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ESTUDIO INFORMATIVO DE LA DUPLICACIÓN DE LA LÍNEA  
MONTCADA BIFURCACIÓ – PUIGCERDÁ FRONTERA FRANCESA.  
TRAMO VIC - CENTELLES.

ANEJO 6. ESTUDIO FUNCIONAL

## ANEJO 6. ESTUDIO FUNCIONAL

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### 1. DESCRIPCIÓN GENERAL DE LA LÍNEA R-3 Y OBJETO DEL ESTUDIO FUNCIONAL

La R3 de cercanías de Barcelona es una línea norte-sur que comunica el área de Barcelona con el Pirineo. Su trayecto se inicia en L'Hospitalet de Llobregat y después de servir a Barcelona y las poblaciones de El Vallès y Osona (Montcada, Granollers, Vic) se dirige hacia al Pirineo para comunicar Ripoll, Ribes de Freser, Puigcerdà y La Tor de Querol, en la Cataluña francesa. Este último tramo es conocido como Ferrocarril Transpirenaico.

Los trenes de esta línea pueden tener como estaciones término al norte: Granollers-Canovelles, La Garriga y Vic si son servicios de cercanías, y hasta Ripoll, Ribes de Freser, Puigcerdà o La Tor de Querol en cuanto a la línea del Transpirenaico.

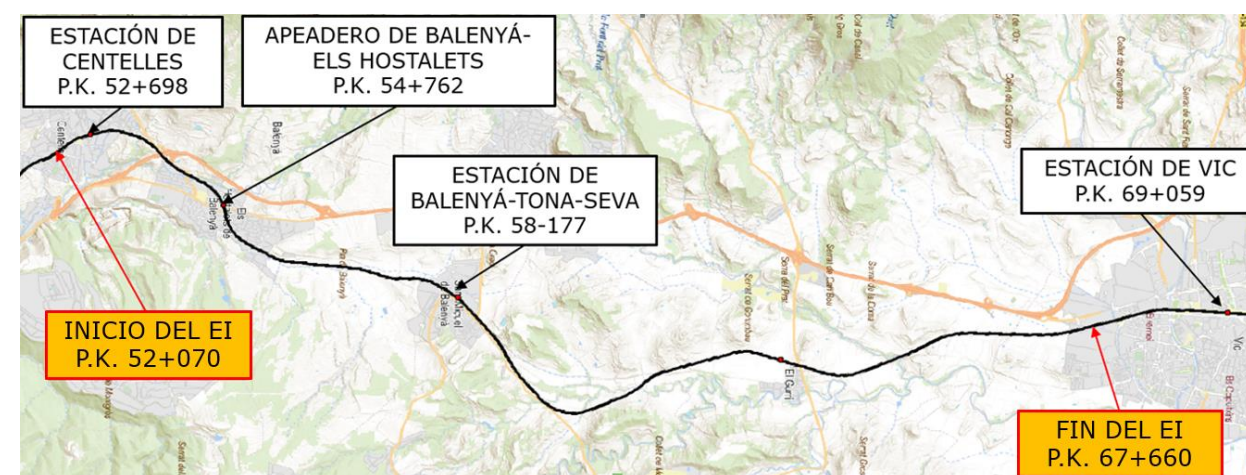
Una de las características de esta línea es que conecta con otros ferrocarriles. Así, en la estación de Ribes de Freser enlaza con el Cremallera de Núria, mientras que en la estación internacional de La Tor de Querol conecta con la red ferroviaria francesa (SNCF), tanto con la línea hasta Toulouse, como con el Tren Groc de la Cerdanya, un tren turístico de vía estrecha. A continuación, se adjunta un mapa de la red de Cercanías de Barcelona, en el que se ha señalado el tramo objeto del presente Estudio Informativo:



Figura 1. Red de Cercanías de Barcelona

El tramo Vic-Centelles objeto del presente Estudio Informativo tiene una longitud aproximada de 16 km, consta de vía única de ancho ibérico electrificada a 3.000 V en corriente continua, con catenaria compensada. Las estaciones y apeaderos presentes en el tramo, además de las de

Centelles y Vic, son el apeadero en vía única de Balenyà - Els Hostalets y la estación de Balenyà – Tona – Seva.



El principal problema que plantea este tramo es el cantón crítico del trayecto en vía única de Vic a Balenyà – Tona – Seva, de unos 11 km, el cual dificulta la explotación de la red y conlleva una considerable falta de capacidad al no poder producirse cruces de trenes en toda su longitud.

El presente anejo tiene por objeto el análisis funcional de las alternativas planteadas en el presente Estudio Informativo para la duplicación de la línea R3 en el tramo entre Vic y Centelles, y la identificación de ventajas e inconvenientes de cada una de ellas para dar servicio a las necesidades futuras de tráfico de viajeros y mercancías por la línea Montcada Bifurcació – Puigcerdà frontera francesa.



## 2. SITUACIÓN ACTUAL

### 2.1 Datos básicos de la línea

La línea R-3 está dotada de vía única de ancho ibérico, electrificada a 3.000 voltios en corriente continua con catenaria compensada.

A continuación, se resumen los datos básicos del tramo:

- Longitud: 15,59 km
- Ámbito del estudio informativo:  
PK de inicio 52+070  
PK fin 67+660
- Estaciones:  
Centelles (52+698)  
Balenyá-Els Hostalets (54+762)  
Balenyá-Tona-Seva (58+177)  
Vic (69+069-fuera del ámbito del EI)
- Subestaciones:  
Les Franqueses del Vallés (fuera del EI)  
Centelles (57+930)  
*Taradell (63+140)*  
Manlleu (fuera del EI)
- Catenaria: compensada 3 kv cc
- Instalaciones de seguridad:  
BA  
CTC  
ASFA
- Enclavamientos:  
Centelles → eléctrico  
Balenyá-Tona-Seva → eléctrico  
Vic → electrónico
- Derivaciones particulares: no
- Términos municipales atravesados:  
Centelles  
Balenyá  
El Brull  
Seva  
Malla  
Taradell  
Tona

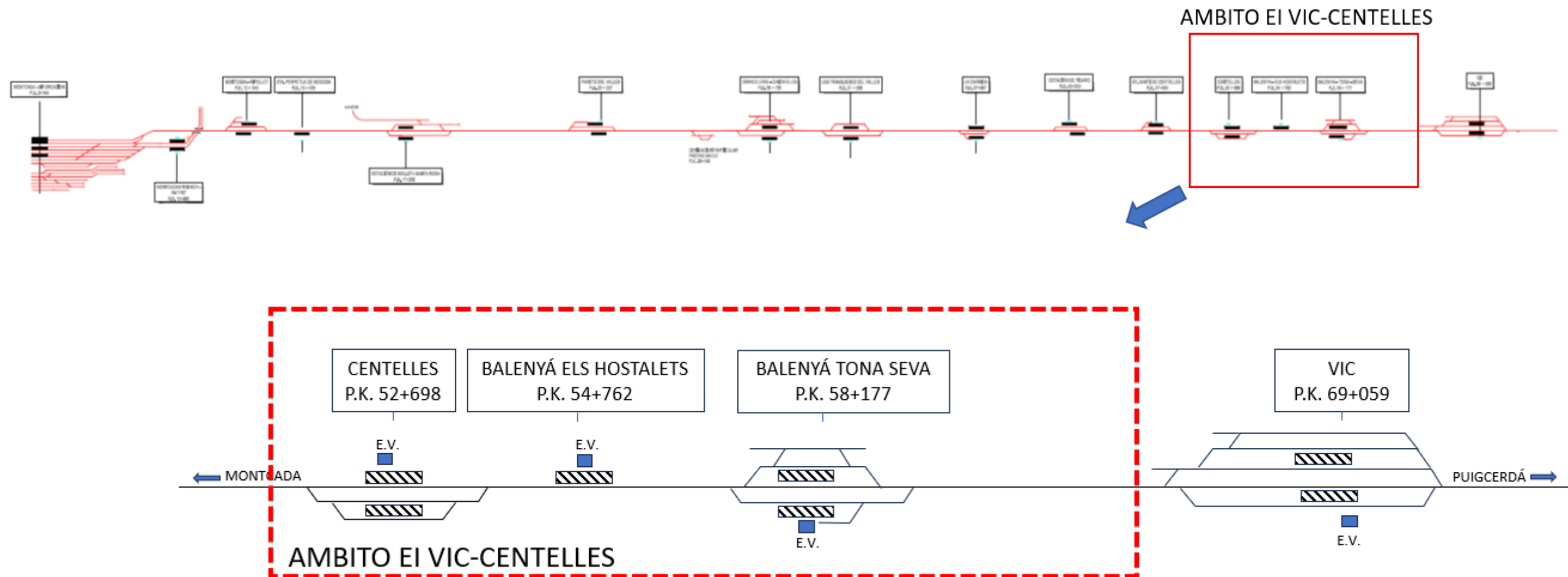
Vic

En el Apéndice 3 se adjuntan los datos de infraestructura y superestructura de la línea, publicados en el documento CIRTRA 2022.

En el Apéndice 4 se adjuntan los cuadros de velocidades máximas del tramo Centelles-Vic.

2.2 Esquema funcional

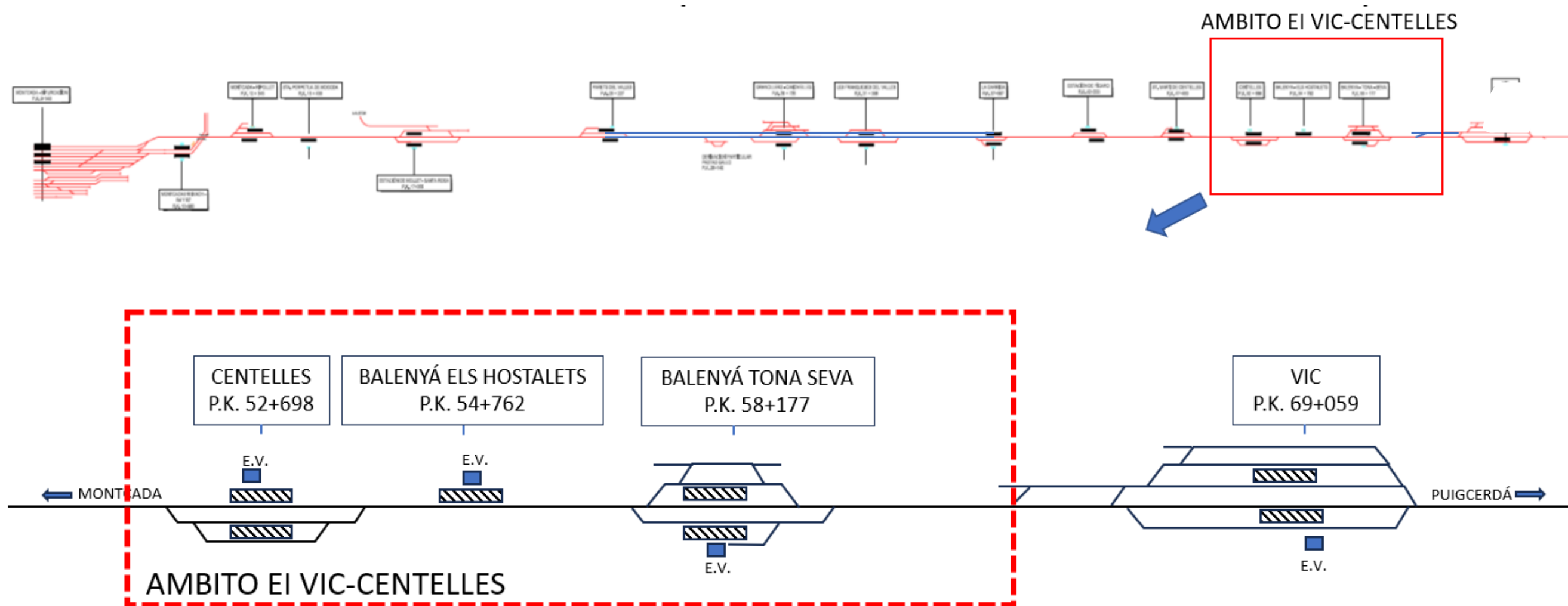
A continuación, se adjunta un esquema funcional del estado actual de la línea.



Actualmente se encuentran dos obras en marcha:

- Duplicación de vía del tramo Parets-La Garriga.
- Prolongación de la Vía 2 en la cabecera sur de la estación de Vic en la línea de La Tour De Carol - Enveigt a Montcada Bifurcació (Barcelona).

Por tanto, como escenario de partida para el presente Estudio Informativo, se considera que dichas obras se encuentran finalizadas. A continuación se adjunta un esquema funcional, que ya recoge estas obras:





## 2.3 Tráficos y material móvil

### 2.3.1 Tráficos

A partir de los datos históricos de tráficos disponibles, se ha elaborado la siguiente tabla, en la que se recogen las circulaciones diarias de viajeros en la R3, en el periodo 2016-2018.

	2018				2016			INCREMENTO 2016-2018
	LONG. (KM)	CIRC.	CIRCXKM	PL.ASIENTOXKM	CIRC.	CIRXKM	PL.ASIENTOXKM	
R3	165,9	77	7.250	2.151.865	78	7107.1	2.049.073	5,0 %

Tabla 1. Variación de la oferta de Servicios R3 2016-2018

En 2.022, el tráfico de viajeros en la R-3 entre Centelles y Vic fue de **28 circulaciones por sentido y día**. Algunas de ellas no tenían parada en Centelles, Balenyá-Els Hostalets y Balenyá-Tona-Seva.

Las circulaciones de trenes de mercancías entre Tarragona y Vic, actualmente cuentan con una programación de dos circulaciones semanales.

### 2.3.2 Material móvil

La R3, en 2.019, dispuso de 18 Unidades 447 y 2 unidades 465. Las características más relevantes de este material móvil son:

TIPO	VELOCIDAD MÁXIMA	COCHES	PLAZAS (SENTADAS)	LONGITUD
447	120 km/h	3	567 (219/221/233)	57,993 m
465	120 km/h	5	997 (277)	98,050 m

Tabla 2. Características del material móvil de la R3 (2019)

## 2.4 Capacidad actual de la línea

En el siguiente gráfico se representan los niveles de saturación de la red de Rodalies:



Fuente: Actualización del Plan de Rodalies de Catalunya 2020-2030

En el Apéndice 2 se recogen los datos del Manual de Capacidades 2021 del tramo Bifurcación Aigües-Vic, si bien corresponden a la estación de referencia de Les Franqueses del Vallés, situada fuera del tramo objeto de este Estudio Informativo.

### 2.5 Demanda actual

A partir de datos de aforos de 2018 facilitados por RENFE, los viajeros en la estación de Vic y en los trenes entre Balenyá-Tona-Seva y Vic (se han señalado en rojo las ocupaciones de asientos en trenes superiores al 50%) en un día tipo fueron los siguientes:

HORA		ORIGEN	DESTINO	SUBEN	BAJAN	PASAN	VIENEN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)
DE	A								
6	7	L'HOSPITALET	VIC	0	27	0	27	219	12%
7	8	L'HOSPITALET	RIPOLL	27	104	55	132	219	60%
7	8	L'HOSPITALET	LA TOUR DE CAROL	12	85	44	117	438	27%
8	9	L'HOSPITALET	VIC	0	195	0	195	219	89%
9	10	L'HOSPITALET	RIBES DE FRESER	12	127	31	146	219	67%
9	10	L'HOSPITALET	VIC	0	77	0	77	219	35%
10	11	L'HOSPITALET	VIC	0	64	0	64	219	29%
11	12	L'HOSPITALET	LA TOUR DE CAROL	14	26	55	67	219	31%
12	13	L'HOSPITALET	RIPOLL	36	74	14	52	219	24%
13	14	L'HOSPITALET	RIPOLL	28	103	33	108	219	49%
13	14	L'HOSPITALET	VIC	0	68	0	68	219	31%
13	14	L'HOSPITALET	LA TOUR DE CAROL	42	56	103	117	438	27%
14	15	L'HOSPITALET	RIPOLL	71	151	68	148	219	68%
15	16	L'HOSPITALET	RIPOLL	41	121	69	149	219	68%

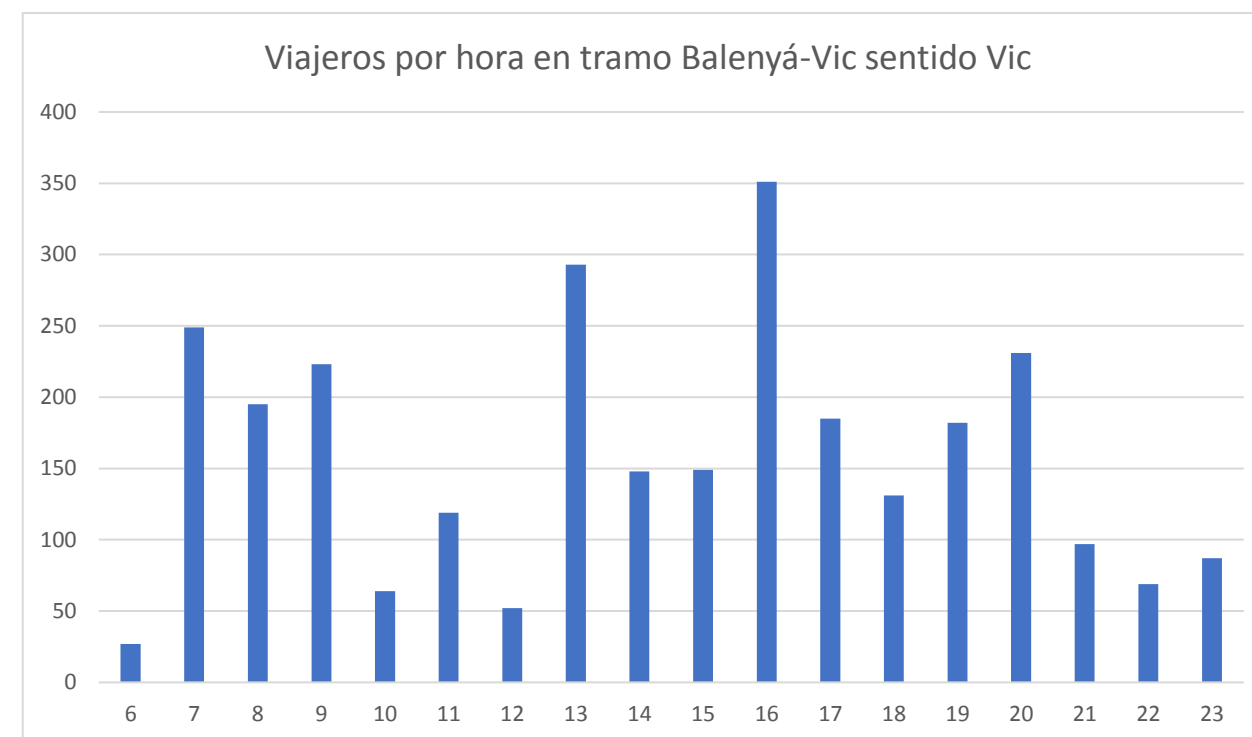
HORA		ORIGEN	DESTINO	SUBEN	BAJAN	PASAN	VIENEN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)	
16	17	L'HOSPITALET	VIC	0	127	0	127	219	58%	
16	17	L'HOSPITALET	LA TOUR DE CAROL	26	73	177	224	438	51%	
17	18	L'HOSPITALET	RIPOLL	19	71	44	96	219	44%	
17	18	L'HOSPITALET	VIC	0	89	0	89	219	41%	
18	19	L'HOSPITALET	PUIGCERDÁ	21	81	71	131	219	60%	
19	20	L'HOSPITALET	RIPOLL	35	91	37	93	219	42%	
19	20	L'HOSPITALET	PUIGCERDÁ	15	77	27	89	219	41%	
20	21	L'HOSPITALET	VIC	0	50	0	50	219	23%	
20	21	L'HOSPITALET	PUIGCERDÁ	34	39	89	94	219	43%	
20	21	L'HOSPITALET	VIC	0	87	0	87	219	40%	
21	22	L'HOSPITALET	RIPOLL	26	71	52	97	438	22%	
22	23	L'HOSPITALET	VIC	0	69	0	69	219	32%	
23	24	L'HOSPITALET	RIPOLL	0	11	0	11	219	5%	
23	24	L'HOSPITALET	VIC	17	71	22	76	219	35%	
				<b>TOTAL</b>	<b>476</b>	<b>2285</b>	<b>991</b>	<b>2800</b>	<b>MEDIA</b>	<b>36%</b>

HORA		ORIGEN	DESTINO	SUBEN	BAJAN	VAN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)
DE	A							
5	6	VIC	L'HOSPITALET	24	0	24	219	11%
6	7	RIPOLL	L'HOSPITALET	24	2	57	438	13%
6	7	VIC	L'HOSPITALET	46	0	46	219	21%

HORA	ORIGEN	DESTINO	SUBEN	BAJAN	VAN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)	
7	8	RIPOLL	L'HOSPITALET	31	25	115	438	26%
7	8	VIC	L'HOSPITALET	43	0	43	438	10%
7	8	PUIGCERDÁ	L'HOSPITALET	80	15	121	219	55%
8	9	VIC	L'HOSPITALET	68	0	68	219	31%
8	9	VIC	L'HOSPITALET	52	0	52	219	24%
9	10	PUIGCERDÁ	L'HOSPITALET	32	45	133	219	61%
9	10	VIC	L'HOSPITALET	34	0	34	219	16%
10	11	RIPOLL	L'HOSPITALET	41	9	54	219	25%
10	11	LA TOUR DE CAROL	L'HOSPITALET	38	21	107	219	49%
11	12	RIBES DE FRESE	L'HOSPITALET	55	15	76	219	35%
12	13	LA TOUR DE CAROL	L'HOSPITALET	48	13	95	219	43%
13	14	VIC	L'HOSPITALET	32	0	32	219	15%
13	14	VIC	L'HOSPITALET	96	0	96	219	44%
14	15	RIPOLL	L'HOSPITALET	73	35	112	438	26%
15	16	LA TOUR DE CAROL	L'HOSPITALET	56	26	57	219	26%
16	17	VIC	L'HOSPITALET	55	0	55	219	25%
16	17	RIPOLL	L'HOSPITALET	41	16	38	219	17%
17	18	RIPOLL	L'HOSPITALET	58	23	70	219	32%
18	19	VIC	L'HOSPITALET	53	0	53	219	24%
19	20	LA TOUR DE CAROL	L'HOSPITALET	46	24	78	438	18%
19	20	RIPOLL	L'HOSPITALET	87	10	99	219	45%

HORA	ORIGEN	DESTINO	SUBEN	BAJAN	VAN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)	
20	21	VIC	L'HOSPITALET	32	0	32	219	15%
20	21	LA TOUR DE CAROL	L'HOSPITALET	38	18	64	438	15%
21	22	RIPOLL	L'HOSPITALET	36	10	40	219	18%
		<b>TOTAL</b>	<b>1319</b>	<b>307</b>	<b>1851</b>	<b>MEDIA</b>	<b>24%</b>	

A continuación se representa la carga de trenes por hora en el trayecto Vic-Balenyá-Tona-Seva en un día tipo:







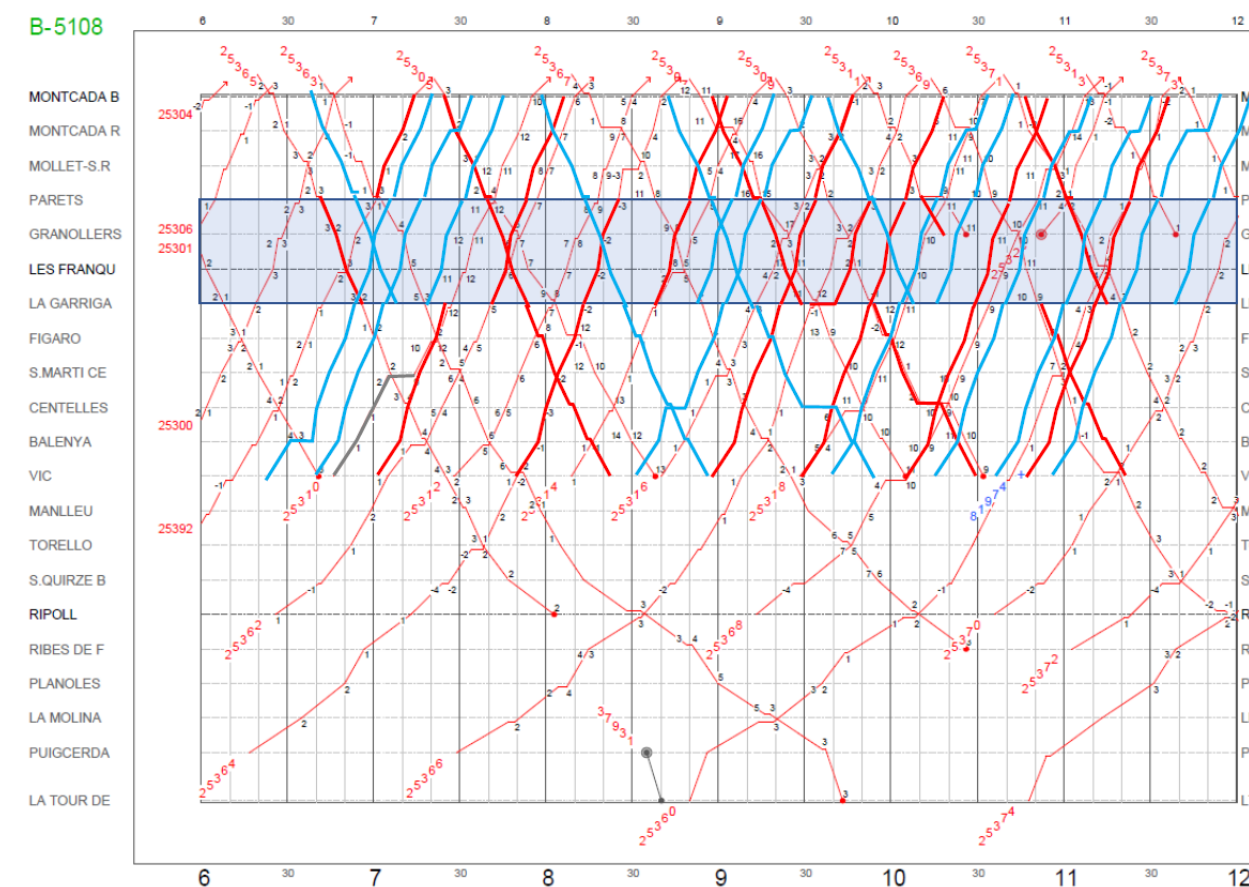
Los datos diarios totales de subidos más bajados en Vic son bastante diferentes por sentido. Se puede observar que es mayor el número de viajeros que bajan en Vic procedentes del sur (2285) que los que suben en Vic con destino sur (1319).

La ocupación media de asientos hacia Vic es del 36%, mientras que hacia Barcelona es del 24%.

De los datos anteriores se deduce que el factor de hora punta es 1,4 sentido Vic y 2,0 sentido Barcelona.

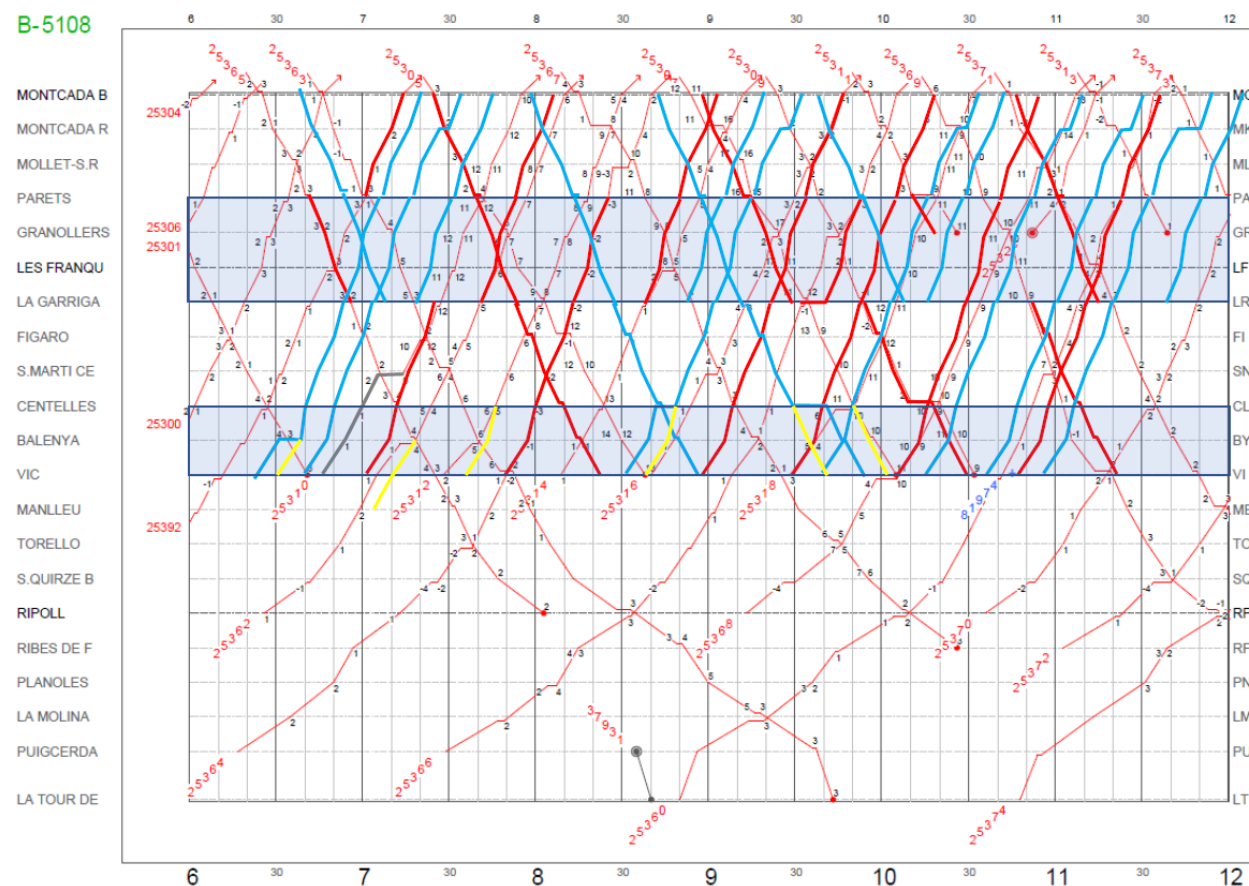
### 3. PROGNOSIS DE CIRCULACIONES Y CAPACIDAD FUTURA

A partir de las mallas de circulación que se adjuntan en el Apéndice 5, se ha analizado la capacidad futura de la línea R3, una vez se duplique el tramo Parets-La Garriga. Se adjunta la malla resultante para el periodo de 6:00 a 12:00, en la que se observa que se pueden habilitar 9 surcos adicionales a los existentes, grafiados en azul:



Esto representa un aumento de capacidad de 14 surcos por sentido y día entre La Garriga y Vic. Considerando una ocupación de éstos de un 50%, se pueden aumentar la oferta en 7 trenes por sentido y día a los actuales, que son 28, por lo que la oferta sería de **35 trenes por sentido y día**. Esto representa un aumento de oferta del 25%.

A partir de estas mallas, se ha estudiado la capacidad de le R3 tras la duplicación del tramo Centelles-Vic. Se adjunta la malla resultante para el periodo de 6:00 a 12:00 horas.



Como se puede observar, la **mall** es muy rígida por los cruces entre Montcada Bif. y Paret, más los de La Garriga-Centelles. Se ha analizado si caben más surcos entre Montcada Bif. y Vic concluyéndose que no es factible. Sí es posible reducir tiempos entre Centelles y Vic en algunos trenes (reducciones representadas en amarillo).

#### 4. ESTIMACIÓN DE TRÁFICOS FUTUROS

En 2.022, el tráfico de viajeros en la R-3 entre Centelles y Vic fue de **28 circulaciones por sentido y día**. Algunas de ellas no tenían parada en Centelles, Balenyá-Els Hostalets y Balenyá-Tona-Seva.

Las circulaciones de trenes de mercancías entre Tarragona y Vic actualmente cuentan con una programación de dos circulaciones semanales.

Con la duplicación de vía Paret-La Garriga, cuyas obras están en ejecución, se podrá incrementar la oferta de servicios hasta 35 trenes por sentido y día.

Las horas punta son de 7 a 10 h, de 13 a 18 h y de 19 a 21 h. En esas horas se prevé una frecuencia el doble que en horas valle, tal y como sucede en la actualidad.

Para el cálculo de la estimación de tráficos futuros necesarios se considera el mismo grado de ocupación de asientos que en la actualidad, un incremento de la demanda del 66,8 % (ver Anejo nº 19 Estudio de Demanda), trenes Serie 465 en composición doble en hora punta y sencilla en hora valle.

Se ha comenzado simulando los niveles de ocupación futuros con los tráficos actuales pero sustituyendo el material móvil y considerando dobles composiciones en las horas punta anteriormente indicadas. Los resultados obtenidos en la Estación de Vic son los siguientes (se han representado en rojo las ocupaciones de asientos en trenes superiores al 50%):

HORA	ORIGEN	DESTINO	SUBEN	BAJAN	PASAN	VIENEN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)	
DE	A								
6	7	L'HOSPITALET	VIC	0	45	0	45	277	16%
7	8	L'HOSPITALET	RIPOLL	45	172	91	218	544	40%
7	8	L'HOSPITALET	LA TOUR DE CAROL	20	140	73	193	544	35%
8	9	L'HOSPITALET	VIC	0	322	0	322	544	59%
9	10	L'HOSPITALET	RIBES DE FRESER	20	210	51	241	544	44%
9	10	L'HOSPITALET	VIC	0	127	0	127	544	23%
10	11	L'HOSPITALET	VIC	0	106	0	106	544	19%

HORA		ORIGEN	DESTINO	SUBEN	BAJAN	PASAN	VIENEN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)
11	12	L'HOSPITALET	LA TOUR DE CAROL	23	43	91	111	277	40%
12	13	L'HOSPITALET	RIPOLL	59	122	23	86	277	31%
13	14	L'HOSPITALET	RIPOLL	46	170	54	178	544	33%
13	14	L'HOSPITALET	VIC	0	112	0	112	544	21%
13	14	L'HOSPITALET	LA TOUR DE CAROL	69	92	170	193	544	35%
14	15	L'HOSPITALET	RIPOLL	117	249	112	244	544	45%
15	16	L'HOSPITALET	RIPOLL	68	200	114	246	544	45%
16	17	L'HOSPITALET	VIC	0	210	0	210	544	39%
16	17	L'HOSPITALET	LA TOUR DE CAROL	43	120	292	370	544	68%
17	18	L'HOSPITALET	RIPOLL	31	117	73	158	544	29%
17	18	L'HOSPITALET	VIC	0	147	0	147	544	27%
18	19	L'HOSPITALET	PUIGCERDÁ	35	134	117	216	277	78%
19	20	L'HOSPITALET	RIPOLL	58	150	61	153	544	28%
19	20	L'HOSPITALET	PUIGCERDÁ	25	127	45	147	544	27%
20	21	L'HOSPITALET	VIC	0	83	0	83	544	15%
20	21	L'HOSPITALET	PUIGCERDÁ	56	64	147	155	544	29%
20	21	L'HOSPITALET	VIC	0	144	0	144	544	26%
21	22	L'HOSPITALET	RIPOLL	43	117	86	160	544	29%
22	23	L'HOSPITALET	VIC	0	114	0	114	277	41%
23	24	L'HOSPITALET	RIPOLL	0	18	0	18	277	7%
23	24	L'HOSPITALET	VIC	28	117	36	125	277	45%
								<b>MEDIA</b>	<b>31%</b>

HORA		ORIGEN	DESTINO	SUBEN	BAJAN	VAN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)
DE	A							
5	6	VIC	L'HOSPITALET	40	0	40	277	14%
6	7	RIPOLL	L'HOSPITALET	40	3	94	544	17%
6	7	VIC	L'HOSPITALET	76	0	76	277	27%
7	8	RIPOLL	L'HOSPITALET	51	41	190	544	35%
7	8	VIC	L'HOSPITALET	71	0	71	544	13%
7	8	PUIGCERDÁ	L'HOSPITALET	132	25	200	544	37%
8	9	VIC	L'HOSPITALET	112	0	112	544	21%
8	9	VIC	L'HOSPITALET	86	0	86	544	16%
9	10	PUIGCERDÁ	L'HOSPITALET	53	74	219	544	40%
9	10	VIC	L'HOSPITALET	56	0	56	544	10%
10	11	RIPOLL	L'HOSPITALET	68	15	89	277	32%
10	11	LA TOUR DE CAROL	L'HOSPITALET	63	35	177	277	64%
11	12	RIBES DE FRESE	L'HOSPITALET	91	25	125	277	45%
12	13	LA TOUR DE CAROL	L'HOSPITALET	79	21	157	277	57%
13	14	VIC	L'HOSPITALET	53	0	53	544	10%
13	14	VIC	L'HOSPITALET	158	0	158	544	29%
14	15	RIPOLL	L'HOSPITALET	120	58	185	544	34%
15	16	LA TOUR DE CAROL	L'HOSPITALET	92	43	94	544	17%
16	17	VIC	L'HOSPITALET	91	0	91	544	17%
16	17	RIPOLL	L'HOSPITALET	68	26	63	544	12%
17	18	RIPOLL	L'HOSPITALET	96	38	116	544	21%



HORA		ORIGEN	DESTINO	SUBEN	BAJAN	VAN	ASIENTOS	OCUPACIÓN (PLAZAS SENTADAS)
18	19	VIC	L'HOSPITALET	87	0	87	277	32%
19	20	LA TOUR DE CAROL	L'HOSPITALET	76	40	129	544	24%
19	20	RIPOLL	L'HOSPITALET	144	17	163	544	30%
20	21	VIC	L'HOSPITALET	53	0	53	544	10%
20	21	LA TOUR DE CAROL	L'HOSPITALET	63	30	106	544	19%
21	22	RIPOLL	L'HOSPITALET	59	17	66	277	24%
							<b>MEDIA</b>	<b>23%</b>

Como conclusión de este análisis, se considera que, en estado futuro, con un crecimiento de la demanda del 65,5 % estimado, manteniendo los horarios actuales y el número de circulaciones de 28 trenes por sentido y día, sustituyendo el material móvil por la Serie 465, y contemplando composición doble en los períodos de hora punta, se consigue reducir los niveles actuales de ocupación de asientos, pasando del 36% al 31% sentido Vic y del 24% al 23% sentido Barcelona. Este escenario conlleva que todas las estaciones de la R3 estén ya adaptadas, con andenes de 200 metros útiles para poder acoger dichas composiciones dobles de la Serie 465.

Por tanto, se considera ajustada la oferta a la demanda. Un aumento de la oferta por encima de la indicada, incorporando hasta 35 trenes por sentido y día (7 trenes adicionales en composición sencilla por sentido y día) supondría rebajar el grado de ocupación de asientos a valores del 27% sentido Vic y 20% sentido Barcelona.

Una vez que se duplique totalmente la R3 hasta Montcada, se podrá modificar el plan de explotación, incrementando frecuencias y sustituyendo composiciones dobles por simples, manteniendo los mismos niveles de ocupación. Este escenario estará condicionado por los surcos disponibles para la entrada de la R3 en los túneles de Barcelona en función de sus encaminamientos futuros.

