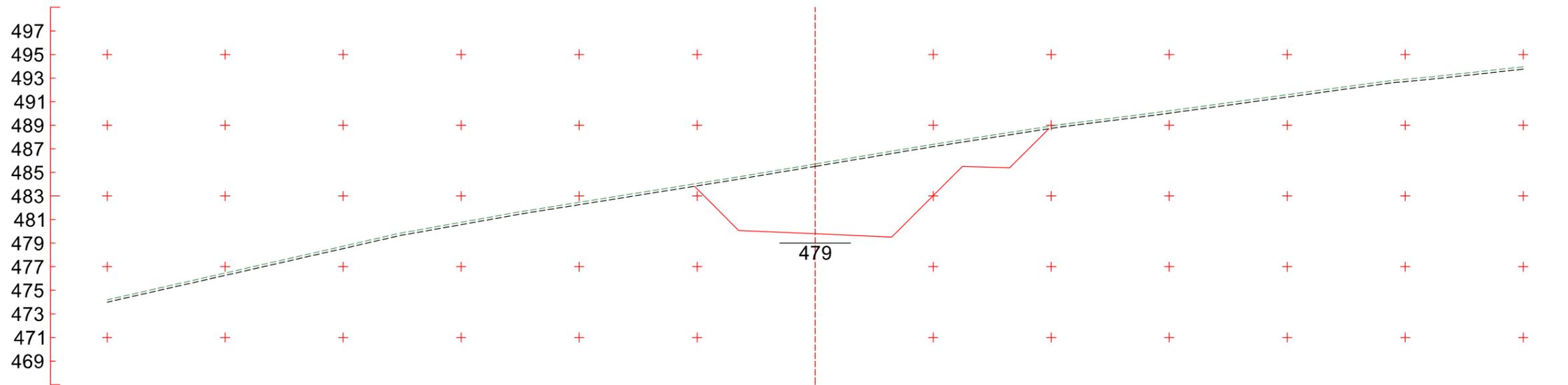
Lote 2
Escala 1:400



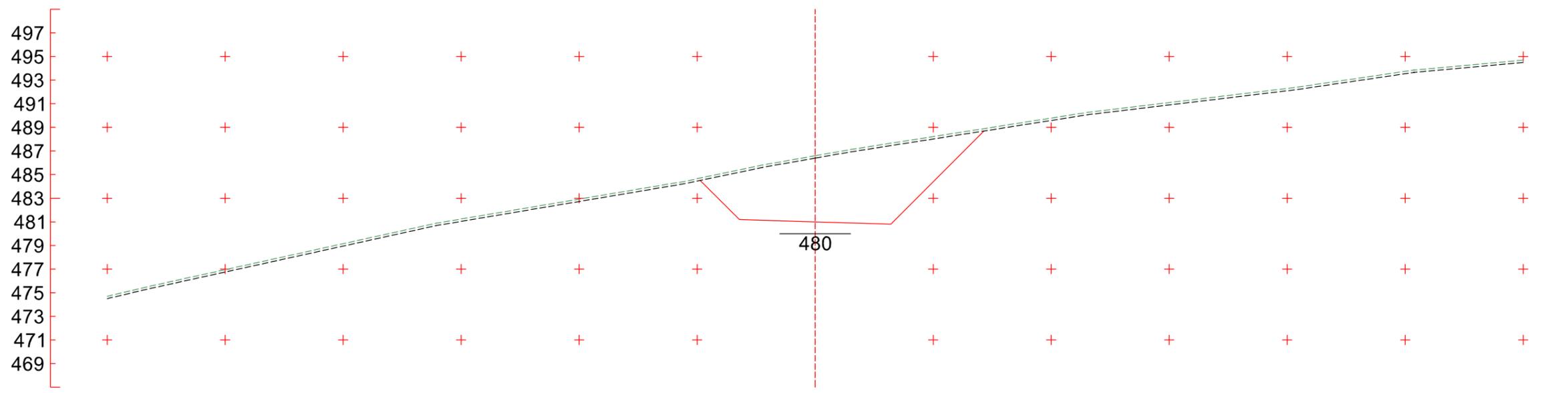
Lote 2
Escala 1:400



5+020
 CT 484,326 m
 CP 478,592 m

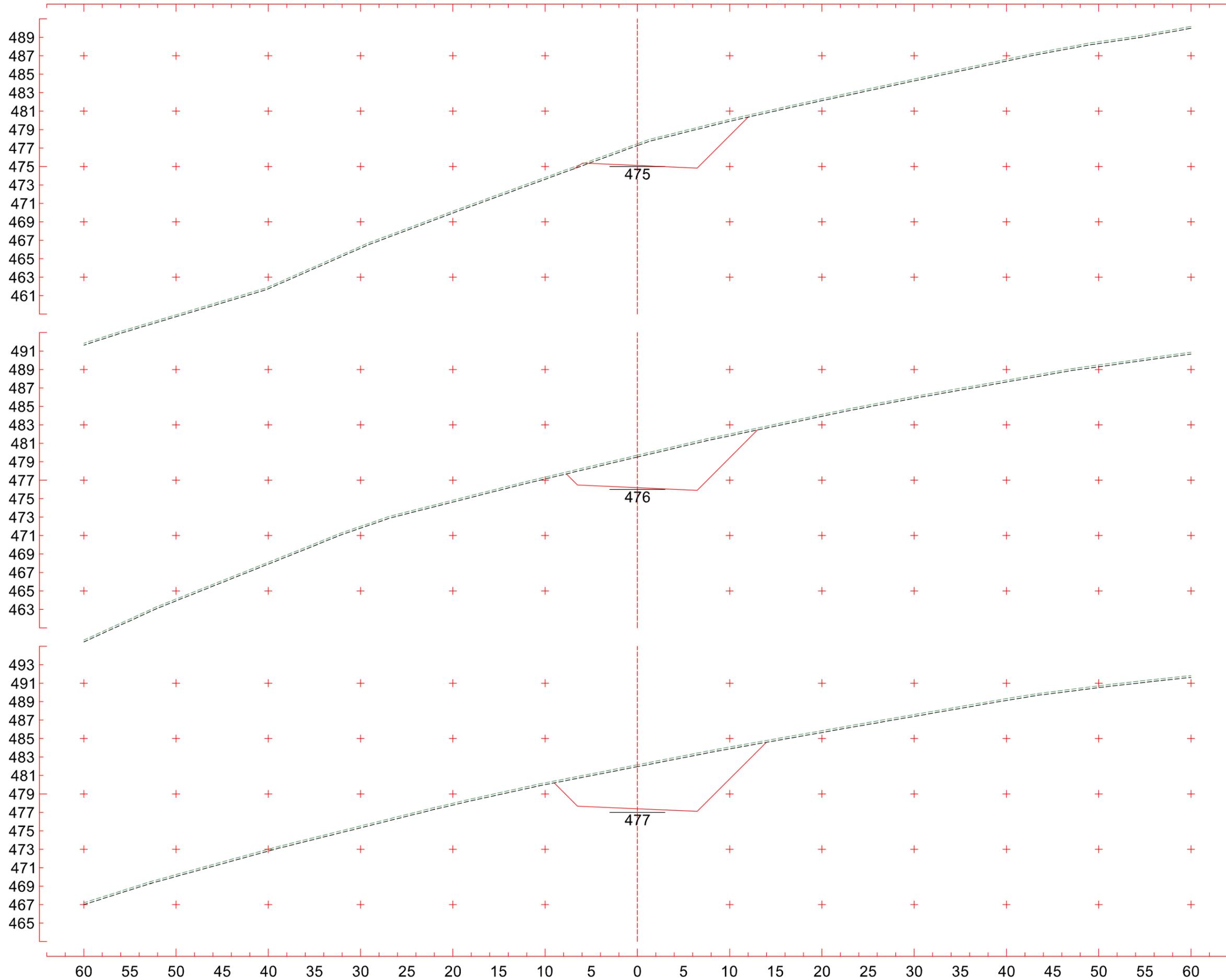


5+000
 CT 485,713 m
 CP 479,795 m



4+980
 CT 486,595 m
 CP 480,997 m

Lote 2
 Escala 1:400



5+080

CT 477,462 m
CP 475,114 m

5+060

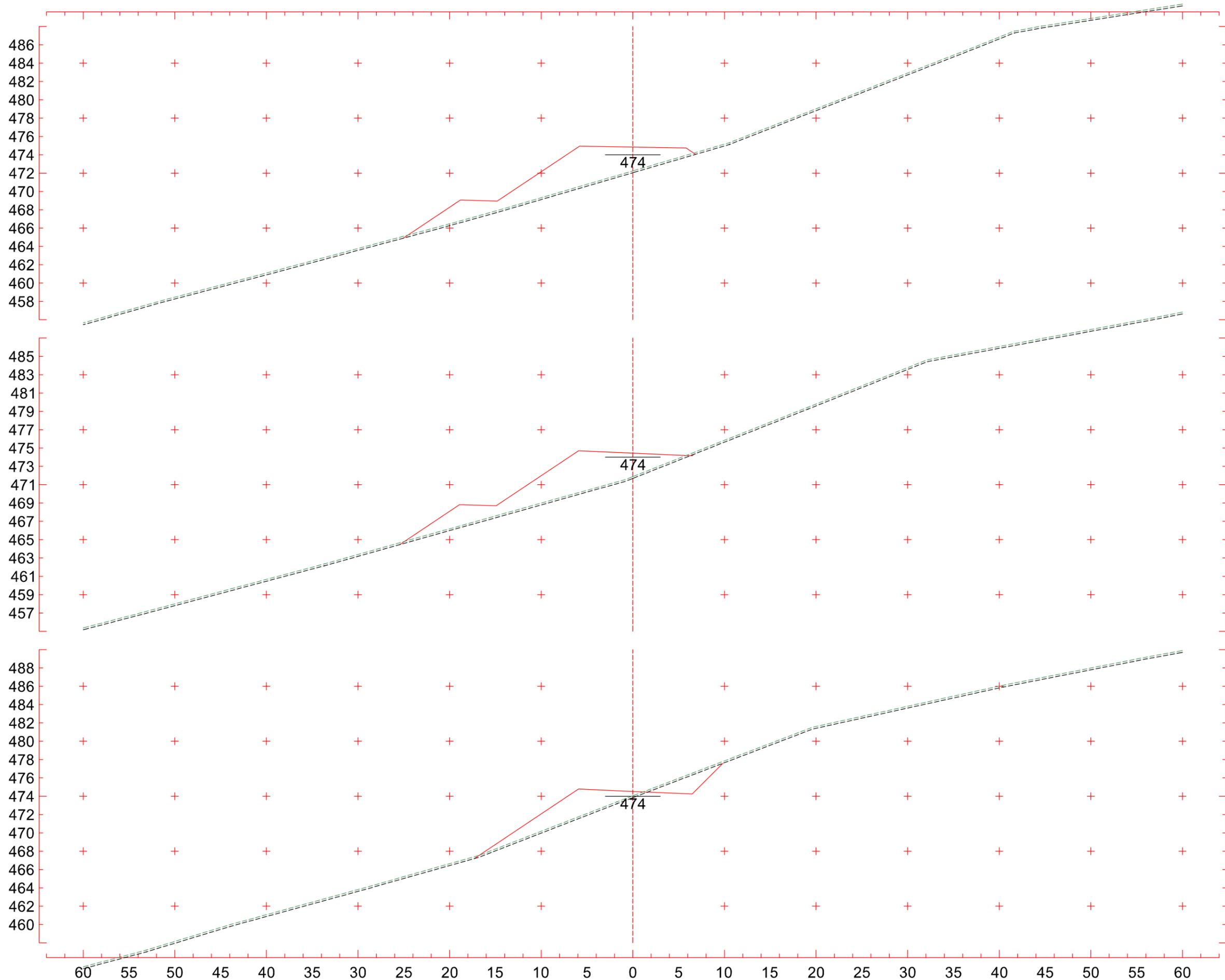
CT 479,710 m
CP 476,187 m

5+040

CT 482,155 m
CP 477,390 m

Lote 2

Escala 1:400



5+140

CT 472,239 m
CP 474,847 m

5+120

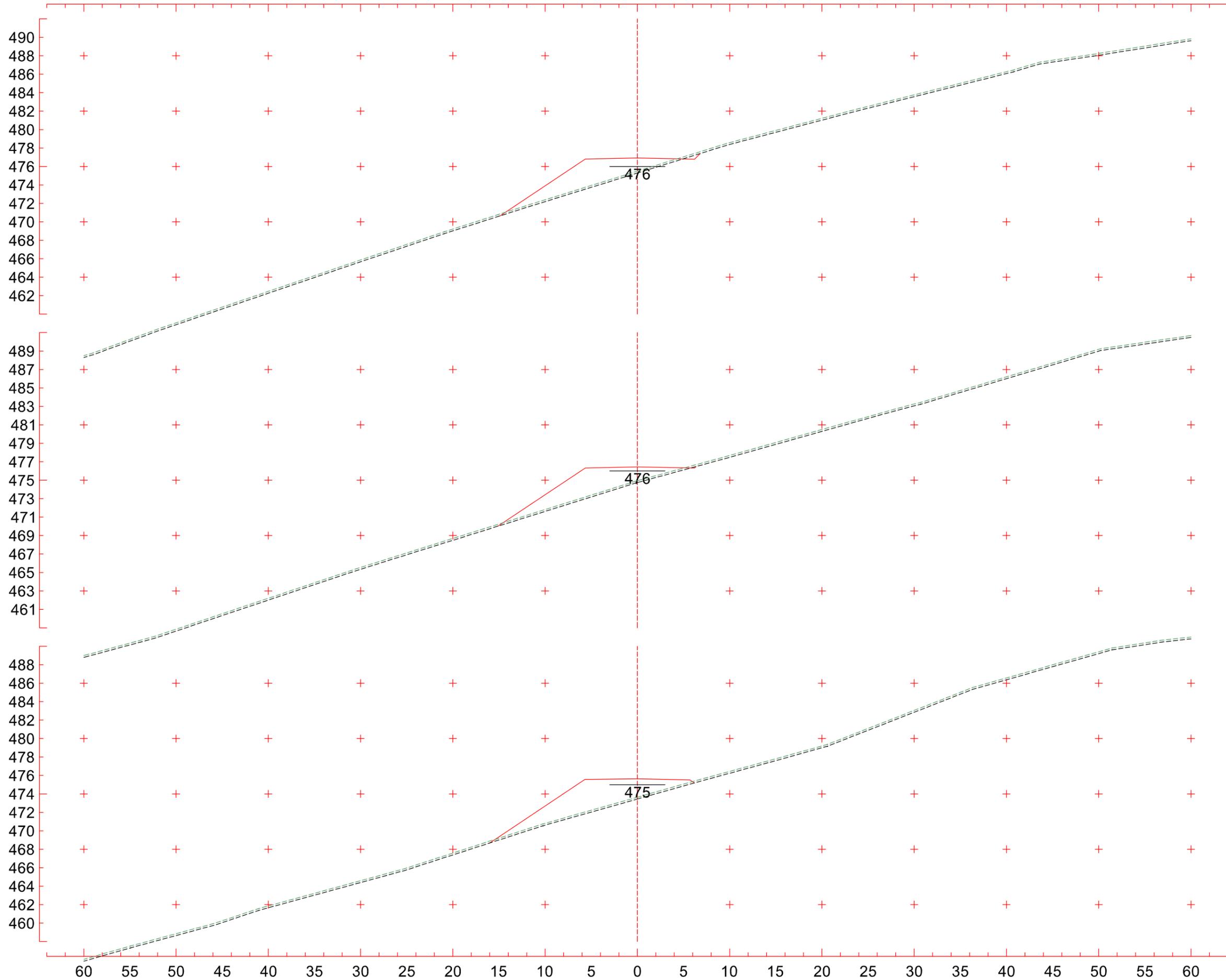
CT 471,880 m
CP 474,433 m

5+100

CT 474,041 m
CP 474,522 m

Lote 2

Escala 1:400



5+200

CT 475,492 m
CP 476,923 m

5+180

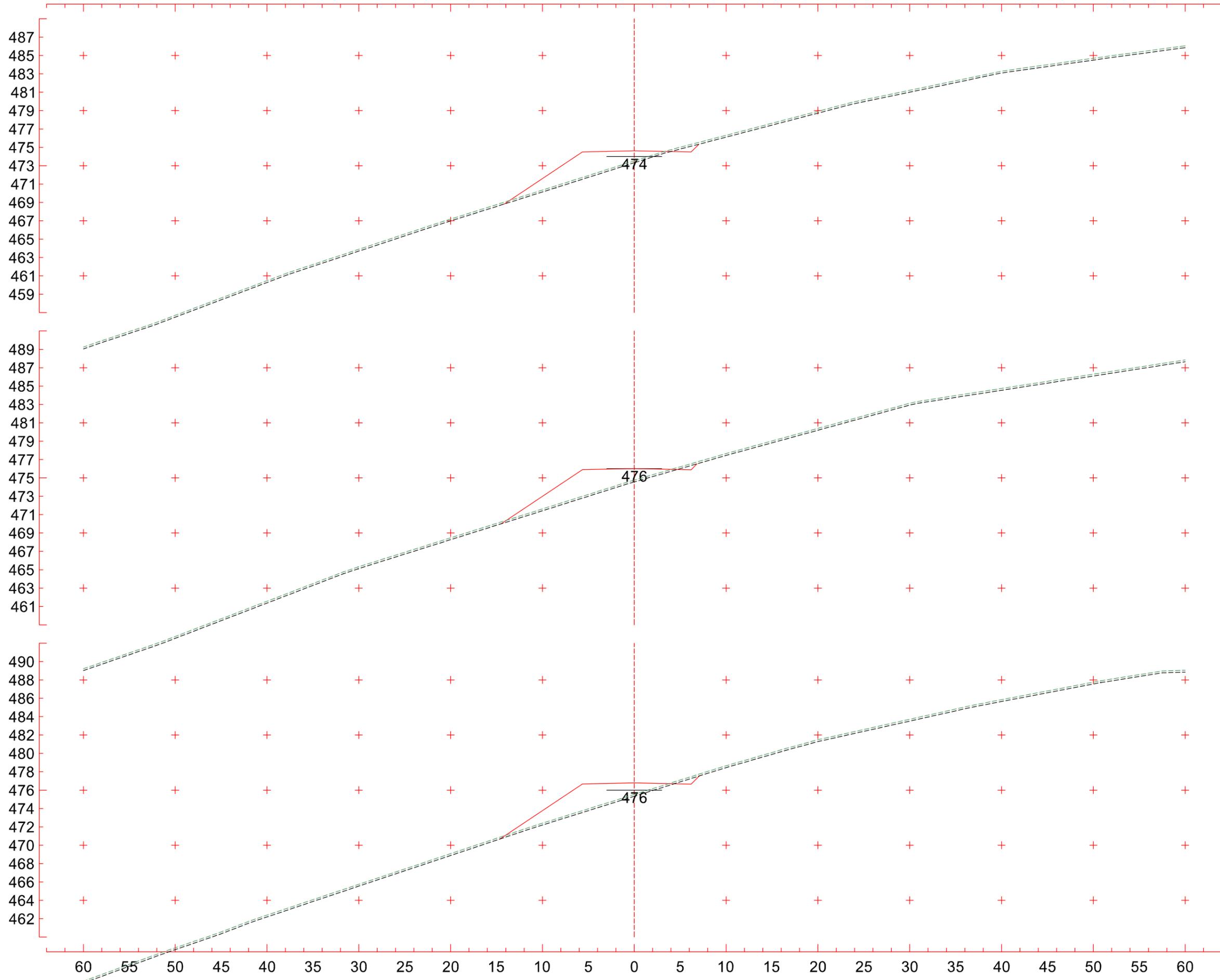
CT 474,945 m
CP 476,440 m

5+160

CT 473,645 m
CP 475,633 m

Lote 2

Escala 1:400

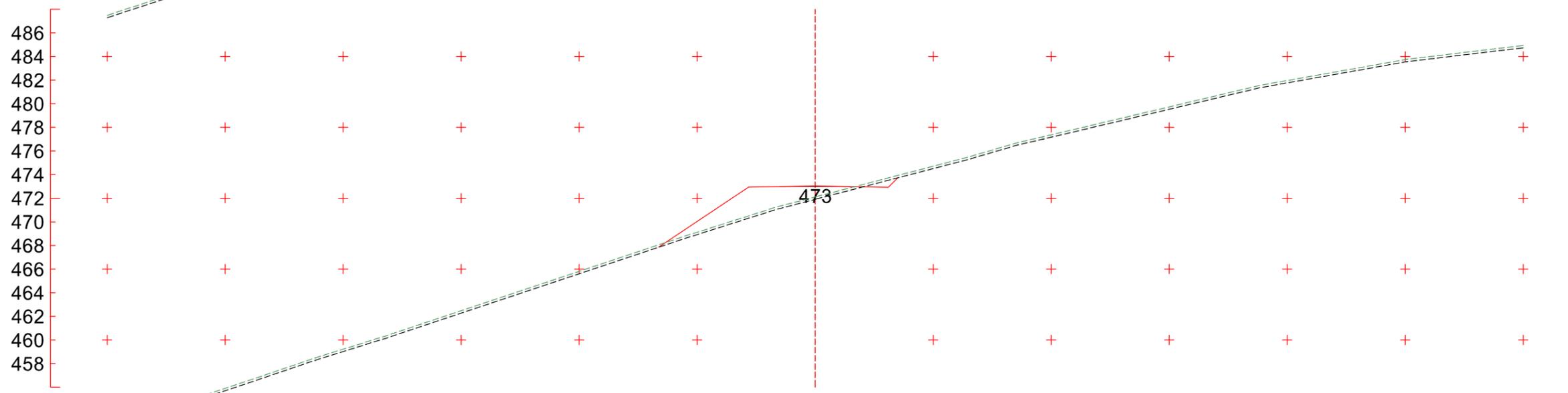
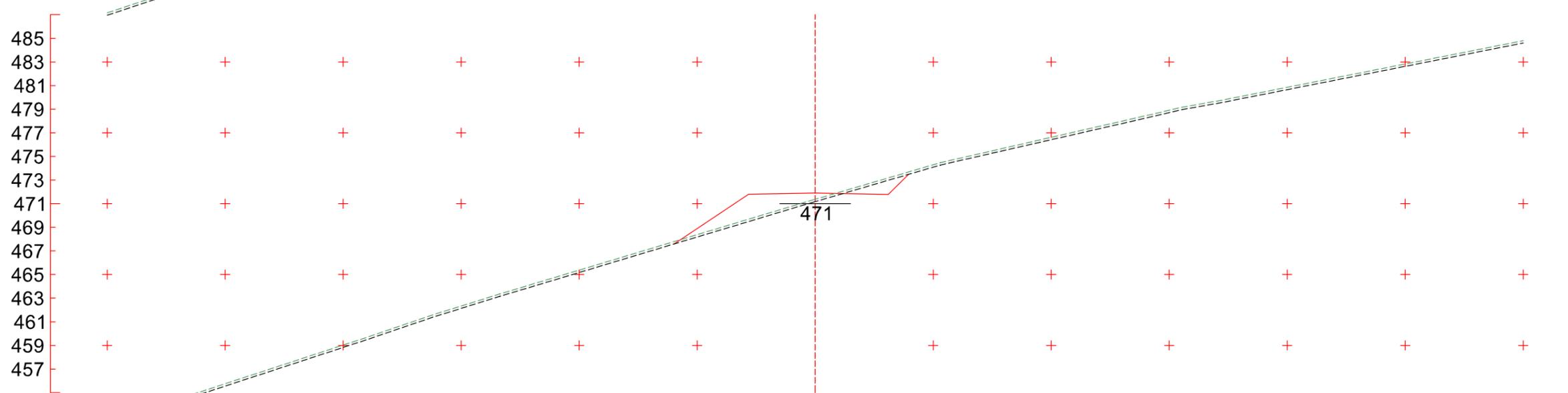
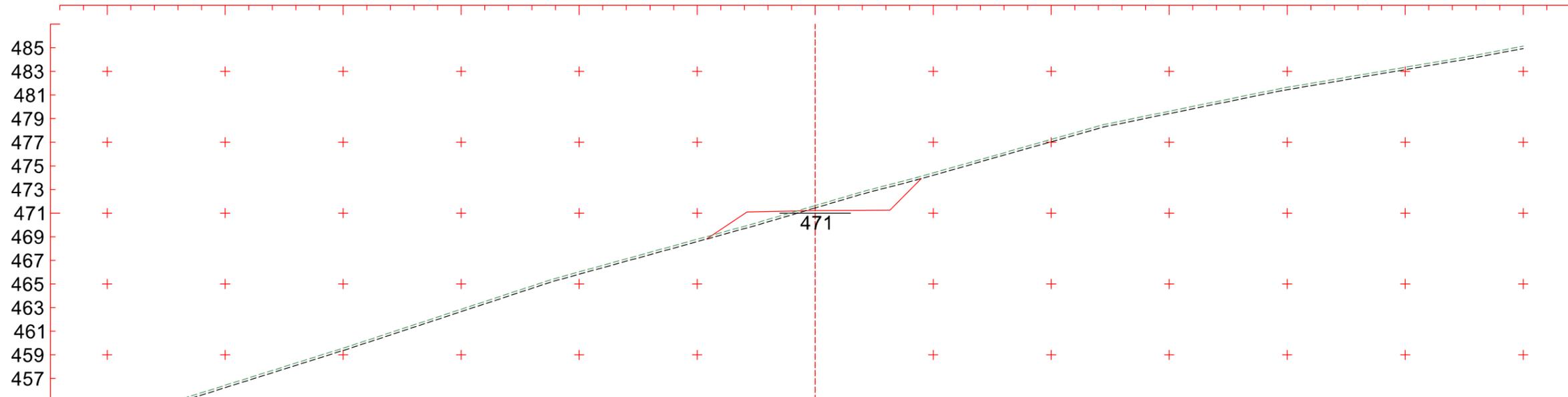


5+260
 CT 473,518 m
 CP 474,623 m

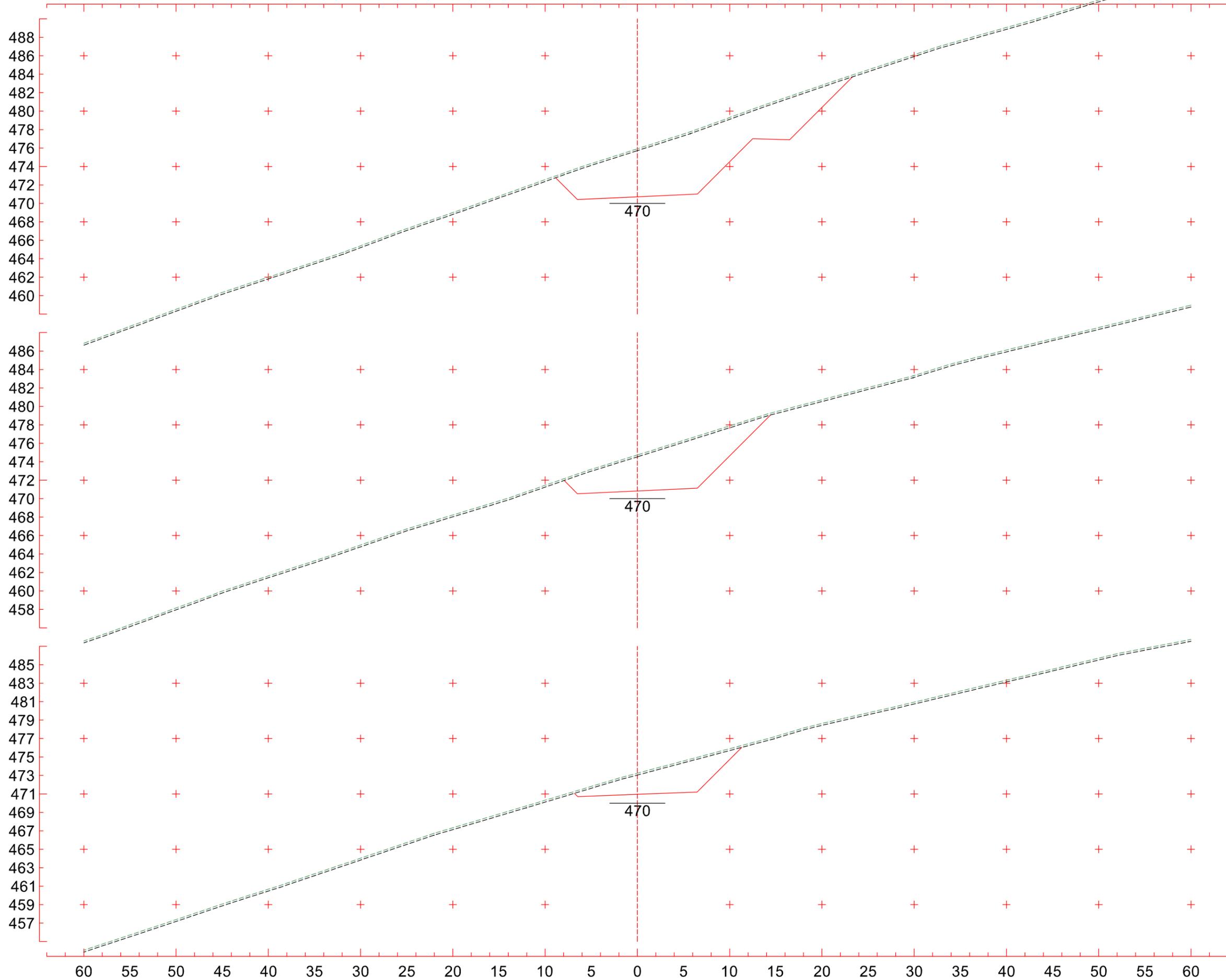
5+240
 CT 474,760 m
 CP 476,014 m

5+220
 CT 475,530 m
 CP 476,781 m

Lote 2
 Escala 1:400



Lote 2
 Escala 1:400



5+380
 CT 475,916 m
 CP 470,714 m

5+360
 CT 474,734 m
 CP 470,833 m

5+340
 CT 473,243 m
 CP 470,952 m

Lote 2
 Escala 1:400

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5+440

CT 475,080 m
CP 470,356 m

5+420

CT 476,395 m
CP 470,475 m

5+400

CT 476,641 m
CP 470,594 m

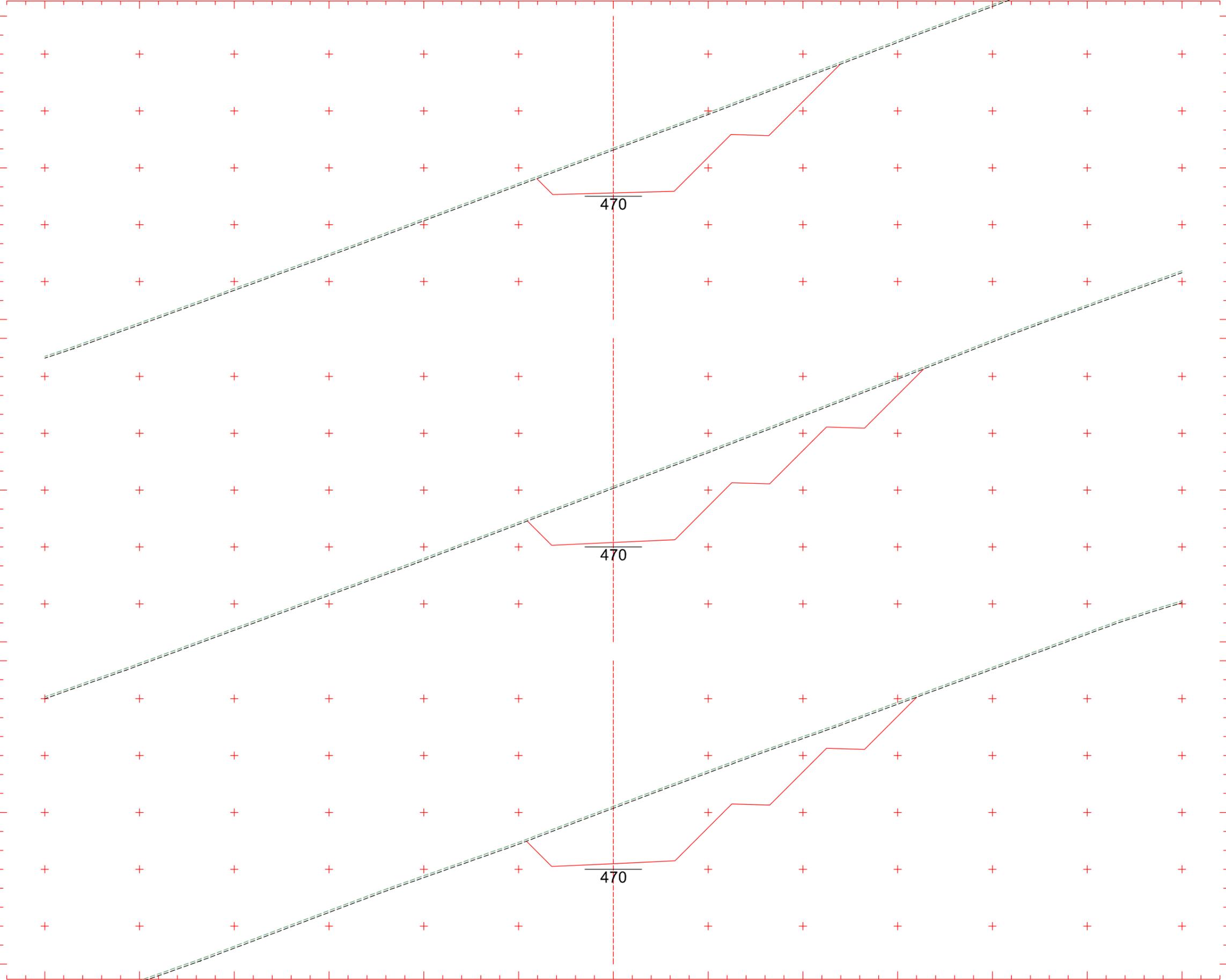
Lote 2

Escala 1:400

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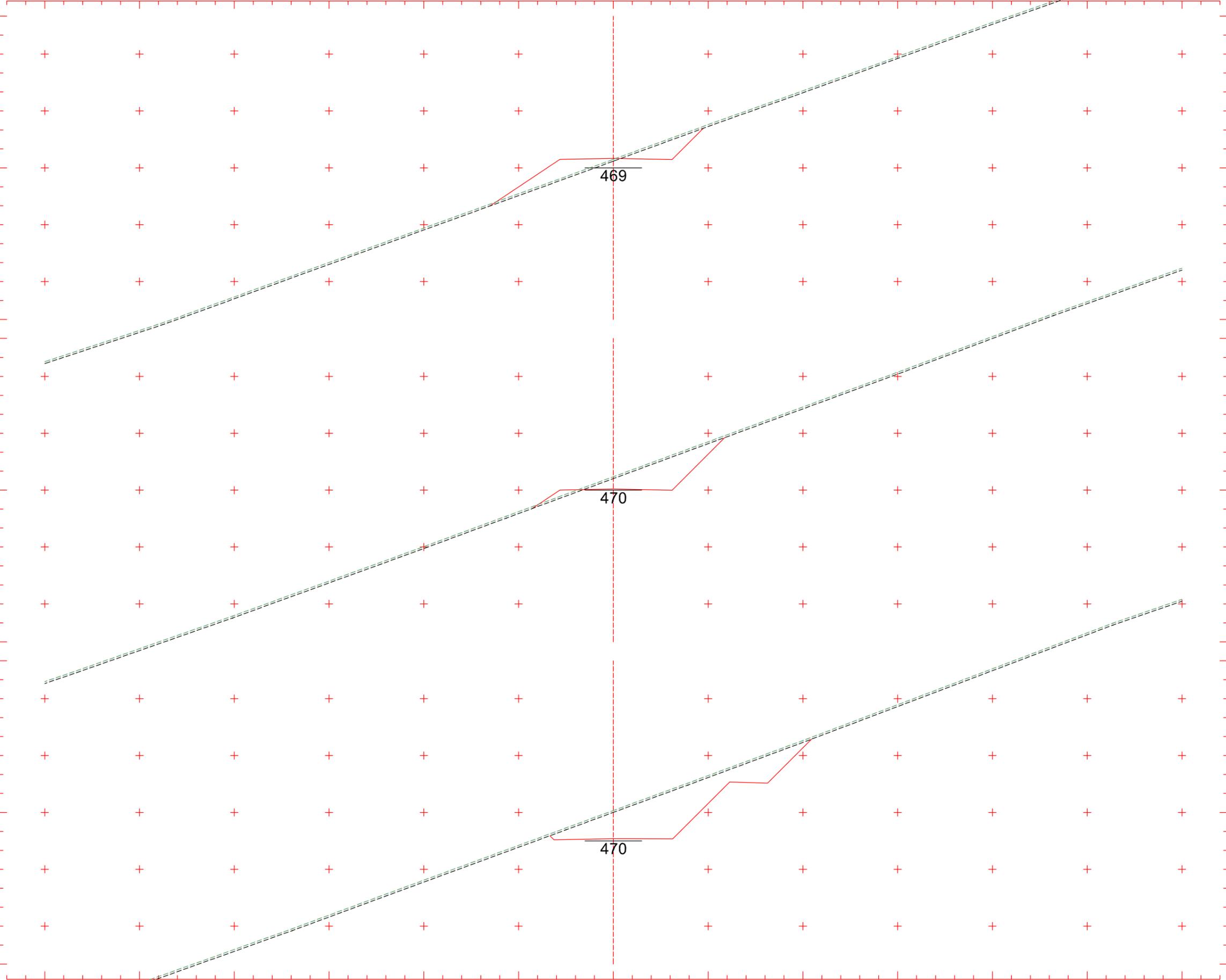


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5+500

CT 469,901 m
CP 469,998 m

5+480

CT 471,414 m
CP 470,117 m

5+460

CT 473,202 m
CP 470,236 m

Lote 2

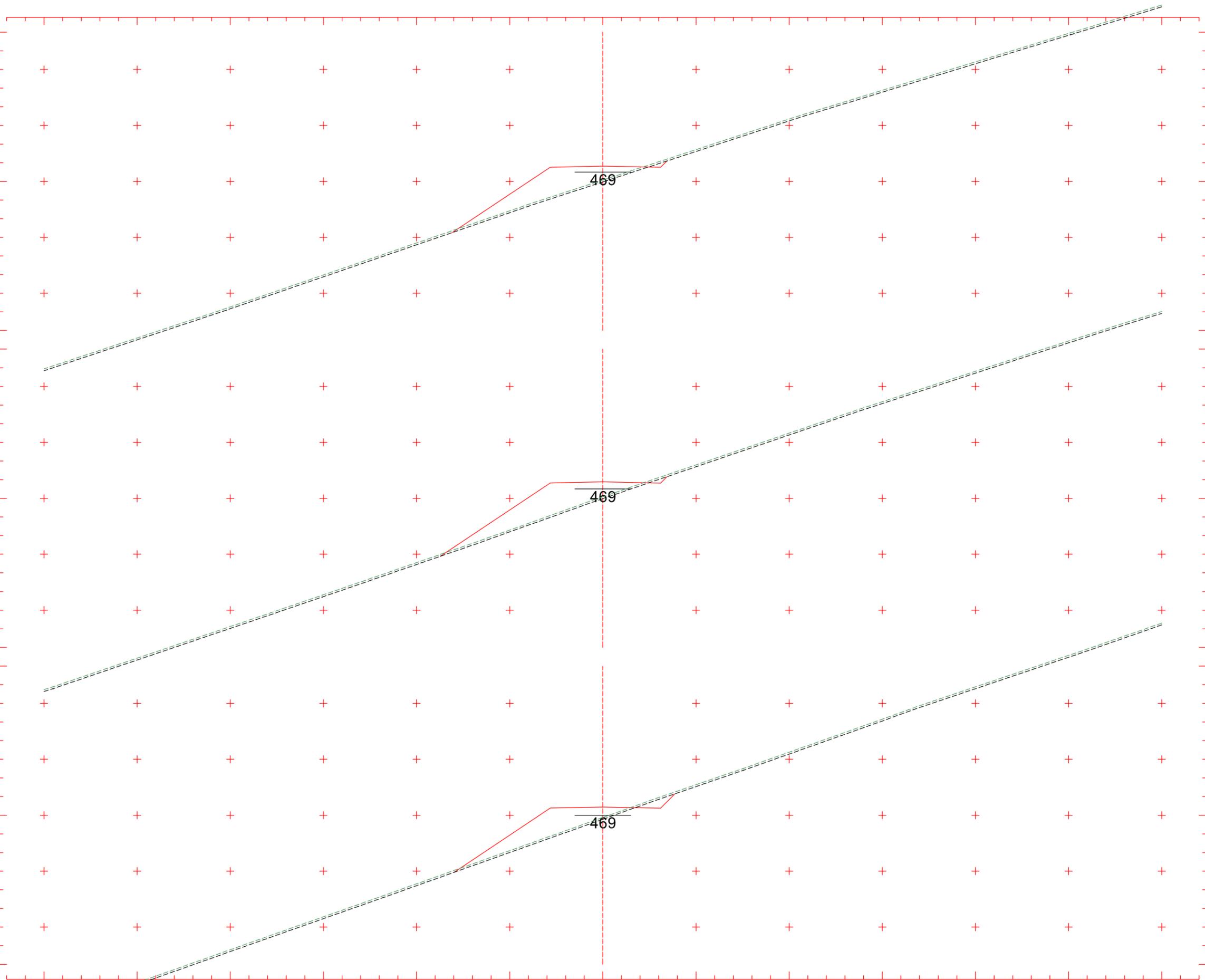
Escala 1:400

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5+560

CT 468,145 m
CP 469,640 m

5+540

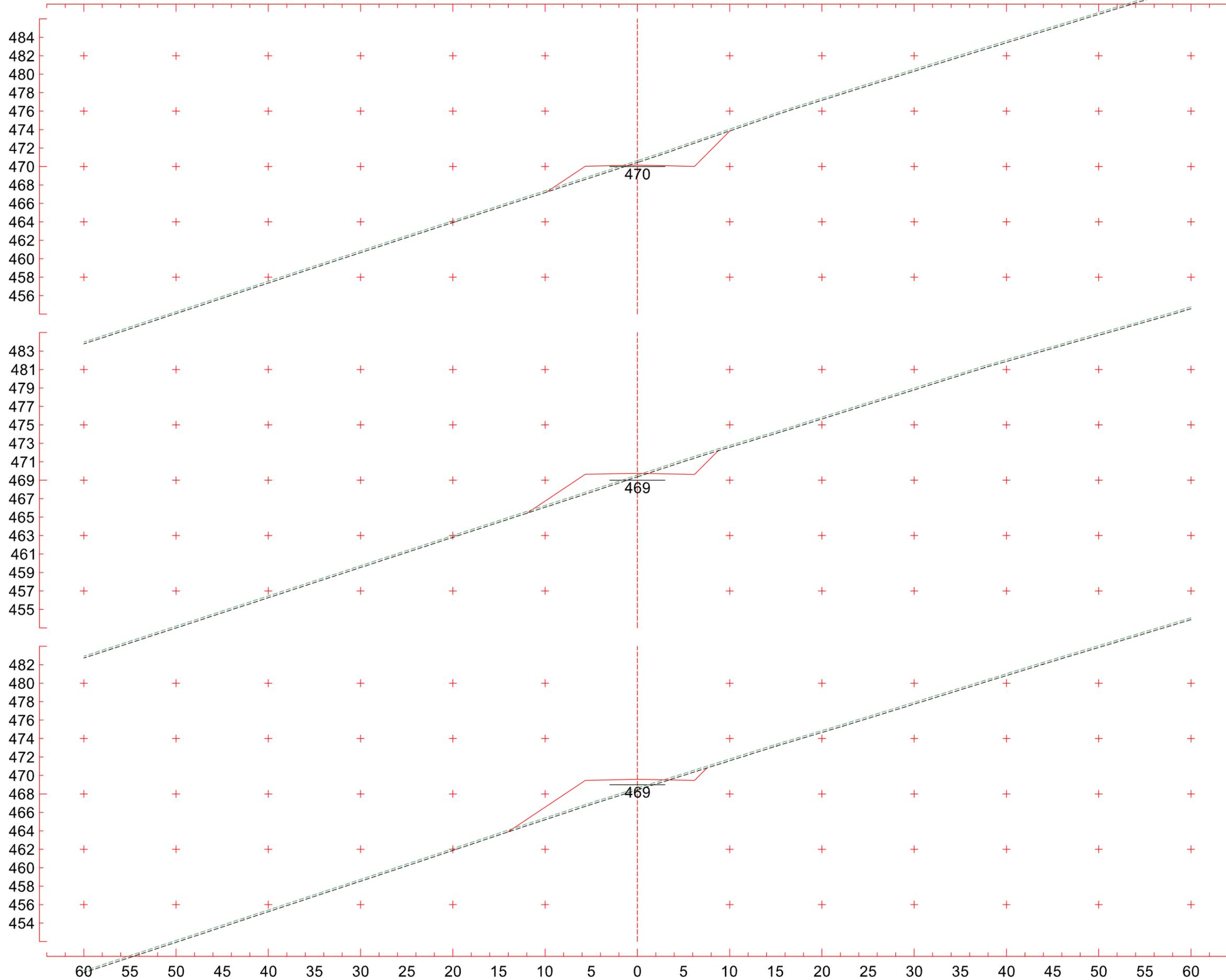
CT 468,164 m
CP 469,759 m

5+520

CT 468,762 m
CP 469,878 m

Lote 2

Escala 1:400



5+620

CT 470,636 m
CP 470,141 m

5+600

CT 469,558 m
CP 469,751 m

5+580

CT 468,632 m
CP 469,586 m

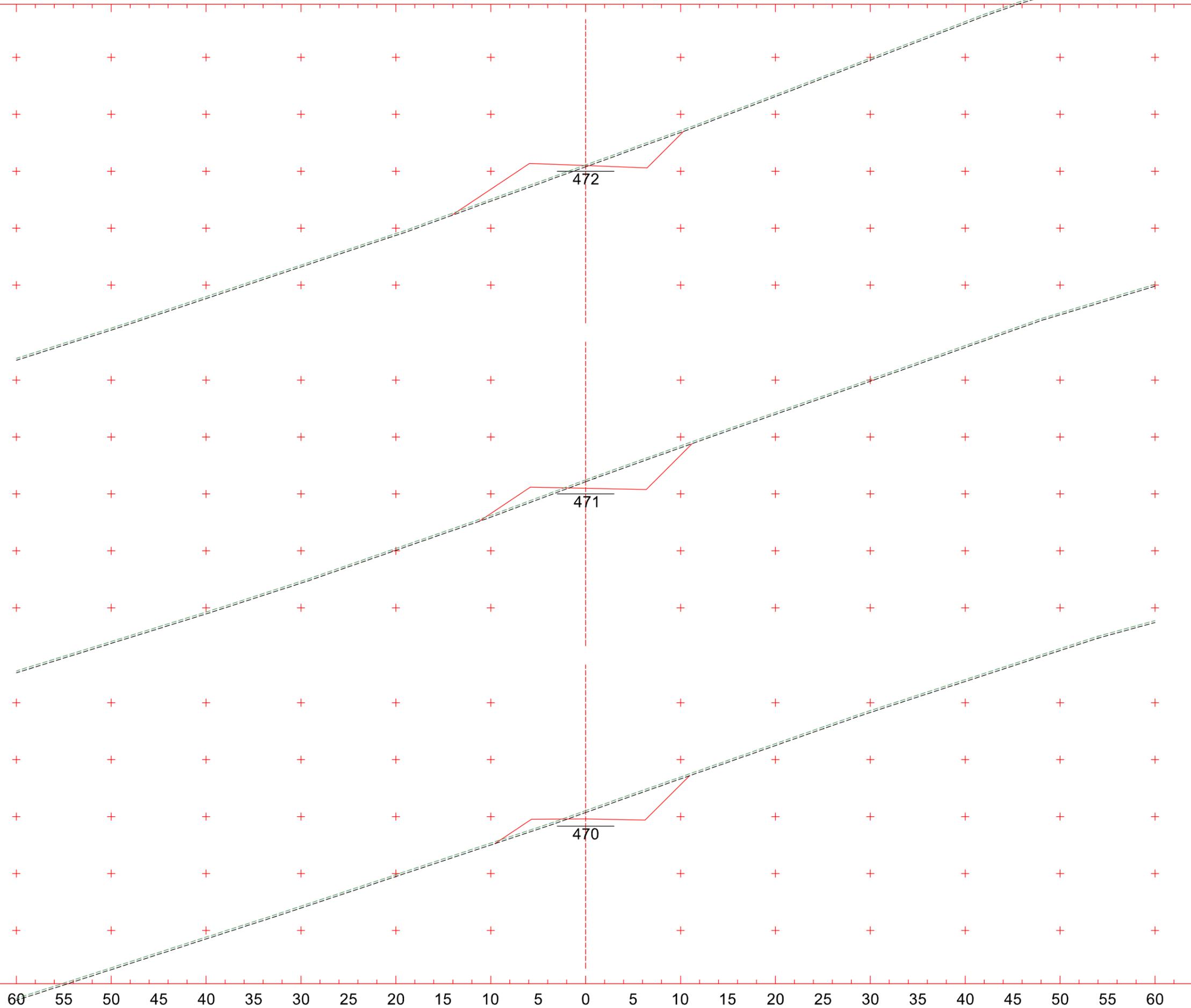
Lote 2

Escala 1:400

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5+680
CT 472,665 m
CP 472,597 m

5+660
CT 472,481 m
CP 471,597 m

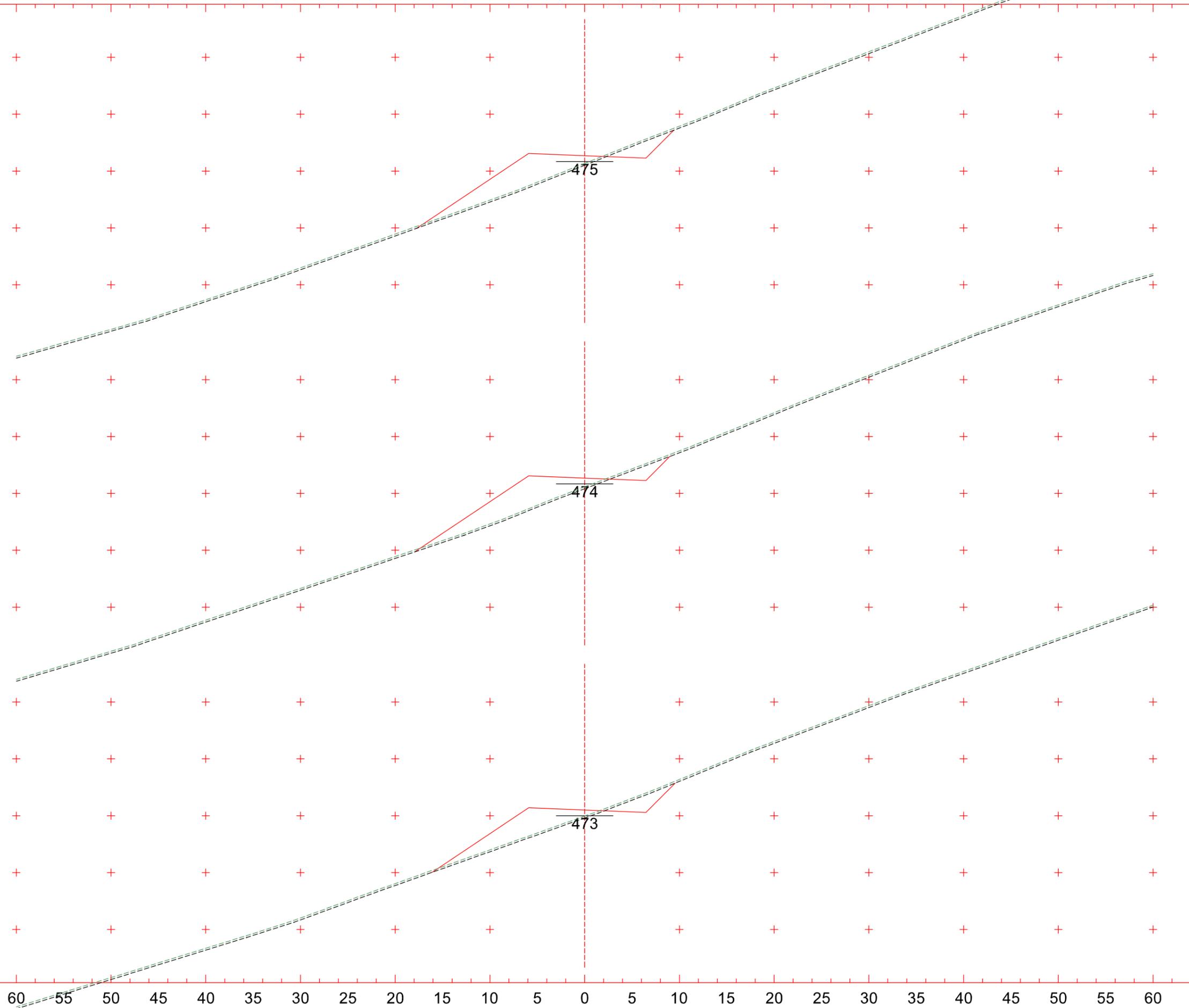
5+640
CT 471,630 m
CP 470,756 m

Lote 2
Escala 1:400

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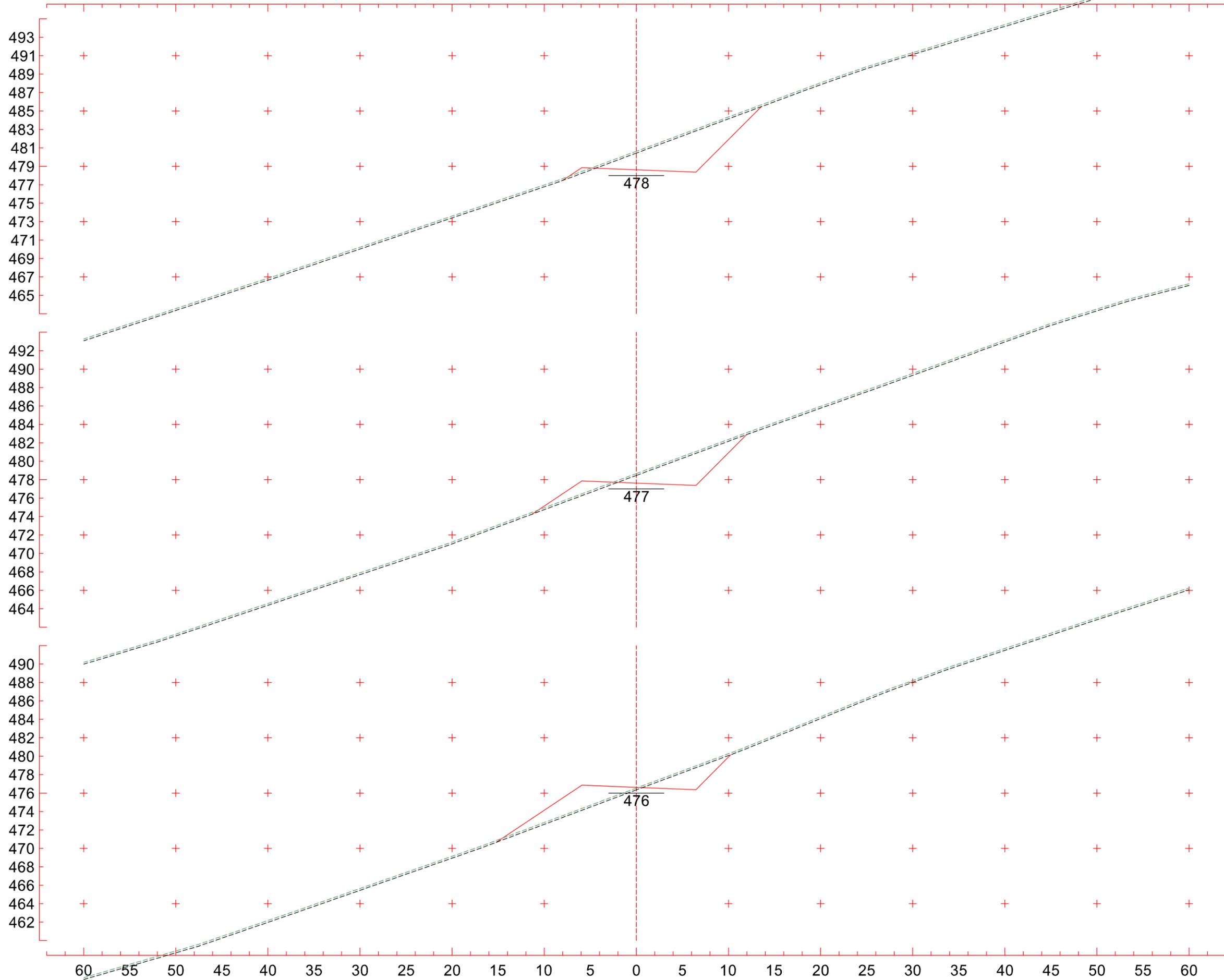


5+740
CT 474,811 m
CP 475,619 m

5+720
CT 473,690 m
CP 474,612 m

5+700
CT 472,961 m
CP 473,605 m

Lote 2
Escala 1:400



5+800
 CT 480,635 m
 CP 478,624 m

5+780
 CT 478,666 m
 CP 477,633 m

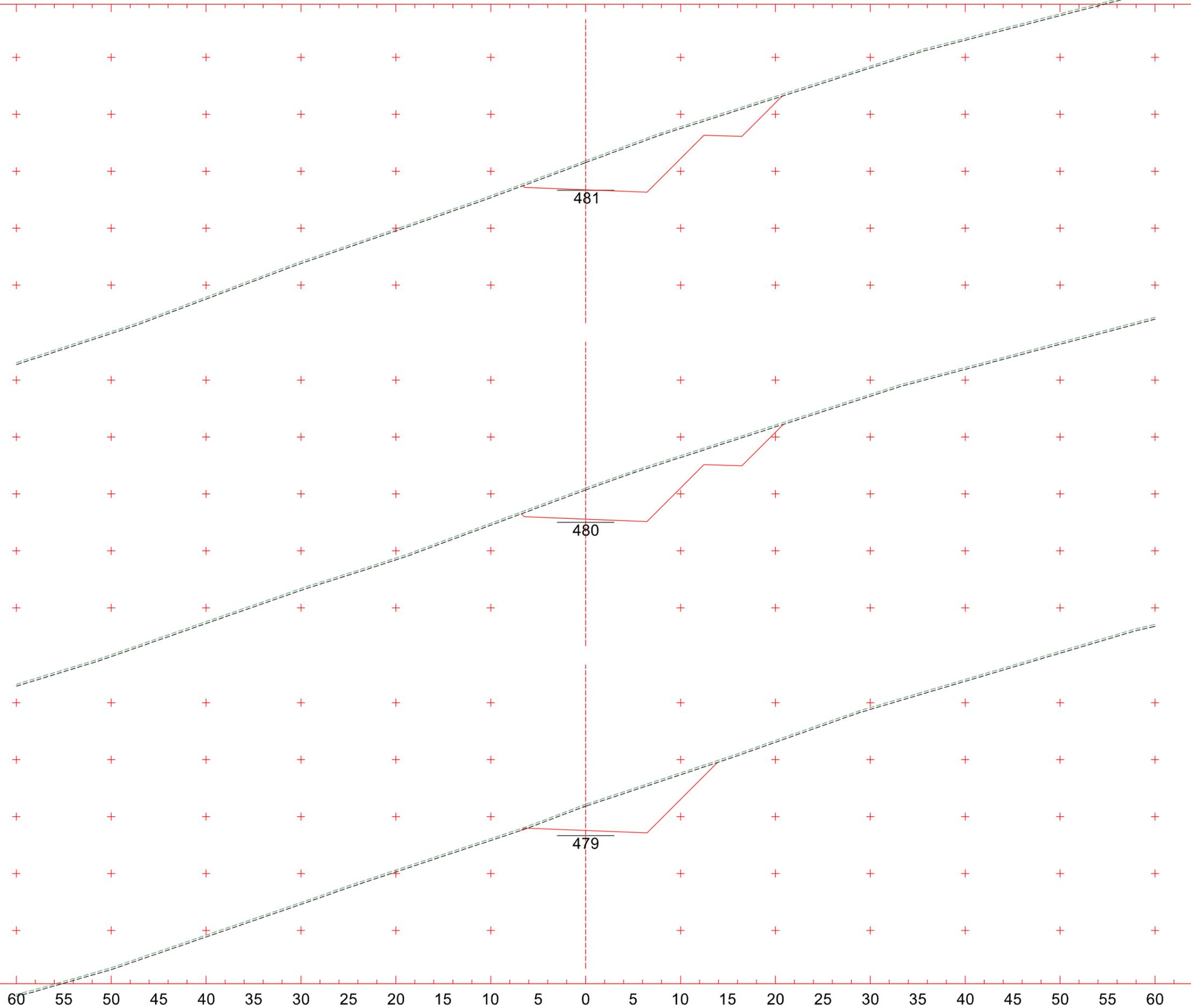
5+760
 CT 476,543 m
 CP 476,626 m

Lote 2
 Escala 1:400

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5+860

CT 484,108 m
CP 481,051 m

5+840

CT 483,615 m
CP 480,337 m

5+820

CT 482,290 m
CP 479,528 m

Lote 2

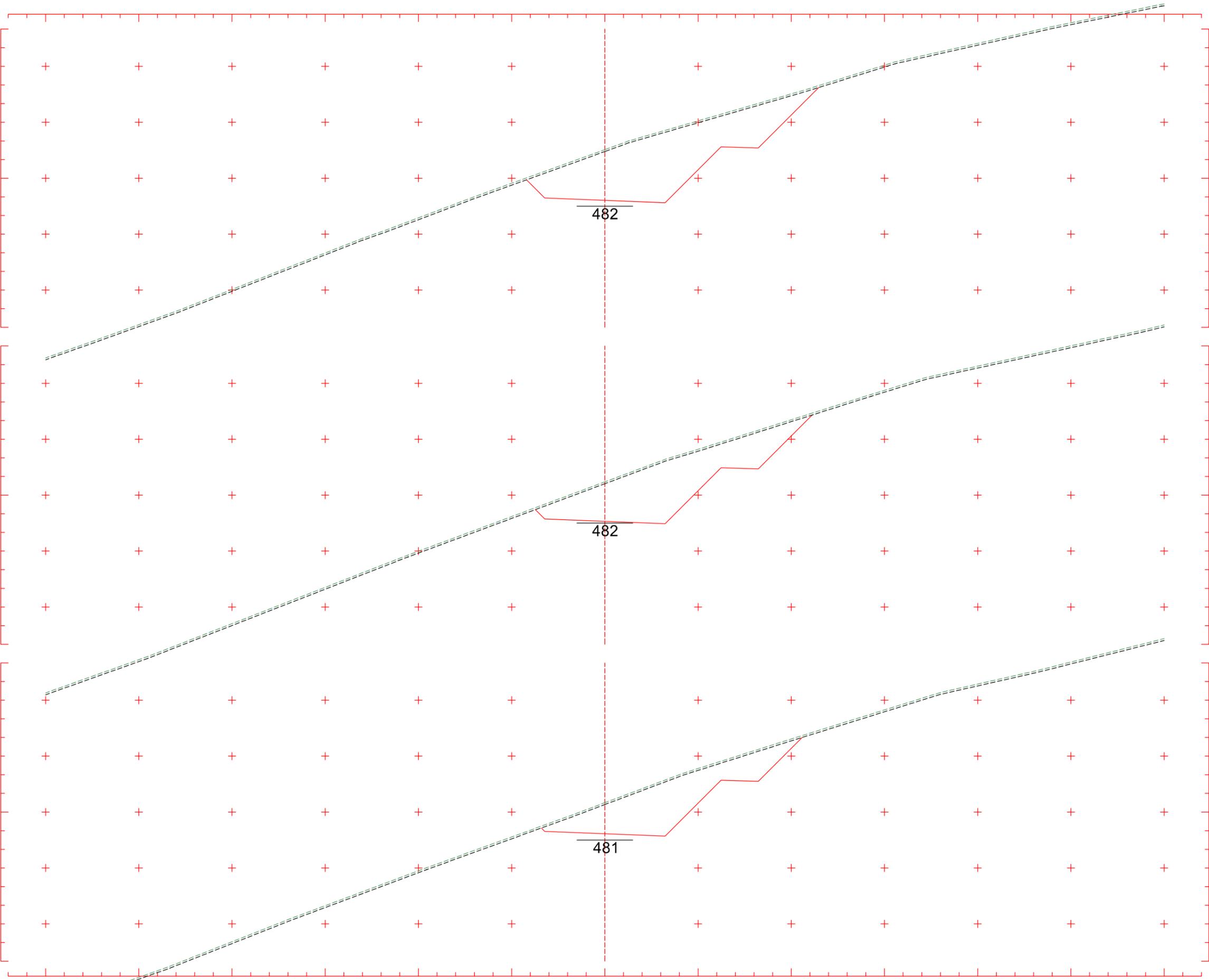
Escala 1:400

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5+920

CT 488,065 m
CP 482,622 m

5+900

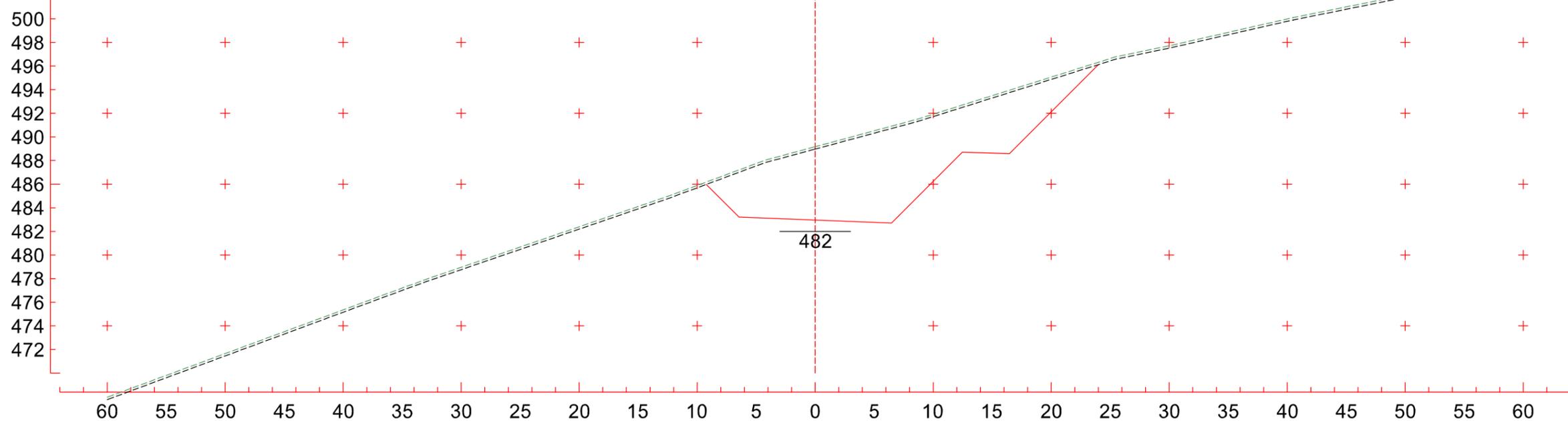
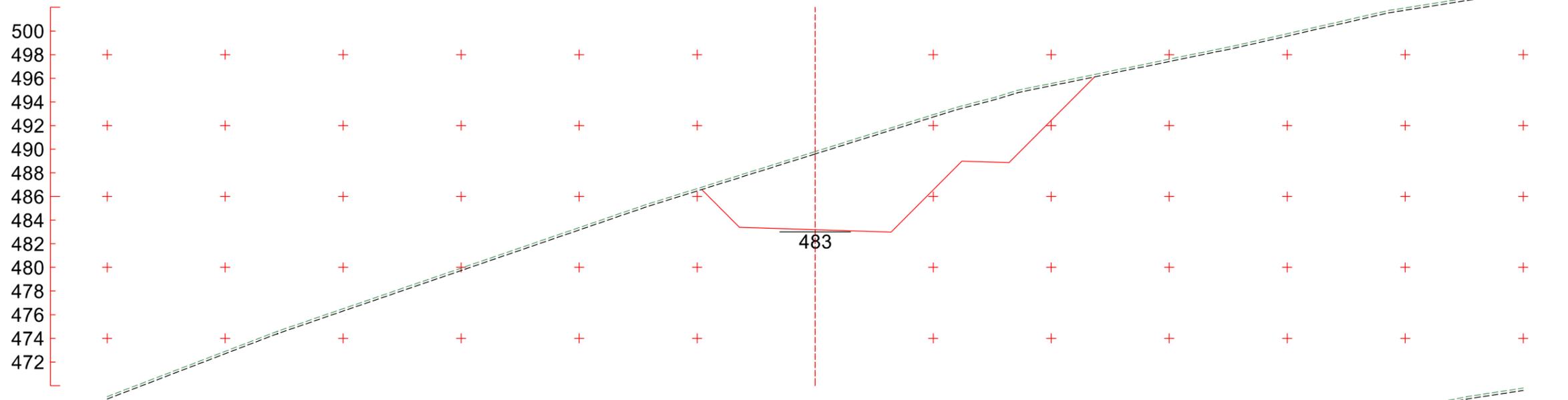
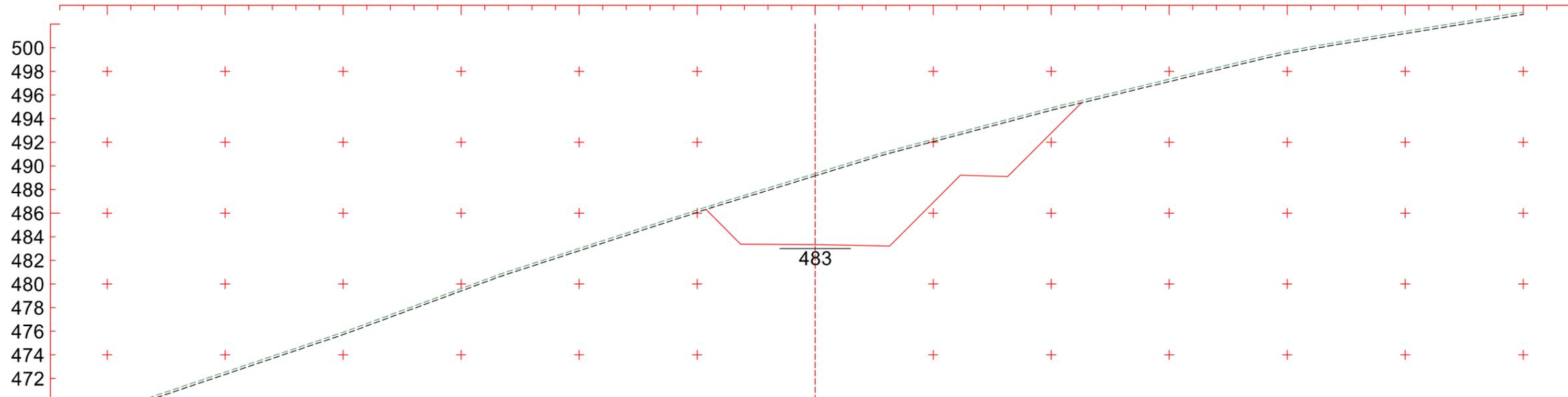
CT 486,424 m
CP 482,193 m