### 5. TIEMPOS DE RECORRIDO

Se han analizado los **tiempos de recorrido** entre Centelles y Vic para las alternativas estudiadas y se han obtenido estos resultados:

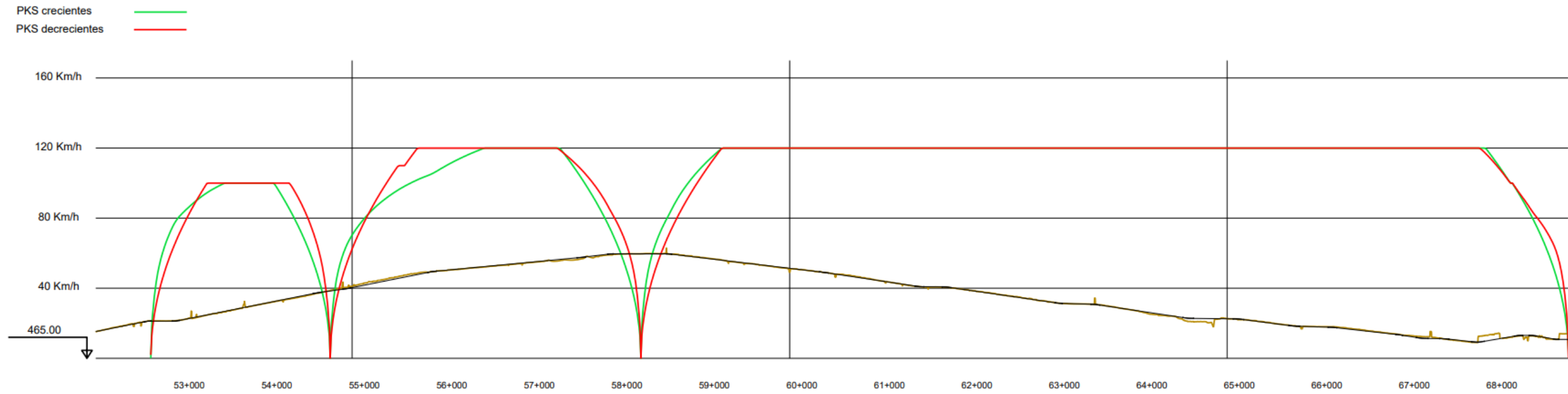
ALTERNATIVA	TIEMPO CENTELLES-VIC	TIEMPO VIC-CENTELLES
1	698 seg (11 min 38 seg)	755 seg (12 min 35 seg)
2	688 seg (11 min 28 seg)	744 seg (12 min 24 seg)
ACTUAL	840 seg (14 min 00 seg)	840 seg (14 min 00 seg)

Para las alternativas 1 y 2 se han considerado trenes de la serie 465 en doble composición, que alcanzan una velocidad máxima de 120 km/h.

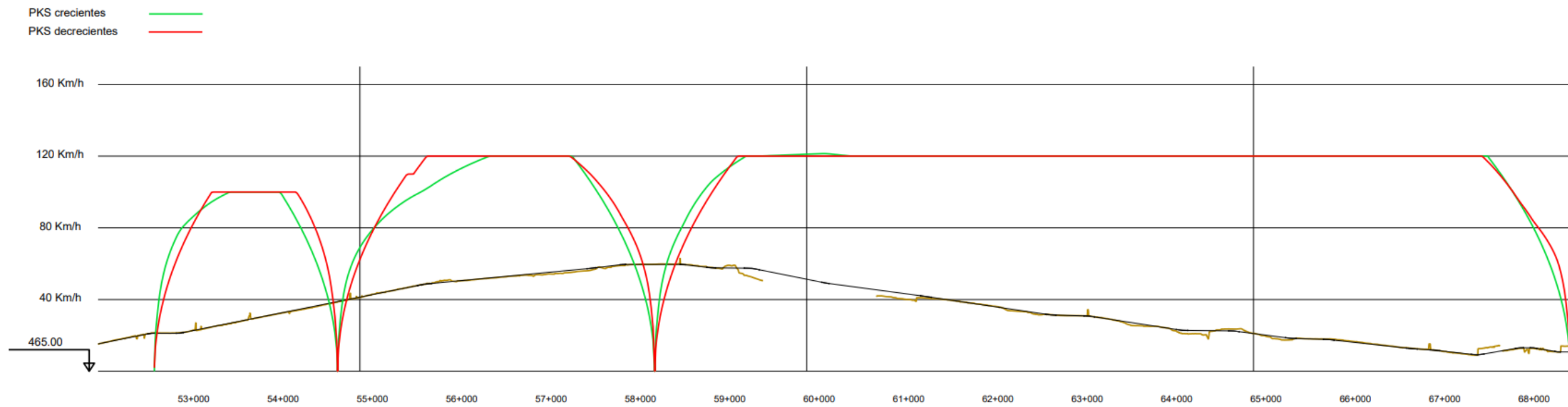
El trazado de la alternativa 2, en parte del recorrido, permite circular a una velocidad máxima de hasta 160 km/h. Esto permite mejorar el servicio en el futuro, con trenes de media distancia que alcancen velocidades de 160 km/h y semidirectos.

En el Apéndice 6 se adjuntan los cálculos de simulaciones de marchas efectuados para la obtención de los tiempos de recorrido de cada una de las alternativas.

A continuación, se adjuntan las gráficas resultantes de las simulaciones de marchas realizadas.

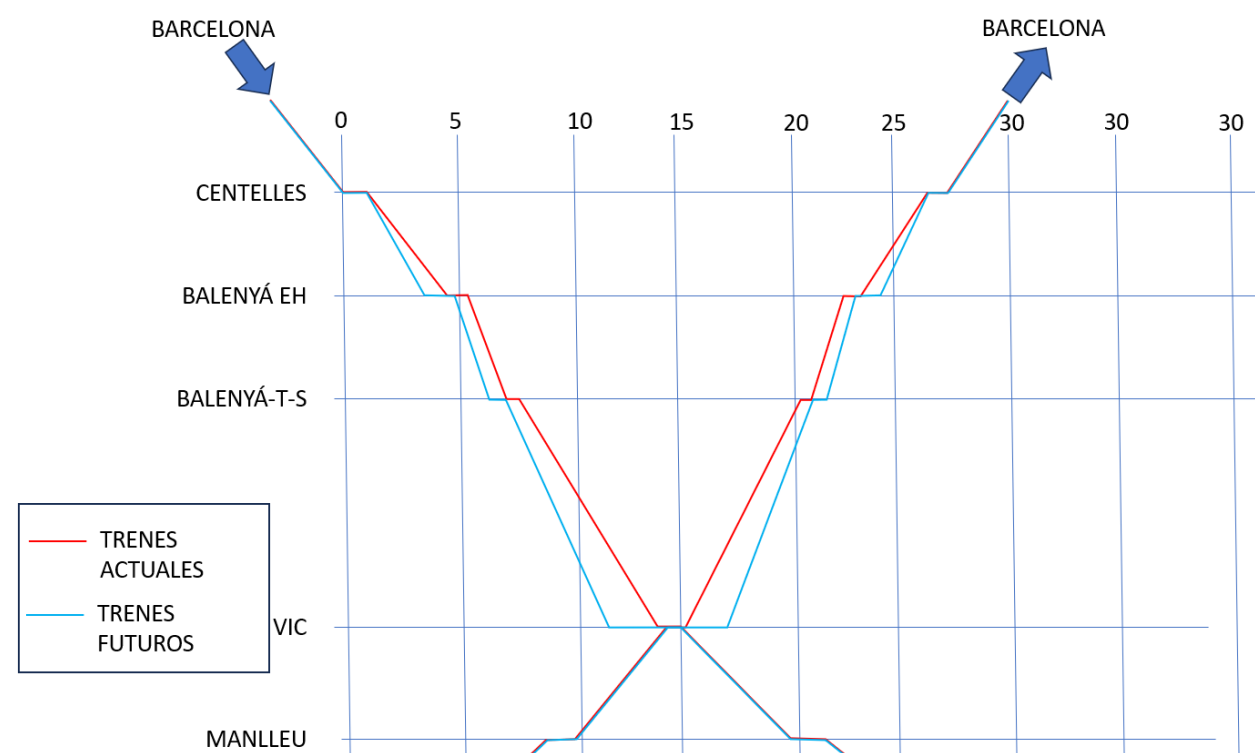


Alternativa 1



Alternativa 2

Estos ahorros de tiempo entre Vic y Centelles están condicionados por los surcos de la línea entre Centelles y La Garriga, que son inflexibles. Por tanto, el ahorro de tiempo ente Centelles y Vic es efectivo únicamente para los viajeros de la R-3 no pasantes por Vic hacia el norte. Los surcos de Vic hacia el norte también son rígidos. Se adjunta un esquema representativo de esta situación:



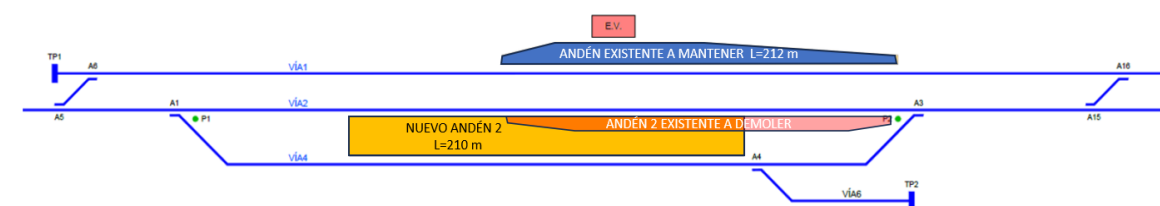
Una vez se ponga en servicio la duplicación completa entre Montcada Bifurcación y Vic, los tiempos de recorrido se reducirán. Se han realizado simulaciones de marcha del trayecto completo, resultando los siguientes valores:

ALTERNATIVA	TIEMPO MONTCADA-VIC	TIEMPO VIC-MONTCADA
1	2.924 seg (48 min 44 seg)	2.876 seg (47 min 56 seg)
2	2.914 seg (48 min 34 seg)	2.865 seg (47 min 45 seg)
ACTUAL	3.120 seg (58 min 00 seg)	3.120 seg (58 min 00 seg)

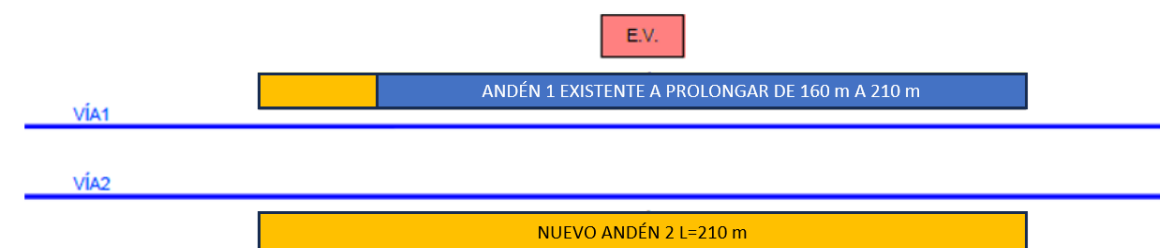
## 6. PROPUESTA FUNCIONAL DE ESTACIONES

Los esquemas funcionales de las estaciones tras la duplicación son los siguientes:

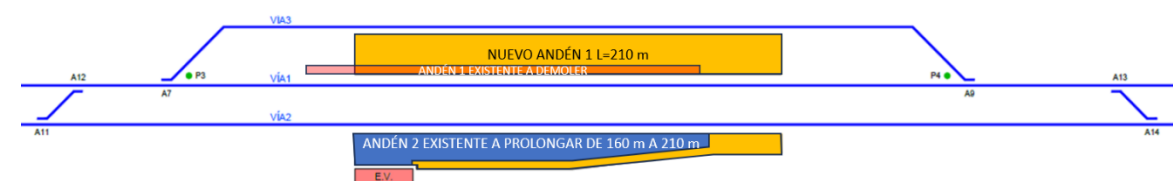
Estación de Centelles:



Estación de Balenyá Els Hostalets:

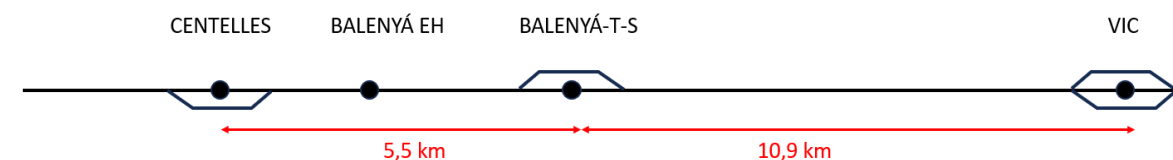


Estación de Balenyá Tona Seva:



El inicio de la duplicación de vía se ha diseñado para compatibilizarlo con la futura duplicación de vía del tramo La Garriga-Centelles y evitar afecciones a viviendas situadas en el pasillo ferroviario. Por este motivo, la vía única procedente de La Garriga conecta con la vía 2 de la Estación de Centelles, mientras que a la 1 del tramo Centelles-Vic se accede por un nuevo escape, que será levantado y sustituido por uno simétrico, cuando se duplique toda la línea.

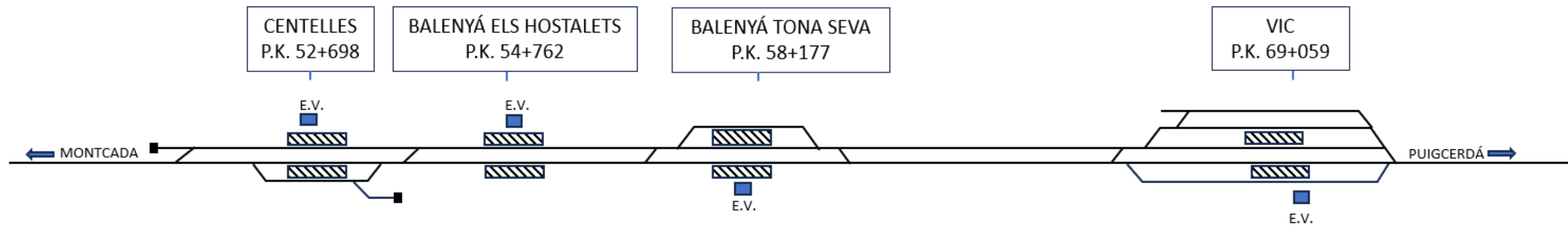
Con esta configuración de estaciones, la línea dispondrá de vías de apartado en Centelles y en Balenyá Tona Seva, además de las ya existentes en Vic. Las distancias entre vías de apartado son de 5,5 y 10,9 kilómetros respectivamente. En la siguiente figura se esquematiza la situación de vías de apartado en el tramo Centelles-Vic.



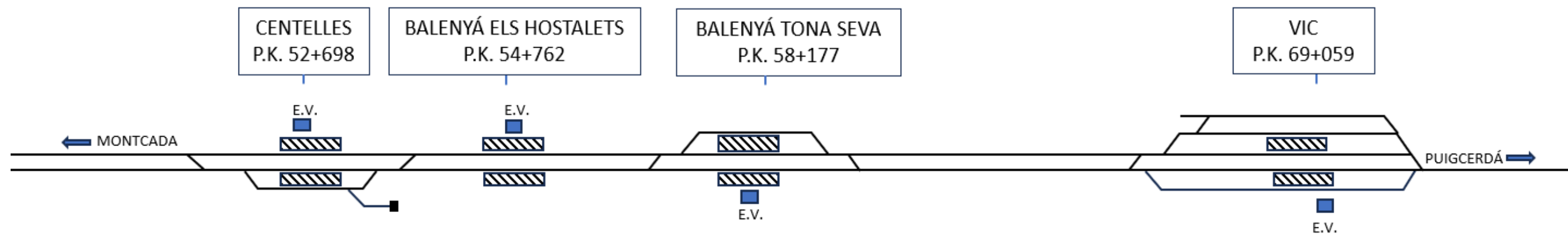


7. ESQUEMA FUNCIONAL PROPUESTO

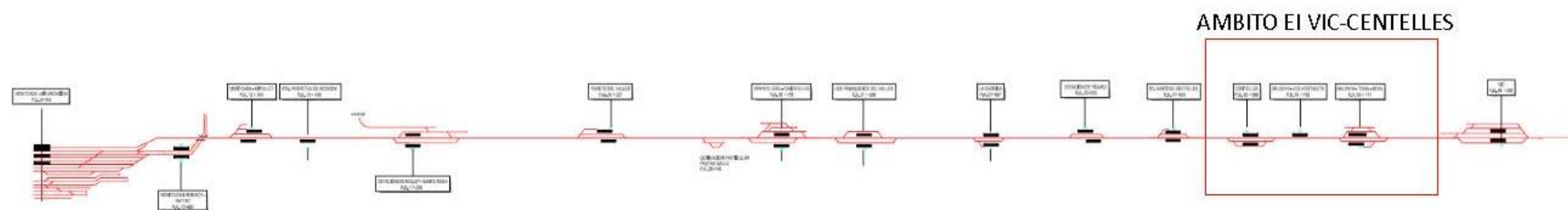
En el Apéndice 1 se adjuntan los esquemas funcionales actual y futuro en distintos escenarios. A continuación se adjunta el esquema funcional propuesto para la duplicación del tramo Centelles-Vic (esta última estación no es objeto del presente Estudio Informativo):



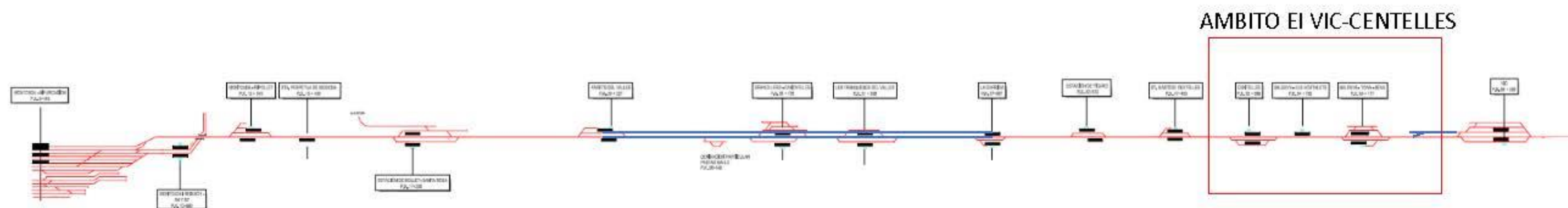
Una vez que se duplique el tramo anterior La Garriga-Centelles, se levantará el escape de entrada a Centelles y se sustituirá por uno simétrico. El esquema funcional pasará a ser el siguiente:



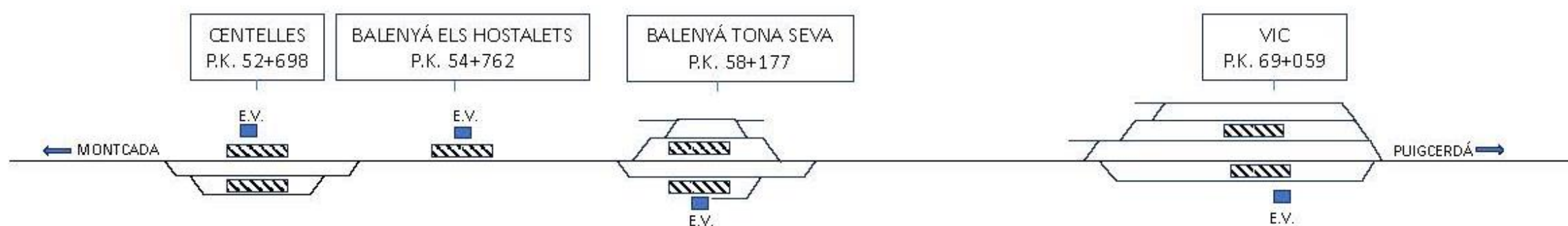
APÉNDICE 1. ESQUEMAS FUNCIONALES



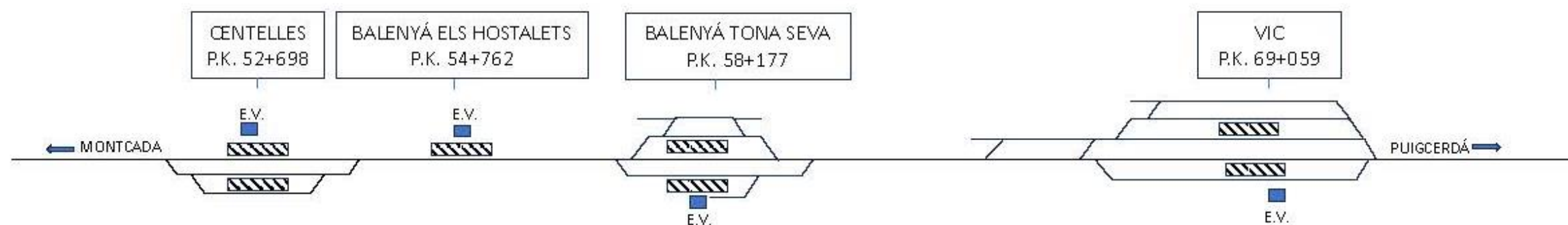
R-3. TRAMO MONTCADA-VIC  
ESQUEMA FUNCIONAL ACTUAL



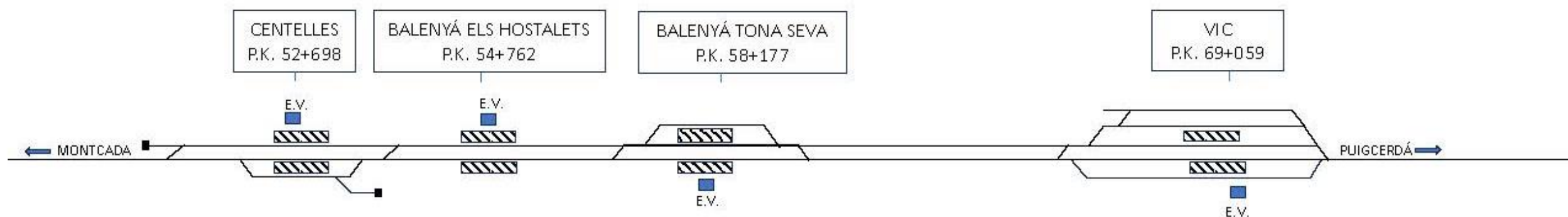
R-3. TRAMO MONTCADA-VIC  
ESQUEMA FUNCIONAL PRÓXIMO TRAS OBRAS EN  
EJECUCIÓN



R-3. TRAMO CENTELLES-VIC  
ESQUEMA FUNCIONAL ACTUAL

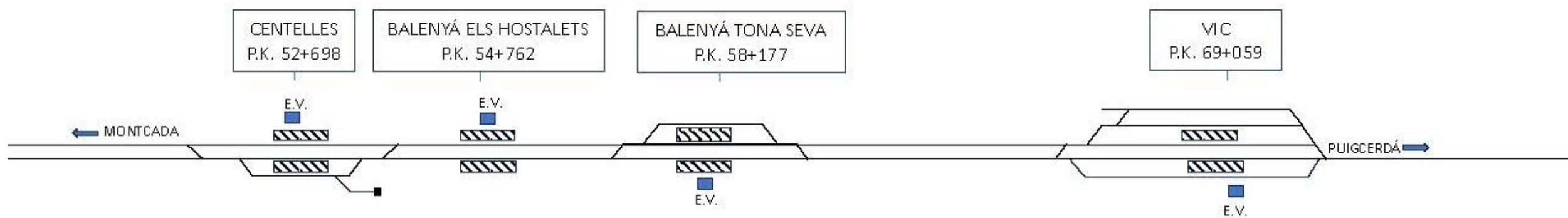


R-3. TRAMO CENTELLES-VIC  
ESQUEMA FUNCIONAL TRAS LA PROLONGACIÓN DE  
LA VÍA 2 EN LA CABECERA SUR DE VIC



R-3. TRAMO CENTELLES-VIC  
ESQUEMA FUNCIONAL TRAS LA DUPLICACIÓN CENTELLES-VIC

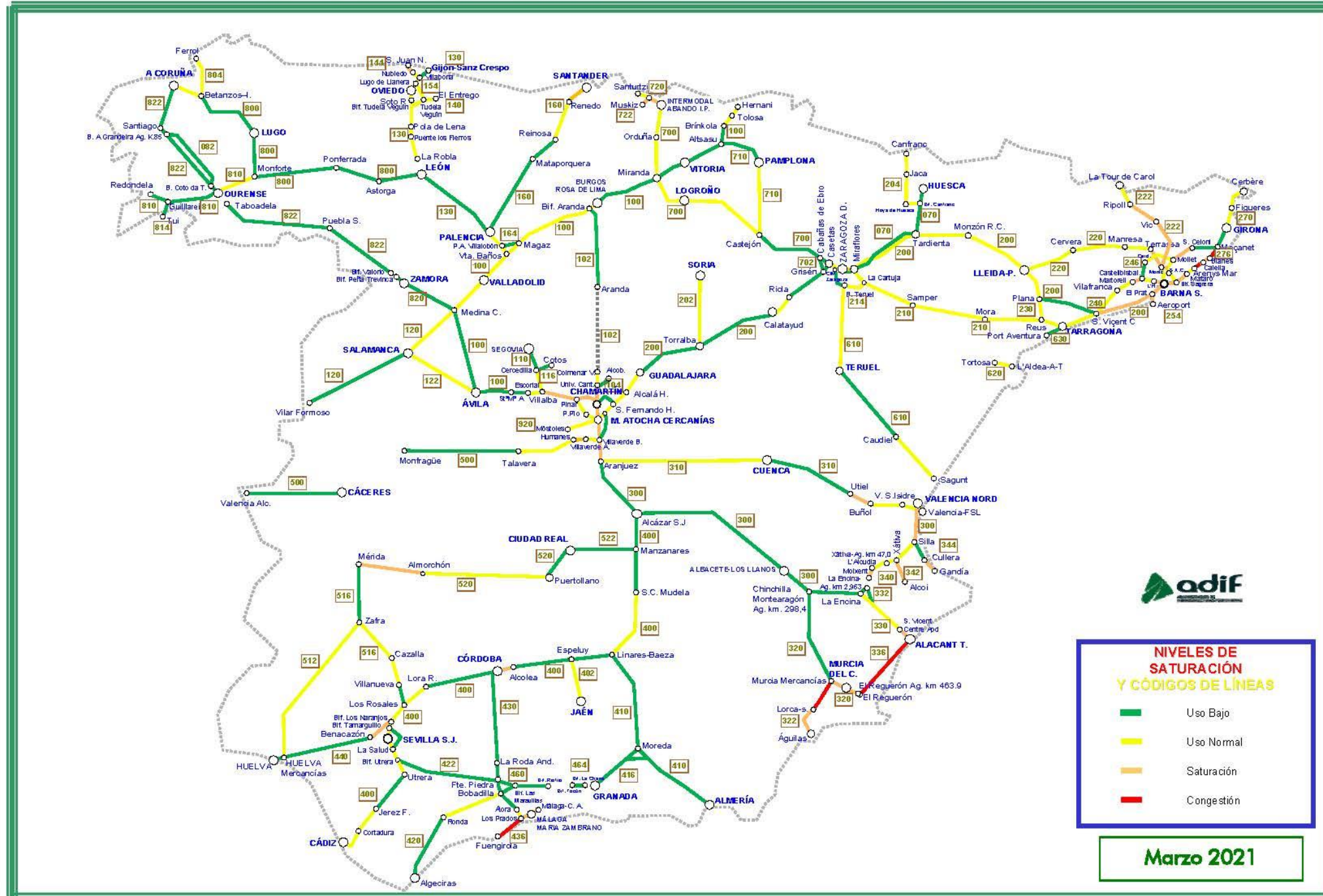




R-3. TRAMO CENTELLES-VIC  
 ESQUEMA FUNCIONAL TRAS LA DUPLICACIÓN COMPLETA DE LA R-3

APÉNDICE 2. MANUAL DE CAPACIDADES

TRAMOS DE LA RFIG REFLEJADOS EN EL MANUAL DE CAPACIDADES DE ADIF





Línea:	222 BIF. AIGÜES - LA TOUR DE CAROL-ENVEIGT
Tramo:	BIF. AIGÜES - VIC
Vigencia:	25/03/2021

Características :		Clasif.	C1	Kilómetros	62.4
Equip. Línea	<input checked="" type="checkbox"/> Tren Tierra <input type="checkbox"/> GSM-R <input checked="" type="checkbox"/> Asfa <input type="checkbox"/> LZB <input type="checkbox"/> Ertms 1 <input type="checkbox"/> Ertms 2 <input type="checkbox"/> Atp				
Descripción	Vía única electrificada a 3 kv.				
Bloqueo	BAD con CTC entre Bif. Aigües y Montcada-Bif. BAU con CTC entre Montcada-Bif y Vic.				
B Mantenimto	De 0:00h a 3:00h de Montcada Bif. a Vic.				
Condiciones de Acceso					

Cupos de surcos por tipo de tráfico :									
Sentido : VIC									
Mod	0-3 h	3-6 h	6-9 h	9-12 h	12-15 h	15-18 h	18-21 h	21-24 h	Tot
BM	0	0	0	0	0	0	0	0	0
ML	0	2	7	6	7	6	7	7	42
VLD	0	0	0	0	0	0	0	0	0
VCR	0	2	7	6	7	6	7	7	42
Merc	0	2	0	1	0	1	0	0	4
Tot	0	4	7	7	7	7	7	7	46

Sentido : BIF. AIGÜES									
Mod	0-3 h	3-6 h	6-9 h	9-12 h	12-15 h	15-18 h	18-21 h	21-24 h	Tot
BM	0	0	0	0	0	0	0	0	0
ML	0	2	7	6	7	6	7	6	42
VLD	0	0	0	0	0	0	0	0	0
VCR	0	2	7	6	7	6	7	6	42
Merc	0	2	0	0	1	0	0	1	4
Tot	0	4	7	7	7	7	7	7	46

Tráfico real programado: [ Estación de referencia: FRANQUESES VALL 25/03/2021 (J) ]																									
Sentido : VIC																									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Tot
Cerc.	0	0	0	0	0	1	2	2	1	2	1	1	2	2	2	2	2	1	2	3	3	1	1	1	32
VLD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VMD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Merc.	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Otros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot	0	0	0	0	0	1	2	2	1	2	1	1	2	2	2	2	1	2	3	3	1	1	1	3	33
NSat	- %				25 %			86 %		57 %			86 %		71 %			114 %					43 %		72

Sentido : BIF. AIGÜES																									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Tot
Cerc.	0	0	0	0	0	1	2	2	3	3	1	2	1	2	1	3	1	1	1	2	3	2	1	0	32
VLD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VMD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Merc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Otros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot	0	0	0	0	0	1	2	2	3	3	1	2	1	2	1	3	1	1	1	2	3	2	1	0	32
NSat	- %				25 %			100 %		86 %			57 %		71 %			86 %					43 %		70



Línea:	222 BIF. AIGÜES - LA TOUR DE CAROL-ENVEIGT
Tramo:	VIC - RIPOLL
Vigencia:	25/03/2021

Características :		Clasif.	C1	Kilómetros	36.6
Equip. Línea	<input checked="" type="checkbox"/> Tren Tierra <input type="checkbox"/> GSM-R <input checked="" type="checkbox"/> Asfa <input type="checkbox"/> LZB <input type="checkbox"/> Ertms 1 <input type="checkbox"/> Ertms 2 <input type="checkbox"/> Atp				
Descripción	Vía única electrificada a 3 kv.				
Bloqueo	BLAU con CTC				
B Mantenimto	De 0:00h a 3:00h.				
Condiciones de Acceso					

Cupos de surcos por tipo de tráfico :									
Sentido : RIPOLL									
Mod	0-3 h	3-6 h	6-9 h	9-12 h	12-15 h	15-18 h	18-21 h	21-24 h	Tot
BM	0	0	0	0	0	0	0	0	0
ML	0	2	4	4	4	4	5	4	27
VLD	0	0	0	0	0	0	0	0	0
VCR	0	2	4	4	4	4	5	4	27
Merc	0	2	1	0	1	0	0	0	4
Tot	0	4	5	4	5	4	5	4	31

Sentido : VIC									
Mod	0-3 h	3-6 h	6-9 h	9-12 h	12-15 h	15-18 h	18-21 h	21-24 h	Tot
BM	0	0	0	0	0	0	0	0	0
ML	0	2	4	5	4	4	4	4	27
VLD	0	0	0	0	0	0	0	0	0
VCR	0	2	4	5	4	4	4	4	27
Merc	0	2	0	0	0	1	0	1	4
Tot	0	4	4	5	4	5	4	5	31

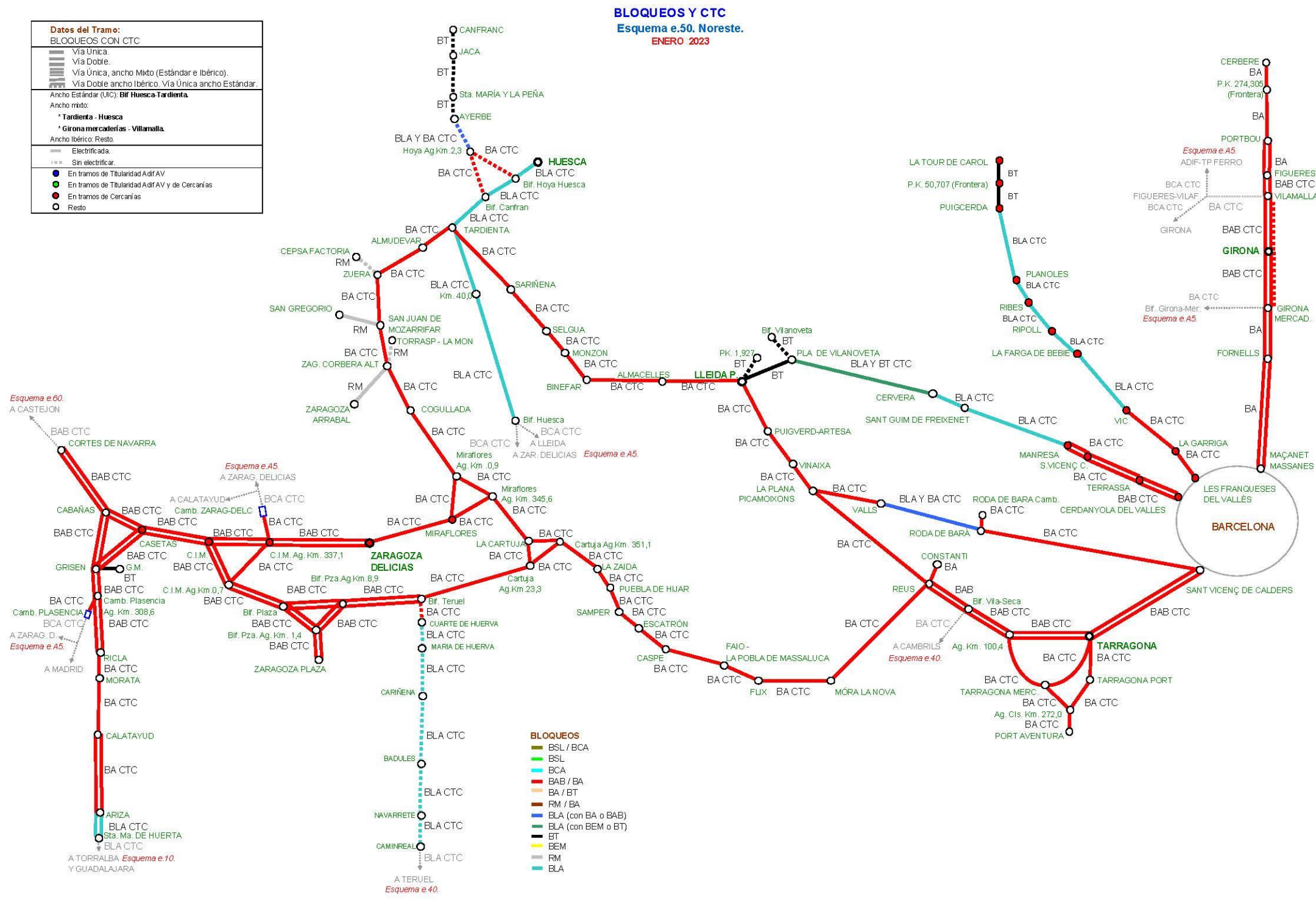
Tráfico real programado: [ Estación de referencia: MANLLEU 25/03/2021 (J) ]																									
Sentido : RIPOLL																									
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Cerc.	0	0	0	0	0	0	0	2	0	1	0	2	1	0	2	1	1	1	1	2	1	1	0	1	17
VLD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VMD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Merc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Otros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
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NSat	- %				0 %			40 %		75 %		60 %		75 %		80 %			50 %						55

Sentido : VIC																									
	0	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	Tot
Cerc.	0	0	0	0	0	0	2	1	1	1	1	2	1	0	1	1	1	1	1	1	1	1	1	0	17
VLD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VMD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Merc.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Otros	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tot	0	0	0	0	0	0	2	1	1	1	1	2	1	0	1	1	1	1	1	1	1	1	1	0	17
NSat	- %				0 %		100 %		80 %		50 %		60 %		75 %			20 %							55