5+880

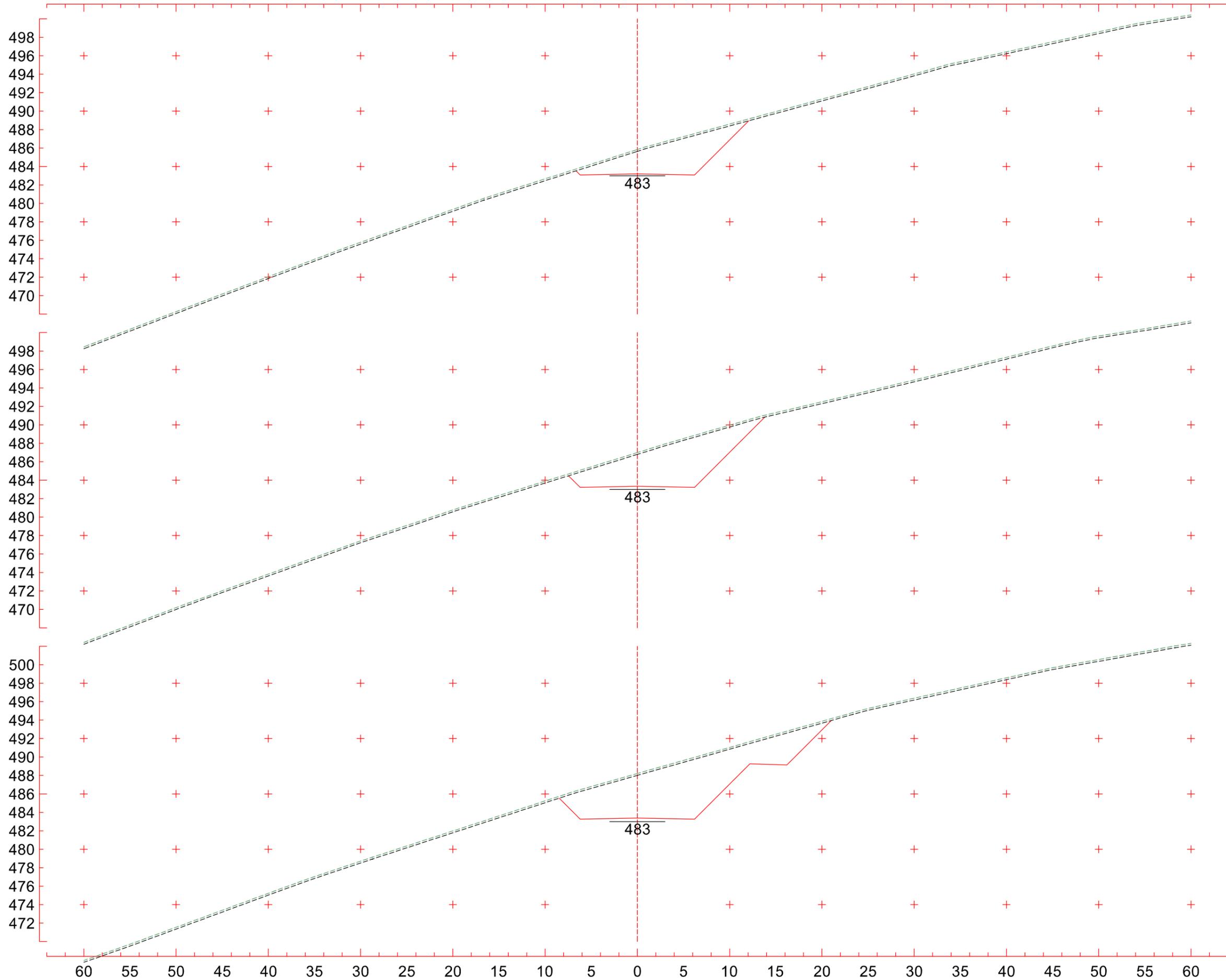
CT 485,002 m
CP 481,669 m

Lote 2

Escala 1:400



Lote 2
 Escala 1:400



6+040

CT 485,842 m
CP 483,200 m

6+020

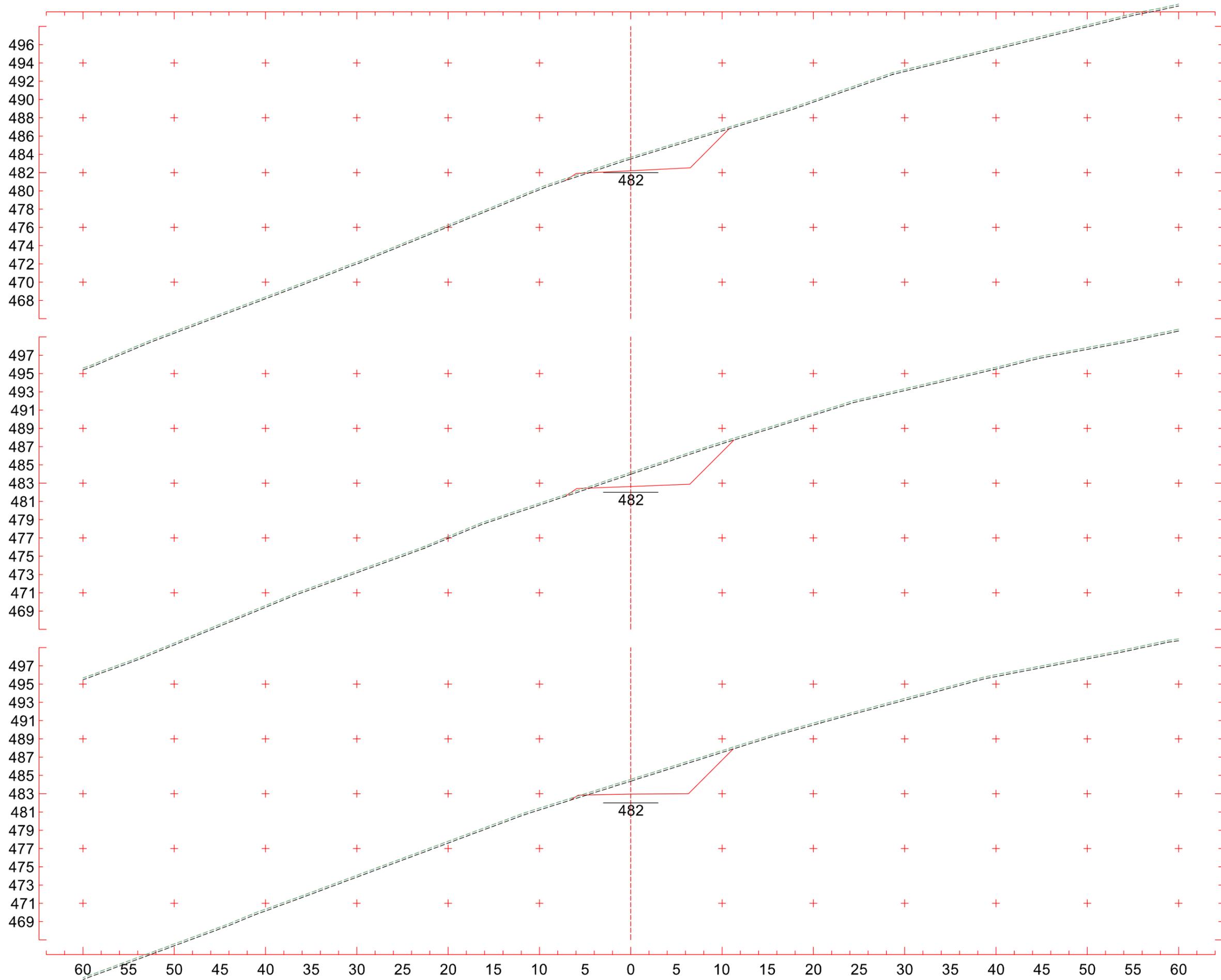
CT 486,996 m
CP 483,341 m

6+000

CT 488,213 m
CP 483,387 m

Lote 2

Escala 1:400



6+100

CT 483,693 m
CP 482,206 m

6+080

CT 484,173 m
CP 482,632 m

6+060

CT 484,571 m
CP 482,964 m

Lote 2

Escala 1:400

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6+160

CT 480,892 m
CP 480,357 m

6+140

CT 481,688 m
CP 481,069 m

6+120

CT 482,614 m
CP 481,685 m

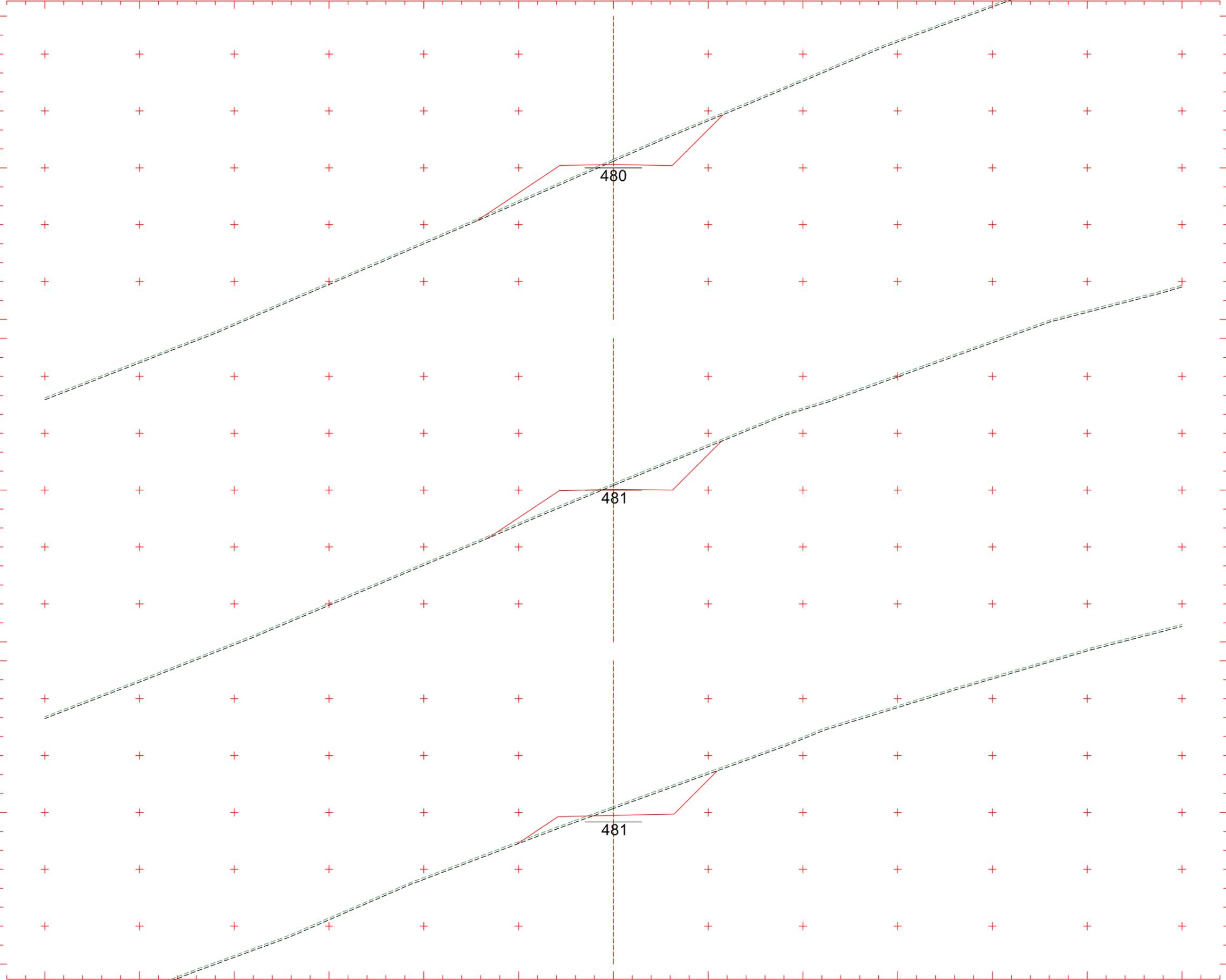
Lote 2

Escala 1:400

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6+220

CT 479,338 m
CP 477,971 m

6+200

CT 479,852 m
CP 478,769 m

6+180

CT 480,283 m
CP 479,567 m

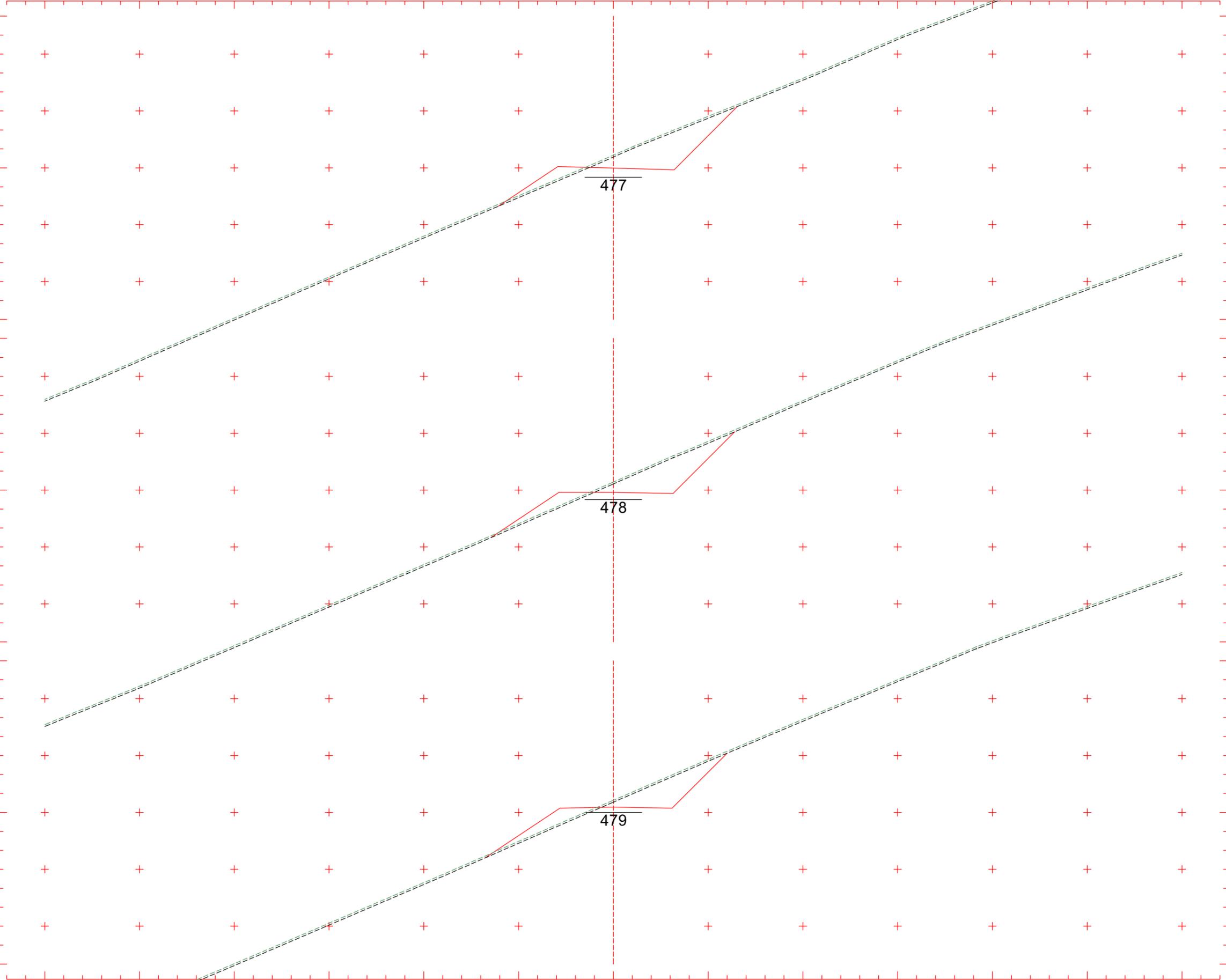
Lote 2

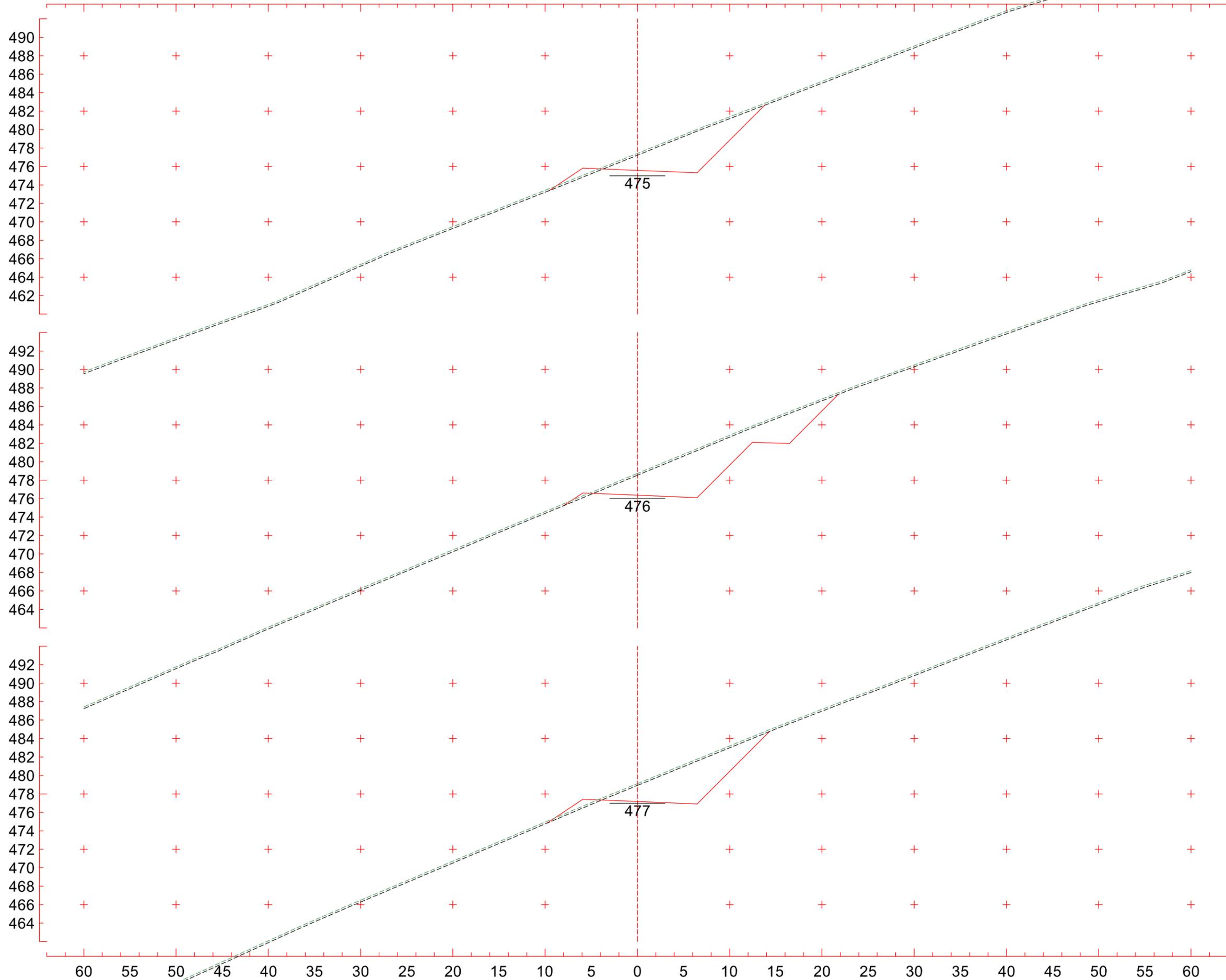
Escala 1:400

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6+280
 CT 477,423 m
 CP 475,577 m

6+260
 CT 478,738 m
 CP 476,375 m

6+240
 CT 479,118 m
 CP 477,173 m

Lote 2
 Escala 1:400

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60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60

6+340

CT 472,538 m
CP 473,183 m

6+320

CT 473,895 m
CP 473,981 m

6+300

CT 475,673 m
CP 474,779 m

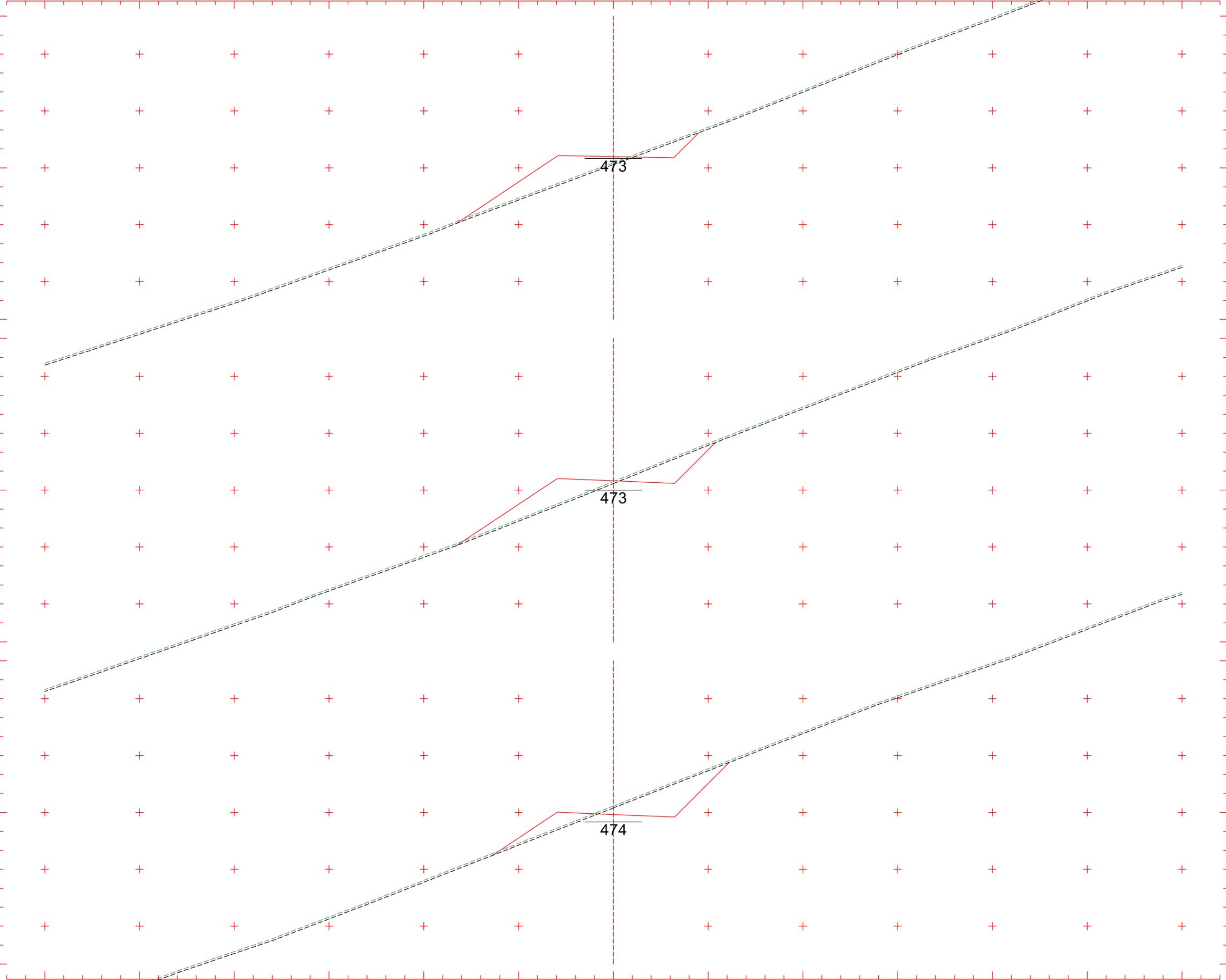
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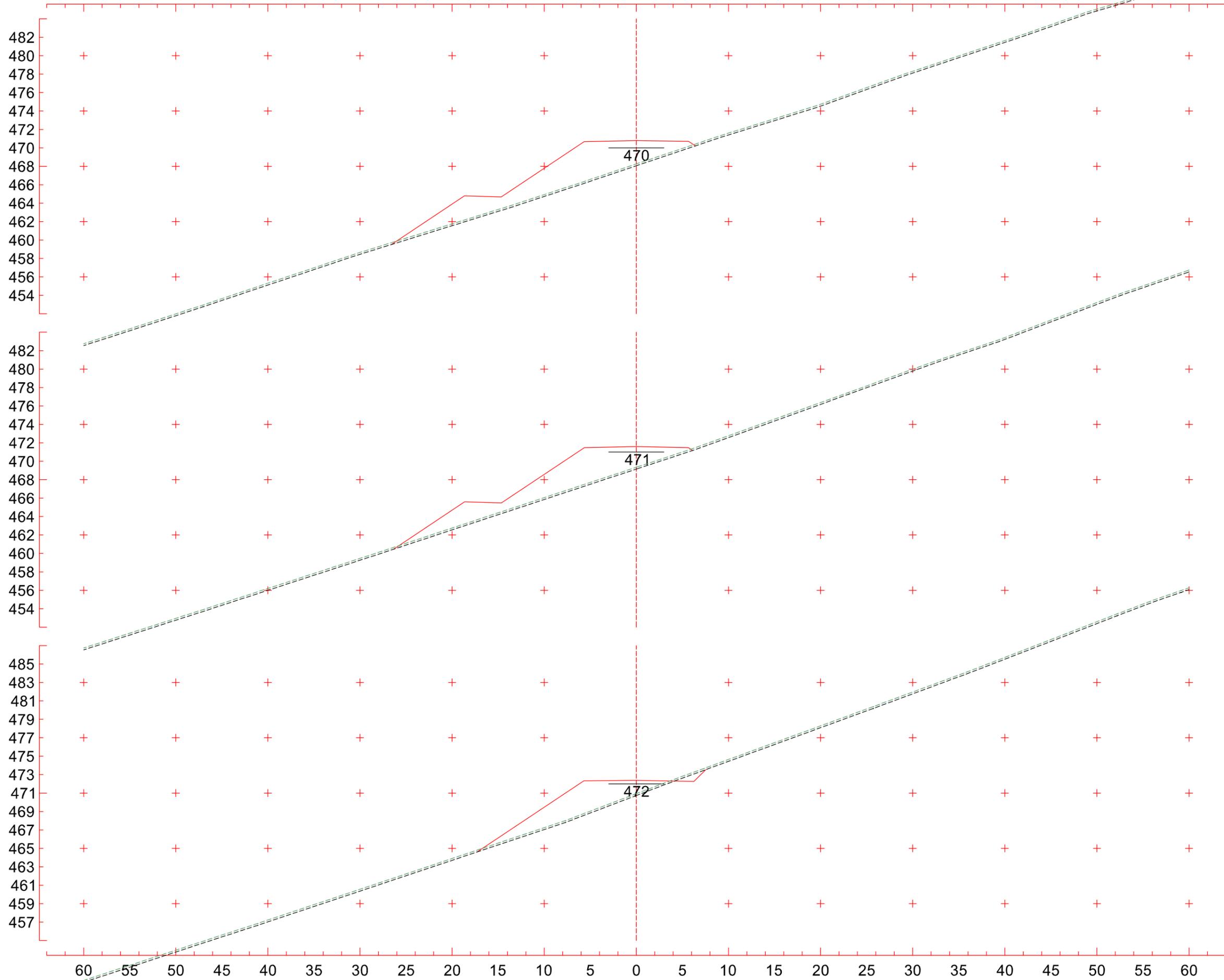
Escala 1:400

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6+400

CT 468,258 m
 CP 470,789 m

6+380

CT 469,350 m
 CP 471,587 m

6+360

CT 470,938 m
 CP 472,385 m

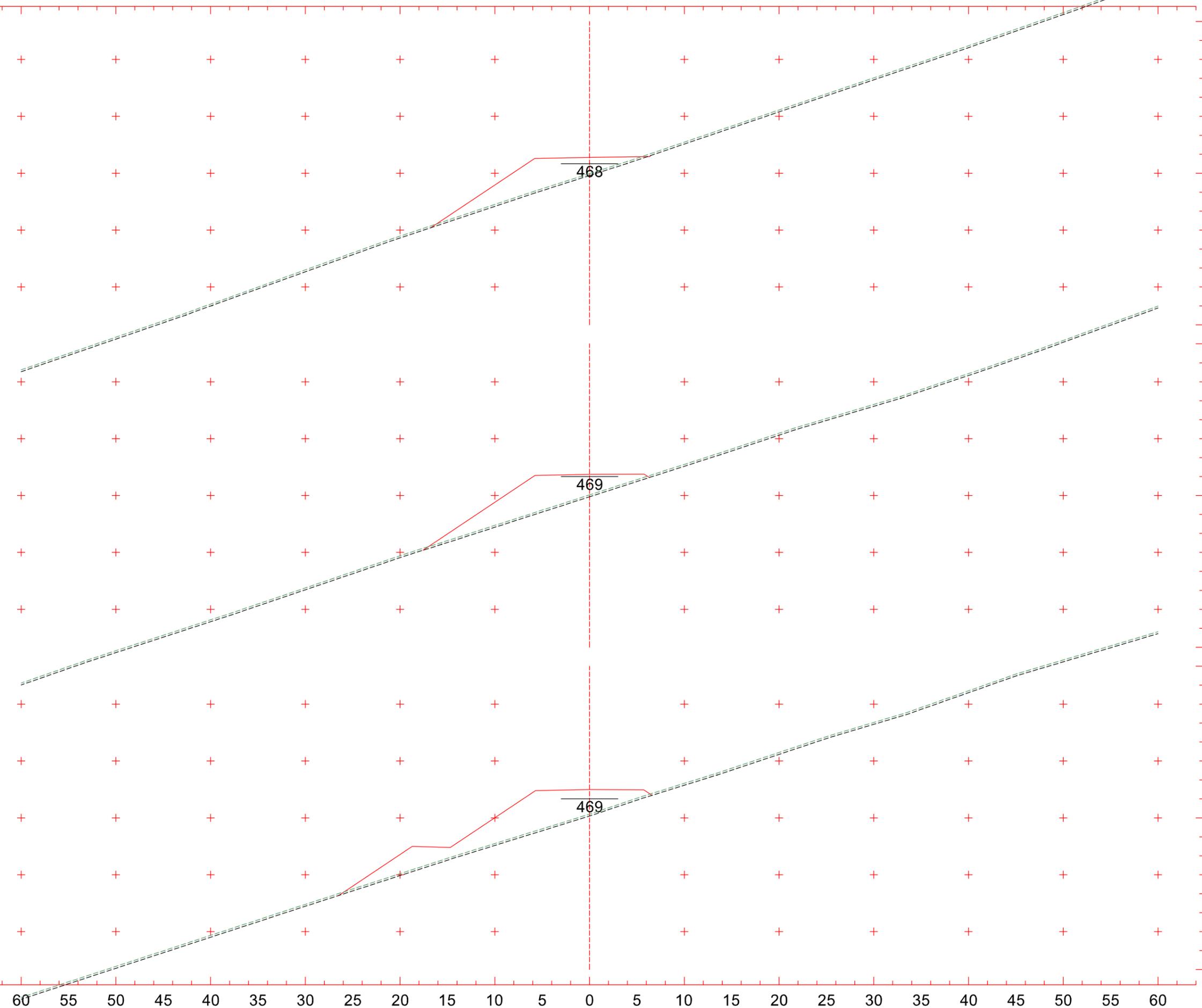
Lote 2

Escala 1:400

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6+460
CT 466,957 m
CP 468,664 m

6+440
CT 467,067 m
CP 469,237 m

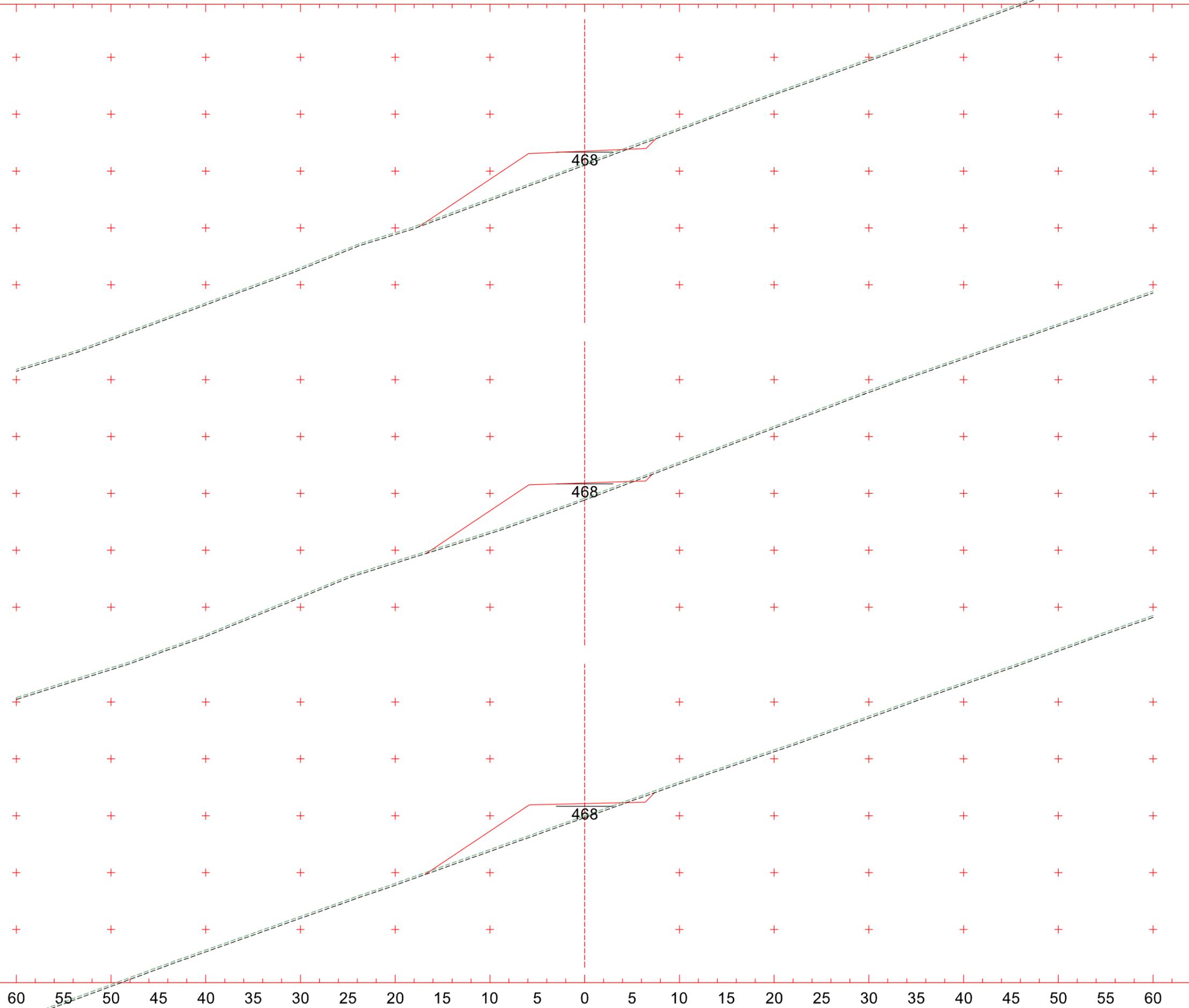
6+420
CT 467,393 m
CP 469,991 m

Lote 2
Escala 1:400

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6+520

CT 466,819 m
CP 468,099 m

6+500

CT 466,499 m
CP 468,095 m

6+480

CT 466,998 m
CP 468,283 m

Lote 2

Escala 1:400

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6+580

CT 469,792 m
CP 468,809 m

6+560

CT 469,103 m
CP 468,550 m

6+540

CT 467,774 m
CP 468,291 m

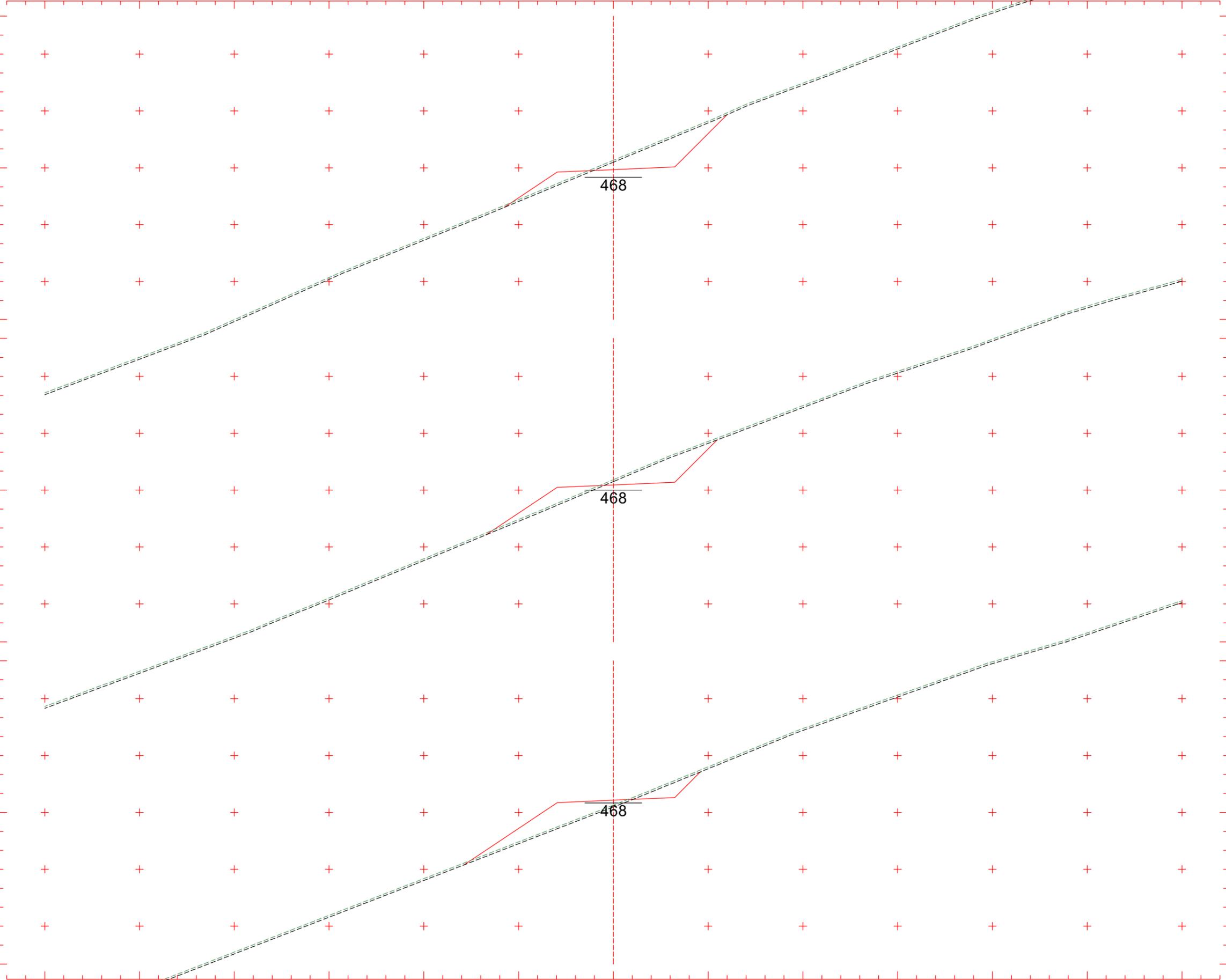
Lote 2

Escala 1:400

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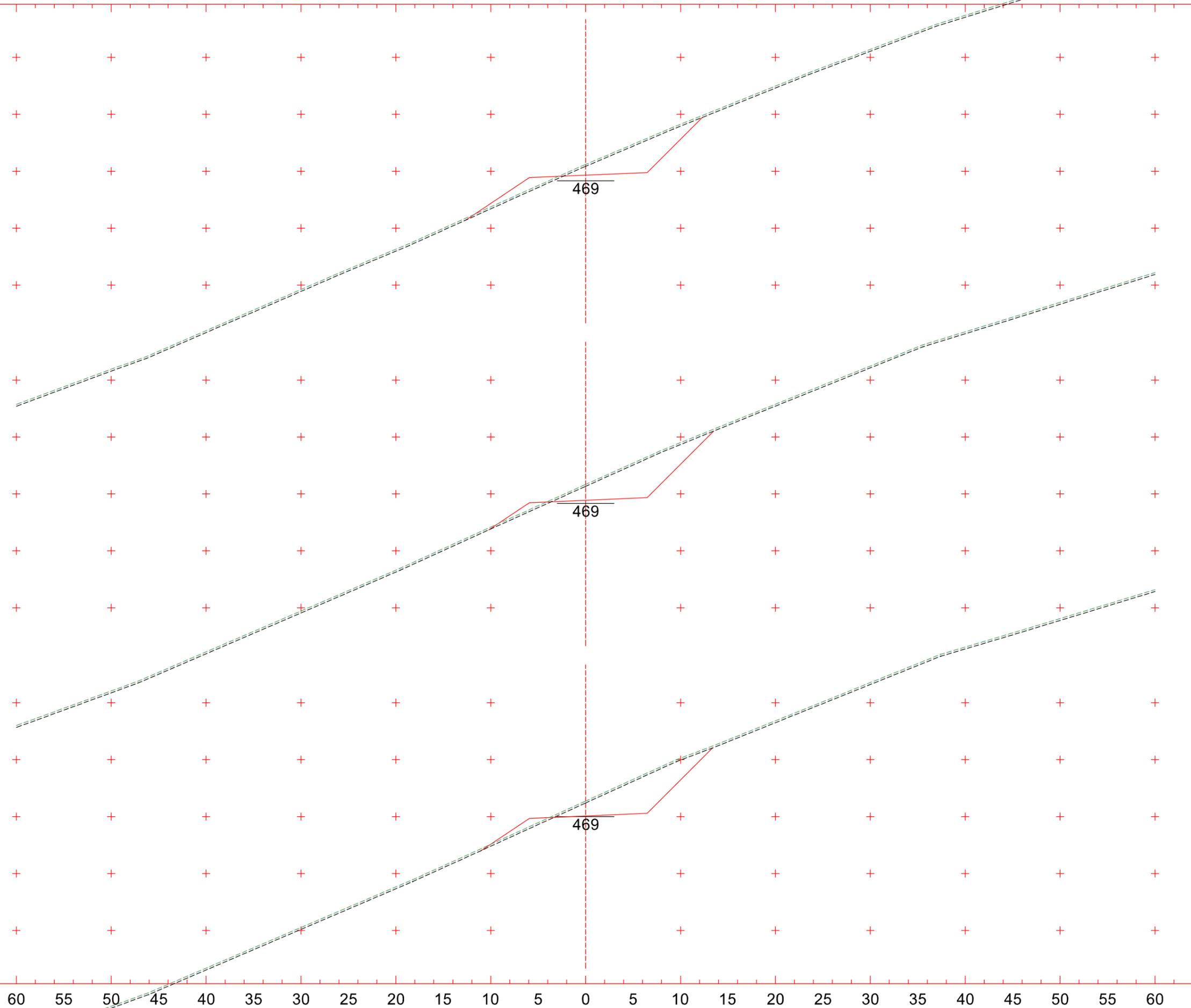
468



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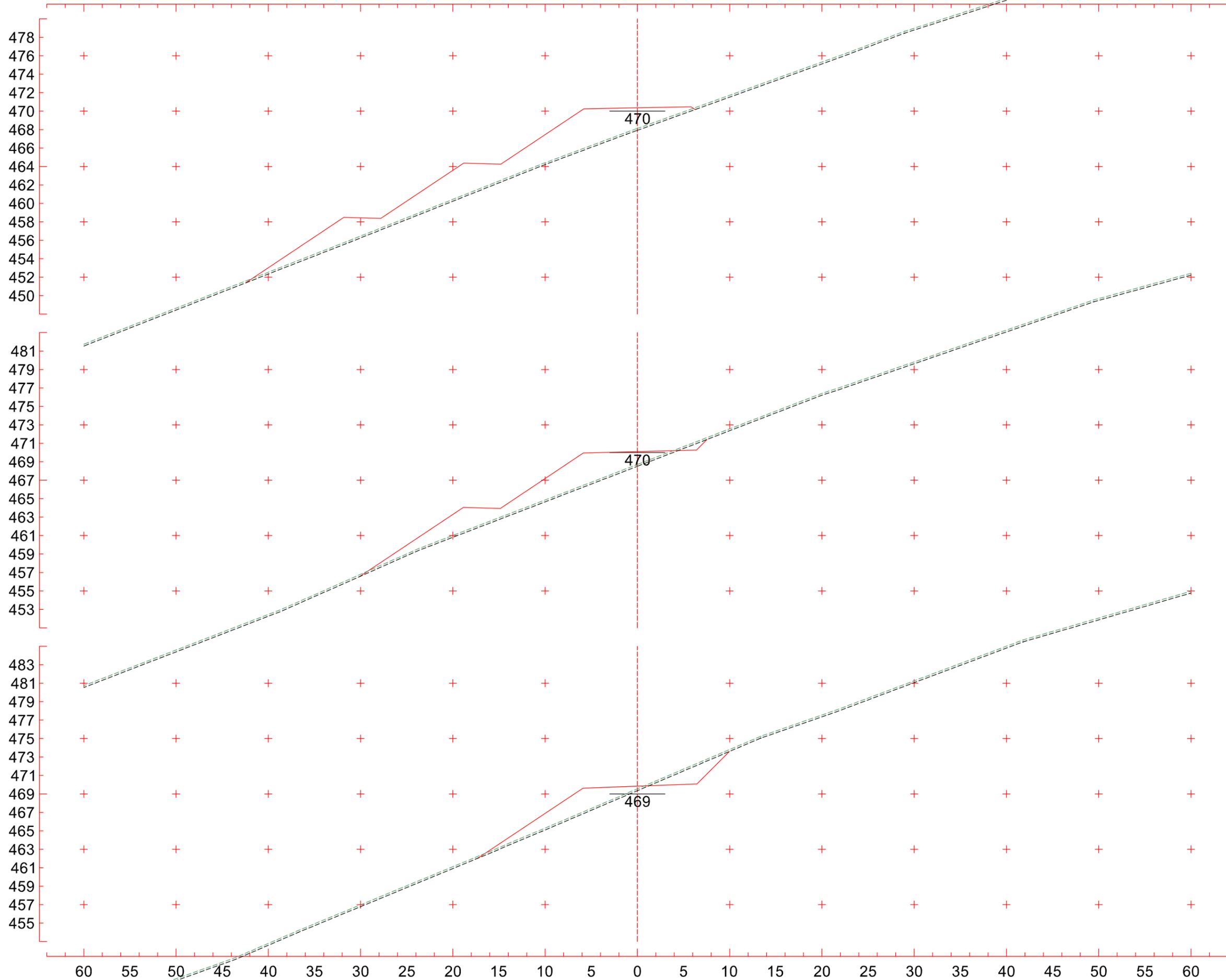


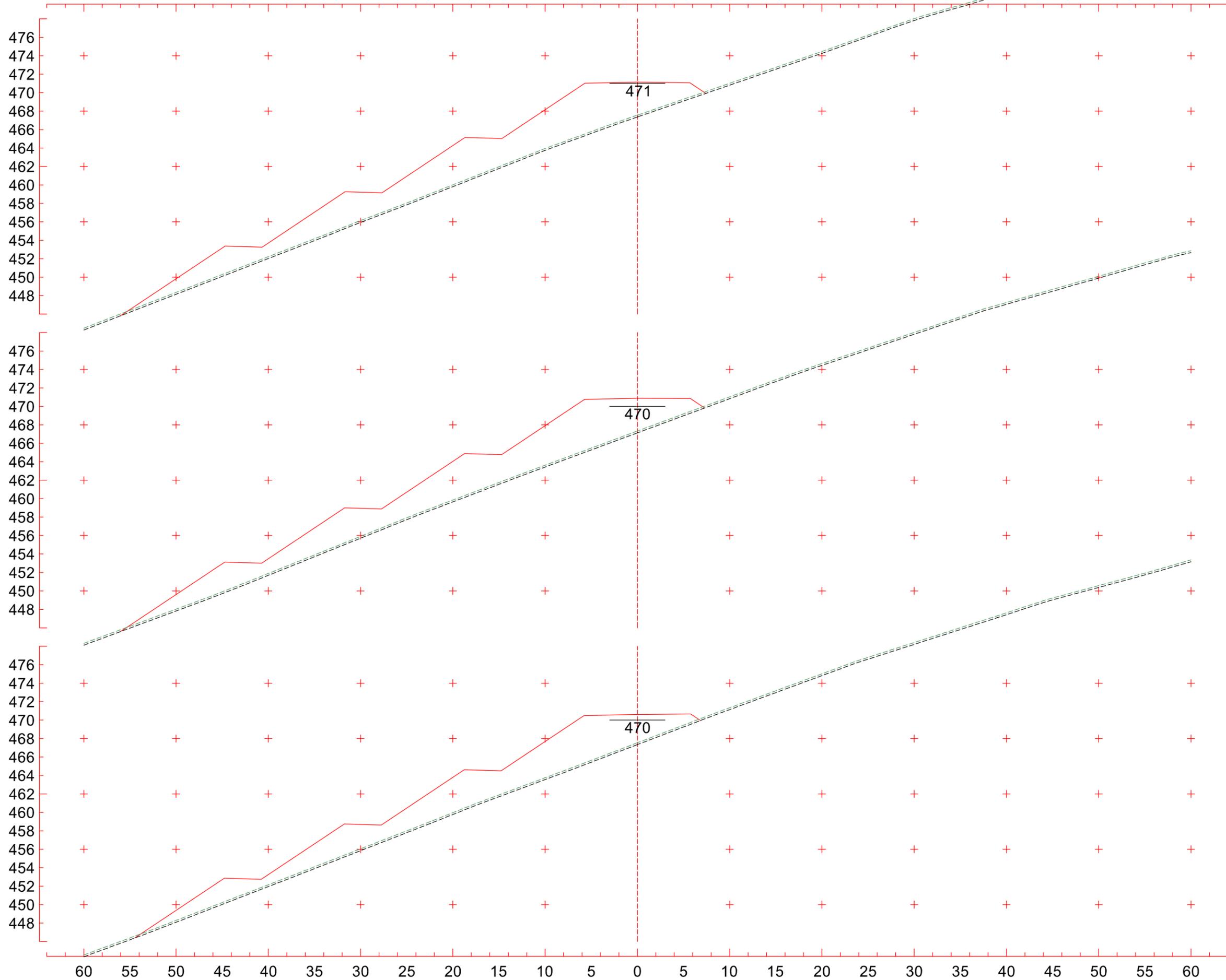
6+640
CT 470,717 m
CP 469,584 m

6+620
CT 471,000 m
CP 469,326 m

6+600
CT 470,639 m
CP 469,067 m

Lote 2
Escala 1:400





6+760

CT 467,563 m
CP 471,136 m

6+740

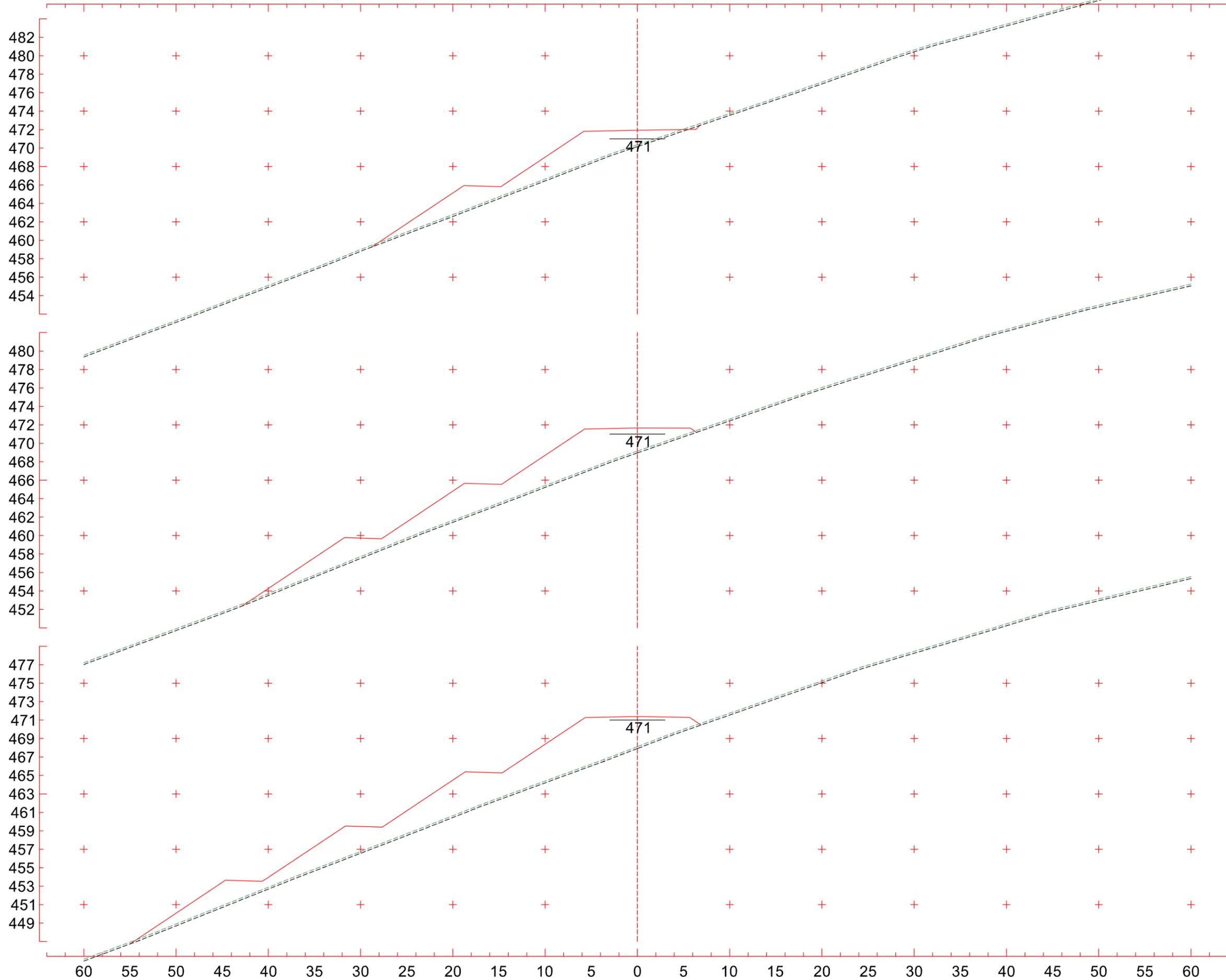
CT 467,331 m
CP 470,877 m

6+720

CT 467,544 m
CP 470,619 m

Lote 2

Escala 1:400



6+820

CT 470,353 m
CP 471,927 m

6+800

CT 469,157 m
CP 471,653 m

6+780

CT 468,123 m
CP 471,394 m

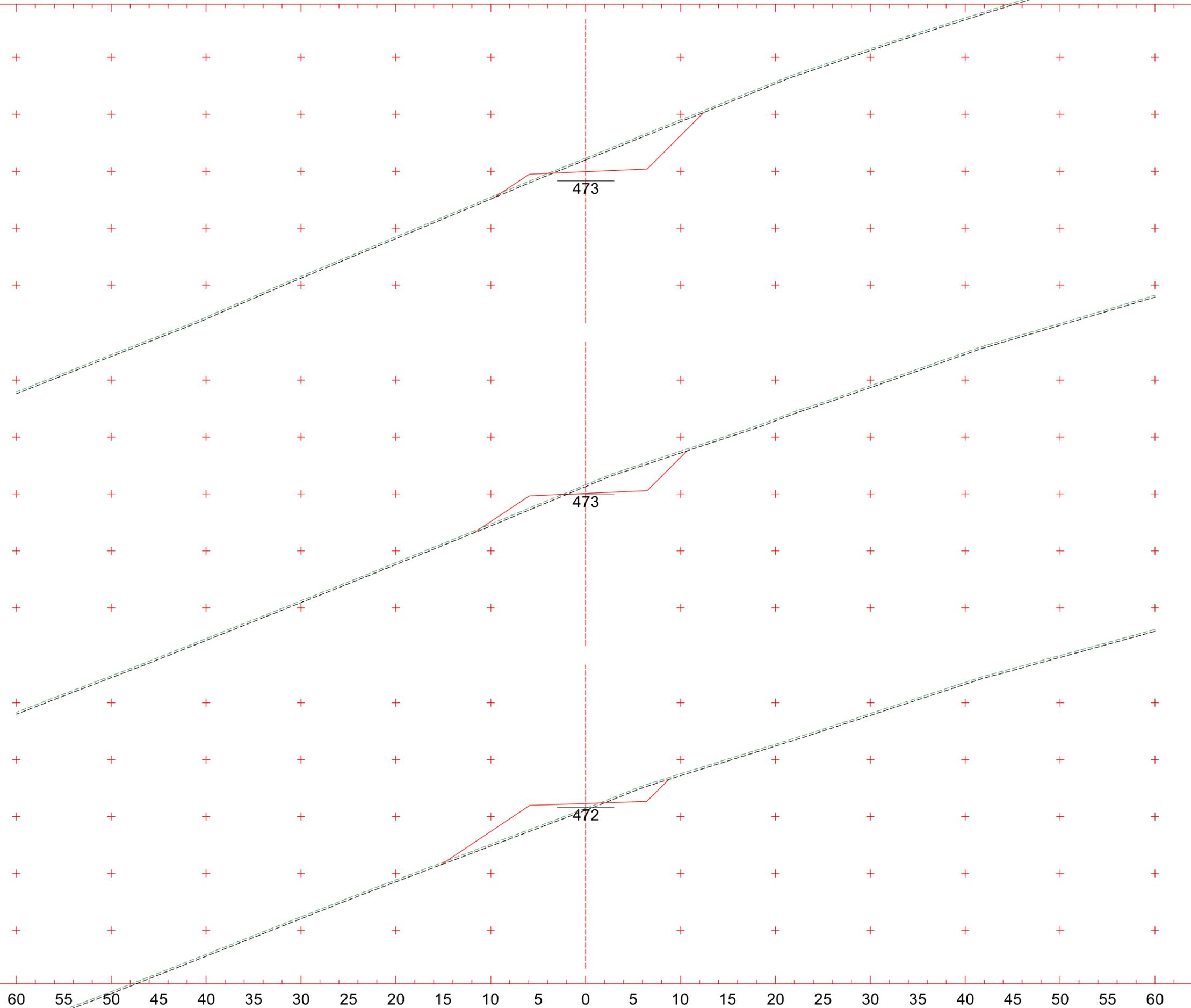
Lote 2

Escala 1:400

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6+880

CT 475,385 m
CP 473,954 m

6+860

CT 473,972 m
CP 473,056 m

6+840

CT 471,867 m
CP 472,381 m

Lote 2

Escala 1:400

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6+940

CT 479,131 m
CP 477,588 m

6+920

CT 478,306 m
CP 476,330 m

6+900

CT 476,903 m
CP 475,073 m

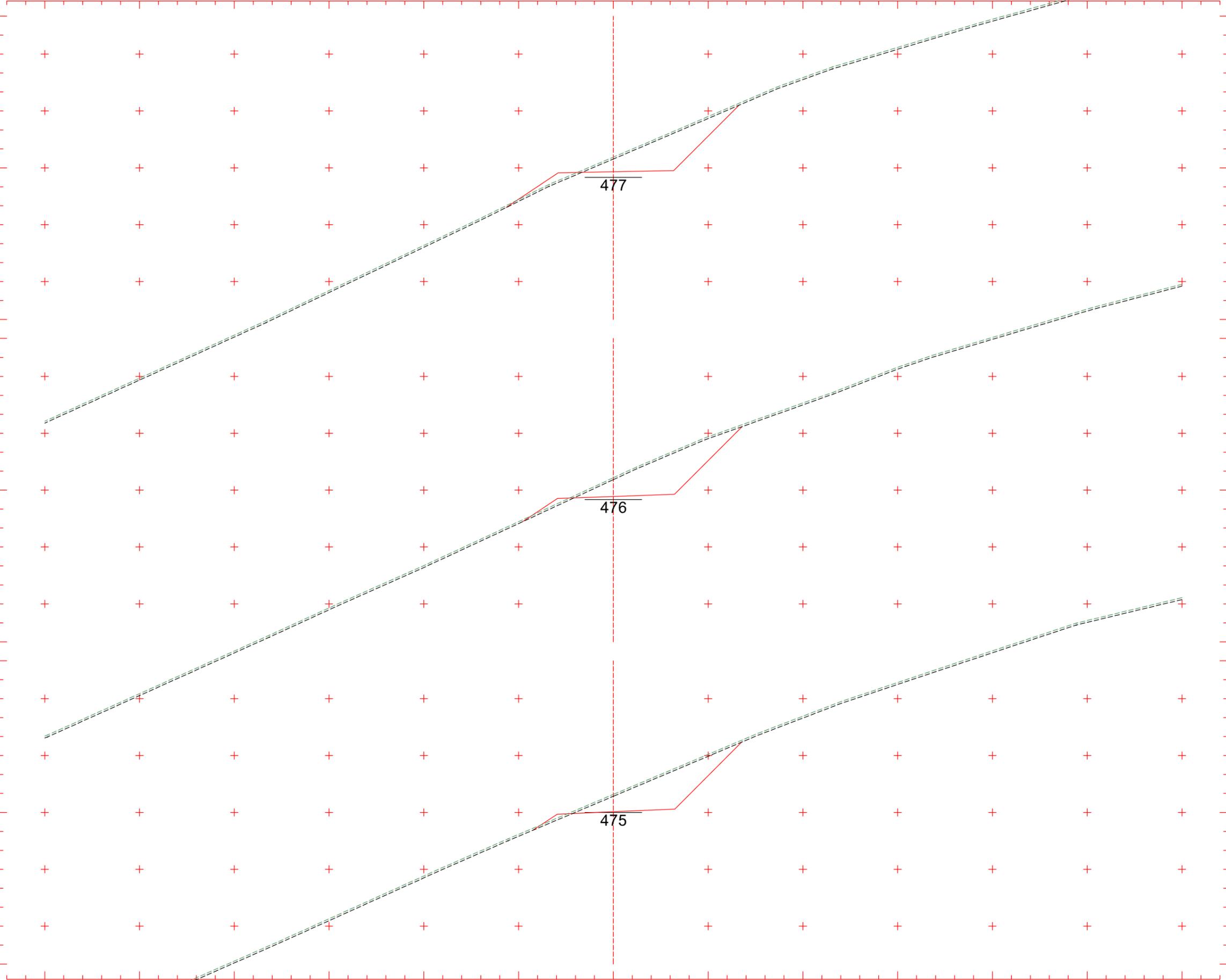
Lote 2

Escala 1:400

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7+000
CT 482,216 m
CP 481,362 m