APÉNDICE 3. CIRTRA

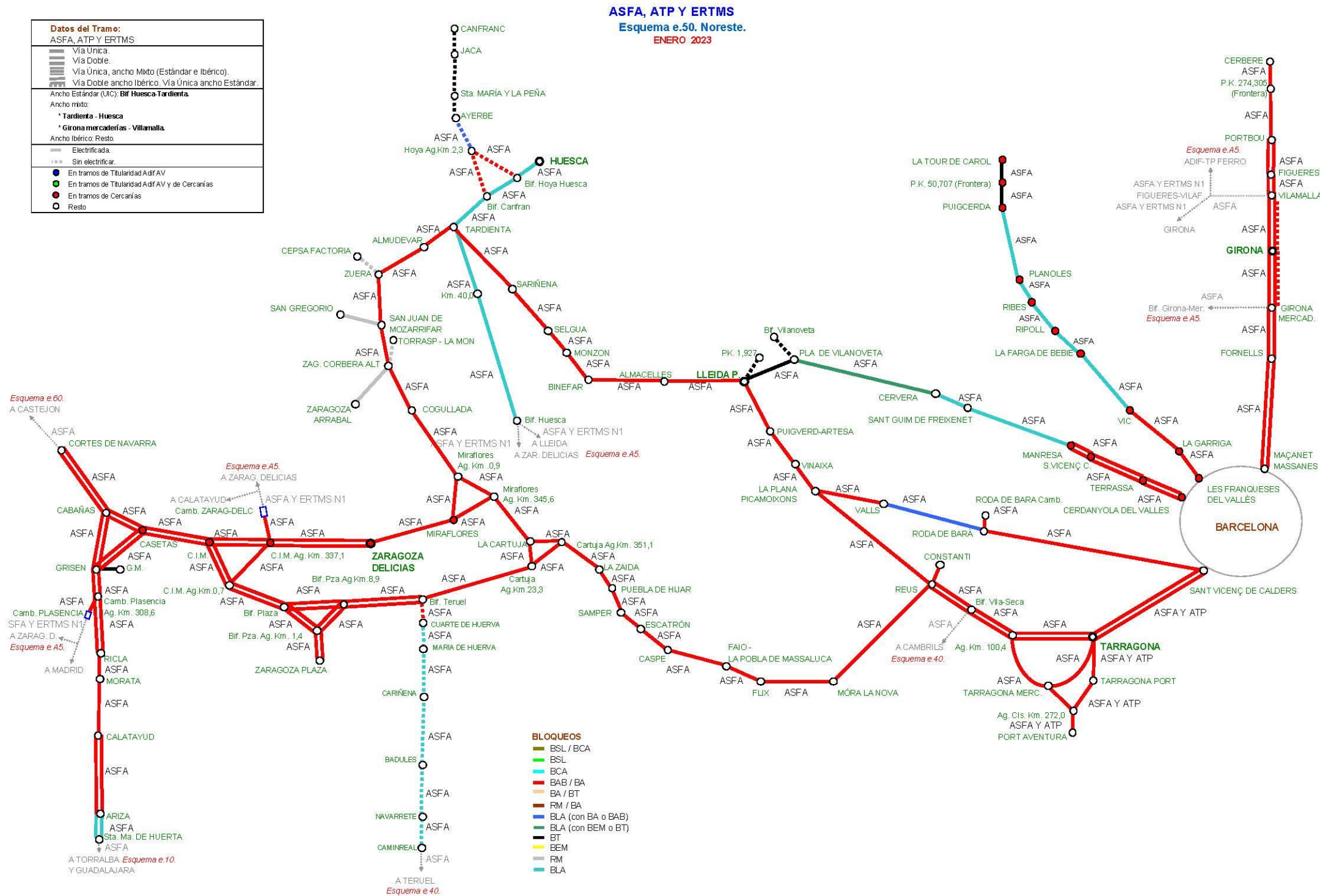




CIRTRA 2022

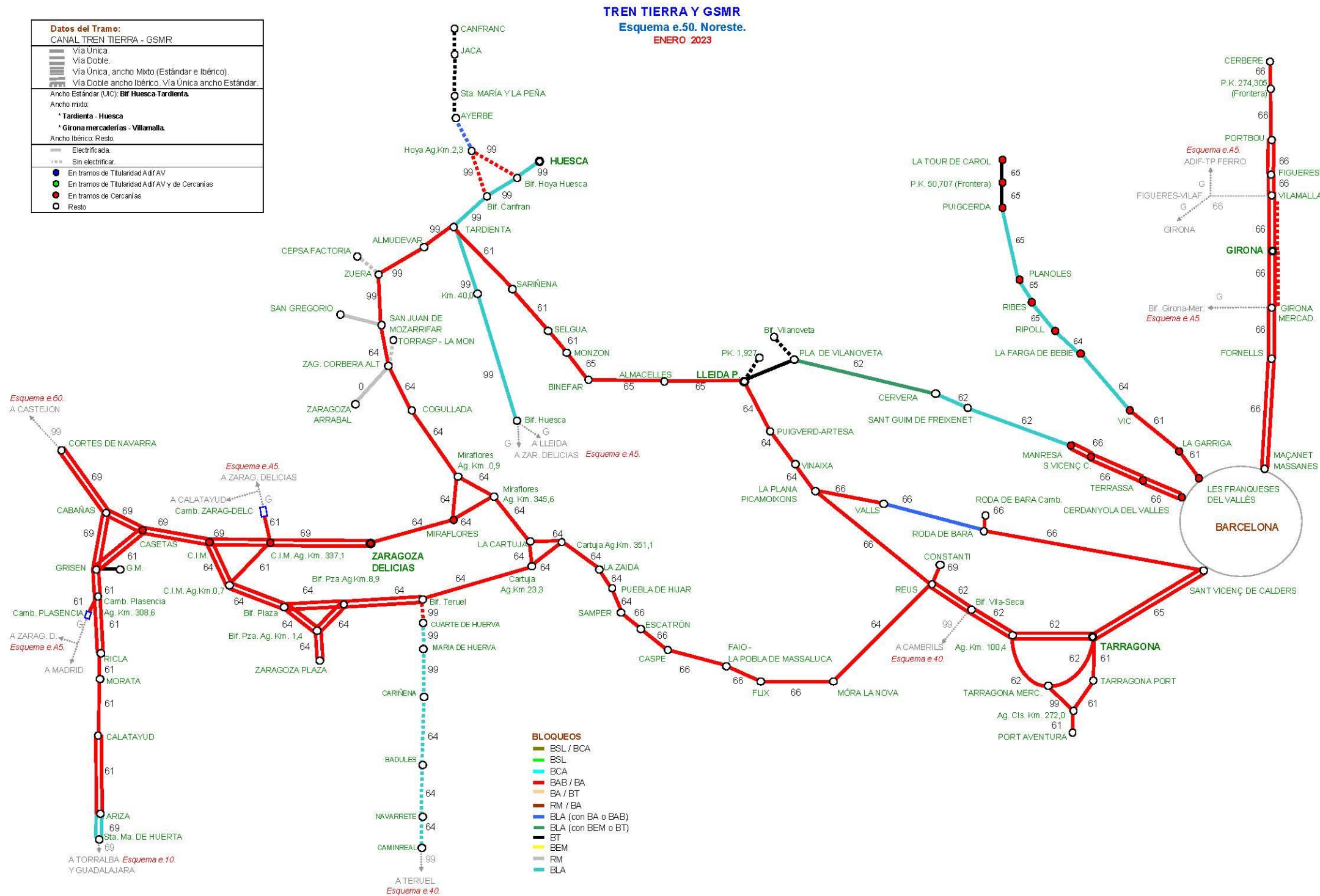






CIRTRA 2022

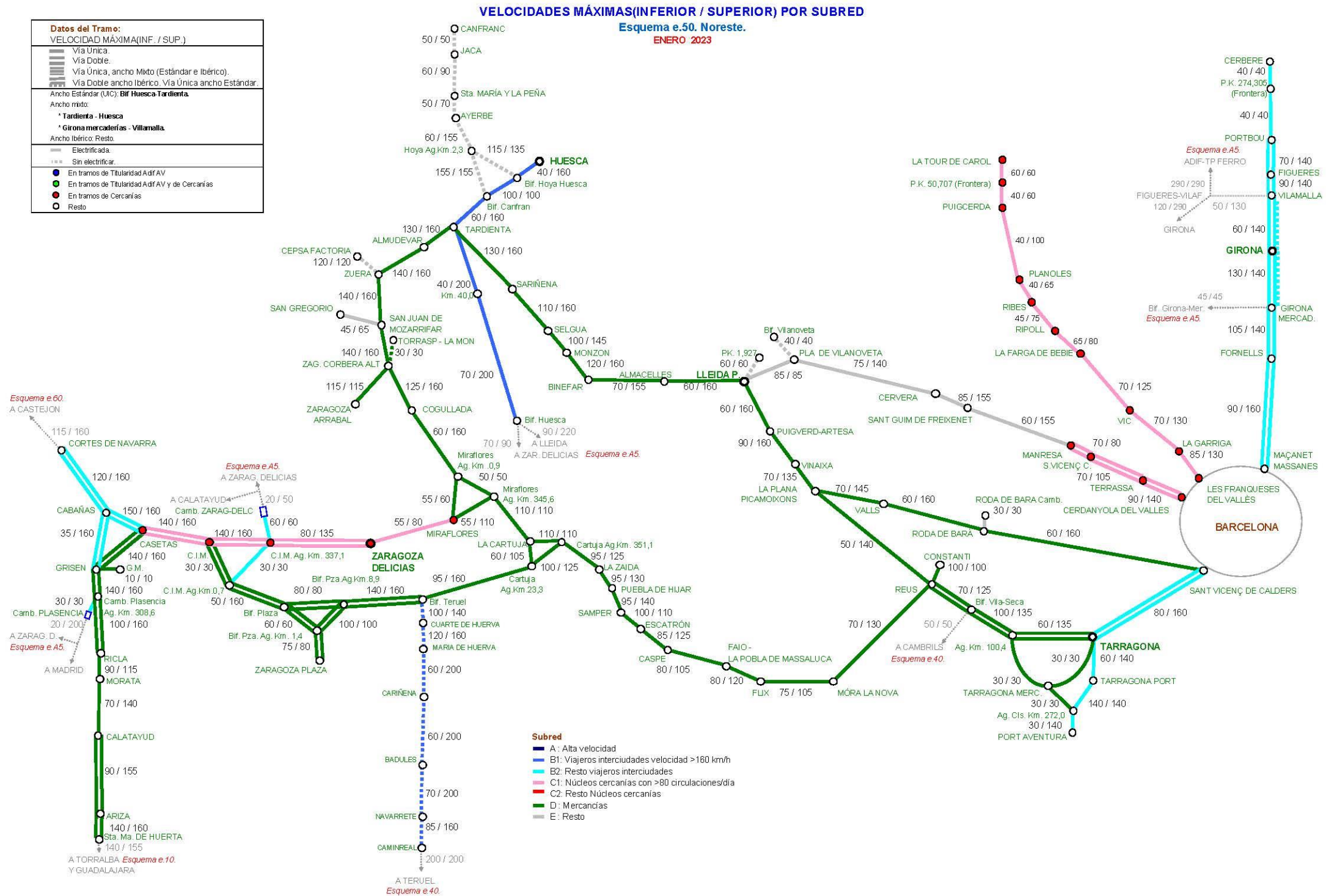




CIRTRA 2022

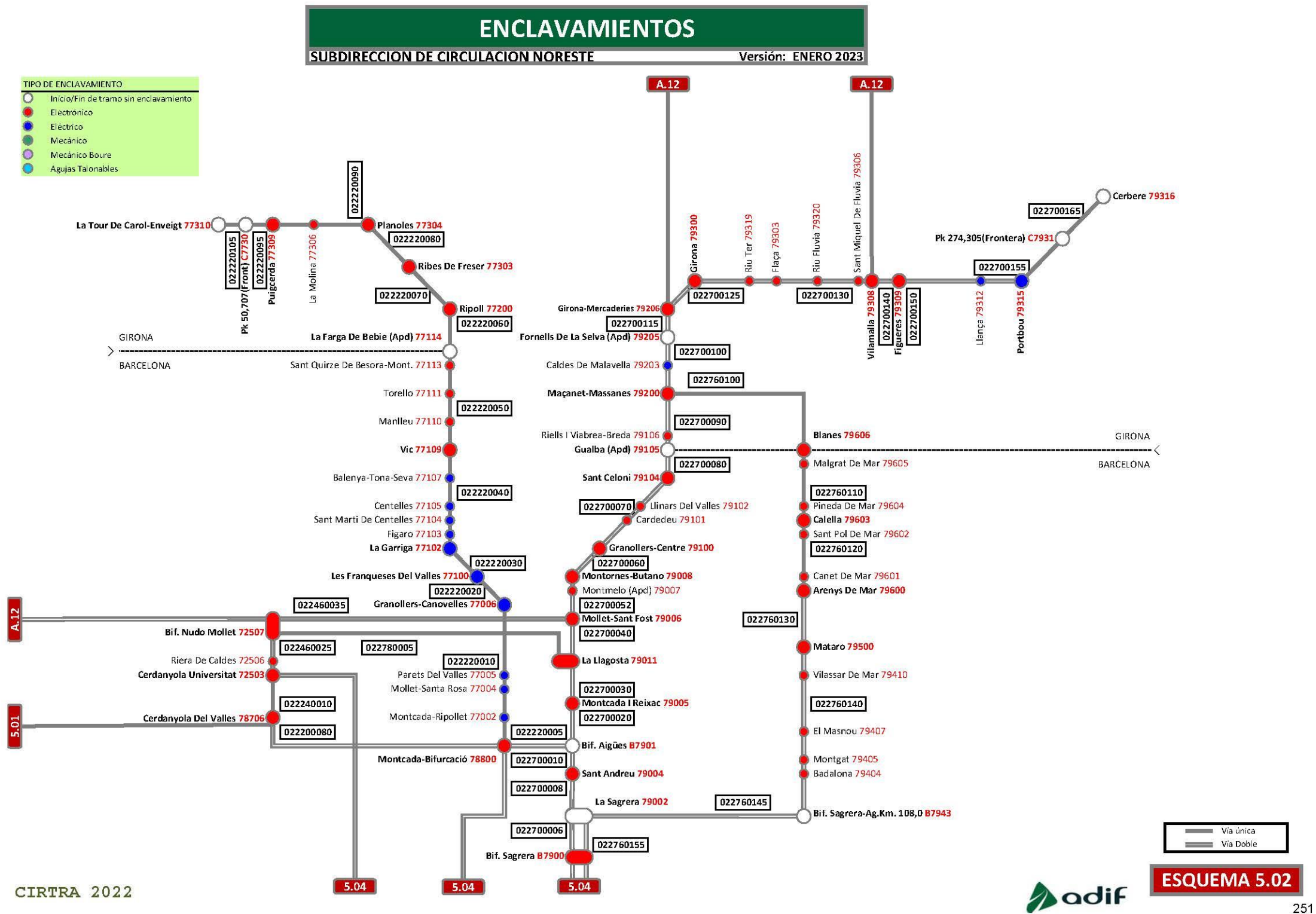




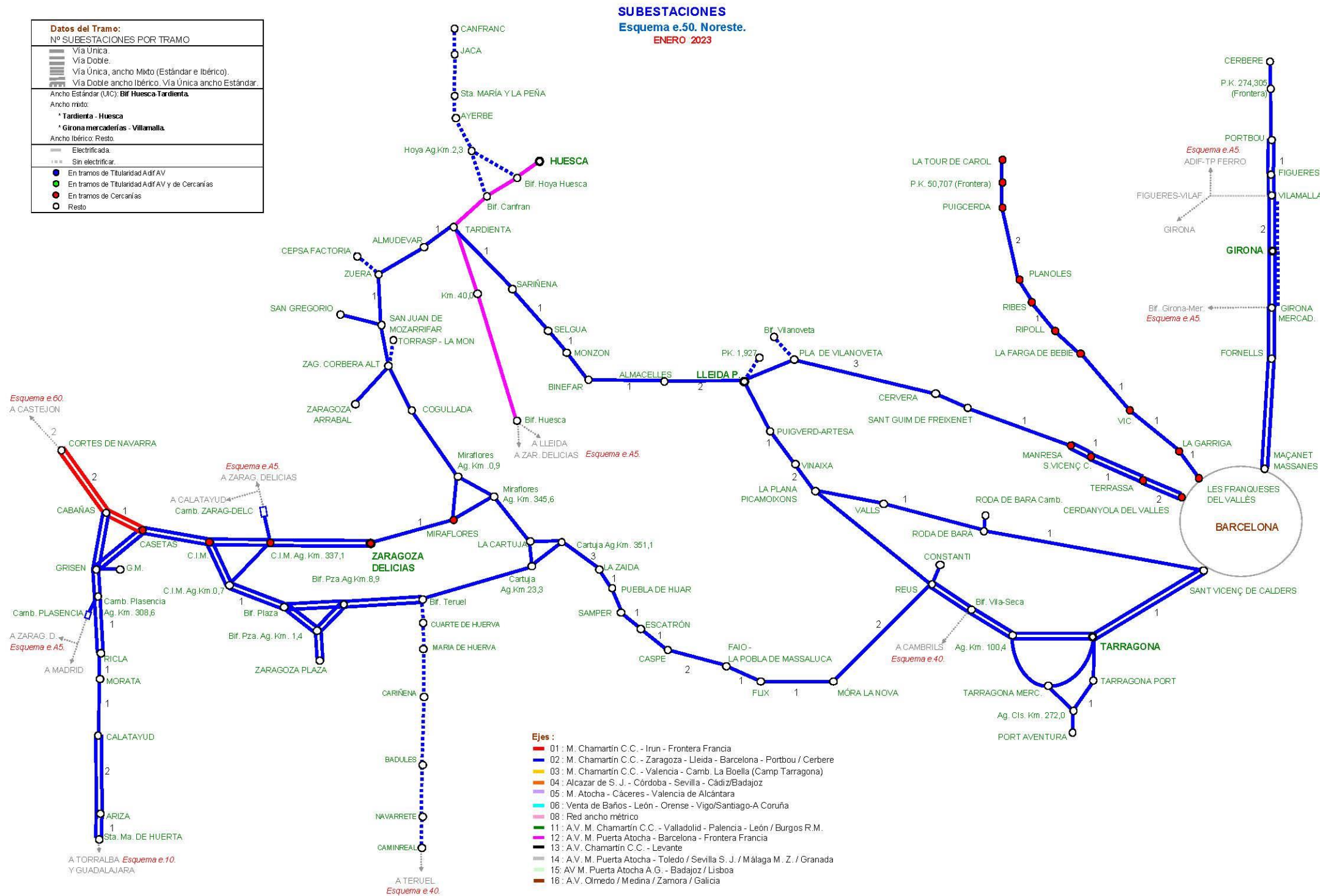


CIRTRA 2022









CIRTRA 2022

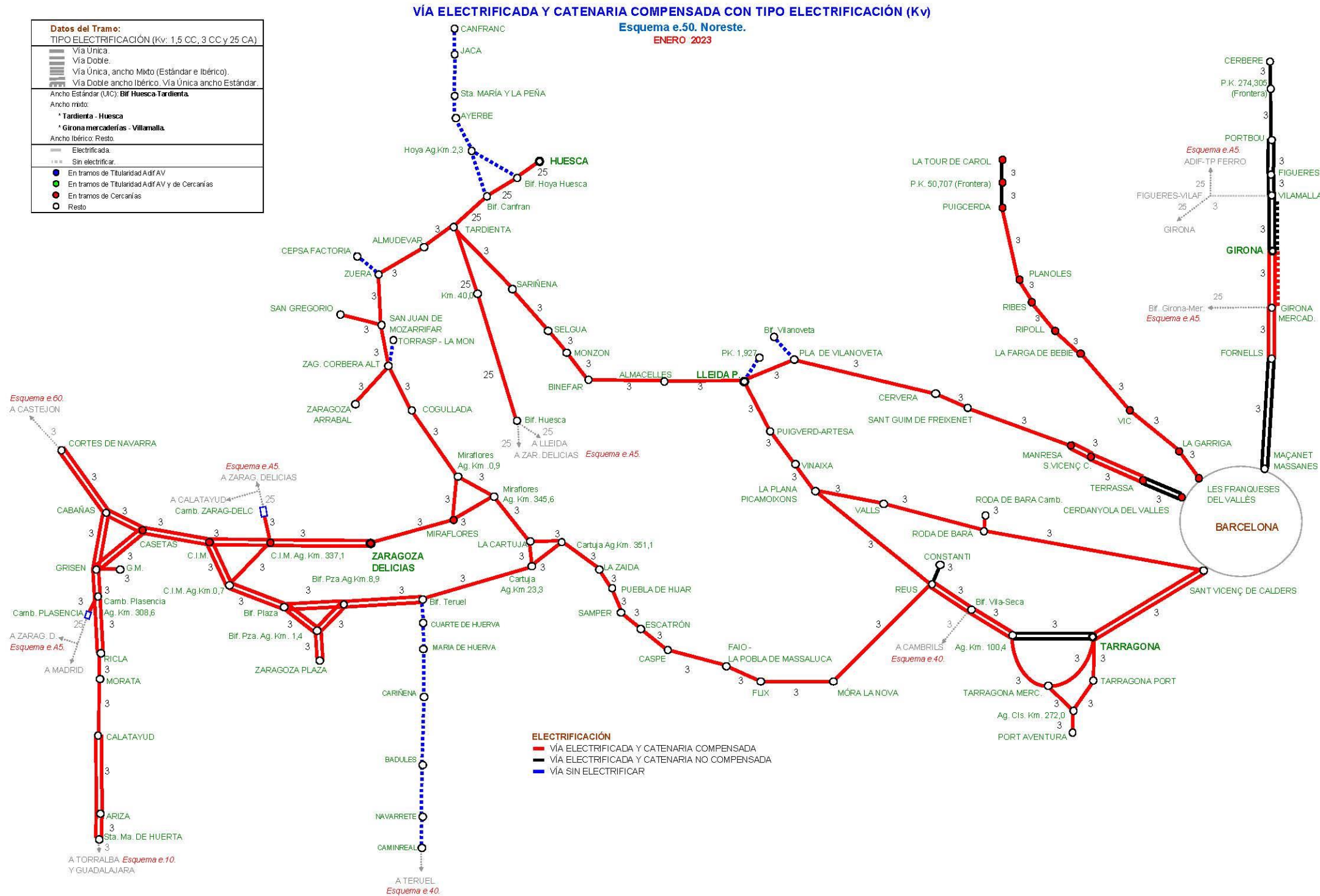




## SUBDIRECCIÓN CIRCULACIÓN NORESTE

TRAMO	LOCALIZACIÓN	FUNCIÓN
017000010	CASETAS	SUBESTACIÓN
017000020	LUCENI	SUBESTACIÓN
017000020	CORTES DE NAVARRA	SUBESTACIÓN
022000170	ARIZA	SUBESTACIÓN
022000180	BUBIERCA	SUBESTACIÓN
022000180	CALATAYUD	SUBESTACIÓN
022000190	MORES	SUBESTACIÓN
022000200	RICLA-LA ALMUNIA	SUBESTACIÓN
022000210	PLASENCIA	SUBESTACIÓN
022000270	MIRAFLORES	SUBESTACIÓN
022000320	ZUERA	SUBESTACIÓN
022000340	TARDIENTA	SUBESTACIÓN
022000350	MARCEN	SUBESTACIÓN
022000360	TOMILLO	SUBESTACIÓN
022000370	MONZÓN RIO ZINCA	SUBESTACIÓN
022000390	TAMARITE	SUBESTACIÓN
022000400	RAIMAT	SUBESTACIÓN
022000400	LLEIDA-PIRINEUS	SUBESTACIÓN
022000430	LES BORGES BLANQUES	SUBESTACIÓN
022000440	VIMBODI	SUBESTACIÓN
022000440	LA PLANA-PICAMOIXONS	SUBESTACIÓN
022000460	SALOMO	SUBESTACIÓN
022000470	SAN VICENÇ DE CALDERS	SUBESTACIÓN
022000490	CUBELLES	SUBESTACIÓN
022000490	VILANOVA I LA GELTRU	SUBESTACIÓN
022000500	SITGES	SUBESTACIÓN
022000510	GARRAF	SUBESTACIÓN
022000510	CASTELLDEFELS	SUBESTACIÓN
022000525	BARNA CAN TUNIS	SUBESTACIÓN
022000560	LA TORRASA( BARNA SANTIS)	SUBESTACIÓN
022000575	BIF. GLORIAS	SUBESTACIÓN
022100040	EL BURGO DE EBRO	SUBESTACIÓN
022100040	PIÑA	SUBESTACIÓN
022100040	LA ZAIDA	SUBESTACIÓN
022100050	LA PUEBLA DE HIJAR	SUBESTACIÓN
022100070	ESCATRÓN	SUBESTACIÓN
022100080	CASPE	SUBESTACIÓN
022100090	FAIO-LA POBLA DE MASSALUQUE	SUBESTACIÓN
022100090	FABARA	SUBESTACIÓN
022100100	FLIX	SUBESTACIÓN
022100110	MORA LA NOVA	SUBESTACIÓN

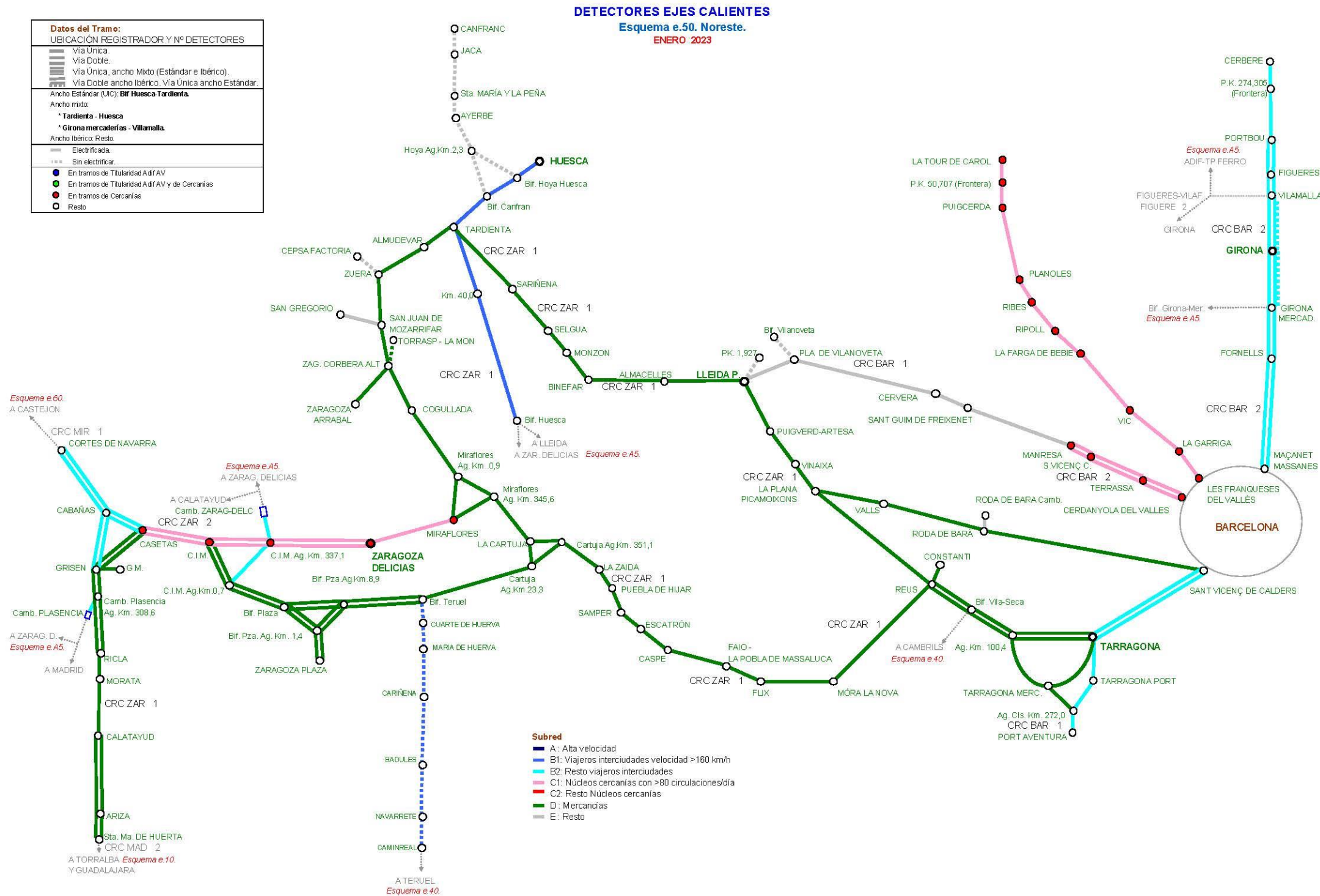
TRAMO	LOCALIZACIÓN	FUNCIÓN
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022100120	REUS	SUBESTACIÓN
022100150	TORREDEMBARRA	SUBESTACIÓN
022140020	FERIA(BIF. PLAZA)	SUBESTACIÓN
022200012	MOLLERUSSA	SUBESTACIÓN
022200012	ANGLESOLA	SUBESTACIÓN
022200012	CERVERA	SUBESTACIÓN
022200040	CALAF	SUBESTACIÓN
022200050	SAN VICENÇ DE CASTELLET	SUBESTACIÓN
022200060	VACARISSES	SUBESTACIÓN
022200070	TORREBONICA	SUBESTACIÓN
022200070	SABADELL	SUBESTACIÓN
022200080	MONTCADA- BIF.	SUBESTACIÓN
022220030	LAS FRANQUESSES DEL VALLÉS	SUBESTACIÓN
022220040	CENTELLES	SUBESTACIÓN
022220050	MANLLEU	SUBESTACIÓN
022220070	RIPOLL	SUBESTACIÓN
022220090	URTX-ALP	SUBESTACIÓN
022220090	PLANOLES	SUBESTACIÓN
022400020	ELS MONJOS	SUBESTACIÓN
022400030	SANT SADURNÍ D'ANOIA	SUBESTACIÓN
022400060	MARTORELL	SUBESTACIÓN
022400070	CASTELLBISBAL	SUBESTACIÓN
022400130	CORNELLA	SUBESTACIÓN
022460015	SANT CUGAT DEL VALLÉS	SUBESTACIÓN
022700030	MONTCADA I REIXAC	SUBESTACIÓN
022700052	MOLLET-SANT FOST	SUBESTACIÓN
022700070	PALAUTORDERA	SUBESTACIÓN
022700070	CARDEDEU	SUBESTACIÓN
022700070	GRANOLLERS-CENTRE	SUBESTACIÓN
022700090	GUALBA	PENDIENTE PUESTA EN SERVICIO
022700090	MAÇANET-MASSANES	SUBESTACIÓN
022700130	GIRONA	SUBESTACIÓN
022700130	SANT MIQUEL DE FLUVIA	SUBESTACIÓN
022700150	LLANÇA	SUBESTACIÓN
022760110	BLANES	SUBESTACIÓN
022760110	PINEDA DE MAR	SUBESTACIÓN
022760130	ARENYS DE MAR	SUBESTACIÓN
022760140	SANT ADRIÀ DE BESOS	SUBESTACIÓN
022760140	PREMIA DE MAR	SUBESTACIÓN
022760140	MATARÓ	SUBESTACIÓN
022760160	BARCELONA-SAGRERA	SUBESTACIÓN
026300020	TARRAGONA	SUBESTACIÓN
<b>TOTAL SUBESTACIONES</b>		<b>84</b>



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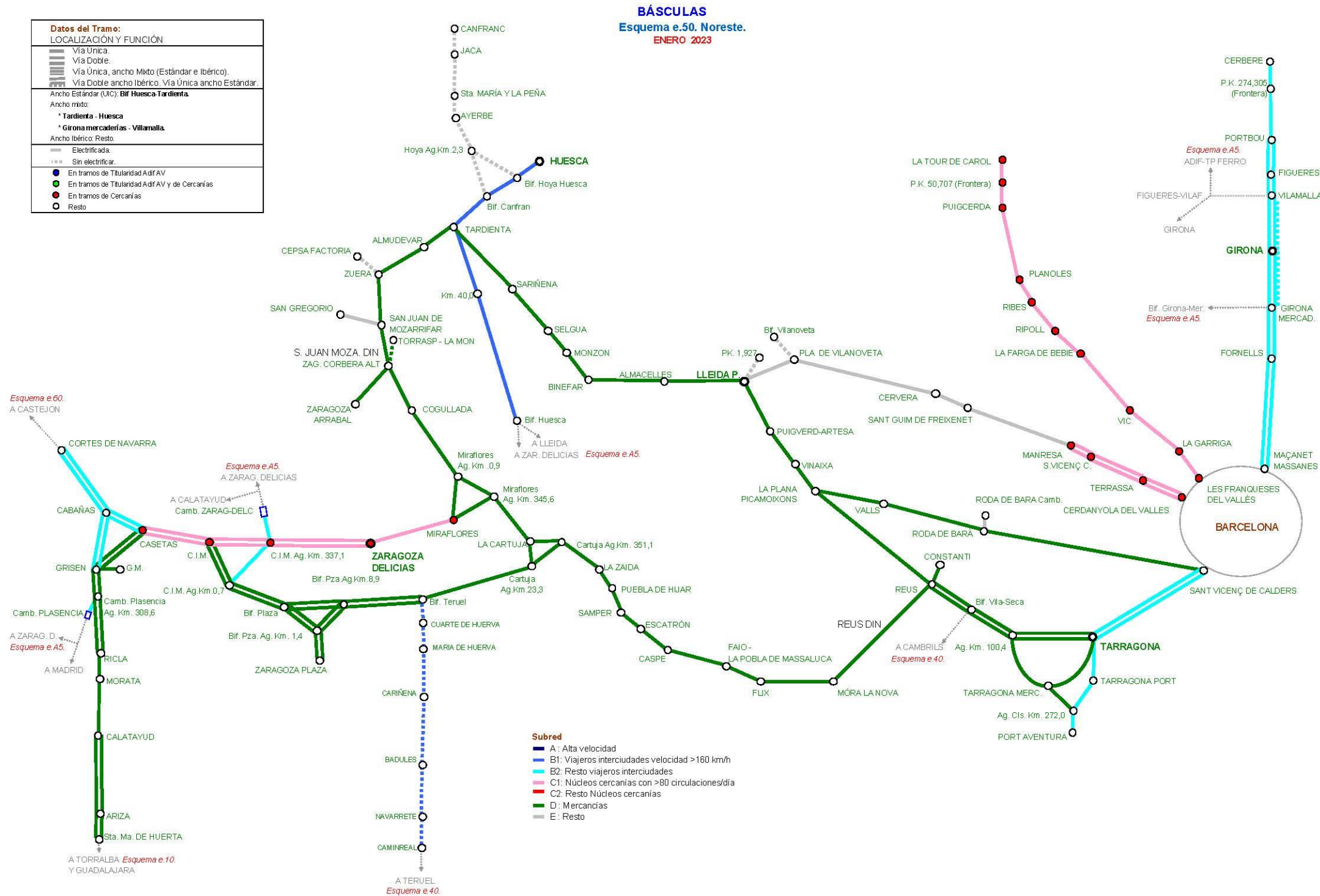






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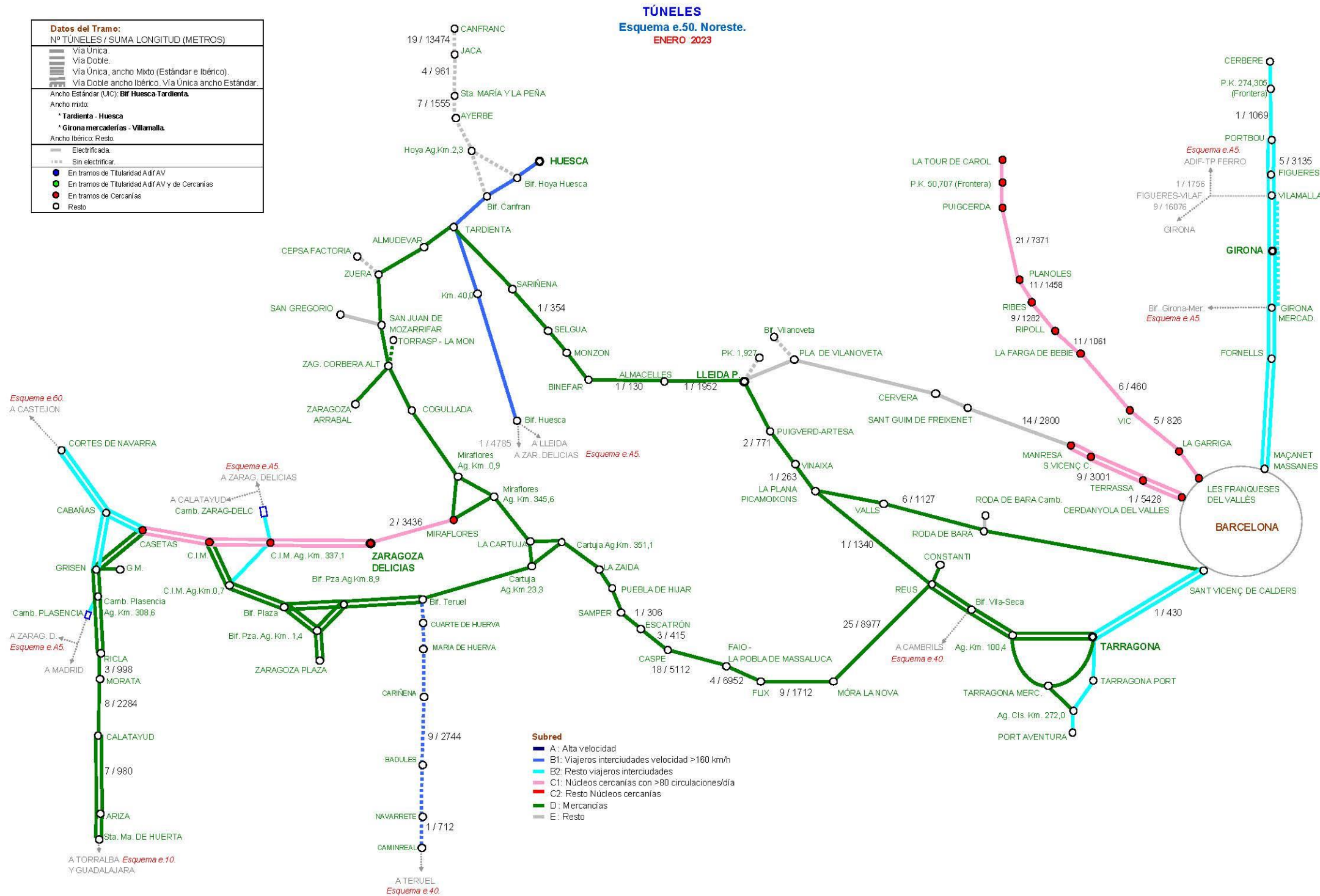




CIRTRA 2022







CIRTRA 2022



## PASOS A NIVEL EN SUBDIRECCIÓN DE CIRCULACIÓN NORESTE

Actualizado a: 01/01/2023

## PPNN de tramos en servicio

Tipo de Línea	Kilómetros de Línea	Pasos a Nivel	PPNN por Km.
B1	192,1	0	0,00
B2	181,3	15	0,08
C1	554,9	62	0,11
D	786,7	111	0,14
E	356,8	69	0,19
<b>Total</b>	<b>2.071,8</b>	<b>257</b>	<b>0,12</b>

## Por Categorías

Protección (R.D.)	Pasos a Nivel
A1	3
A2	97
A3	52
A4	1
P	104
<b>Total</b>	<b>257</b>

Clase	Protección (R.D.929/2020 y Resolución 12/2020 AESF)
A1	Protección activa. Manual. Aviso o protección al usuario activados o realizados manualmente por personal ferroviario. Regulado mediante Consigna del Administrador de Infraestructuras Ferroviarias
A2	Protección activa. Automática con aviso al usuario. Aviso al usuario activado de forma automática por el tren que se aproxima o como consecuencia del establecimiento de un itinerario que afecte al paso.
A3	Protección activa. Automática con protección al usuario. Protección y/o aviso al usuario activados de forma automática por el tren que se aproxima o como consecuencia del establecimiento de un itinerario que afecte al paso.
A4	Protección activa. Automática con protección a la vía. Una señal o un sistema de protección de tren le permiten a este el paso normal tras comprobar que el PN está protegido al usuario y libre de obstáculos.
P	Protección pasiva. Sin sistema de aviso o protección que advierta al usuario de la llegada del tren.