6+980
CT 480,872 m
CP 480,104 m

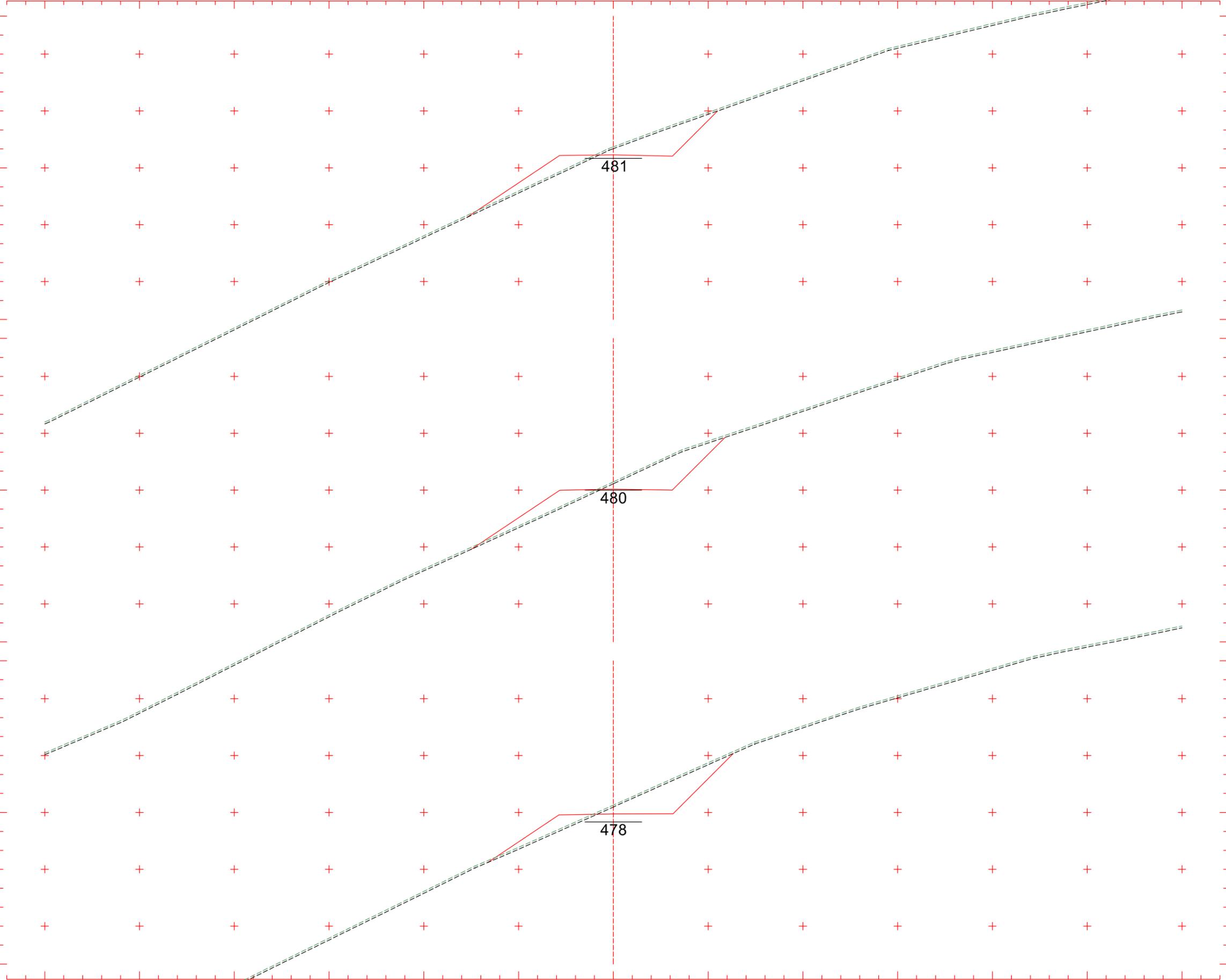
6+960
CT 479,774 m
CP 478,846 m

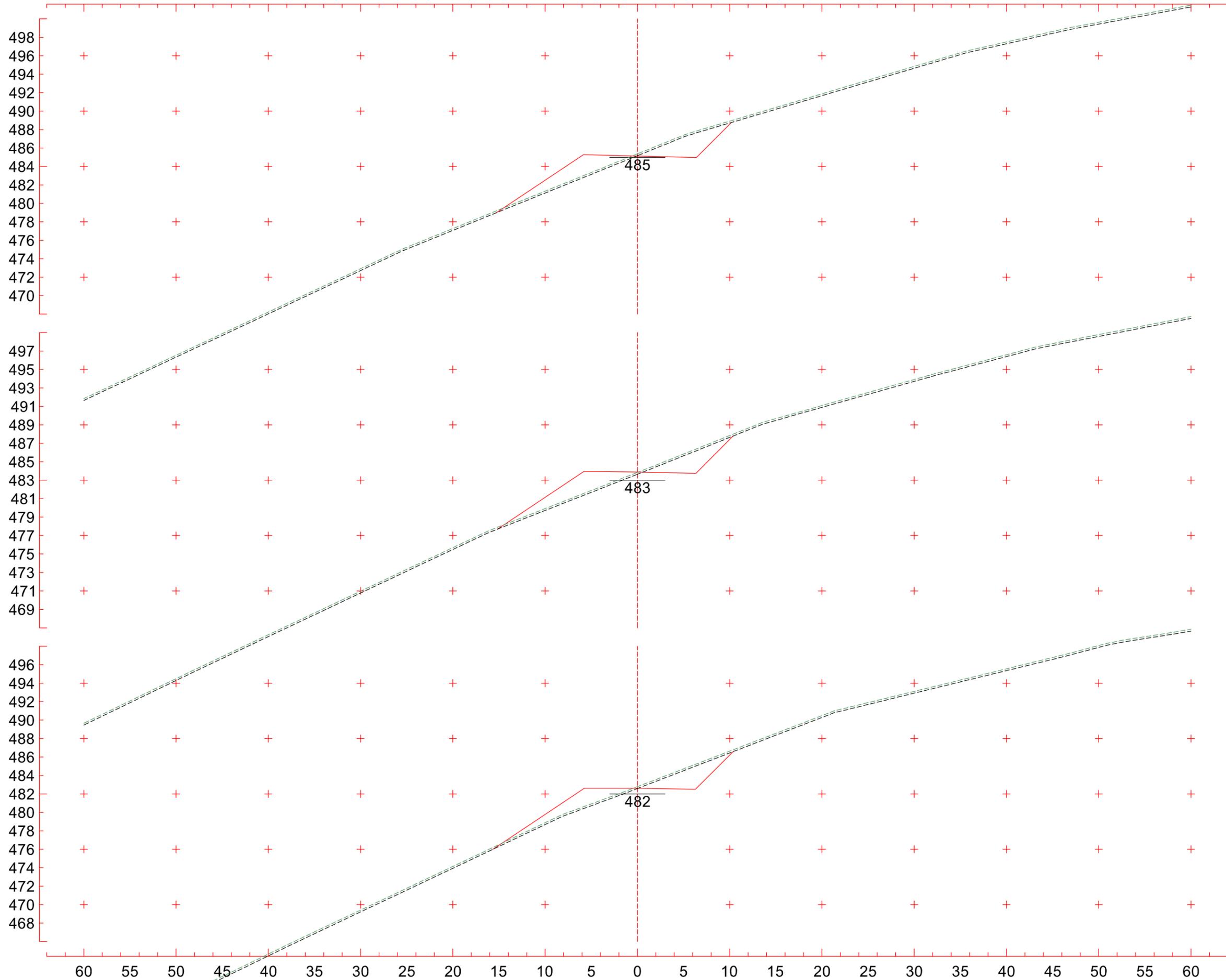
Lote 2
Escala 1:400

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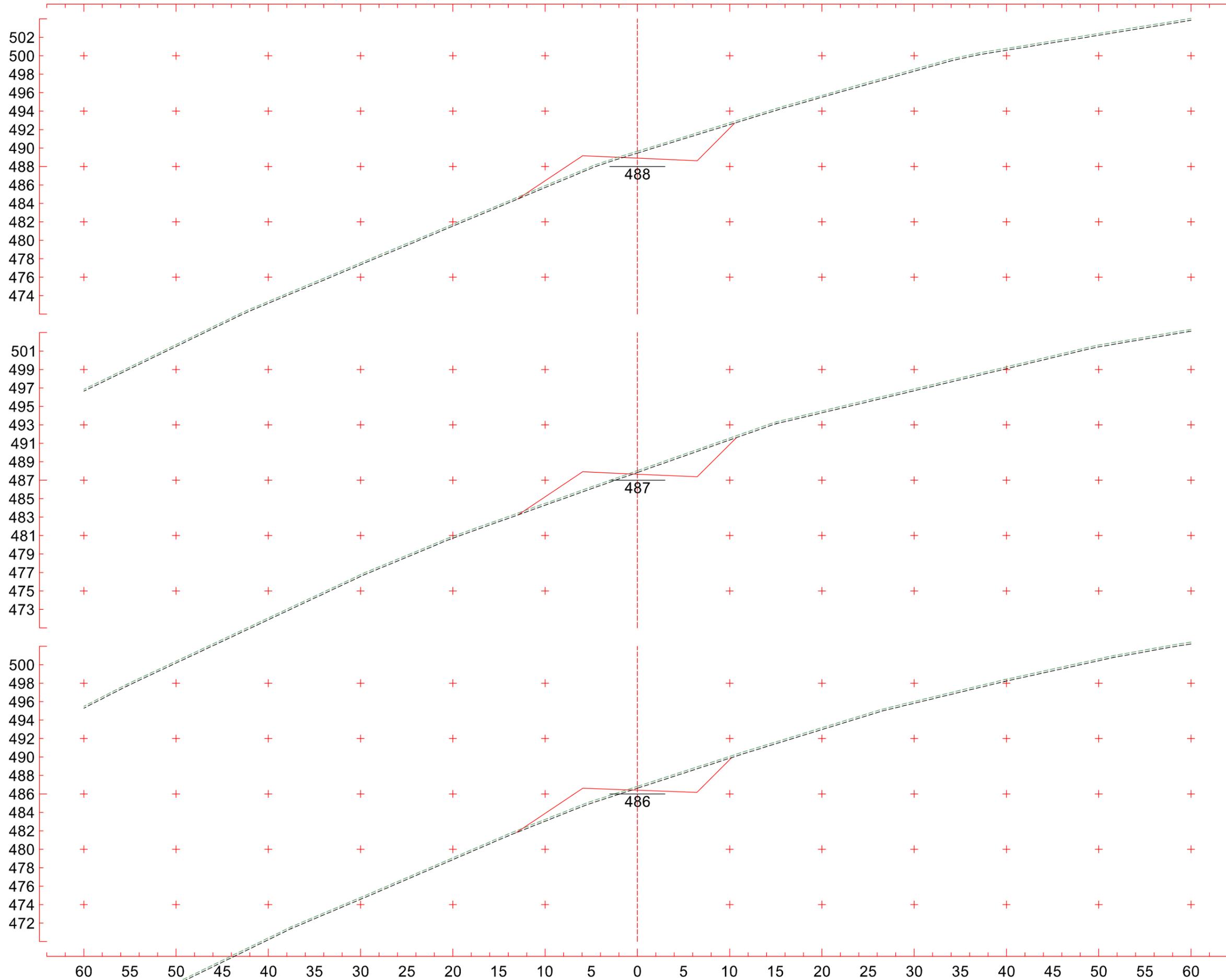


7+060
 CT 485,369 m
 CP 485,136 m

7+040
 CT 483,844 m
 CP 483,878 m

7+020
 CT 482,786 m
 CP 482,620 m

Lote 2
 Escala 1:400

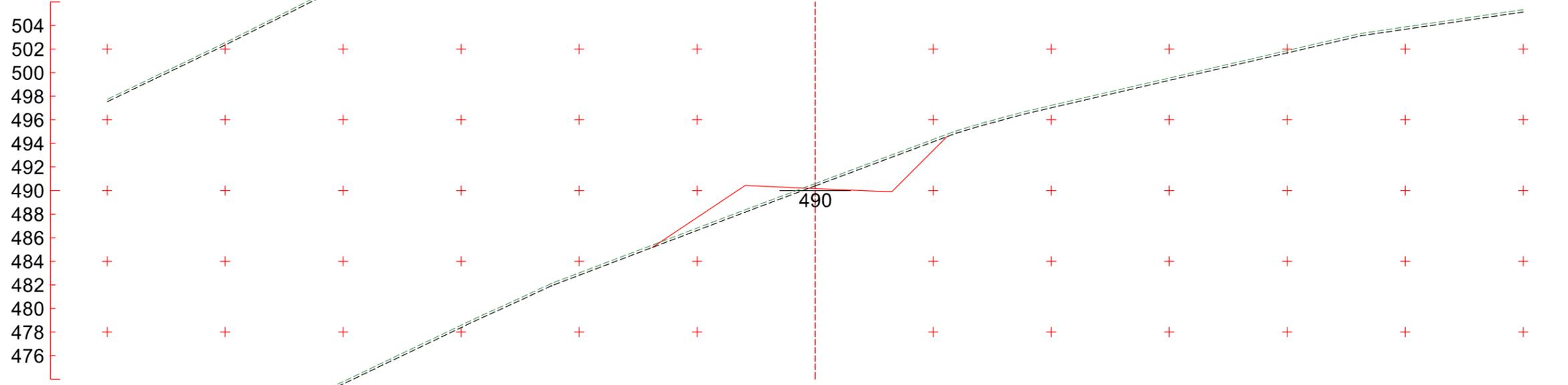
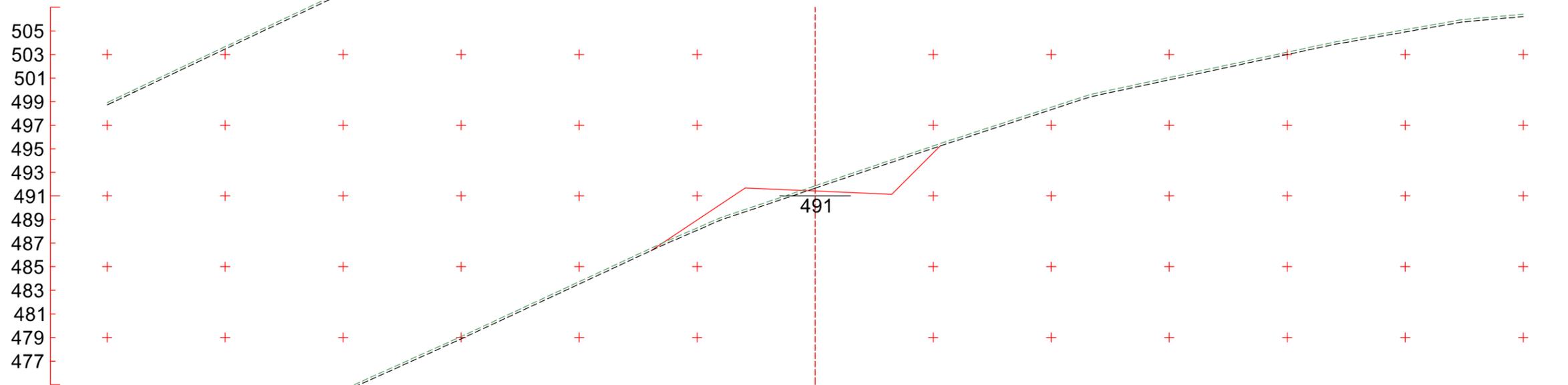
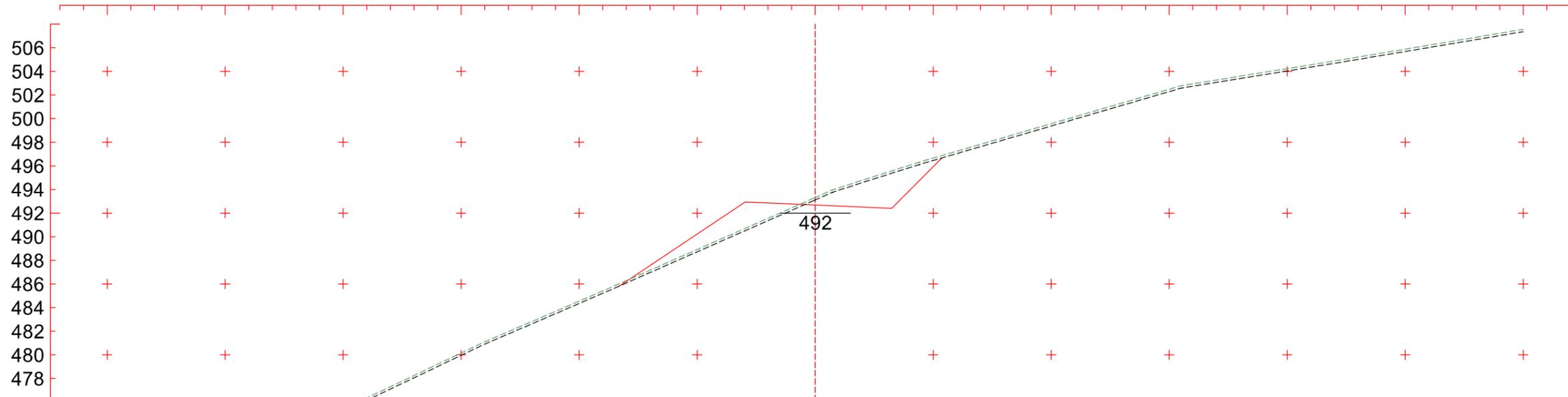


7+120
 CT 489,652 m
 CP 488,911 m

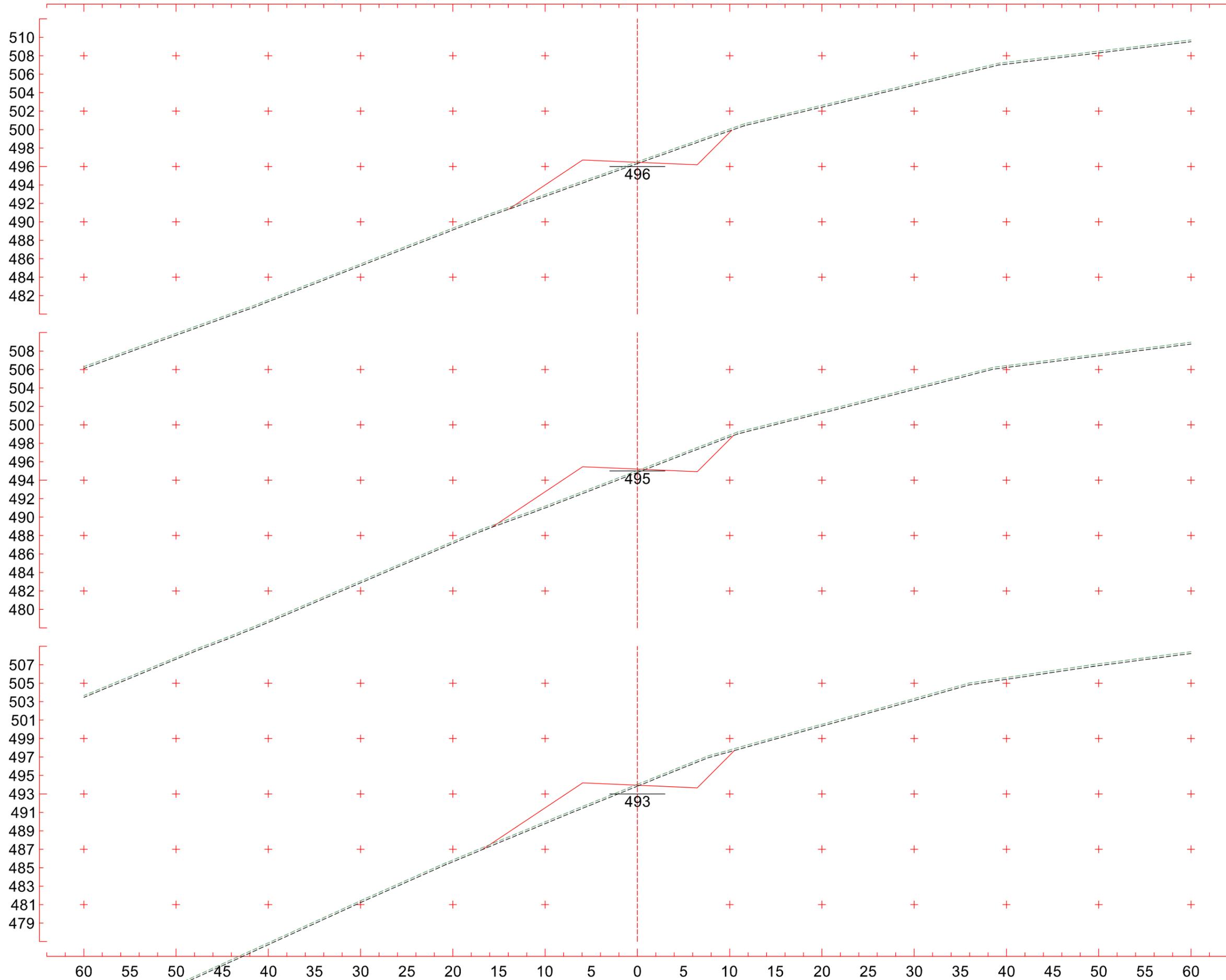
7+100
 CT 488,035 m
 CP 487,653 m

7+080
 CT 486,815 m
 CP 486,395 m

Lote 2
 Escala 1:400



Lote 2
 Escala 1:400



7+240

CT 496,513 m
CP 496,460 m

7+220

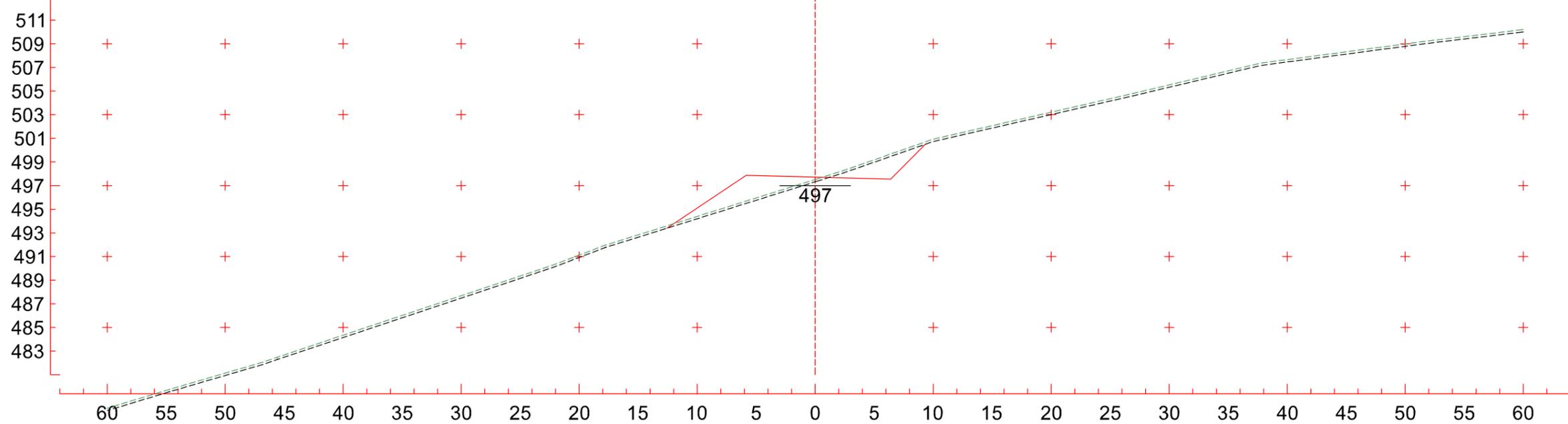
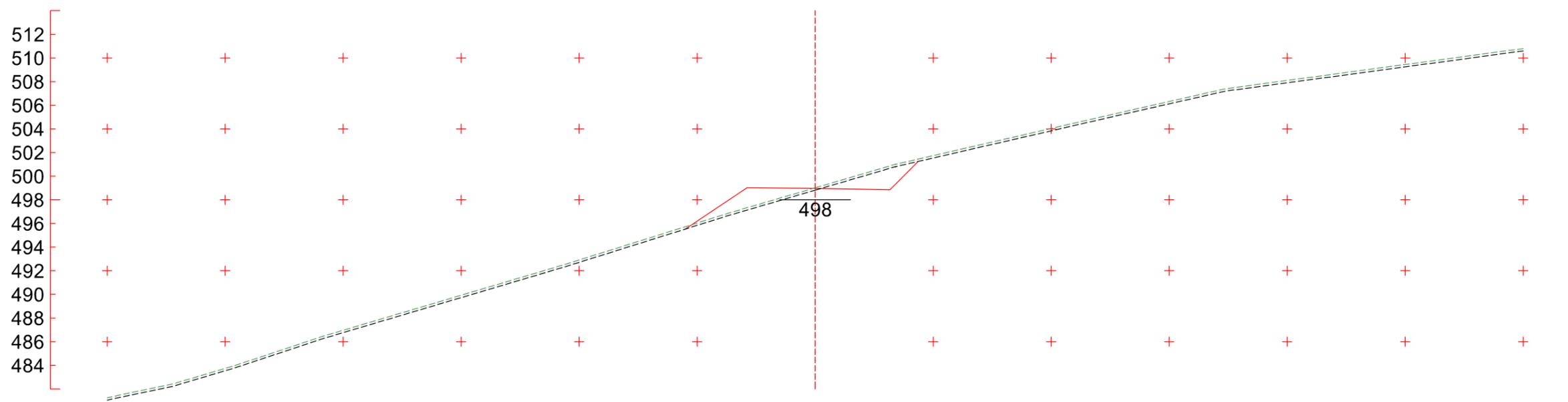
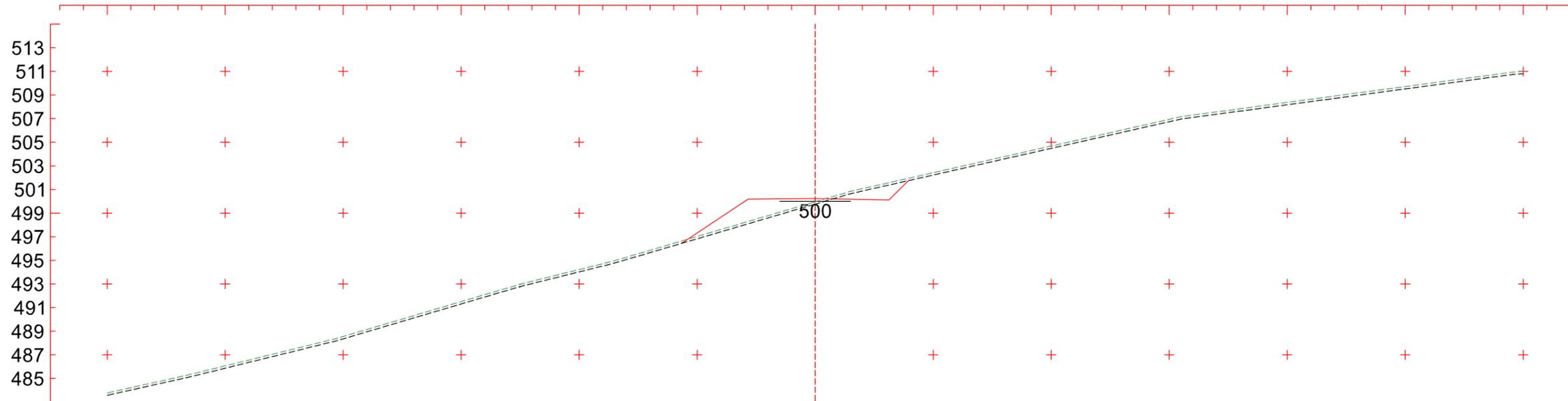
CT 495,039 m
CP 495,201 m

7+200

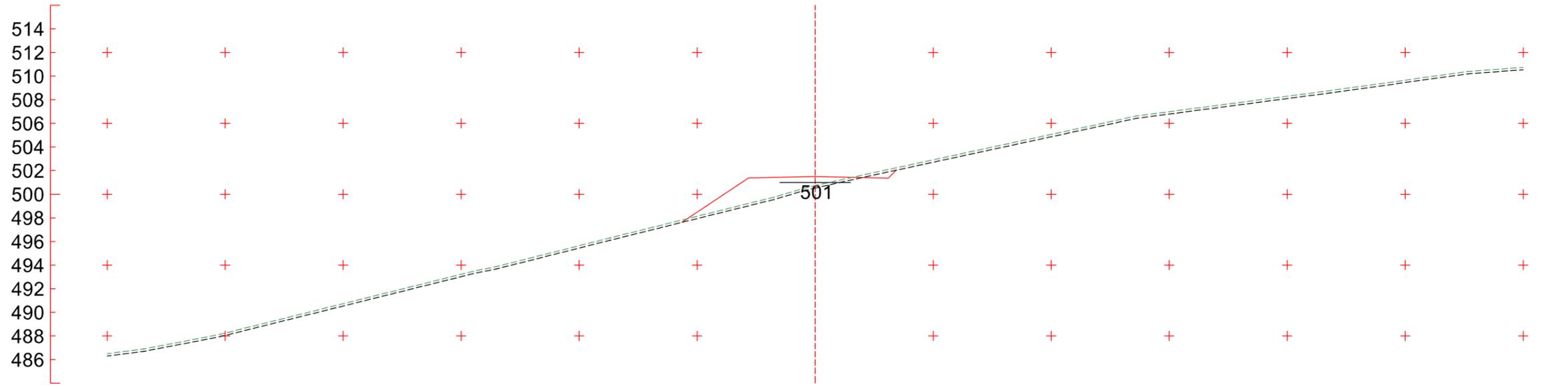
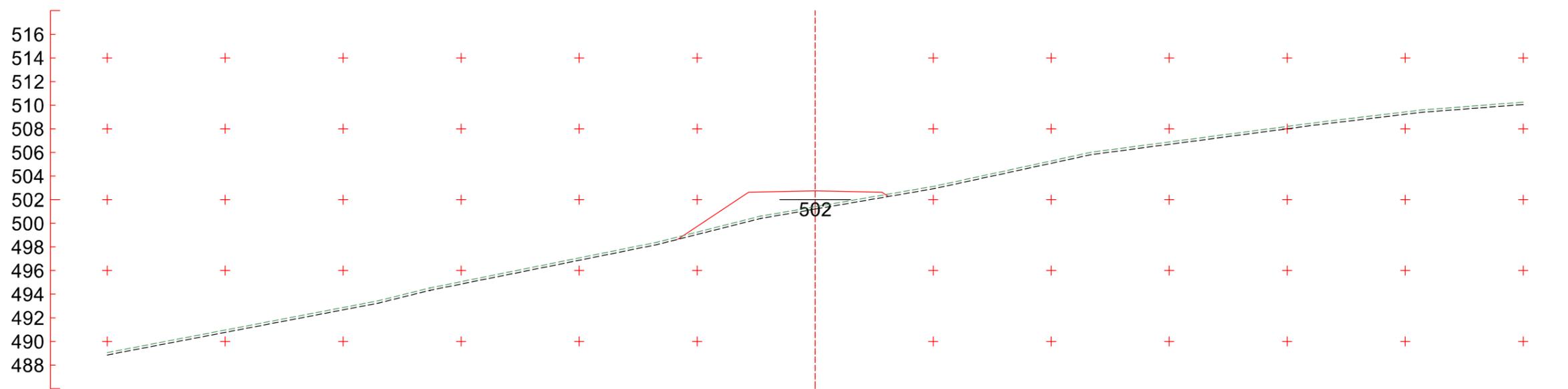
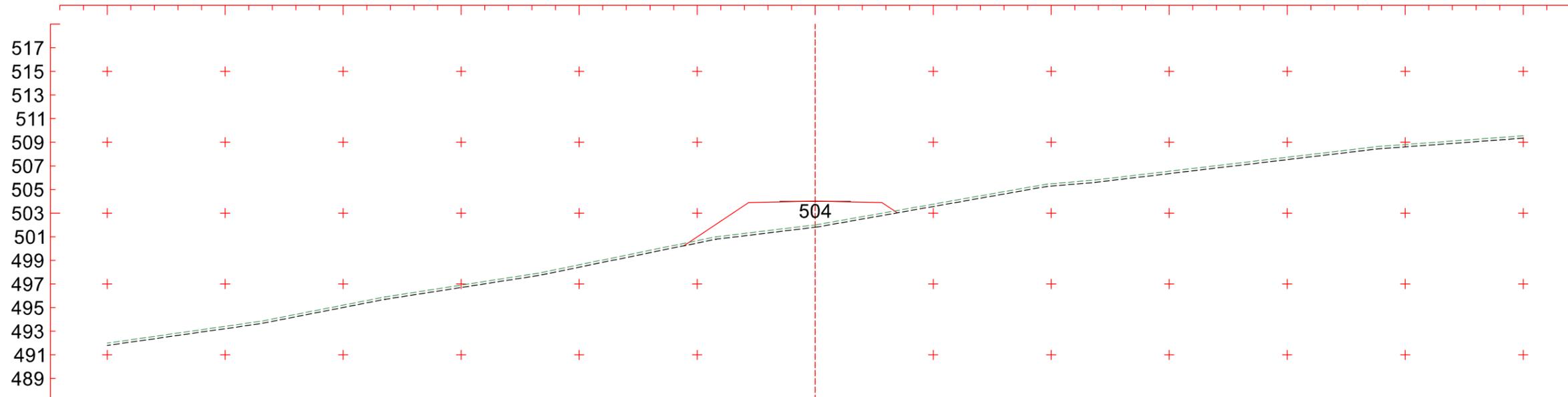
CT 494,036 m
CP 493,943 m

Lote 2

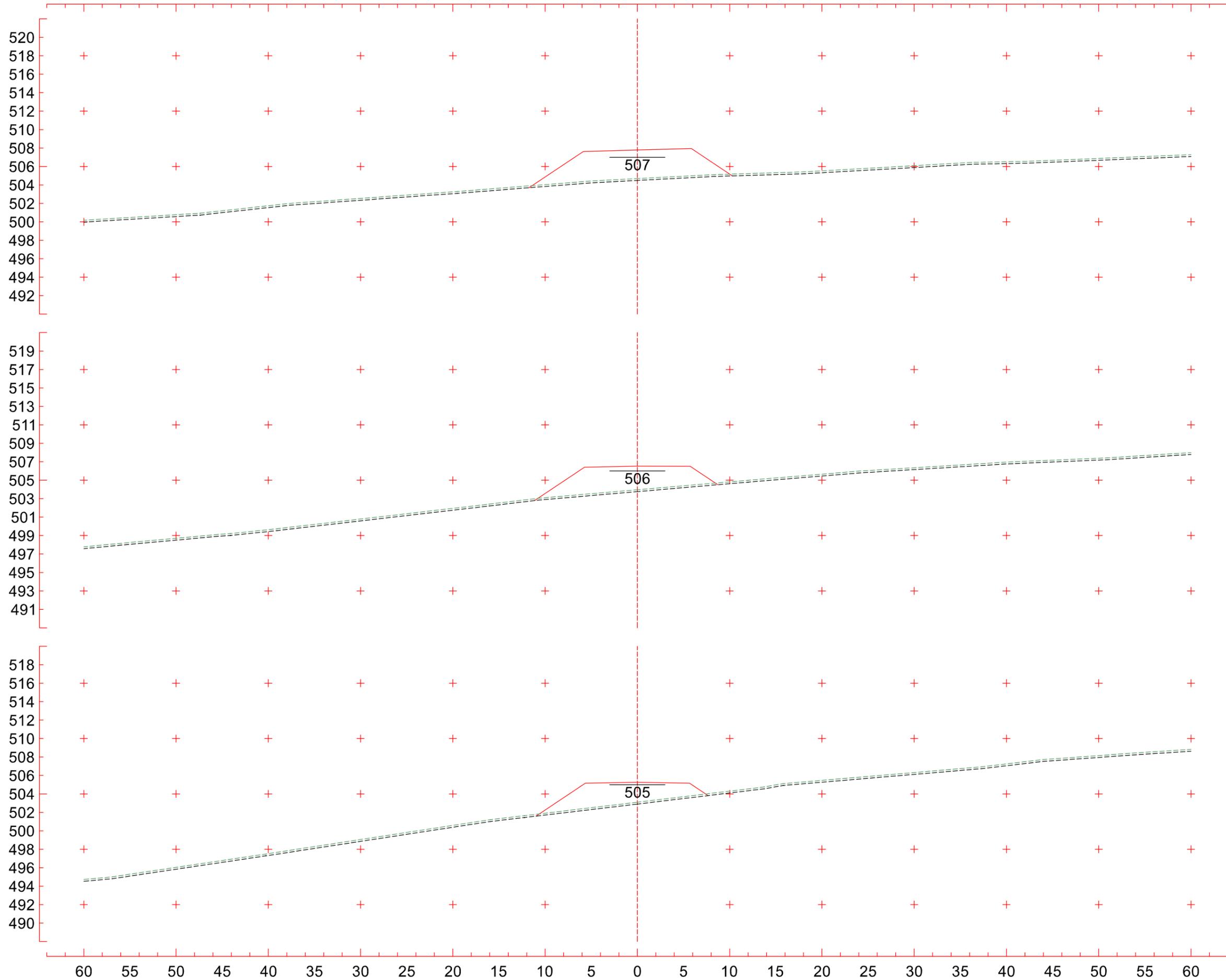
Escala 1:400



Lote 2
 Escala 1:400



Lote 2
 Escala 1:400



7+420

CT 504,687 m
CP 507,783 m

7+400

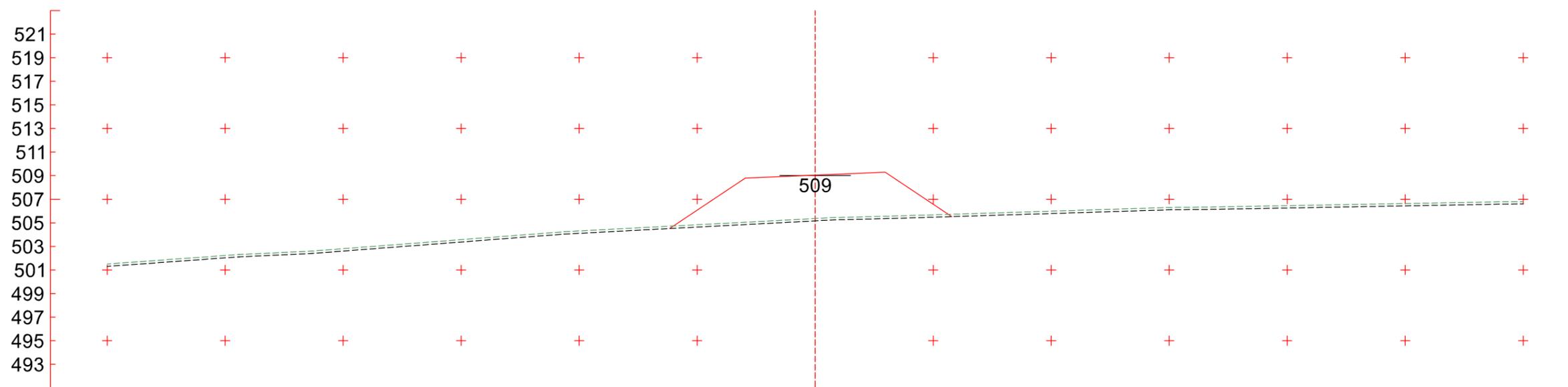
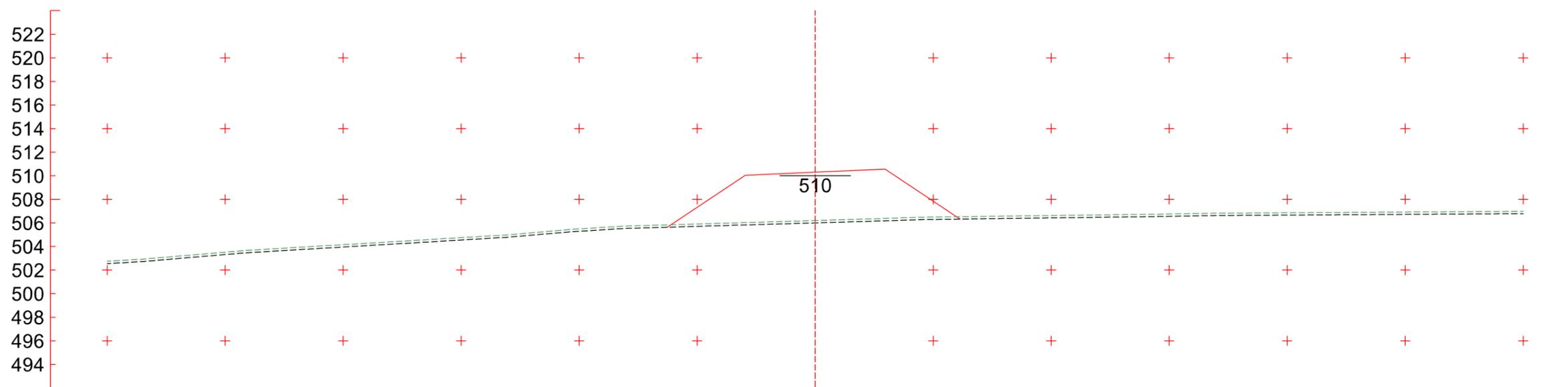
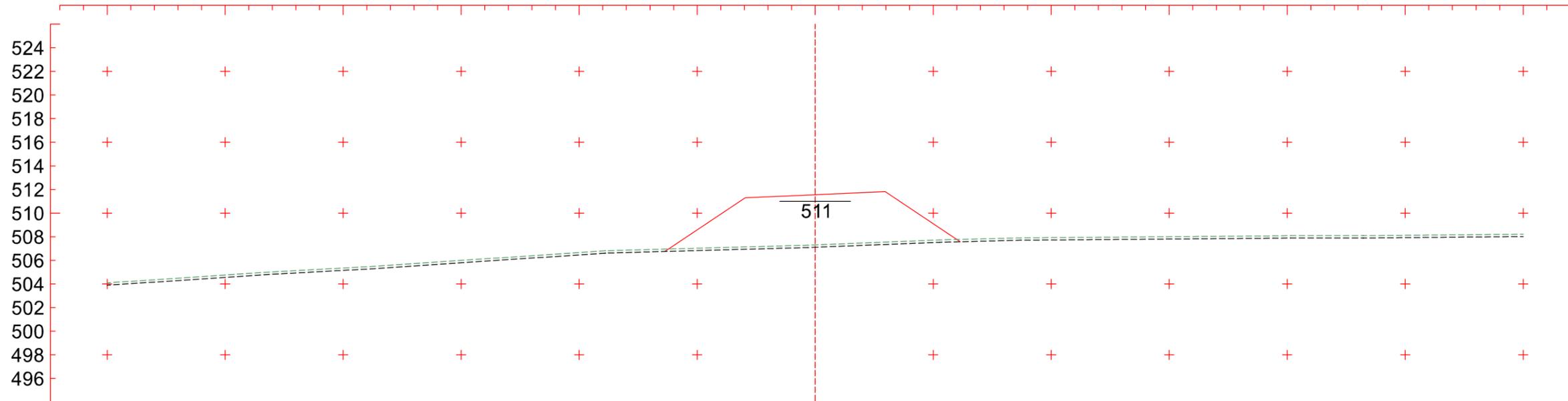
CT 503,963 m
CP 506,525 m

7+380

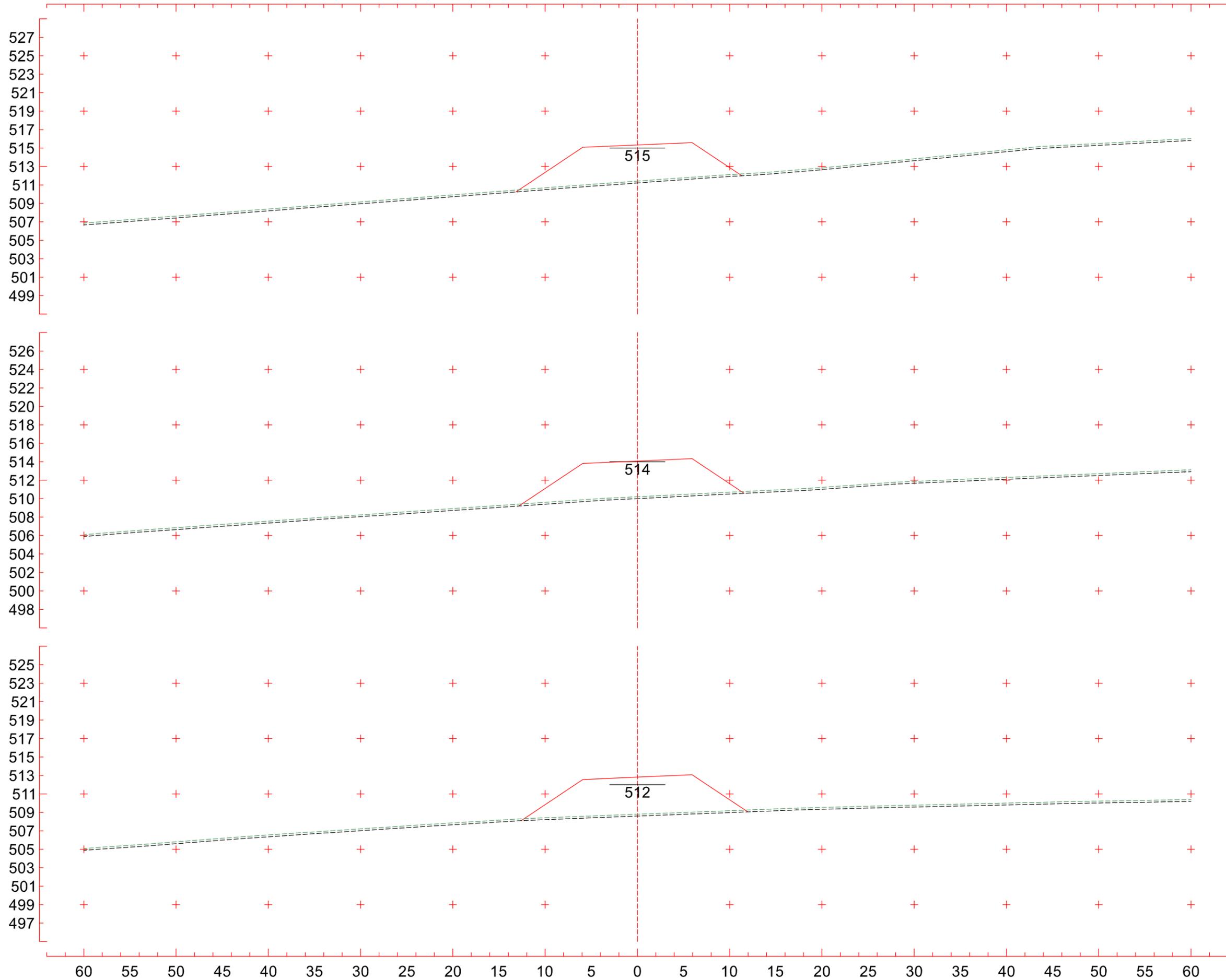
CT 503,100 m
CP 505,266 m

Lote 2

Escala 1:400



Lote 2
 Escala 1:400



7+540

CT 511,416 m
CP 515,331 m

7+520

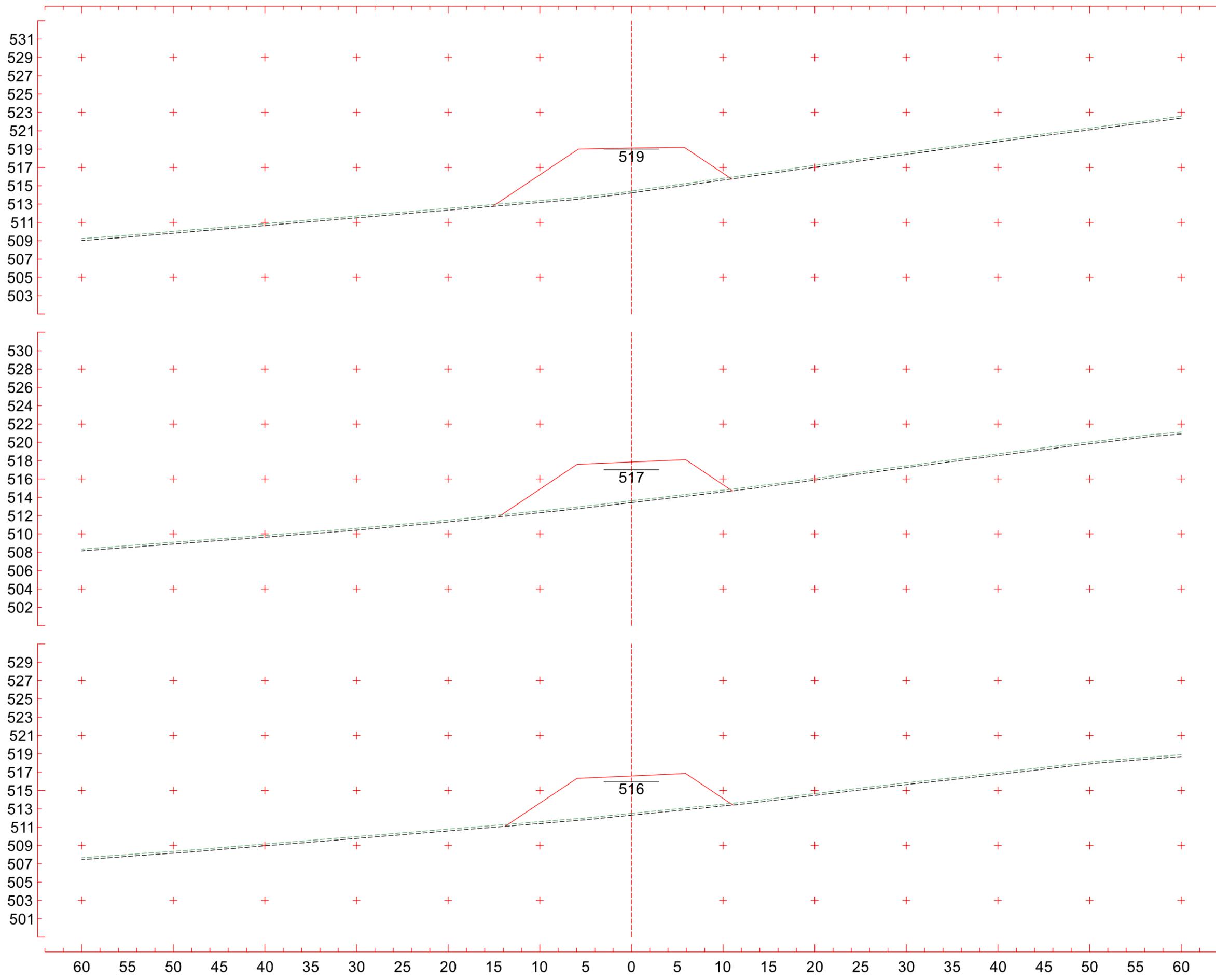
CT 510,210 m
CP 514,073 m

7+500

CT 508,797 m
CP 512,815 m

Lote 2

Escala 1:400



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7+600
CT 514,423 m
CP 519,106 m

7+580
CT 513,627 m
CP 517,848 m

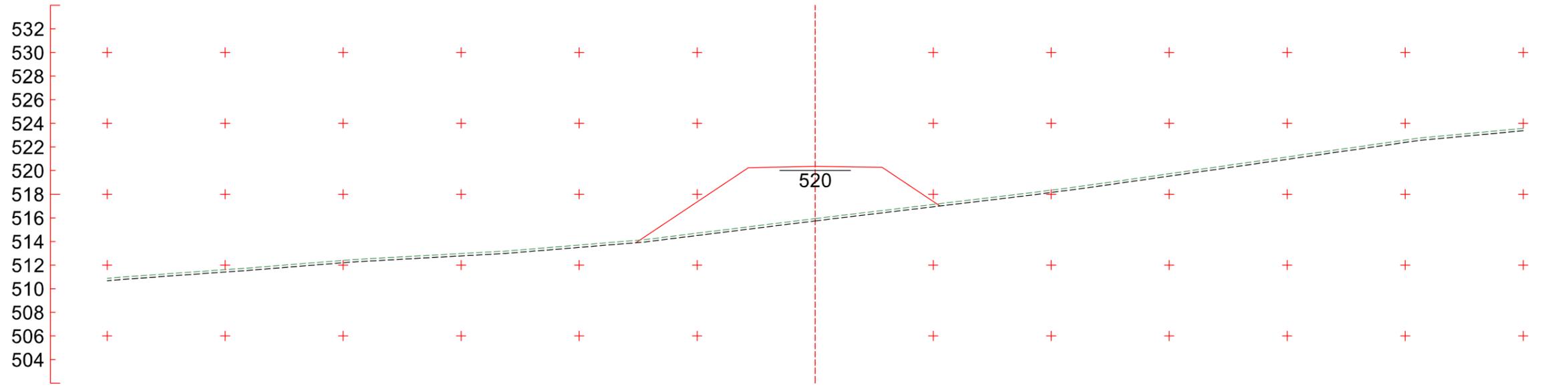
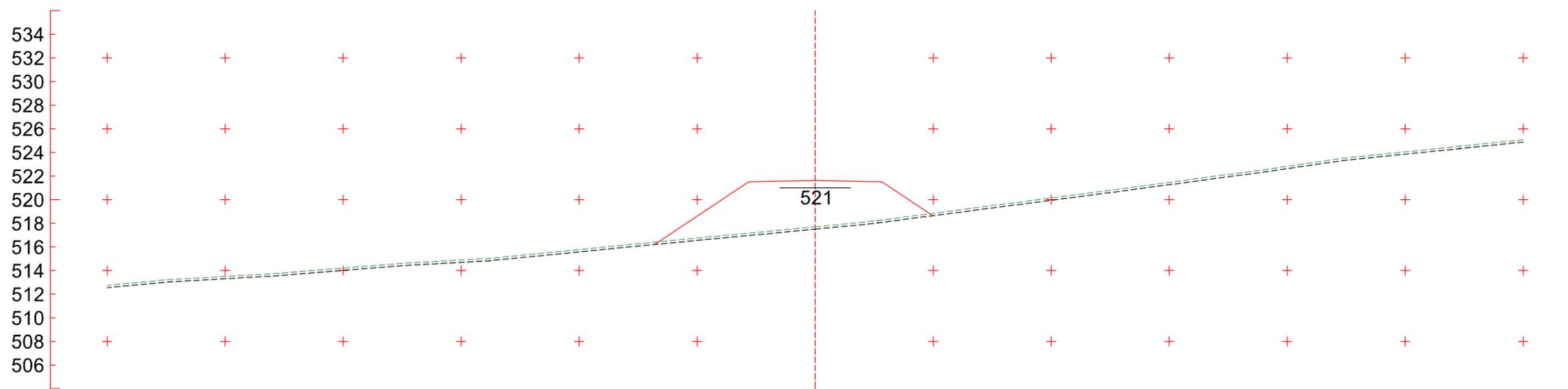
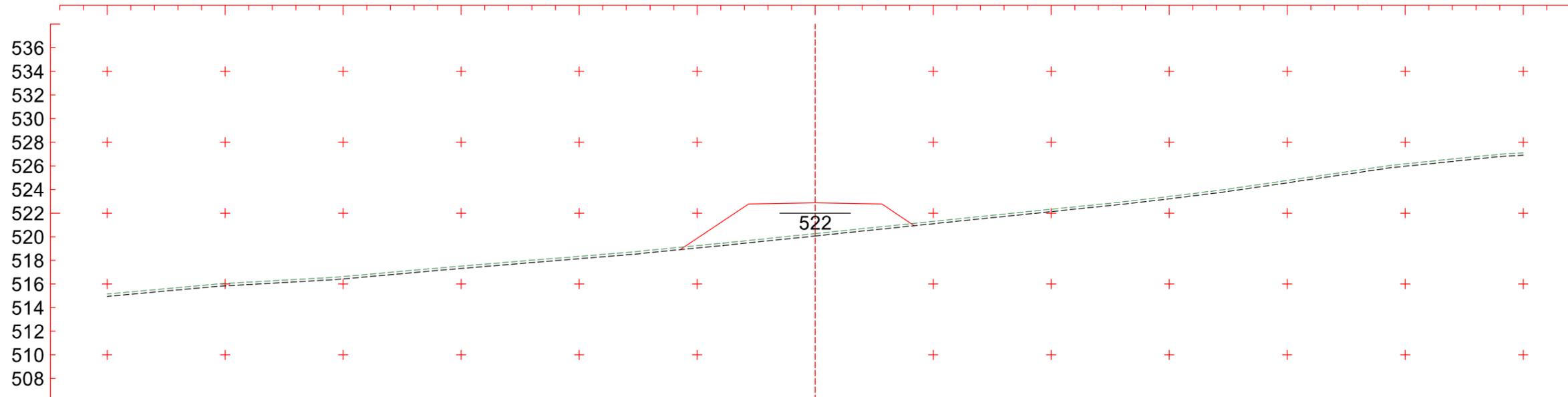
7+560
CT 512,509 m
CP 516,590 m

Lote 2
Escala 1:400

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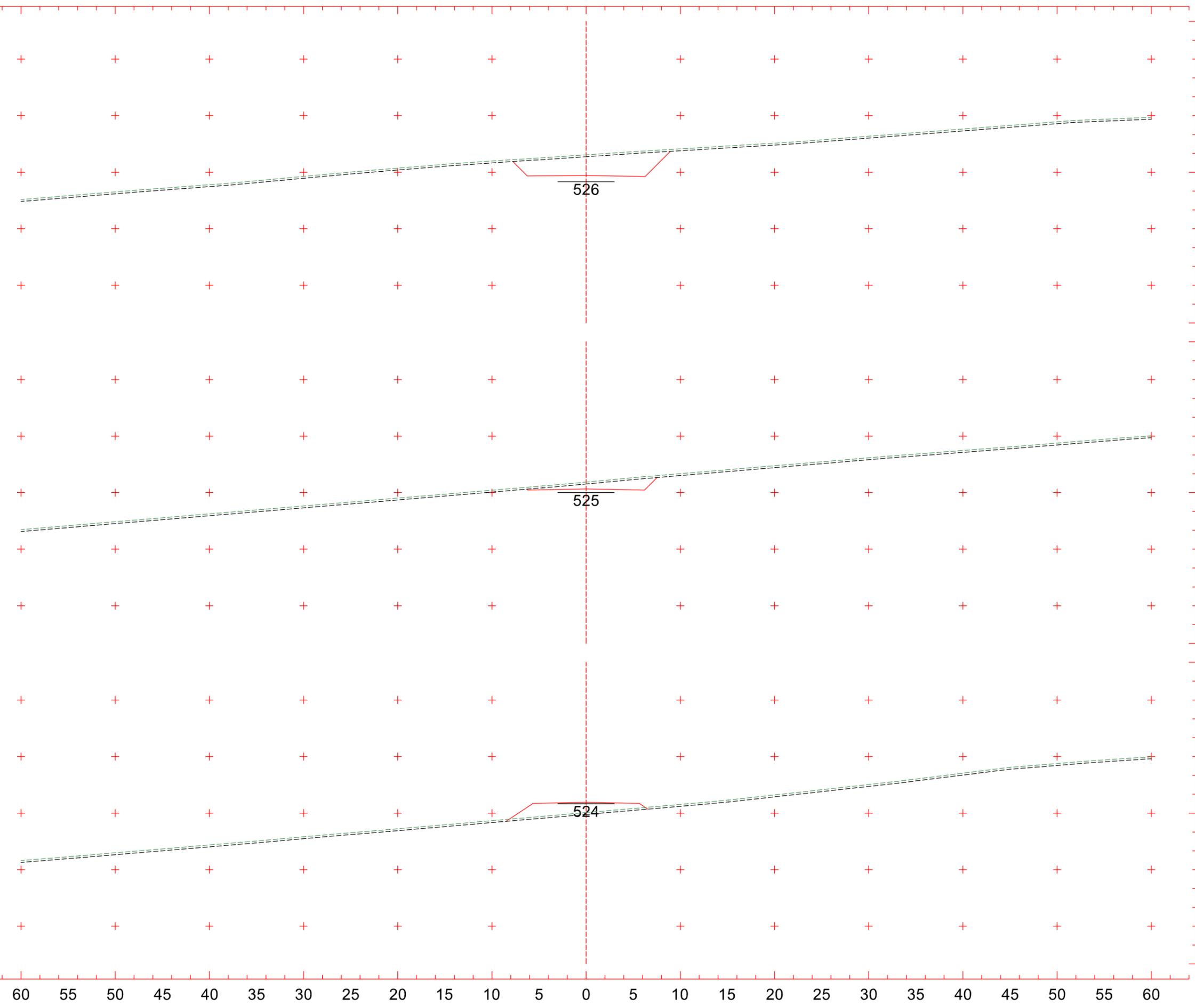


Lote 2
 Escala 1:400

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7+720

CT 528,843 m
CP 526,654 m

7+700

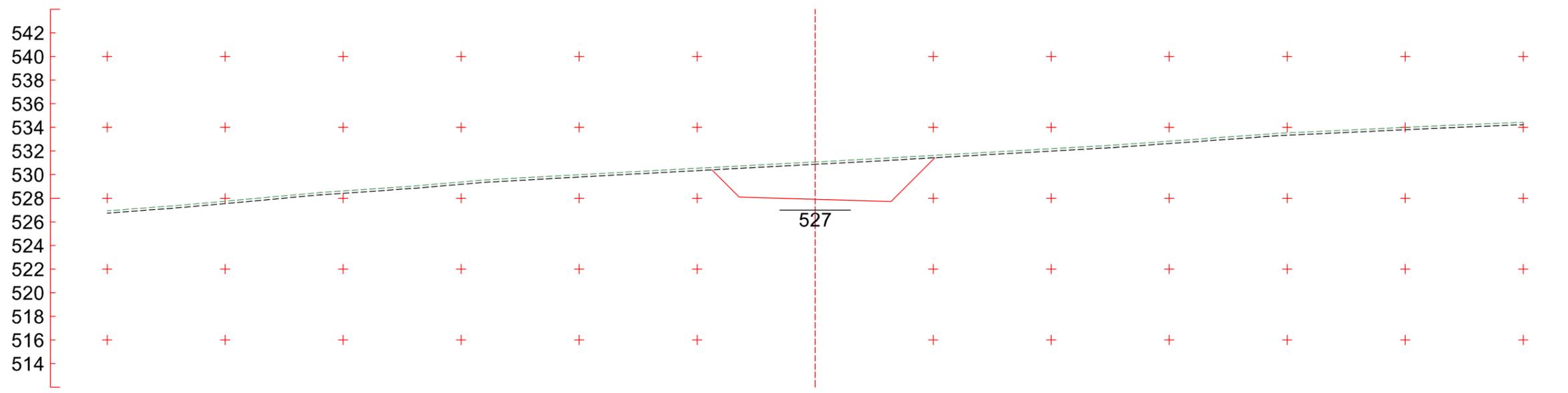
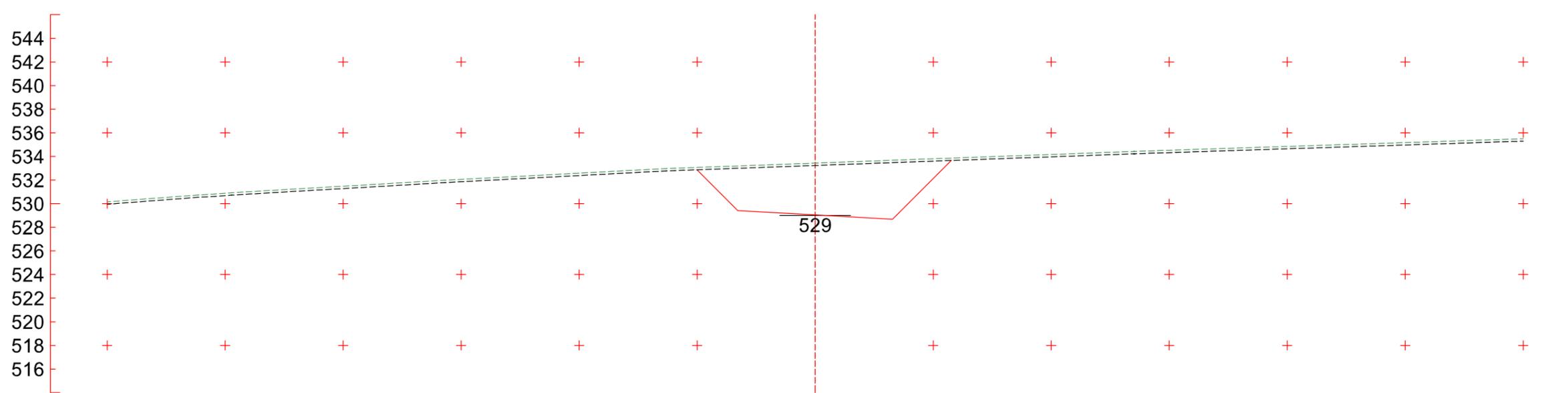
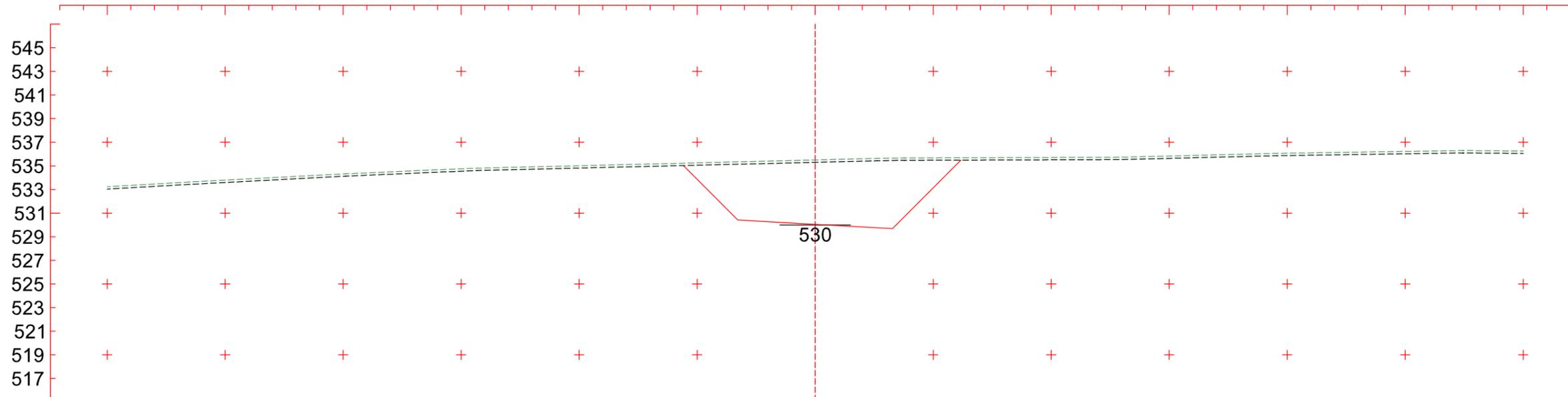
CT 526,116 m
CP 525,396 m

7+680

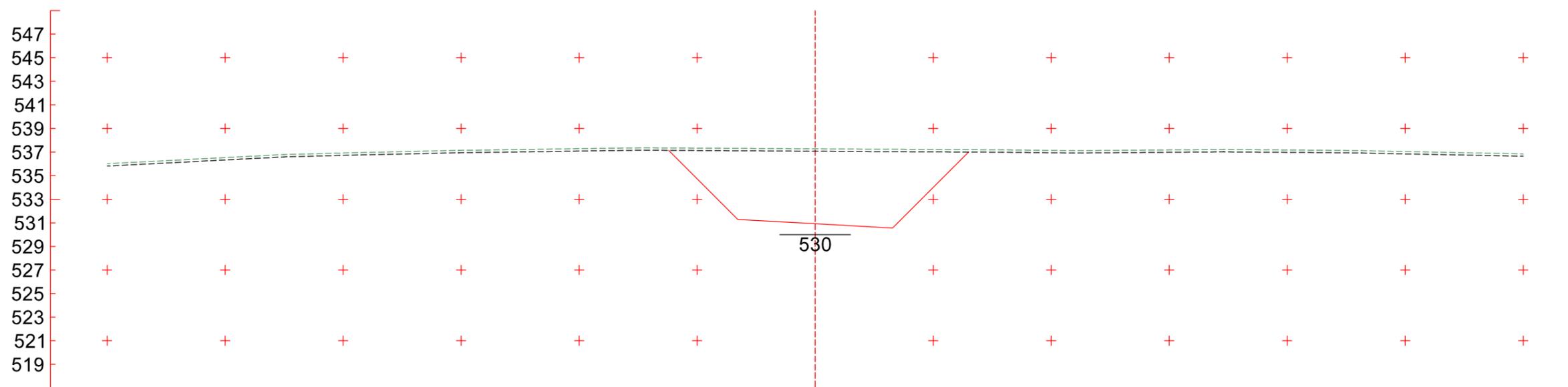
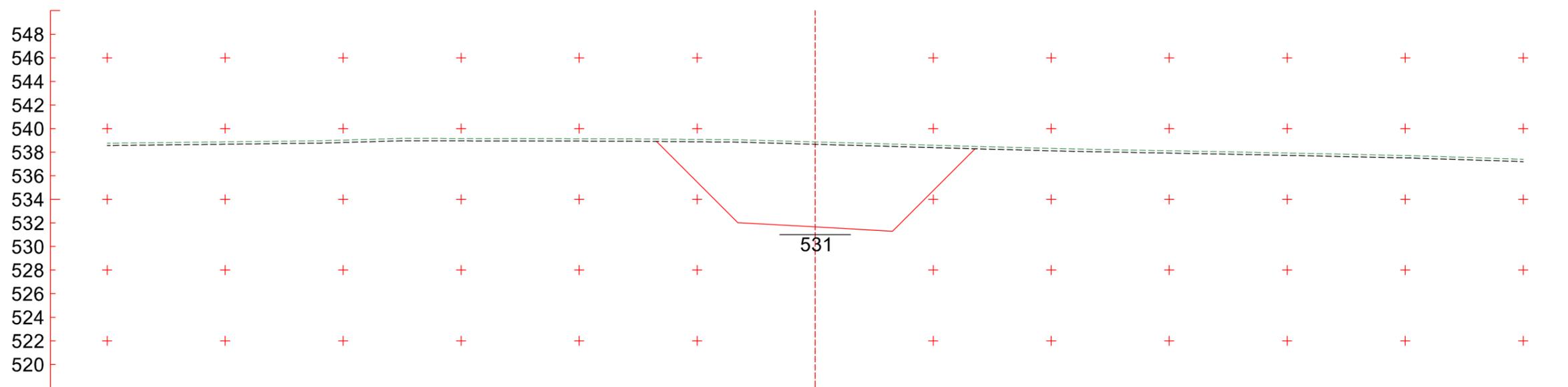
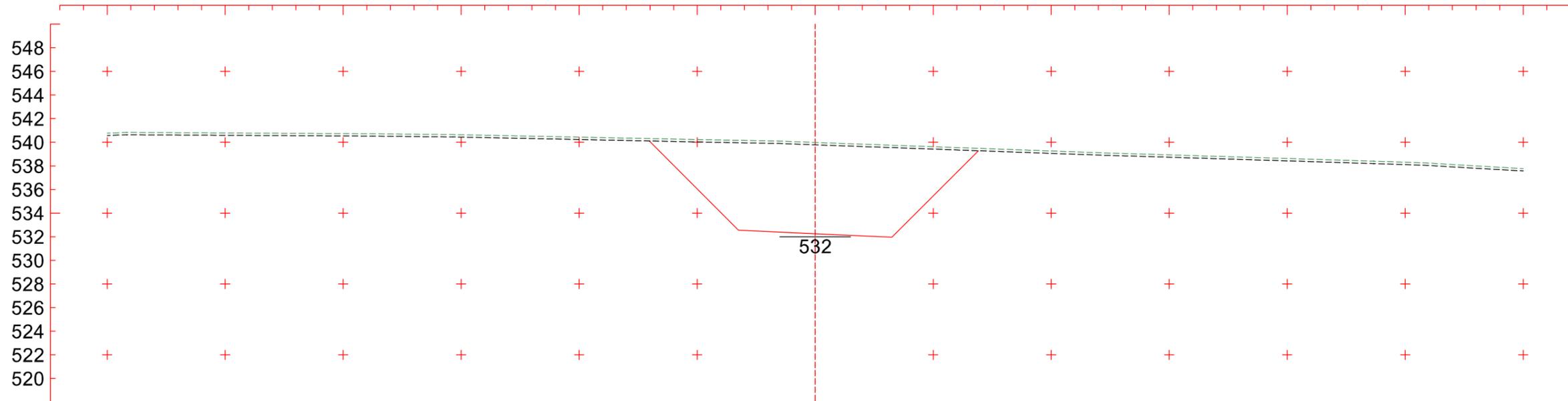
CT 523,057 m
CP 524,138 m