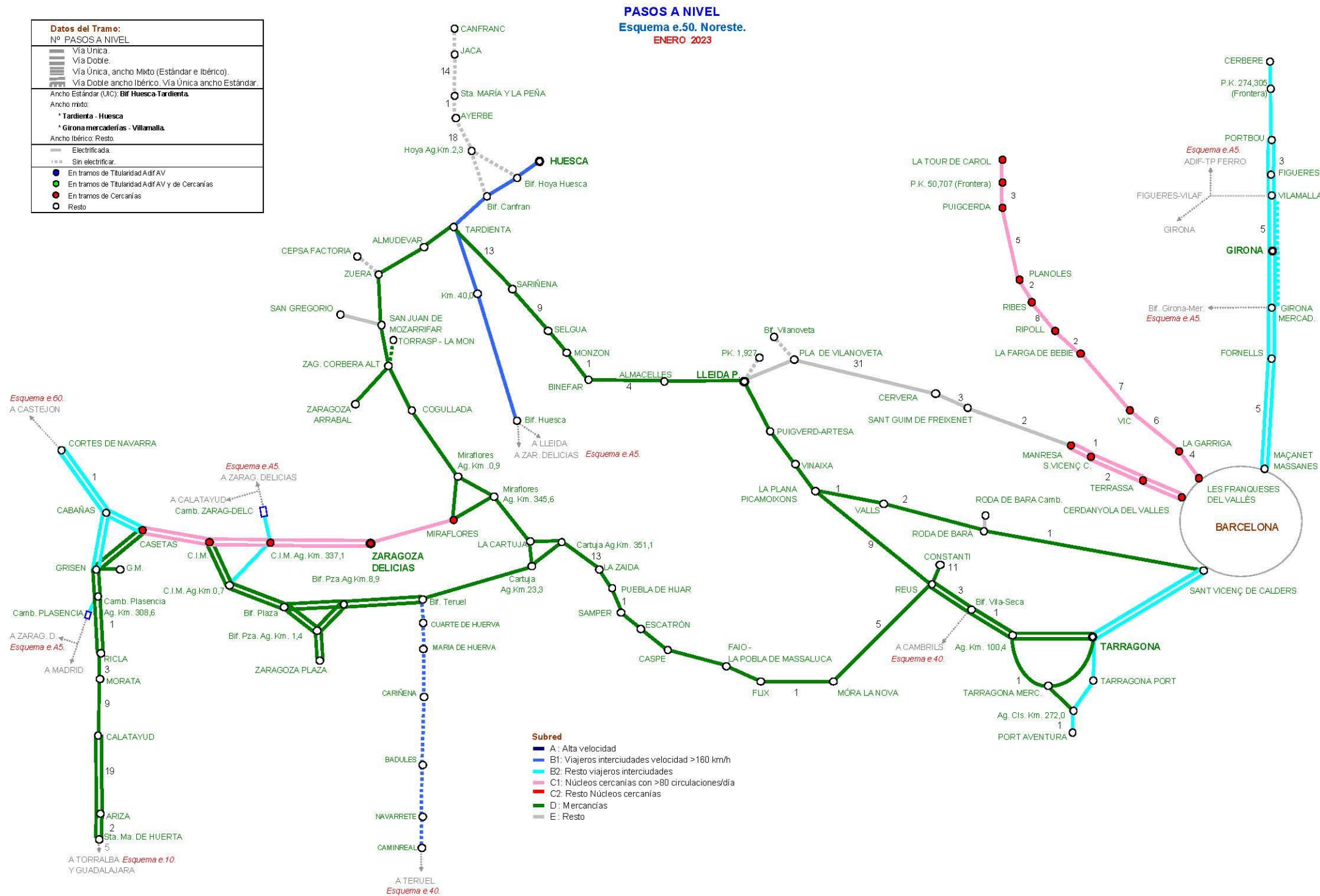
## Por Tramos

\* Total Km. Comprende la longitud de los tramos con PPNN

Tramo	Inicio Tramo	Final Tramo	Km.	PPNN	PPNN/Km.
017000020	CABAÑAS DE E.	CORTES NAVARRA	25,425	1	0,04
022000170	STA. MA. HUERTA	ARIZA	12,943	2	0,15
022000180	ARIZA	CALATAYUD	39,584	19	0,48
022000190	CALATAYUD	MORATA DE JALON	27,625	9	0,33
022000200	MORATA DE JALON	RICLA-LA ALMUNIA	8,196	3	0,37
022000210	RICLA-LA ALMUNIA	CAMB-AG.KM.308,6	28,152	1	0,04
022000350	TARDIENTA	SARIÑENA	37,992	13	0,34
022000360	SARIÑENA	SELGUA	31,953	9	0,28
022000380	MONZON-RIO CINCA	BINEFAR	10,81	1	0,09
022000390	BINEFAR	ALMACELLES	20,94	4	0,19
022000450	PLANA-PICAMOIXON	VALLS	6,116	1	0,16
022000460	VALLS	RODA DE BARA	22,535	2	0,09
022000470	RODA DE BARA	S.VICENÇ CALDERS	7,306	1	0,14
022040020	HOYA H-AG KM 2,3	AYERBE	36,273	18	0,50
022040030	AYERBE	STA.MARIA Y PEÑA	18,595	1	0,05
022040040	STA.MARIA Y PEÑA	JACA	56,619	14	0,25
022100040	CARTUJA-AG 351,1	LA ZAIDA-SASTAGO	45,604	13	0,29
022100060	LA PUEBLA HIJAR	SAMPER	9,495	1	0,11
022100110	FLIX	MORA LA NOVA	19,7	1	0,05
022100120	MORA LA NOVA	REUS	48,177	5	0,10
022100125	REUS	BIF. VILA-SECA	8,273	3	0,36
022100135	BIF. VILA-SECA	AG.CLAS.KM 100.4	6,746	1	0,15
022200012	AG. KM. 185,747	CERVERA	54,357	31	0,57
022200030	CERVERA	S.GUIM FREIXENET	13,903	3	0,22
022200040	S.GUIM FREIXENET	MANRESA	47,712	2	0,04
022200050	MANRESA	S.VICENÇ CASTELL	7,909	1	0,13
022200060	S.VICENÇ CASTELL	TERRASSA	24,112	2	0,08
022220010	MONTCADA-BIFURCA	GRANOLLERS-CANOV	19,723	3	0,15

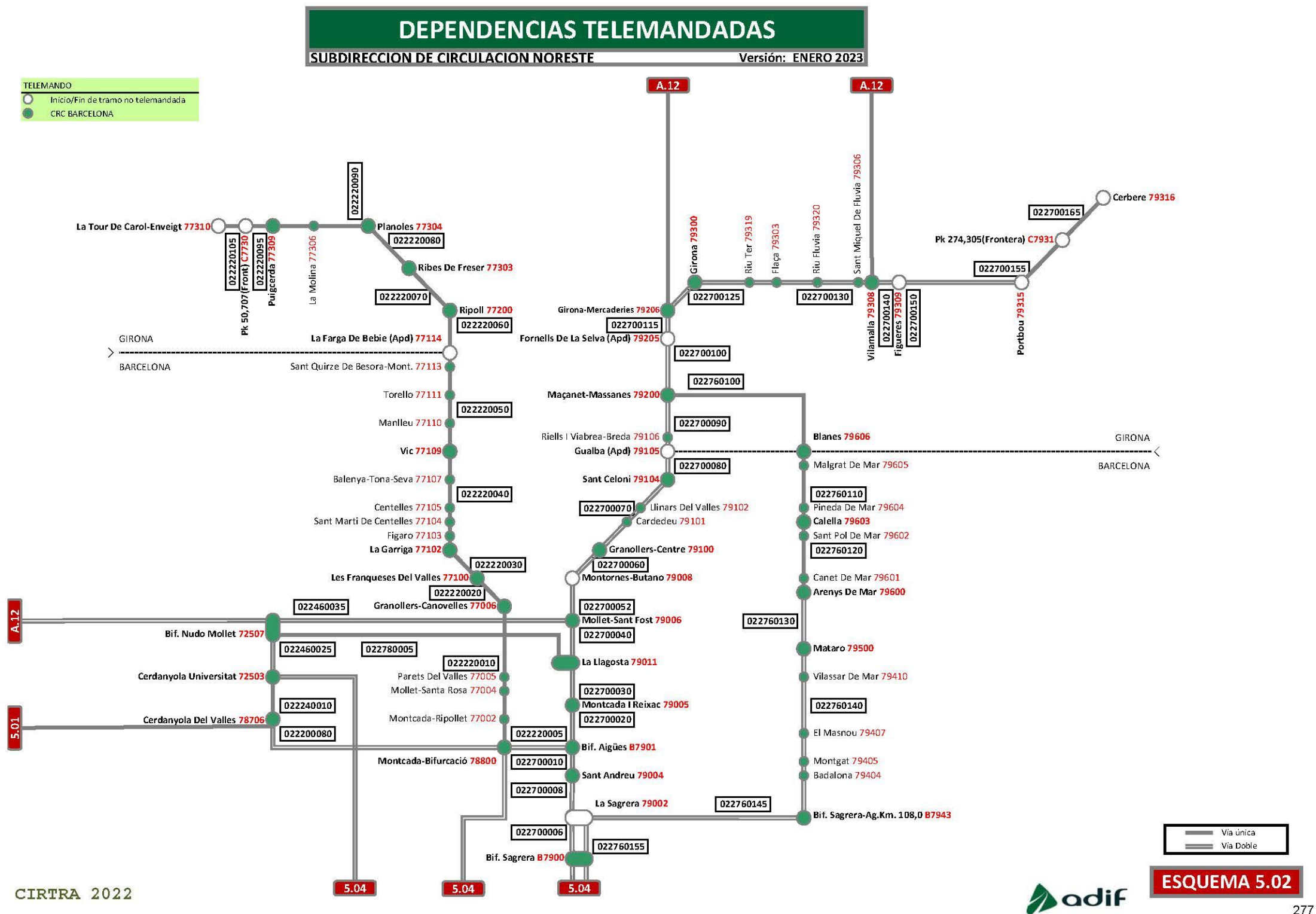
Tramo	Inicio Tramo	Final Tramo	Km.	PPNN	PPNN/Km.
022220030	FRANQUESES VALLE	LA GARRIGA	6,206	4	0,64
022220040	LA GARRIGA	VIC	31,382	6	0,19
022220050	VIC	LA FARGA DE BEBI	27,974	7	0,25
022220060	LA FARGA DE BEBI	RIPOLL	8,6	2	0,23
022220070	RIPOLL	RIBES DE FRESER	13,45	8	0,59
022220080	RIBES DE FRESER	PLANOLES	6,76	2	0,30
022220090	PLANOLES	PUIGCERDA	28,347	5	0,18
022220095	PUIGCERDA	P.K. 50,707	2,15	3	1,40
022300010	PLANA-PICAMOIXON	REUS	20,889	9	0,43
022340010	REUS	CONSTANTI	6,2	11	1,77
022380030	BARNA-C. TUNIS	BARNA-MORROT	4,339	1	0,23
022400010	S.VICENÇ CALDERS	LARBOÇ	12,312	1	0,08
022400030	VILAFRANCA PEN.	S. SADURNI	11,776	3	0,25
022700020	BIF. AIGÜES	MONTCADA I R	3,321	2	0,60
022700070	GRANOLLERS-CENTR	SANT CELONI	22,102	1	0,05
022700100	MAÇANET-MASSANES	FORNELLS	24,486	5	0,20
022700130	GIRONA	VILAMALLA	36,072	5	0,14
022700150	FIGUERES	PORTBOU	26,065	3	0,12
022760100	MAÇANET-MASSANES	BLANES	15,232	8	0,53
022760110	BLANES	CALELLA	11,384	1	0,09
022760120	CALELLA	ARENYS DE MAR	10,678	3	0,28
026240010	AG.CLAS.KM 100.4	TARRAGONA MERC.	0,6	1	1,67
026300010	PORT AVENTURA	AG.CLAS.KM.272	6,4	1	0,16
<b>Total *</b>			<b>1.033,5</b>	<b>257</b>	



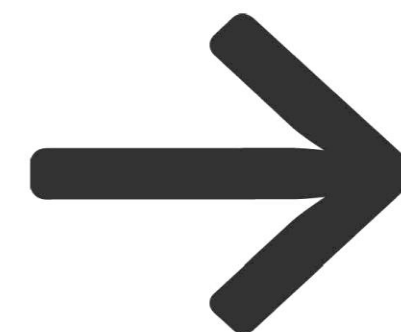


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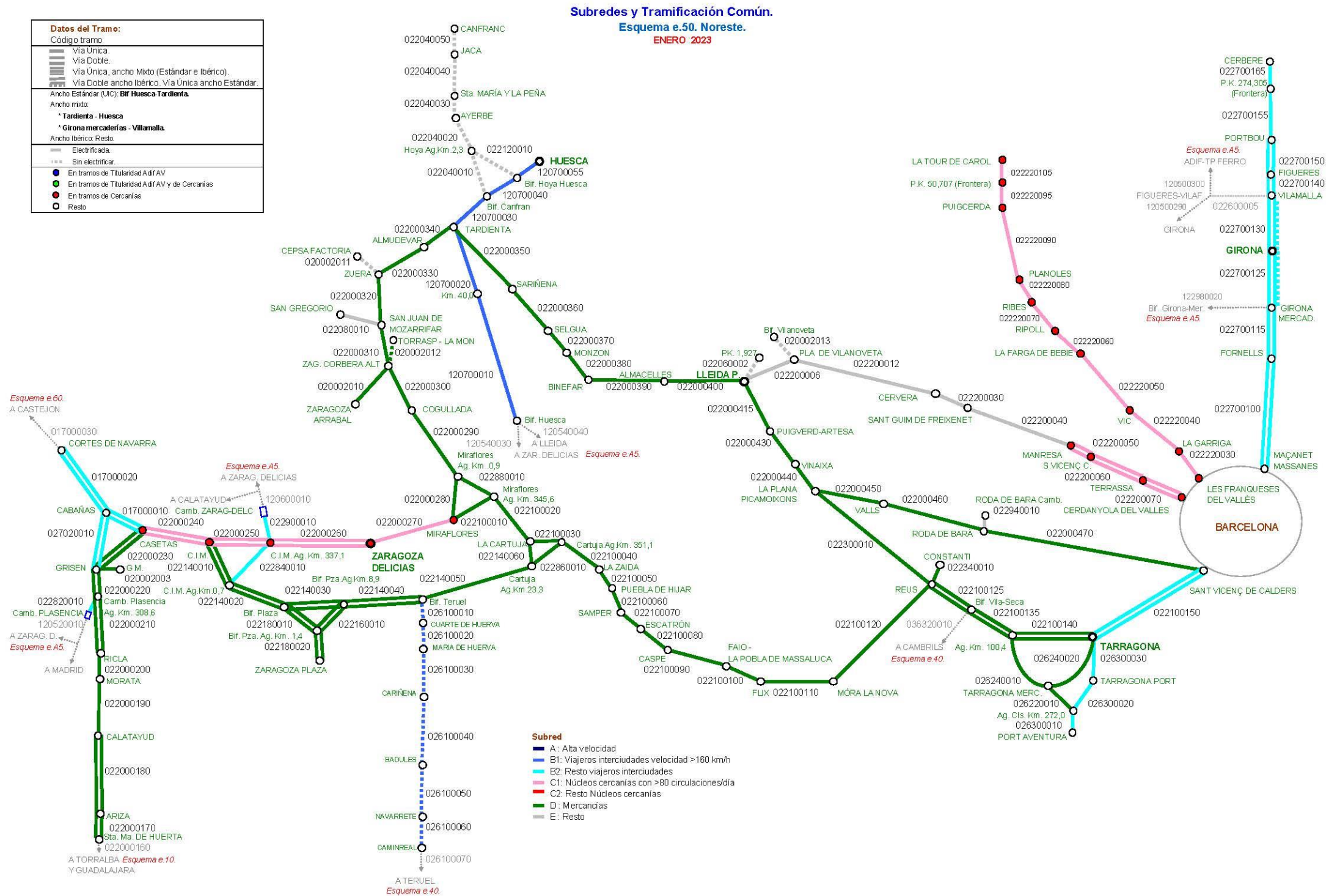
# Esquemas de tramos y Puntos de Mallas Circulación Noreste



D.G. CIRCULACIÓN Y GESTIÓN DE CAPACIDAD  
D. de Tráfico  
S.D. Análisis y Control de la Puntualidad







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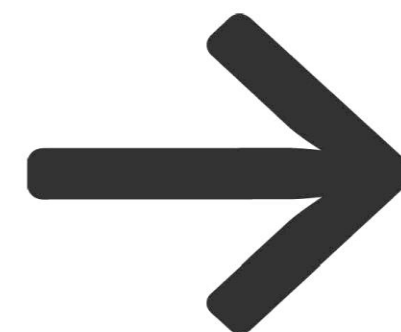




# Listado de tramos y sus características

## Circulación Noreste

D.G. CIRCULACIÓN Y GESTIÓN DE CAPACIDAD  
D. de Tráfico  
S.D. Análisis y Control de la Puntualidad





LISTADO DE TRAMOS POR EJES Y LINEAS (CUADRO DE VELOCIDADES MÁXIMAS)

SUBDIRECCIÓN DE CIRCULACIÓN NORESTE

EJE	TRAMO CVM	ORD	INICIO DE TRAMO	FINAL DE TRAMO	PUNTO KILOMETRICO			SUB. CIRCULACIÓN	JEF. OPER.	ÁREA MANTENIMIENTO	NUCLEO CERC.	TITUL.	CANON	SUB RED	VA	ELE	KV	CAT. COMP.	BLOQUEO	ASFA	ATP	ERTMS	TIERRA	BANDA SITRA	VELOCIDAD					
					INICIO	FINAL	L.LIN																		L.VA	ANCHO	MIN.	MAX.		
01	700	0010	70800	CASSETS	81209	CABAÑAS DE E.	15.4	29.9	14,473	28,946	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	B2	B2	D	SI	3	SI	BAB	CTC	SI	NO	69	5403-	150	160
01	700	0020	81209	CABAÑAS DE E.	81205	CORTES NAVARRA	29.9	55.3	25,425	50,85	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	B2	B2	D	SI	3	SI	BAB	CTC	SI	NO	69	5403-	120	160
02	000	2003	70706	GRISEN	00004	GENERAL MOTOS	0.0	0.0	1,17	1,17	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BT		NO	NO		NO-	10	10
02	000	2008	71901	BARNIA-C. TUNIS	00005	TALLERES	0.0	0.0	0,892	0,892	IBE	NORESTE	BARCELONA/GRONA	J.A. Mto. Barcelona		AD	E	E	U	NO		NO	BT		NO	NO		NO-	10	10
02	000	2009	71901	BARNIA-C. TUNIS	00003	MERCABARNA	0.0	0.0	3,642	3,642	IBE	NORESTE	BARCELONA/GRONA	J.A. Mto. Barcelona		AD	D	D	U	NO		NO	SB		NO	NO		NO-	10	10
02	000	2010	78007	ZAG. CORBERA ALT	78002	ZARAGOZA-ARRABAL	4.2	0.0	4,269	4,269	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	SB		NO	NO		5404-	115	115
02	000	2011	78100	ZUERA	00017	CEPSA FACTORIA	0.0	2.6	2,55	2,55	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	E	E	U	NO		NO	SB		NO	NO		NO-	120	120
02	000	2012	78007	ZAG. CORBERA ALT	50403	TORRAS- LA MON	0.0	2.08	2,079	2,079	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	NO		NO	SB		NO	NO		NO-	30	30
02	000	2013	88401	AG. KM. 185,747	87511	BIF VILANOVETA	0.5	0.0	0,508	0,508	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	E	E	U	NO		NO	BT		NO	NO		5102-	40	40
02	200	0170	70404	STA. MA. HUERTA	70500	ARIZA	192.1	205.0	12,943	25,886	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	D	SI	3	SI	BLAD	CTC	SI	NO	69	1109-	140	160
02	200	0180	70500	ARIZA	70600	CALATAYUD	205.0	244.7	39,584	79,168	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	D	SI	3	SI	BAD	CTC	SI	NO	61	5402-	90	155
02	200	0190	70600	CALATAYUD	70607	MORATA DE JALON	244.7	272.3	27,625	27,625	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	61	5402-	70	140
02	200	0200	70607	MORATA DE JALON	70700	RICLA-LA ALMUNIA	272.3	280.4	8,196	8,196	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	61	5402-	90	115
02	200	0210	70700	RICLA-LA ALMUNIA	A7070	CAMB-AG KM 308,6	280.4	308.6	28,152	56,304	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	61	5402-	100	160
02	200	0220	A7070	CAMB-AG KM 308,6	70706	GRISEN	308.6	314.6	6,043	12,086	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	61	5402-	140	160
02	200	0230	70706	GRISEN	70800	CASSETS	314.6	327.5	13,125	26,25	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	61	5402-	140	160
02	200	0240	70800	CASSETS	70803	C.I. M. DE ZARAGO	327.5	335.6	7,805	15,61	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	ZARAGOZA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	69	5403-	140	160
02	200	0250	70803	C.I. M. DE ZARAGO	A7080	CIM-AG KM 337,1	335.6	337.1	1,48	2,96	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	ZARAGOZA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	69	5403-	140	160
02	200	0260	A7080	CIM-AG KM 337,1	04040	ZARAGOZA DELIC.	337.1	339.4	2,335	4,67	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	ZARAGOZA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	69	5403-	80	135
02	200	0270	04040	ZARAGOZA DELIC.	71100	MIRAFLORES	339.4	344.3	4,974	4,974	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	ZARAGOZA	AD	C1	C1	U	SI	3	SI	BAU	CTC	SI	NO	64	5403-	55	80
02	200	0280	71100	MIRAFLORES	A7880	MIRAF-AG KM 0,9	0.0	0.9	0,917	0,917	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5404-	55	60
02	200	0290	A7880	MIRAF-AG KM 0,9	78902	COGULLADA	0.9	6.1	5,143	5,143	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5404-	60	160
02	200	0300	78902	COGULLADA	78007	ZAG. CORBERA ALT	6.1	8.5	2,44	2,44	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5404-	125	160
02	200	0310	78007	ZAG. CORBERA ALT	78004	S. JUAN MOZARRIFA	8.5	11.5	2,986	2,986	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5404-	140	160
02	200	0320	78004	S. JUAN MOZARRIFA	78100	ZUERA	7.3	25.7	18,477	18,477	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	99	5408-	140	160
02	200	0330	78100	ZUERA	78102	ALMUDEVAR	25.7	43.8	18,087	18,087	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	99	5408-	140	160
02	200	0340	78102	ALMUDEVAR	78200	TARDIENTA	43.8	52.8	9,082	9,082	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	99	5408-	130	160
02	200	0350	78200	TARDIENTA	78203	SARIÑENA	52.8	90.9	37,992	37,992	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	61	5408-	130	160
02	200	0360	78203	SARIÑENA	78300	SELGUA	90.9	122.8	31,953	31,953	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	61	5408-	110	160
02	200	0370	78300	SELGUA	78301	MONZON-RIO CINCA	122.8	127.5	4,707	4,707	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	61	5408-	100	145
02	200	0380	78301	MONZON-RIO CINCA	78302	BINEFAR	127.5	138.3	10,81	10,81	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	65	5410-	120	160
02	200	0390	78302	BINEFAR	78304	ALMACELLES	138.3	159.3	20,94	20,94	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	65	5410-	70	155
02	200	0400	78304	ALMACELLES	78400	LLEIDA-PIRINEUS	159.3	183.6	24,367	24,367	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	65	5410-	60	160
02	200	0415	78400	LLEIDA-PIRINEUS	73001	PUGVERD-ARTESA	0.0	11.6	11,7	11,7	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5410-	60	160
02	200	0430	73001	PUGVERD-ARTESA	73005	VINAIXA	11.6	40.4	28,81	28,81	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5410-	90	160
02	200	0440	73005	VINAIXA	73100	PLANA-PICAMOIXON	40.4	68.6	28,218	28,218	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5410-	70	135
02	200	0450	73100	PLANA-PICAMOIXON	76004	VALLS	0.0	6.1	6,116	6,116	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	66	5117-	70	145
02	200	0460	76004	VALLS	72100	RODA DE BARA	6.1	28.7	22,535	22,535	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	66	5117-	60	160
02	200	0470	72100	RODA DE BARA	71600	S VICEÑ CALDERS	610.7	618.0	7,306	7,306	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona		AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	66	5117-	60	160
02	200	0480	71600	S VICEÑ CALDERS	71603	CUNIT	618.0	627.0	9,006	18,012	IBE	NORESTE	BARCELONA/GRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	SI	99	5106-	140	160
02	200	0490	71603	CUNIT	71700	VILANVI LA GELT	627.0	636.0	8,994	17,988	IBE	NORESTE	BARCELONA/GRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	SI	99	5106-	105	160
02	200	0500	71700	VILANVI LA GELT	71701	SITGES	636.0	643.3	7,294	14,588	IBE	NORESTE	BARCELONA/GRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	SI	64	5105-	110	160
02	200	0510	71701	SITGES	71705	CASTELDEFELS	643.3	658.9	15,653	31,306	IBE	NORESTE	BARCELONA/GRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	SI	64	5105-	100	1



LISTADO DE TRAMOS POR EJES Y LINEAS (CUADRO DE VELOCIDADES MÁXIMAS)

SUBDIRECCIÓN DE CIRCULACIÓN NORESTE

EJE	TRAMO CVM	ORD	INICIO DE TRAMO	FINAL DE TRAMO	PUNTO KILOMETRICO			SUB. CIRCULACIÓN	JEF. OPER.	ÁREA MANTENIMIENTO	NUCLEO CERC.	TITUL.	CANON	SUB RED	VA	ELE	KV	CAT. COMP.	BLOQUEO	ASFA	ATP	ERTMS	TIERRA	BANDA SITRA	VELOCIDAD					
					INICIO	FINAL	L.LIN																		L.VA	ANCHO	MIN.	MAX.		
02	210	0150	71500	TARRAGONA	71600	S.VICENÇ CALDERS	0.0	24.8	24,871	49,742	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	B2	B2	D	SI	3	SI	BAB	CTC	SI	SI	65	5106-	80	160	
02	212	0010	B7801	BIF. HOYA HUESCA	A7400	HOYA H-AG KM 2,3	0.0	1.7	1,723	1,723	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	E	E	U	NO	NO	BAU	CTC	SI	NO	99	5405-	115	135		
02	214	0010	70803	C.I.M. DE ZARAGO	A7081	CIM-AGUIA KM 0,7	335.6	0.7	1,487	2,974	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	64	5407-	30	30	
02	214	0020	A7081	CIM-AGUIA KM 0,7	B7082	BIF. PLAZA	0.7	7.3	6,593	13,186	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	64	5407-	50	160	
02	214	0030	B7082	BIF. PLAZA	A7086	BIF.PZA.AG.K.8,9	7.3	8.9	1,467	2,934	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	64	5407-	80	80	
02	214	0040	A7086	BIF. PZA. AG. K.8,9	B7081	BIF. TERUEL	8.9	12.0	3,253	6,506	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	64	5407-	140	160	
02	214	0050	B7081	BIF. TERUEL	A7083	CARTUJA-AG 23,3	12.0	23.3	11.3	11.3	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5407-	95	160	
02	214	0060	A7083	CARTUJA-AG 23,3	71101	LA CARTUJA	23.3	24.7	1,425	1,425	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5407-	60	105	
02	216	0010	A7087	BIF.PZA.AG.K.1,4	A7086	BIF.PZA.AG.K.8,9	0.0	2.0	1,958	3,916	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	64	5407-	100	100	
02	218	0010	B7082	BIF. PLAZA	A7087	BIF.PZA.AG.K.1,4	0.0	1.4	1,371	2,742	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	64	5407-	60	60	
02	218	0020	A7087	BIF.PZA.AG.K.1,4	70805	ZARAGOZA-PLAZA	1.4	4.5	3,164	6,328	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	64	5407-	75	80	
02	220	0006	78400	LLEIDA-PRINEUS	A8401	AG. KM. 185,747	183.6	185.7	2,063	2,063	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza	AD	E	E	U	SI	3	SI	BT	CTC	SI	NO		5102-	85	85	
02	220	0012	A8401	AG. KM. 185,747	78500	CERVERA	185.7	240.1	54,357	54,357	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza	AD	E	E	U	SI	3	SI	BT	CTC	SI	NO	62	5102-	75	140	
02	220	0030	78500	CERVERA	78501	S.GUIM FREIXENET	240.1	254.0	13,909	13,909	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza	AD	E	E	U	SI	3	SI	BLAU	CTC	SI	NO	62	5102-	85	155	
02	220	0040	78501	S.GUIM FREIXENET	78600	MANRESA	254.0	301.7	47,712	47,712	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Zaragoza	AD	E	E	U	SI	3	SI	BLAU	CTC	SI	NO	62	5102-	60	155	
02	220	0050	78600	MANRESA	78604	S.VICENÇ CASTELL	301.7	309.6	7,909	15,818	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAD	CTC	SI	NO	66	5102-	70	80
02	220	0060	78604	S.VICENÇ CASTELL	78700	TERASSA	309.6	333.7	24,112	48,224	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAD	CTC	SI	NO	66	5102-	70	105
02	220	0070	78700	TERASSA	78706	CERDANYOLA VALLE	333.7	351.2	17,497	34,994	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	66	5102-	90	140
02	220	0080	78706	CERDANYOLA VALLE	78800	MONTCADA-BIFURCA	351.2	356.7	5,469	10,938	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	66	5102-	70	140
02	220	0090	78800	MONTCADA-BIFURCA	88801	BIF.VILANOVA	356.7	365.4	8,711	17,422	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	62	5101-	50	100
02	222	0005	B7901	BIF. AIGÜES	78800	MONTCADA-BIFURCA	0.0	2.4	2.4	4.8	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAD	CTC	SI	NO	69	5103-	60	60
02	222	0010	78800	MONTCADA-BIFURCA	77006	GRANOLLERS-CANOV	9.0	28.7	19,723	19,723	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BAU	CTC	SI	NO	61	5108-	85	140
02	222	0020	77006	GRANOLLERS-CANOV	77100	FRANQUESE VALLE	28.7	31.4	2,671	2,671	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BAU	CTC	SI	NO	61	5108-	95	130
02	222	0030	77100	FRANQUESE VALLE	77102	LA GARRIGA	31.4	37.6	6,206	6,206	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BAU	CTC	SI	NO	61	5108-	85	130
02	222	0040	77102	LA GARRIGA	77108	VIC	37.6	69.0	31,382	31,382	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BAU	CTC	SI	NO	61	5108-	70	130
02	222	0050	77108	VIC	77114	LA FARGA DE BÉBI	69.0	97.0	27,974	27,974	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	64	5108-	70	125
02	222	0060	77114	LA FARGA DE BÉBI	77200	RIPOLL	97.0	105.6	8.6	8.6	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	64	5108-	65	80
02	222	0070	77200	RIPOLL	77303	RIBES DE FRESER	0.2	13.5	13.45	13.45	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	65	5108-	45	75
02	222	0080	77303	RIBES DE FRESER	77304	PLANOLLES	13.5	20.2	6.76	6.76	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	65	5108-	40	65
02	222	0090	77304	PLANOLLES	77309	PUIGCERDÀ	20.2	48.6	28,347	28,347	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	65	5108-	40	100
02	222	0095	77309	PUIGCERDÀ	C7730	P.K. 50,707	48.6	50.7	2.15	2.15	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	NO	BT	CTC	SI	NO	65	5108-	40	60
02	224	0010	72503	CERDANYOLA UNIV.	78706	CERDANYOLA VALLE	0.0	3.6	3.6	3.6	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	U	SI	3	SI	BAU	CTC	SI	NO	69	5111-	50	140
02	230	0010	73100	PLANA-PICAMEDON	71400	REUS	68.6	0.0	20,889	20,889	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	66	5117-	50	140	
02	234	0010	71400	REUS	72006	CONSTANTI	579.5	585.7	6.2	6.2	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	D	D	U	SI	3	NO	BAU	CTC	SI	NO	69	5118-	100	100	
02	238	0005	A7190	CAST-AGS LLOBREG	A7229	CAST-AGS MOLINS	0.0	1.4	1,385	2,770	MIX	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	69	5104-	100	100
02	238	0015	A7229	CAST-AGS MOLINS	71908	RIU LLOBREGAT	0.9	6.2	4,795	9,590	MIX	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	69	5116-	100	100
02	238	0020	71908	RIU LLOBREGAT	71901	BARNA-C. TUNIS	6.2	21.1	15,163	30,326	MIX	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	69	5116-	30	160
02	238	0030	71901	BARNA-C. TUNIS	71902	BARNA-MORROT	21.1	25.4	4,339	8,678	MIX	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	D	D	D	SI	3	SI	BAB	CTC	SI	NO	69	5116-	30	70
02	240	0010	71600	S.VICENÇ CALDERS	72202	LARBOÇ	24.1	36.5	12,312	24,624	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	64	5104-	60	140
02	240	0020	72202	LARBOÇ	72204	VILAFRANCA PEN.	36.5	48.3	11,766	23,532	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	64	5104-	140	140
02	240	0030	72204	VILAFRANCA PEN.	72207	S. SADURNI	48.3	60.1	11,776	23,552	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	64	5104-	110	140
02	240	0040	72207	S. SADURNI	A7225	AGUIA KM. 70,477	60.1	70.4	20,373	20,746	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	BARCELONA	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	64	5104-	110	140
02	240	0050	A7225	AGUIA KM. 70,477	A7226	AGUIA KM. 71,185	70.4	71.1	0,738	1,476	IBE	NORESTE																		



LISTADO DE TRAMOS POR EJES Y LINEAS (CUADRO DE VELOCIDADES MÁXIMAS)

SUBDIRECCIÓN DE CIRCULACIÓN NORESTE

EJE	TRAMO CVM	ORD	INICIO DE TRAMO	FINAL DE TRAMO	PUNTO KILOMETRICO		L.LIN	L.VIA	ANCHO	SUB. CIRCULACIÓN	JEF. OPER.	ÁREA MANTENIMIENTO	NUCLEO CERC.	TITUL.	CANON	SUB RED	VIA	ELE.	KV.	CAT. COMP.	BLOQUEO	ASFA.	ATP.	ERTMS	TREN TIERRA	BANDA SITRA	VELOCIDAD		
					INICIO	FINAL																					MIN.	MAX.	
02	270	0150	79309	FIGUERES	79315	PORTBOU	247.0	273.1	26,065	52,13	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	B2	B2	D	SI	3	NO	BAD	SI	NO	66	5114-	70	140	
02	270	0155	79315	PORTBOU	79331	P-K 274,305(FRA)	273.1	274.3	1,198	1,198	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	B2	B2	U	SI	3	NO	BAU	SI	NO	66	5114-	40	40	
02	276	0100	79200	MAÇANET-MASSANES	79606	BLANES	75.3	60.1	15,232	15,232	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	61	5113-	80	105
02	276	0110	79606	BLANES	79603	CALELLA	60.1	48.7	11,384	11,384	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	61	5113-	80	130
02	276	0120	79603	CALELLA	79600	ARENYS DE MAR	48.7	38.0	10,678	10,678	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	U	SI	3	SI	BLAU	CTC	SI	NO	61	5113-	50	110
02	276	0130	79600	ARENYS DE MAR	79500	MATARO	38.0	133.1	9,88	19,76	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	65	5113-	90	140
02	276	0140	79500	MATARO	87943	B.SAG.AG. 108,0	133.1	108.0	24,878	49,756	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	65	5113-	75	140
02	276	0145	87943	B.SAG.AG. 108,0	79002	LA SAGRERA	108.0	106.5	0,658	1,316	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	69	5113-	60	60
02	276	0155	79002	LA SAGRERA	87900	BIF. SAGRERA	106.5	105.9	1,472	2,944	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	69	5113-	60	60
02	276	0160	87900	BIF. SAGRERA	79009	BARNA-CLOT-ARAGO	105.7	105.3	0,636	1,272	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	69	5101-	80	80
02	276	0170	79009	BARNA-CLOT-ARAGO	87183	BIF.GLORIAS-CLOT	105.3	104.2	1	2	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	62	5101-	60	85
02	276	0180	87183	BIF.GLORIAS-CLOT	88801	BIF.VILANOVA	104.2	103.5	0,918	1,836	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	62	5101-	60	60
02	276	0190	88801	BIF.VILANOVA	71801	BARNA-SANTS	103.5	99.3	4,425	8,85	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	62	5101-	45	60
02	276	0200	71801	BARNA-SANTS	72305	LHOSPITALET	99.3	95.2	3,964	7,928	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	C1	C1	D	SI	3	SI	BAB	CTC	SI	NO	61	5107-	45	70
02	278	0005	72507	BIF.NUDO MOLLET	79011	LA LLAGOSTA	0.0	2.3	2,296	2,296	IBE	NORESTE	BARCELONA/GIRONA	J.A. Mto. Barcelona	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5110-	50	50
02	282	0010	A7070	CAMB-AG KM 308,6	70715	CBDOOR PLASENCIA	0.0	1.4	1,4	1,4	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B2	B2	U	SI	3	SI	BAU	CTC	SI	NO	61	5402-	30	30
02	284	0010	A7080	CIM-AG KM 337,1	A7081	CIM-AGUIJA KM 0,7	0.0	0.7	0,7	0,7	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B2	B2	U	SI	3	SI	BAU	CTC	SI	NO	61	5407-	30	30
02	286	0010	A7083	CARTUJA-AG 23,3	A7110	CARTUJA-AG 351,1	0.0	1.2	1,146	1,146	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5407-	100	125
02	288	0010	A7111	MIRA-AG KM 345,6	A7890	MIRAFL-AG KM 0,9	0.0	0.9	0,874	0,874	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	64	5404-	50	50
02	290	0010	A7080	CIM-AG KM 337,1	70899	CBDOOR-ZARAG-DELC	0.0	0.3	0,3	0,3	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B2	B2	U	SI	3	SI	BAU	CTC	SI	NO	61	5403-	60	60
02	294	0010	04200	RODA CAMBIADOR	72100	RODA DE BARA	610.5	610.7	0,204	0,204	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	E	E	U	SI	3	SI	BAU	CTC	SI	NO	66	5117-	30	30
02	610	0010	B7081	BIF. TERUEL	67002	CUARTE DE HUERVA	113.6	110.1	3,465	3,465	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B1	B1	U	NO	NO	NO	BLAU	CTC	SI	NO	99	5406-	100	140
02	610	0020	67002	CUARTE DE HUERVA	67004	MARIA DE HUERVA	110.1	102.9	7,178	7,178	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B1	B1	U	NO	NO	NO	BLAU	CTC	SI	NO	99	5406-	120	160
02	610	0030	67004	MARIA DE HUERVA	67010	CARIÑENA	102.9	70.7	32,222	32,222	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B1	B1	U	NO	NO	NO	BLAU	CTC	SI	NO	99	5406-	60	200
02	610	0040	67010	CARIÑENA	67015	BADULES	70.7	38.2	32,474	32,474	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B1	B1	U	NO	NO	NO	BLAU	CTC	SI	NO	64	5406-	60	200
02	610	0050	67015	BADULES	67020	NAVARRETE	38.2	13.1	25,112	25,112	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B1	B1	U	NO	NO	NO	BLAU	CTC	SI	NO	64	5406-	70	200
02	610	0060	67020	NAVARRETE	67100	CAMINREAL-FTES	13.1	0.8	12,742	12,742	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B1	B1	U	NO	NO	NO	BLAU	CTC	SI	NO	64	5406-	85	160
02	622	0010	A6541	AG.CLAS KM 272	71403	TARRAGONA MERC.	272.0	273.1	1,1	1,1	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	D	D	U	SI	3	SI	BAU	CTC	NO	NO	99	5118-	30	30
02	624	0010	A7141	AG.CLAS KM 100.4	71403	TARRAGONA MERC.	100.4	101.0	0,6	0,6	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	62	5118-	30	30
02	624	0020	71403	TARRAGONA MERC.	71500	TARRAGONA	101.0	109.5	2,5	2,5	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	D	D	U	SI	3	SI	BAU	CTC	SI	NO	62	5118-	30	30
02	630	0010	65411	PORT AVENTURA	A6541	AG.CLAS KM 272	265.6	272.0	6,4	6,4	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	B2	B2	U	SI	3	SI	BAU	CTC	SI	SI	61	5119-	30	140
02	630	0020	A6541	AG.CLAS KM 272	71504	TARRAGONA PORT	272.0	273.3	1,3	1,3	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	B2	B2	U	SI	3	SI	BAU	CTC	SI	SI	61	5119-	140	140
02	630	0030	71504	TARRAGONA PORT	71500	TARRAGONA	273.3	275.6	2,3	2,3	IBE	NORESTE	TARRAGONA/LLEIDA	J.A. Mto. Barcelona	AD	B2	B2	U	SI	3	SI	BAU	CTC	SI	SI	61	5119-	60	140
02	702	0010	70706	GRISEN	81209	CABAÑAS DE E.	0.0	6.0	5,846	11,692	IBE	NORESTE	ZARAGOZA	J.A. Mto. Zaragoza	AD	B2	B2	D	SI	3	SI	BAB	CTC	SI	NO	69	5403-	35	160
12	070	0010	B4041	BIF.HUESCA	C7805	KM 40,0	0.0	40.0	44,329	44,329	UIC	NORESTE	ZARAGOZA	Jef Base - Av. Noreste	AD	B1	B1	U	SI	25	SI	BLAU	CTC	SI	NO	99	5405-	70	200
12	070	0020	C7805	KM 40,0	78200	TARDIENTA	40.0	52.9	12,914	12,914	UIC	NORESTE	ZARAGOZA	Jef Base - Av. Noreste	AD	B1	B1	U	SI	25	SI	BLAU	CTC	SI	NO	99	5405-	40	200
12	070	0030	78200	TARDIENTA	87800	BIF. CANFRANC	0.0	15.7	15,683	15,683	MIX	NORESTE	ZARAGOZA	Jef Base - Av. Noreste	AD	B1	B1	U	SI	25	SI	BLAU	CTC	SI	NO	99	5405-	60	160
12	070	0040	B7800	BIF. CANFRANC	87801	BIF. HOYA HUESCA	15.7	18.0	2,326	2,326	MIX	NORESTE	ZARAGOZA	Jef Base - Av. Noreste	AD	B1	B1	U	SI	25	SI	BLAU	CTC	SI	NO	99	5405-	100	100
12	070	0055	B7801	BIF. HOYA HUESCA	74200	HUESCA	18.0	21.7	3,678	3,678	MIX	NORESTE	ZARAGOZA	Jef Base - Av. Noreste	AD	B1	B1	U	SI	25	SI	BLAU	CTC	SI	NO	99	5405-	40	160
					TOTAL=		1.984	2.666																					