Lote 2

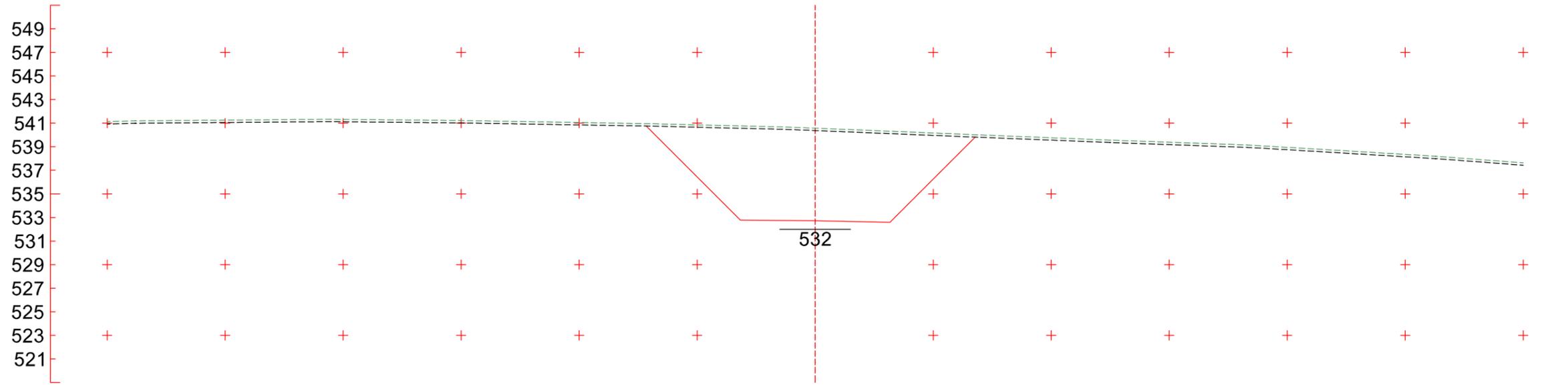
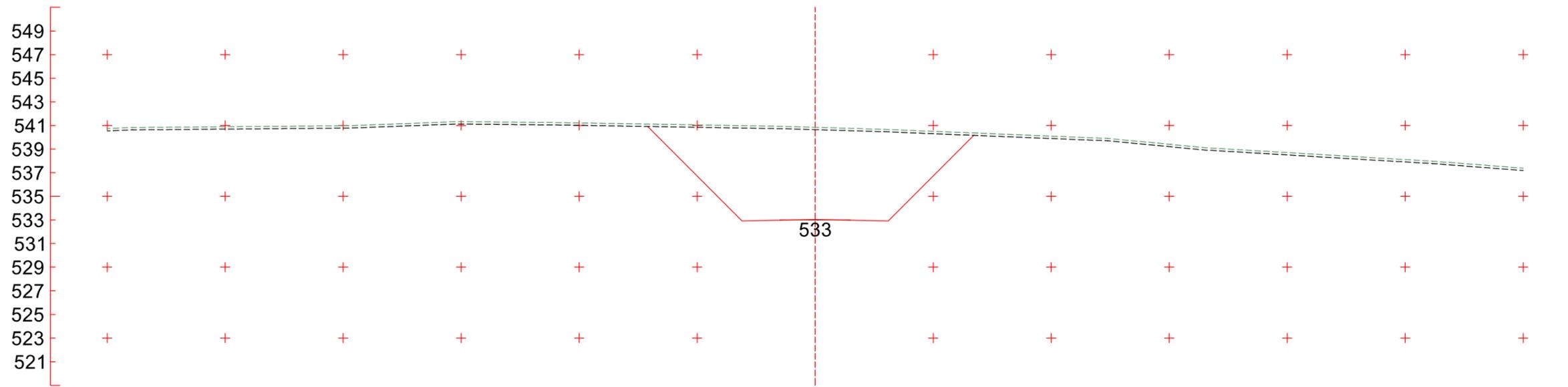
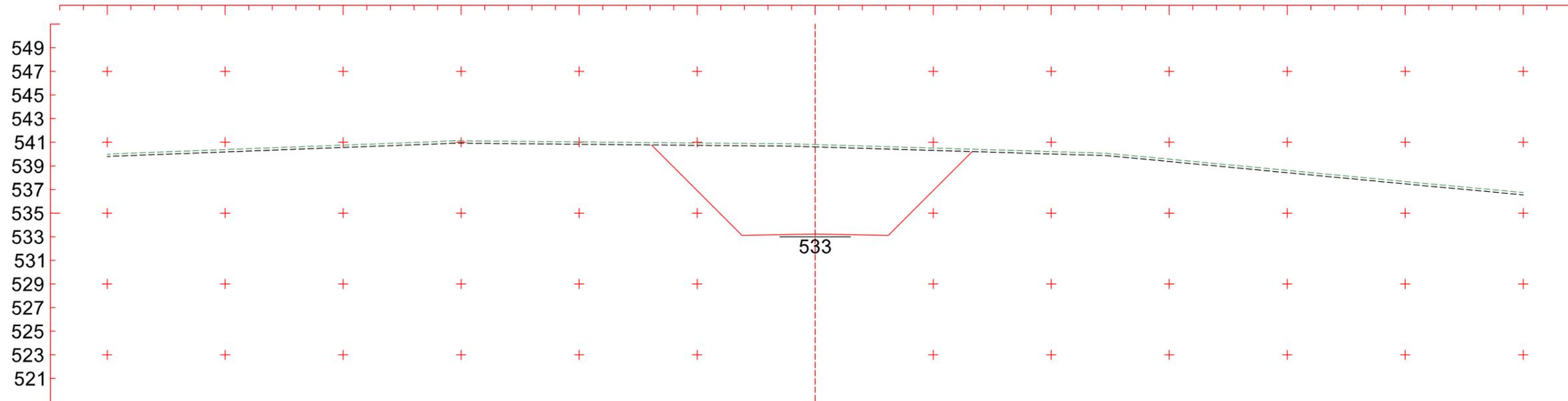
Escala 1:400



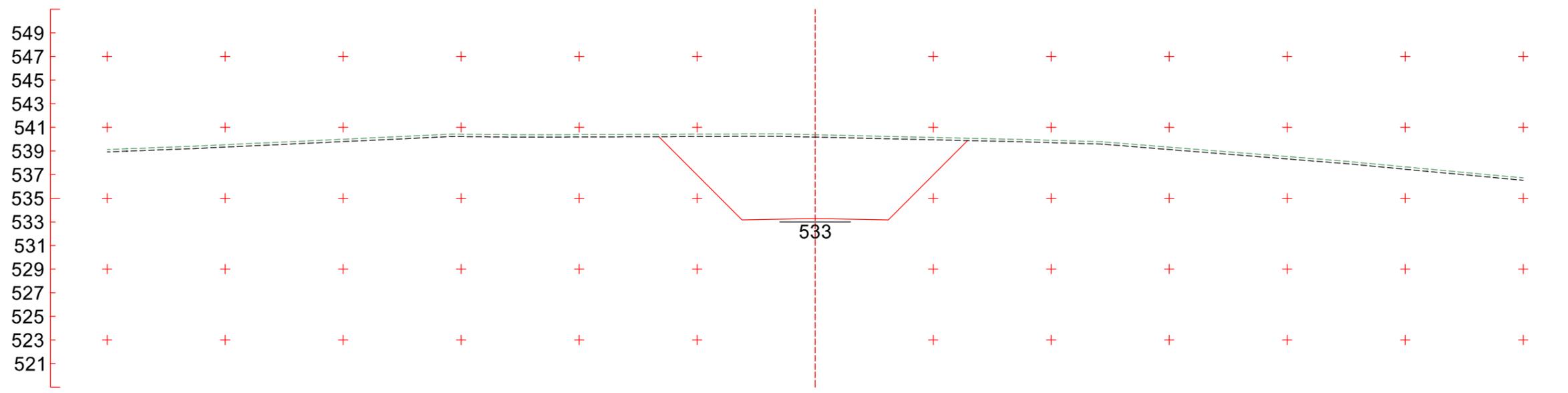
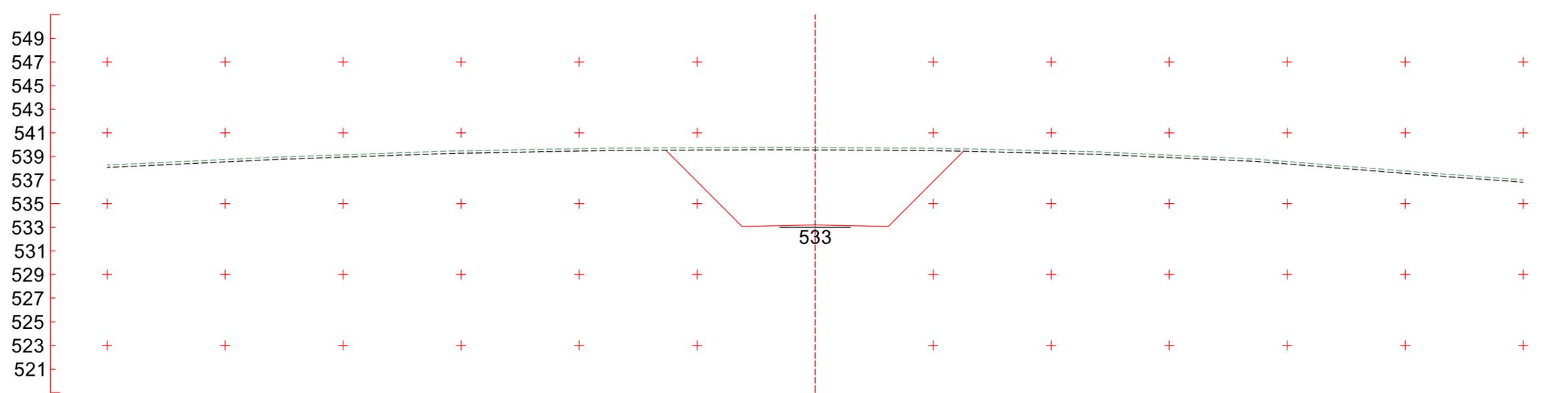
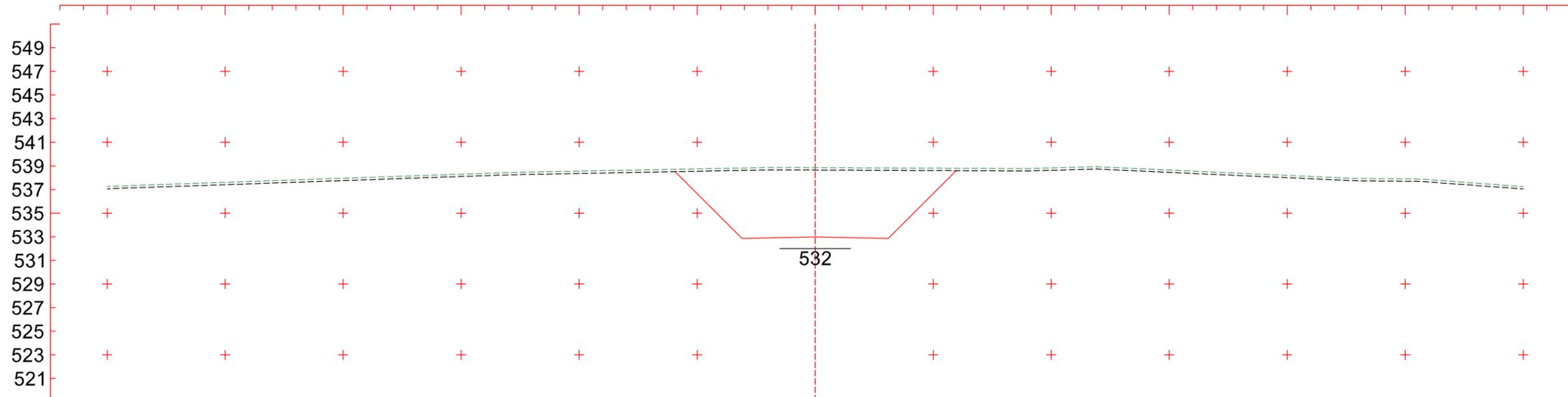
Lote 2
 Escala 1:400



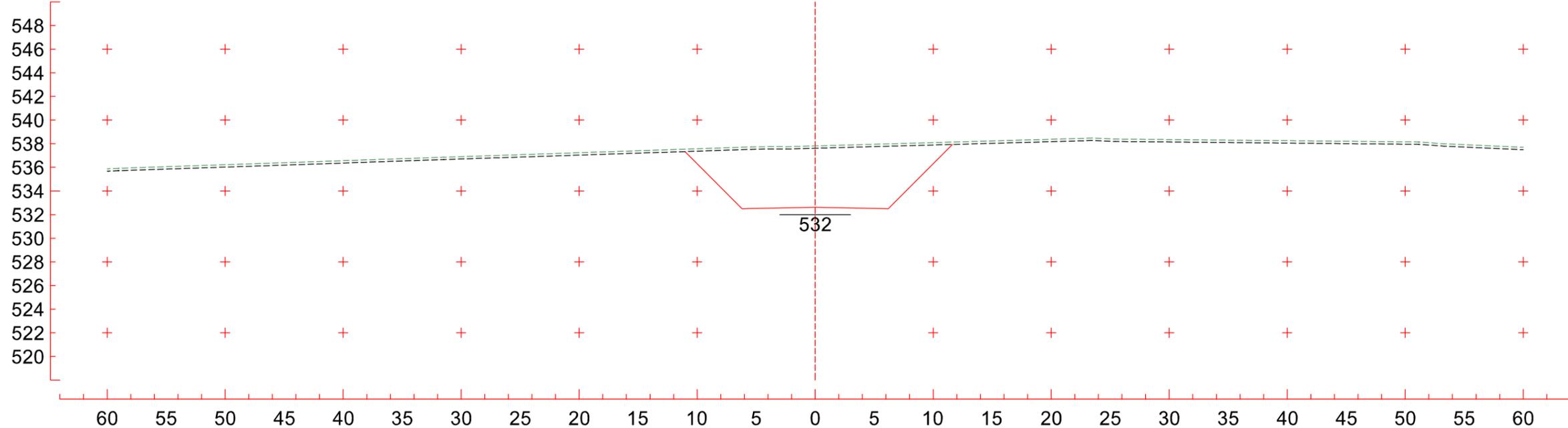
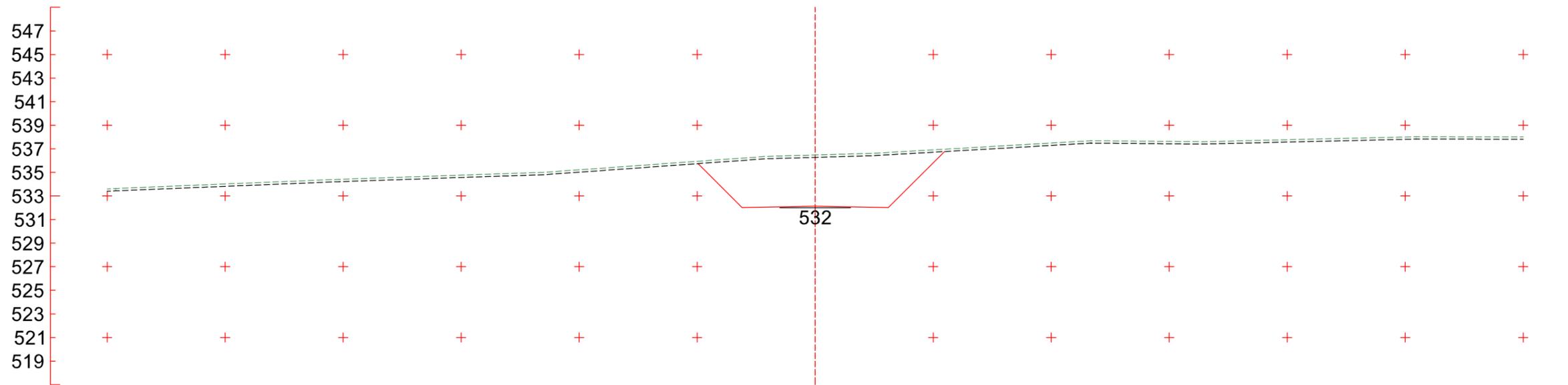
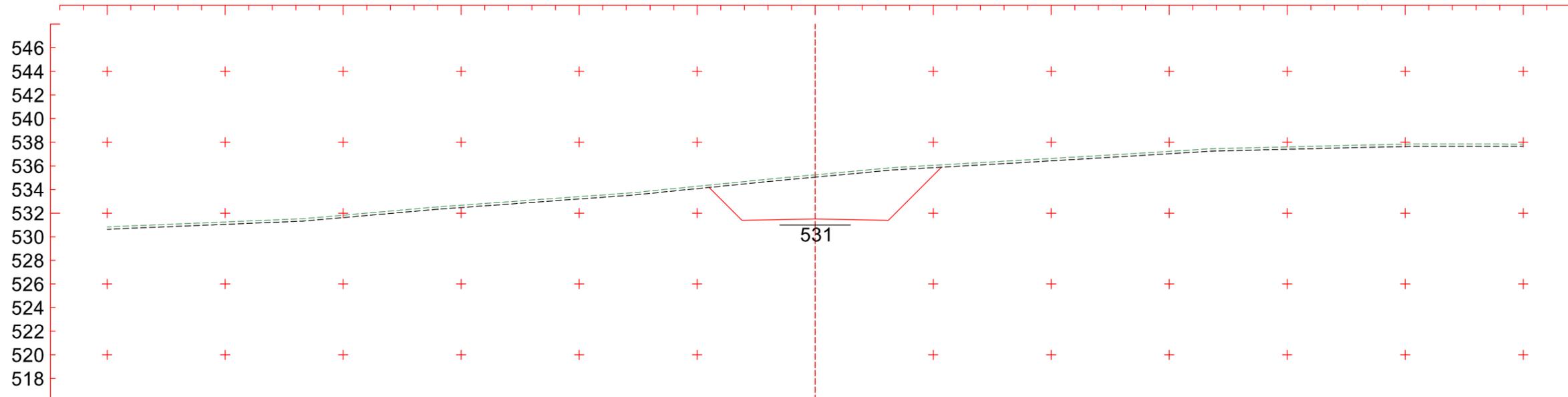
Lote 2
 Escala 1:400



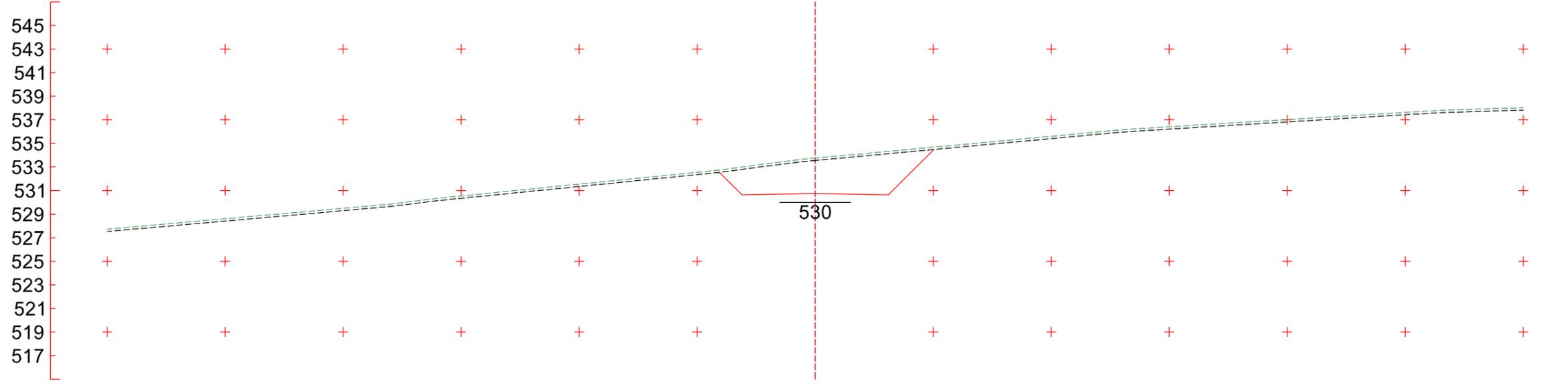
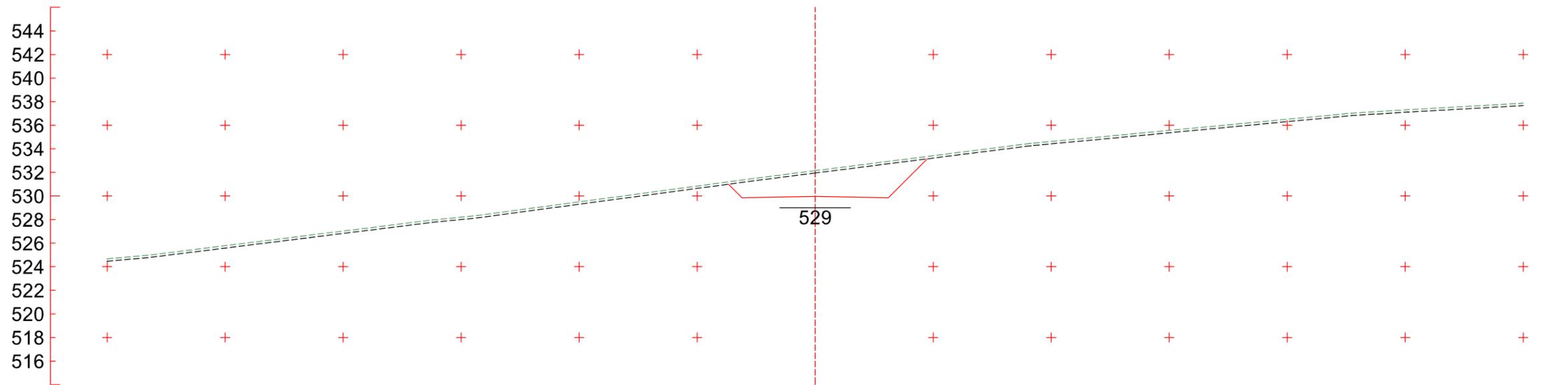
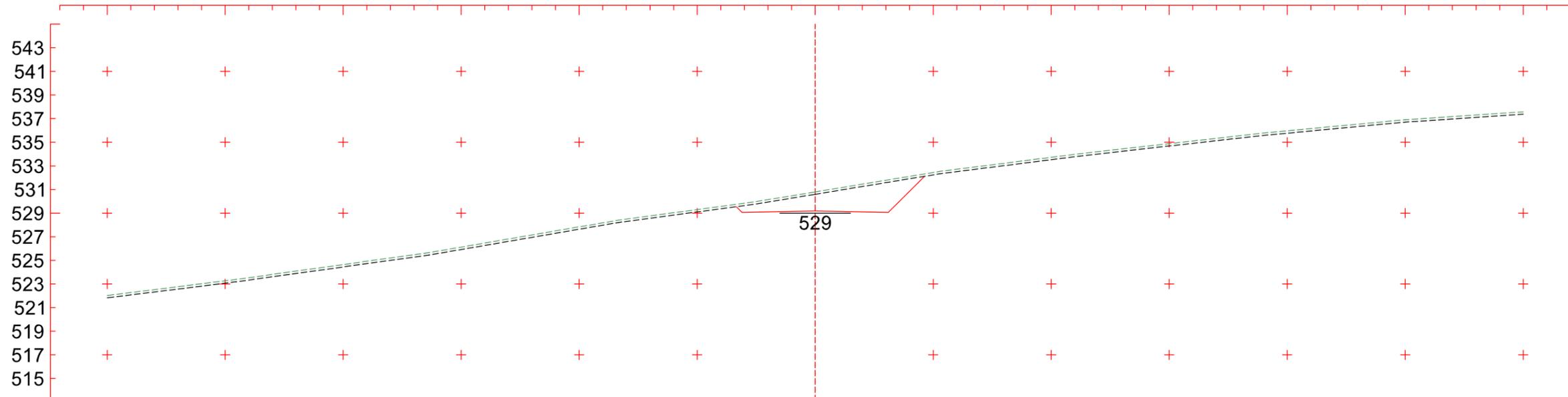
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Escala 1:400



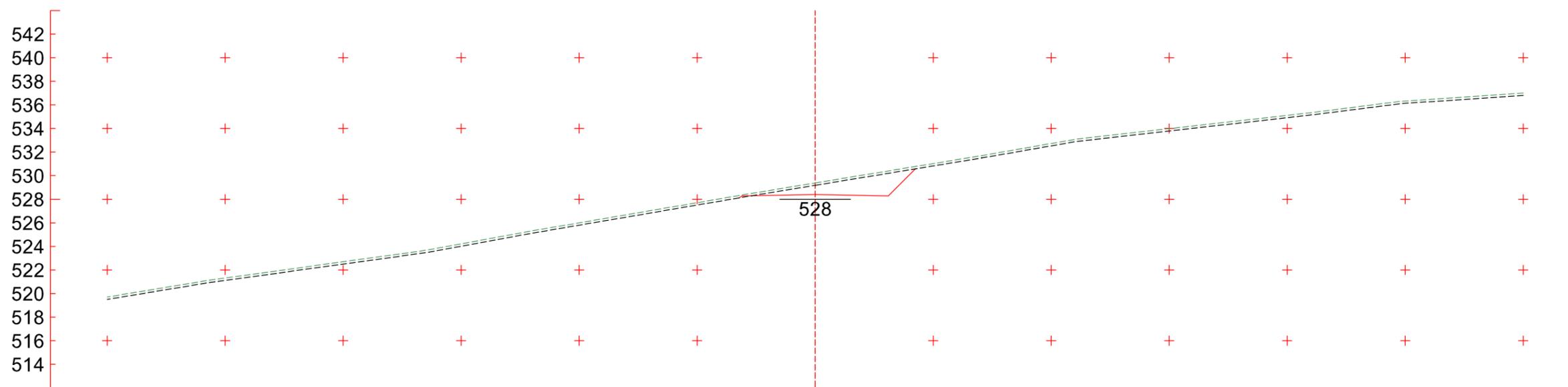
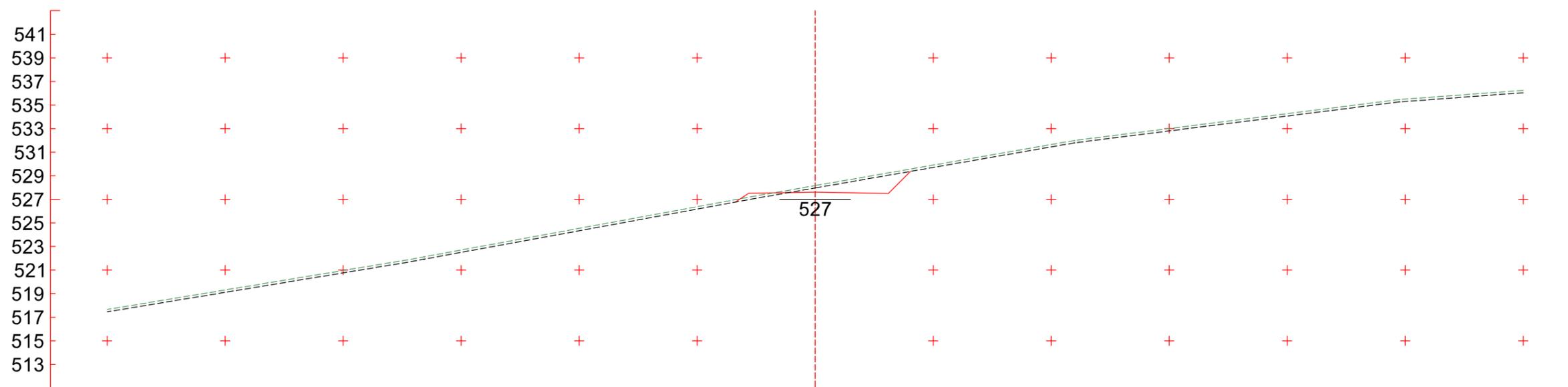
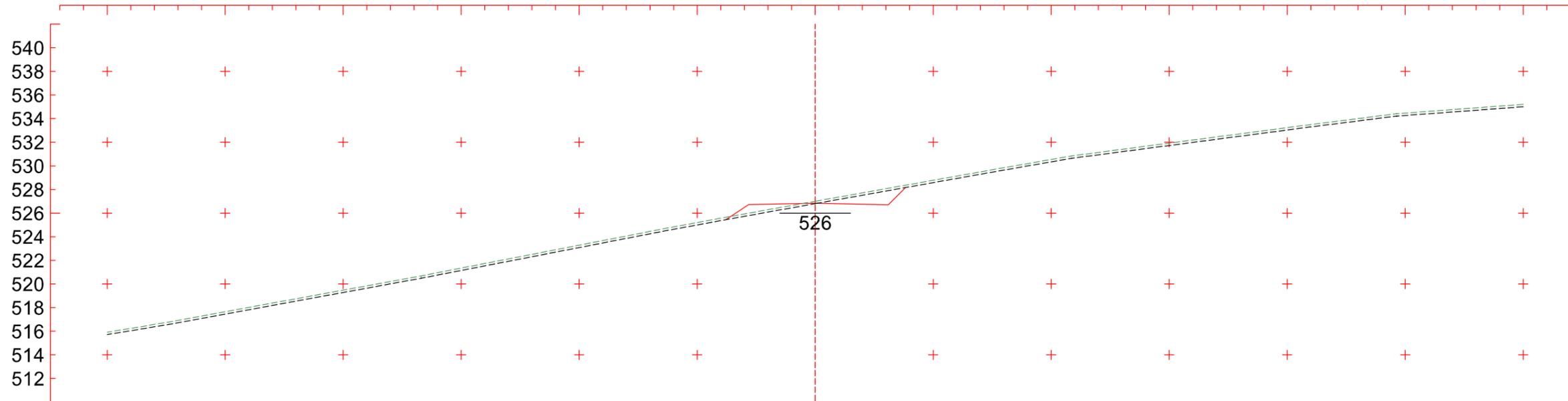
Lote 2
 Escala 1:400



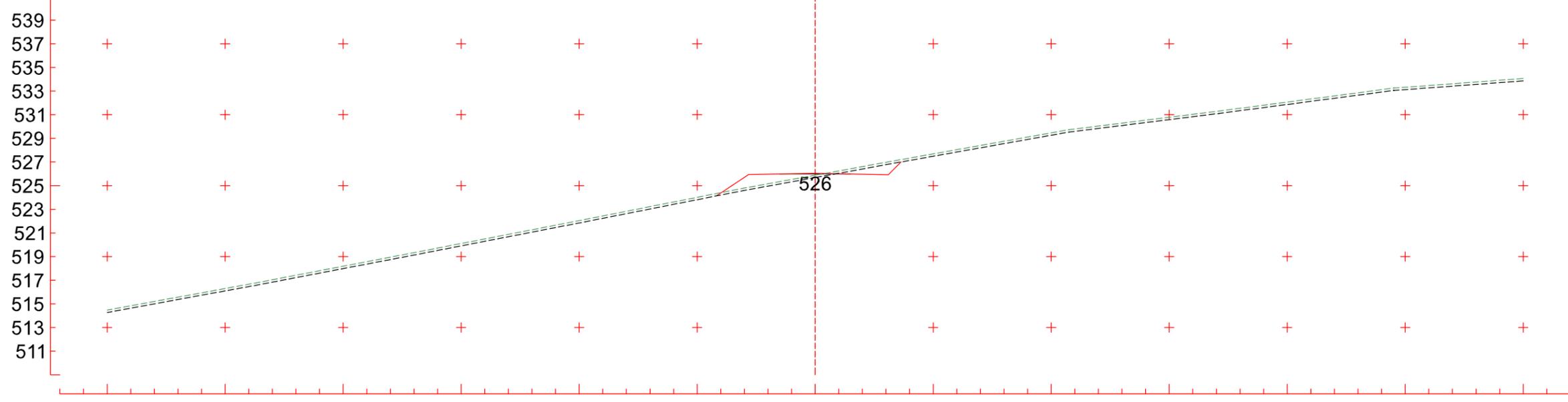
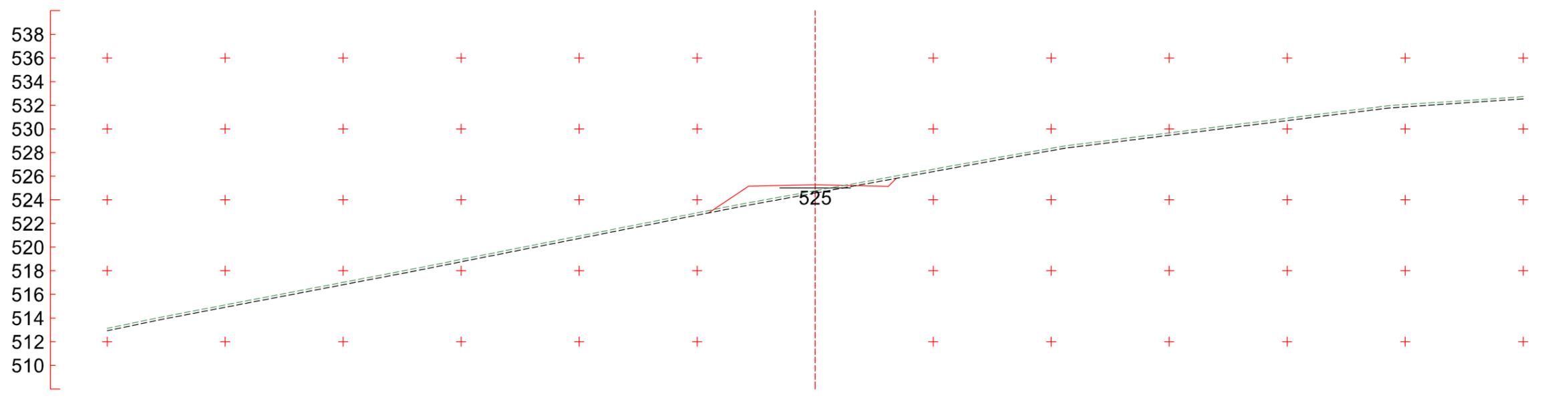
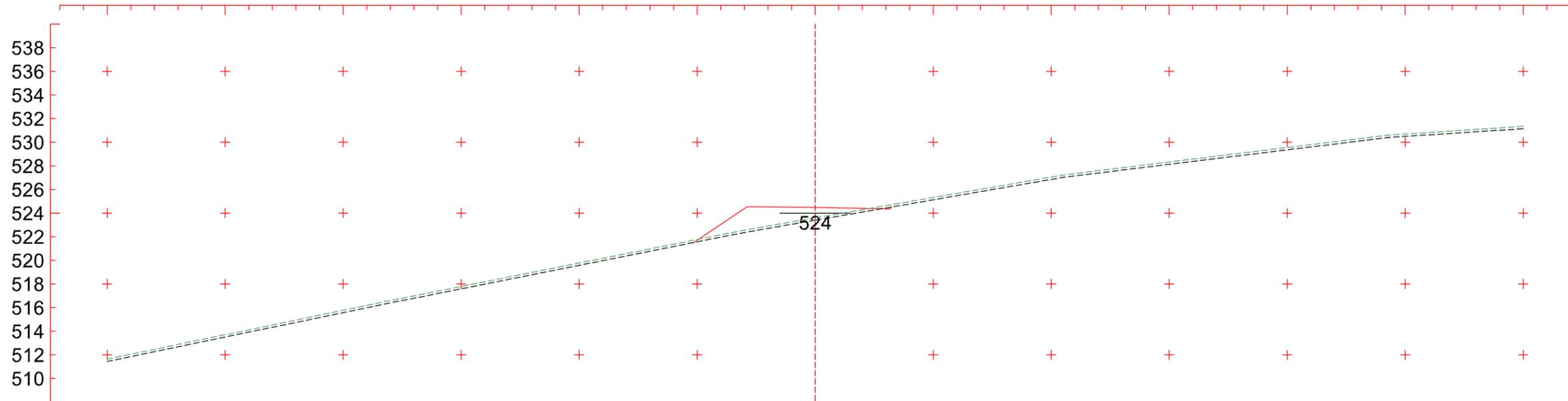
Lote 2
 Escala 1:400



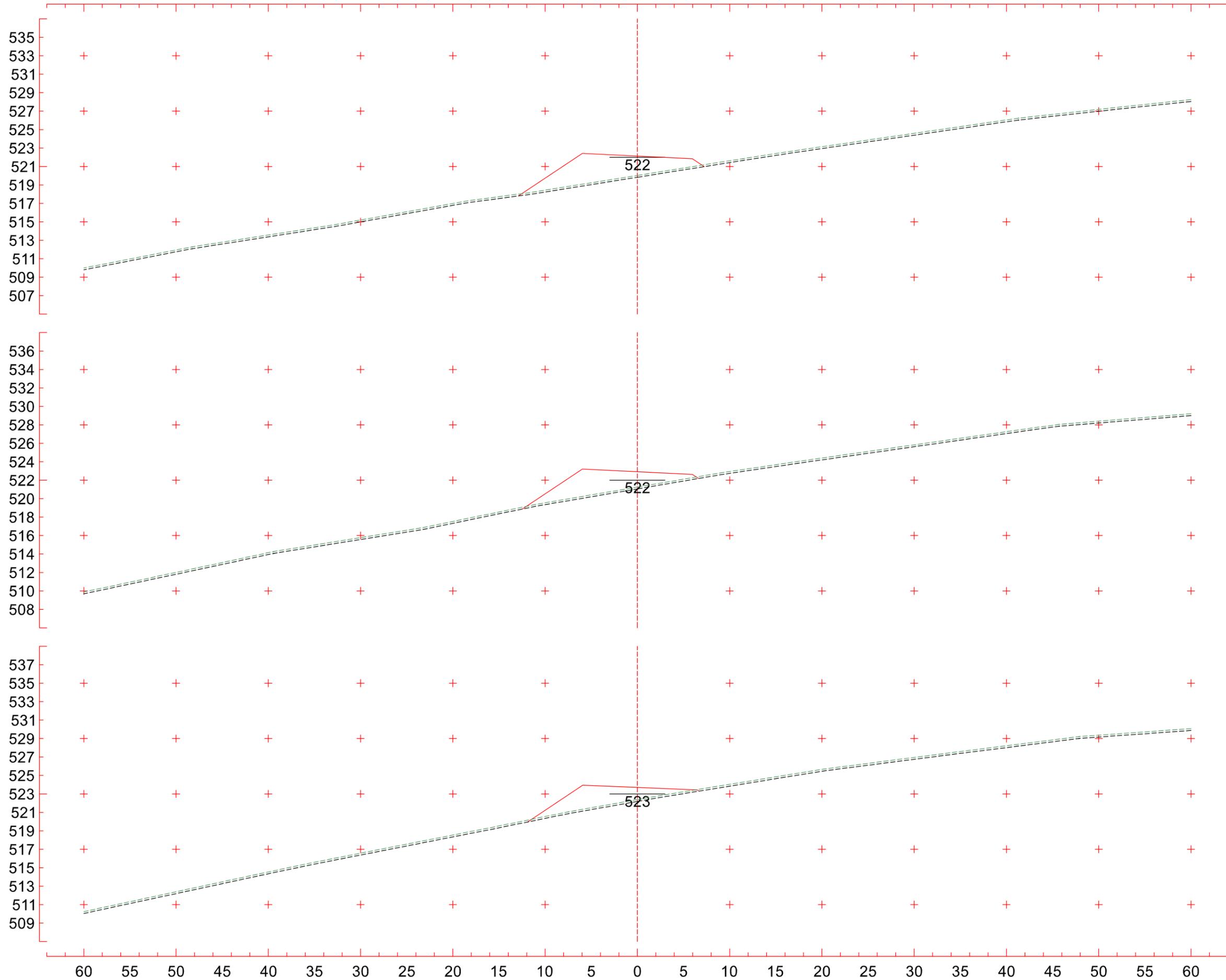
Lote 2
 Escala 1:400



Lote 2
 Escala 1:400



Lote 2
 Escala 1:400



8+260

CT 520,032 m
CP 522,131 m

8+240

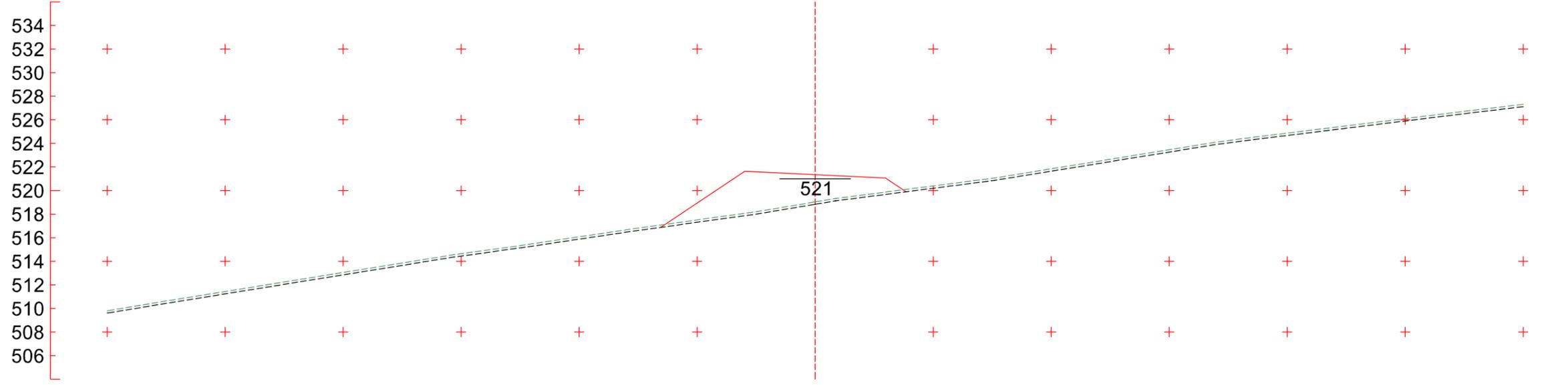
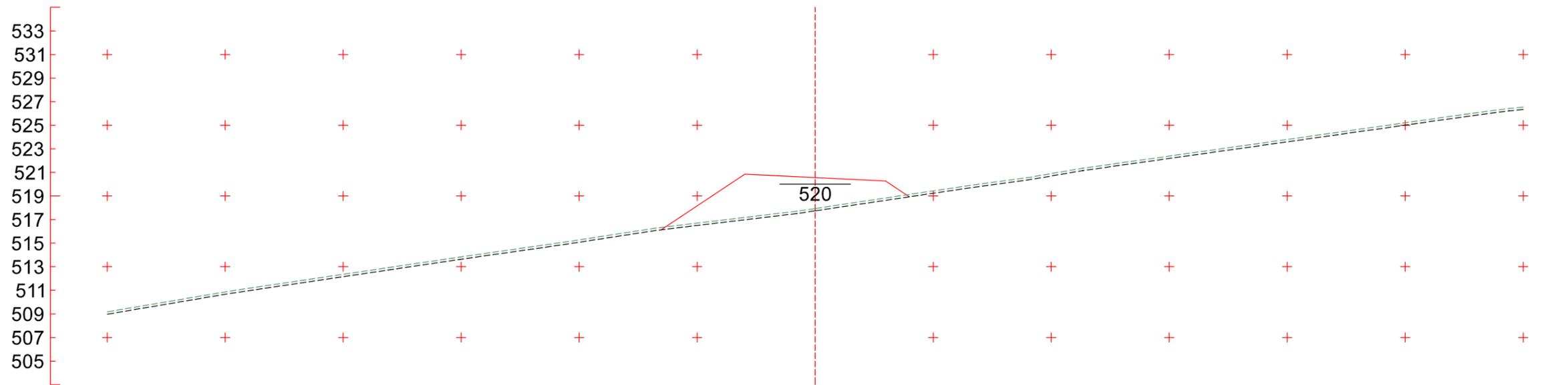
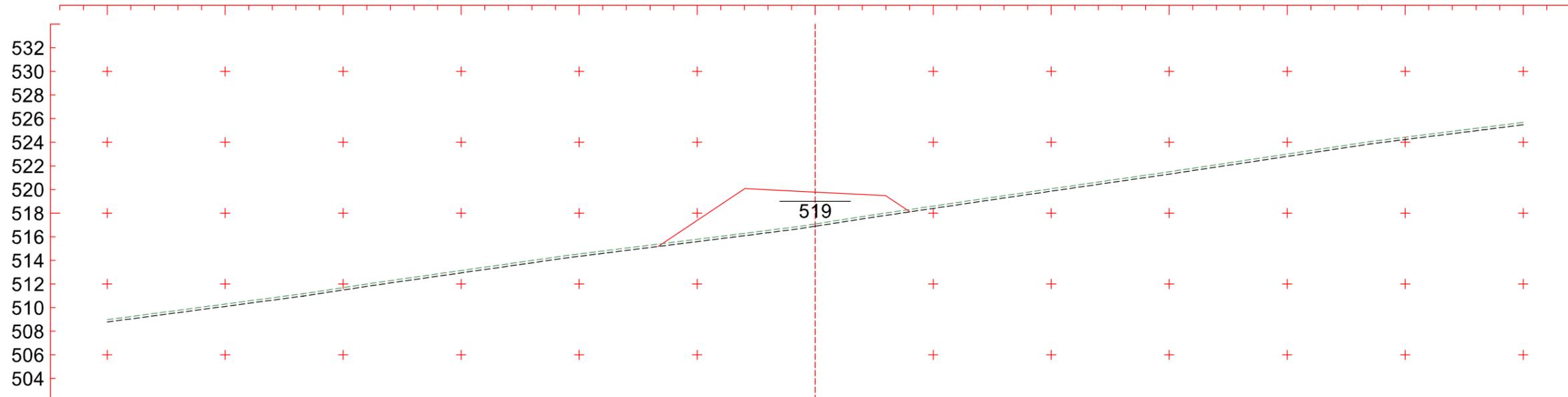
CT 521,255 m
CP 522,915 m

8+220

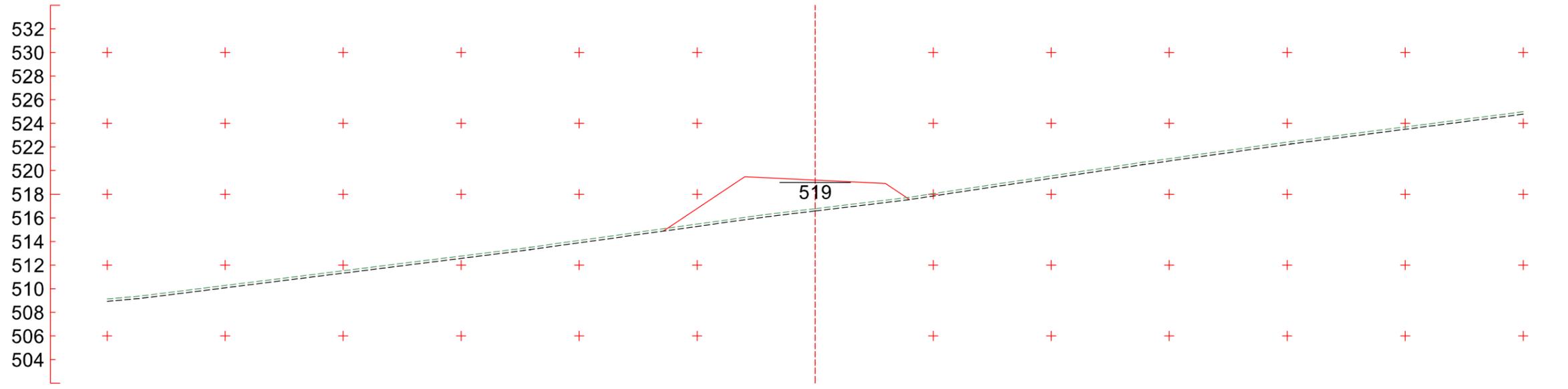
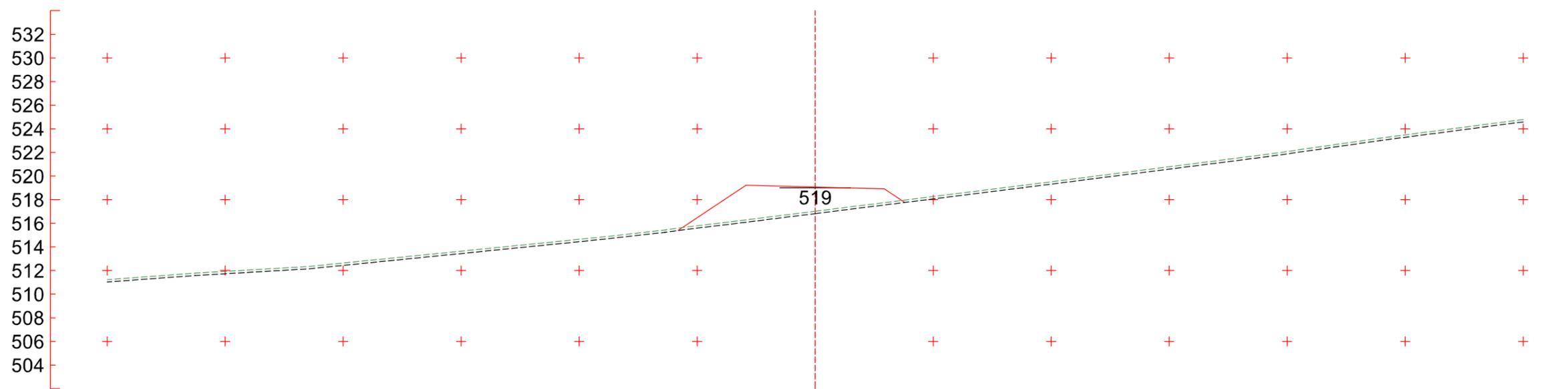
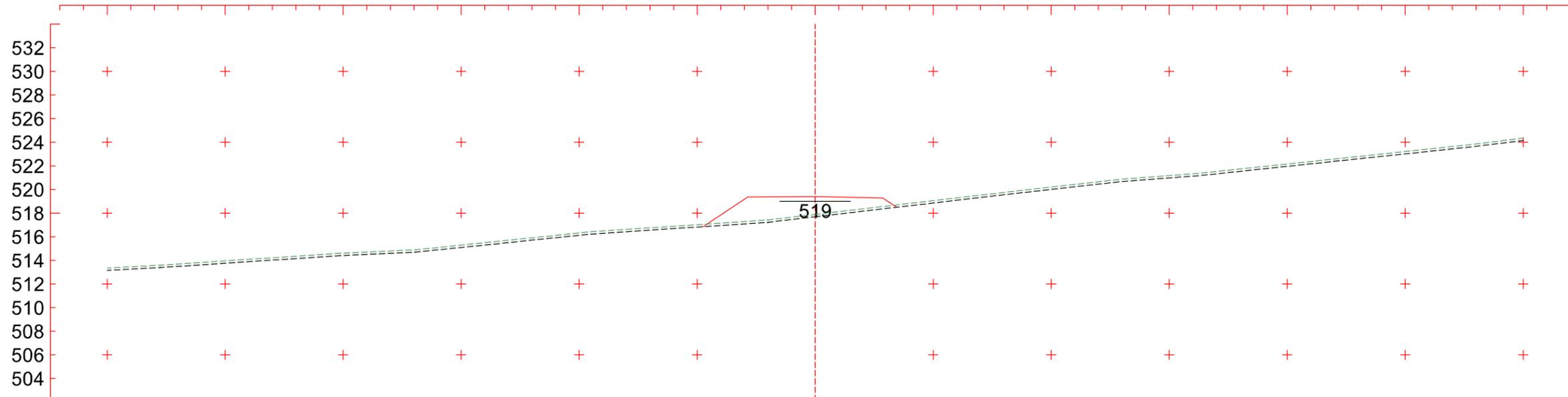
CT 522,383 m
CP 523,699 m

Lote 2

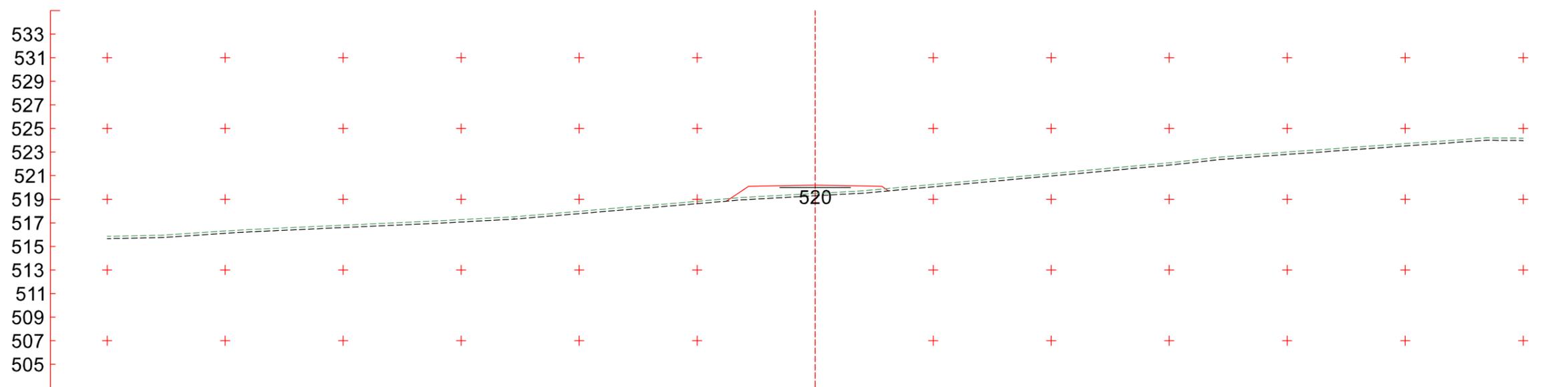
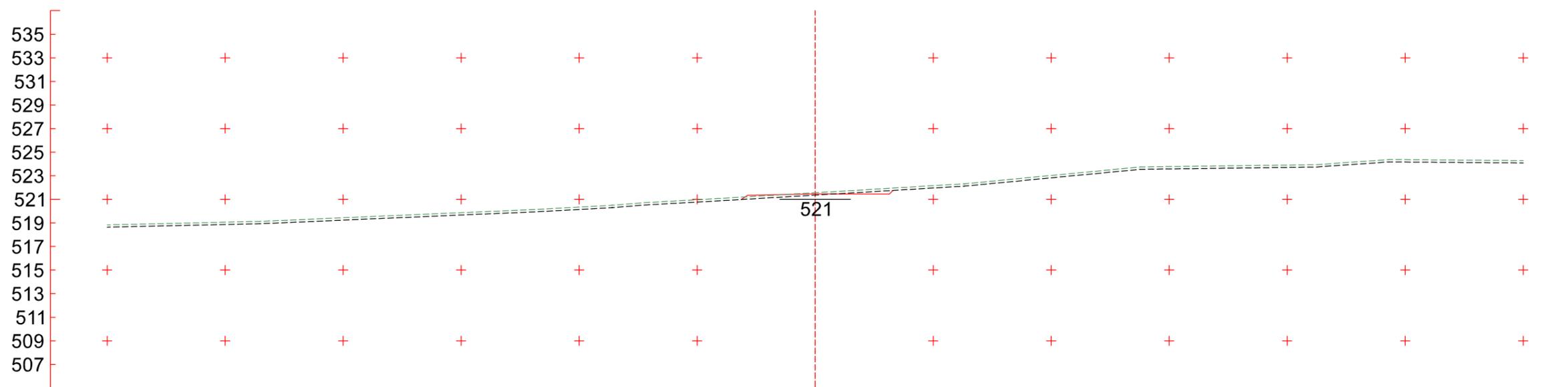
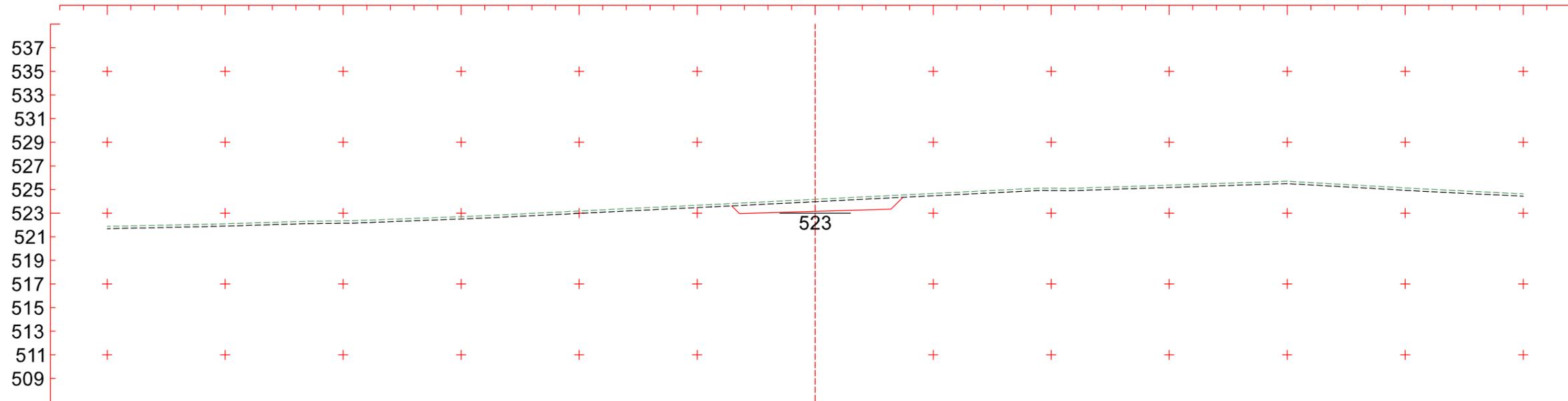
Escala 1:400



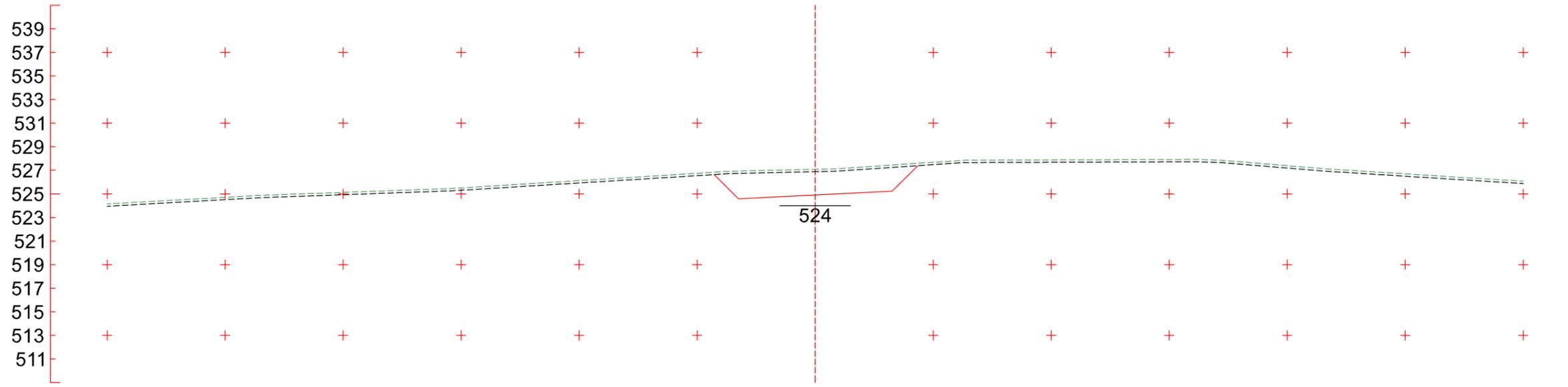
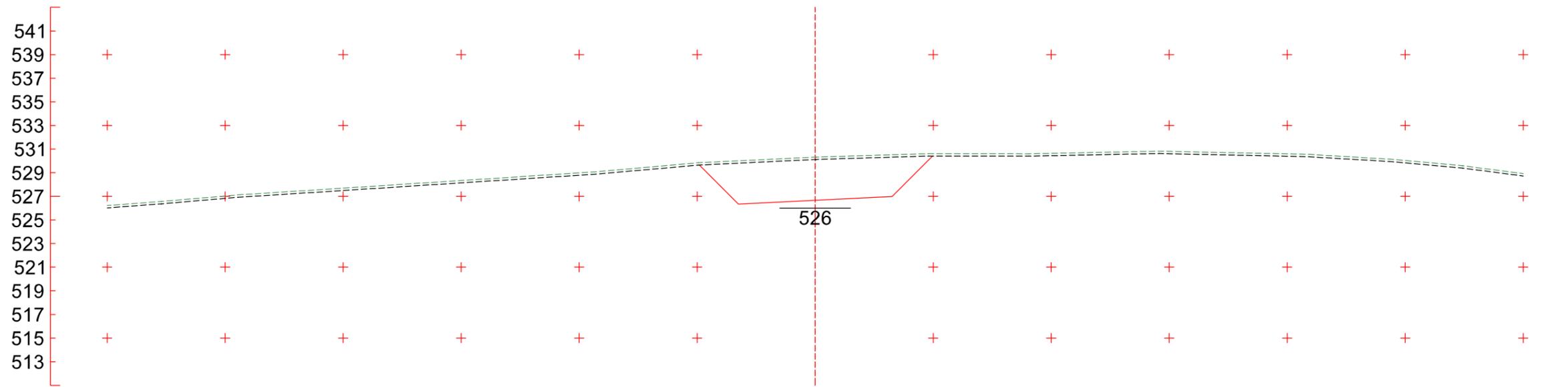
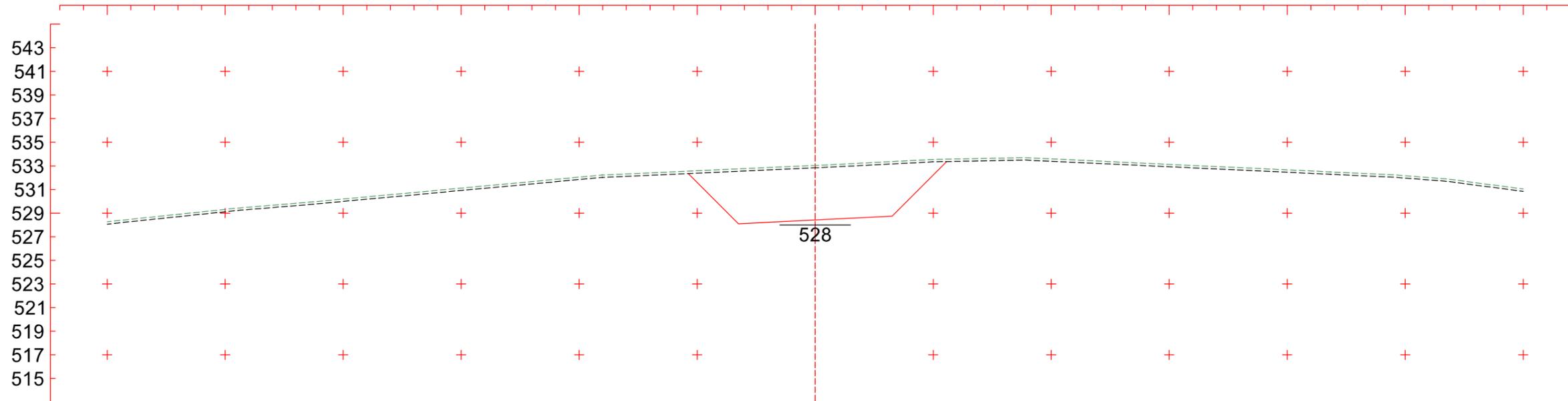
Lote 2
 Escala 1:400



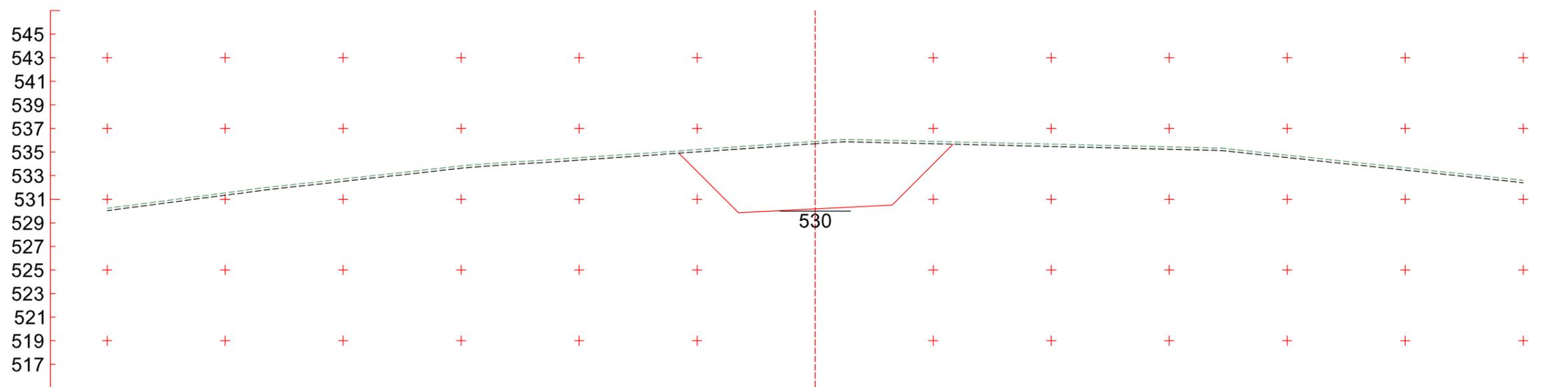
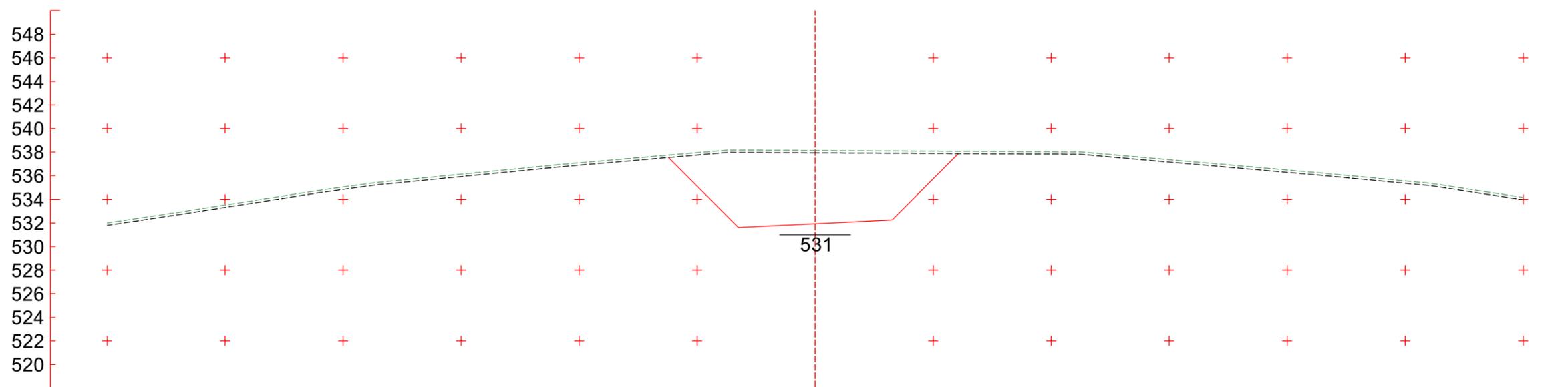
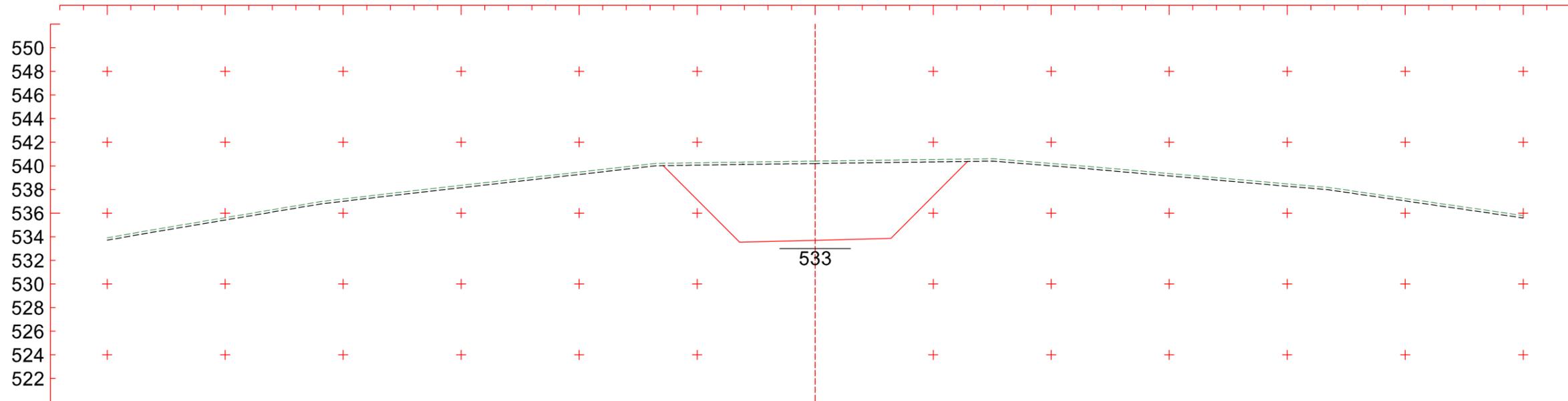
Lote 2
Escala 1:400



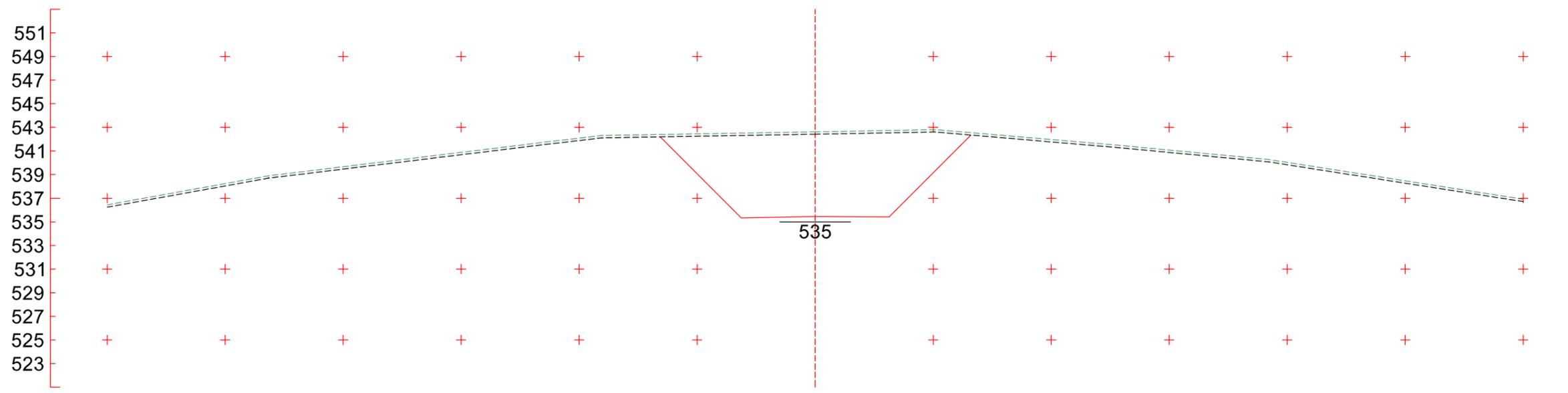
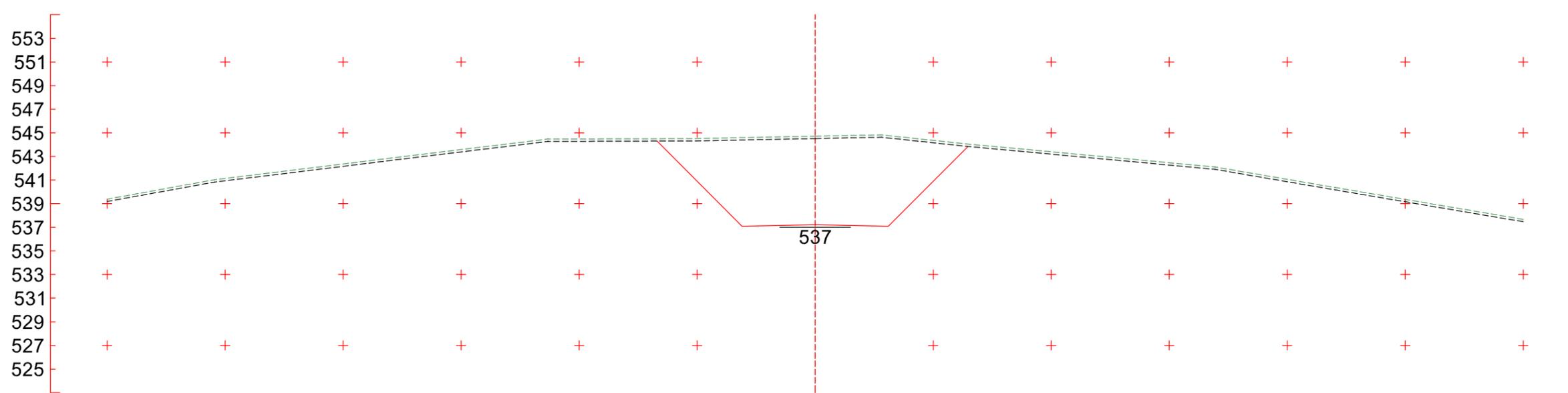
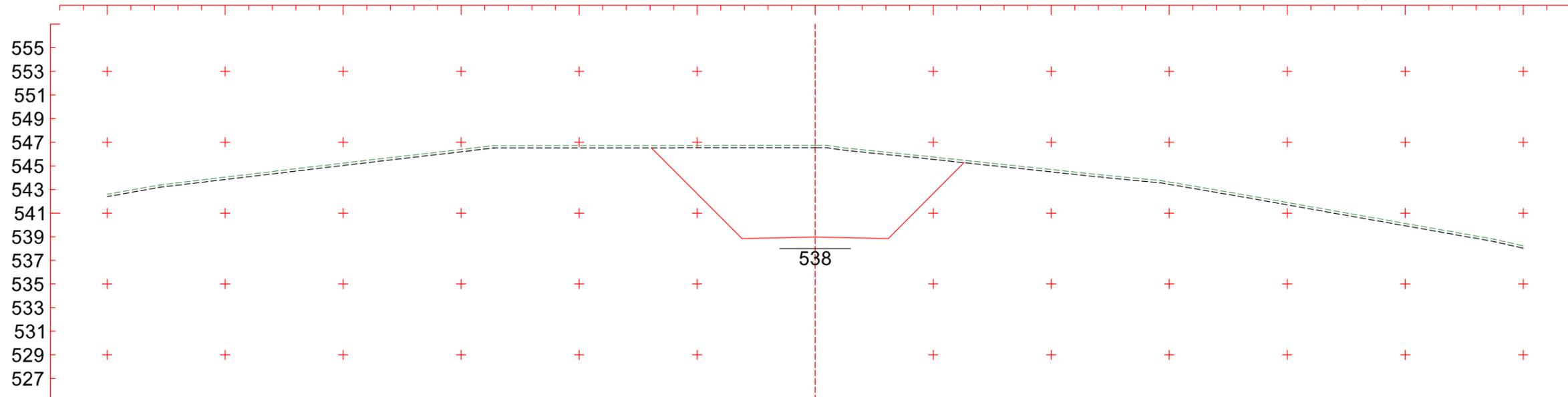
Lote 2
 Escala 1:400



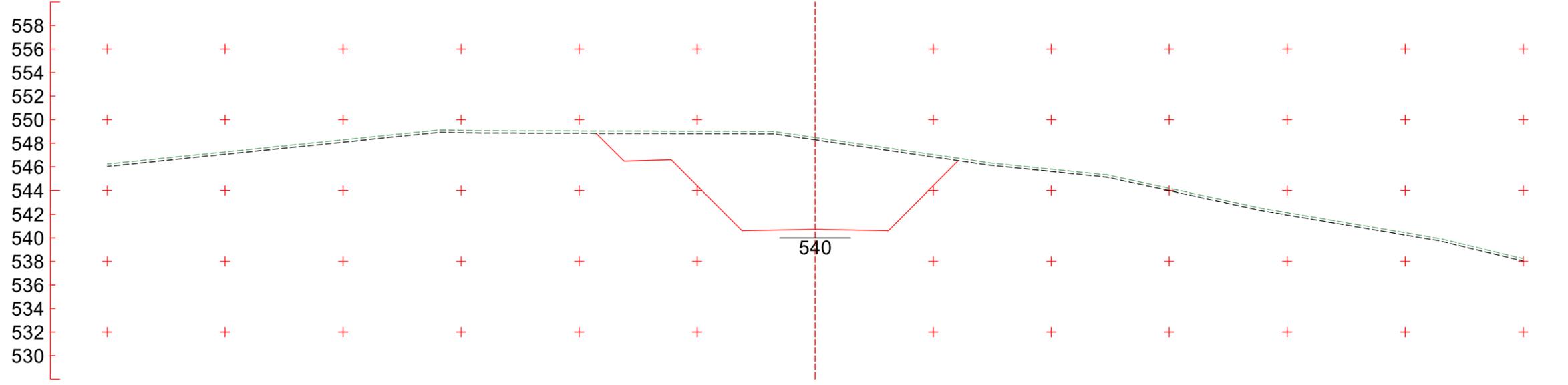
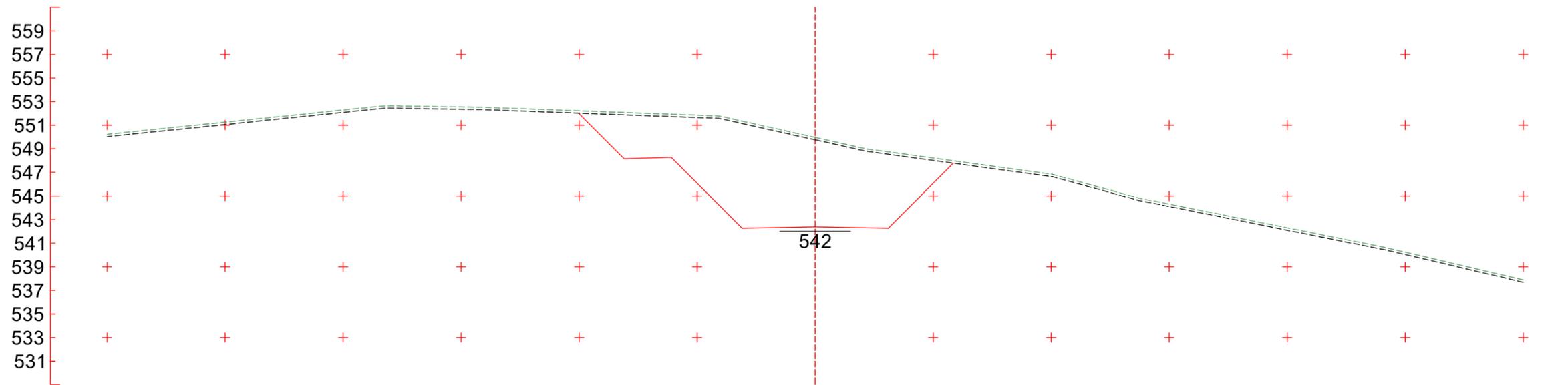
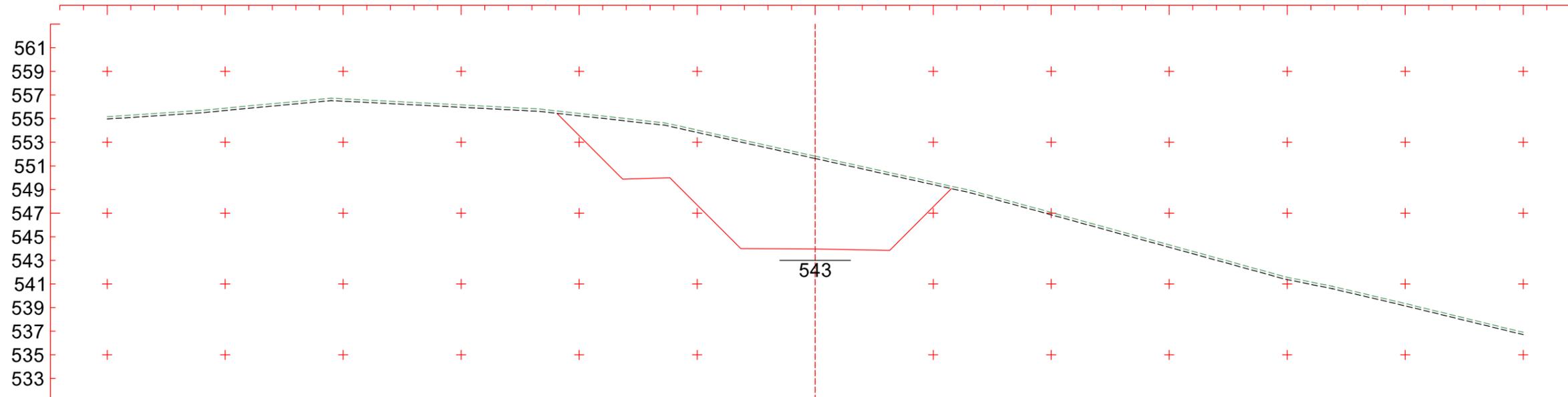
Lote 2
 Escala 1:400



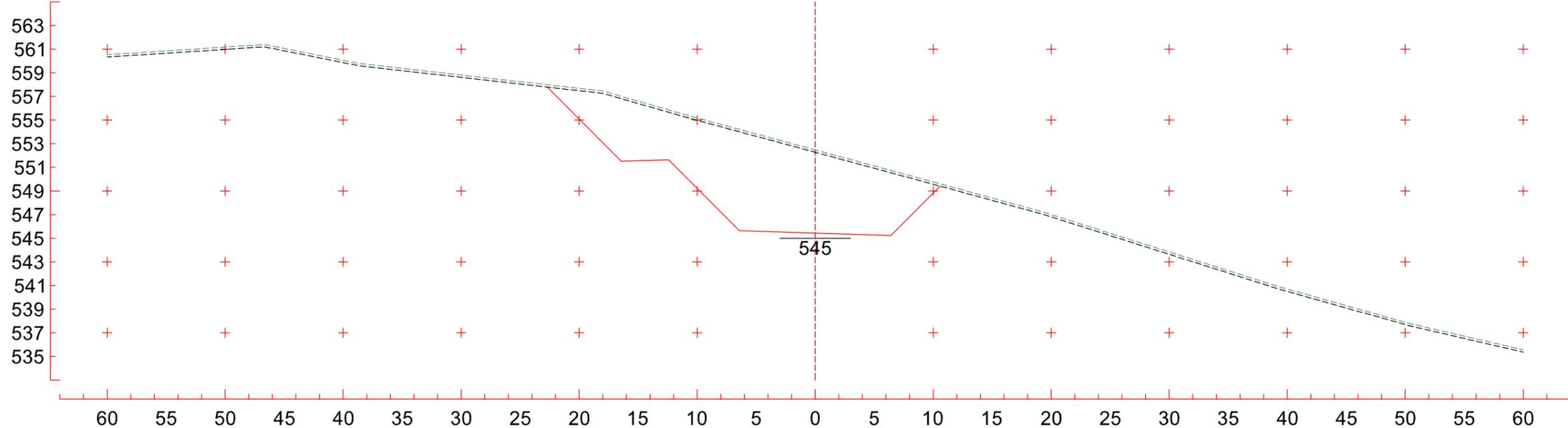
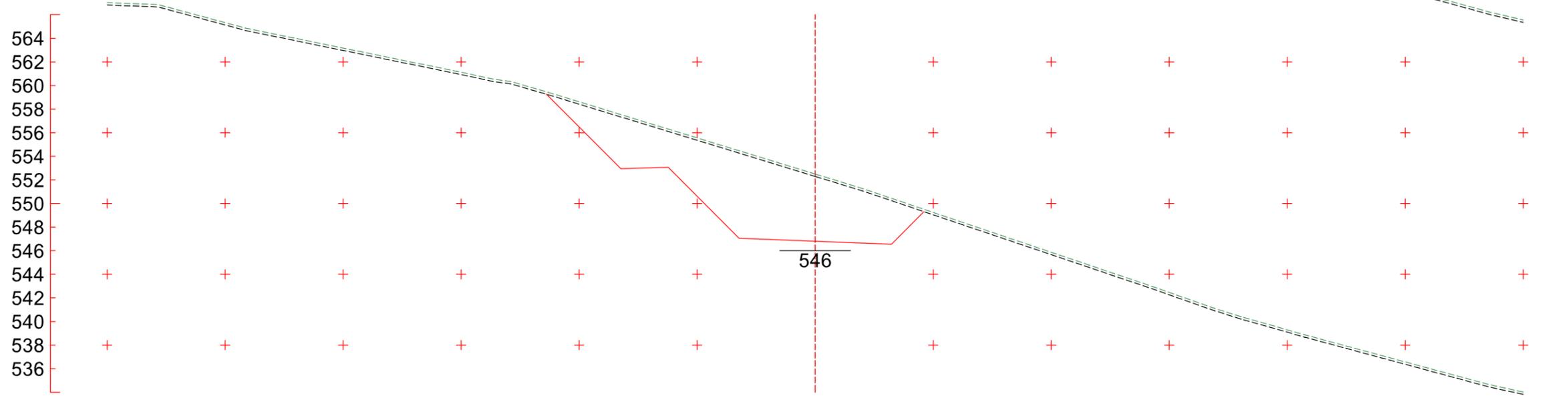
Lote 2
Escala 1:400



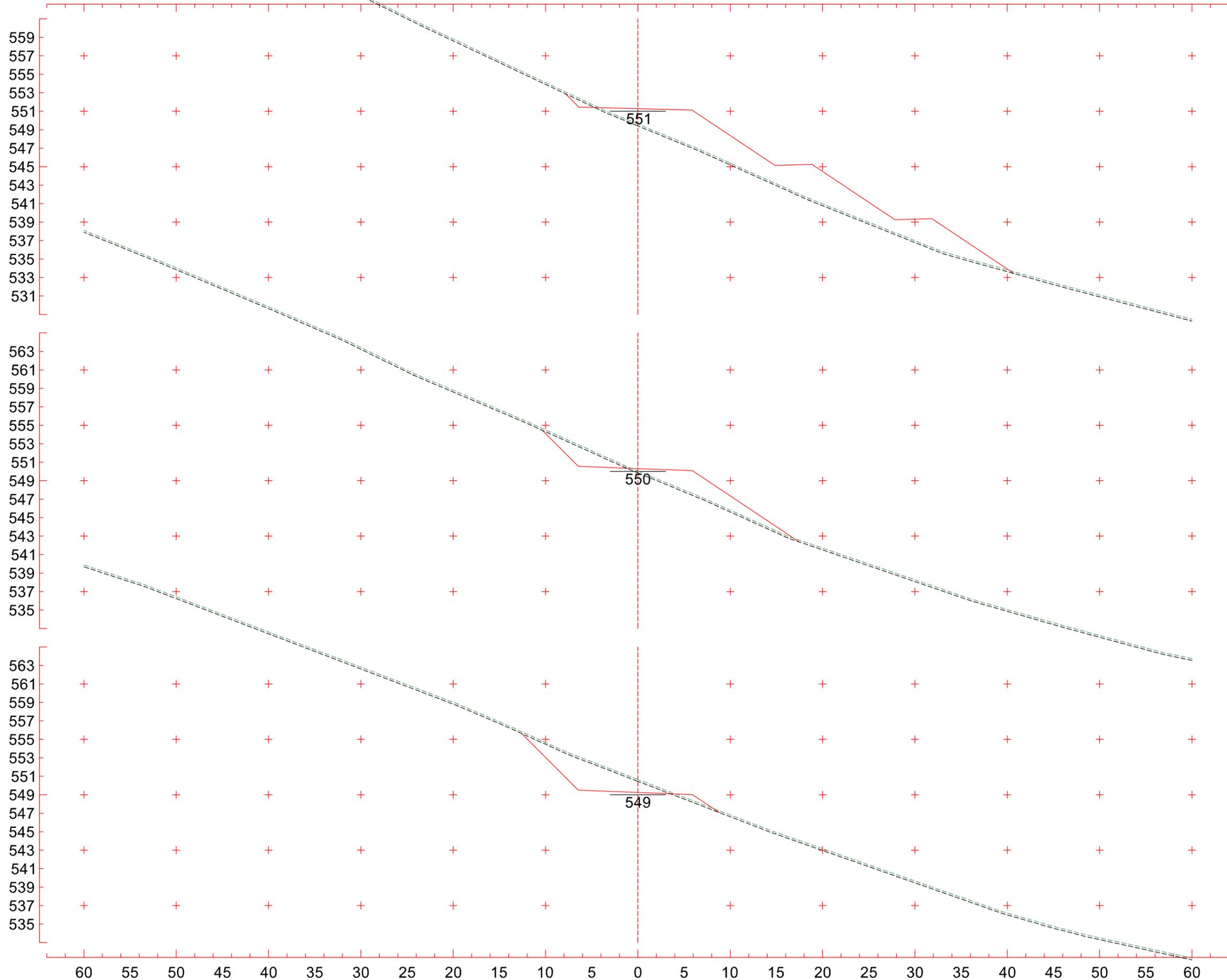
Lote 2
Escala 1:400



Lote 2
 Escala 1:400



Lote 2
 Escala 1:400



8+800

CT 549,608 m
CP 551,281 m

8+780

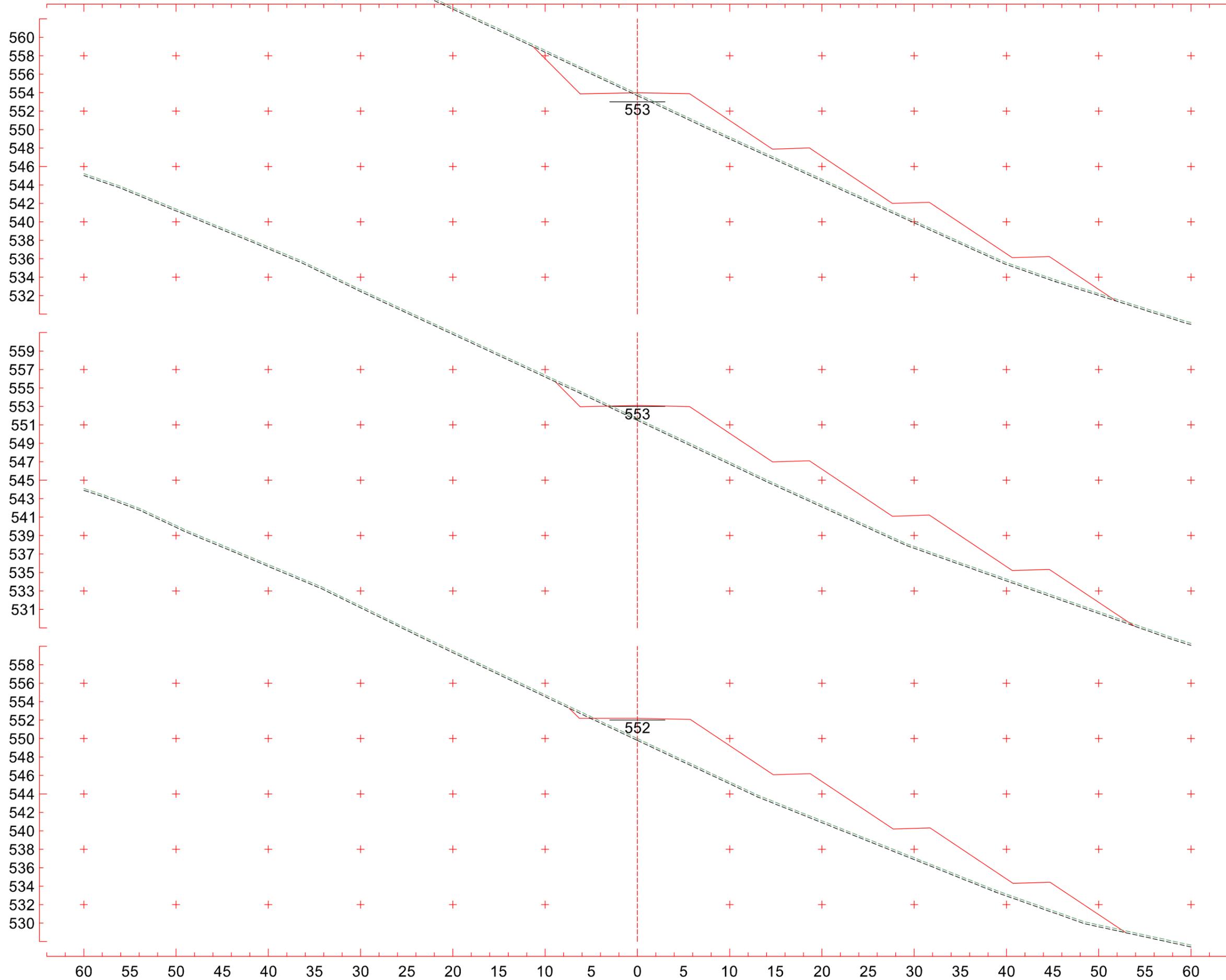
CT 550,046 m
CP 550,313 m

8+760

CT 550,655 m
CP 549,245 m

Lote 2

Escala 1:400



8+860

CT 553,880 m
CP 553,996 m

8+840

CT 551,683 m
CP 553,091 m

8+820

CT 550,000 m
CP 552,186 m

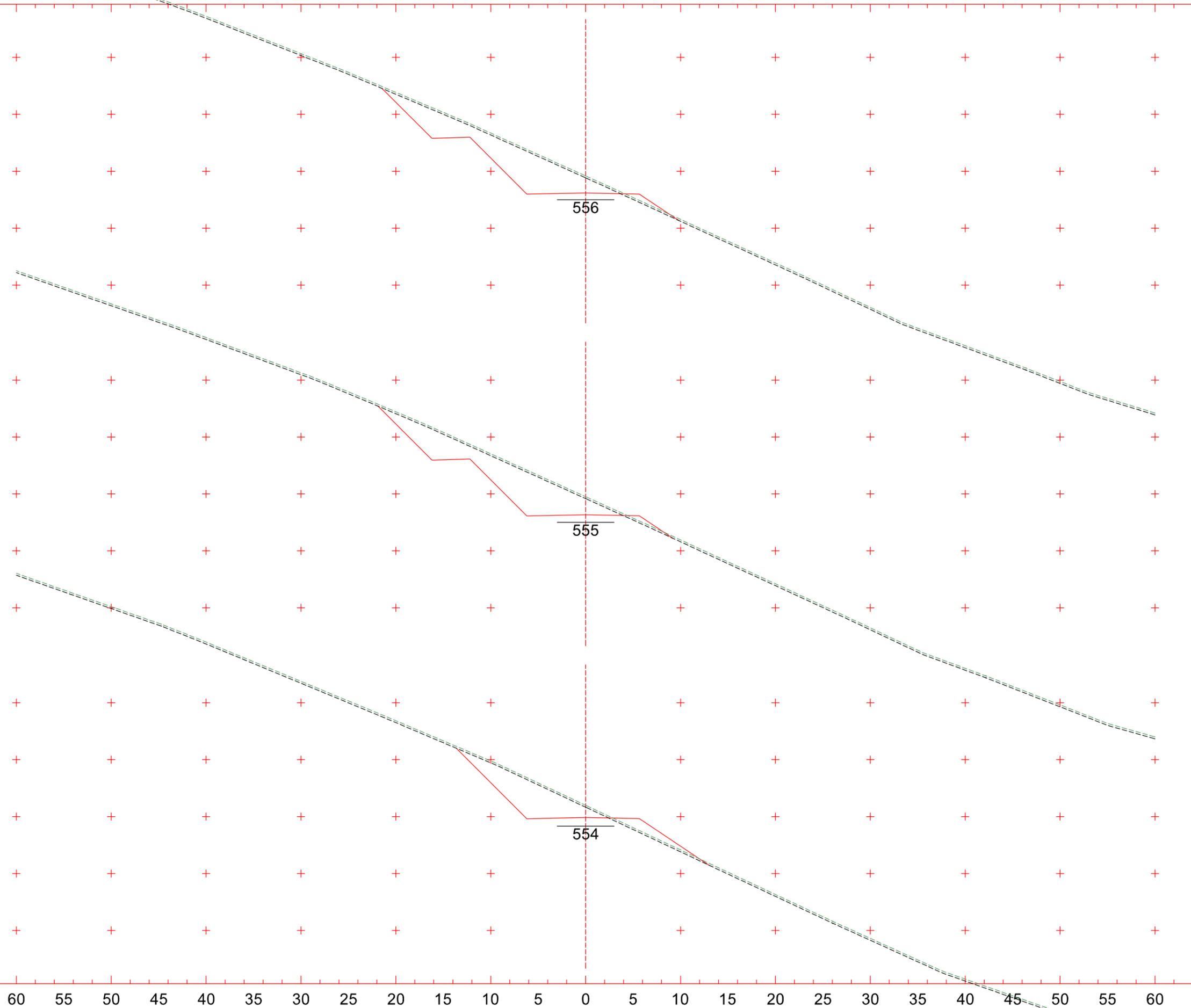
Lote 2

Escala 1:400

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8+920

CT 558,502 m
CP 556,710 m

8+900

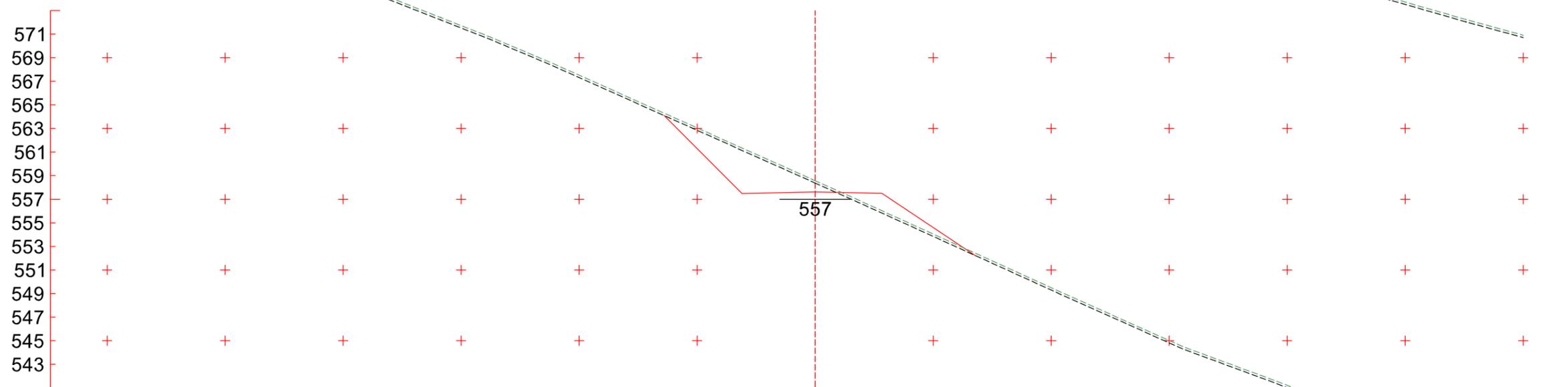
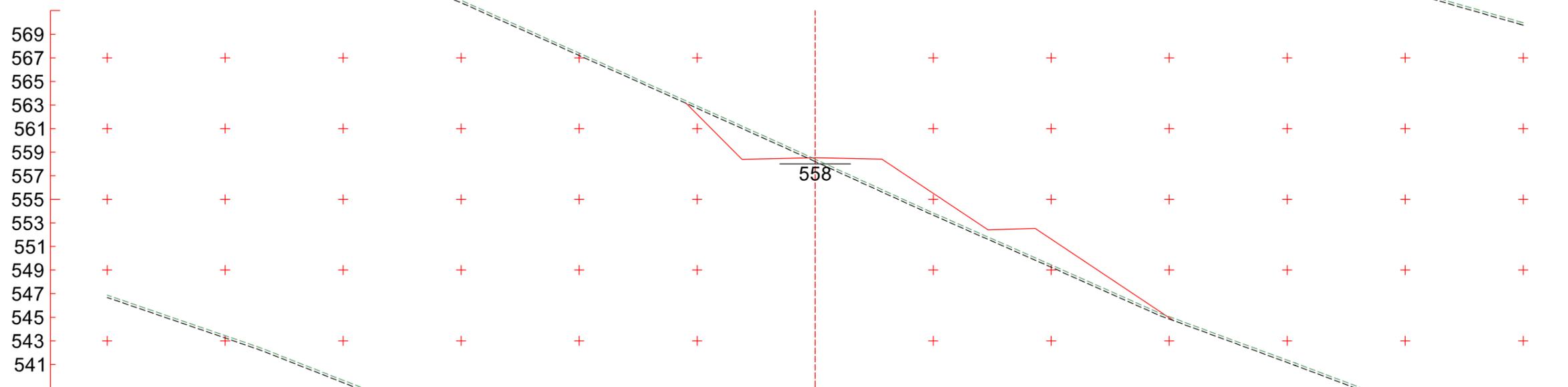
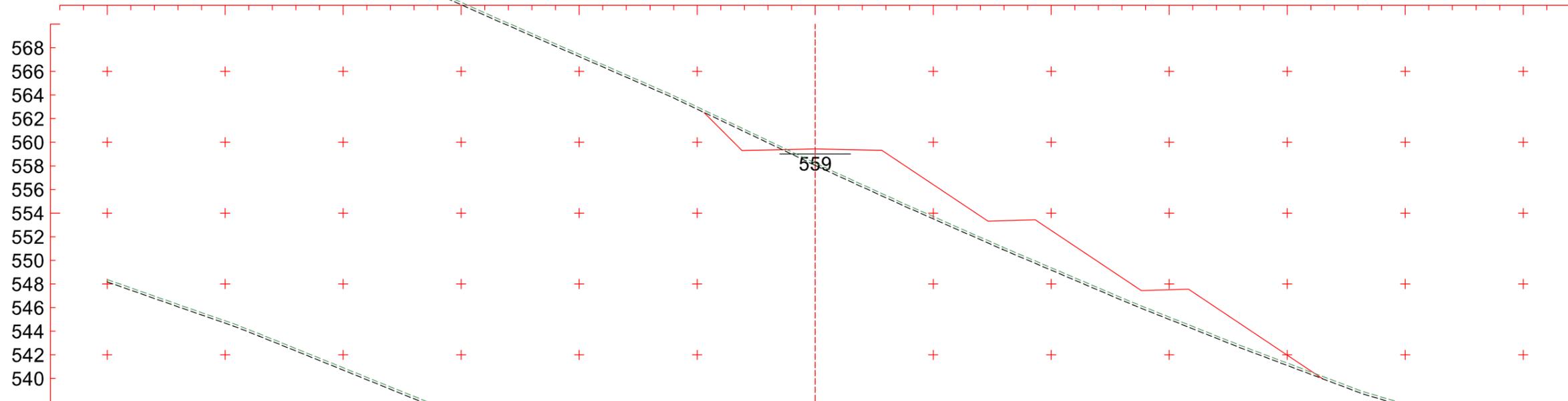
CT 557,707 m
CP 555,805 m

8+880

CT 556,189 m
CP 554,901 m

Lote 2

Escala 1:400

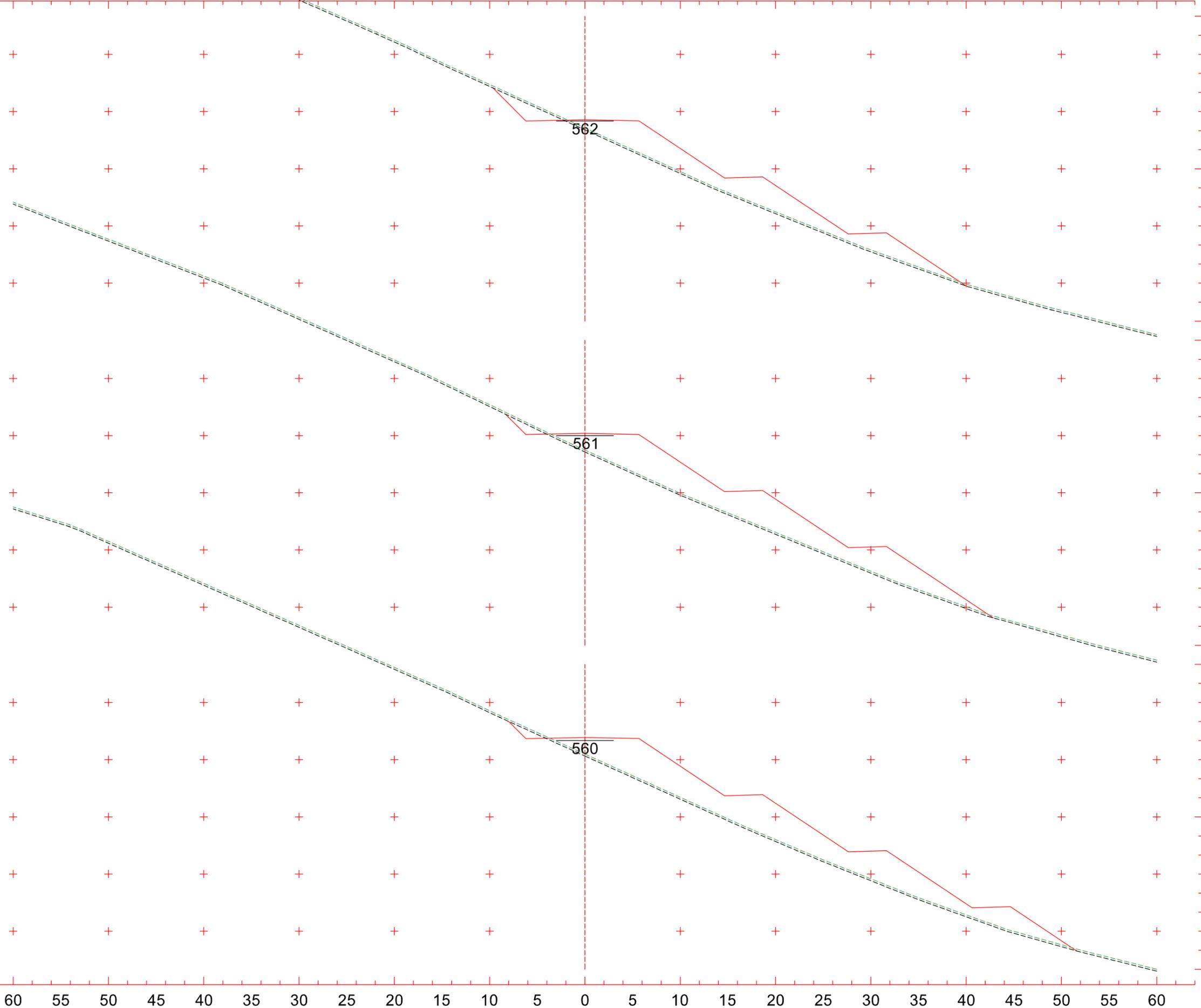


Lote 2
 Escala 1:400

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9+040
CT 561,275 m
CP 562,139 m

9+020
CT 559,490 m
CP 561,234 m

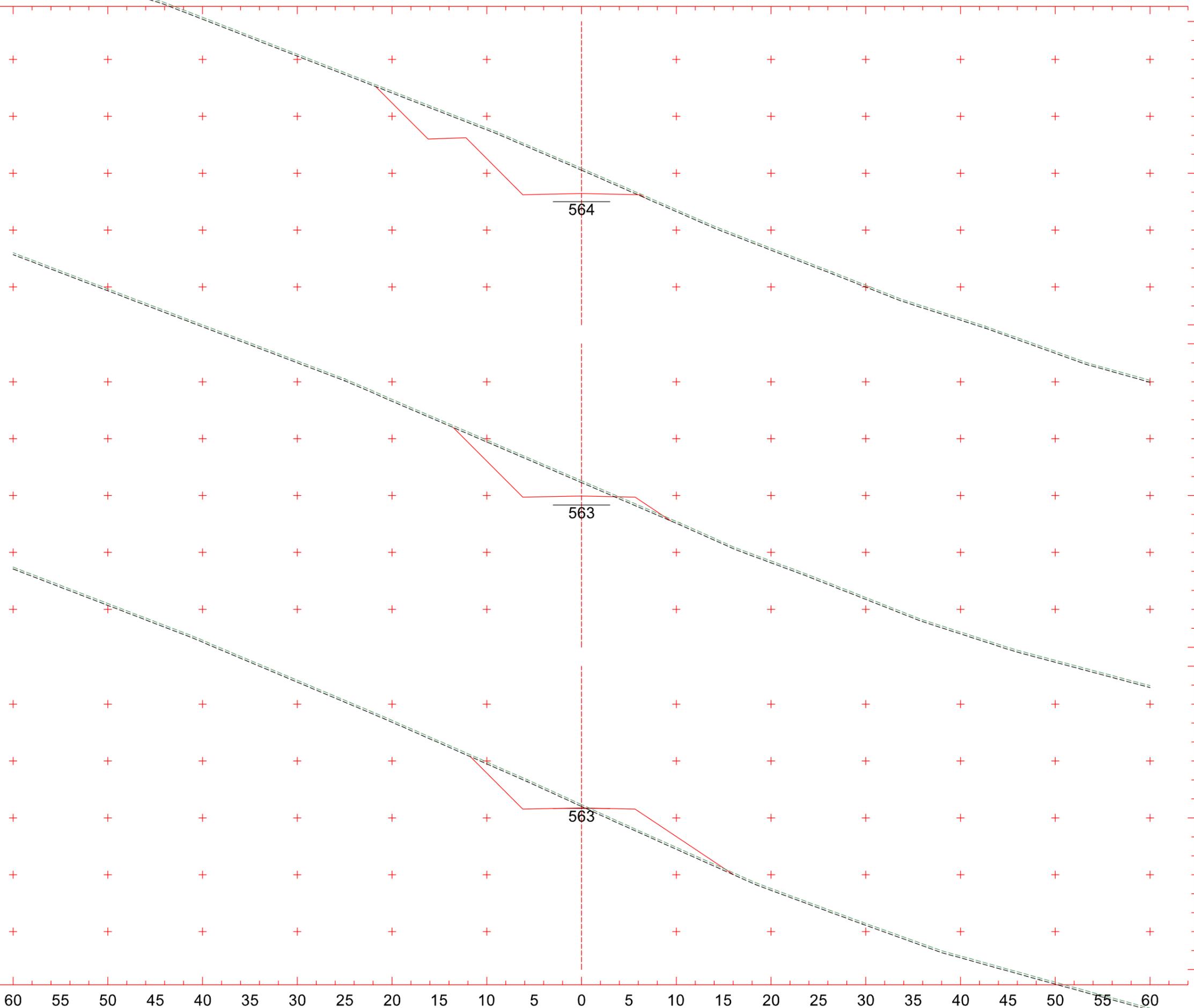
9+000
CT 558,584 m
CP 560,329 m

Lote 2
Escala 1:400

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9+100
CT 567,522 m
CP 564,853 m

9+080
CT 565,564 m
CP 563,948 m

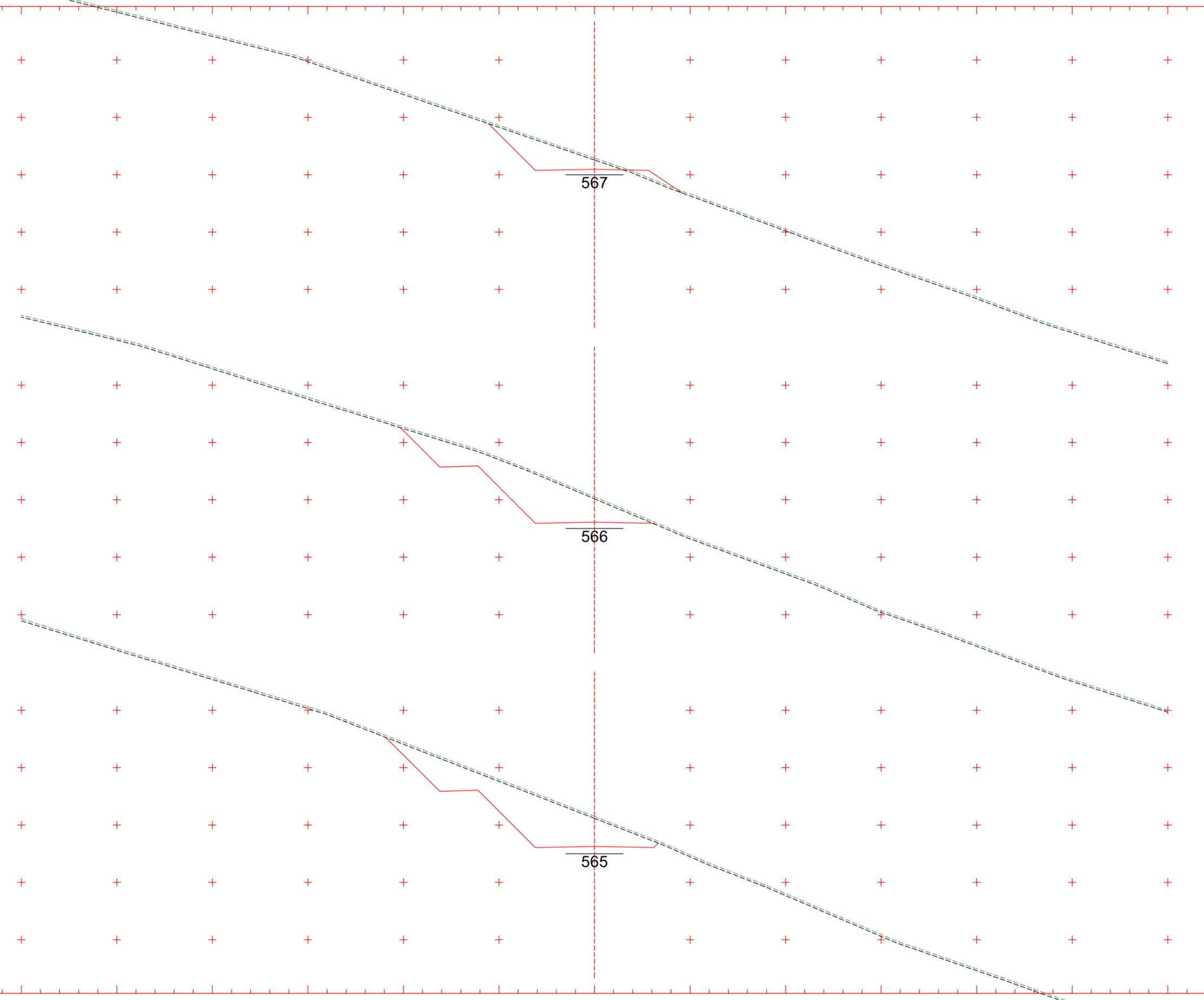
9+060
CT 563,405 m
CP 563,044 m

Lote 2
Escala 1:400

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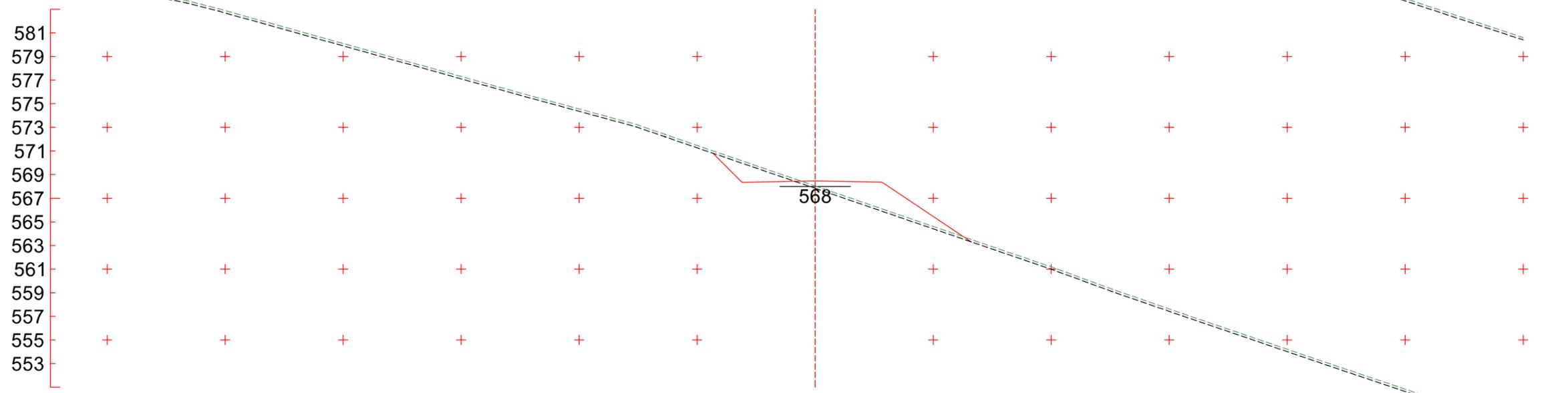
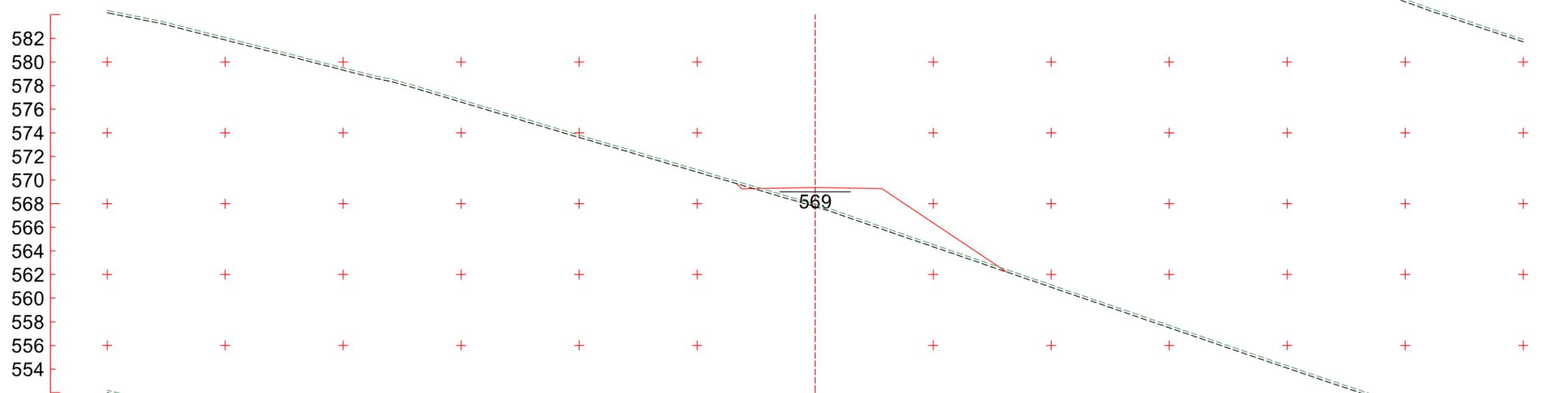
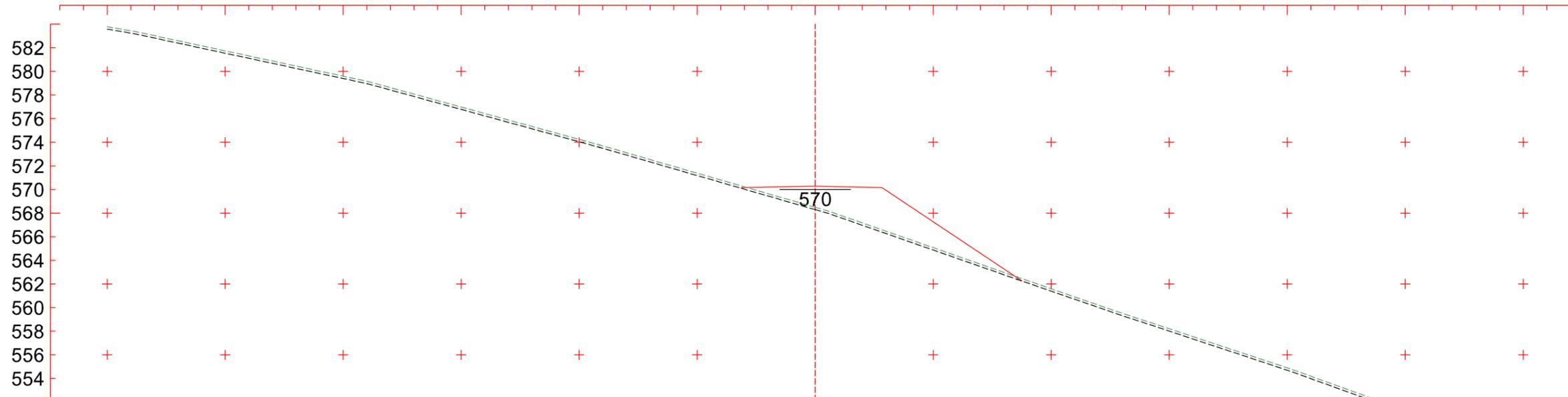


9+160
CT 568,739 m
CP 567,568 m

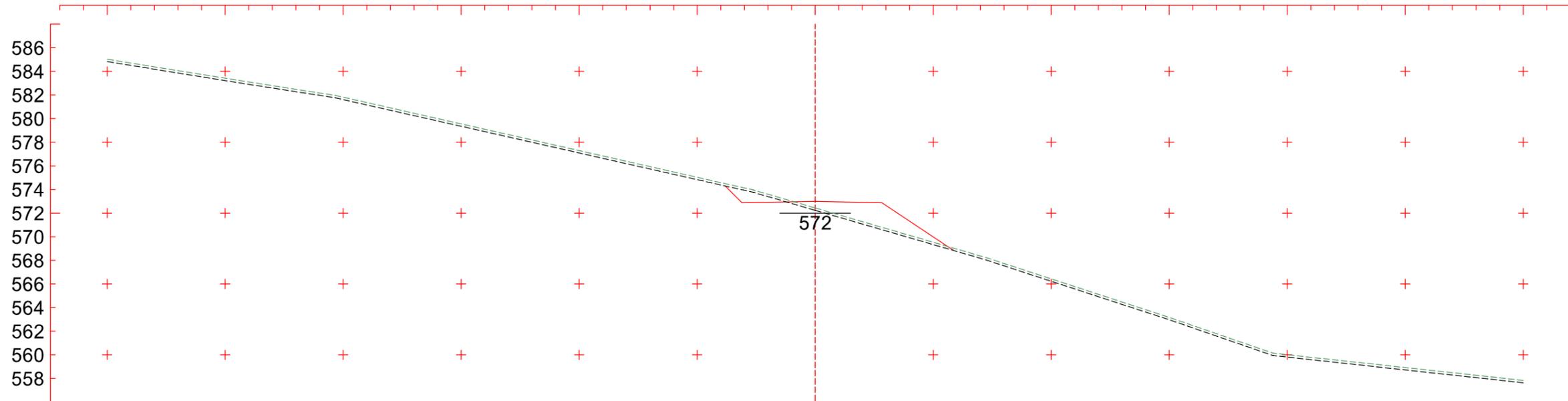
9+140
CT 569,308 m
CP 566,663 m

9+120
CT 568,889 m
CP 565,758 m

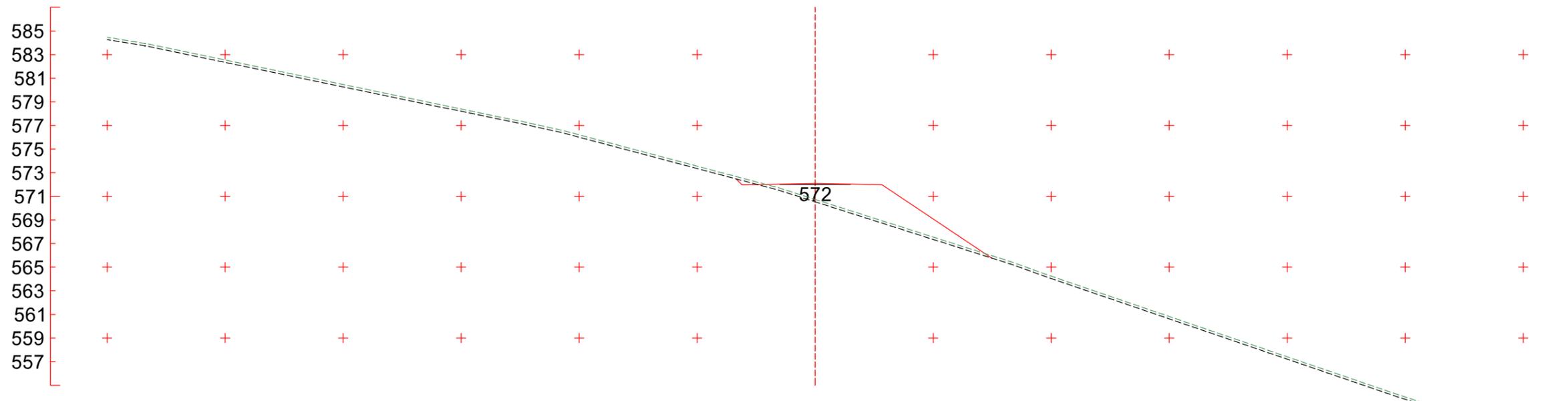
Lote 2
Escala 1:400



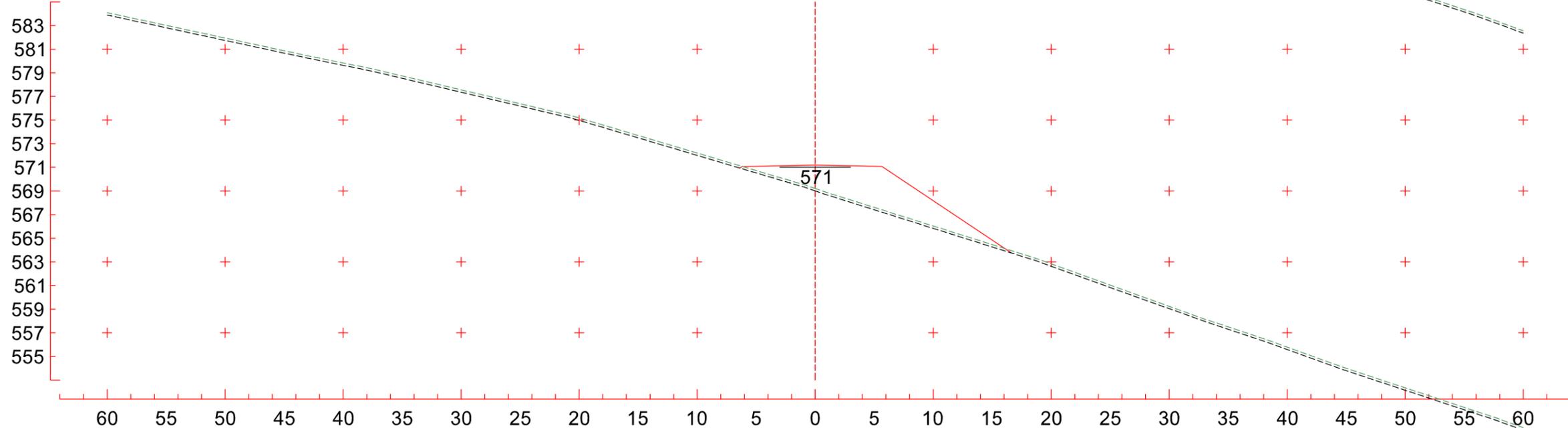
Lote 2
 Escala 1:400



9+280
 CT 572,437 m
 CP 572,996 m

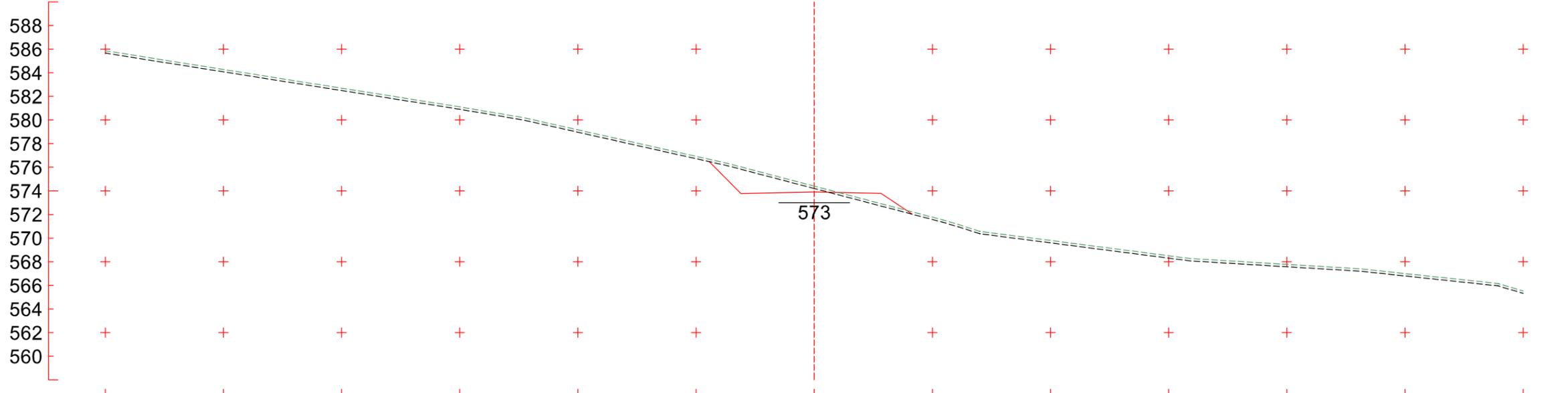
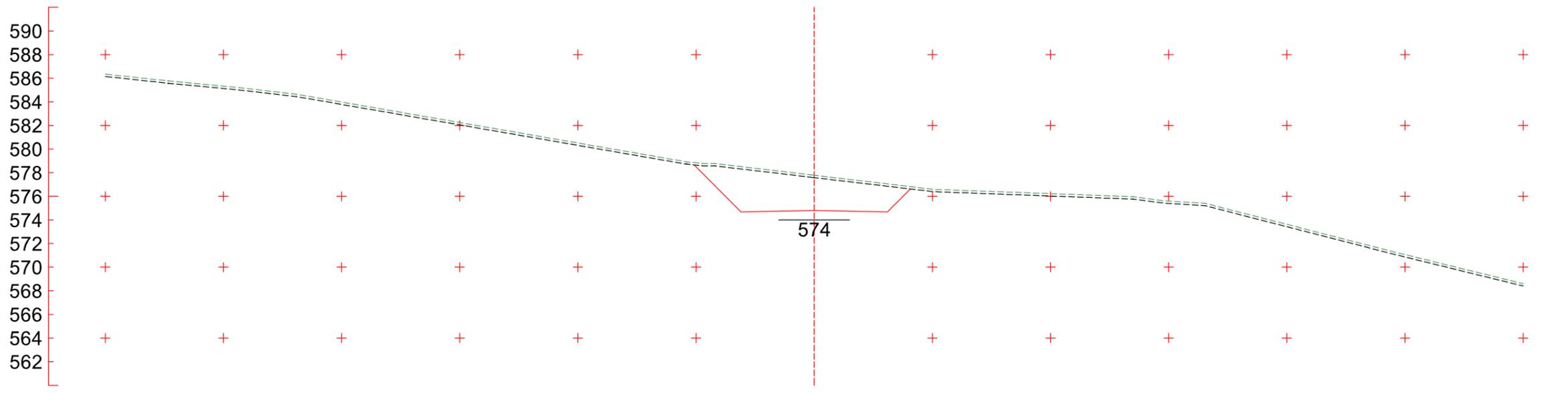
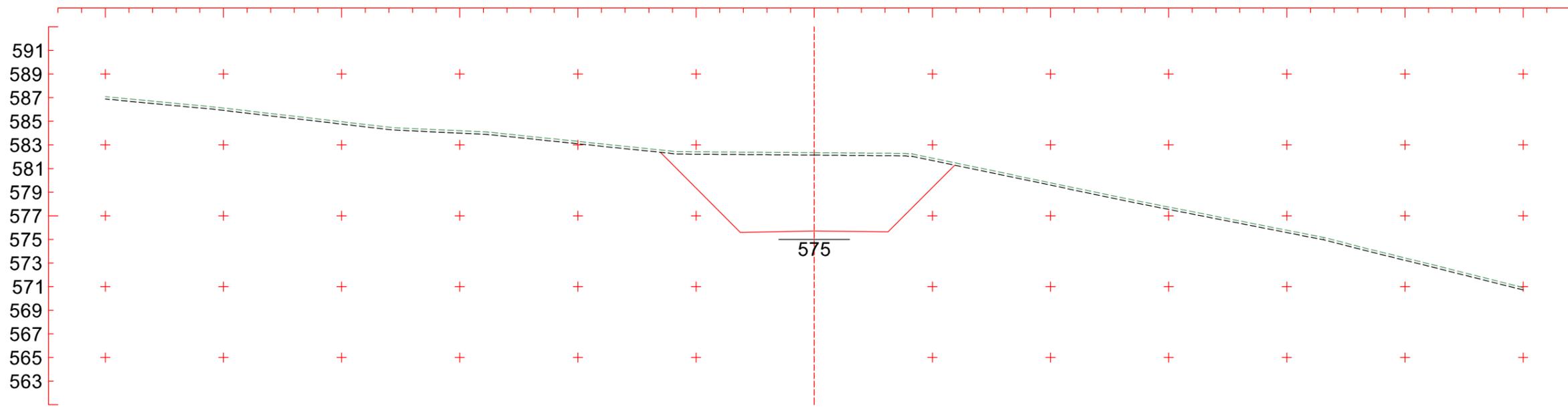


9+260
 CT 570,734 m
 CP 572,091 m

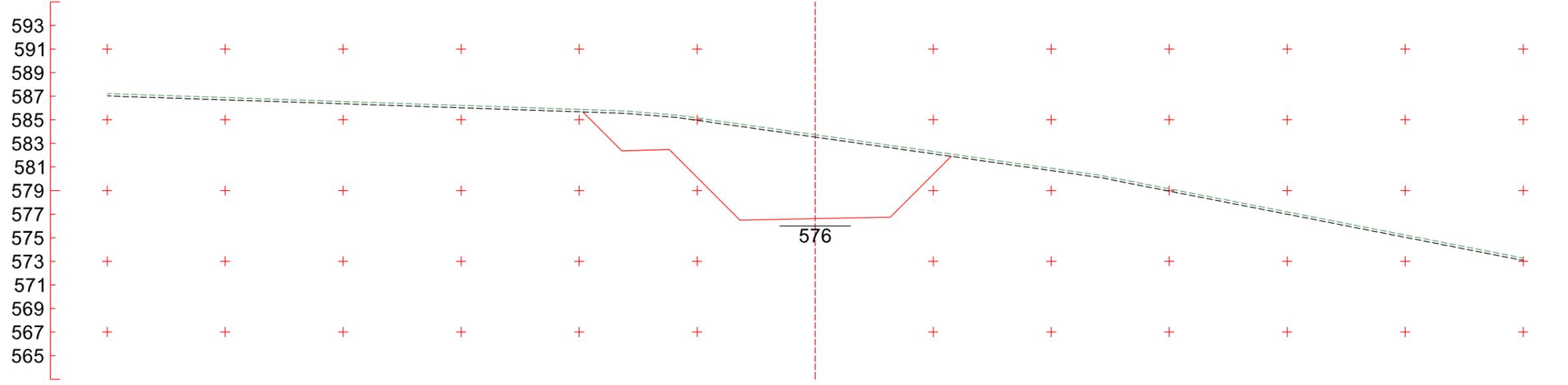
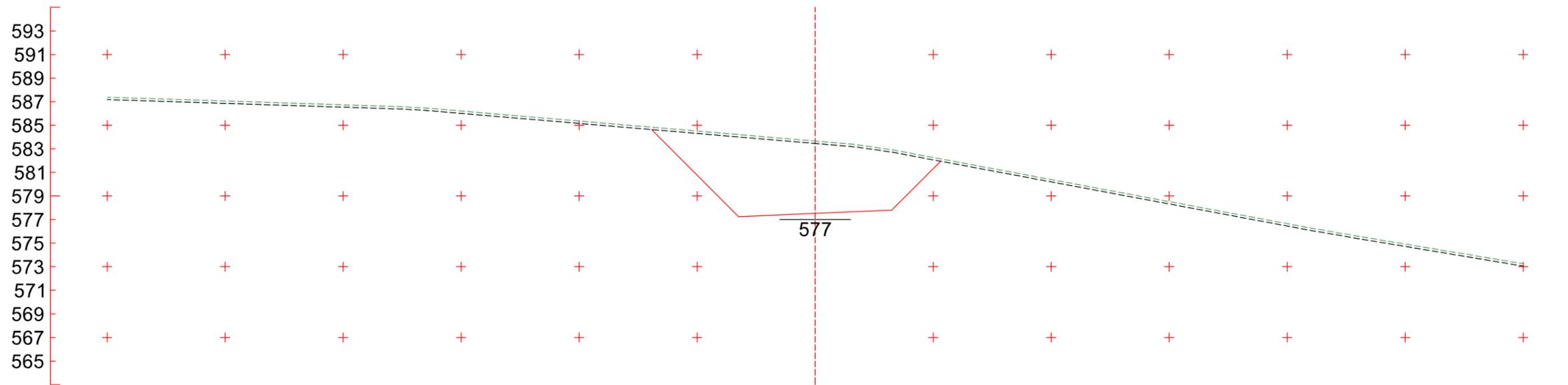
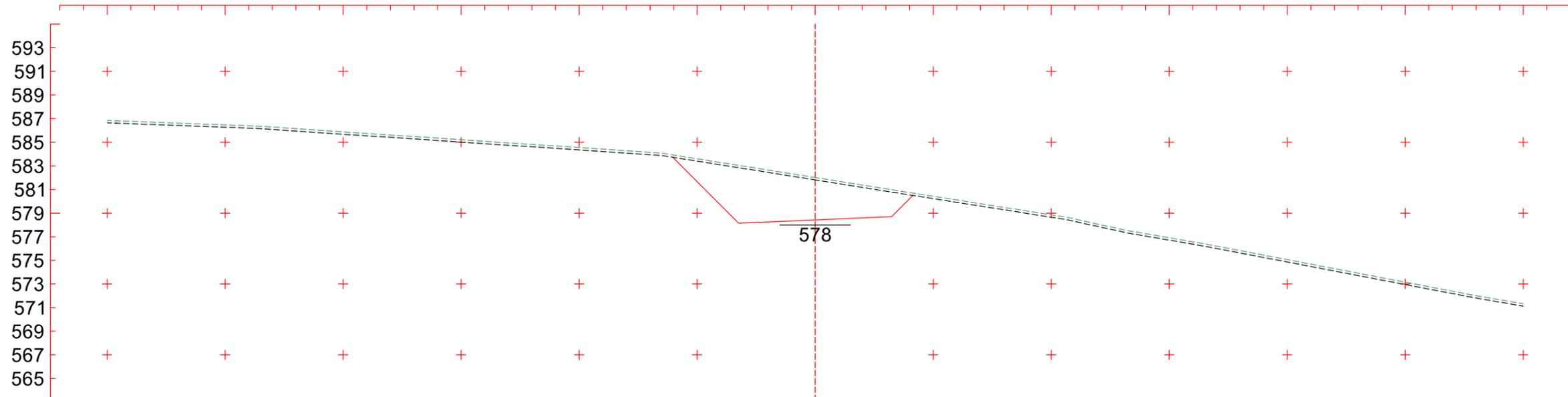