APÉNDICE 4. CUADRO DE VELOCIDADES MÁXIMAS

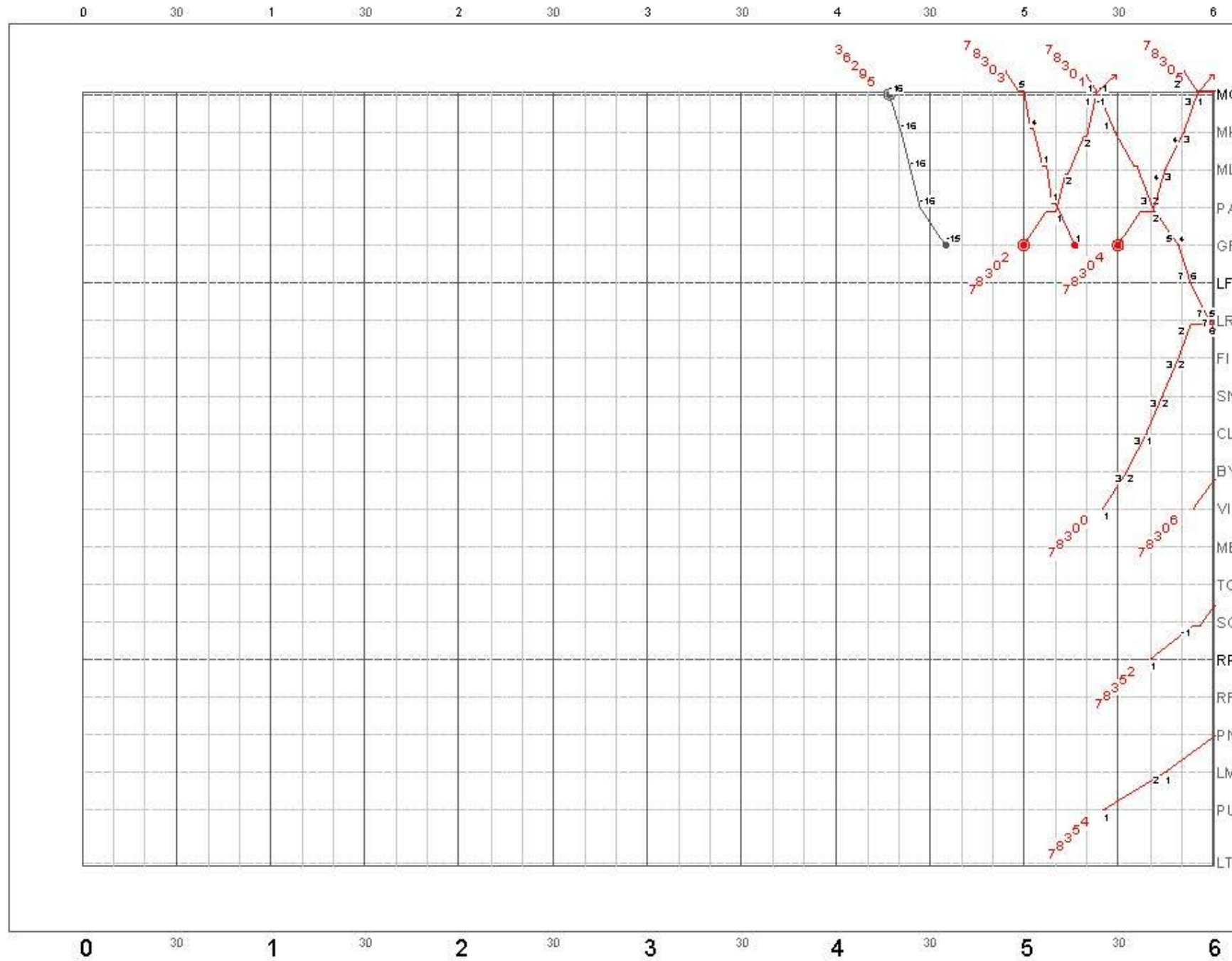
Línea 222 (sentido Par)		De : LA TOUR DE CAROL-ENVEIGT a : BIF. AIGÜES			Línea 222 (sentido Par)			
Bloqueo	V. Máx TIPO			Sit Km	Dependencias	Dist Int	Rad	Rampa Caract
	N	A	B					
BLAU ctc	85	85		93.4	SANT QUIRZE DE BESORA-MONT.....			
	75	75		92.3				
	85	85		91.7				
	75	75		87.7	BORGONYA (APD).....	5.7↓		
	85	85		87.0				
	80	80		85.1	TORELLO.....	2.6↓		
	95	95		83.6			(64)	
	85			82.1				
	105	105		80.0			16	
	110	110		77.2	MANLLEU.....	7.9↓		
	95	125	125	74.1				
	105	105		70.6				
	80	80	80	69.7				
	110	125	130	69.0	VIC.....	8.2↓		
	BAU ctc	105	105		63.1			
95		120	125	61.4				
105		110		58.2	BALENYA-TONA-SEVA.....	10.8↓	(61)	
70				54.8	BALENYA-ELS HOSTALETS (APD).....	3.4↓		
80		80		53.3			2	
				52.7	CENTELLES.....	2.1↓		

Línea 222 (sentido Impar)		De : BIF. AIGÜES a : LA TOUR DE CAROL-ENVEIGT			Línea 222 (sentido Impar)			
Bloqueo	V. Máx TIPO			Sit Km	Dependencias	Dist Int	Rad	Rampa Caract
	N	A	B					
BAU ctc	100	105		37.6	LA GARRIGA.....			
	85	95	95	40.2				
	100	105		40.7				
	75	100	105	42.3	FIGARO.....	4.7↓		
	80	80		44.8				
	75	100	105	46.4				
	90	90		47.0				
	90	90		47.5	SANT MARTI DE CENTELLES.....	5.2↓		
	105	110		48.0				
	90	100	100	50.1			(61)	
	105	110		50.5				
	70	80	80	52.4				
	80	80		52.7	CENTELLES.....	5.2↓		
	105	110		53.3				
	95	120	125	54.8	BALENYA-ELS HOSTALETS (APD).....	2.1↓		
BLAU ctc	105	105		58.2	BALENYA-TONA-SEVA.....	3.4↓		
	110	125	130	61.4				
	80	80	80	63.1				
	105	105		63.1				
	95	125	125	69.0	VIC.....	10.8↓		
	110	110		69.0			8	
BLAU ctc	105	105		69.7				
	95	125	125	70.6			(64)	
	110	110		74.1				
				77.2	MANLLEU.....	8.2↓		

APÉNDICE 5. MALLAS DE CIRCULACIÓN

**B-5108**

- MONTCADA B
- MONTCADA R
- MOLLET-S.R
- PARETS
- GRANOLLERS
- LES FRANQU
- LA GARRIGA
- FIGARO
- S.MARTI CE
- CENTELLES
- BALENYA
- VIC
- MANLLEU
- TORELLO
- S.QUIRZE B
- RIPOLL
- RIBES DE F
- PLANOLES
- LA MOLINA
- PUIGCERDA
- LA TOUR DE

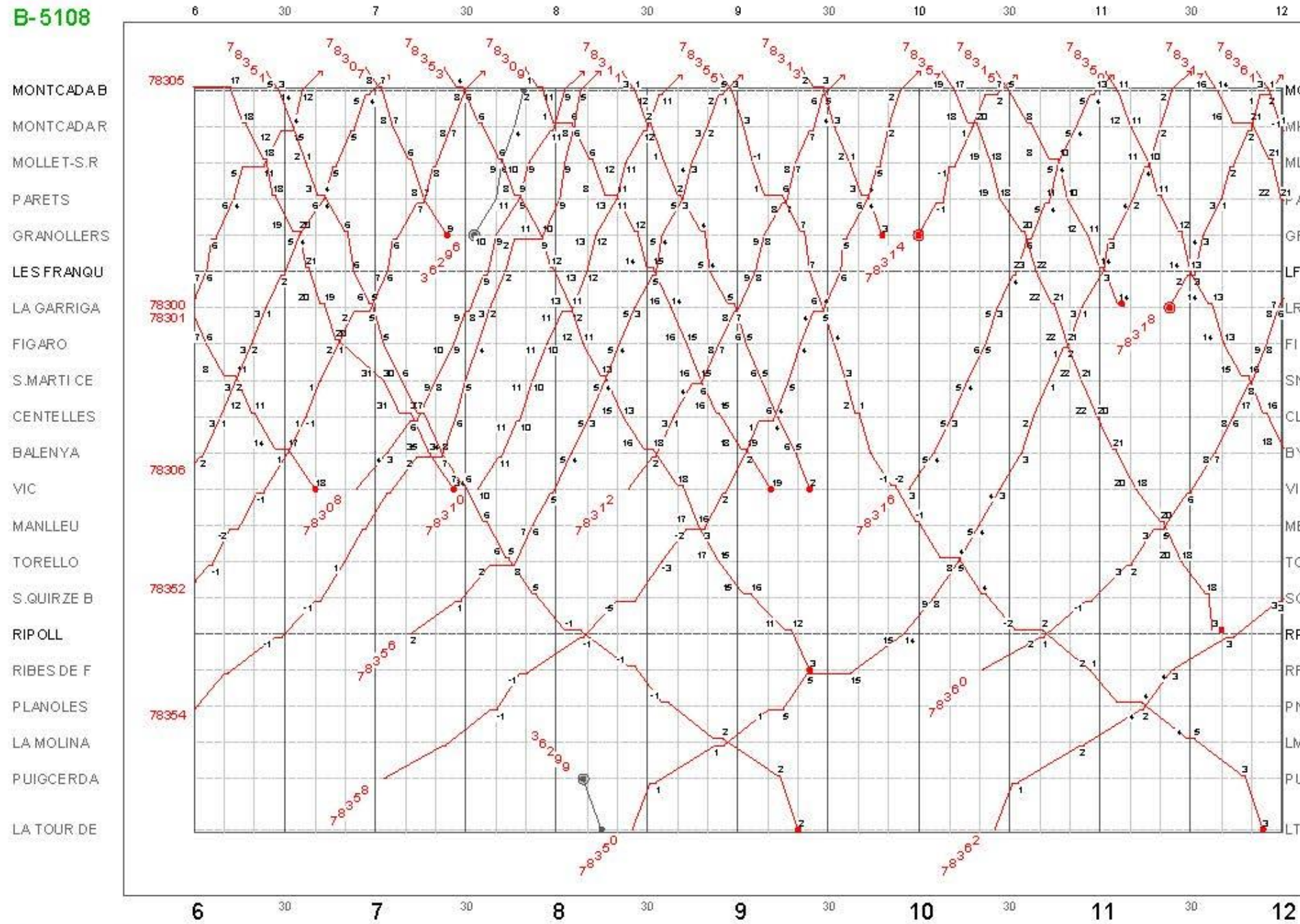


**R real** **Todos** **SitraP-2016** **13 JUN.2022**

Color: L.Dist:---- Cercan:---- Md.Dist:---- Merc. :---- Resto :---- Sv.Int:---- Mat. Pet:---- Ter: carr:---- Elaborado: 06-07-22 11:38:23



**B-5108**

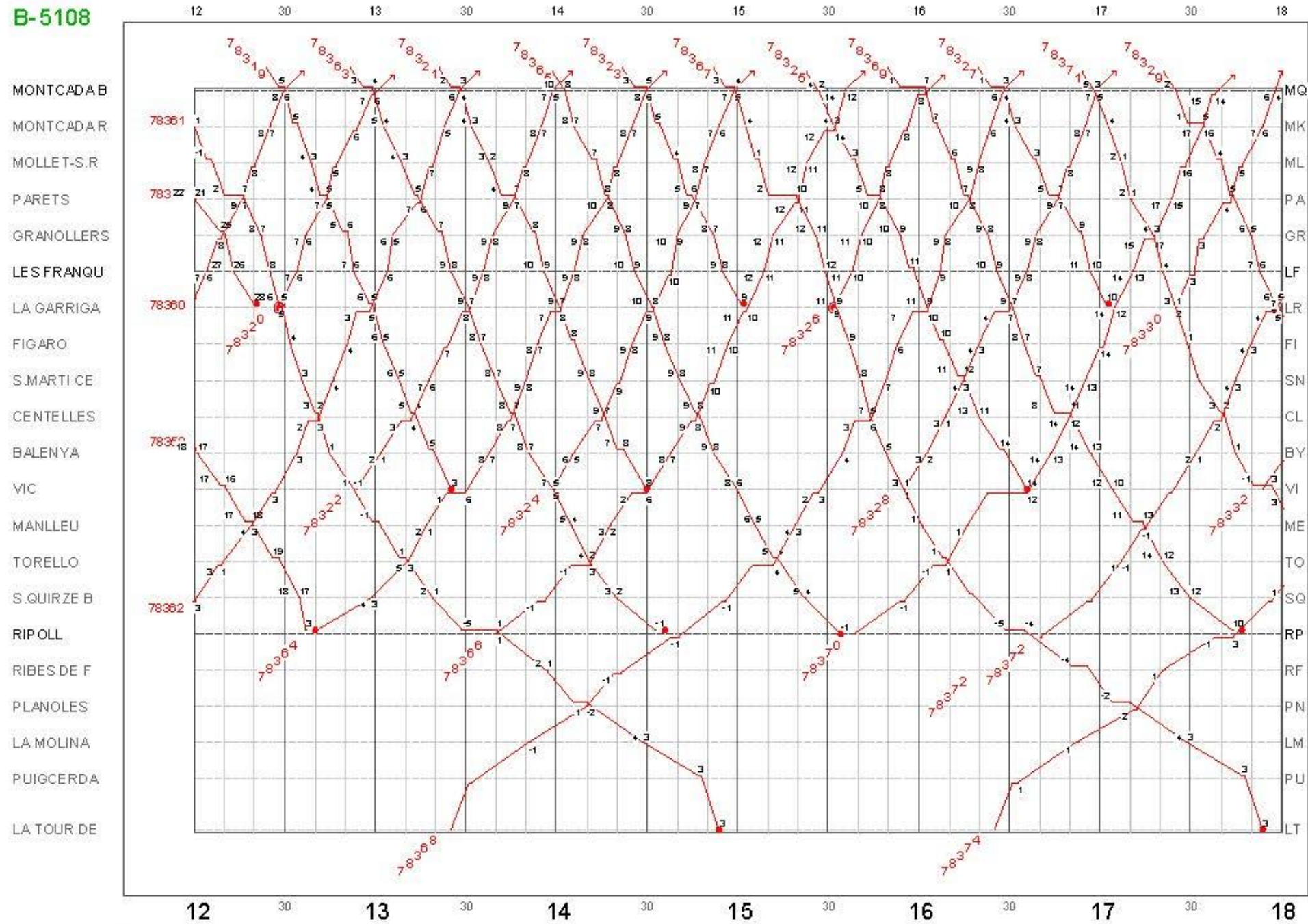


R real
Todos
SitraP-2016
13.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:---Ter.carr.:--- Elaborado: 06-07-22 11:38:23



**B-5108**

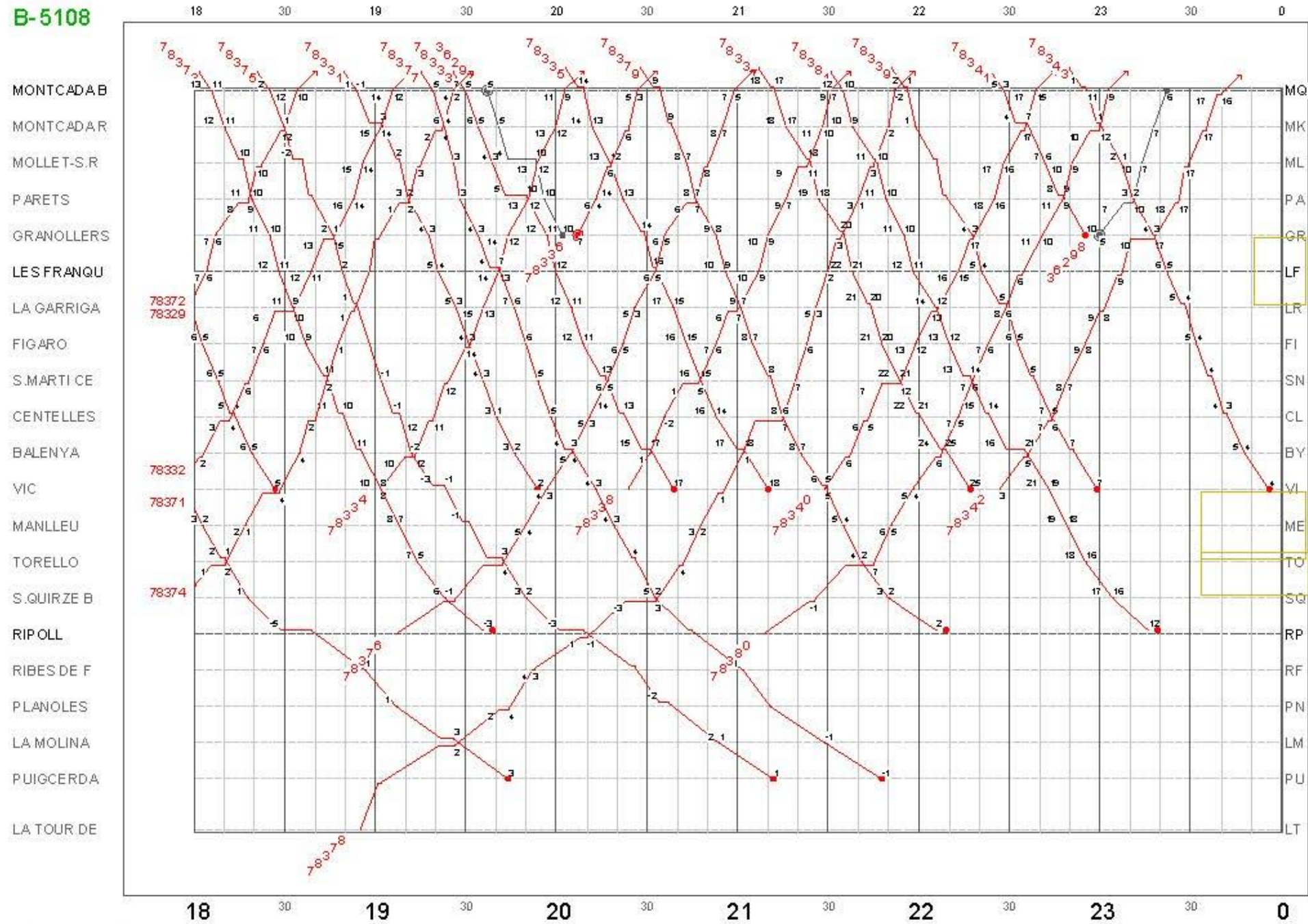


R real
Todos
SitraP-2016
13.JUN.2022

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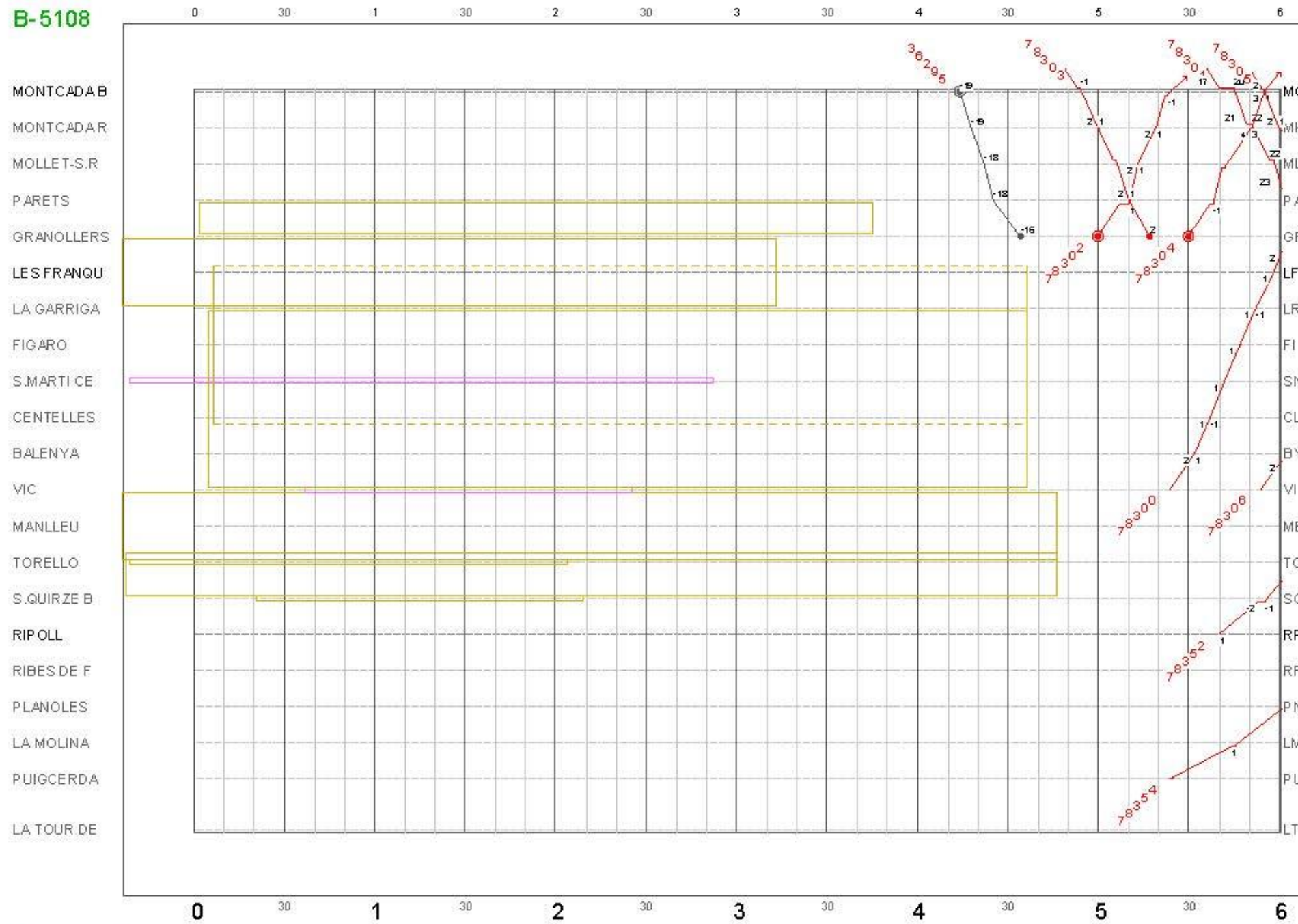


B-5108



R real
Todos
SitraP<sub>-2016</sub>
13.JUN.2022

Color: L.Dist.:---- Cercan.:---- Md.Dist.:---- Merc.:---- Resto:---- Sv.Int.:---- Mat.Pel.:---- Ter.carr.:---- Elaborado: 06-07-22 11:38:40



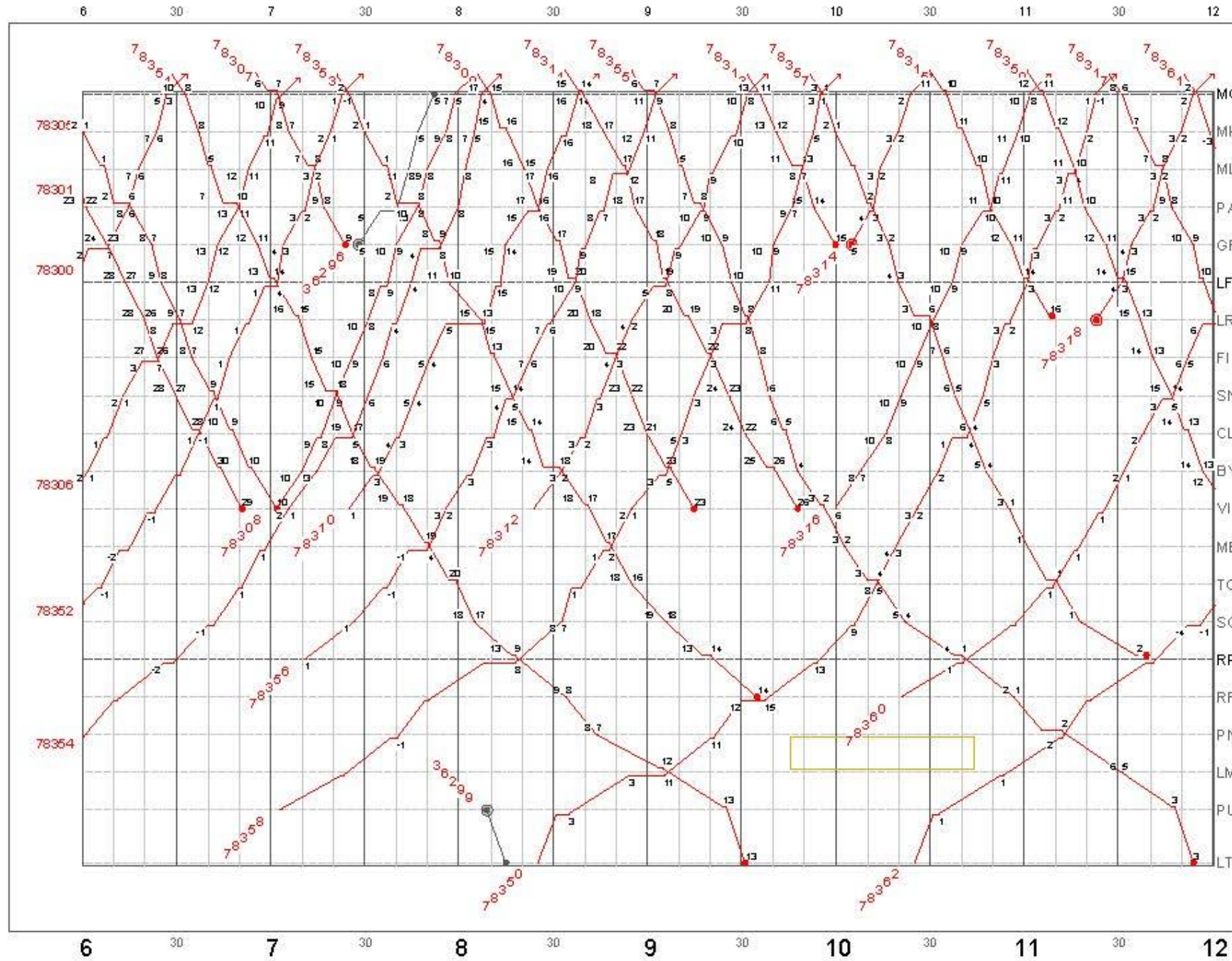
R real
Todos
SitraP-2016
14.JUN.2022

Color: L.Dist.:---- Cercan.:---- Md.Dist.:---- Merc. :---- Resto :----  
 Sv.Int.:---- Mat. Pel.:---- Ter: carr.:---- Elaborado: 06-07-22 11:47:07



**B-5108**

- MONTCADAB
- MONTCADAR
- MOLLET-S.R
- PARETS
- GRANOLLERS
- LES FRANQU
- LA GARRIGA
- FIGARO
- S.MARTI CE
- CENTELLES
- BALENYA
- VIC
- MANLLEU
- TORELLO
- S.QUIRZE B
- RIPOLL
- RIBES DE F
- PLANOLES
- LA MOLINA
- PUIGCERDA
- LA TOUR DE



R real
Todos
SitraP-2016
14.JUN.2022

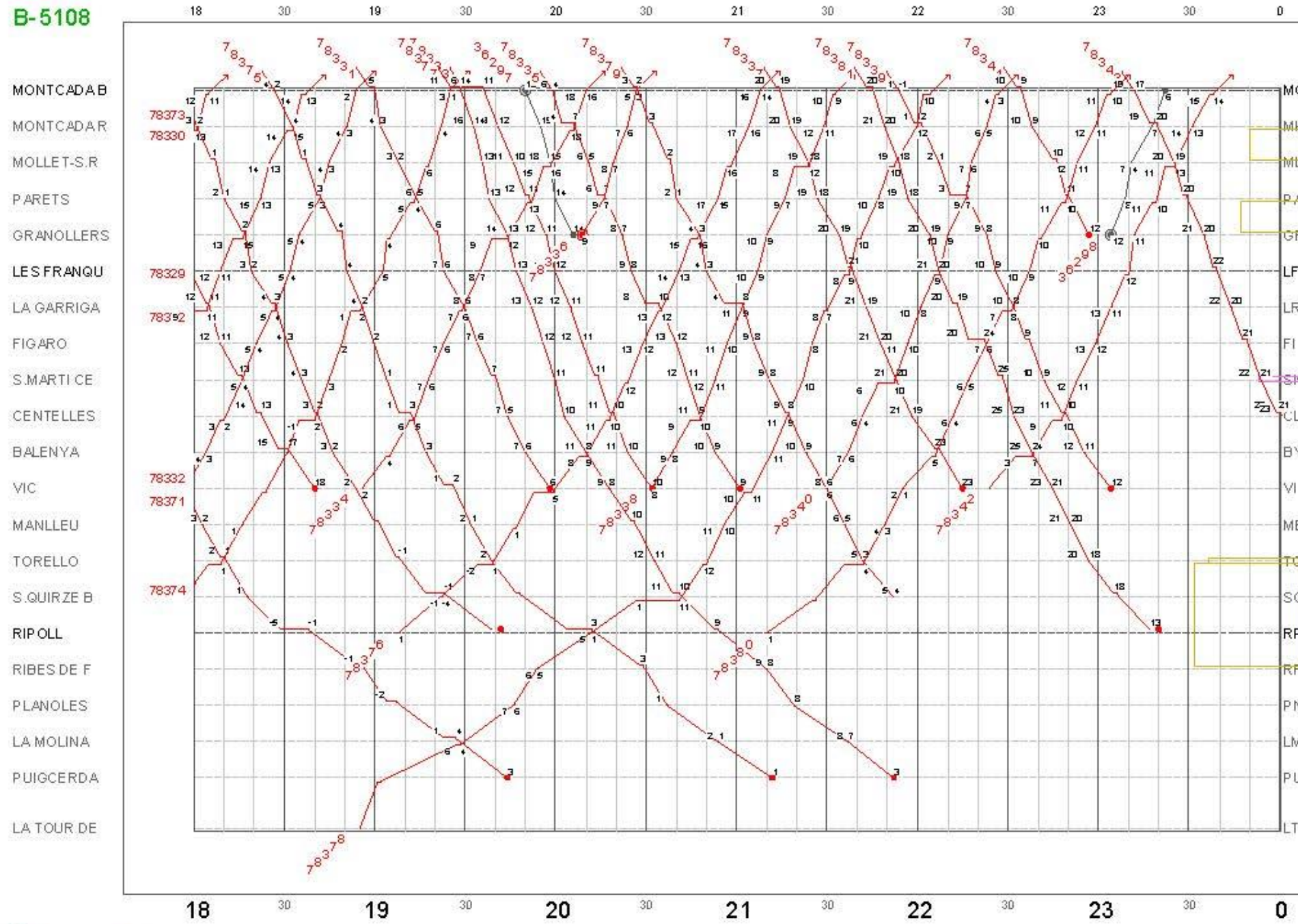
Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :---  
 Sv.Int.:--- Mat.Pel.:---Ter.carr.:--- Elaborado: 06-07-22 11:47:07





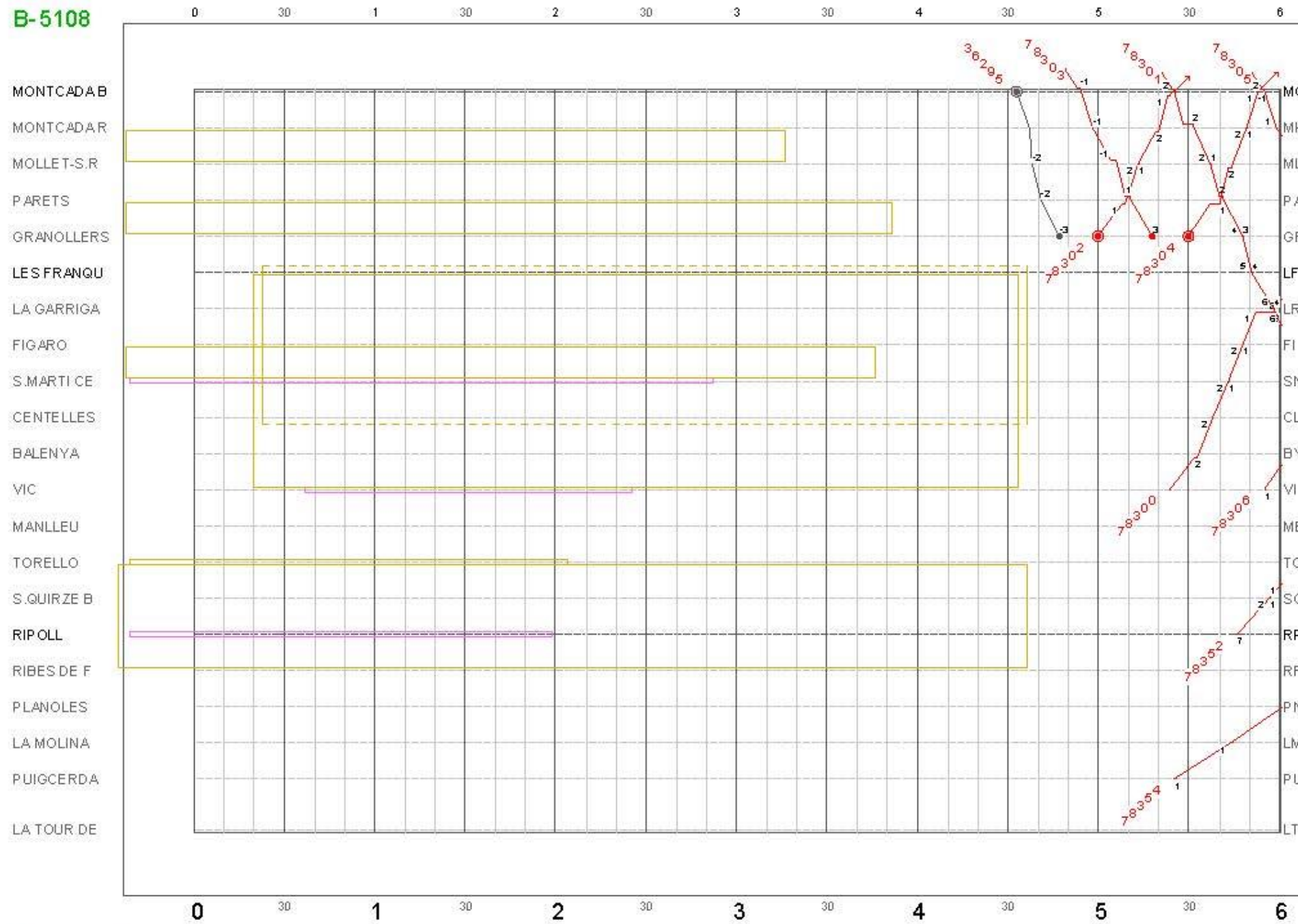


B-5108



R real
Todos
SitraP-2016
14.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:47:49

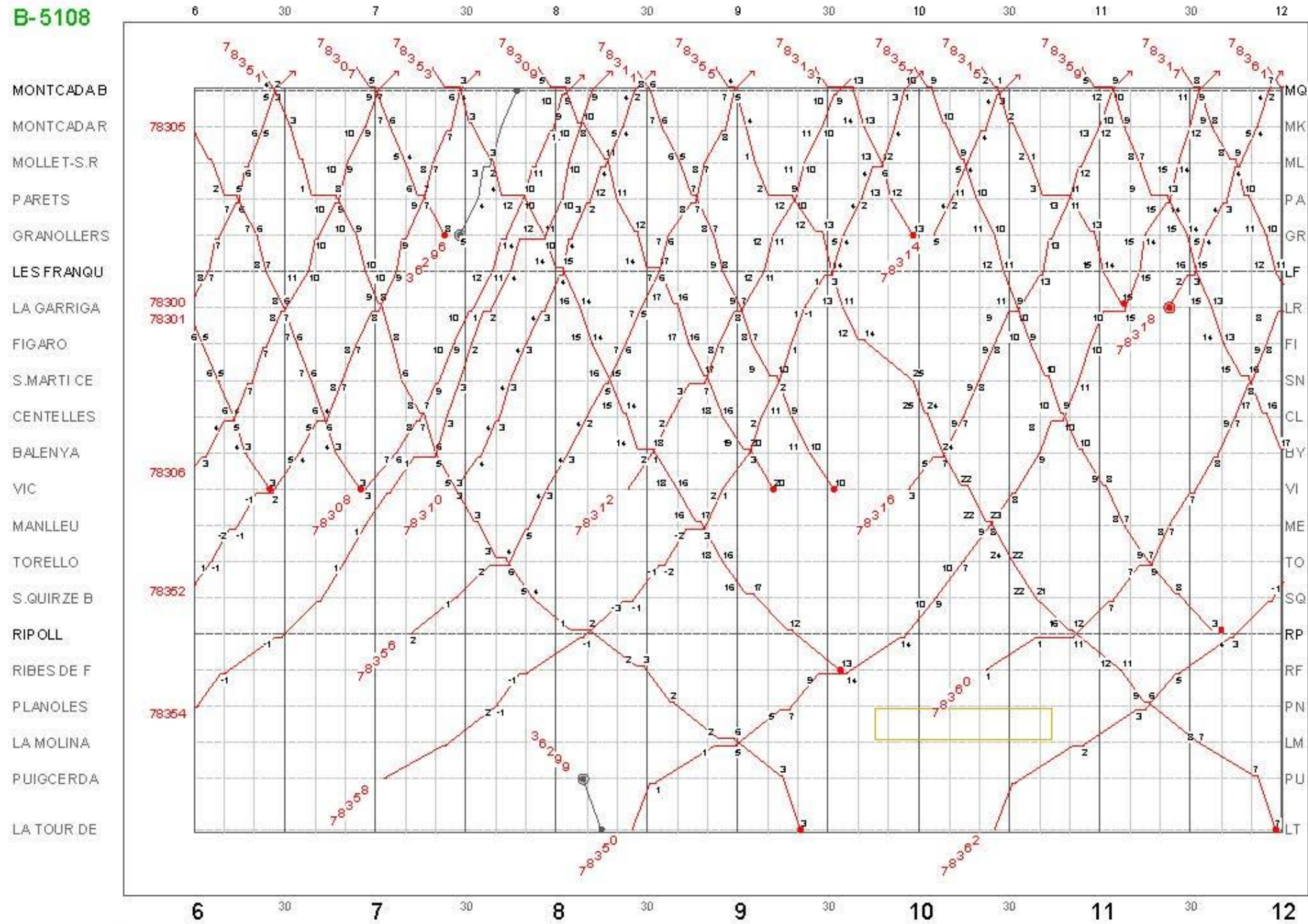


R real
Todos
SitraP-2016
15.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:51:34



B-5108

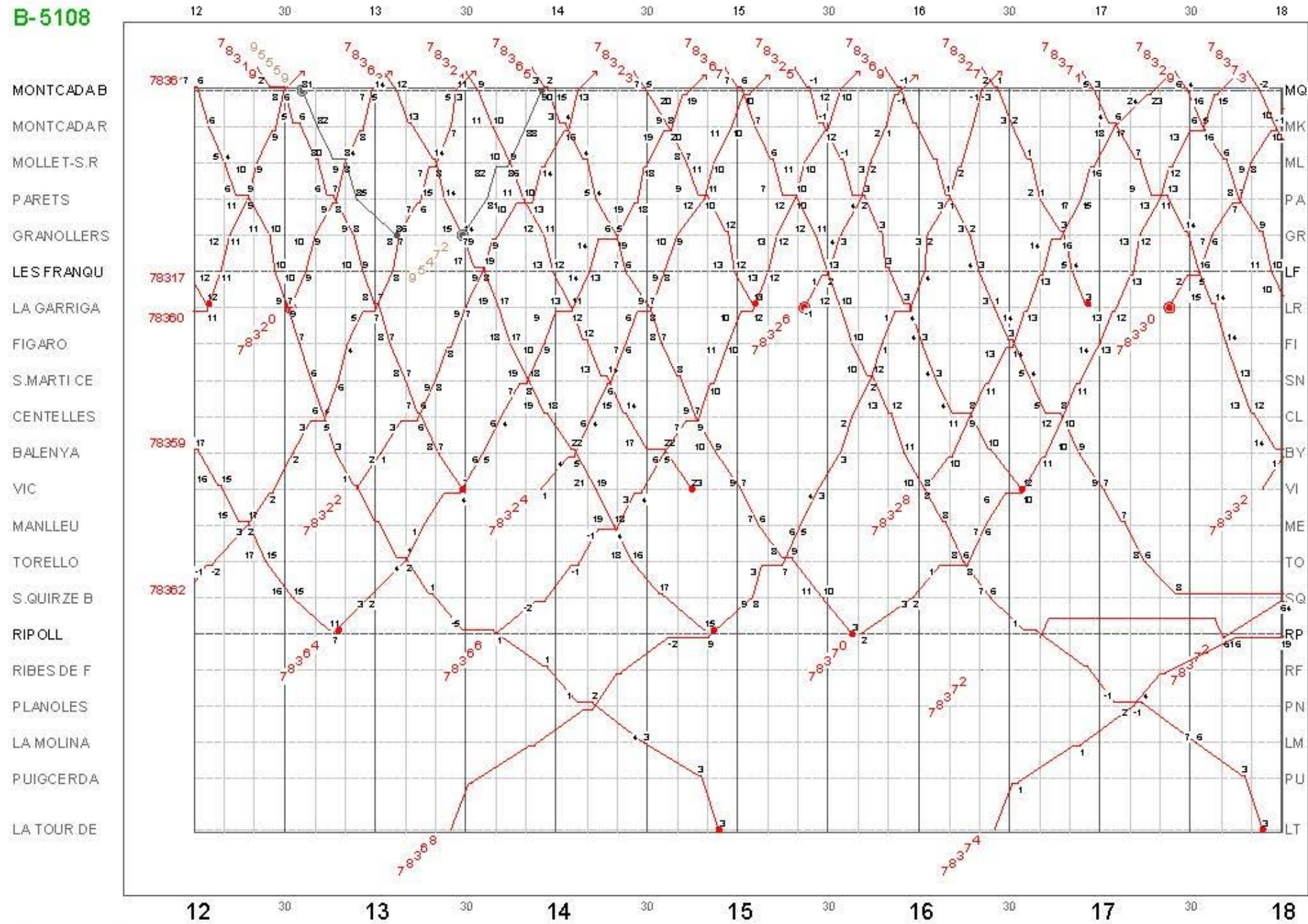


**R real** **Todos** **SitraP-2016** **15.JUN.2022**

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:51:34



**B-5108**

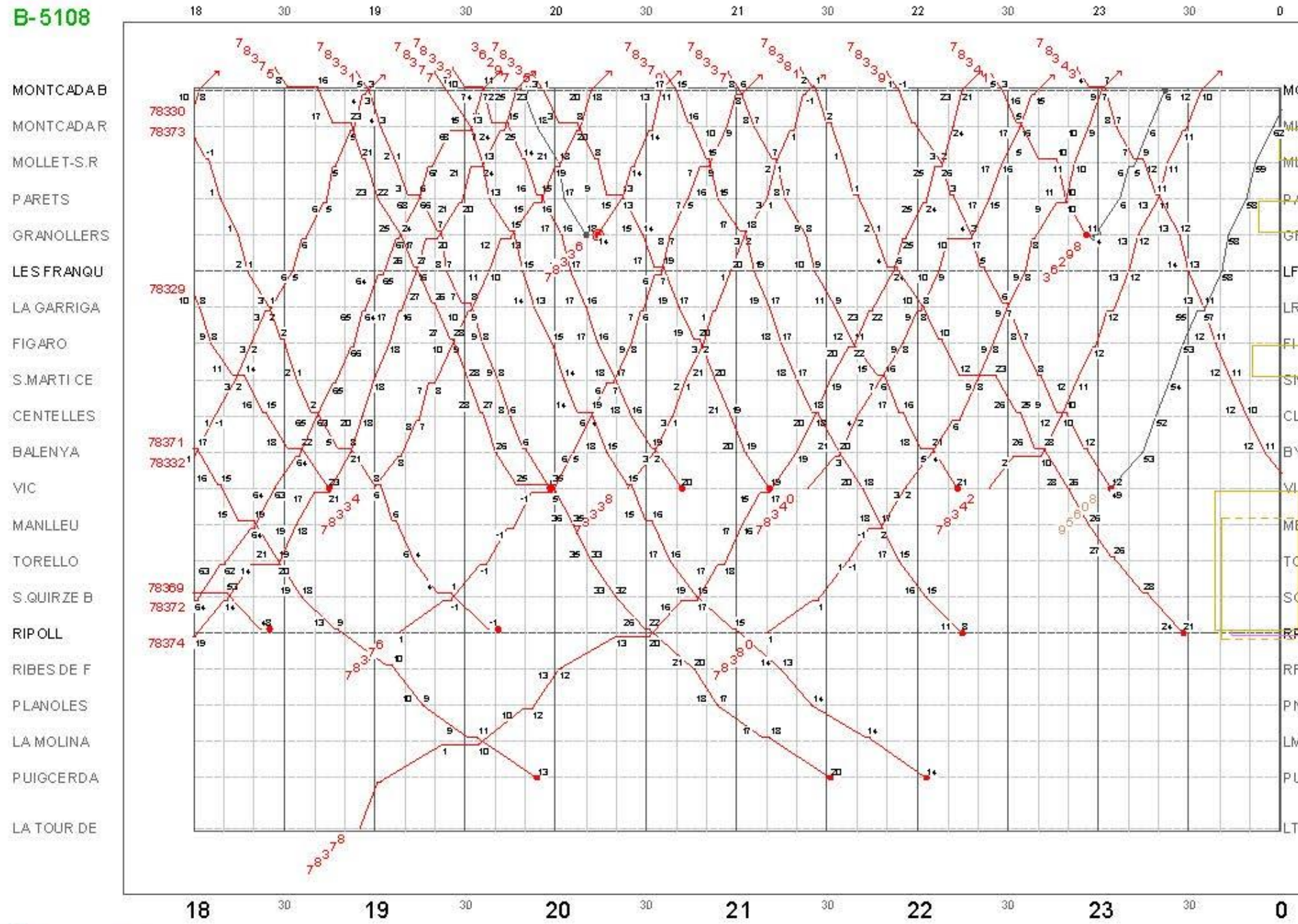


R real
Todos
SitraP-2016
15.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:51:49

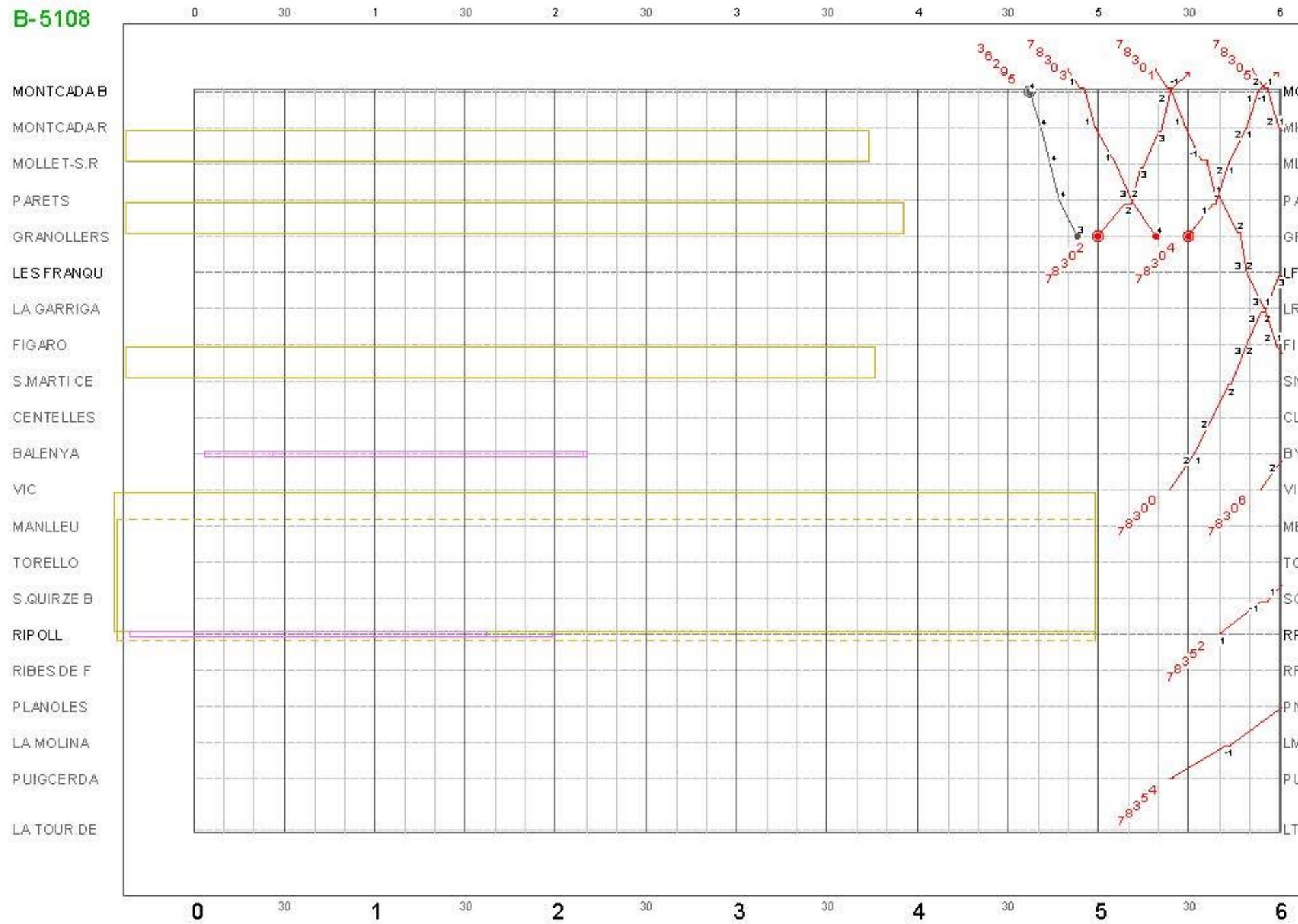


B-5108



R real
Todos
SitraP<sub>-2016</sub>
15.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:51:49

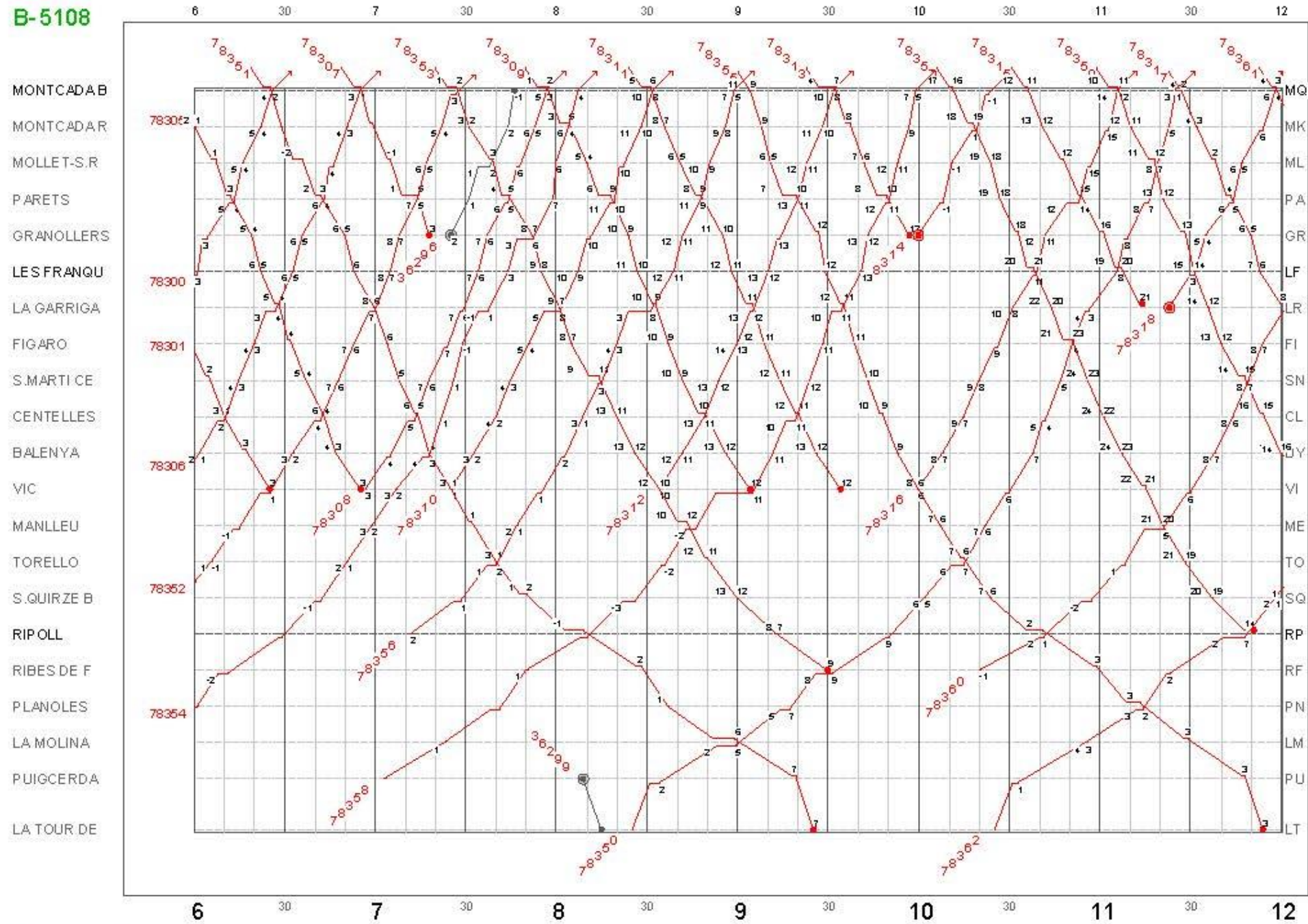


**R real** **Todos** **SitraP-2016** **16.JUN.2022**

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat. Pel.:--- Ter: carr.:--- Elaborado: 06-07-22 11:53:51



**B-5108**

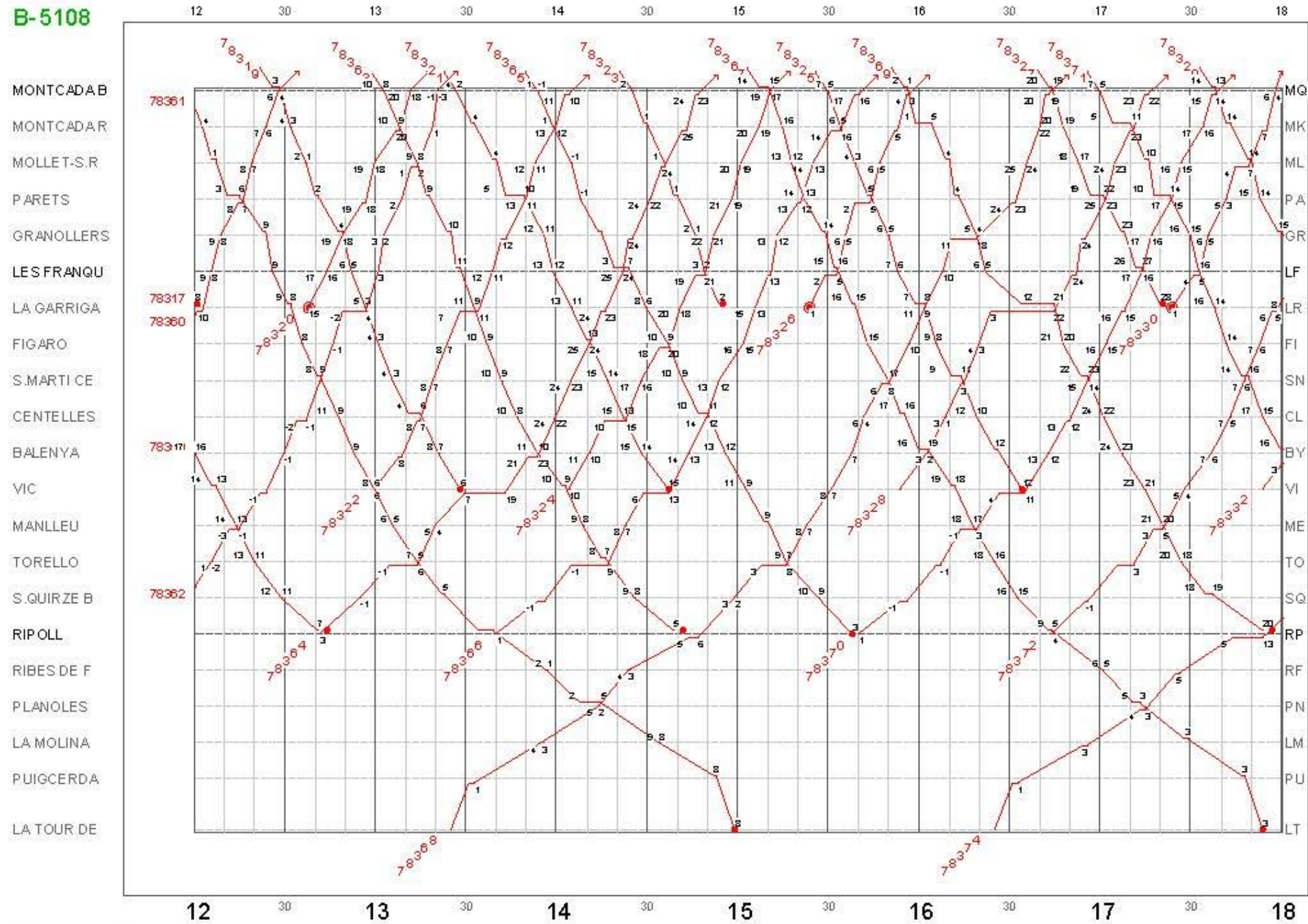


R real
Todos
SitraP-2016
16 JUN 2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc.:--- Resto:---  
 Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:53:51



**B-5108**

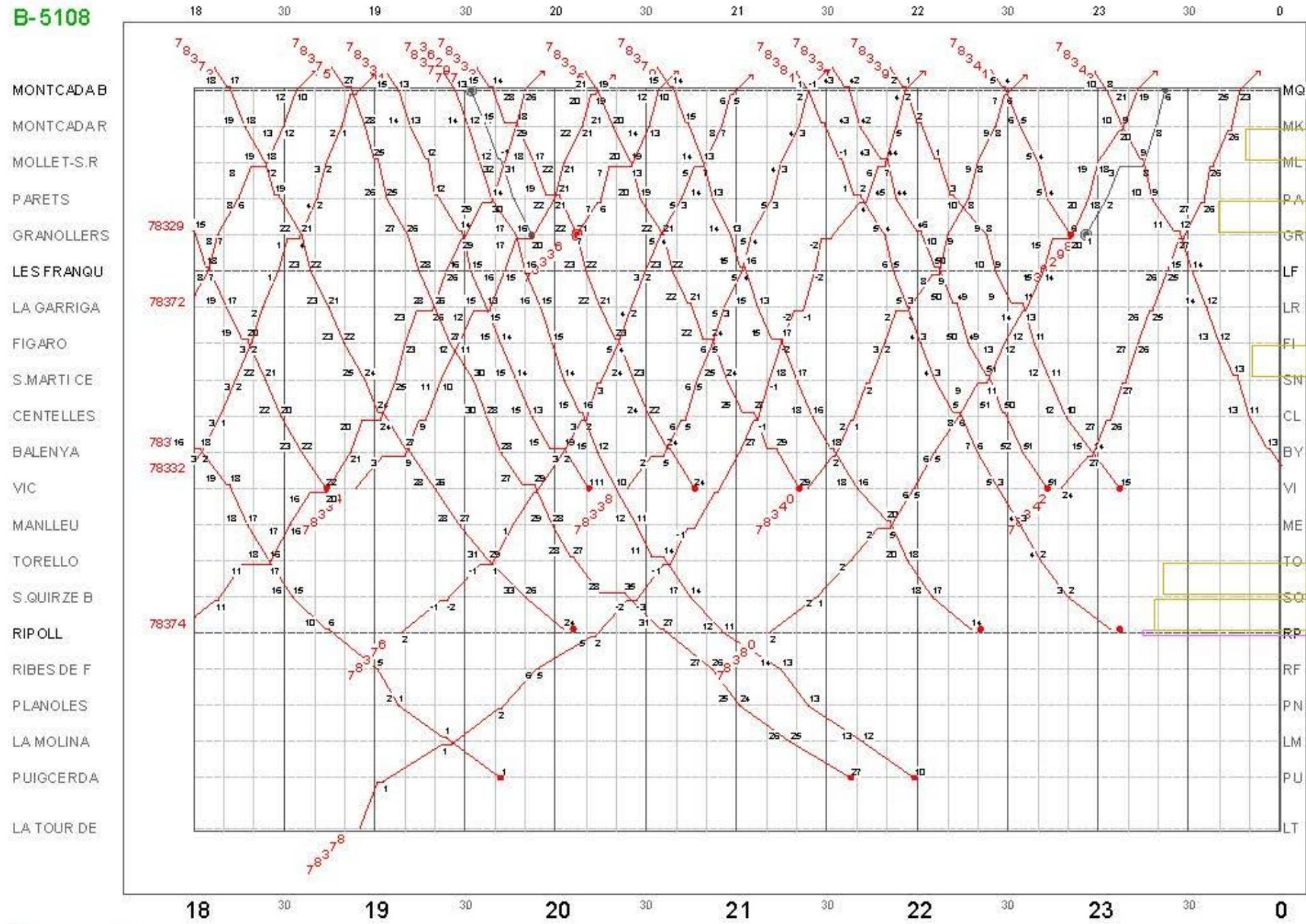


R real
Todos
SitraP-2016
16.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:54:13



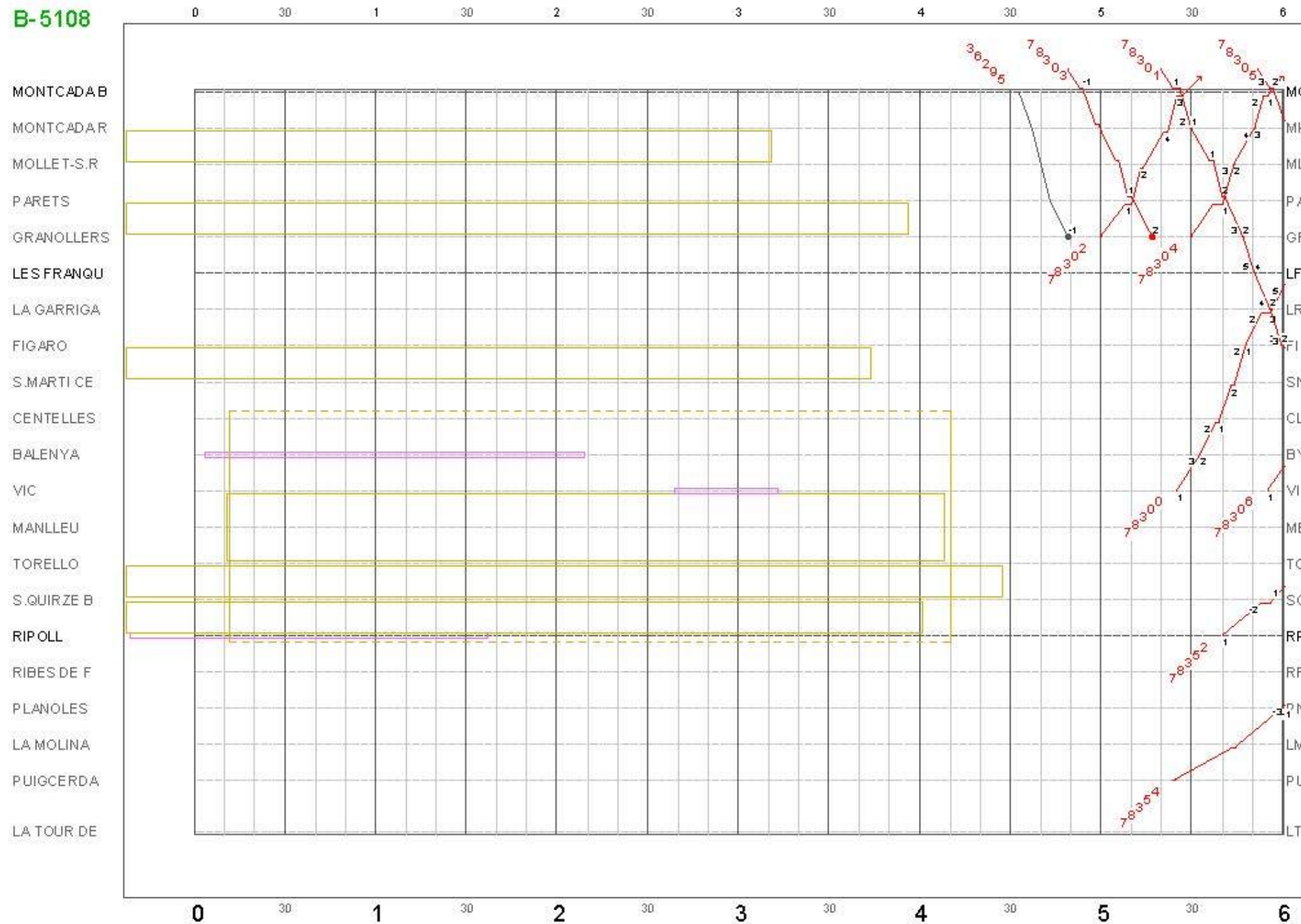
B-5108



**R real** **Todos** **SitraP-2016** **16.JUN.2022**

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:54:13

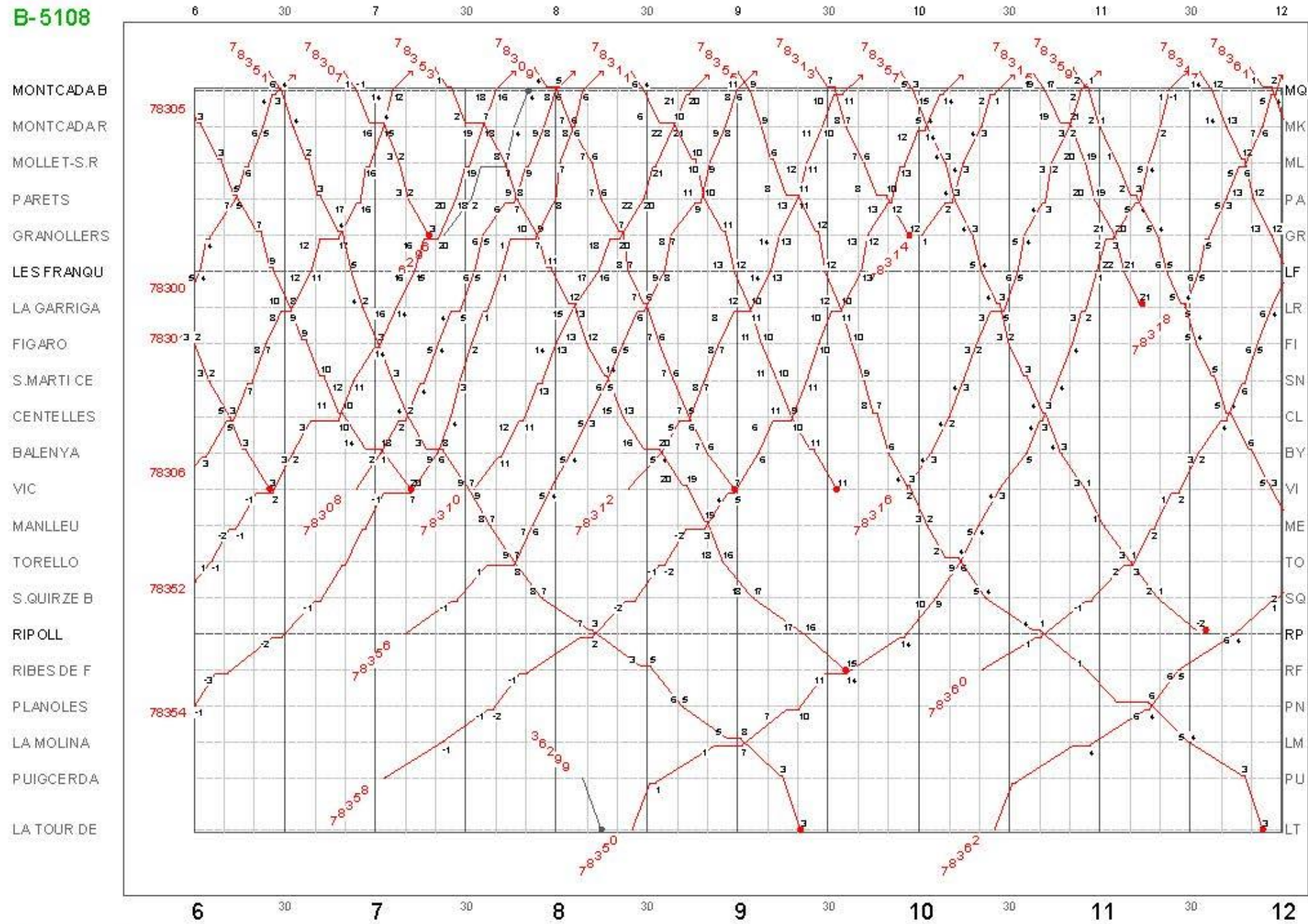




R real
Todos
SitraP-2016
17.JUN.2022

Color: L.Dist.:---- Cercan.:---- Md.Dist.:---- Merc. :---- Resto :---- Sv.Int.:---- Mat. Pel.:---- Ter: carr.:---- Elaborado: 06-07-22 11:55:59

B-5108

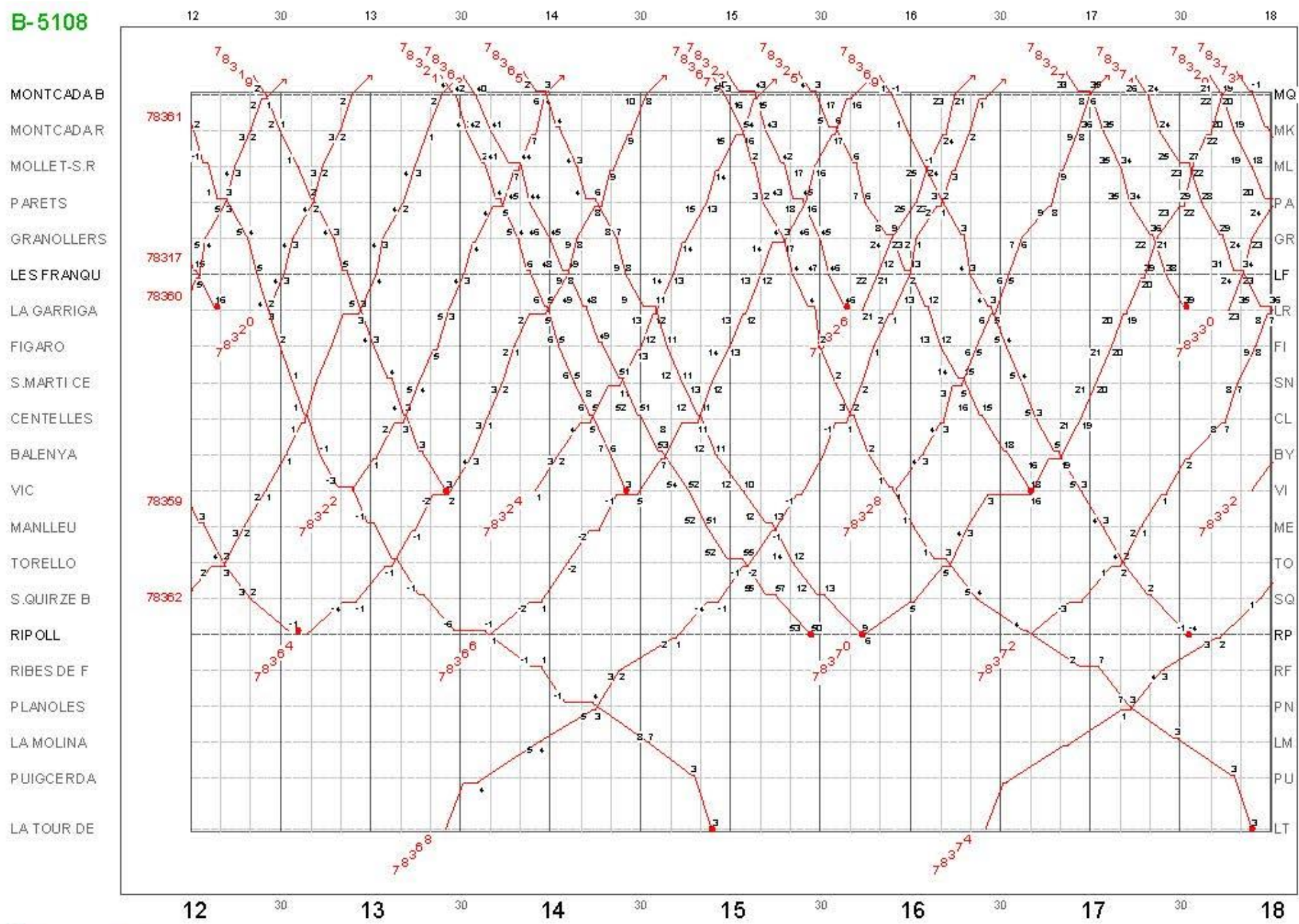


R real
Todos
SitraP-2016
17.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:---Ter.carr.:--- Elaborado: 06-07-22 11:55:59



**B-5108**

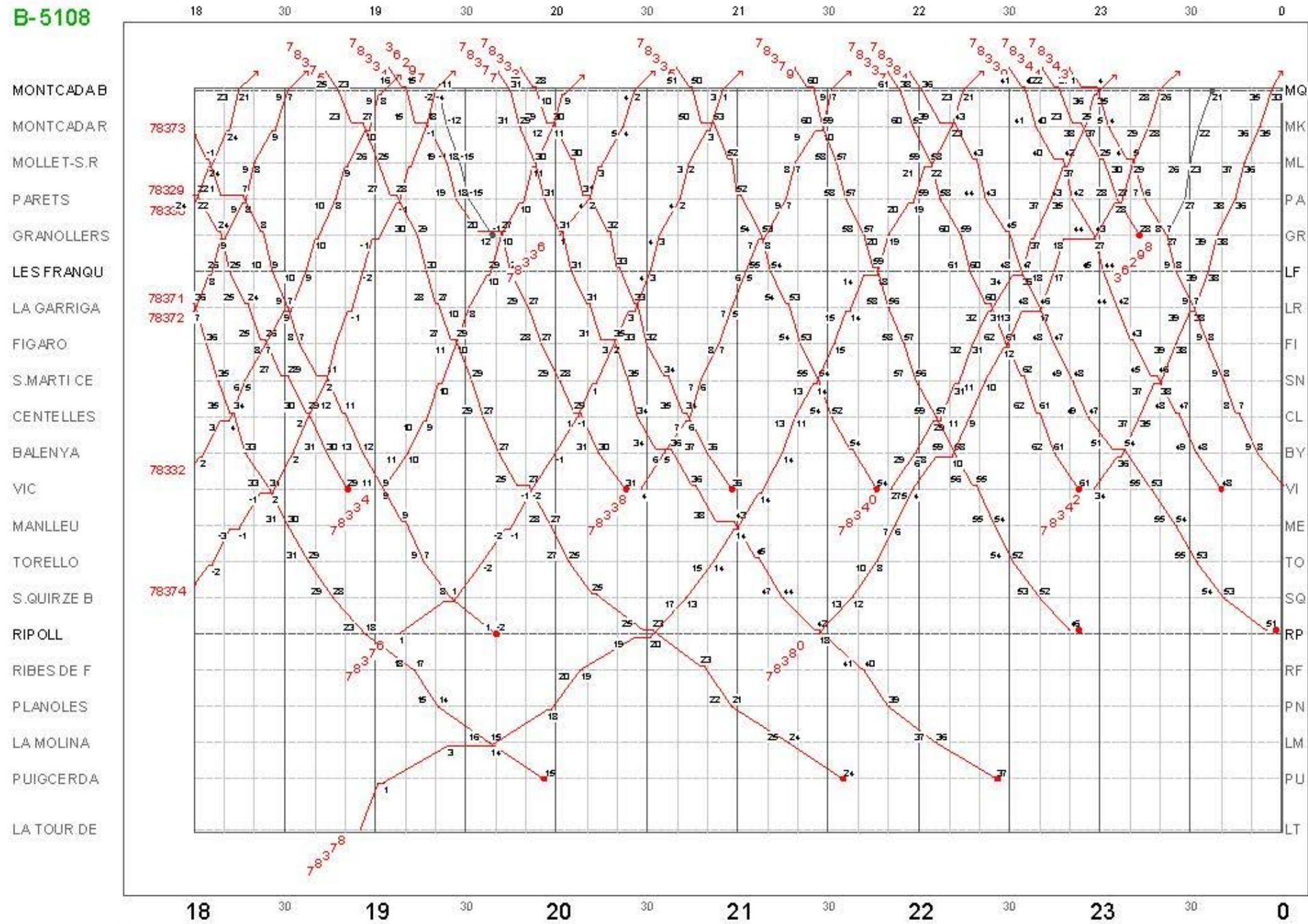


**R real** **Todos** **SitraP-2016** **17.JUN.2022**

Color: L.Dist.:---- Cercan.:---- Md.Dist.:---- Merc. :---- Resto :---- Sv.Int.:---- Mat.Pel.:---- Ter.carr.:---- Elaborado: 06-07-22 11:56:14