9+240
 CT 569,206 m
 CP 571,187 m

Lote 2
 Escala 1:400

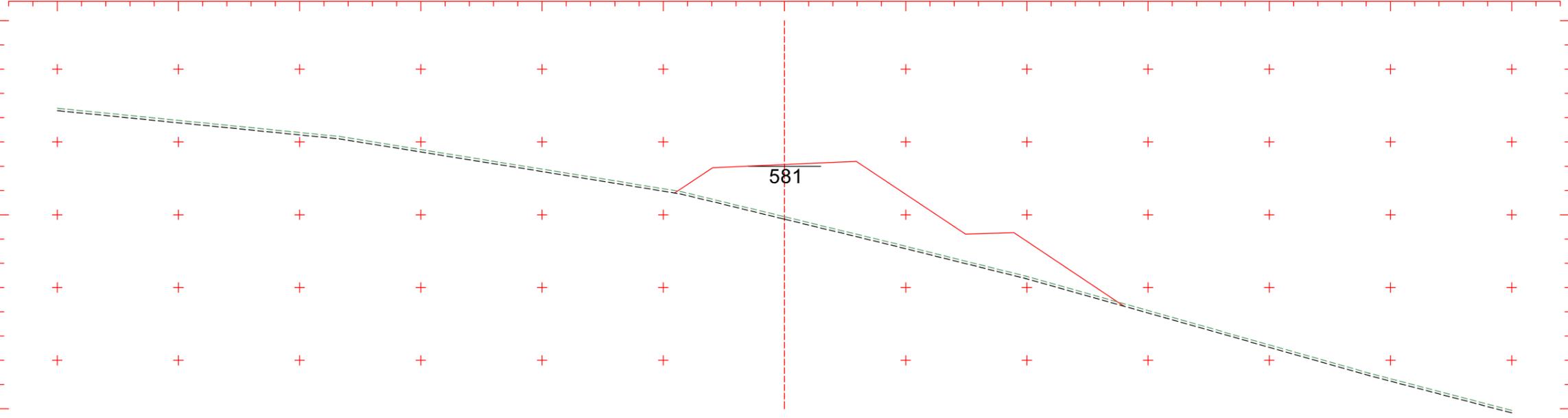


Lote 2
 Escala 1:400



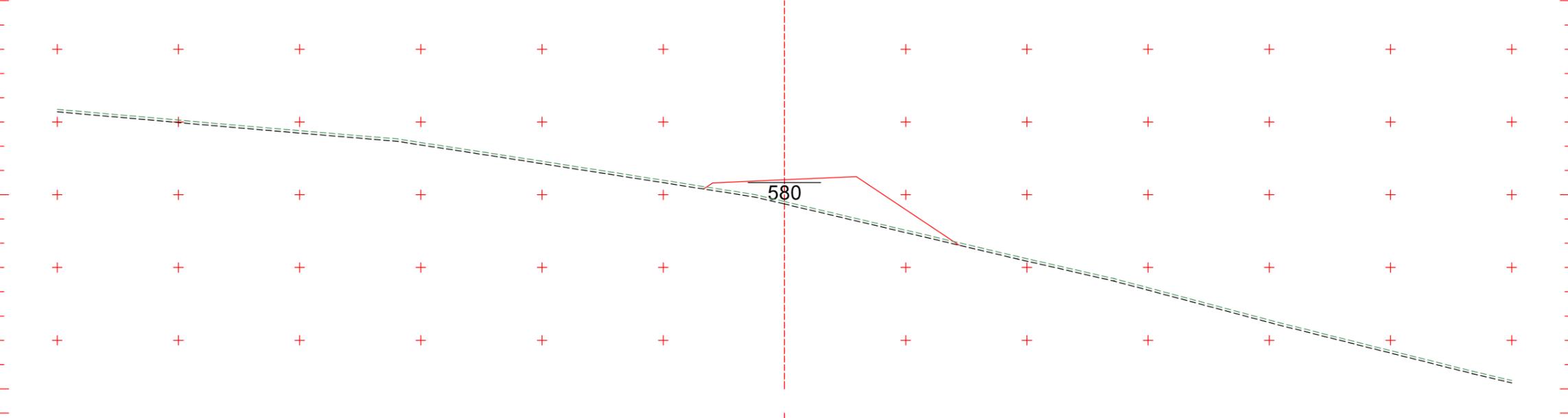
Lote 2
Escala 1:400

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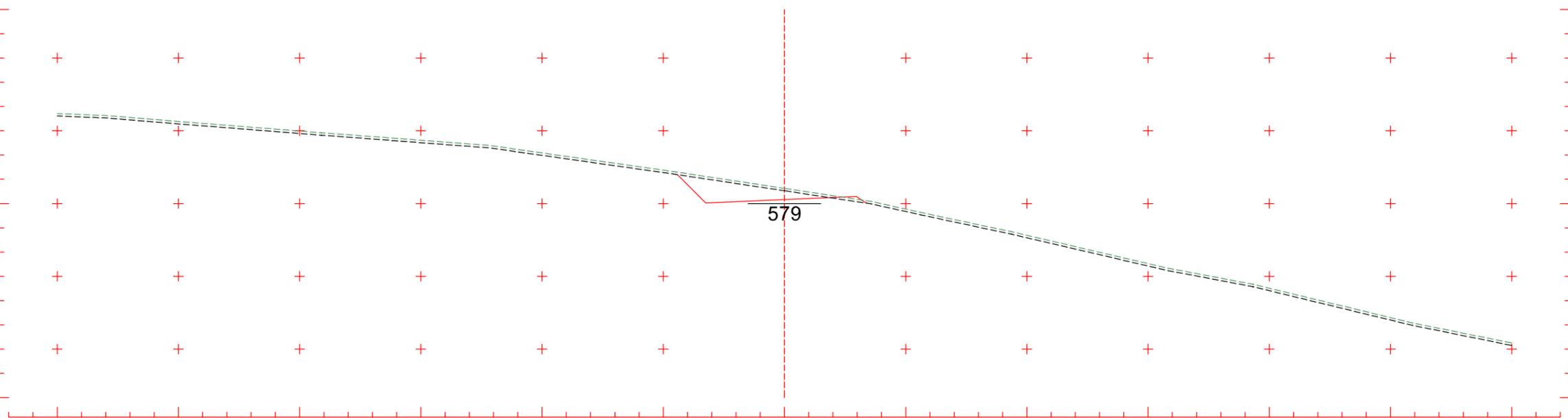
9+460
CT 576,837 m
CP 581,139 m

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9+440
CT 578,438 m
CP 580,234 m

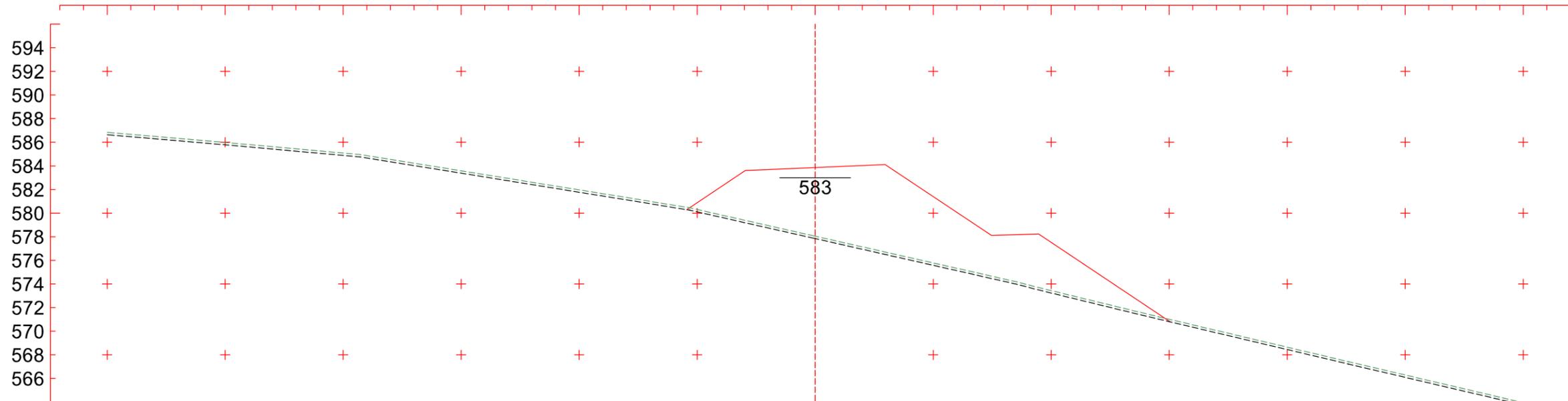
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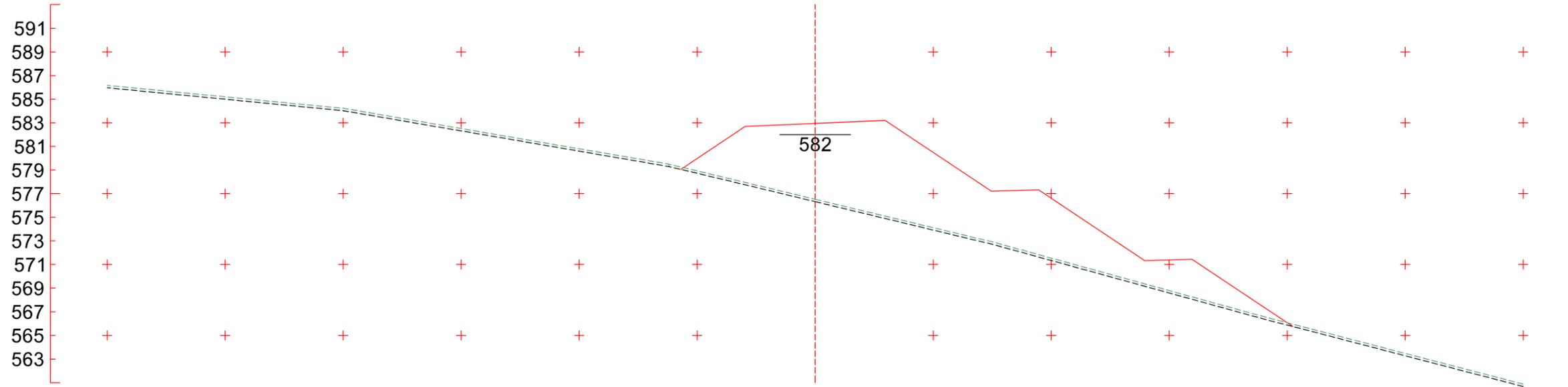
9+420
CT 580,253 m
CP 579,330 m

Lote 2
Escala 1:400

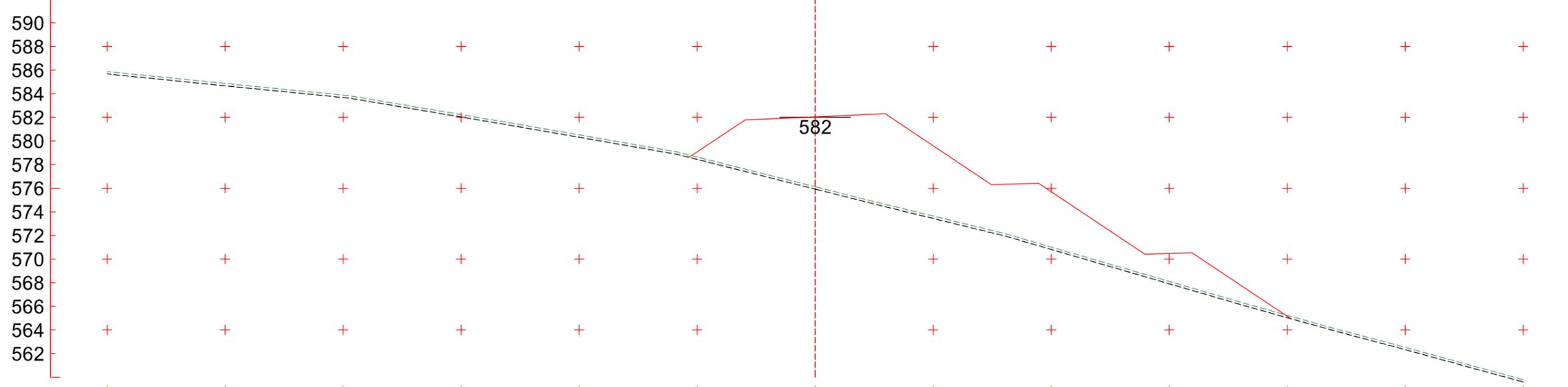
60 55 50 45 40 35 30 25 20 15 10 5 0 5 10 15 20 25 30 35 40 45 50 55 60



9+520
 CT 578,043 m
 CP 583,854 m

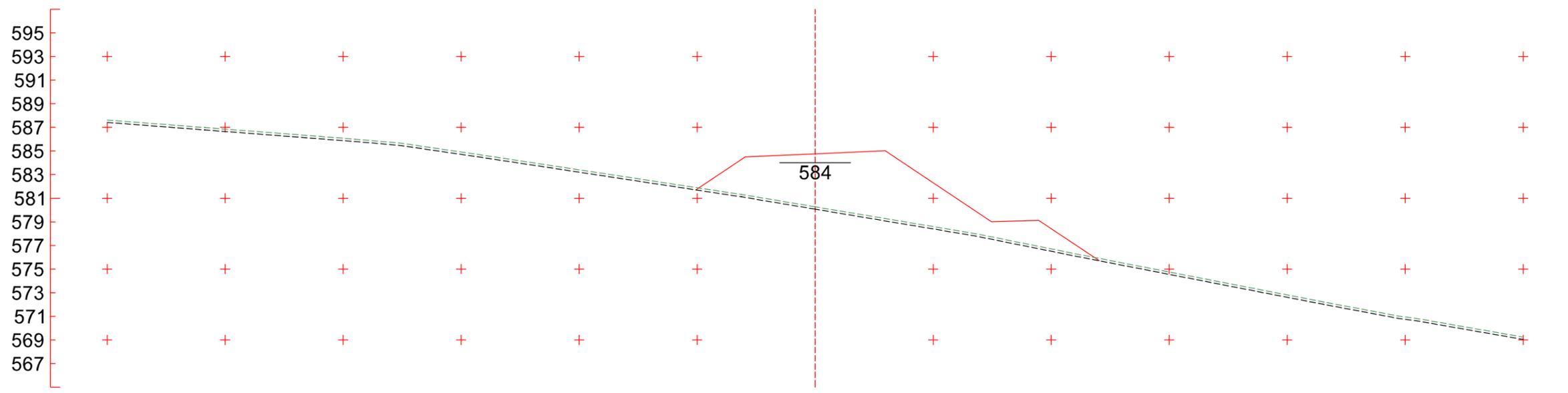
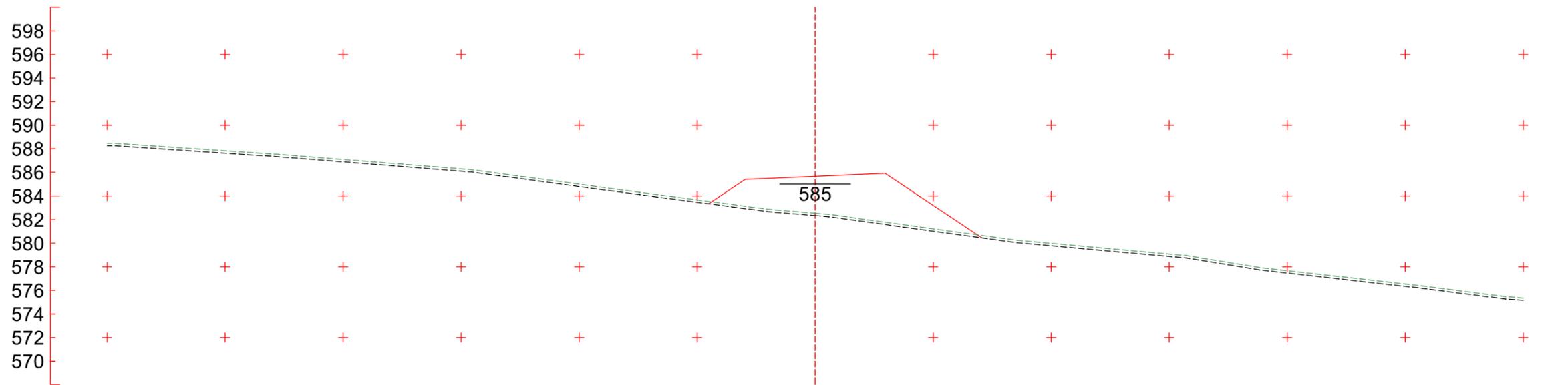
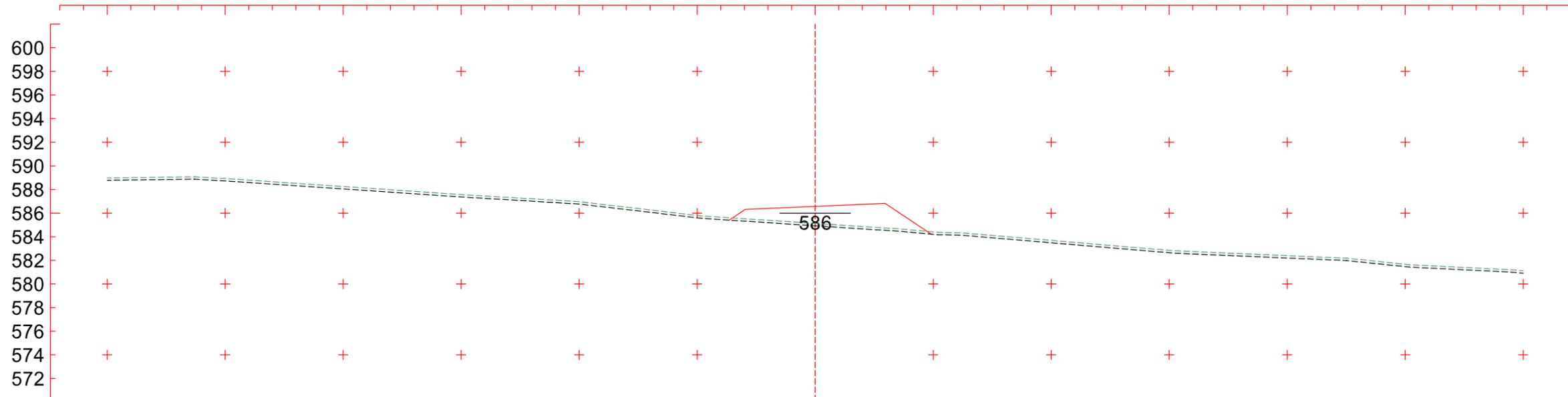


9+500
 CT 576,523 m
 CP 582,949 m

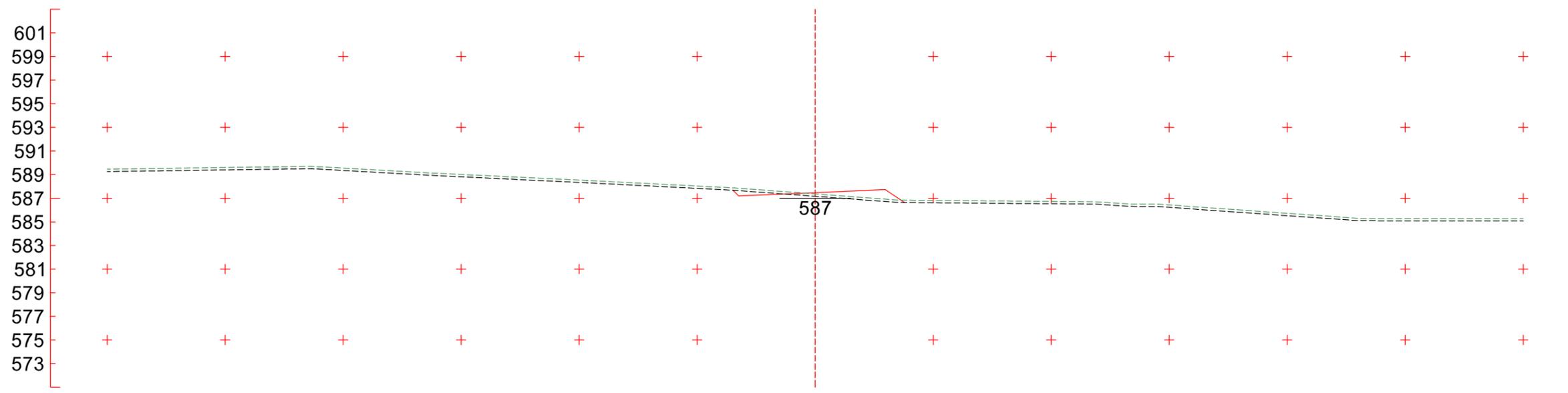
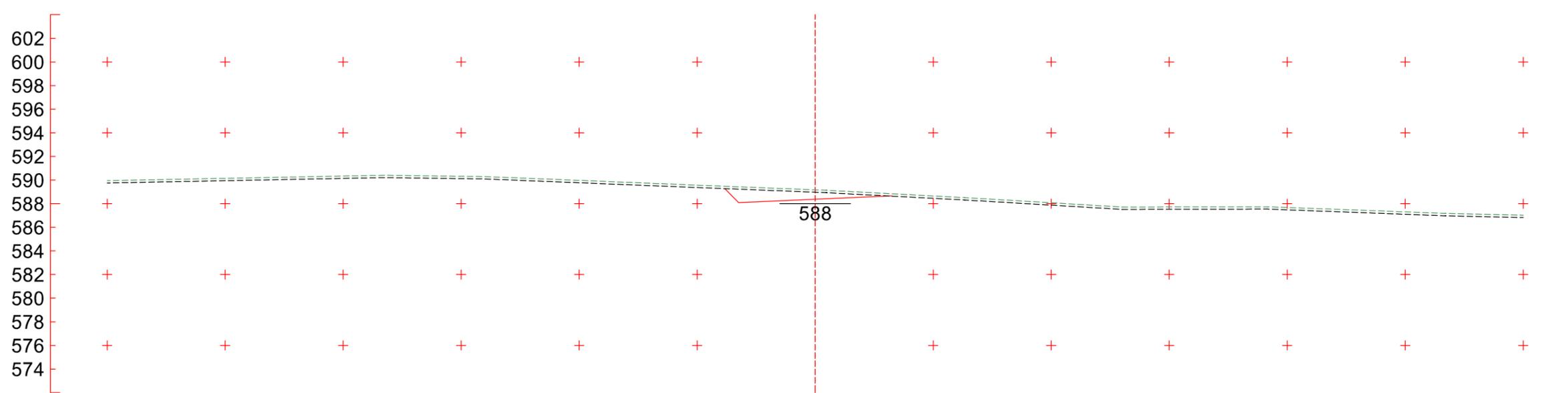
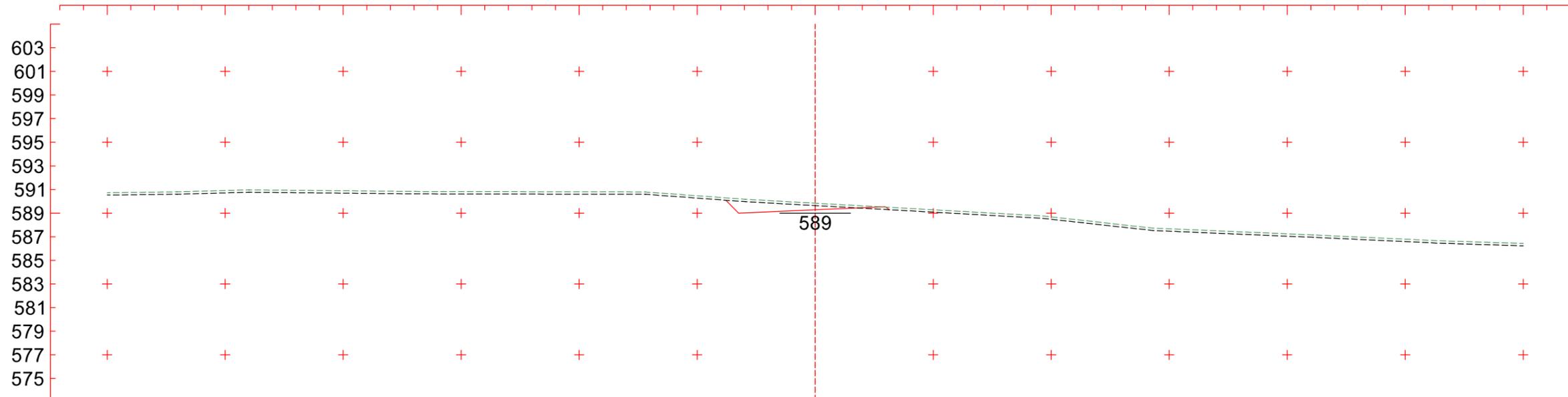


9+480
 CT 576,125 m
 CP 582,044 m

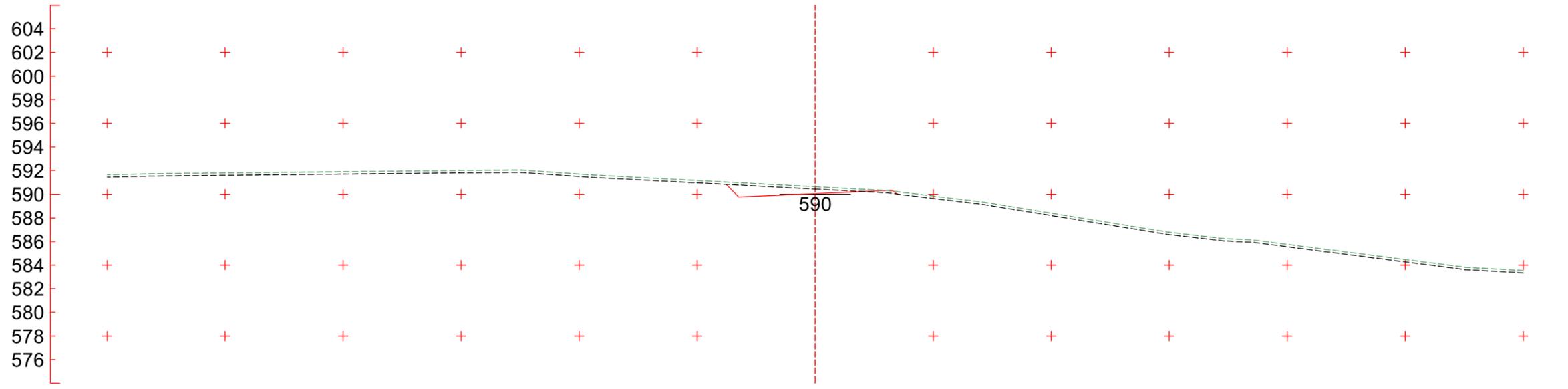
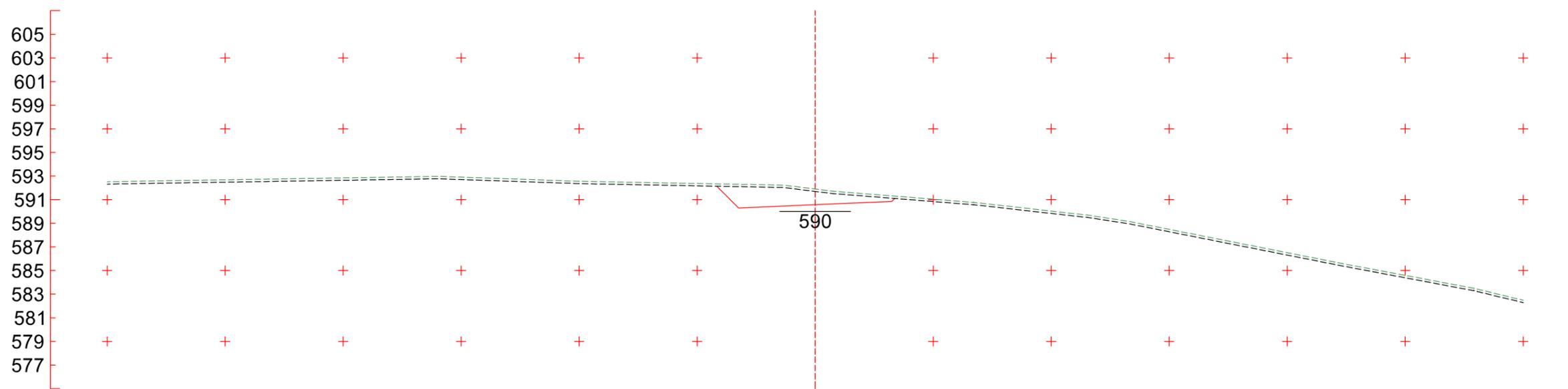
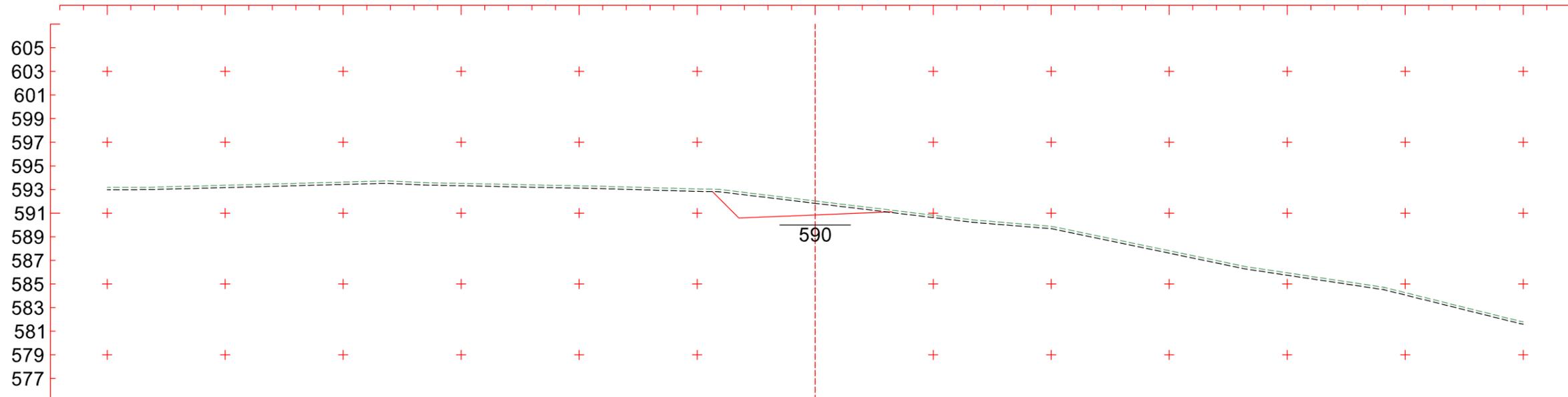
Lote 2
 Escala 1:400



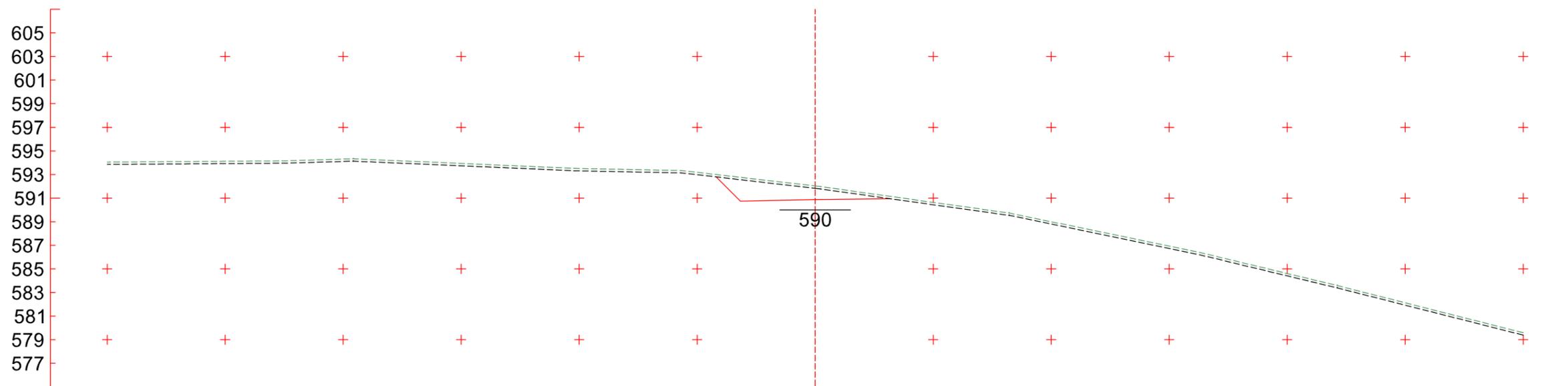
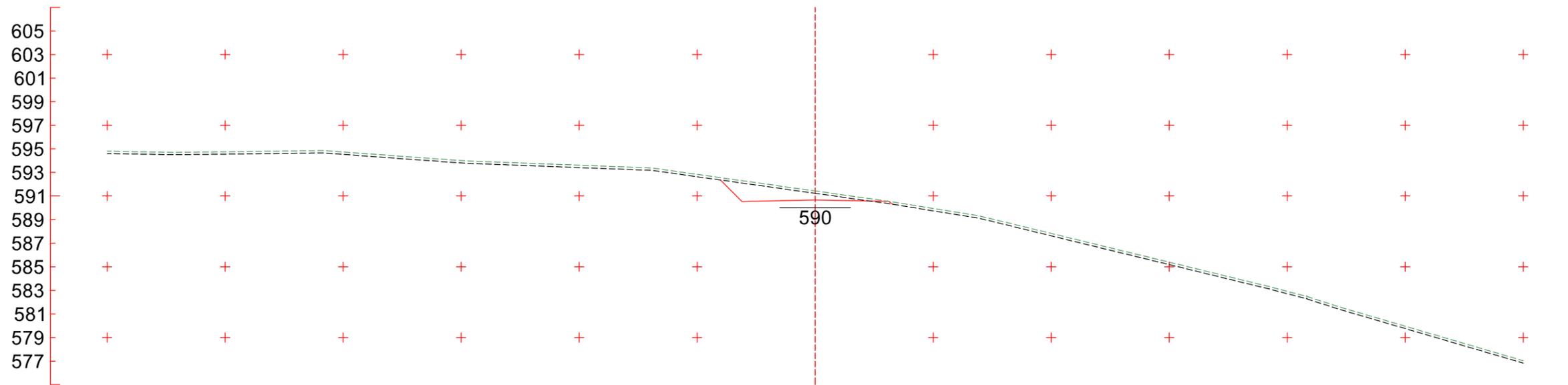
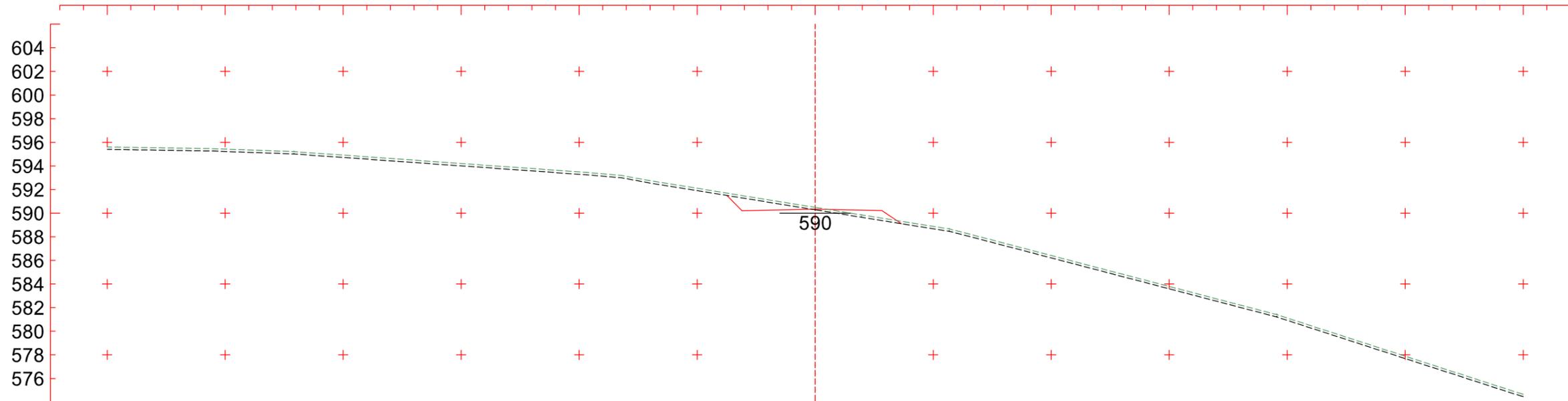
Lote 2
Escala 1:400



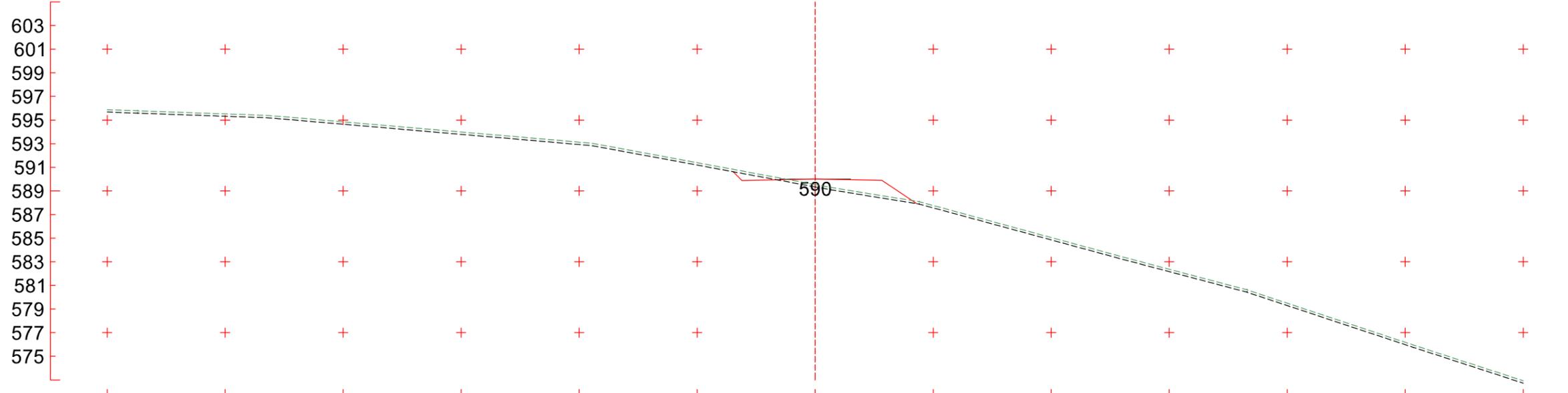
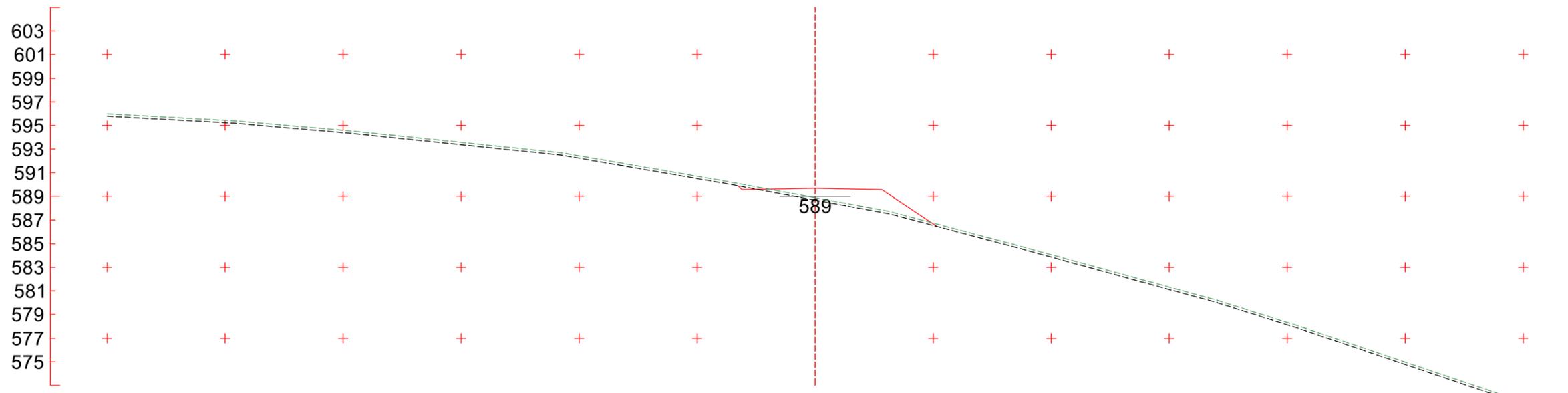
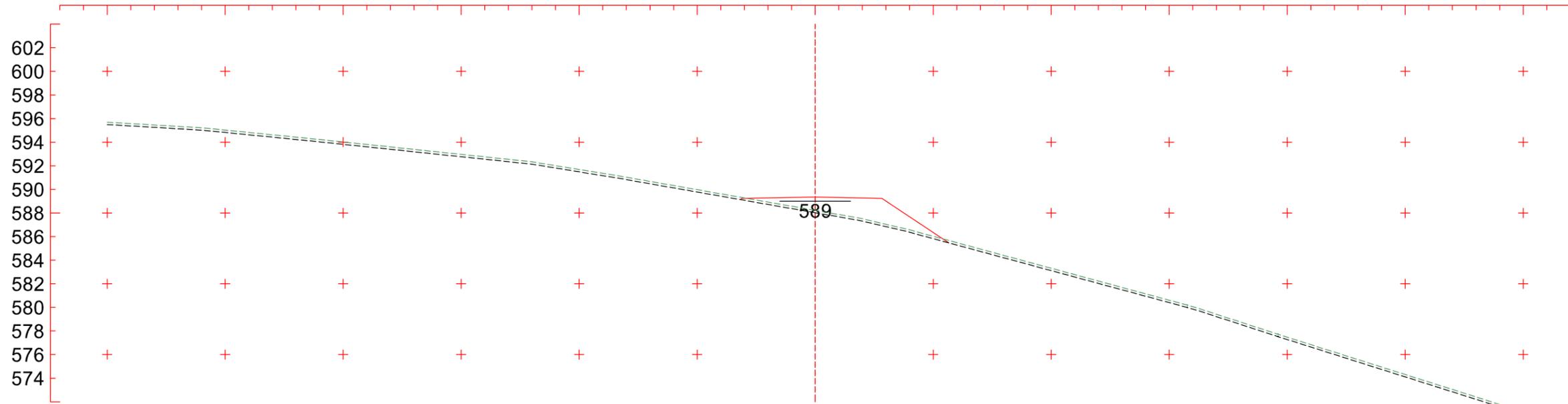
Lote 2
 Escala 1:400



Lote 2
 Escala 1:400

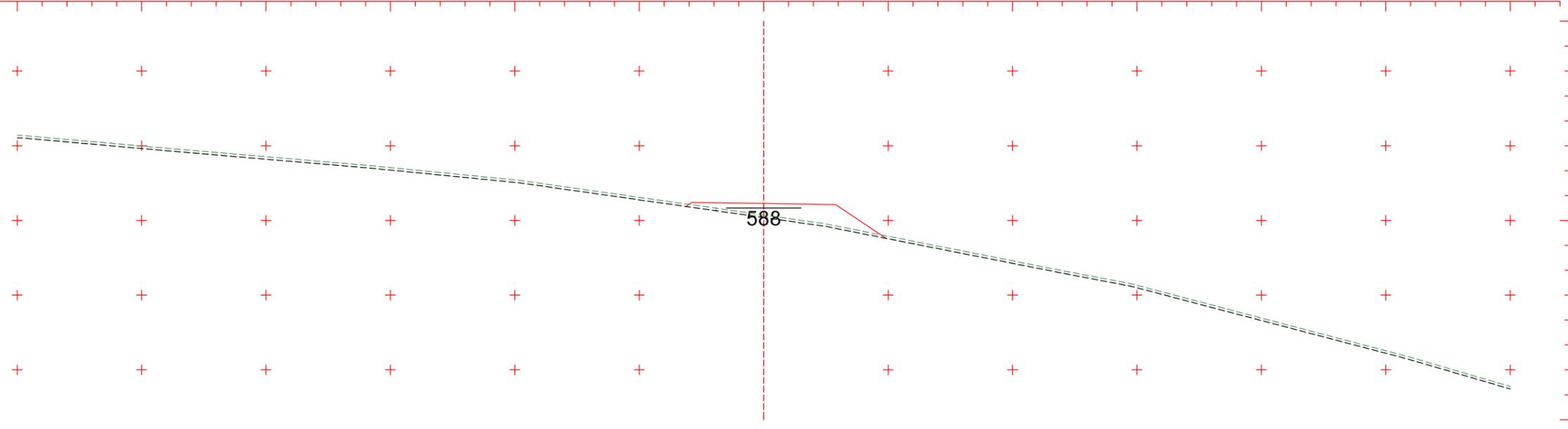


Lote 2
 Escala 1:400



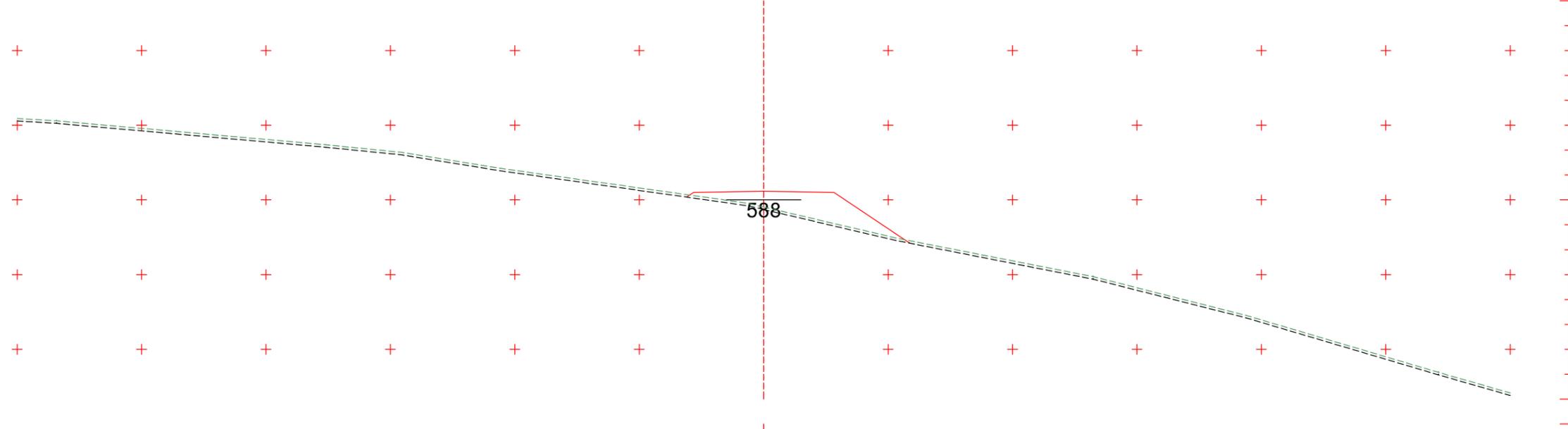
Lote 2
 Escala 1:400

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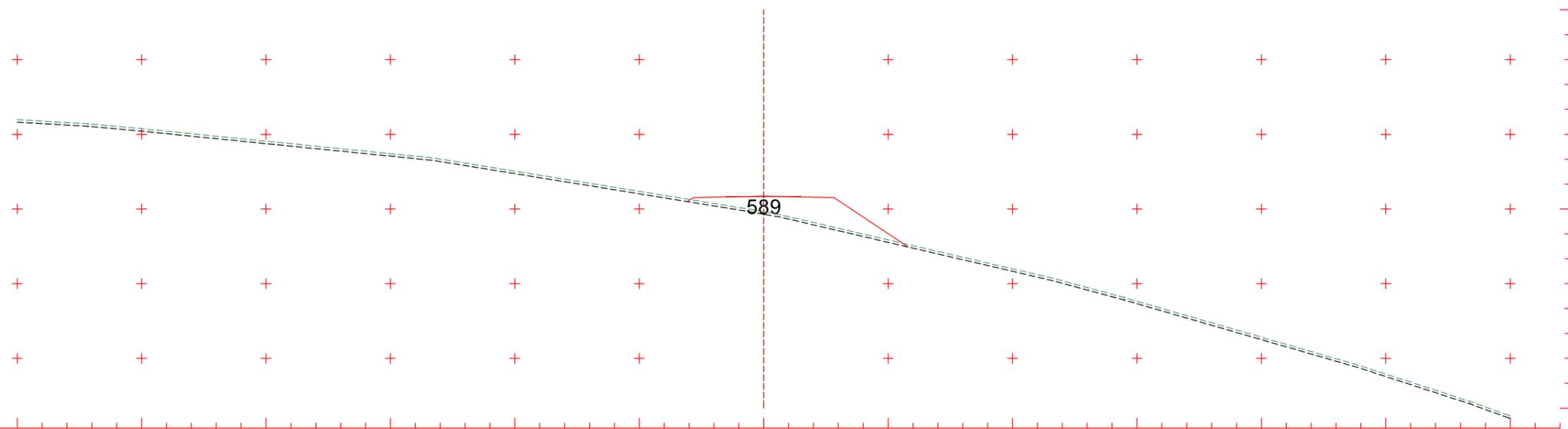
9+880
CT 587,434 m
CP 588,378 m

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9+860
CT 587,429 m
CP 588,704 m

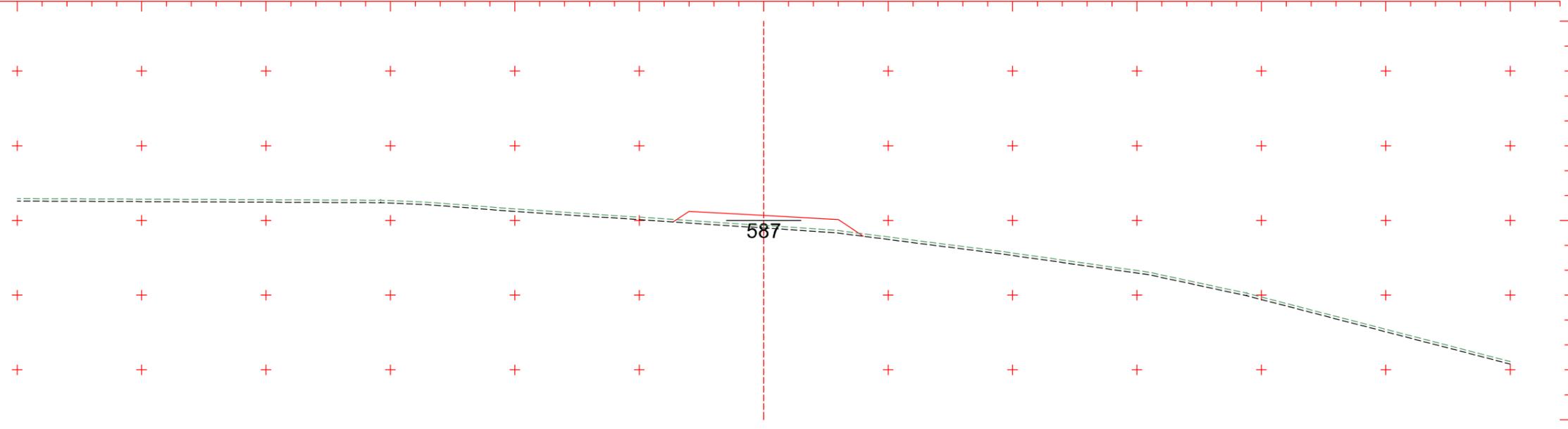
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9+840
CT 587,779 m
CP 589,030 m

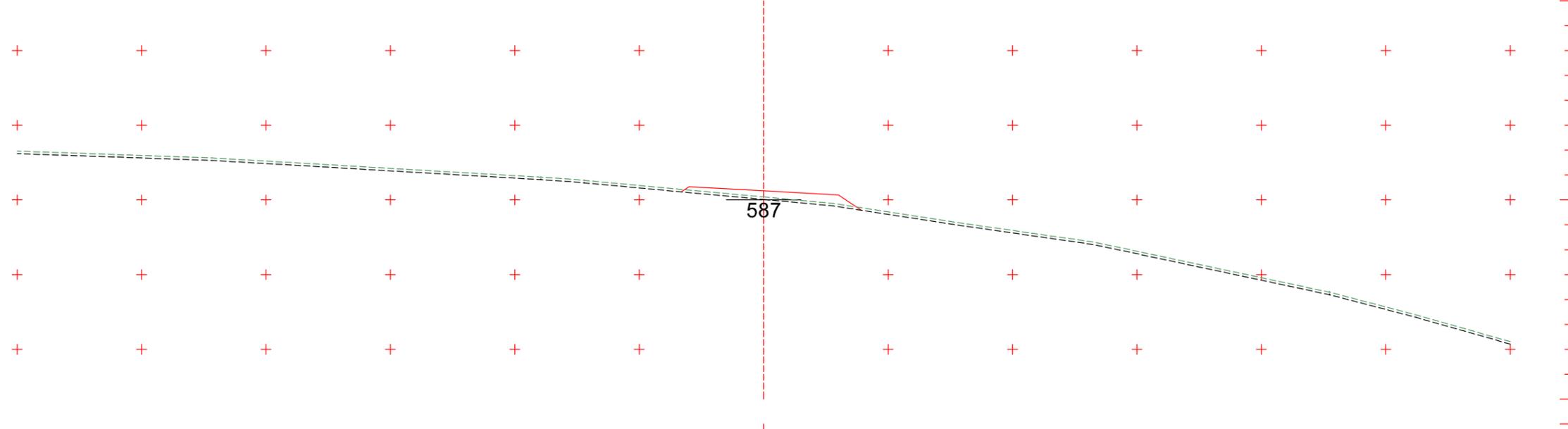
Lote 2
Escala 1:400

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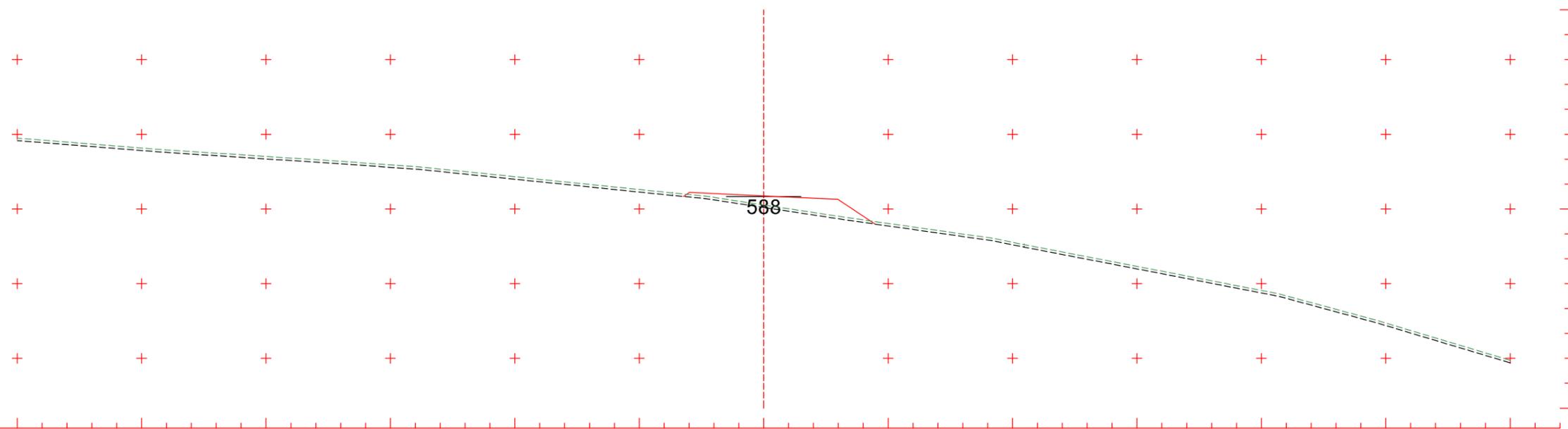
9+940
CT 586,597 m
CP 587,401 m

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9+920
CT 587,236 m
CP 587,726 m

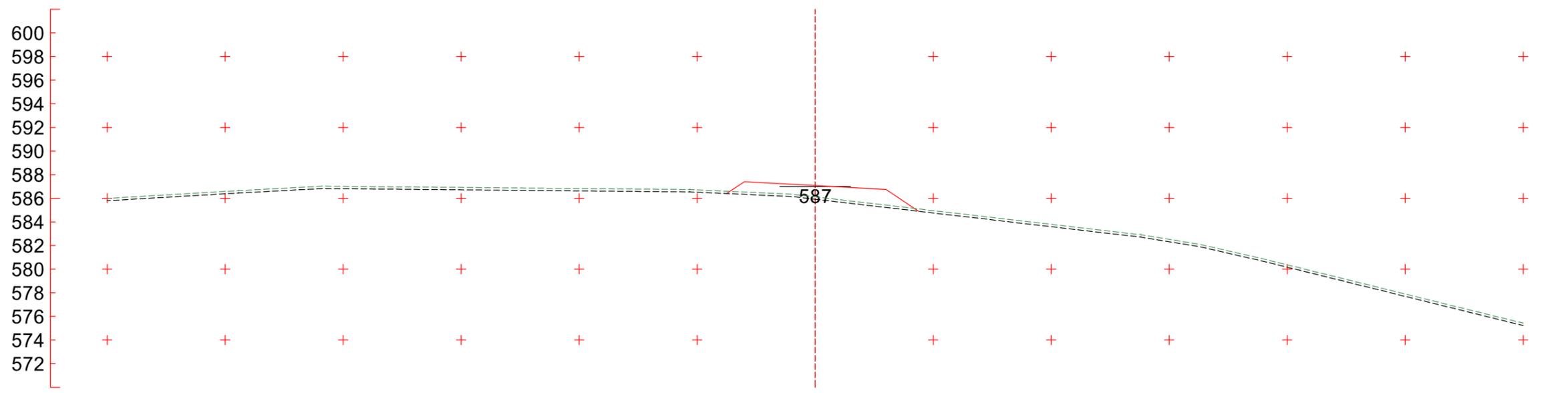
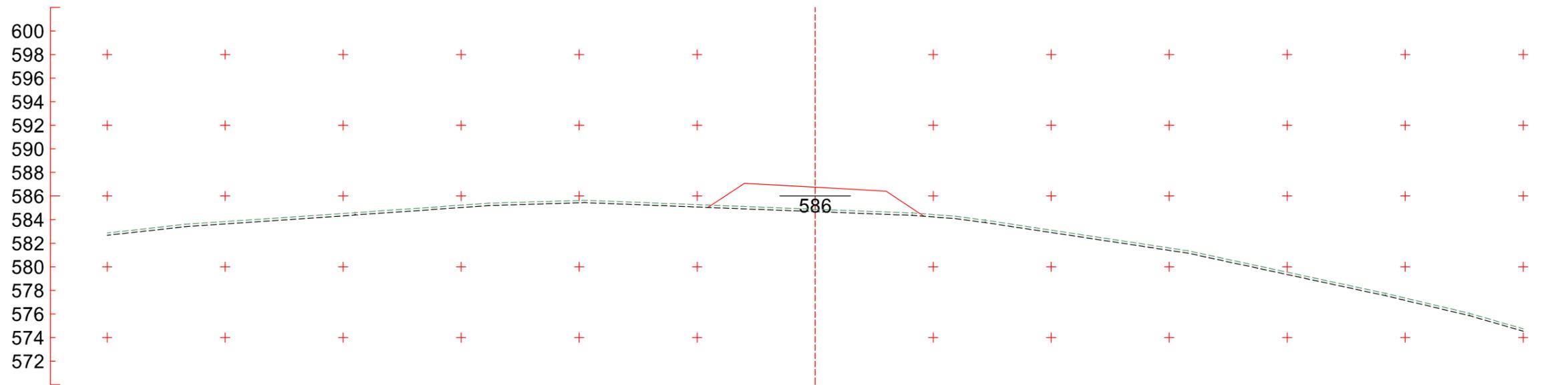
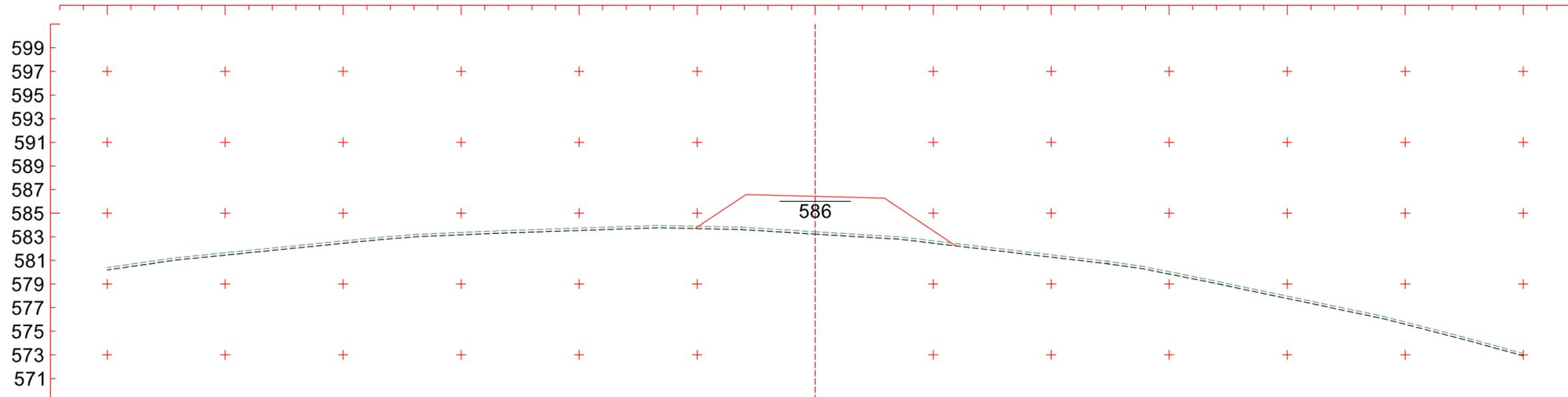
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573



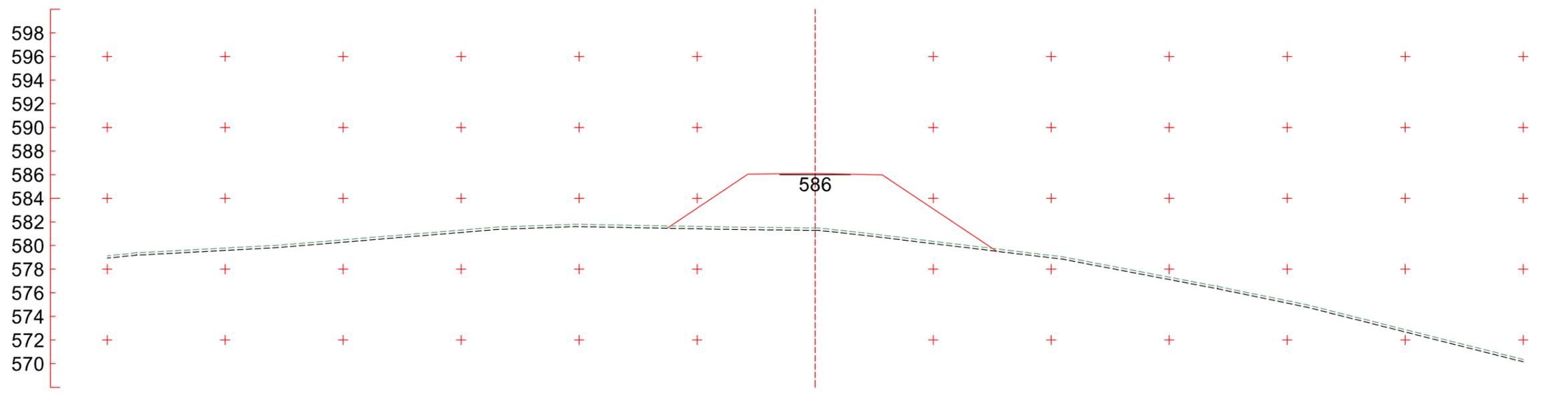
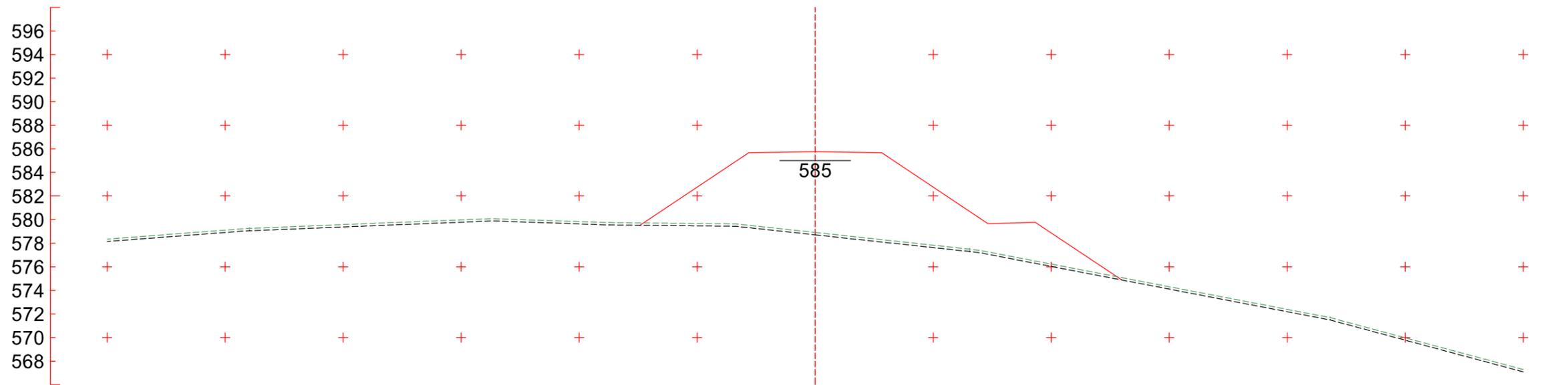
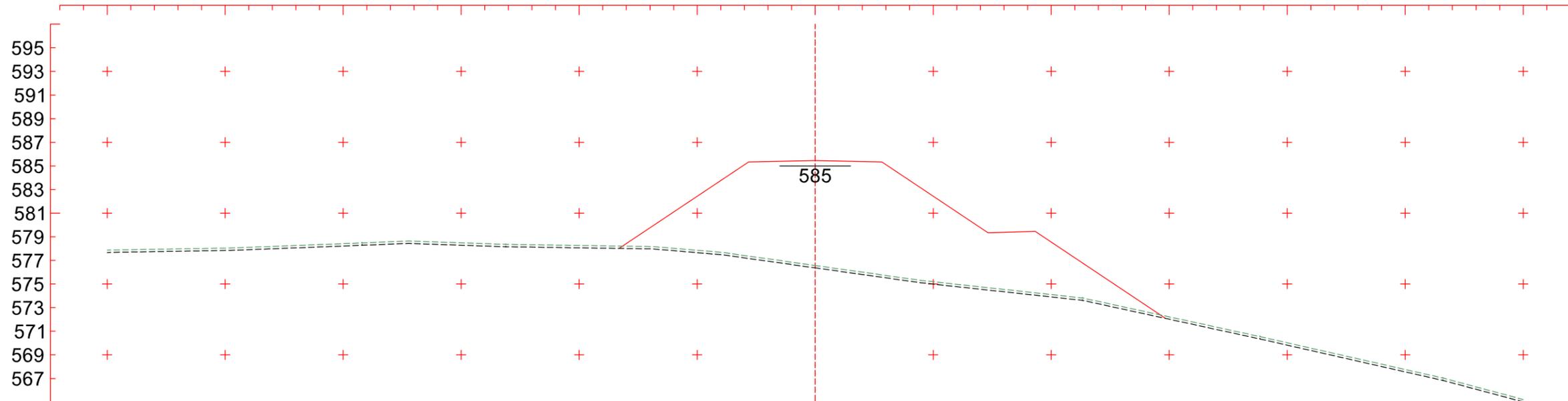
9+900
CT 587,323 m
CP 588,052 m

Lote 2
Escala 1:400

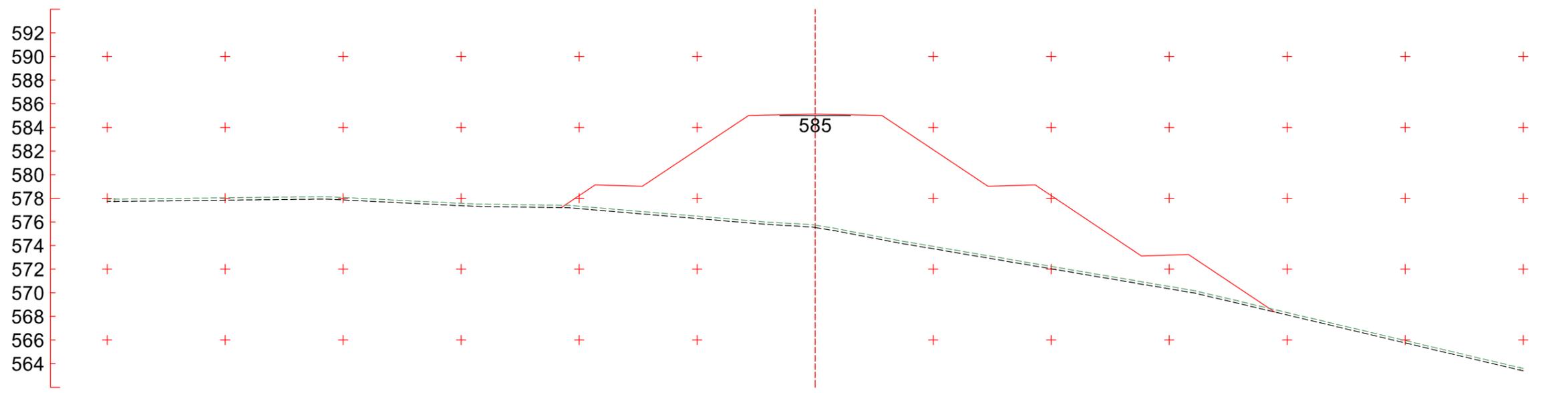
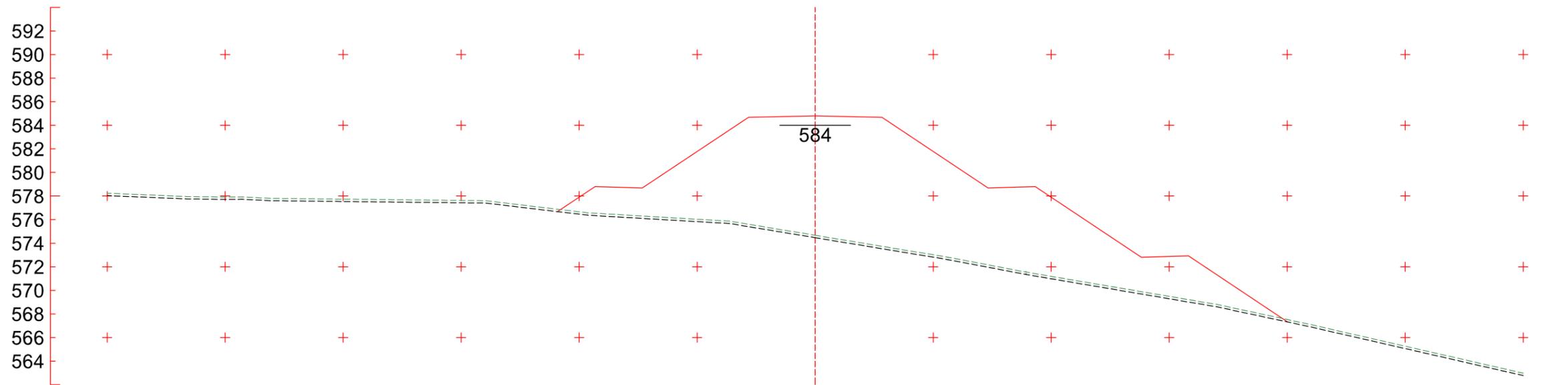
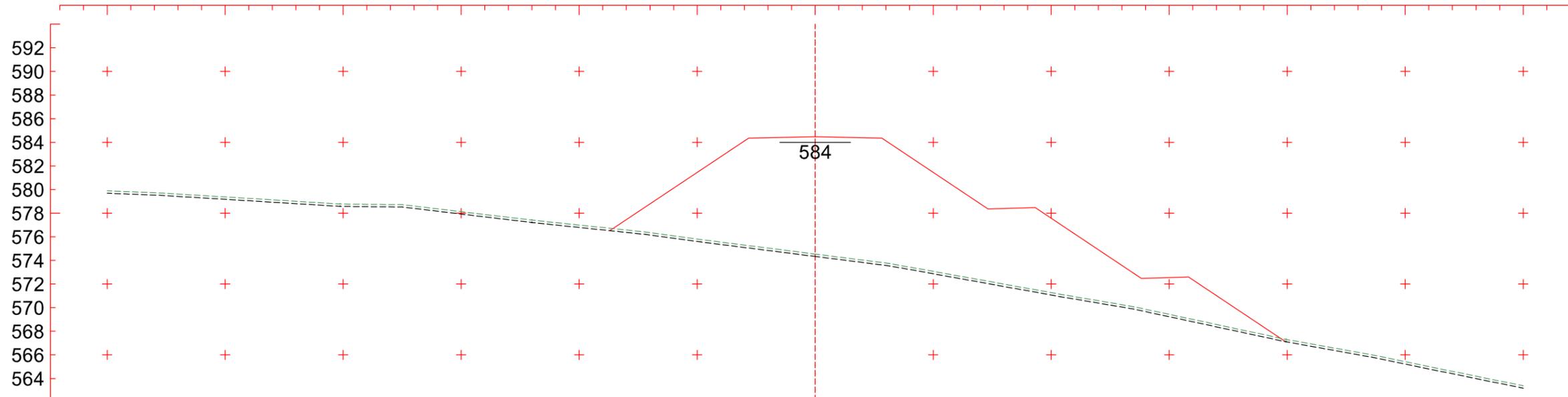
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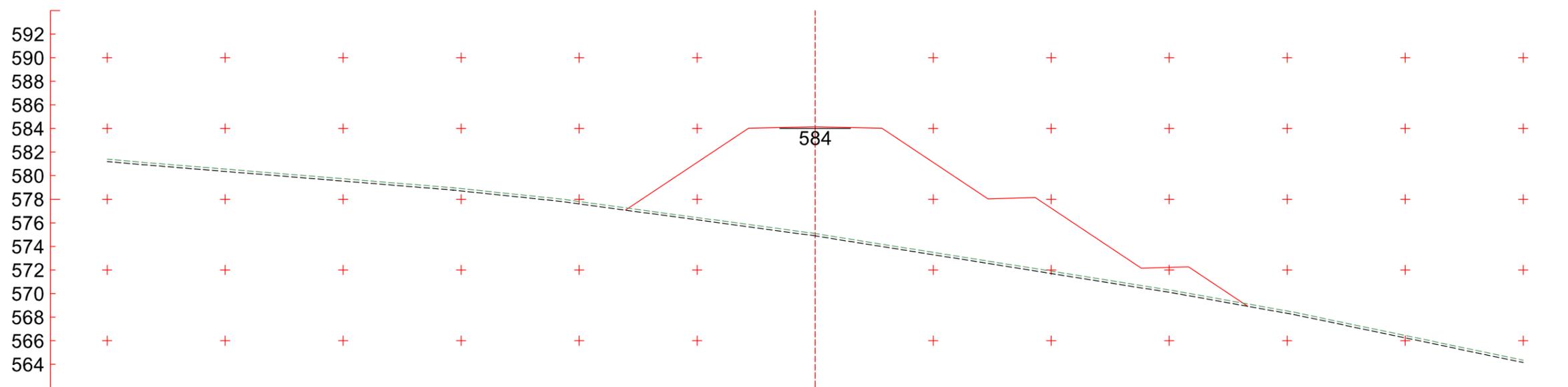
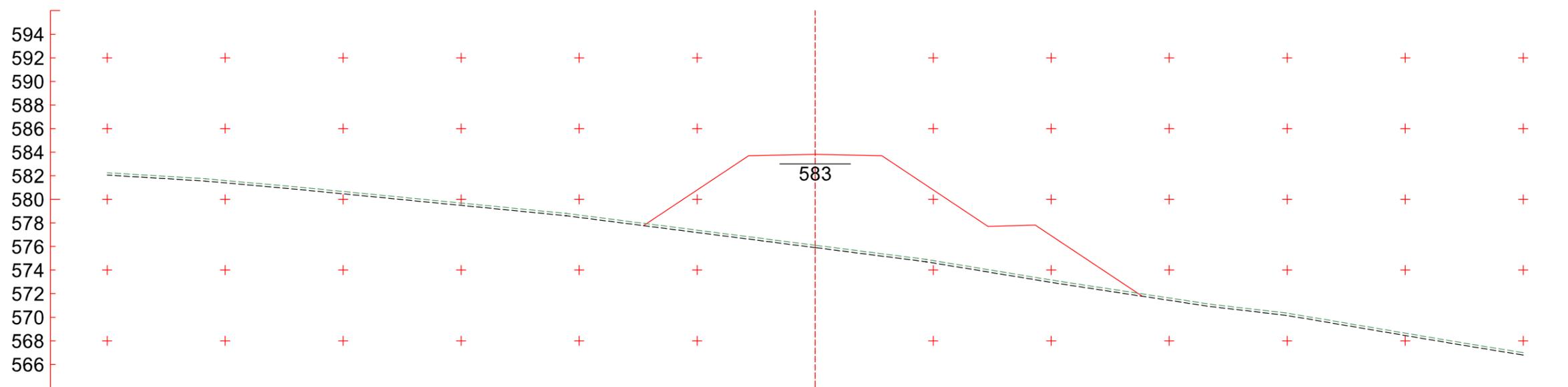
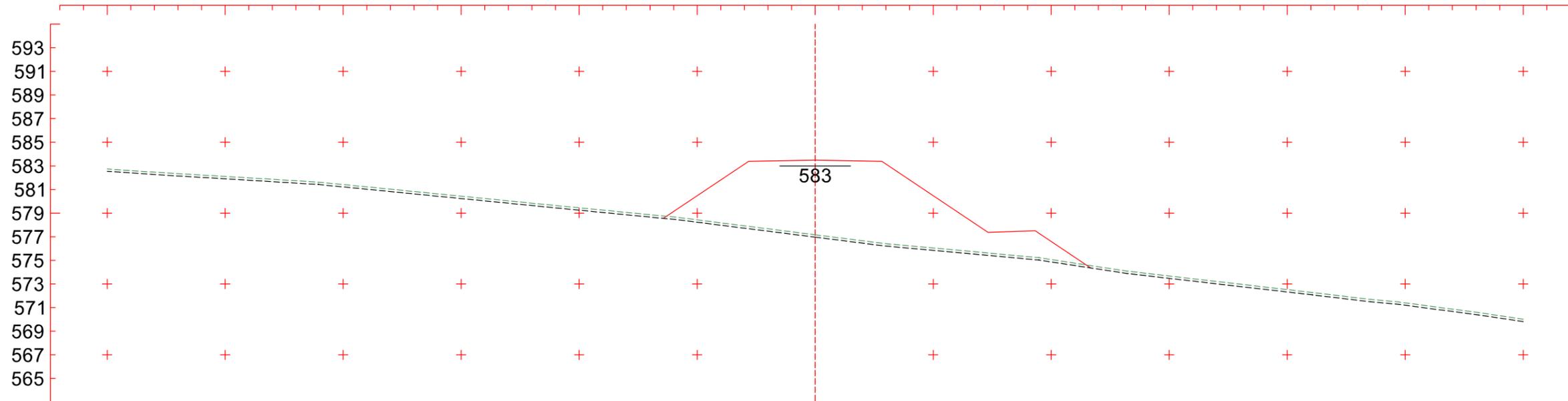
Lote 2
 Escala 1:400



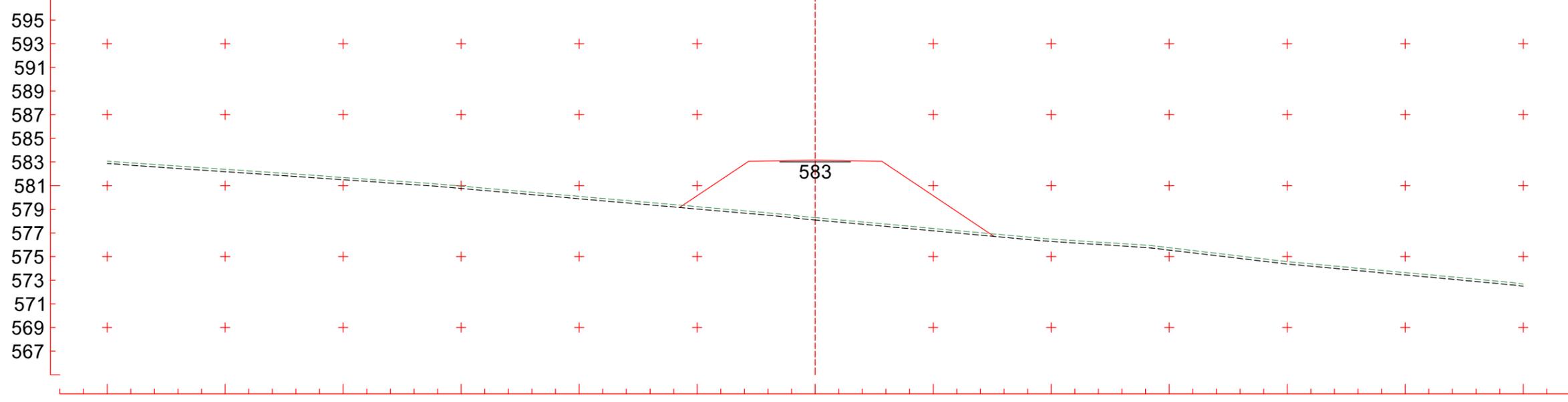
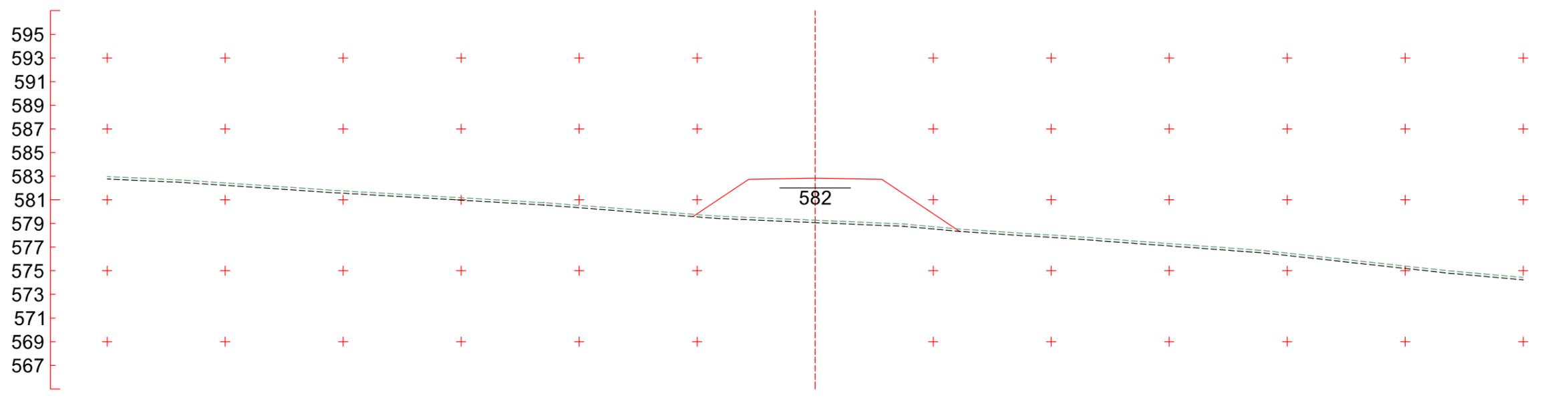
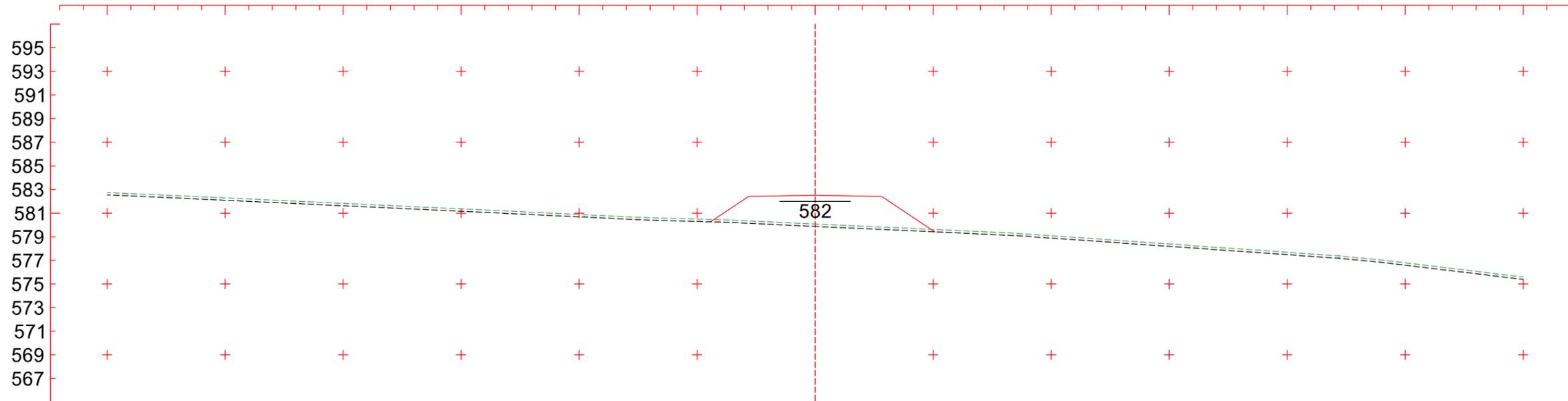
Lote 2
Escala 1:400



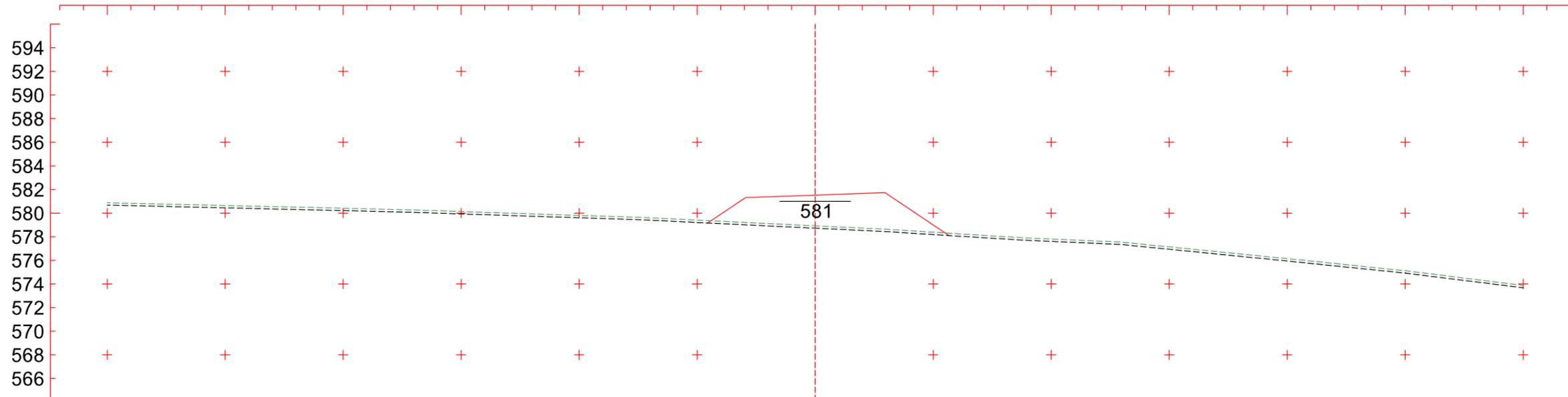
Lote 2
Escala 1:400



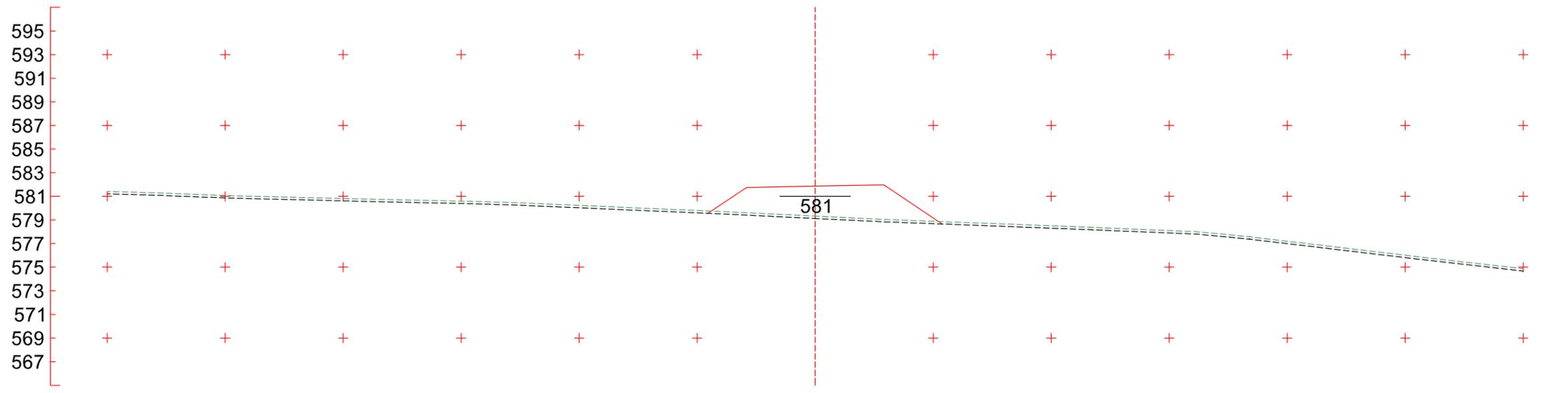
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Escala 1:400



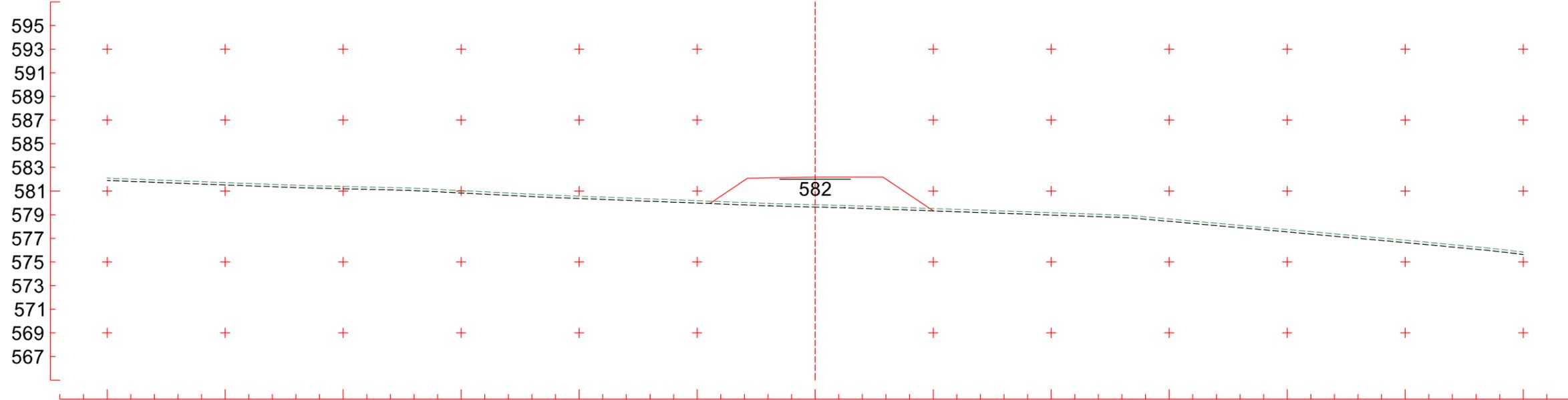
Lote 2
Escala 1:400



10+300
 CT 578,924 m
 CP 581,524 m

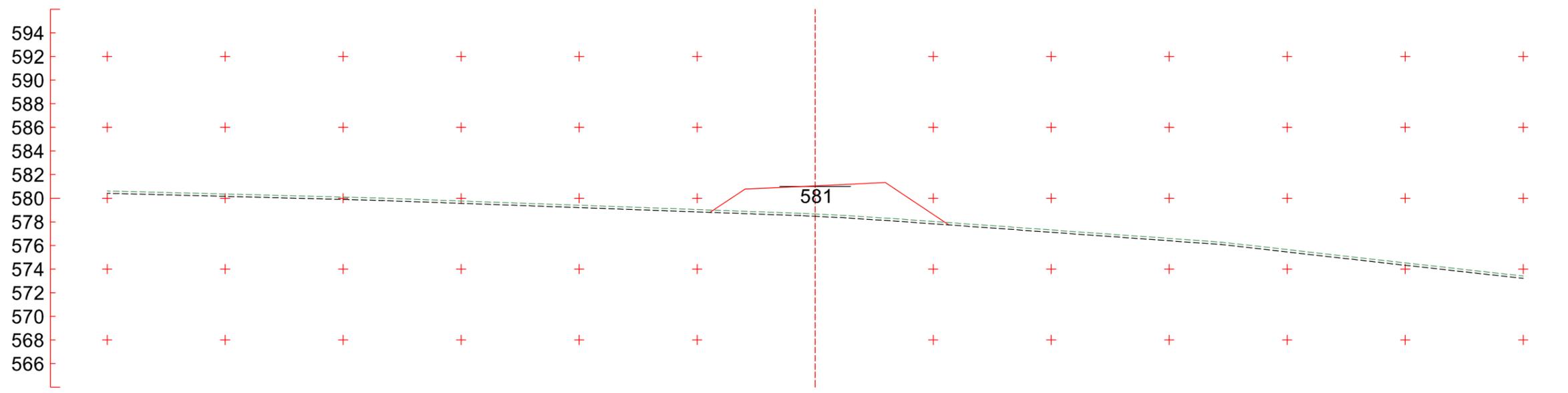
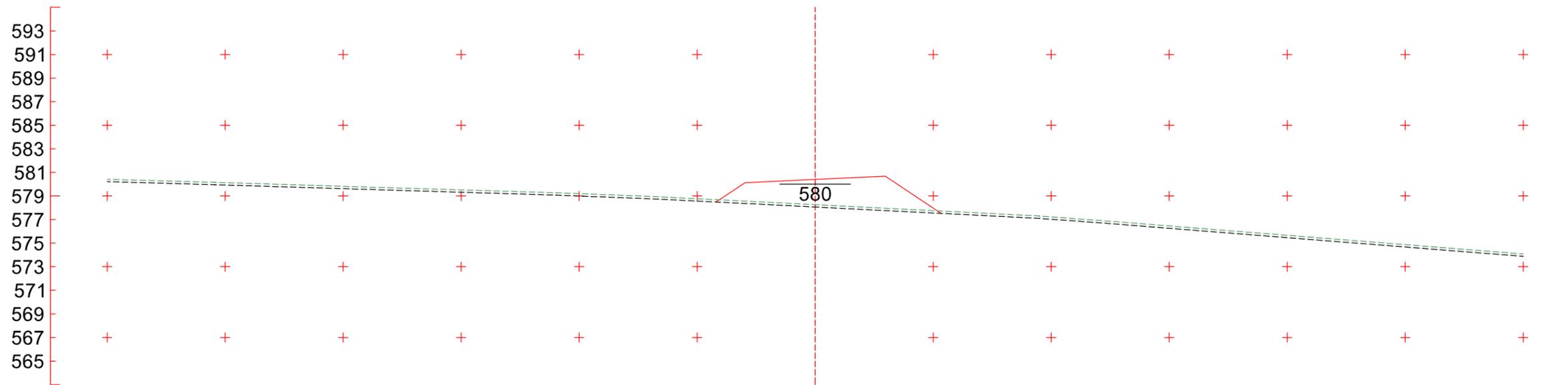
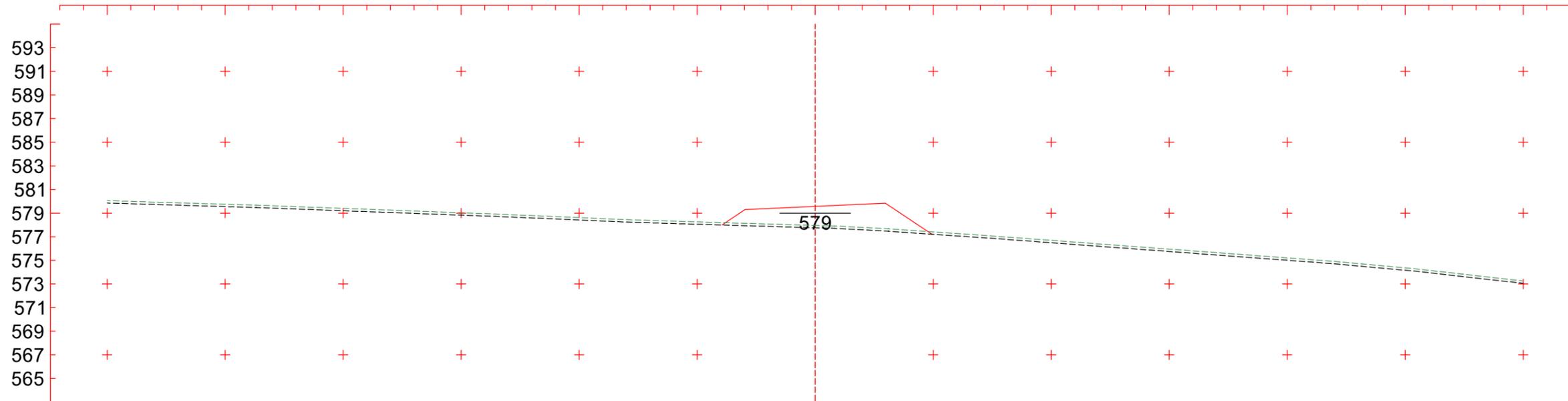


10+280
 CT 579,325 m
 CP 581,860 m

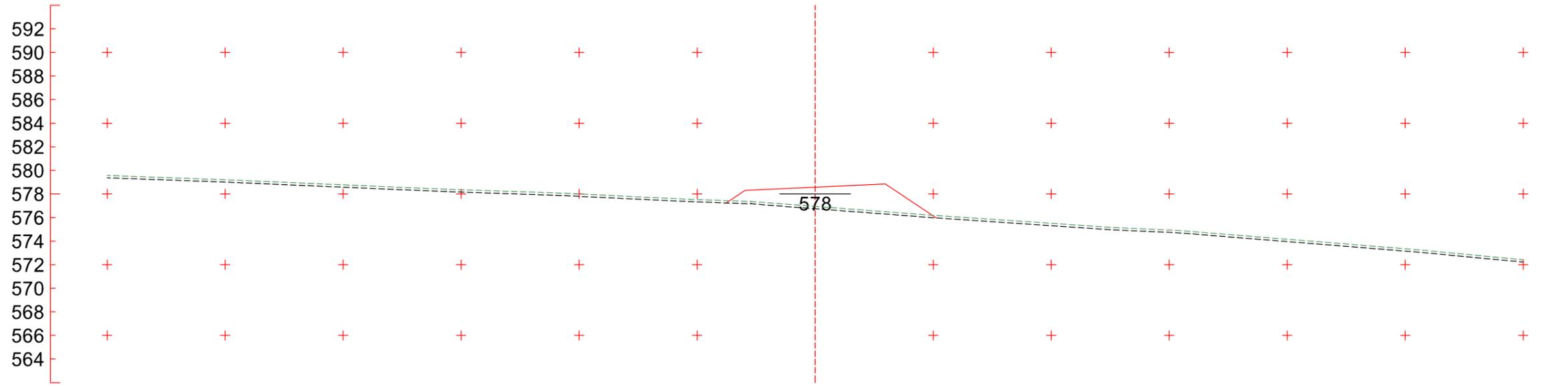
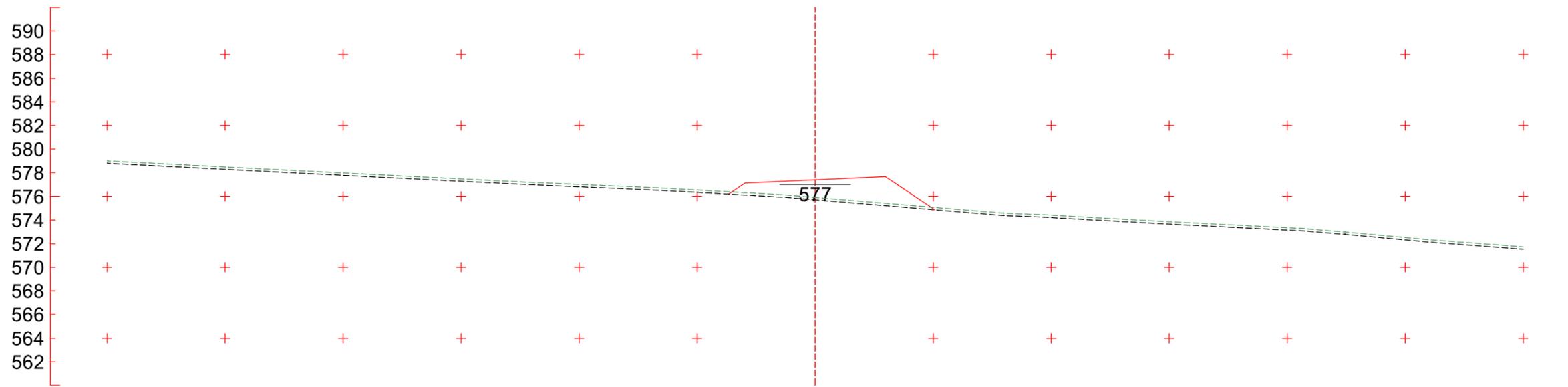
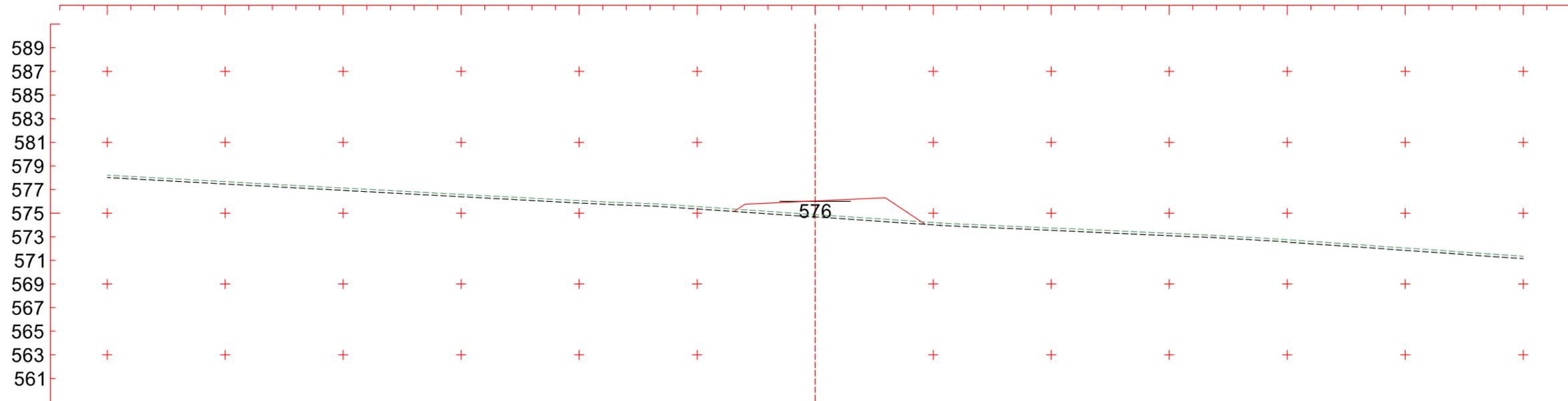


10+260
 CT 579,845 m
 CP 582,186 m

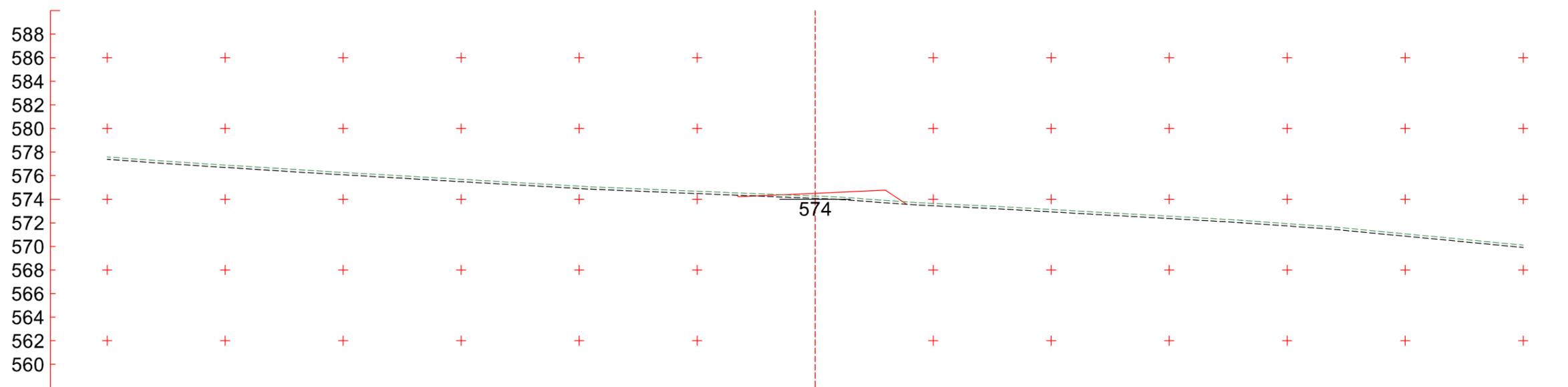
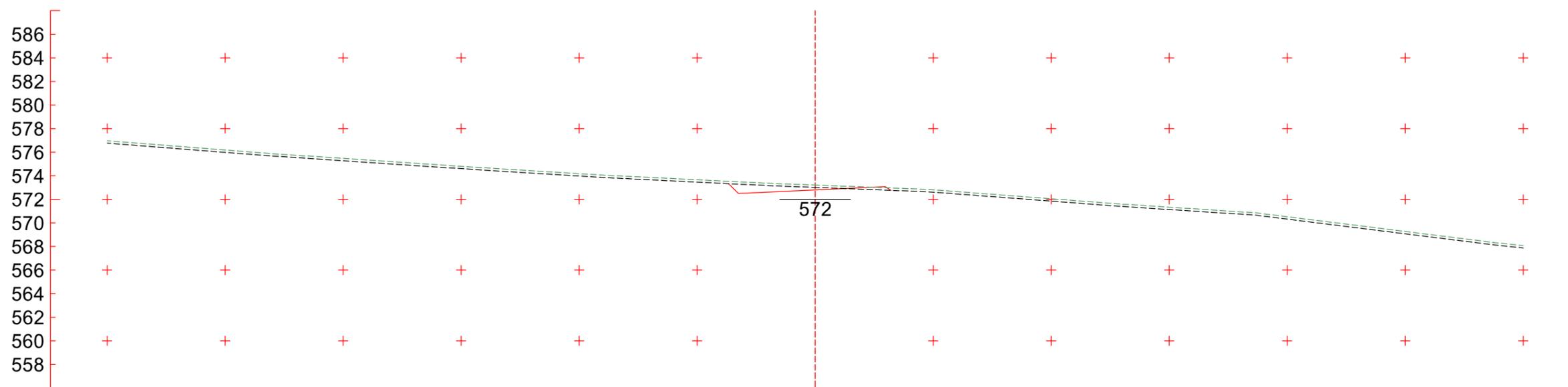
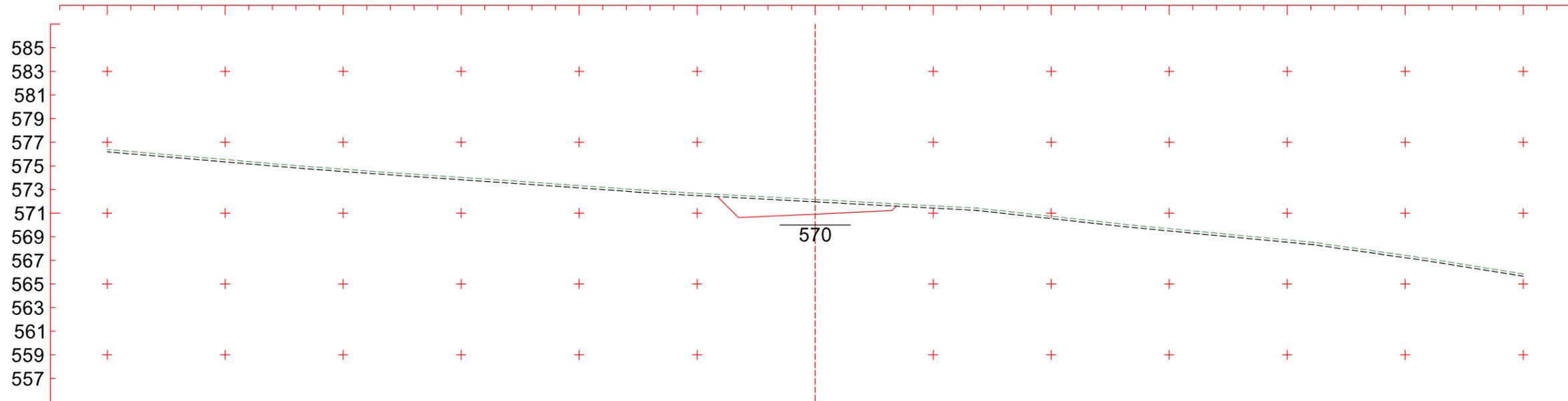
Lote 2
 Escala 1:400



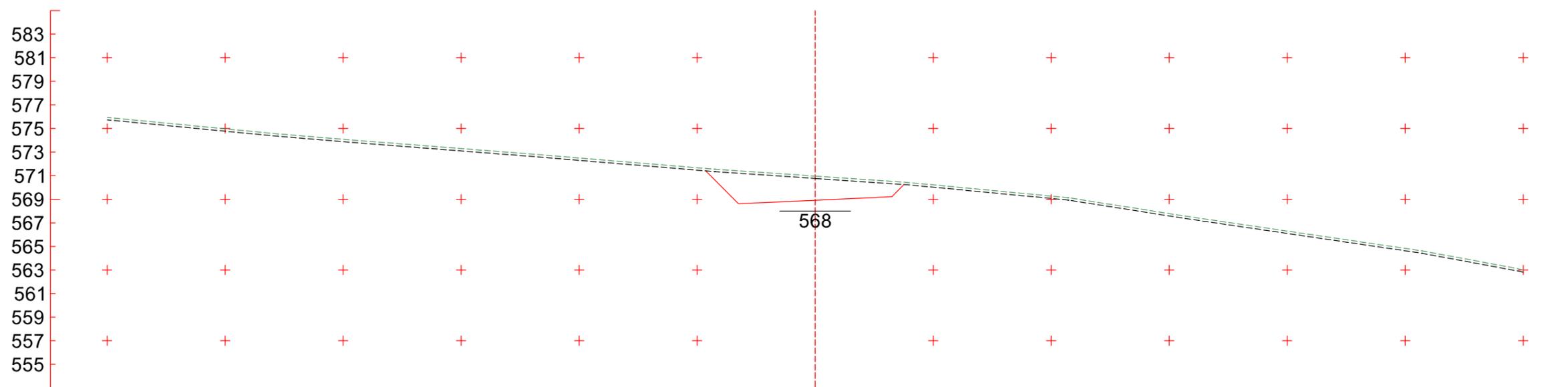
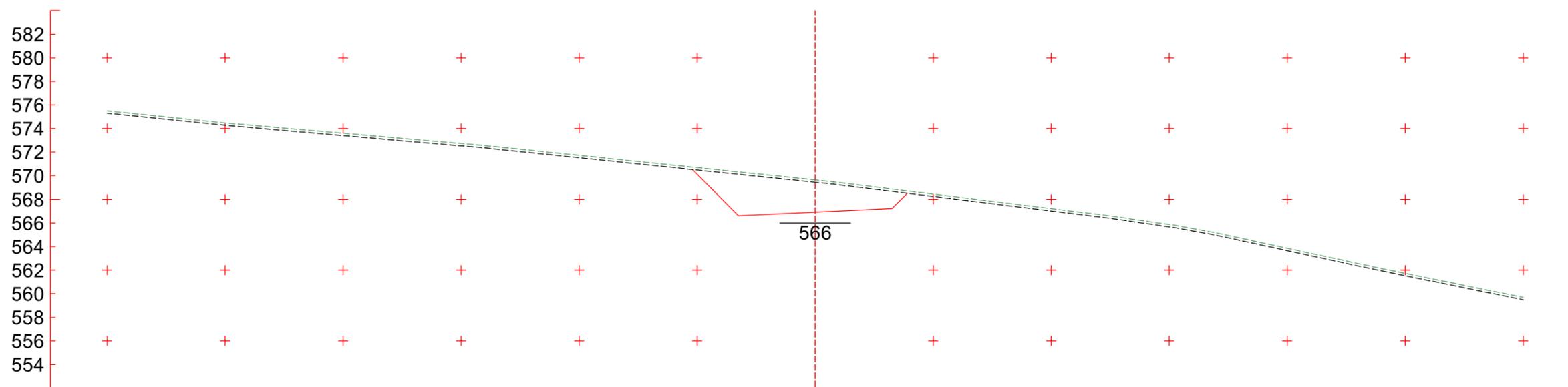
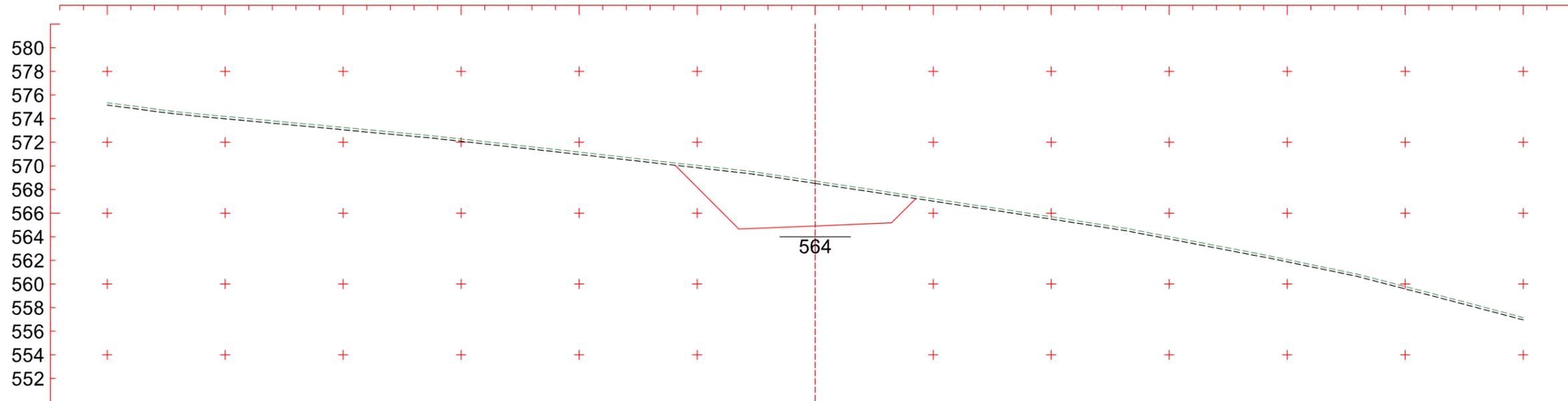
Lote 2
 Escala 1:400



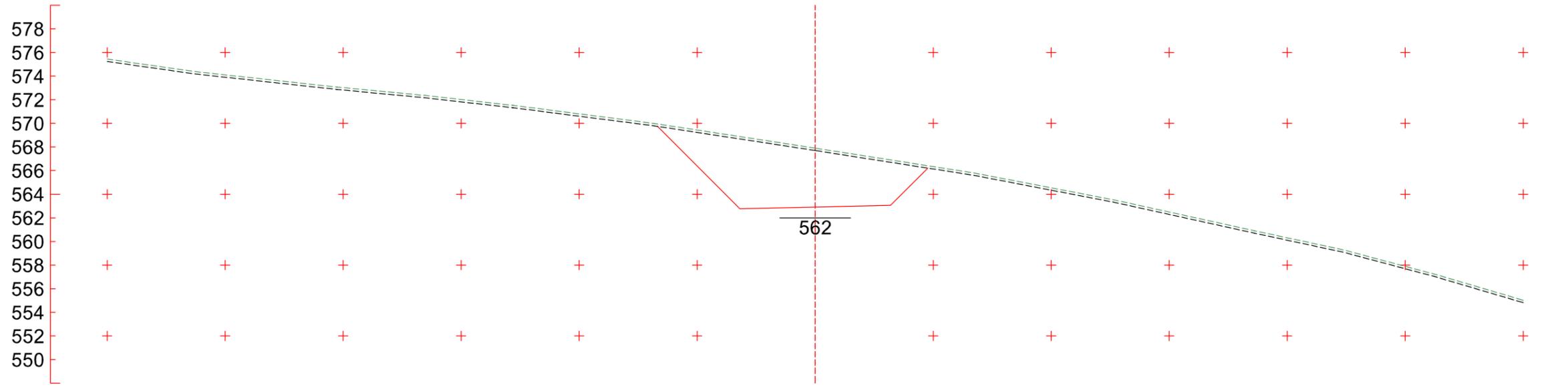
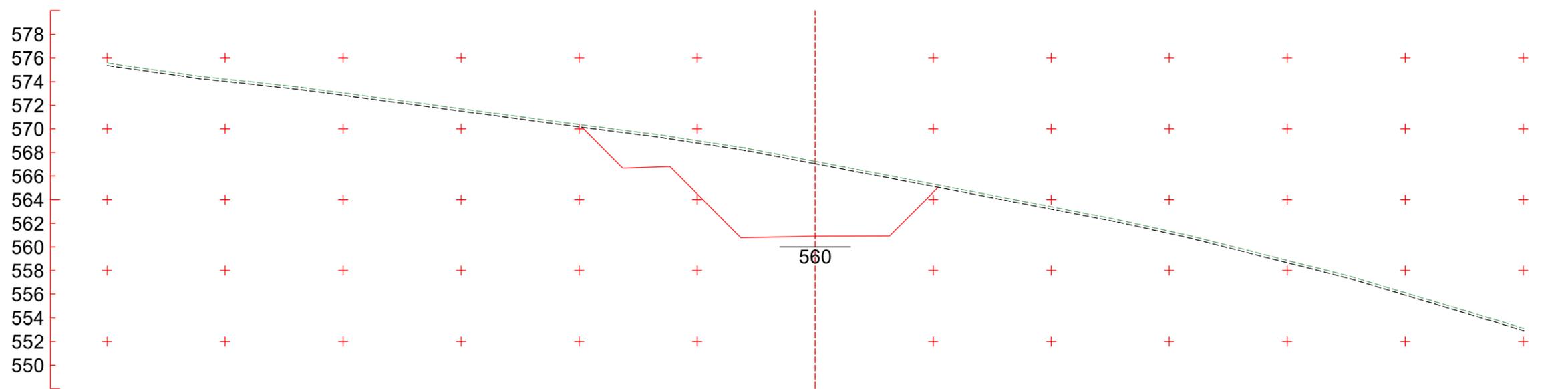
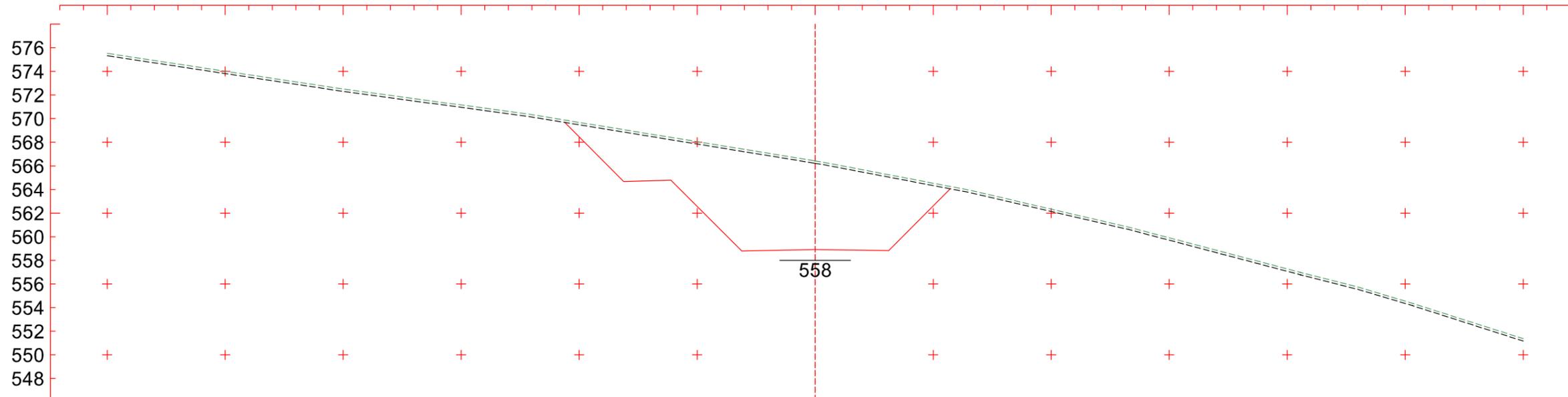
Lote 2
 Escala 1:400



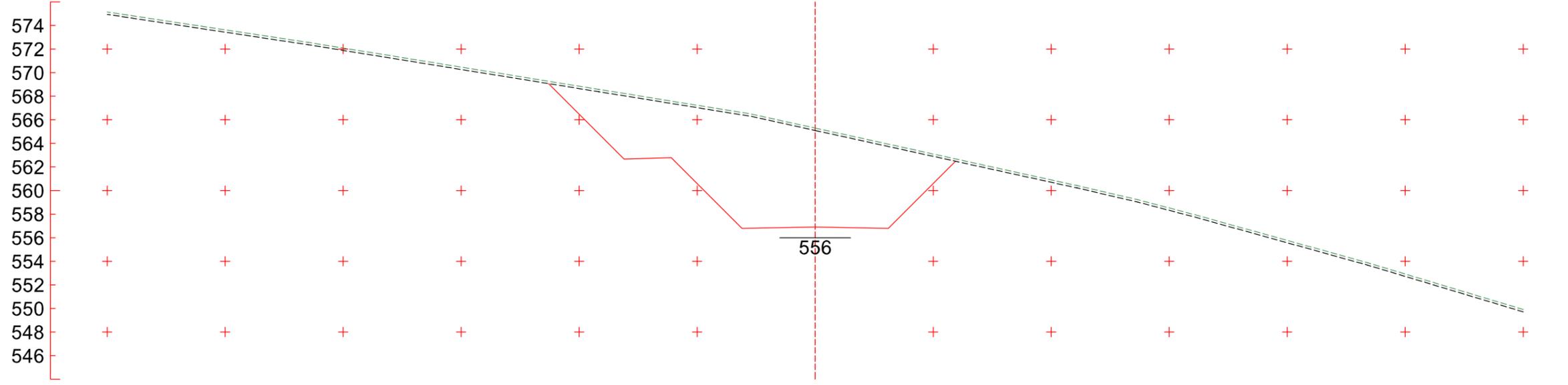
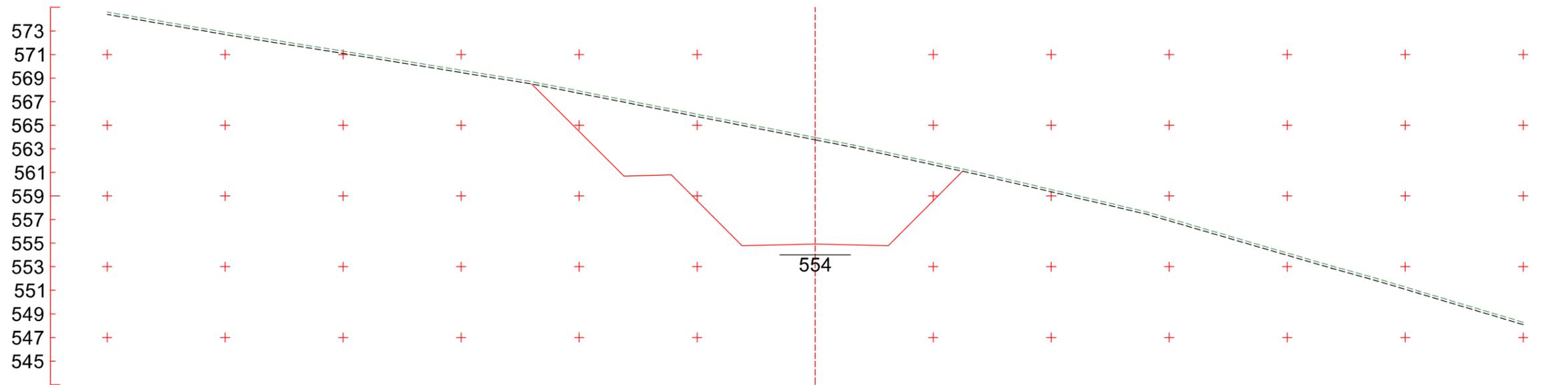
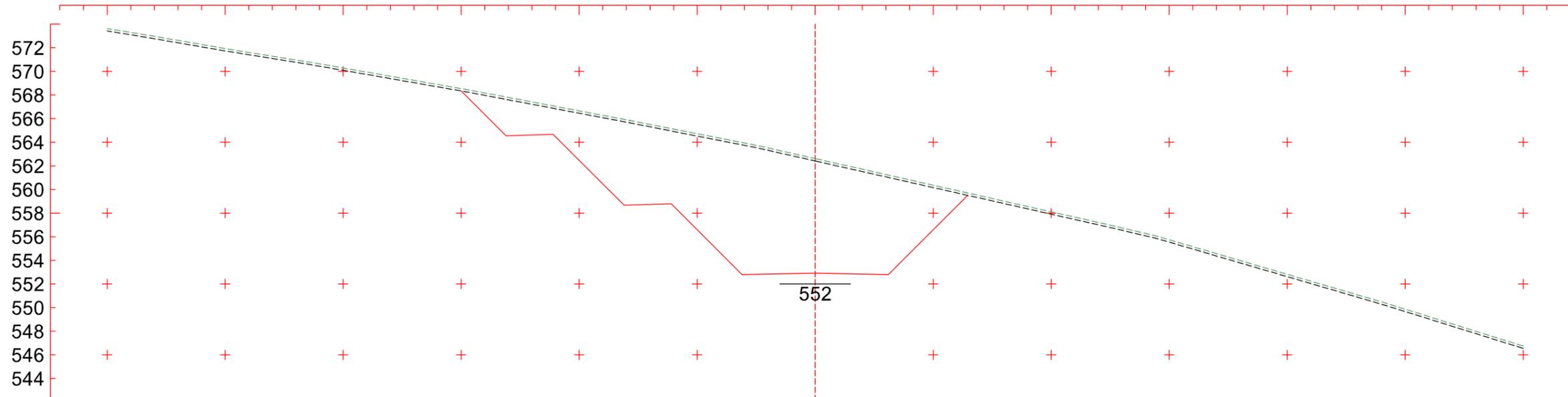
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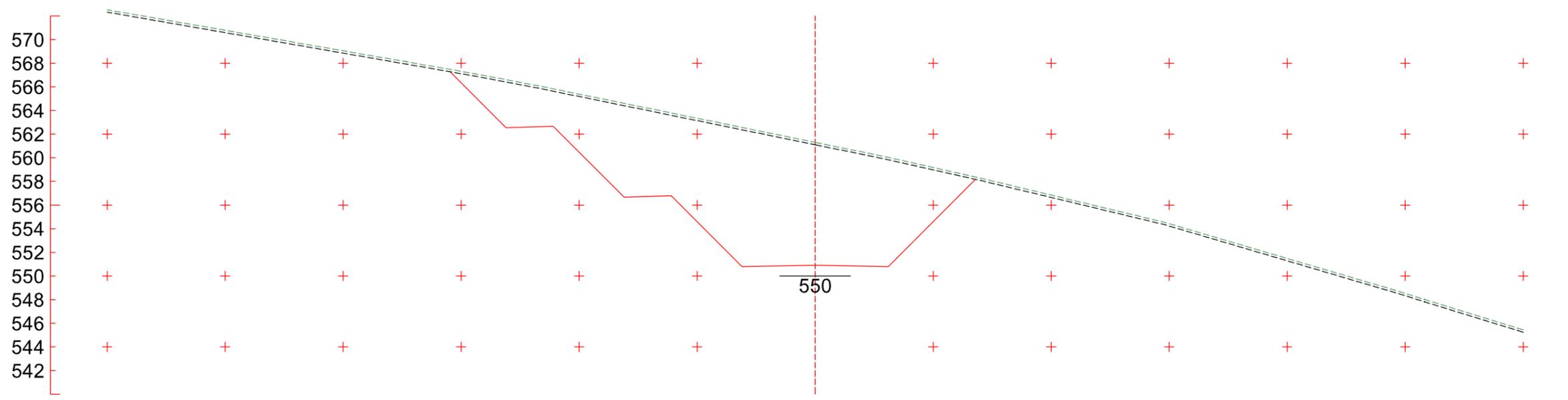
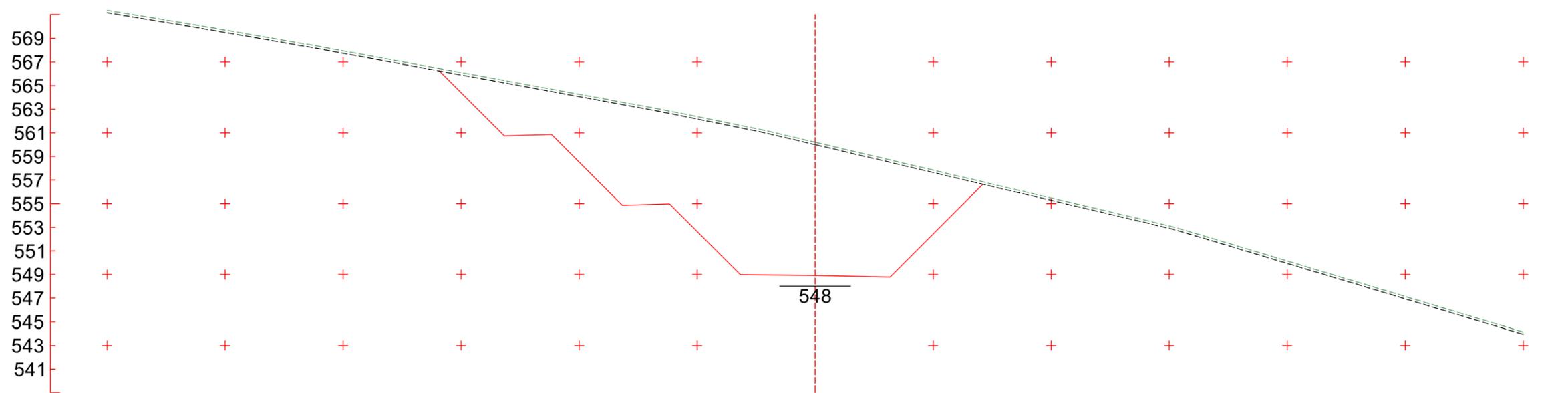
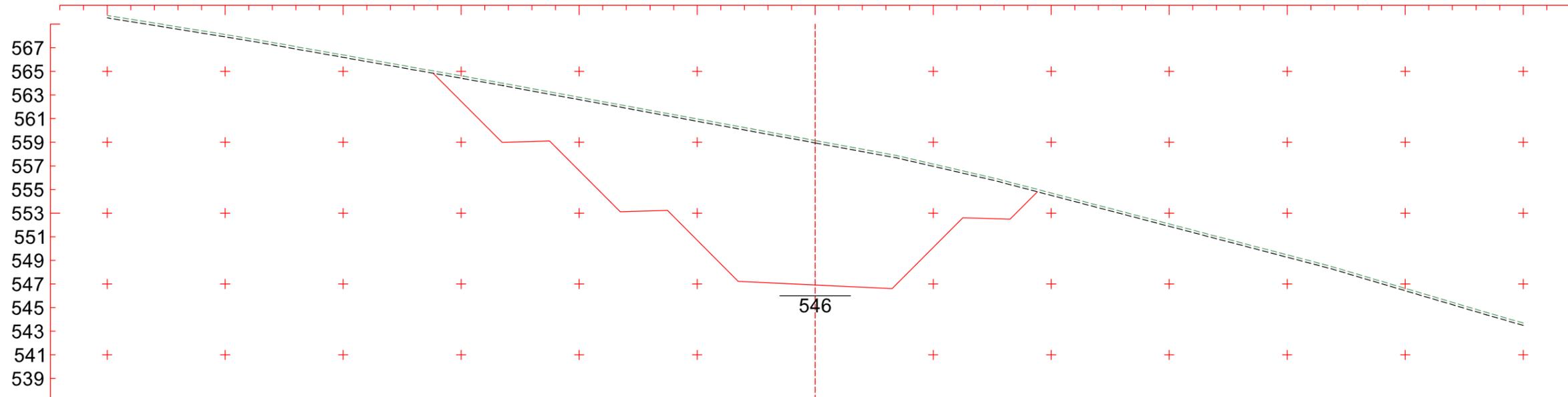
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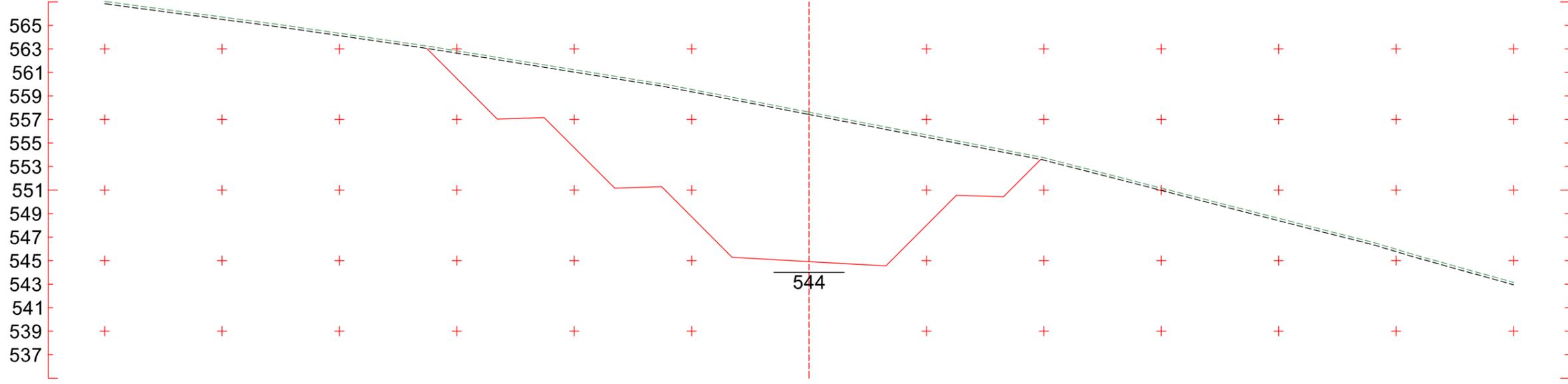
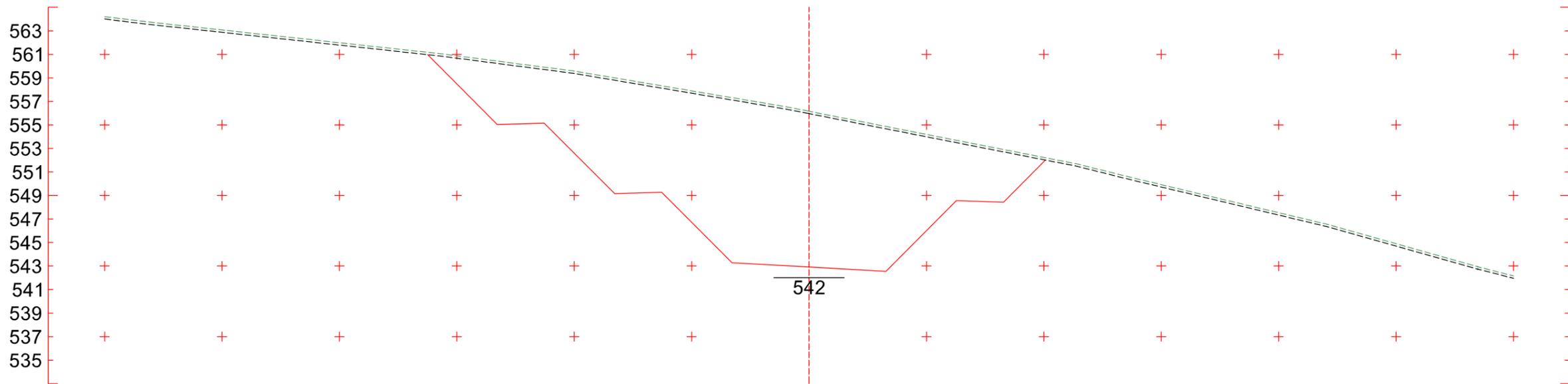
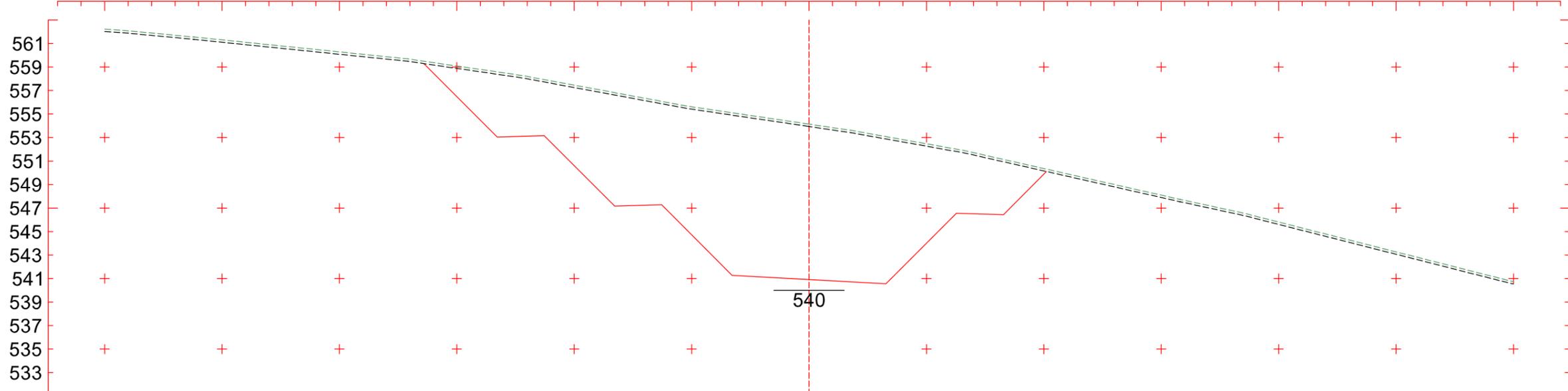
Lote 2
 Escala 1:400