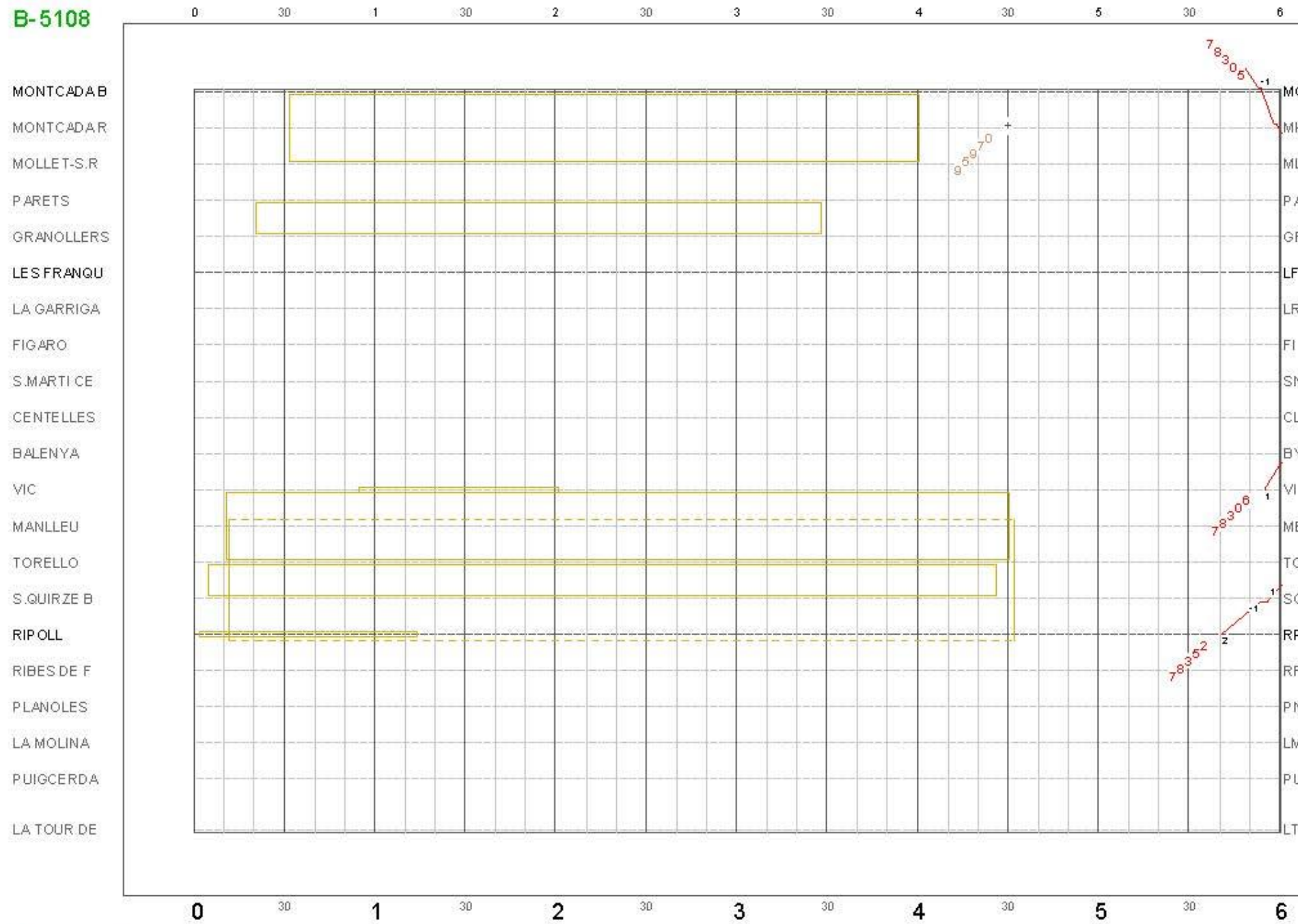
B-5108



R real
Todos
SitraP<sub>-2016</sub>
17.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:56:14

**B-5108**

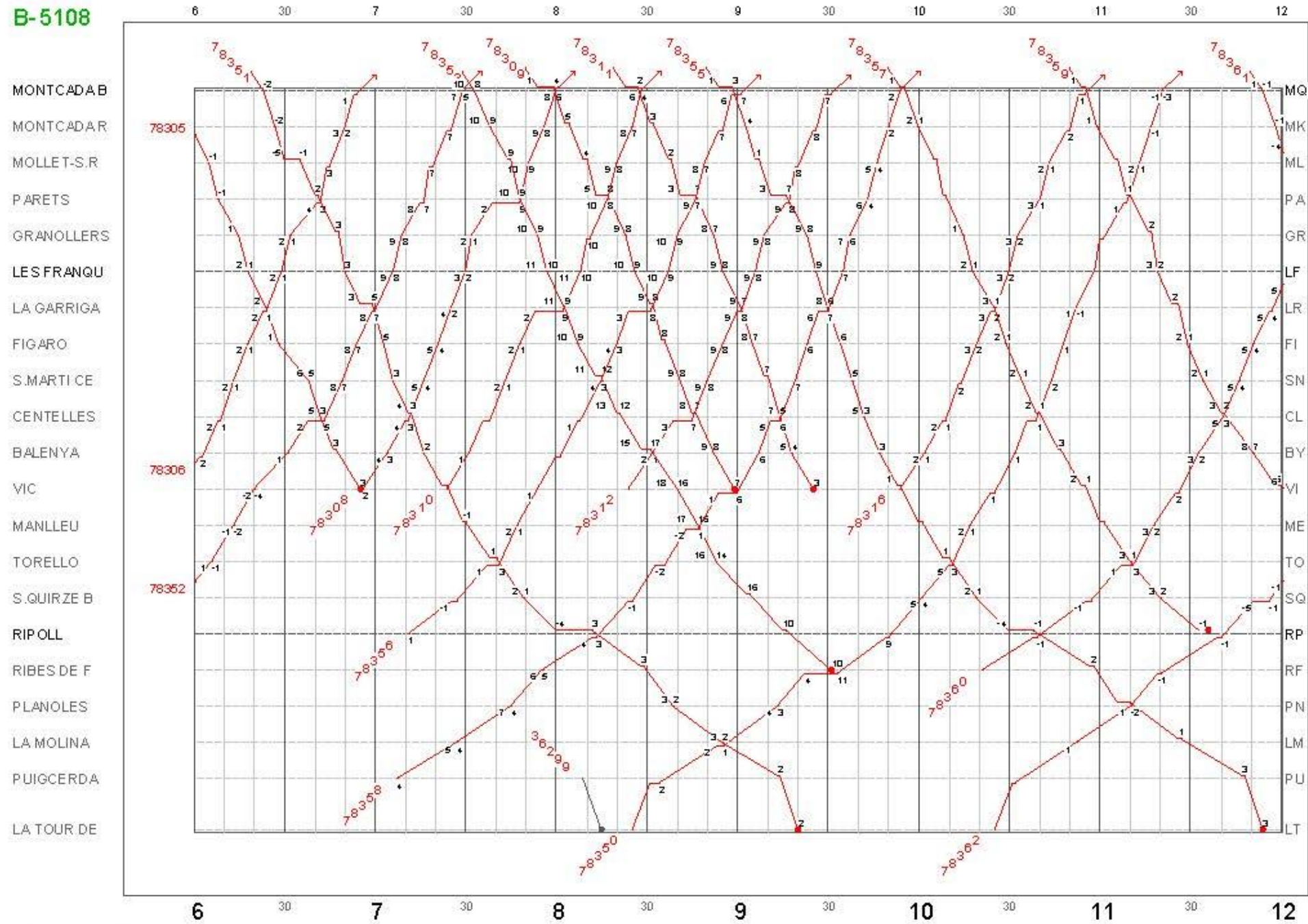


**R real** **Todos** **SitraP<sub>-2016</sub>** **18.JUN.2022**

Color: L.Dist.:---- Cercan.:---- Md.Dist.:---- Merc. :---- Resto :---- Sv.Int.:---- Mat. Pel.:---- Ter: carr.:---- Elaborado: 06-07-22 11:58:03



**B-5108**

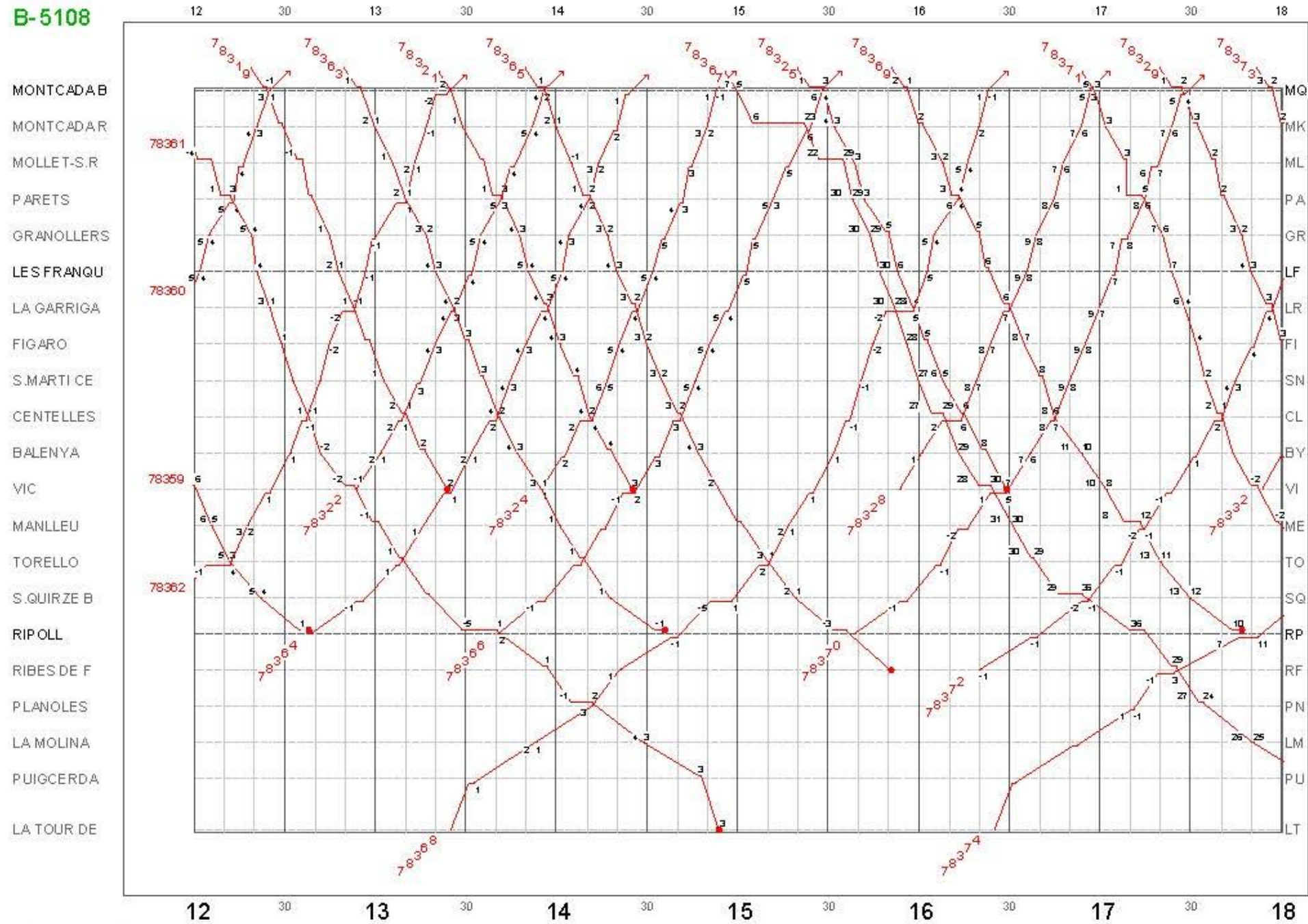


**R real** **Todos** **SitraP<sub>2016</sub>** **18.JUN.2022**

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:58:03



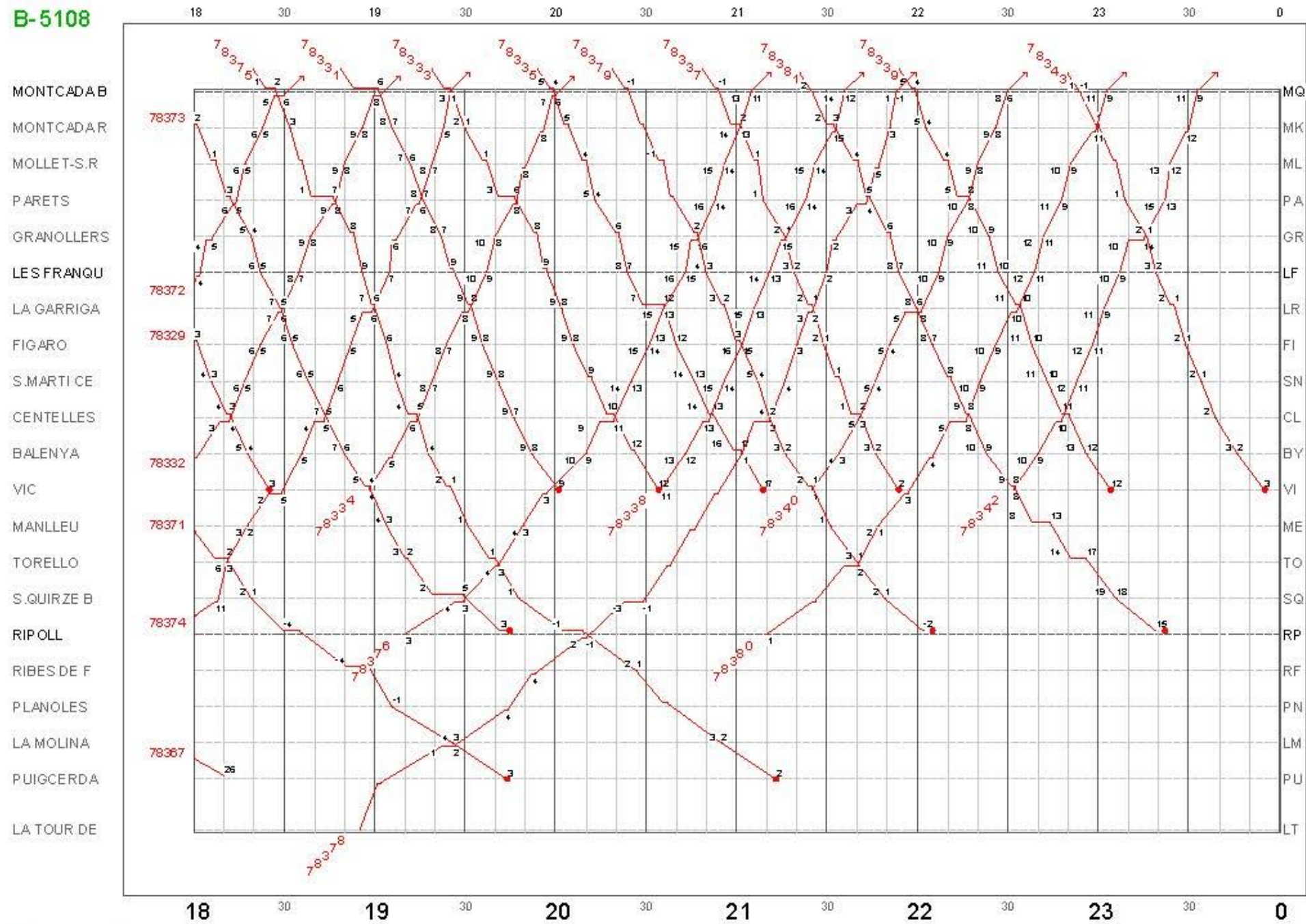
**B-5108**



**R real** **Todos** **SitraP-2016** **18.JUN.2022**

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:58:21

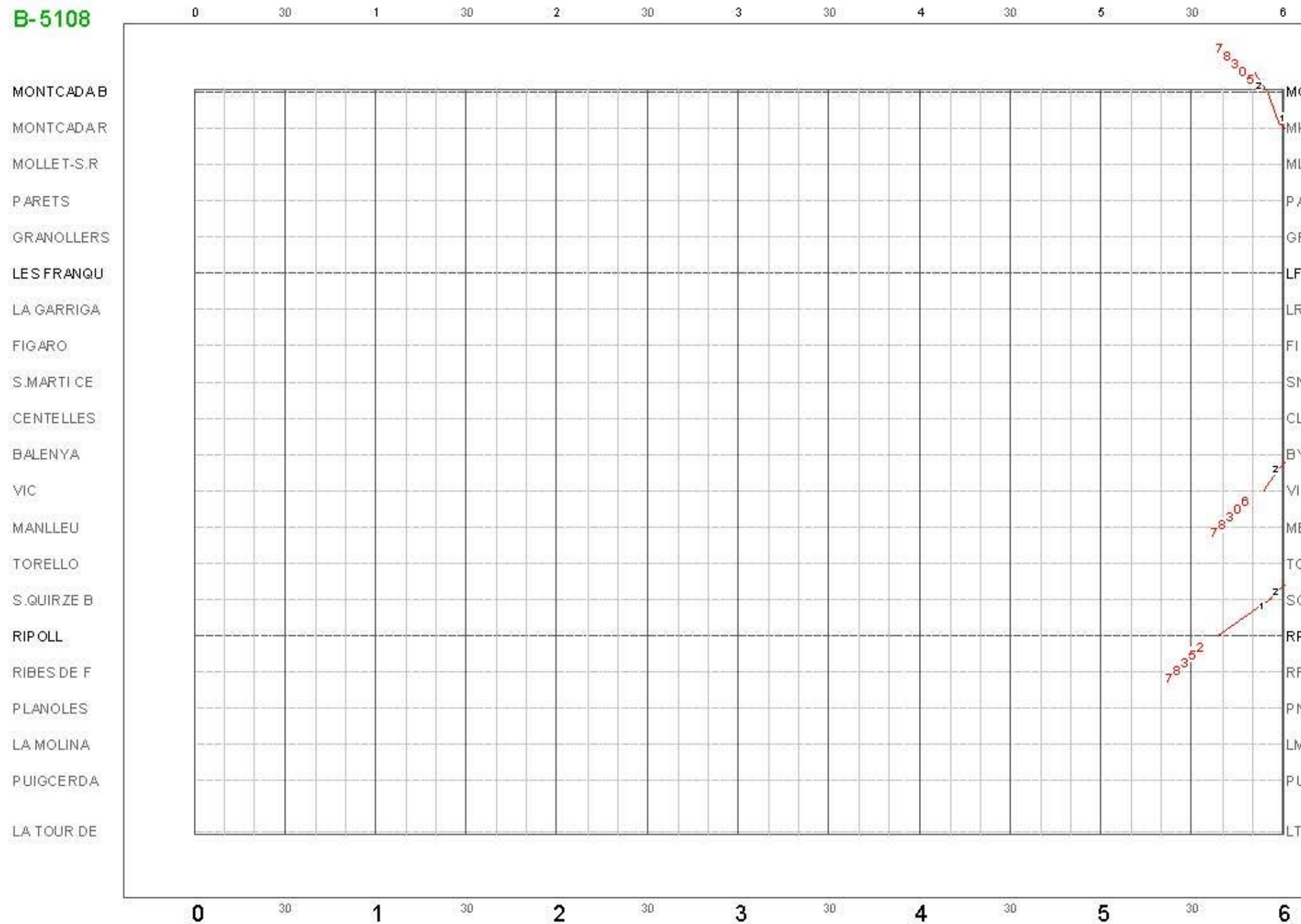
B-5108



R real
Todos
SitraP-2016
18.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc.:--- Resto:---  
 Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 11:58:21



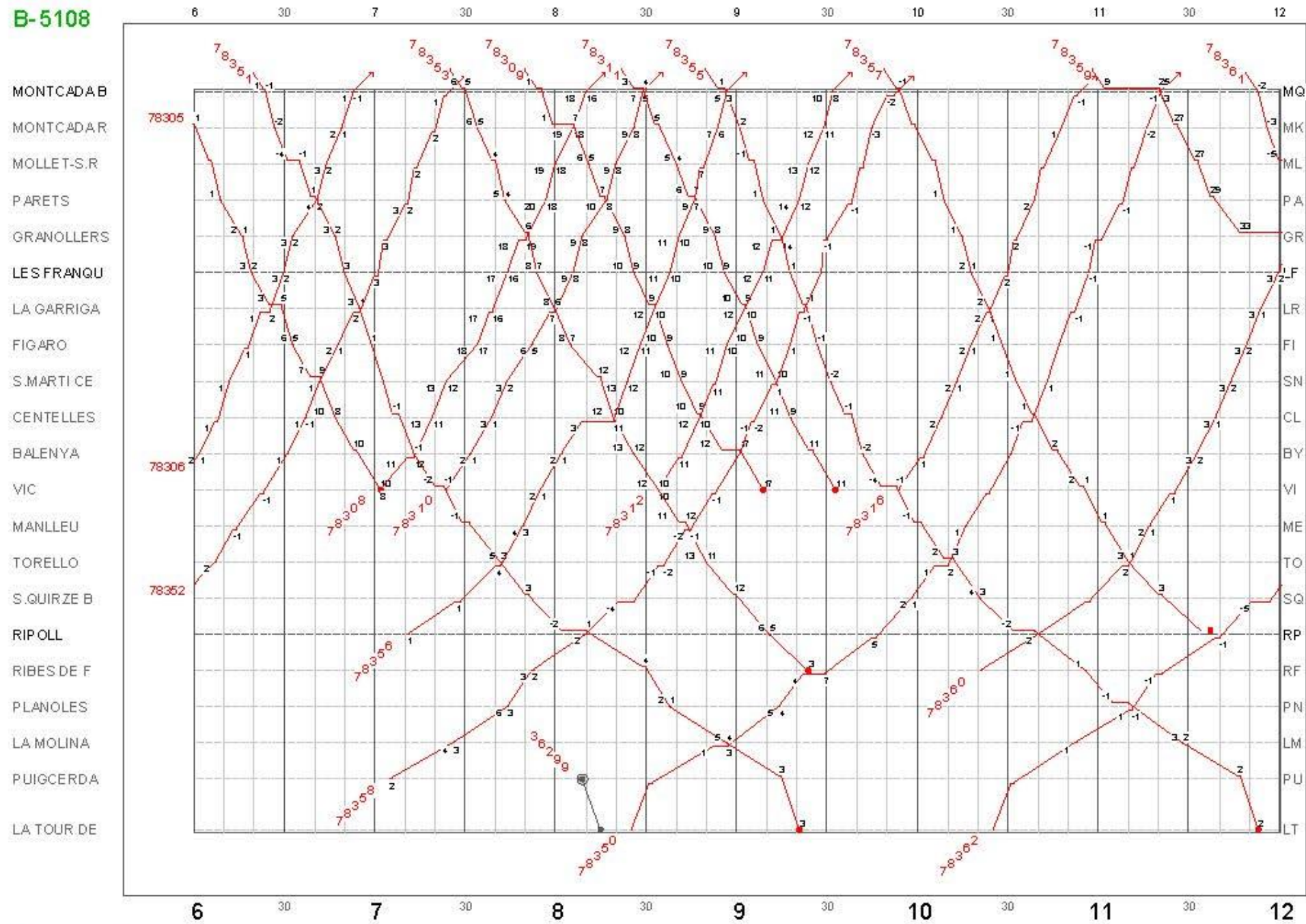


R real
Todos
SitraP<sub>-2016</sub>
19.JUN.2022

Color: L.Dist.:---- Cercan.:---- Md.Dist.:---- Merc. :---- Resto :----  
 Sv.Int.:---- Mat. Pel.:---- Ter: carr.:---- Elaborado: 06-07-22 12:00:17



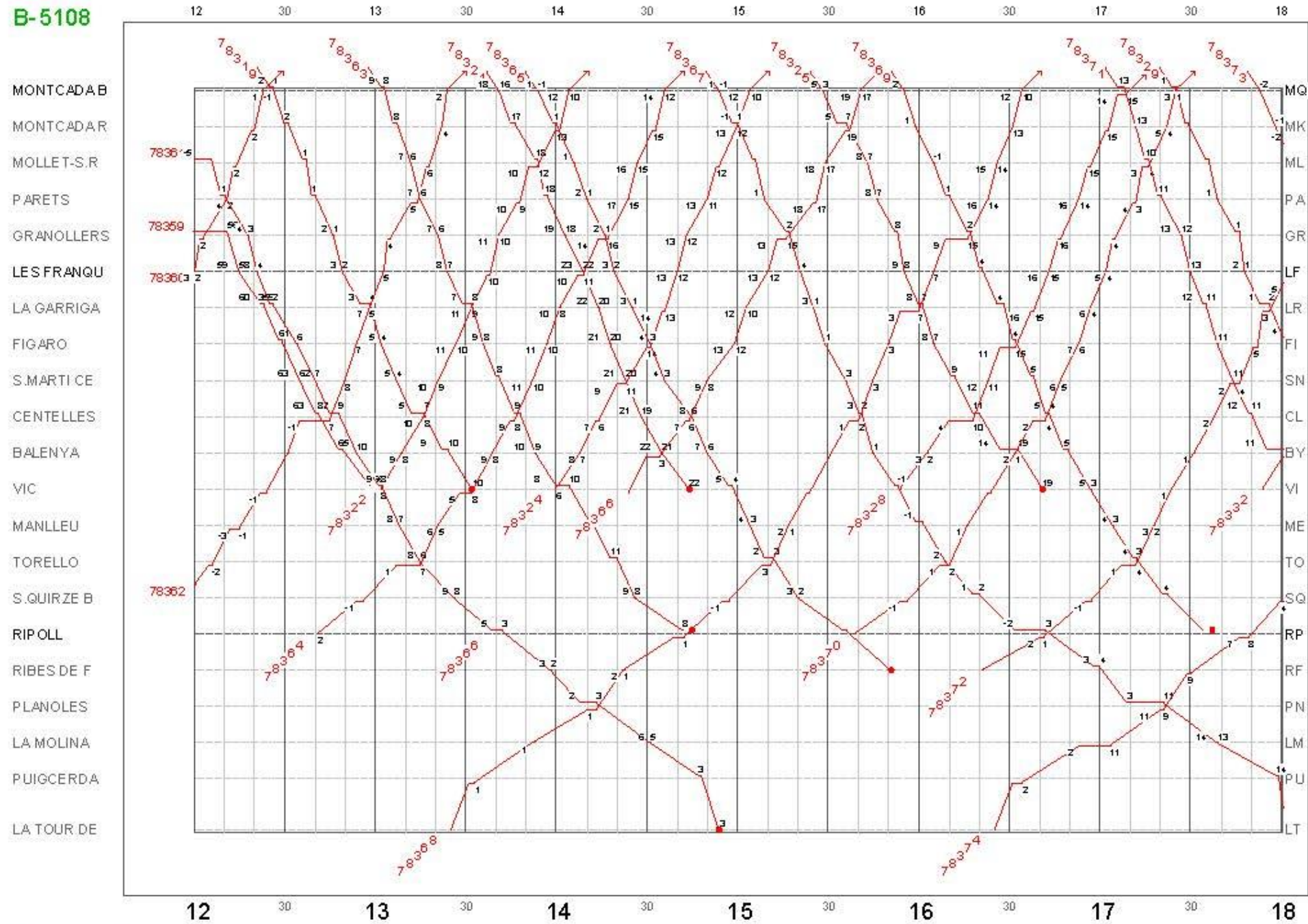
**B-5108**



R real
Todos
SitraP<sub>-2016</sub>
19.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc.:--- Resto:--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 12:00:17

**B-5108**

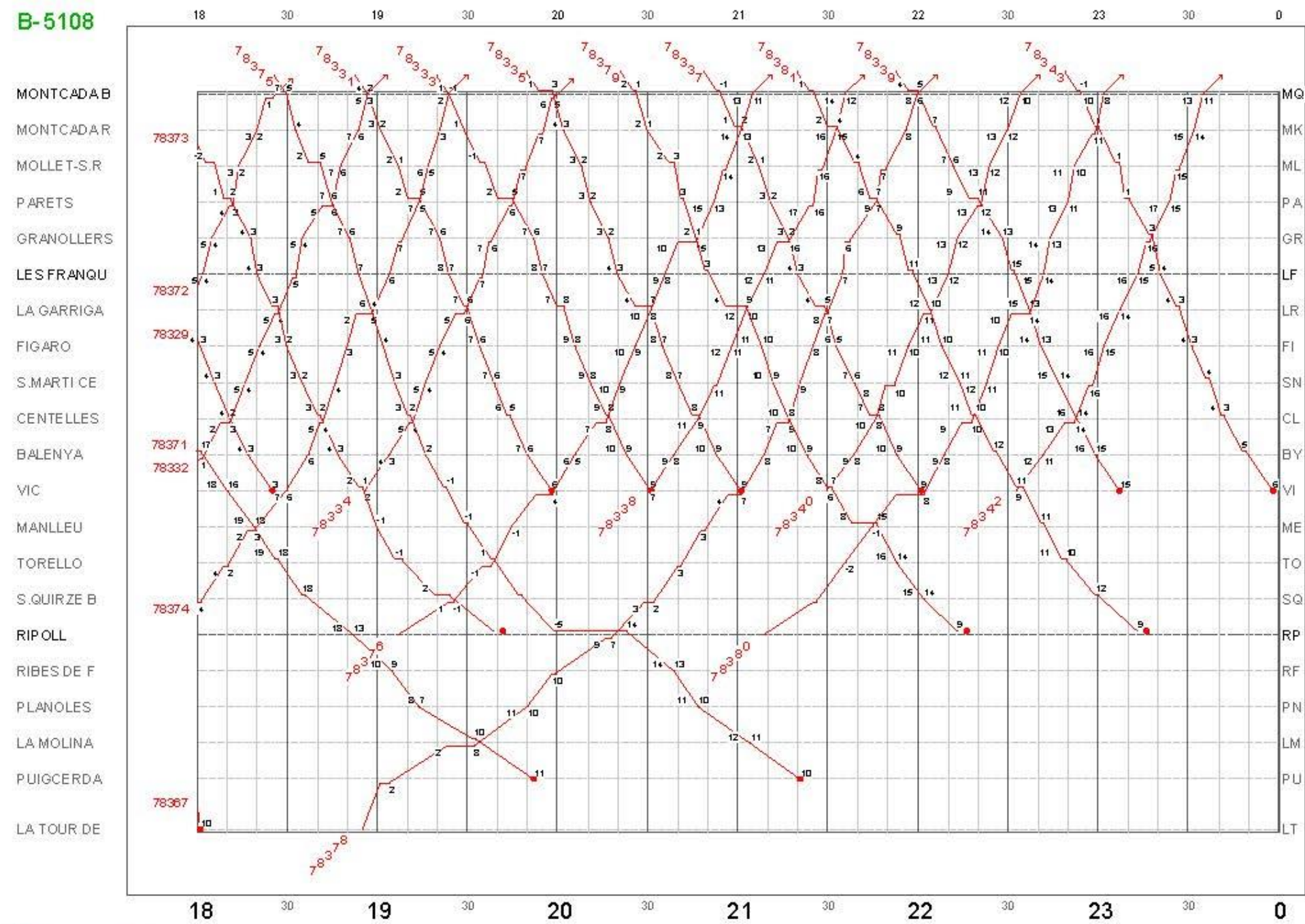


R real
Todos
SitraP-2016
19.JUN.2022

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pel.:--- Ter.carr.:--- Elaborado: 06-07-22 12:00:32



**B-5108**



**R real** **Todos** **SitraP<sub>2016</sub>** **19.JUN.2022**

Color: L.Dist.:--- Cercan.:--- Md.Dist.:--- Merc. :--- Resto :--- Sv.Int.:--- Mat.Pet.:--- Ter.carr.:--- Elaborado: 06-07-22 12:00:32



APÉNDICE 6. CALCULOS DE SIMULACIONES DE MARCHAS

1. ALTERNATIVA 1

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

pagina 1

\*\*\*\*\*  
 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
52700.00	0.00	0.00	100.00	-0.00	1144.44	1.219	0.00	0.00	45	-0.257	0.00
52710.00	5.89	17.64	100.00	100.00	2302.94	0.000	101.46	1.20	23	-0.117	8.54
52720.00	7.58	24.94	100.00	100.00	0.00	0.000	101.61	1.20	0	0.000	8.39
52740.00	9.97	35.27	100.00	100.00	0.00	0.000	101.37	1.20	0	0.000	8.63
52760.00	11.81	43.17	100.00	100.00	0.00	0.000	91.97	1.15	0	0.000	8.87
52780.00	13.37	49.13	100.00	100.00	0.00	0.000	79.12	0.99	0	0.000	9.08
52800.00	14.76	53.84	100.00	100.00	0.00	0.000	71.21	0.89	0	0.000	9.27
52820.00	16.05	57.80	100.00	100.00	0.00	0.000	65.51	0.82	0	0.000	9.44
52840.00	17.26	61.24	90.00	100.00	0.00	0.000	61.08	0.76	0	0.000	9.60
52860.00	18.41	64.30	90.00	100.00	0.00	0.000	57.49	0.72	0	0.000	9.74
52880.00	19.51	67.06	90.00	100.00	0.00	0.000	54.56	0.68	0	0.000	9.88
52900.00	20.56	69.59	90.00	100.00	0.00	0.000	52.31	0.65	0	0.000	10.02
52920.00	21.58	71.94	90.00	100.00	0.00	0.000	50.50	0.63	0	0.000	10.14
52940.00	22.56	74.15	90.00	100.00	14793.58	0.000	48.91	0.61	4	0.009	10.31
52960.00	23.52	76.17	90.00	100.00	1131.32	3.711	44.19	0.55	46	0.133	13.82
52980.00	24.45	77.91	90.00	100.00	588.15	8.711	38.63	0.48	89	0.291	18.37
53000.00	25.37	79.39	90.00	100.00	397.37	13.711	33.28	0.42	132	0.476	22.89
53020.00	26.27	80.64	90.00	100.00	350.00	18.711	28.40	0.35	150	0.584	27.09
53040.00	27.16	81.72	90.00	100.00	350.00	20.000	26.68	0.33	150	0.623	28.21
53060.00	28.03	82.76	90.00	100.00	350.00	20.000	26.04	0.33	150	0.661	28.28
53080.00	28.90	83.76	90.00	100.00	350.00	20.000	25.41	0.32	150	0.698	28.34
53100.00	29.75	84.73	90.00	100.00	350.00	20.000	24.81	0.31	150	0.733	28.40
53120.00	30.60	85.66	90.00	100.00	350.00	20.000	24.21	0.30	150	0.768	28.46
53140.00	31.43	86.57	90.00	100.00	484.33	20.000	24.11	0.30	108	0.580	28.03
53160.00	32.26	87.46	90.00	100.00	801.04	20.000	24.04	0.30	66	0.366	27.58
53180.00	33.08	88.35	90.00	100.00	2314.54	20.000	23.93	0.30	23	0.132	27.13
53200.00	33.89	89.22	90.00	100.00	0.00	20.000	23.59	0.29	0	0.000	26.91
53220.00	34.69	90.00	90.00	100.00	0.00	20.000	23.04	0.00	0	0.000	26.96
53240.00	35.49	90.80	120.00	100.00	0.00	20.000	22.43	0.28	0	0.000	27.02
53260.00	36.28	91.59	120.00	100.00	0.00	20.000	21.83	0.27	0	0.000	27.07
53280.00	37.06	92.35	120.00	100.00	0.00	20.000	21.22	0.27	0	0.000	27.13
53300.00	37.84	93.08	120.00	100.00	4530.51	20.000	20.50	0.26	20	0.035	27.32
53320.00	38.61	93.78	120.00	100.00	2095.84	20.000	19.77	0.25	43	0.081	27.53
53340.00	39.37	94.45	120.00	100.00	1363.24	20.000	19.08	0.24	66	0.131	27.74
53360.00	40.13	95.09	120.00	100.00	1010.15	20.000	18.41	0.23	89	0.186	27.94

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
53380.00	40.89	95.70	120.00	100.00	802.33	20.000	17.76	0.22	112	0.246	28.15
53400.00	41.64	96.29	120.00	100.00	665.43	20.000	17.14	0.21	135	0.309	28.36
53420.00	42.38	96.85	120.00	100.00	600.00	20.000	16.61	0.21	150	0.357	28.50
53440.00	43.13	97.40	120.00	100.00	600.00	20.000	16.21	0.20	150	0.371	28.54
53460.00	43.86	97.93	120.00	100.00	600.00	20.000	15.82	0.20	150	0.384	28.58
53480.00	44.60	98.45	120.00	100.00	600.00	20.000	15.47	0.19	150	0.397	28.62
53500.00	45.33	98.95	120.00	100.00	600.00	20.000	15.13	0.19	150	0.410	28.66
53520.00	46.05	99.44	120.00	100.00	600.00	20.000	14.82	0.19	150	0.423	28.70
53540.00	46.77	99.92	120.00	100.00	600.00	20.000	14.51	0.18	150	0.435	28.73
53560.00	47.49	100.00	120.00	100.00	600.00	20.000	14.46	0.00	150	0.437	28.74
53580.00	48.21	100.00	120.00	100.00	600.00	20.000	14.46	0.00	150	0.437	28.74
53600.00	48.93	100.00	120.00	100.00	639.80	20.000	14.52	0.00	141	0.410	28.68
53620.00	49.65	100.00	120.00	100.00	765.36	20.000	14.68	0.00	118	0.343	28.52
53640.00	50.37	100.00	120.00	100.00	952.23	20.000	14.85	0.00	95	0.275	28.35
53660.00	51.09	100.00	120.00	100.00	1259.84	20.000	15.01	0.00	71	0.208	28.19
53680.00	51.81	100.00	120.00	100.00	1861.01	20.000	15.17	0.00	48	0.141	28.03
53700.00	52.53	100.00	120.00	100.00	3559.59	20.000	15.33	0.00	25	0.074	27.87
53720.00	53.25	100.00	120.00	100.00	40781.84	20.000	15.49	0.00	2	0.006	27.71
53740.00	53.97	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53760.00	54.69	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53780.00	55.41	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53800.00	56.13	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53820.00	56.85	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53840.00	57.57	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53860.00	58.29	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53880.00	59.01	100.00	120.00	100.00	-3285.01	20.000	15.32	0.00	-27	0.080	27.88
53900.00	59.73	100.00	120.00	100.00	-1568.02	20.000	15.11	0.00	-57	0.167	28.09
53920.00	60.45	100.00	120.00	100.00	-1029.78	20.000	14.90	0.00	-87	0.255	28.30
53940.00	61.17	100.00	120.00	100.00	-766.63	20.000	14.69	0.00	-117	0.342	28.51
53960.00	61.89	100.00	120.00	100.00	-610.60	20.000	14.48	0.00	-147	0.429	28.72
53980.00	62.61	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54000.00	63.33	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54020.00	64.05	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54040.00	64.77	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54060.00	65.49	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
54080.00	66.21	100.00	120.00	100.00	-704.77	20.000	14.61	0.00	-128	0.372	28.59
54100.00	66.93	100.00	120.00	100.00	-921.17	20.000	14.82	0.00	-98	0.285	28.38
54120.00	67.66	99.00	120.00	100.00	-1329.36	20.000	15.66	-0.60	-68	0.186	28.09
54140.00	68.39	97.42	120.00	100.00	-2387.16	20.000	16.97	-0.60	-38	0.093	27.76
54160.00	69.13	95.81	120.00	100.00	-11685.78	20.000	18.39	-0.60	-8	0.017	27.43
54180.00	69.89	94.17	120.00	100.00	0.00	20.000	19.74	-0.60	0	0.000	27.26
54200.00	70.66	92.50	120.00	100.00	0.00	20.000	21.09	-0.60	0	0.000	27.14
54220.00	71.45	90.81	120.00	100.00	0.00	20.000	22.42	-0.60	0	0.000	27.02
54240.00	72.25	89.08	120.00	100.00	0.00	20.000	23.68	-0.60	0	0.000	26.90
54260.00	73.07	87.31	110.00	100.00	0.00	20.000	24.91	-0.60	0	0.000	26.78
54280.00	73.90	85.51	110.00	100.00	0.00	20.000	26.09	-0.60	0	0.000	26.66
54300.00	74.75	83.68	110.00	100.00	0.00	20.000	27.26	-0.60	0	0.000	26.54
54320.00	75.62	81.80	110.00	100.00	0.00	20.000	28.42	-0.60	0	0.000	26.42
54340.00	76.51	79.87	110.00	100.00	0.00	20.000	29.60	-0.60	0	0.000	26.30
54360.00	77.42	77.90	110.00	100.00	51507.86	20.000	30.81	-0.60	1	0.001	26.20
54380.00	78.36	75.88	110.00	100.00	3057.11	20.000	31.90	-0.60	25	0.006	26.27
54400.00	79.32	73.80	110.00	100.00	1575.30	20.000	33.09	-0.60	48	-0.003	26.34
54420.00	80.31	71.66	110.00	100.00	1061.02	20.000	34.42	-0.60	71	-0.027	26.42
54440.00	81.33	69.45	110.00	100.00	799.88	20.000	35.94	-0.60	94	-0.065	26.49
54460.00	82.39	67.18	110.00	100.00	641.90	20.000	37.74	-0.60	117	-0.119	26.56
54480.00	83.48	64.82	110.00	100.00	536.03	20.000	39.99	-0.60	140	-0.187	26.64
54500.00	84.61	62.37	110.00	100.00	500.00	20.000	42.74	-0.60	150	-0.249	26.60
54520.00	85.79	59.83	110.00	100.00	500.00	20.000	45.87	-0.60	150	-0.297	26.48
54540.00	87.02	57.17	110.00	100.00	500.00	20.000	49.40	-0.60	150	-0.345	26.36
54560.00	88.31	54.38	110.00	100.00	500.00	19.566	53.74	-0.60	150	-0.393	25.90
54580.00	89.67	51.44	110.00	100.00	500.00	18.366	59.35	-0.60	150	-0.441	24.84
54600.00	91.12	48.32	110.00	100.00	500.00	17.166	65.85	-0.60	150	-0.489	23.78
54620.00	92.66	44.98	110.00	100.00	500.00	15.966	73.73	-0.60	150	-0.537	22.72
54640.00	94.33	41.38	110.00	100.00	500.00	14.766	83.98	-0.60	150	-0.585	21.66
54660.00	96.15	37.43	110.00	100.00	500.00	14.000	89.07	-0.60	150	-0.633	20.93
54680.00	98.20	33.01	110.00	100.00	500.00	14.000	89.19	-0.60	150	-0.681	20.81
54700.00	100.56	27.90	110.00	100.00	500.00	14.000	89.31	-0.60	150	-0.729	20.69
54720.00	103.47	21.61	110.00	100.00	500.00	14.000	89.43	-0.60	150	-0.777	20.57
54740.00	107.70	12.47	110.00	100.00	500.00	14.000	89.55	-0.59	150	-0.825	20.45
54750.00	113.10	0.00	110.00	0.00	500.00	14.000	89.61	0.00	150	-0.849	20.39