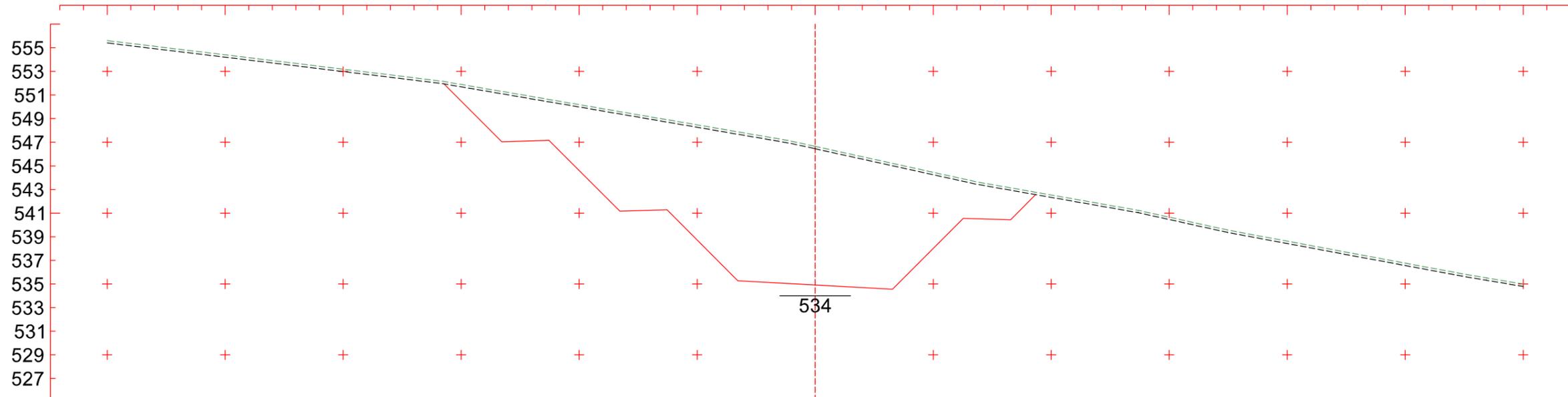
Lote 2
 Escala 1:400



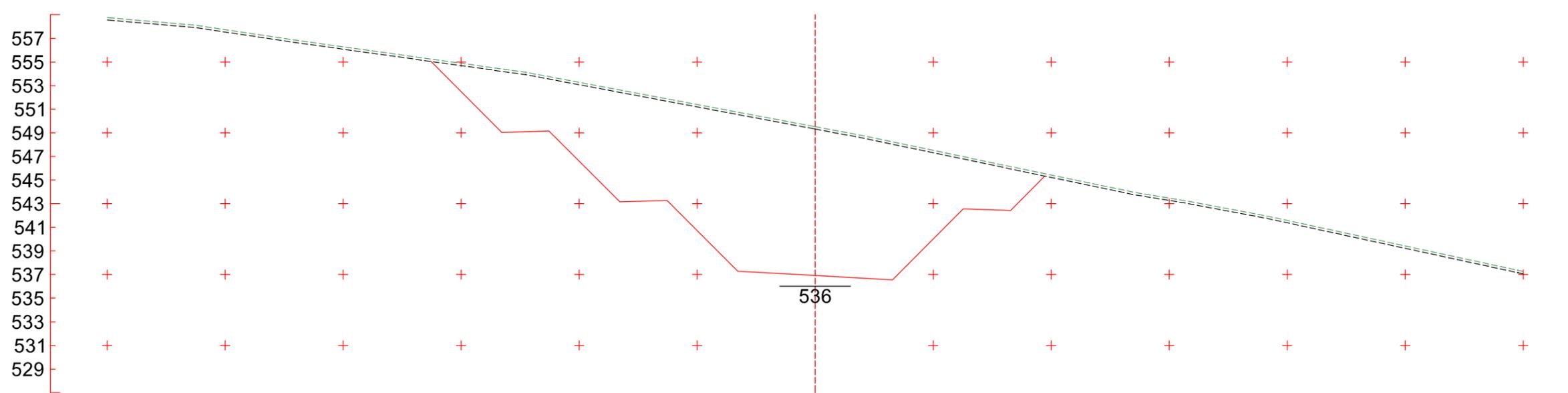
Lote 2
 Escala 1:400



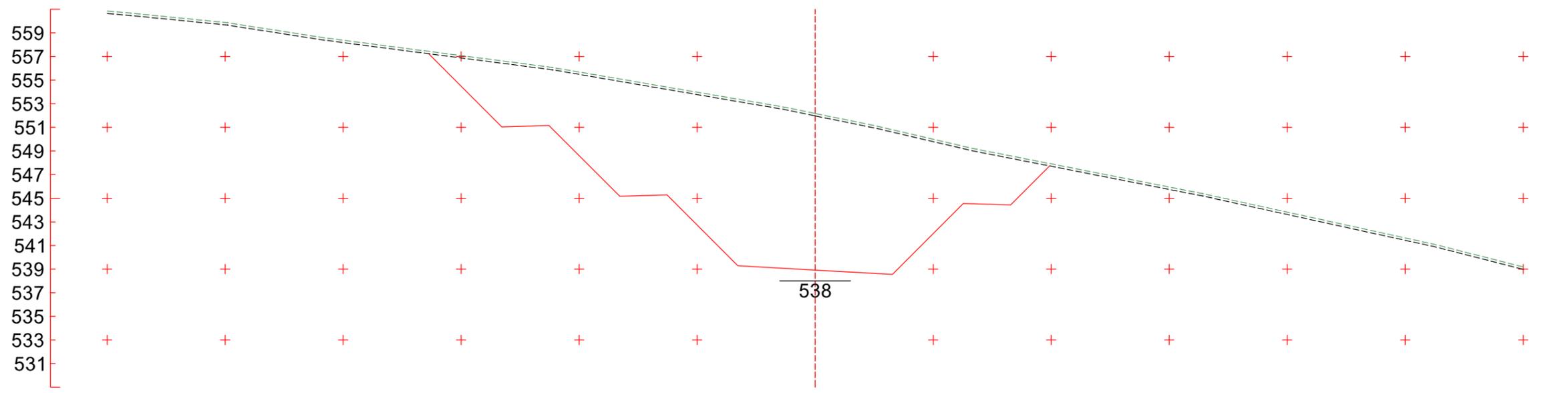
Lote 2
Escala 1:400



10+840
 CT 546,649 m
 CP 534,915 m

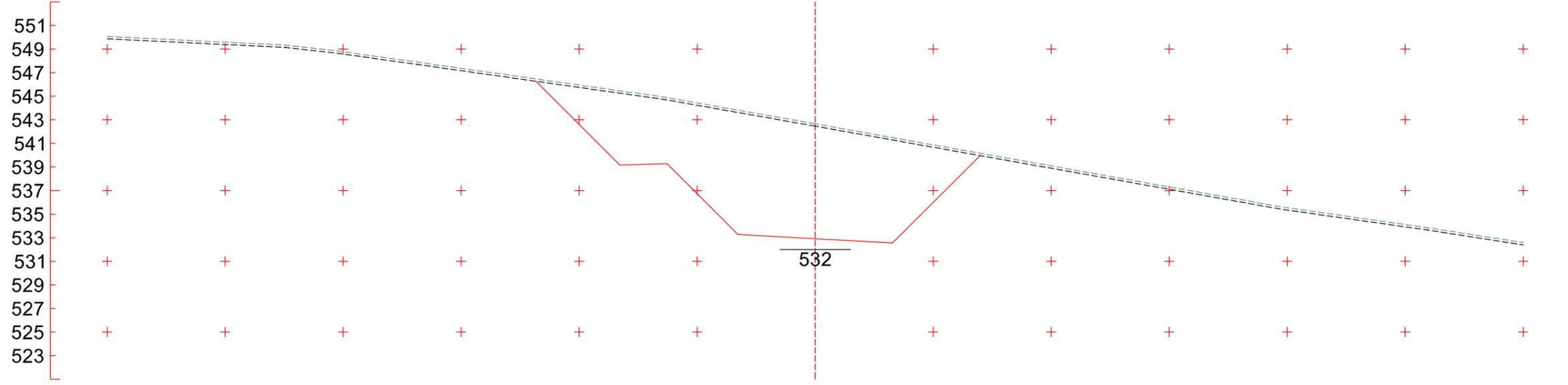
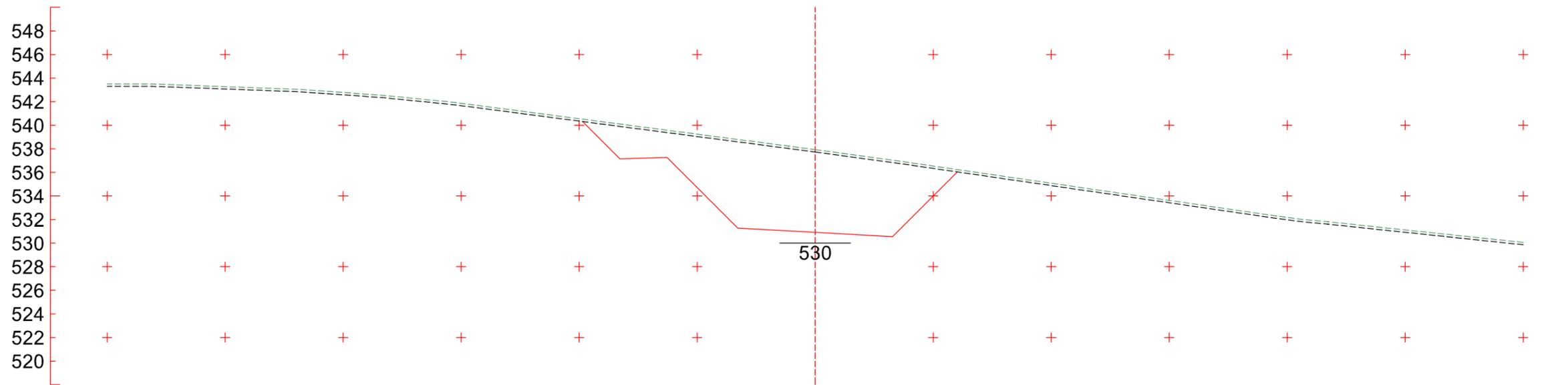
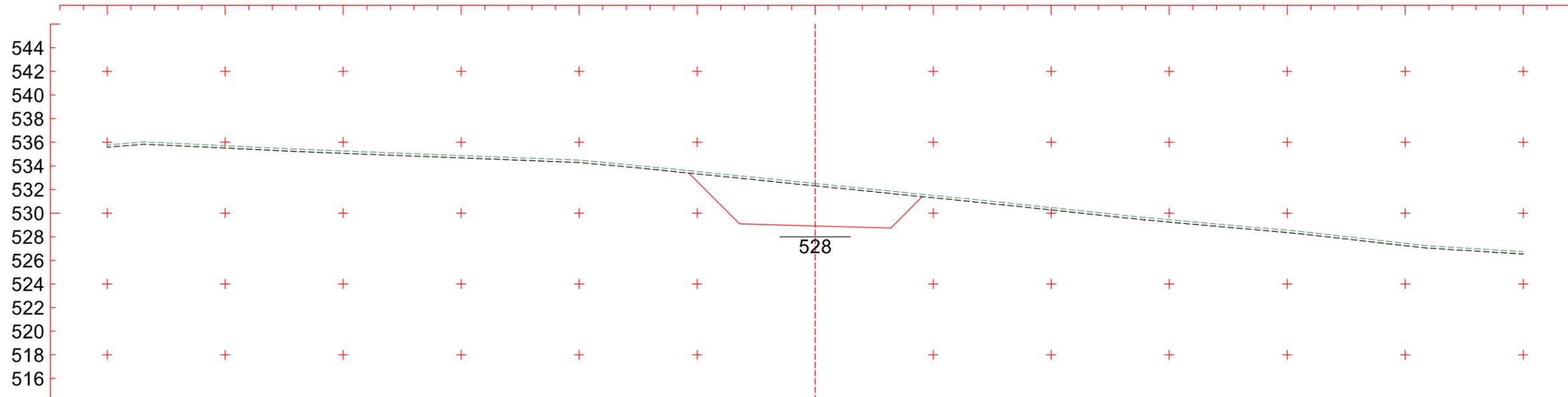


10+820
 CT 549,516 m
 CP 536,915 m

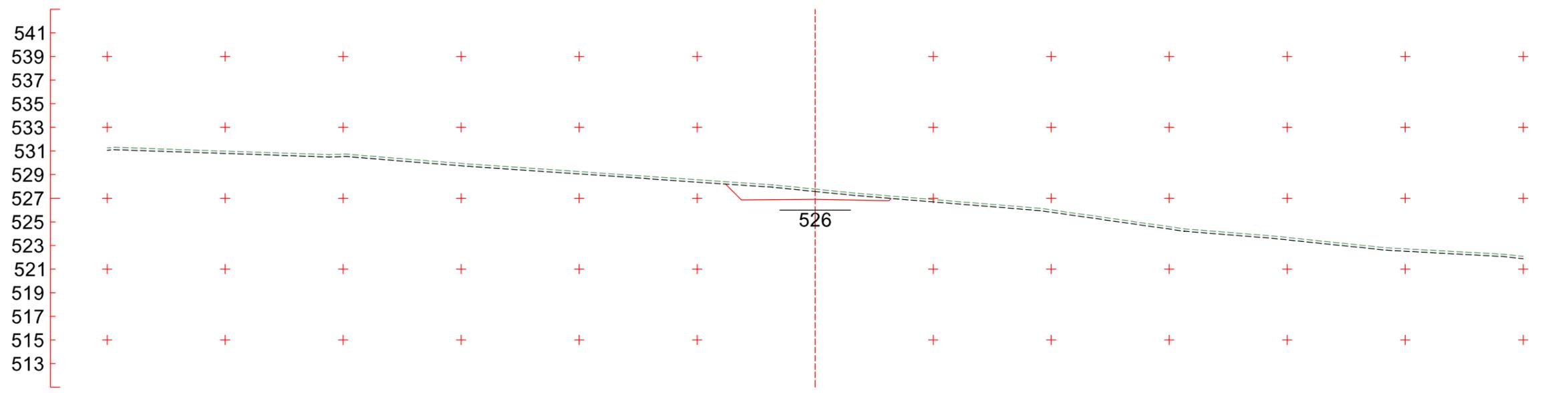
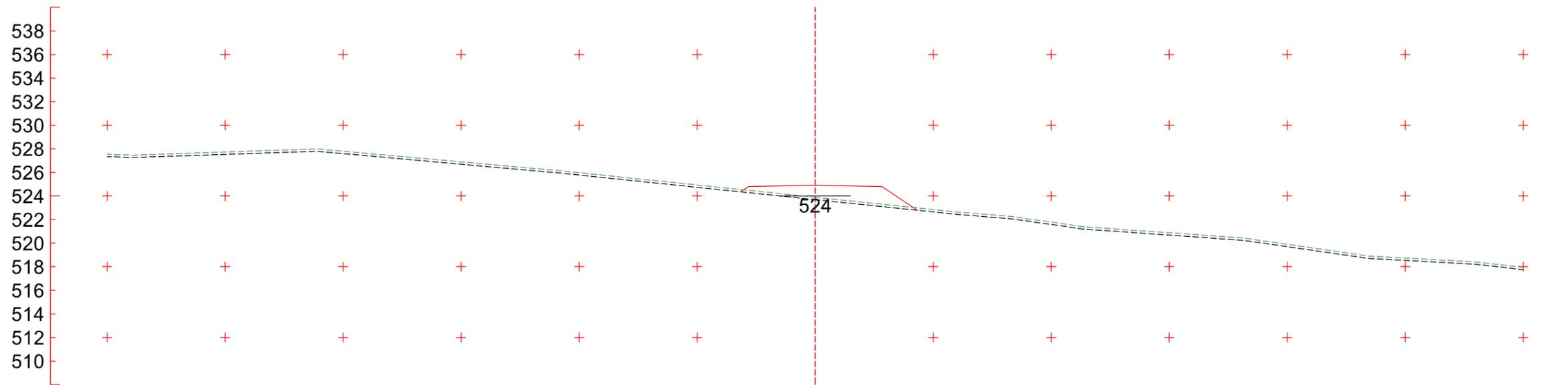
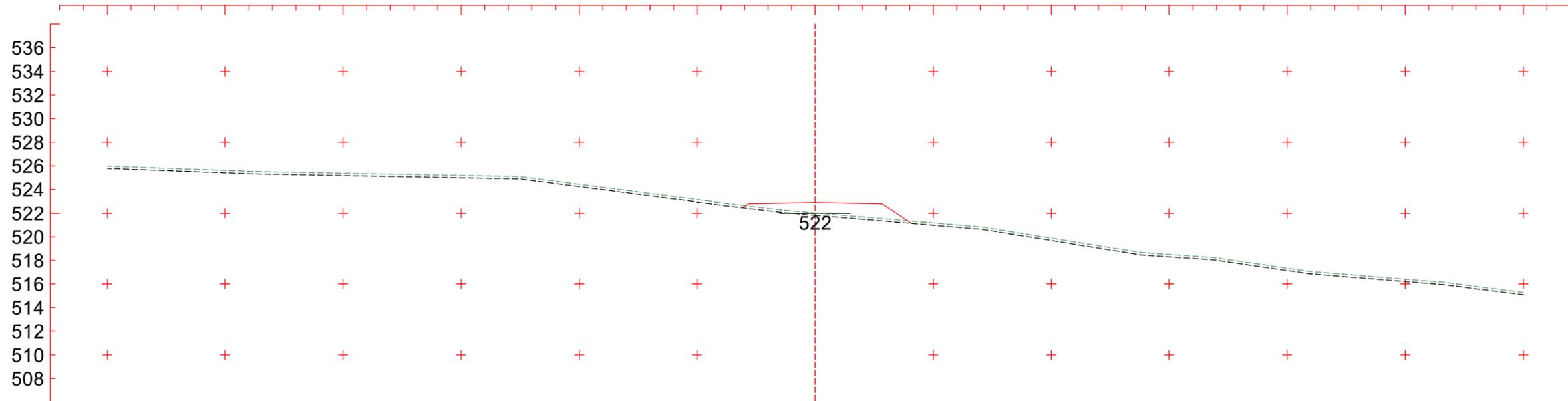


10+800
 CT 552,175 m
 CP 538,915 m

Lote 2
 Escala 1:400



Lote 2
 Escala 1:400



Lote 2
 Escala 1:400

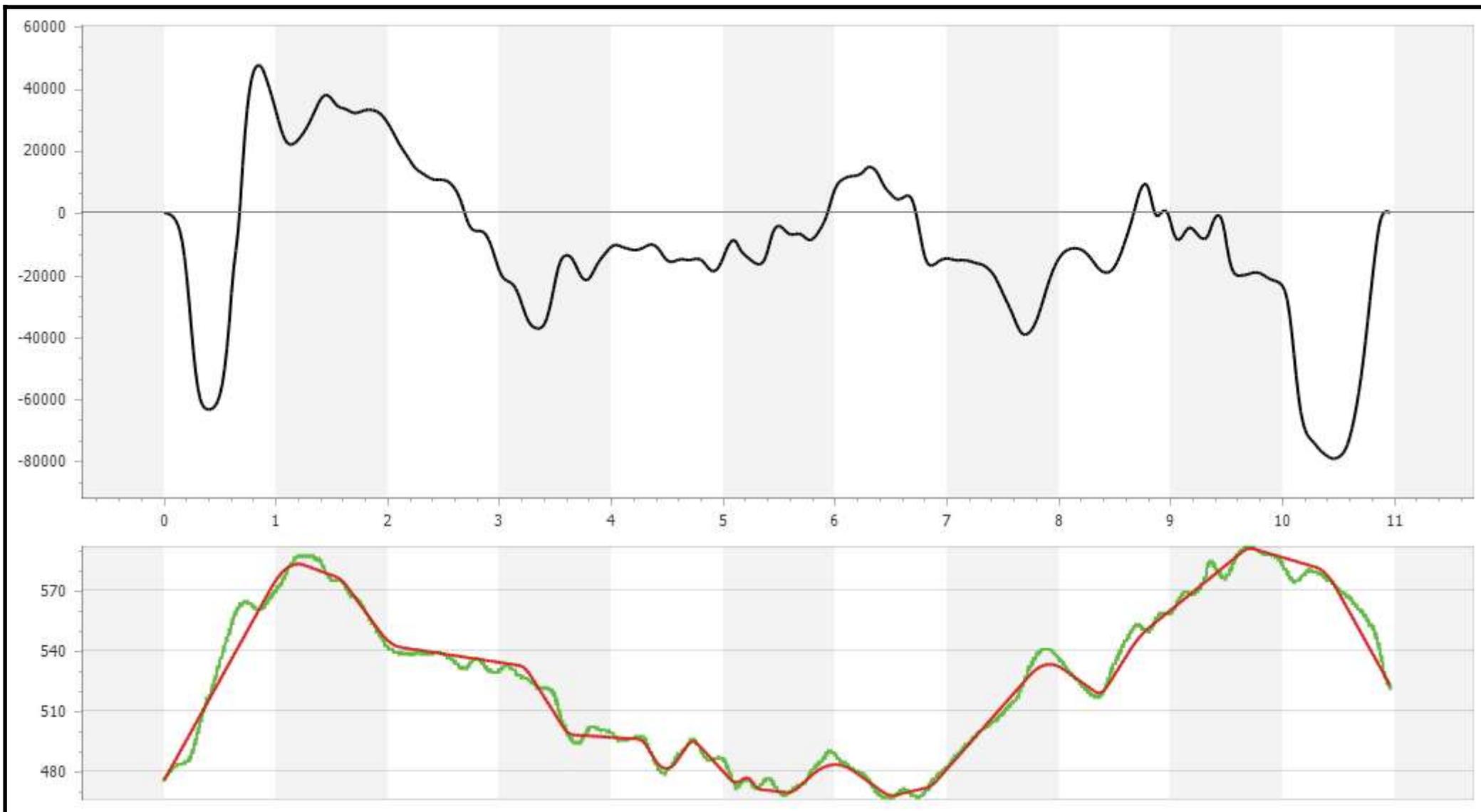
PROJETO DE TERRAPLENAGEM

DIAGRAMA DE MASSAS (BRÜCKNER)

Rodovia: Roca Sales - Coronel Pilar - BB
Trecho: Lote 2
Segmento: km: 0+000,00 ao km: 10+973,80

Homogeneização:
- Aterro Camada Superior: 1,000
- Aterro Camada Inferior : 1,000

- Corte 1ª Categoria: 1,300
- Corte 2ª Categoria: 1,000
- Corte 3ª Categoria: 0,800



QUADRO DE ORIENTAÇÃO DA TERRAPLENAGEM

Rodovia: Roca Sales - Coronel Pilar - BB	Homogeneização:	- Corte 1ª Categoria: 1,300	Vol. transp. : 484212,03m³
Trecho: Lote 2	- Aterro Camada Superior: 1,000	- Corte 2ª Categoria: 1,000	Momento tot.: 347132,02m³.m
Segmento: km: 0+000,00 ao km: 10+973,80	- Aterro Camada Inferior : 1,000	- Corte 3ª Categoria: 0,800	DMT : 0,717km

ORIGEM						DESTINO						TRANSPORTE			OBSERVAÇÕES					
IDENTIFICAÇÃO		LOCALIZAÇÃO			VOLUMES (m3)			IDENTIFICAÇÃO		LOCALIZAÇÃO			VOLUME	DIST.		VOL.	MOM. DE			
ESPECIFICAÇÃO		FATOR	POSICIONAMENTO			DM	GEO.	HOMOGENEIZADO		ESPECIFICAÇÃO		POSICIONAMENTO				DM	GEO.	TRANSP.	COMP.	TRANSP.
ID	TIPO	HOMO.	INÍCIO	CM	FIM	(km)	TOTAL	TOTAL	PARC.	ID	TIPO	INÍCIO	CM	FIM		(km)	TOTAL	(km)	(m³)	(m³ x km)
C01-1	C1ª	1,30	0+000	0+010	0+030		31,00	23,85												
									23,85	A01-I	AI	0+000	0+220	0+390		56177,00	0,210	31,00	6,510	
C02-1	C1ª	1,30	0+390	0+640	0+870		144646,00	111266,15												
									56153,15	A01-I	AI	0+000	0+220	0+390			0,420	72999,10	30659,622	
									7323,00	A01-S	AS	0+000	0+210	0+410		7323,00	0,430	9519,90	4093,557	
									21048,00	A02-I	AI	0+830	0+980	1+130		21048,00	0,340	27362,40	9303,216	
									4744,00	A02-S	AS	0+830	0+970	1+130		4744,00	0,330	6167,20	2035,176	
									3574,00	A03-I	AI	1+450	1+540	1+690		3574,00	0,900	4646,20	4181,580	
									2339,00	A03-S	AS	1+430	1+560	1+710		2339,00	0,920	3040,70	2797,444	
									16085,00	A04-I1	AI	1+830	2+110	2+430		16215,00	1,470	20910,50	30738,435	
C03-1	C1ª	1,30	1+110	1+300	1+470		20899,00	16076,15												
									130,00	A04-I1	AI	1+830	2+110	2+430			0,810	169,00	136,890	
									12993,00	A04-I2	AI	2+490	2+660	2+790		12993,00	1,360	16890,90	22971,624	
									2953,15	A04-I3	AI	2+830	3+070	3+330		25028,00	1,770	3839,10	6795,207	
C04-1	C1ª	1,30	1+570	1+580	1+590		28,00	21,54												
									21,54	A04-I3	AI	2+830	3+070	3+330			1,490	28,00	41,720	
C05-1	C1ª	1,30	1+690	1+760	1+890		1441,00	1108,46												
									1108,46	A04-I3	AI	2+830	3+070	3+330			1,310	1441,00	1887,710	
C06-1	C1ª	1,30	2+410	2+460	2+510		148,00	113,85												
									113,85	A04-I3	AI	2+830	3+070	3+330			0,610	148,00	90,280	
C07-1	C1ª	1,30	2+790	2+800	2+830		28,00	21,54												
									21,54	A04-I3	AI	2+830	3+070	3+330			0,270	28,00	7,560	
C08-1	C1ª	1,30	3+350	3+470	3+610		4311,00	3316,15												
									3316,15	A04-I3	AI	2+830	3+070	3+330			0,400	4311,00	1724,400	
C08-2	C2ª	1,00	3+350	3+470	3+590		8585,00	8585,00												
									8585,00	A04-I3	AI	2+830	3+070	3+330			0,400	8585,00	3434,000	
C08-3	C3ª	0,80	3+390	3+470	3+570		9441,00	11801,25												
									8908,31	A04-I3	AI	2+830	3+070	3+330			0,400	7126,65	2850,658	
									2892,94	A05-I	AI	3+610	3+680	3+770		6191,00	0,210	2314,35	486,014	
C09-1	C1ª	1,30	3+750	3+900	4+050		3727,00	2866,92												
									2866,92	A04-S	AS	1+830	2+610	3+350		16512,00	1,290	3727,00	4807,830	
C09-2	C2ª	1,00	3+770	3+890	4+010		6664,00	6664,00												
									6664,00	A04-S	AS	1+830	2+610	3+350			1,280	6664,00	8529,920	
C09-3	C3ª	0,80	3+790	3+850	3+990		1546,00	1932,50												
									1932,50	A05-I	AI	3+610	3+680	3+770			0,170	1546,00	262,820	
C10-1	C1ª	1,30	4+110	4+280	4+410		2950,00	2269,23												
									2269,23	A04-S	AS	1+830	2+610	3+350			1,670	2950,00	4926,500	
C11-1	C1ª	1,30	4+530	4+570	4+630		1184,00	910,77												
									910,77	A04-S	AS	1+830	2+610	3+350			1,960	1184,00	2320,640	
C12-1	C1ª	1,30	4+670	4+730	4+810		597,00	459,23												
									459,23	A04-S	AS	1+830	2+610	3+350			2,120	597,00	1265,640	
C13-1	C1ª	1,30	4+890	5+000	5+130		13719,00	10553,08												
									3341,85	A04-S	AS	1+830	2+610	3+350			2,390	4344,40	10383,116	

QUADRO DE ORIENTAÇÃO DA TERRAPLENAGEM

Rodovia: Roca Sales - Coronel Pilar - BB	Homogeneização:	- Corte 1ª Categoria: 1,300	Vol. transp. : 484212,03m³
Trecho: Lote 2	- Aterro Camada Superior: 1,000	- Corte 2ª Categoria: 1,000	Momento tot.: 347132,02m³.m
Segmento: km: 0+000,00 ao km: 10+973,80	- Aterro Camada Inferior : 1,000	- Corte 3ª Categoria: 0,800	DMT : 0,717km

ORIGEM						DESTINO						TRANSPORTE			OBSERVAÇÕES					
IDENTIFICAÇÃO			LOCALIZAÇÃO			VOLUMES (m3)			IDENTIFICAÇÃO			LOCALIZAÇÃO				VOLUME	DIST.	VOL.	MOM. DE	
ESPECIFICAÇÃO		FATOR	POSICIONAMENTO			DM	GEO.	HOMOGENEIZADO		ESPECIFICAÇÃO		POSICIONAMENTO				DM	GEO.	TRANSP.	COMP.	TRANSP.
ID	TIPO	HOMO.	INÍCIO	CM	FIM	(km)	TOTAL	TOTAL	PARC.	ID	TIPO	INÍCIO	CM	FIM		(km)	TOTAL	(km)	(m³)	(m³ x km)
C14-1	C1ª	1,30	5+170	5+790	6+370		52480,00	1365,56		A05-I	AI	3+610	3+680	3+770			1,320	1775,23	2343,297	
								1964,00		A05-S	AS	3+590	3+680	3+790	1964,00	1,320	2553,20	3370,224		
								782,00		A06-I	AI	4+050	4+120	4+230	782,00	0,880	1016,60	894,608		
								1163,00		A06-S	AS	4+030	4+120	4+270	1163,00	0,880	1511,90	1330,472		
								1936,67		A07-I	AI	4+350	4+440	4+530	3973,00	0,560	2517,67	1409,898		
								2036,33		A07-I	AI	4+350	4+440	4+530		1,350	2647,23	3573,754		
								1877,00		A07-S	AS	4+330	4+440	4+550	1877,00	1,350	2440,10	3294,135		
								8,00		A08-I	AI	4+650	4+660	4+670	8,00	1,130	10,40	11,752		
								275,00		A08-S	AS	4+610	4+650	4+690	275,00	1,140	357,50	407,550		
								2809,00		A09-I	AI	4+770	4+840	4+910	2809,00	0,950	3651,70	3469,115		
								1384,00		A09-S	AS	4+750	4+840	4+930	1384,00	0,950	1799,20	1709,240		
								5796,00		A10-I	AI	5+090	5+170	5+330	5796,00	0,620	7534,80	4671,576		
								2664,00		A10-S	AS	5+070	5+190	5+330	2664,00	0,600	3463,20	2077,920		
								4236,00		A11-I	AI	5+470	5+630	5+790	4236,00	0,160	5506,80	881,088		
2531,00		A11-S	AS	5+470	5+630	5+830	2531,00	0,160	3290,30	526,448										
497,00		A12-I1	AI	6+110	6+170	6+250	497,00	0,380	646,10	245,518										
16255,90		A12-I2	AI	6+270	6+640	6+890	26005,00	0,850	21132,68	17962,774										
C15-1	C1ª	1,30	6+450	6+600	6+690		3030,00	2330,77		A12-I2	AI	6+270	6+640	6+890			0,050	3030,00	151,500	
								6513,85		A12-I2	AI	6+270	6+640	6+890		0,380	8468,00	3217,840		
C16-1	C1ª	1,30	6+810	7+020	7+330		8468,00	6513,85		A12-I2	AI	6+270	6+640	6+890			0,380	8468,00	3217,840	
C17-1	C1ª	1,30	7+690	7+880	8+210		36515,00	28088,46		A12-I2	AI	6+270	6+640	6+890			1,240	1175,83	1458,023	
								904,48		A12-I2	AI	6+270	6+640	6+890		0,420	27259,70	11449,074		
								20969,00		A12-I3	AI	6+910	7+460	7+690	20969,00	0,960	8079,47	7756,296		
C18-1	C1ª	1,30	8+410	8+710	9+210		48068,00	36975,38		A12-S	AS	6+050	6+920	7+690			1,790	14631,53	26190,430	
								11255,02		A12-S	AS	6+050	6+920	7+690		0,420	6945,90	2917,278		
								5343,00		A13-I	AI	8+130	8+290	8+410	5343,00	0,430	3474,90	1494,207		
								2673,00		A13-S	AS	8+090	8+280	8+430	2673,00	0,200	21349,90	4269,980		
								16423,00		A14-I	AI	8+750	8+910	9+090	16423,00	0,200	1665,77	333,155		
1281,37		A14-S	AS	8+750	8+910	9+110	5811,00													
C19-1	C1ª	1,30	9+250	9+360	9+430		10322,00	7940,00		A14-S	AS	8+750	8+910	9+110			0,450	5888,53	2649,836	
								4529,63		A15-I	AI	9+150	9+220	9+310	2632,00	0,140	3421,60	479,024		
								2632,00		A15-S	AS	9+150	9+220	9+310	1395,00	0,140	1011,87	141,662		
C20-1	C1ª	1,30	9+590	9+690	9+810		1598,00	1229,23		A15-S	AS	9+150	9+220	9+310			0,470	801,63	376,764	
								616,63		A16-I	AI	9+430	9+500	9+610	16371,00	0,190	796,37	151,311		
C21-1	C1ª	1,30	10+430	10+730	10+930		103791,00	79839,23		A16-I	AI	9+430	9+500	9+610			1,230	20485,93	25197,688	
								15758,40		A16-S	AS	9+410	9+500	9+610	3317,00	1,230	4312,10	5303,883		
								3317,00		A17-S	AS	9+630	9+650	9+670	14,00	1,080	18,20	19,656		

QUADRO DE ORIENTAÇÃO DA TERRAPLENAGEM

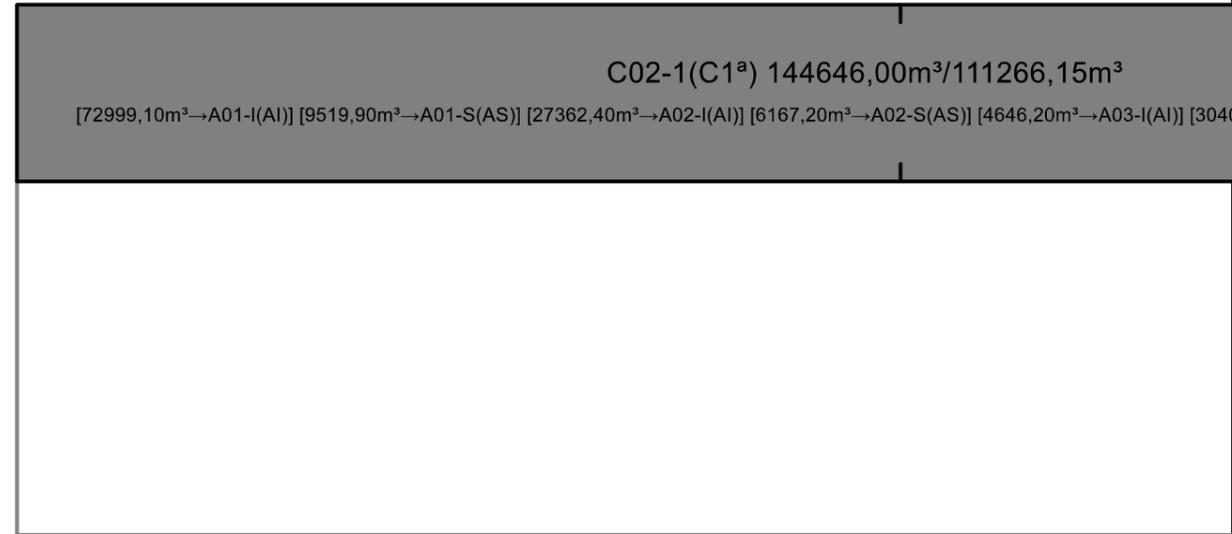
Rodovia: Roca Sales - Coronel Pilar - BB	Homogeneização:	- Corte 1ª Categoria: 1,300	Vol. transp. : 484212,03m³
Trecho: Lote 2	- Aterro Camada Superior: 1,000	- Corte 2ª Categoria: 1,000	Momento tot.: 347132,02m³.m
Segmento: km: 0+000,00 ao km: 10+973,80	- Aterro Camada Inferior : 1,000	- Corte 3ª Categoria: 0,800	DMT : 0,717km

ORIGEM							DESTINO							TRANSPORTE			OBSERVAÇÕES		
IDENTIFICAÇÃO		LOCALIZAÇÃO			VOLUMES (m3)		IDENTIFICAÇÃO		LOCALIZAÇÃO			VOLUME	DIST.	VOL.	MOM. DE				
ESPECIFICAÇÃO		POSICIONAMENTO		DM	GEO.	HOMOGENEIZADO		ESPECIFICAÇÃO		POSICIONAMENTO		DM	GEO.	TRANSP.	COMP.	TRANSP.			
ID	TIPO	HOMO.	INÍCIO	CM	FIM	(km)	TOTAL	TOTAL	PARC.	ID	TIPO	INÍCIO	CM	FIM	(km)	TOTAL		(km)	(m³)
							50117,00			A18-I	AI	9+750	10+110	10+450		50117,00	0,620	65152,10	40394,302
							10064,00			A18-S	AS	9+730	10+110	10+470		10064,00	0,620	13083,20	8111,584
							243,00			A19-I	AI	10+930	10+930	10+974		243,00	0,200	315,90	63,180
							322,00			A19-S	AS	10+930	10+940	10+974		322,00	0,210	418,60	87,906



Daqui

C01-1(C1^a) 31,00m³/23,85m³
[31,00m³→A01-I(AI)]



C02-1(C1^a) 144646,00m³/111266,15m³
[72999,10m³→A01-I(AI)] [9519,90m³→A01-S(AS)] [27362,40m³→A02-I(AI)] [6167,20m³→A02-S(AS)] [4646,20m³→A03-I(AI)] [30467,40m³→A03-S(AS)]

0+000

0+100

0+200

0+300

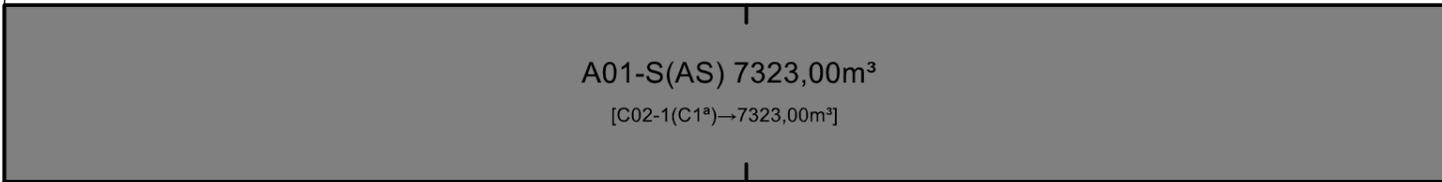
0+400

0+500

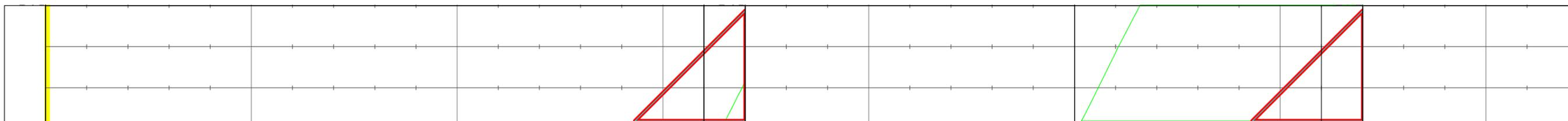
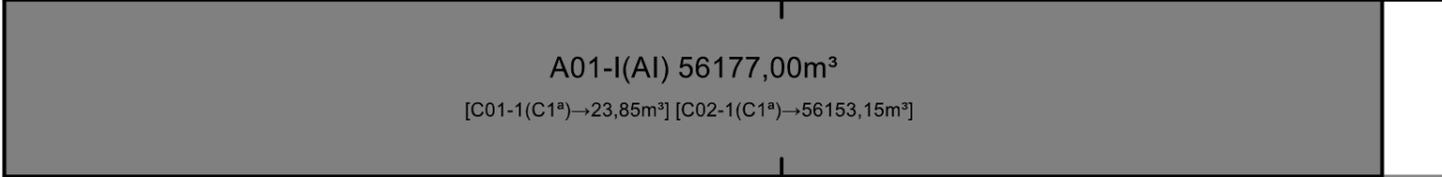
0+600

0+700

A01-S(AS) 7323,00m³
[C02-1(C1^a)→7323,00m³]



A01-I(AI) 56177,00m³
[C01-1(C1^a)→23,85m³] [C02-1(C1^a)→56153,15m³]

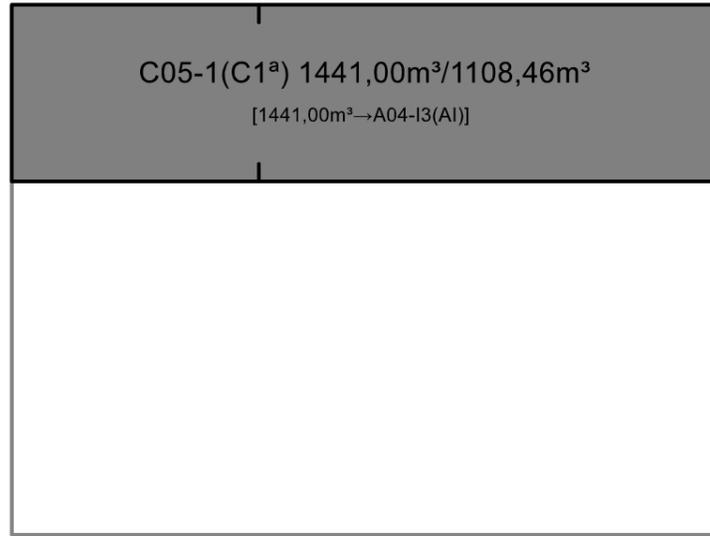




Daqui



C04-1(C1^a) 28,00m³/21,54m³
[28,00m³→A04-I3(AI)]



C05-1(C1^a) 1441,00m³/1108,46m³
[1441,00m³→A04-I3(AI)]

1+500

1+600

1+700

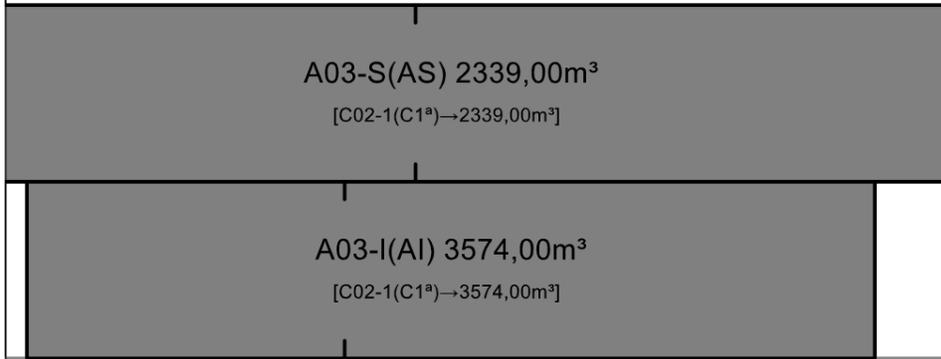
1+800

1+900

2+000

2+100

2+200

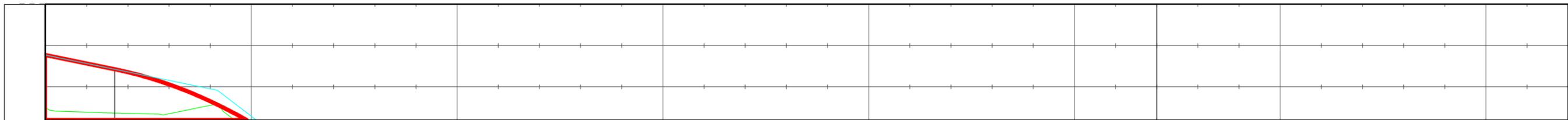


A03-S(AS) 2339,00m³
[C02-1(C1^a)→2339,00m³]

A03-I(AI) 3574,00m³
[C02-1(C1^a)→3574,00m³]

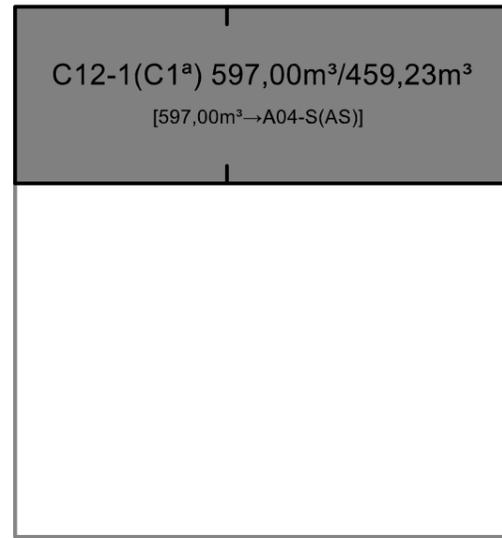
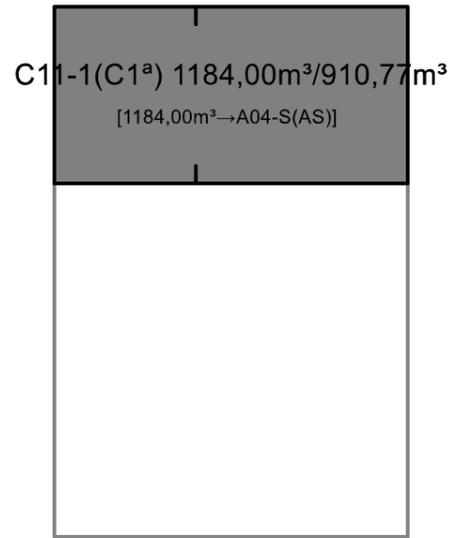


A04-I1(AI) 16215,00m³
[C02-1(C1^a)→16085,00m³] [C03-1(C1^a)→130,00m³]

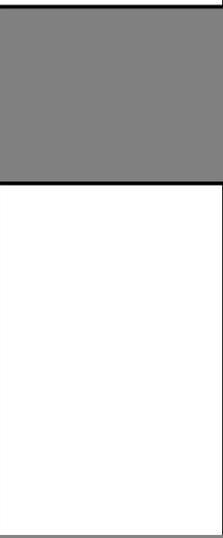
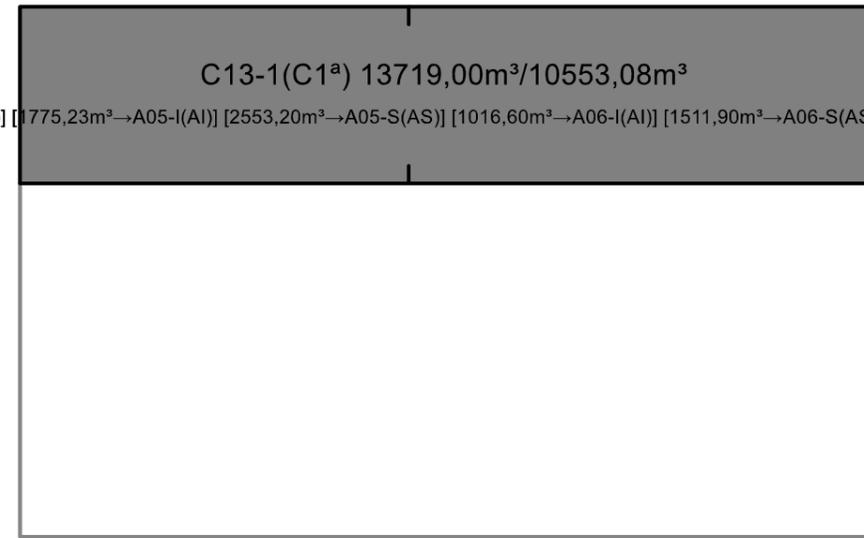




Daqui



[4344,40m³→A04-S(AS)] [775,23m³→A05-I(AI)] [2553,20m³→A05-S(AS)] [1016,60m³→A06-I(AI)] [1511,90m³→A06-S(AS)] [2517,67m³→



4+500

4+600

4+700

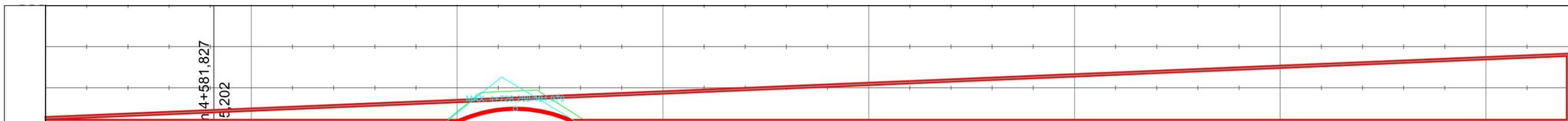
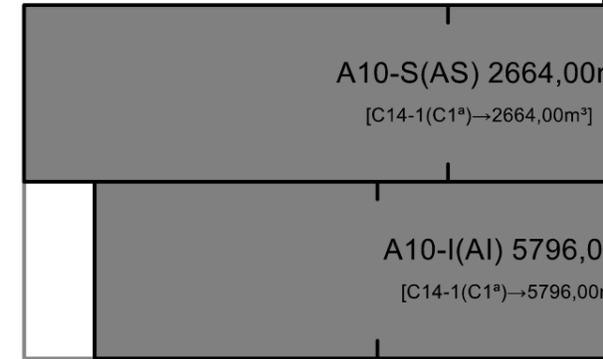
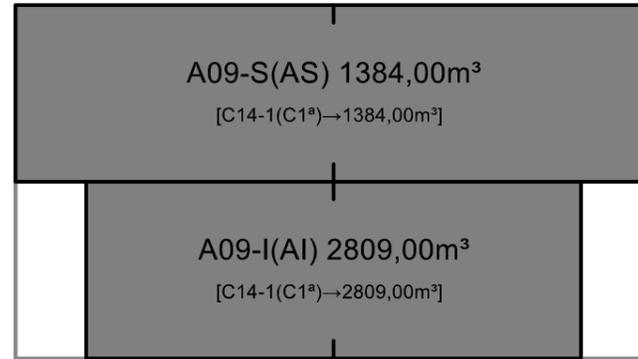
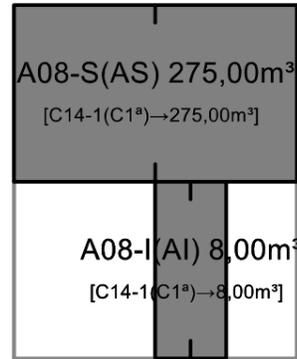
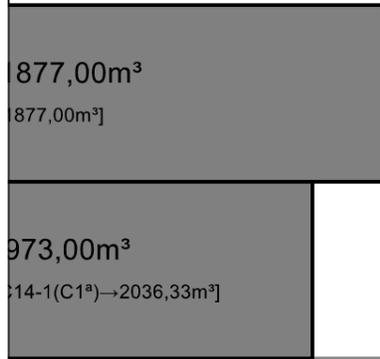
4+800

4+900

5+000

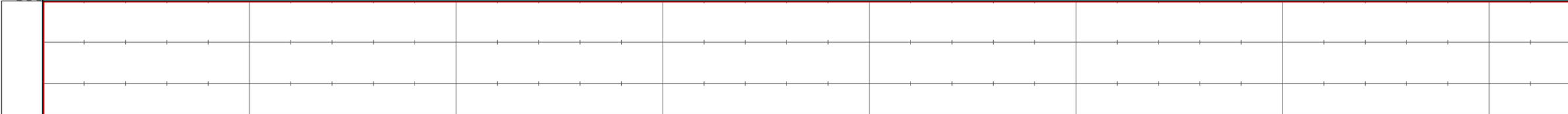
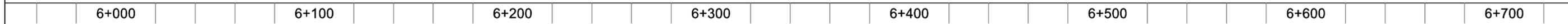
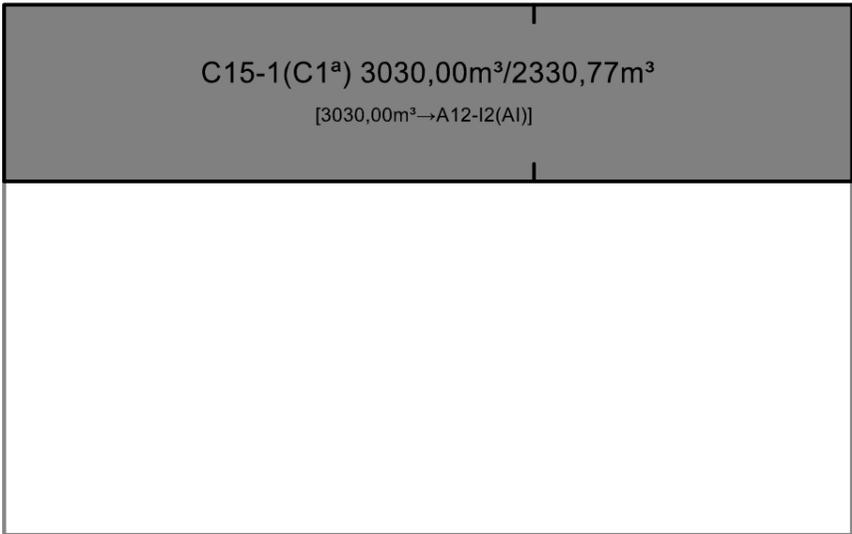
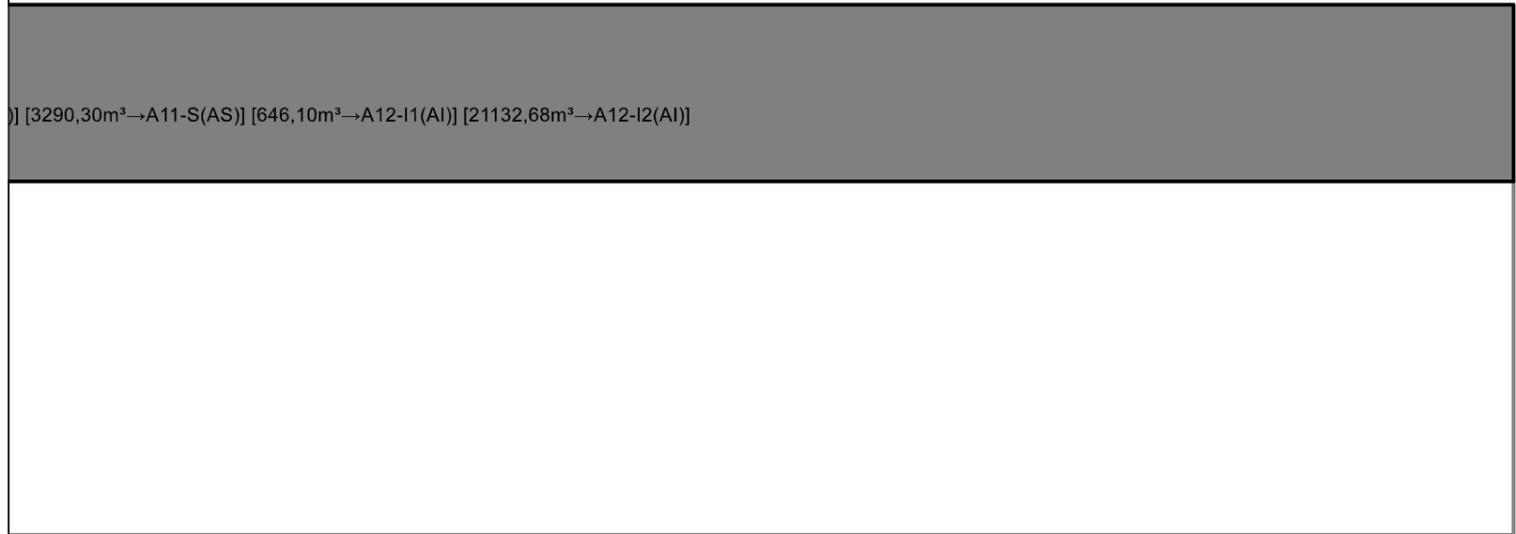
5+100

5+200



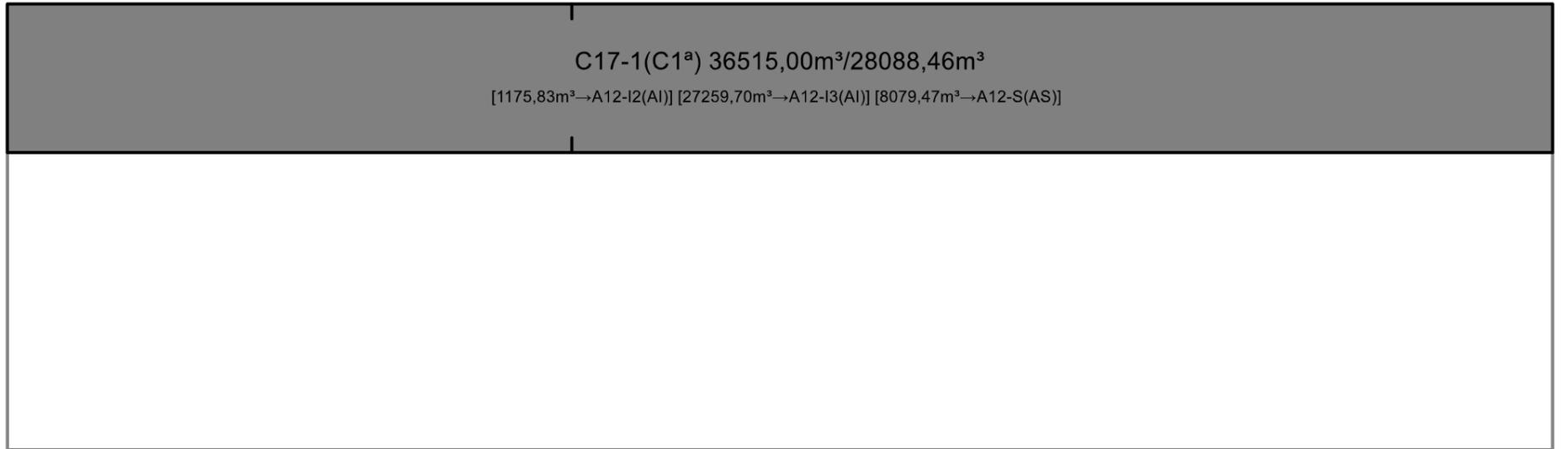


Daqui

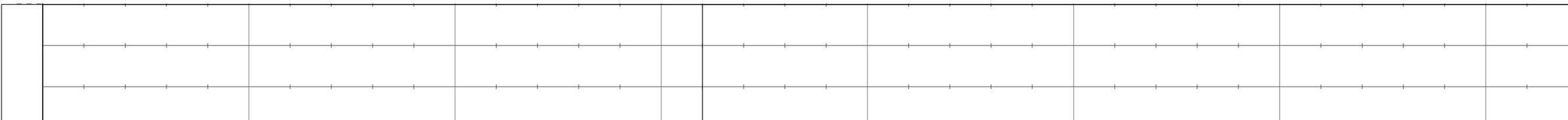




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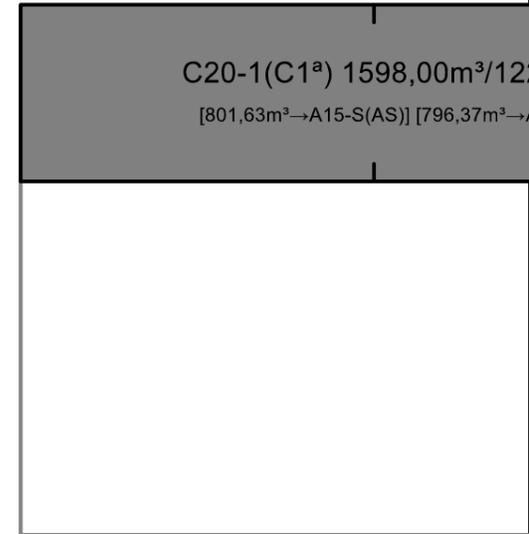
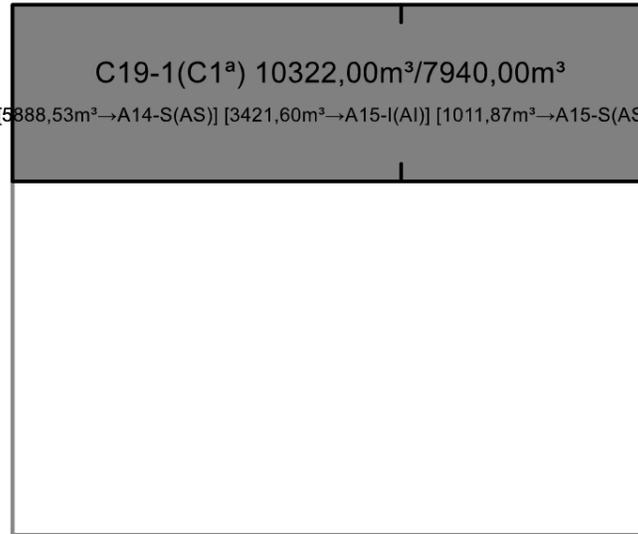


7+500 7+600 7+700 7+800 7+900 8+000 8+100 8+200

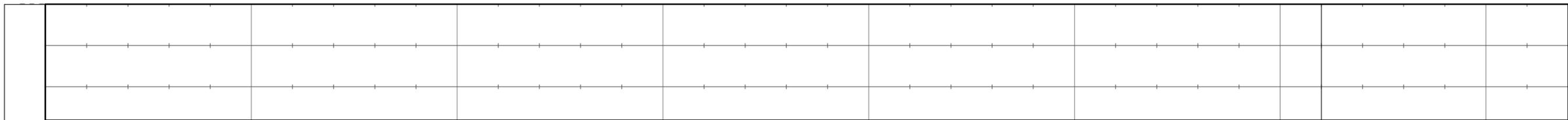
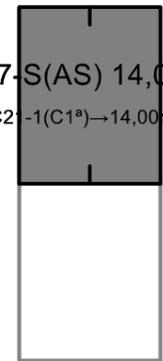
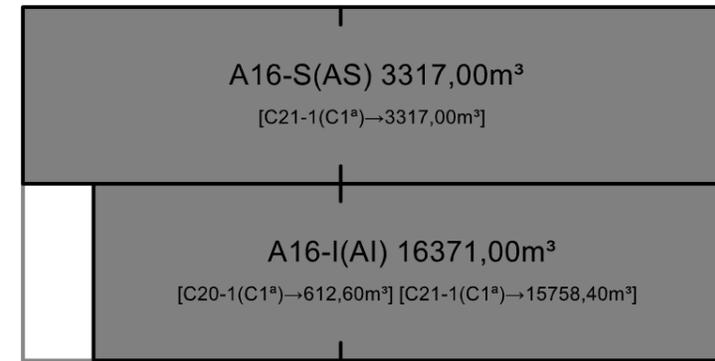
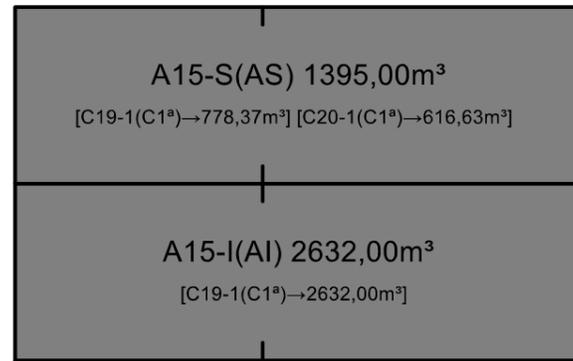




Daqui



9+000 9+100 9+200 9+300 9+400 9+500 9+600 9+700





Daqui

C21-1(C1ª) 103791,00m³/79839,23m³

10+500

10+600

10+700

10+800

10+900

11+000

11+100

11+200

A19-S(AS) 322,00m³

[C21-1(C1ª)→322,00m³]

A19-I(AI) 243,00m³

[C21-1(C1ª)→243,00m³]