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
54750.00	143.10	0.00	110.00	0.00	500.00	14.000	89.61	0.00	0	0.000	20.39
54760.00	149.13	17.03	110.00	100.00	500.00	14.000	89.50	1.12	150	-0.804	20.50
54780.00	152.23	29.49	110.00	100.54	510.49	14.000	89.30	1.12	147	-0.700	20.70
54800.00	154.36	38.05	110.00	101.08	605.62	14.000	89.27	1.12	124	-0.517	20.73
54820.00	156.09	44.64	110.00	101.62	744.32	14.000	76.57	0.96	101	-0.364	20.75
54840.00	157.62	49.54	110.00	102.16	965.42	14.000	66.69	0.83	78	-0.244	20.74
54860.00	159.02	53.52	110.00	102.70	1373.40	14.000	60.24	0.75	55	-0.148	20.70
54880.00	160.32	56.91	110.00	103.24	2378.52	14.000	55.47	0.69	32	-0.073	20.65
54900.00	161.55	59.87	110.00	103.78	8870.14	14.436	51.39	0.64	8	-0.017	20.93
54920.00	162.73	62.48	110.00	104.32	-5642.34	15.769	47.11	0.59	-11	-0.007	22.14
54940.00	163.86	64.78	110.00	104.86	-2188.42	17.103	43.20	0.54	-28	-0.009	23.48
54960.00	164.96	66.82	110.00	105.41	-1357.46	18.436	39.87	0.50	-45	0.002	24.80
54980.00	166.02	68.66	110.00	105.95	-983.87	19.769	36.97	0.46	-61	0.022	26.12
55000.00	167.05	70.34	110.00	106.49	-771.54	20.000	35.23	0.44	-78	0.051	26.57
55020.00	168.07	71.91	110.00	107.03	-634.59	20.000	33.83	0.42	-95	0.089	26.83
55040.00	169.06	73.39	103.41	107.57	-550.00	20.000	32.64	0.41	-110	0.133	27.06
55060.00	170.03	74.80	103.41	108.11	-550.00	20.000	31.67	0.40	-110	0.162	27.14
55080.00	170.98	76.14	103.41	108.65	-550.00	20.000	30.80	0.39	-110	0.191	27.22
55100.00	171.92	77.42	103.41	109.19	-550.00	20.000	29.98	0.37	-110	0.218	27.30
55120.00	172.84	78.65	103.41	109.73	-550.00	20.000	29.22	0.37	-110	0.245	27.37
55140.00	173.75	79.83	103.41	110.27	-550.00	20.000	28.49	0.36	-110	0.271	27.44
55160.00	174.65	80.96	103.41	110.81	-550.00	20.000	27.79	0.35	-110	0.297	27.51
55180.00	175.53	82.05	103.41	111.35	-550.00	20.000	27.12	0.34	-110	0.322	27.58
55200.00	176.40	83.11	103.41	111.89	-550.00	20.000	26.47	0.33	-110	0.346	27.65
55220.00	177.26	84.12	103.41	112.43	-550.00	20.000	25.84	0.32	-110	0.370	27.71
55240.00	178.12	85.10	103.41	112.97	-550.00	20.000	25.22	0.32	-110	0.393	27.78
55260.00	178.96	86.04	103.41	113.51	-550.00	20.000	24.61	0.31	-110	0.416	27.84
55280.00	179.79	86.95	103.41	114.05	-550.00	20.000	24.02	0.30	-110	0.438	27.90
55300.00	180.61	87.83	103.41	114.59	-550.00	20.000	23.42	0.29	-110	0.460	27.96
55320.00	181.43	88.68	103.41	115.14	-550.00	20.000	22.83	0.29	-110	0.481	28.01
55340.00	182.24	89.50	103.41	115.68	-550.00	20.000	22.25	0.28	-110	0.501	28.07
55360.00	183.04	90.29	103.87	116.22	-554.98	20.000	21.69	0.27	-109	0.516	28.12
55380.00	183.83	91.06	110.00	116.76	-656.97	20.000	21.28	0.27	-92	0.453	27.99
55400.00	184.62	91.81	110.00	117.30	-804.89	20.000	20.87	0.26	-75	0.382	27.87
55420.00	185.40	92.53	110.00	117.84	-1038.76	20.000	20.47	0.26	-58	0.306	27.75



Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
55440.00	186.18	93.24	110.00	118.38	-1464.19	20.000	20.08	0.25	-41	0.224	27.62
55460.00	186.95	93.93	110.00	118.92	-2479.85	20.000	19.70	0.25	-24	0.136	27.50
55480.00	187.71	94.60	110.00	119.46	-8095.23	20.000	19.33	0.24	-7	0.043	27.37
55500.00	188.47	95.25	110.00	120.00	0.00	20.000	18.90	0.24	0	0.000	27.34
55520.00	189.22	95.88	110.00	120.00	0.00	20.000	18.39	0.23	0	0.000	27.38
55540.00	189.97	96.50	110.00	120.00	0.00	20.000	17.93	0.22	0	0.000	27.43
55560.00	190.71	97.09	110.00	120.00	0.00	20.000	17.48	0.22	0	0.000	27.47
55580.00	191.45	97.66	110.00	120.00	0.00	20.000	17.07	0.21	0	0.000	27.51
55600.00	192.19	98.22	110.00	120.00	0.00	20.000	16.67	0.21	0	0.000	27.56
55620.00	192.92	98.76	120.00	120.00	0.00	20.000	16.30	0.20	0	0.000	27.60
55640.00	193.65	99.29	120.00	120.00	0.00	20.000	15.96	0.20	0	0.000	27.64
55660.00	194.37	99.80	120.00	120.00	0.00	20.000	15.63	0.20	0	0.000	27.68
55680.00	195.09	100.31	120.00	120.00	0.00	20.000	15.33	0.19	0	0.000	27.72
55700.00	195.80	100.80	120.00	120.00	0.00	20.000	15.05	0.19	0	0.000	27.75
55720.00	196.52	101.27	120.00	120.00	-84586.73	20.000	14.78	0.18	-1	0.003	27.80
55740.00	197.23	101.74	120.00	120.00	-2850.58	20.000	14.33	0.18	-31	0.104	28.04
55760.00	197.93	102.19	120.00	120.00	-1449.72	20.000	13.88	0.17	-61	0.210	28.29
55780.00	198.64	102.62	120.00	120.00	-972.03	20.000	13.46	0.17	-91	0.321	28.54
55800.00	199.34	103.04	120.00	120.00	-731.13	20.000	13.04	0.16	-121	0.435	28.79
55820.00	200.03	103.44	120.00	120.00	-590.00	20.000	12.65	0.16	-150	0.550	29.02
55840.00	200.73	103.83	120.00	120.00	-590.00	20.000	12.47	0.16	-150	0.561	29.06
55860.00	201.42	104.22	120.00	120.00	-590.00	20.000	12.29	0.15	-150	0.571	29.09
55880.00	202.11	104.61	120.00	120.00	-590.00	18.325	13.41	0.17	-150	0.582	27.83
55900.00	202.80	105.05	120.00	120.00	-590.00	16.225	14.87	0.19	-150	0.594	26.21
55920.00	203.48	105.53	120.00	120.00	-590.00	14.125	16.32	0.20	-150	0.607	24.59
55940.00	204.16	106.05	120.00	120.00	-590.00	12.025	17.75	0.22	-150	0.622	22.98
55960.00	204.84	106.61	120.00	120.00	-676.22	9.925	19.27	0.24	-131	0.556	21.26
55980.00	205.51	107.21	120.00	120.00	-877.33	9.500	19.58	0.24	-101	0.440	20.74
56000.00	206.18	107.80	120.00	120.00	-1248.69	9.500	19.53	0.24	-71	0.317	20.58
56020.00	206.85	108.38	120.00	120.00	-2165.19	9.500	19.48	0.24	-41	0.187	20.41
56040.00	207.51	108.96	120.00	120.00	-8138.63	9.500	19.43	0.24	-11	0.051	20.25
56060.00	208.17	109.54	120.00	120.00	0.00	9.500	19.24	0.24	0	0.000	20.22
56080.00	208.82	110.10	120.00	120.00	0.00	9.500	18.97	0.24	0	0.000	20.27
56100.00	209.48	110.65	120.00	120.00	0.00	9.500	18.69	0.23	0	0.000	20.31
56120.00	210.13	111.19	120.00	120.00	0.00	9.500	18.42	0.23	0	0.000	20.36

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
56140.00	210.77	111.73	120.00	120.00	0.00	9.500	18.16	0.23	0	0.000	20.40
56160.00	211.42	112.25	120.00	120.00	0.00	9.500	17.89	0.22	0	0.000	20.45
56180.00	212.06	112.76	120.00	120.00	0.00	9.500	17.64	0.22	0	0.000	20.49
56200.00	212.69	113.26	120.00	120.00	0.00	9.500	17.38	0.22	0	0.000	20.54
56220.00	213.33	113.75	120.00	120.00	0.00	9.500	17.13	0.21	0	0.000	20.58
56240.00	213.96	114.24	120.00	120.00	0.00	9.500	16.88	0.21	0	0.000	20.62
56260.00	214.59	114.71	120.00	120.00	0.00	9.500	16.64	0.21	0	0.000	20.66
56280.00	215.21	115.18	120.00	120.00	0.00	9.500	16.40	0.21	0	0.000	20.70
56300.00	215.84	115.63	120.00	120.00	0.00	9.500	16.16	0.20	0	0.000	20.74
56320.00	216.46	116.08	120.00	120.00	0.00	9.500	15.93	0.20	0	0.000	20.78
56340.00	217.08	116.52	120.00	120.00	0.00	9.500	15.70	0.20	0	0.000	20.82
56360.00	217.69	116.96	120.00	120.00	0.00	9.500	15.48	0.19	0	0.000	20.86
56380.00	218.31	117.38	120.00	120.00	0.00	9.500	15.25	0.19	0	0.000	20.90
56400.00	218.92	117.80	120.00	120.00	0.00	9.500	15.03	0.19	0	0.000	20.94
56420.00	219.53	118.21	120.00	120.00	0.00	9.500	14.82	0.19	0	0.000	20.98
56440.00	220.14	118.61	120.00	120.00	0.00	9.500	14.60	0.18	0	0.000	21.01
56460.00	220.75	119.01	120.00	120.00	0.00	9.500	14.39	0.18	0	0.000	21.05
56480.00	221.35	119.39	120.00	120.00	0.00	9.500	14.19	0.18	0	0.000	21.08
56500.00	221.95	119.78	120.00	120.00	0.00	9.500	13.98	0.17	0	0.000	21.12
56520.00	222.55	120.00	120.00	120.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56540.00	223.15	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56560.00	223.75	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56580.00	224.35	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56600.00	224.95	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56620.00	225.55	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56640.00	226.15	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56660.00	226.75	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56680.00	227.35	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56700.00	227.95	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56720.00	228.55	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56740.00	229.15	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56760.00	229.75	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56780.00	230.35	120.00	120.00	120.00	0.00	9.500	13.86	0.09	0	0.000	21.14
56800.00	230.95	120.00	120.00	120.00	4480.37	9.500	13.72	0.09	30	0.077	21.28
56820.00	231.55	120.00	120.00	120.00	2127.16	9.500	13.57	0.10	63	0.163	21.43

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
56840.00	232.15	120.00	120.00	120.00	1394.66	9.500	13.41	0.10	97	0.249	21.59
56860.00	232.75	120.00	120.00	120.00	1037.41	9.500	13.26	0.11	130	0.334	21.74
56880.00	233.35	120.00	120.00	120.00	900.00	9.500	13.17	0.11	150	0.385	21.84
56900.00	233.95	120.00	120.00	120.00	900.00	9.500	13.17	0.11	150	0.385	21.84
56920.00	234.55	120.00	120.00	120.00	900.00	9.500	13.17	0.11	150	0.385	21.84
56940.00	235.15	120.00	120.00	120.00	900.00	9.500	13.17	0.11	150	0.385	21.84
56960.00	235.75	120.00	120.00	120.00	900.00	9.500	13.17	0.11	150	0.385	21.84
56980.00	236.35	120.00	120.00	120.00	900.00	9.500	13.17	0.11	150	0.385	21.84
57000.00	236.95	120.00	120.00	120.00	975.21	9.500	13.22	0.11	138	0.356	21.78
57020.00	237.55	120.00	120.00	120.00	1284.51	9.500	13.37	0.10	105	0.270	21.63
57040.00	238.15	120.00	120.00	120.00	1881.15	9.500	13.53	0.10	72	0.184	21.47
57060.00	238.75	120.00	120.00	120.00	3512.75	9.500	13.68	0.10	38	0.099	21.32
57080.00	239.35	120.00	120.00	120.00	26480.29	9.500	13.84	0.09	5	0.013	21.16
57100.00	239.95	120.00	120.00	120.00	-4250.01	9.500	13.72	0.09	-25	0.118	21.29
57120.00	240.55	120.00	120.00	120.00	-1949.05	9.500	13.54	0.10	-55	0.256	21.46
57140.00	241.15	120.00	120.00	120.00	-1264.46	9.500	13.37	0.10	-85	0.395	21.63
57160.00	241.75	120.00	120.00	120.00	-935.78	9.500	13.19	0.11	-115	0.534	21.81
57180.00	242.35	120.00	120.00	120.00	-742.72	9.500	13.02	0.11	-145	0.673	21.98
57200.00	242.95	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57220.00	243.55	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57240.00	244.15	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57260.00	244.75	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57280.00	245.35	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57300.00	245.95	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57320.00	246.55	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57340.00	247.15	120.00	120.00	120.00	-720.00	9.500	12.99	0.11	-150	0.694	22.01
57360.00	247.75	120.00	120.00	120.00	-751.38	9.500	13.03	0.11	-144	0.665	21.97
57380.00	248.35	119.64	120.00	120.00	-949.58	9.500	13.39	-0.60	-114	0.519	21.77
57400.00	248.96	118.33	120.00	120.00	-1289.78	9.500	14.26	-0.60	-84	0.364	21.48
57420.00	249.57	117.01	120.00	120.00	-2009.86	9.500	15.13	-0.60	-54	0.221	21.18
57440.00	250.19	115.67	120.00	120.00	-4550.25	9.500	15.99	-0.60	-24	0.093	20.89
57460.00	250.82	114.32	120.00	120.00	13886.58	9.500	16.79	-0.60	6	0.037	20.67
57480.00	251.45	112.95	120.00	120.00	2399.00	9.500	17.27	-0.60	36	0.205	20.77
57500.00	252.09	111.56	120.00	120.00	1312.91	9.500	17.76	-0.60	66	0.356	20.87
57520.00	252.74	110.16	120.00	120.00	903.75	9.500	18.23	-0.60	96	0.491	20.96

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
57540.00	253.40	108.74	120.00	120.00	725.00	9.500	18.74	-0.60	120	0.579	21.02
57560.00	254.06	107.30	120.00	120.00	725.00	9.500	19.38	-0.60	120	0.546	20.90
57580.00	254.74	105.84	120.00	120.00	725.00	9.739	19.83	-0.60	120	0.513	20.96
57600.00	255.42	104.36	120.00	120.00	725.00	10.239	20.09	-0.60	120	0.480	21.24
57620.00	256.12	102.86	120.00	120.00	725.00	10.739	20.39	-0.60	120	0.447	21.51
57640.00	256.83	101.33	120.00	120.00	725.00	11.239	20.76	-0.60	120	0.414	21.78
57660.00	257.54	99.79	120.00	120.00	725.00	11.739	21.26	-0.60	120	0.380	22.06
57680.00	258.27	98.21	120.00	120.00	725.00	12.000	22.08	-0.60	120	0.347	22.15
57700.00	259.01	96.62	120.00	120.00	725.00	12.000	23.23	-0.60	120	0.314	22.03
57720.00	259.76	94.99	120.00	120.00	725.00	12.000	24.50	-0.60	120	0.281	21.91
57740.00	260.52	93.34	120.00	120.00	725.00	12.000	25.83	-0.60	120	0.248	21.79
57760.00	261.30	91.66	120.00	120.00	725.00	12.000	27.16	-0.60	120	0.215	21.67
57780.00	262.09	89.95	120.00	120.00	725.00	12.000	28.48	-0.60	120	0.182	21.55
57800.00	262.90	88.20	120.00	120.00	725.00	12.000	29.70	-0.60	120	0.149	21.43
57820.00	263.73	86.42	120.00	120.00	725.00	12.000	30.91	-0.60	120	0.116	21.31
57840.00	264.57	84.60	120.00	120.00	725.00	12.000	32.09	-0.60	120	0.082	21.19
57860.00	265.43	82.74	120.00	120.00	725.00	12.000	33.25	-0.60	120	0.049	21.07
57880.00	266.31	80.84	120.00	120.00	725.00	12.000	34.42	-0.60	120	0.016	20.95
57900.00	267.21	78.89	120.00	120.00	761.97	12.000	35.66	-0.60	114	-0.016	20.79
57920.00	268.14	76.89	120.00	120.00	1033.53	12.000	37.11	-0.60	84	-0.035	20.45
57940.00	269.09	74.84	120.00	120.00	1605.83	8.130	41.66	-0.60	54	-0.038	17.11
57960.00	270.06	72.74	120.00	120.00	3598.40	4.130	46.49	-0.60	24	-0.023	13.63
57980.00	271.07	70.56	120.00	120.00	0.00	0.130	51.43	-0.60	0	0.000	10.19
58000.00	272.10	68.32	120.00	120.00	0.00	0.000	53.40	-0.60	0	0.000	9.95
58020.00	273.18	66.01	120.00	120.00	0.00	0.000	55.62	-0.60	0	0.000	9.83
58040.00	274.29	63.61	120.00	120.00	0.00	0.000	58.27	-0.60	0	0.000	9.71
58060.00	275.44	61.11	120.00	120.00	0.00	0.000	61.20	-0.60	0	0.000	9.59
58080.00	276.64	58.51	120.00	120.00	5000.00	0.000	64.37	-0.60	0	0.053	9.60
58100.00	277.90	55.79	120.00	120.00	5000.00	0.000	68.11	-0.60	0	0.048	9.48
58120.00	279.23	52.93	120.00	120.00	0.00	0.000	72.55	-0.60	0	0.000	9.23
58140.00	280.63	49.90	120.00	120.00	0.00	0.000	77.61	-0.60	0	0.000	9.11
58160.00	282.12	46.68	120.00	120.00	5537.96	0.000	83.74	-0.60	22	-0.092	9.11
58180.00	283.72	43.22	120.00	120.00	1859.72	0.000	91.44	-0.60	65	-0.288	9.21
58200.00	285.46	39.45	120.00	120.00	1117.50	0.000	100.69	-0.60	107	-0.500	9.31
58220.00	287.39	35.29	120.00	120.00	800.00	0.000	100.58	-0.60	150	-0.729	9.42

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
58240.00	289.58	30.56	120.00	120.00	800.00	0.000	100.70	-0.60	150	-0.759	9.30
58260.00	292.17	24.95	120.00	120.00	800.00	0.000	100.83	-0.60	150	-0.789	9.17
58280.00	295.55	17.64	120.00	120.00	800.00	0.000	100.95	-0.60	150	-0.819	9.05
58290.00	297.94	12.47	120.00	120.00	800.00	0.000	101.01	-0.59	150	-0.834	8.99
58300.00	303.35	0.00	120.00	0.00	800.00	0.000	101.07	0.00	150	-0.849	8.93
58310.00	333.35	0.00	120.00	0.00	800.00	0.000	101.07	0.00	0	0.000	8.93
58310.00	339.23	17.64	120.00	120.00	800.00	0.000	100.95	1.20	150	-0.819	9.05
58320.00	340.92	24.94	120.00	120.00	800.00	0.000	100.83	1.20	150	-0.789	9.17
58340.00	343.32	35.27	120.00	120.00	800.00	0.000	100.58	1.20	150	-0.729	9.42
58360.00	345.15	43.16	120.00	120.00	800.00	0.000	91.22	1.14	150	-0.669	9.65
58380.00	346.71	49.07	120.00	120.00	1038.44	0.000	78.62	0.98	116	-0.475	9.69
58400.00	348.11	53.77	120.00	120.00	1650.59	0.000	70.95	0.89	73	-0.276	9.65
58420.00	349.40	57.72	120.00	120.00	4020.90	0.000	65.43	0.82	30	-0.105	9.59
58440.00	350.61	61.17	120.00	120.00	0.00	0.000	61.14	0.76	0	0.000	9.59
58460.00	351.76	64.23	120.00	120.00	0.00	0.000	57.56	0.72	0	0.000	9.74
58480.00	352.86	67.00	120.00	120.00	0.00	0.000	54.62	0.68	0	0.000	9.88
58500.00	353.91	69.54	120.00	120.00	0.00	0.000	52.36	0.65	0	0.000	10.01
58520.00	354.93	71.89	120.00	120.00	0.00	0.000	50.54	0.63	0	0.000	10.14
58540.00	355.91	74.10	120.00	120.00	0.00	0.000	48.98	0.61	0	0.000	10.27
58560.00	356.87	76.18	120.00	120.00	0.00	0.000	47.62	0.60	0	0.000	10.39
58580.00	357.81	78.16	120.00	120.00	0.00	0.000	46.36	0.58	0	0.000	10.50
58600.00	358.72	80.04	120.00	120.00	0.00	-1.376	46.27	0.58	0	0.000	9.54
58620.00	359.61	81.93	120.00	120.00	0.00	-5.342	48.21	0.60	0	0.000	6.57
58640.00	360.47	83.85	120.00	120.00	0.00	-9.309	50.13	0.63	0	0.000	3.58
58660.00	361.32	85.80	120.00	120.00	0.00	-11.900	50.96	0.64	0	0.000	1.64
58680.00	362.15	87.68	120.00	120.00	0.00	-11.900	49.71	0.62	0	0.000	1.77
58700.00	362.97	89.47	120.00	120.00	0.00	-11.900	48.45	0.61	0	0.000	1.89
58720.00	363.76	91.19	120.00	120.00	0.00	-11.900	47.18	0.59	0	0.000	2.01
58740.00	364.55	92.82	120.00	120.00	0.00	-11.900	45.88	0.57	0	0.000	2.13
58760.00	365.31	94.39	120.00	120.00	0.00	-11.900	44.63	0.56	0	0.000	2.24
58780.00	366.07	95.89	120.00	120.00	0.00	-11.900	43.43	0.54	0	0.000	2.35
58800.00	366.82	97.33	120.00	120.00	0.00	-11.900	42.35	0.53	0	0.000	2.45
58820.00	367.55	98.71	120.00	120.00	0.00	-11.900	41.38	0.52	0	0.000	2.56
58840.00	368.28	100.05	120.00	120.00	0.00	-11.900	40.52	0.51	0	0.000	2.66
58860.00	368.99	101.34	120.00	120.00	0.00	-11.900	39.79	0.50	0	0.000	2.76

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
58880.00	369.70	102.59	120.00	120.00	15280.41	-11.900	39.12	0.49	11	-0.008	2.90
58900.00	370.39	103.81	120.00	120.00	3738.83	-11.900	38.42	0.48	44	-0.027	3.12
58920.00	371.08	104.99	120.00	120.00	2130.00	-11.900	37.76	0.47	77	-0.039	3.34
58940.00	371.77	106.14	120.00	120.00	1489.19	-11.900	37.13	0.46	111	-0.043	3.56
58960.00	372.44	107.26	120.00	120.00	1144.79	-11.900	36.52	0.46	144	-0.040	3.78
58980.00	373.11	108.35	120.00	120.00	1100.00	-11.900	36.02	0.45	150	-0.026	3.89
59000.00	373.77	109.41	120.00	120.00	1100.00	-11.900	35.52	0.44	150	-0.009	3.98
59020.00	374.42	110.45	120.00	120.00	1100.00	-11.900	35.02	0.44	150	0.007	4.07
59040.00	375.07	111.47	120.00	120.00	1100.00	-11.900	34.51	0.43	150	0.022	4.16
59060.00	375.72	112.46	120.00	120.00	1100.00	-11.900	34.01	0.43	150	0.038	4.24
59080.00	376.35	113.43	120.00	120.00	1100.00	-11.900	33.52	0.42	150	0.053	4.33
59100.00	376.99	114.37	120.00	120.00	1100.00	-11.900	33.04	0.41	150	0.069	4.41
59120.00	377.61	115.30	120.00	120.00	1163.84	-11.900	32.59	0.41	142	0.079	4.46
59140.00	378.24	116.21	120.00	120.00	1521.60	-11.900	32.25	0.40	108	0.071	4.41
59160.00	378.85	117.10	120.00	120.00	2196.93	-11.900	31.91	0.40	75	0.056	4.37
59180.00	379.47	117.97	120.00	120.00	3950.06	-11.900	31.58	0.39	42	0.035	4.32
59200.00	380.07	118.83	120.00	120.00	19553.86	-11.900	31.25	0.39	8	0.008	4.27
59220.00	380.68	119.68	120.00	120.00	0.00	-11.900	30.83	0.39	0	0.000	4.31
59240.00	381.28	120.00	120.00	120.00	0.00	-11.900	-4.34	-0.05	0	0.000	4.34
59260.00	381.88	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59280.00	382.48	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59300.00	383.08	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59320.00	383.68	120.00	120.00	120.00	-13681.40	-11.900	30.61	0.05	-11	0.020	4.39
59340.00	384.28	120.00	120.00	120.00	-3191.50	-11.900	30.46	0.06	-46	0.086	4.54
59360.00	384.88	120.00	120.00	120.00	-1806.45	-11.900	30.31	0.06	-82	0.151	4.69
59380.00	385.48	120.00	120.00	120.00	-1259.74	-11.900	30.16	0.06	-117	0.217	4.84
59400.00	386.08	120.00	120.00	120.00	-967.07	-11.900	30.01	0.06	-153	0.283	4.99
59420.00	386.68	120.00	120.00	120.00	-925.00	-11.900	29.98	0.06	-160	0.295	5.02
59440.00	387.28	120.00	120.00	120.00	-925.00	-11.900	29.98	0.06	-160	0.295	5.02
59460.00	387.88	120.00	120.00	120.00	-925.00	-11.900	29.98	0.06	-160	0.295	5.02
59480.00	388.48	120.00	120.00	120.00	-925.00	-11.900	29.98	0.06	-160	0.295	5.02
59500.00	389.08	120.00	120.00	120.00	-925.00	-11.900	29.98	0.06	-160	0.295	5.02
59520.00	389.68	120.00	120.00	120.00	-925.00	-11.900	29.98	0.06	-160	0.295	5.02
59540.00	390.28	120.00	120.00	120.00	-1142.05	-11.900	30.11	0.06	-130	0.239	4.89
59560.00	390.88	120.00	120.00	120.00	-1573.87	-11.900	30.26	0.06	-94	0.174	4.74



Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
59580.00	391.48	120.00	120.00	120.00	-2530.76	-11.900	30.41	0.06	-58	0.108	4.59
59600.00	392.08	120.00	120.00	120.00	-6455.87	-11.900	30.56	0.06	-23	0.042	4.44
59620.00	392.68	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59640.00	393.28	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59660.00	393.88	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59680.00	394.48	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59700.00	395.08	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59720.00	395.68	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59740.00	396.28	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59760.00	396.88	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59780.00	397.48	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59800.00	398.08	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59820.00	398.68	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59840.00	399.28	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59860.00	399.88	120.00	120.00	120.00	0.00	-11.900	30.66	0.05	0	0.000	4.34
59880.00	400.48	120.00	120.00	120.00	-4141.96	-11.900	30.51	0.06	-14	0.187	4.50
59900.00	401.08	120.00	120.00	120.00	-1731.40	-11.900	30.29	0.06	-34	0.447	4.71
59920.00	401.68	120.00	120.00	120.00	-1094.45	-11.900	30.08	0.06	-54	0.707	4.92
59940.00	402.28	120.00	120.00	120.00	-800.11	-11.900	29.87	0.06	-74	0.968	5.13
59960.00	402.88	120.00	120.00	120.00	-630.53	-11.900	29.66	0.07	-94	1.228	5.34
59980.00	403.48	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60000.00	404.08	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60020.00	404.68	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60040.00	405.28	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60060.00	405.88	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60080.00	406.48	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60100.00	407.08	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60120.00	407.68	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60140.00	408.28	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60160.00	408.88	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60180.00	409.48	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60200.00	410.08	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60220.00	410.68	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60240.00	411.28	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60260.00	411.88	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
60280.00	412.48	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60300.00	413.08	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60320.00	413.68	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60340.00	414.28	120.00	120.00	120.00	-595.00	-11.900	29.60	0.07	-100	1.301	5.40
60360.00	414.88	120.00	120.00	120.00	-595.00	-12.500	30.07	0.06	-100	1.301	4.93
60380.00	415.48	120.00	120.00	120.00	-595.00	-13.120	30.56	0.06	-100	1.301	4.44
60400.00	416.08	120.00	120.00	120.00	-595.00	-13.740	31.05	0.05	-100	1.301	3.96
60420.00	416.68	120.00	120.00	120.00	-595.00	-14.360	31.53	0.04	-100	1.301	3.47
60440.00	417.28	120.00	120.00	120.00	-595.00	-14.980	32.02	0.04	-100	1.301	2.98
60460.00	417.88	120.00	120.00	120.00	-595.00	-15.000	32.03	0.04	-100	1.301	2.97
60480.00	418.48	120.00	120.00	120.00	-595.00	-15.000	32.03	0.04	-100	1.301	2.97
60500.00	419.08	120.00	120.00	120.00	-595.00	-15.000	32.03	0.04	-100	1.301	2.97
60520.00	419.68	120.00	120.00	120.00	-595.00	-15.000	32.03	0.04	-100	1.301	2.97
60540.00	420.28	120.00	120.00	120.00	-595.00	-15.000	32.03	0.04	-100	1.301	2.97
60560.00	420.88	120.00	120.00	120.00	-595.00	-15.000	32.03	0.04	-100	1.301	2.97
60580.00	421.48	120.00	120.00	120.00	-595.00	-15.000	32.03	0.04	-100	1.301	2.97
60600.00	422.08	120.00	120.00	120.00	-673.69	-15.000	32.16	0.04	-88	1.149	2.84
60620.00	422.68	120.00	120.00	120.00	-870.91	-15.000	32.37	0.03	-68	0.889	2.63
60640.00	423.28	120.00	120.00	120.00	-1231.39	-15.000	32.58	0.03	-48	0.629	2.42
60660.00	423.88	120.00	120.00	120.00	-2101.04	-15.000	32.79	0.03	-28	0.369	2.21
60680.00	424.48	120.00	120.00	120.00	-7152.02	-15.000	33.00	0.03	-8	0.108	2.00
60700.00	425.08	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60720.00	425.68	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60740.00	426.28	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60760.00	426.88	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60780.00	427.48	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60800.00	428.08	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60820.00	428.68	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60840.00	429.28	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60860.00	429.88	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60880.00	430.48	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60900.00	431.08	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60920.00	431.68	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60940.00	432.28	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
60960.00	432.88	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
60980.00	433.48	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
61000.00	434.08	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
61020.00	434.68	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
61040.00	435.28	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
61060.00	435.88	120.00	120.00	120.00	-10691.74	-15.000	33.03	0.02	-7	0.066	1.97
61080.00	436.48	120.00	120.00	120.00	-2693.18	-15.000	32.86	0.03	-27	0.261	2.14
61100.00	437.08	120.00	120.00	120.00	-1540.63	-15.000	32.68	0.03	-47	0.457	2.32
61120.00	437.68	120.00	120.00	120.00	-1078.91	-15.000	32.51	0.03	-67	0.652	2.49
61140.00	438.28	120.00	120.00	120.00	-830.12	-15.000	32.33	0.03	-87	0.847	2.67
61160.00	438.88	120.00	120.00	120.00	-720.00	-15.000	32.22	0.03	-100	0.977	2.78
61180.00	439.48	120.00	120.00	120.00	-720.00	-15.000	32.22	0.03	-100	0.977	2.78
61200.00	440.08	120.00	120.00	120.00	-720.00	-15.000	32.22	0.03	-100	0.977	2.78
61220.00	440.68	120.00	120.00	120.00	-720.00	-15.000	32.22	0.03	-100	0.977	2.78
61240.00	441.28	120.00	120.00	120.00	-720.00	-15.000	32.22	0.03	-100	0.977	2.78
61260.00	441.88	120.00	120.00	120.00	-720.00	-15.000	32.22	0.03	-100	0.977	2.78
61280.00	442.48	120.00	120.00	120.00	-783.99	-15.000	32.29	0.03	-92	0.897	2.71
61300.00	443.08	120.00	120.00	120.00	-1002.25	-15.000	32.46	0.03	-72	0.702	2.54
61320.00	443.68	120.00	120.00	120.00	-1388.94	-15.000	32.64	0.03	-52	0.507	2.36
61340.00	444.28	120.00	120.00	120.00	-2261.43	-15.000	32.81	0.03	-32	0.311	2.19
61360.00	444.88	120.00	120.00	120.00	-6081.99	-15.000	32.99	0.03	-12	0.116	2.01
61380.00	445.48	120.00	120.00	120.00	8821.62	-15.000	33.02	0.02	8	0.080	1.98
61400.00	446.08	120.00	120.00	120.00	2556.66	-15.000	32.84	0.03	28	0.275	2.16
61420.00	446.68	120.00	120.00	120.00	1494.96	-15.000	32.67	0.03	48	0.471	2.33
61440.00	447.28	120.00	120.00	120.00	1056.31	-14.225	31.89	0.04	68	0.666	3.11
61460.00	447.88	120.00	120.00	120.00	816.68	-11.425	29.52	0.07	88	0.861	5.49
61480.00	448.48	120.00	120.00	120.00	720.00	-8.625	27.22	0.10	100	0.977	7.79
61500.00	449.08	120.00	120.00	120.00	720.00	-5.825	25.02	0.12	100	0.977	9.98
61520.00	449.68	119.99	120.00	120.00	720.00	-3.025	22.82	0.15	100	0.977	12.18
61540.00	450.28	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77
61560.00	450.88	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77
61580.00	451.48	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77
61600.00	452.08	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77
61620.00	452.68	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77
61640.00	453.28	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77
61660.00	453.88	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
61680.00	454.48	119.99	120.00	120.00	720.00	-1.000	21.23	0.17	100	0.977	13.77
61700.00	455.08	119.99	120.00	120.00	878.01	-1.000	21.39	0.17	82	0.801	13.61
61720.00	455.68	119.99	120.00	120.00	1161.21	-1.000	21.56	0.17	62	0.606	13.44
61740.00	456.28	119.99	120.00	120.00	1714.12	-1.000	21.74	0.17	42	0.410	13.26
61760.00	456.88	119.99	120.00	120.00	3272.12	-3.313	23.73	0.14	22	0.215	11.27
61780.00	457.48	120.00	120.00	120.00	35926.74	-6.013	26.02	0.11	2	0.020	8.98
61800.00	458.08	120.00	120.00	120.00	0.00	-8.713	28.16	0.09	0	0.000	6.84
61820.00	458.68	120.00	120.00	120.00	0.00	-11.413	30.28	0.06	0	0.000	4.73
61840.00	459.28	120.00	120.00	120.00	0.00	-14.113	32.39	0.03	0	0.000	2.61
61860.00	459.88	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
61880.00	460.48	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
61900.00	461.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
61920.00	461.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
61940.00	462.28	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
61960.00	462.88	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
61980.00	463.48	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62000.00	464.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62020.00	464.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62040.00	465.28	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62060.00	465.88	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62080.00	466.48	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62100.00	467.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62120.00	467.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62140.00	468.28	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62160.00	468.88	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62180.00	469.48	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62200.00	470.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62220.00	470.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62240.00	471.28	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62260.00	471.88	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62280.00	472.48	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62300.00	473.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62320.00	473.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62340.00	474.28	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62360.00	474.88	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
62380.00	475.48	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62400.00	476.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62420.00	476.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62440.00	477.28	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62460.00	477.88	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62480.00	478.48	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62500.00	479.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62520.00	479.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
62540.00	480.28	120.00	120.00	120.00	3617.62	-14.500	32.52	0.03	18	0.206	2.48
62560.00	480.88	120.00	120.00	120.00	1804.40	-14.500	32.35	0.03	36	0.412	2.65
62580.00	481.48	120.00	120.00	120.00	1201.95	-14.500	32.17	0.04	54	0.619	2.83
62600.00	482.08	120.00	120.00	120.00	901.10	-14.500	32.00	0.04	72	0.826	3.00
62620.00	482.68	120.00	120.00	120.00	720.70	-14.500	31.83	0.04	90	1.033	3.17
62640.00	483.28	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62660.00	483.88	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62680.00	484.48	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62700.00	485.08	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62720.00	485.68	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62740.00	486.28	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62760.00	486.88	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62780.00	487.48	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62800.00	488.08	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62820.00	488.68	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62840.00	489.28	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62860.00	489.88	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62880.00	490.48	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62900.00	491.08	120.00	120.00	120.00	720.00	-14.500	31.83	0.04	90	1.034	3.18
62920.00	491.68	120.00	120.00	120.00	783.94	-14.500	31.90	0.04	83	0.949	3.10
62940.00	492.28	120.00	120.00	120.00	1002.18	-14.500	32.07	0.04	65	0.743	2.93
62960.00	492.88	120.00	120.00	120.00	1388.79	-14.500	32.25	0.03	47	0.536	2.76
62980.00	493.48	120.00	120.00	120.00	2261.04	-14.500	32.42	0.03	29	0.329	2.58
63000.00	494.08	120.00	120.00	120.00	6079.16	-14.500	32.59	0.03	11	0.122	2.41
63020.00	494.68	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
63040.00	495.28	120.00	120.00	120.00	0.00	-13.860	32.19	0.03	0	0.000	2.81
63060.00	495.88	120.00	120.00	120.00	0.00	-10.985	29.94	0.06	0	0.000	5.06

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
63080.00	496.48	120.00	120.00	120.00	0.00	-8.110	27.68	0.09	0	0.000	7.32
63100.00	497.08	120.00	120.00	120.00	0.00	-5.235	25.43	0.12	0	0.000	9.57
63120.00	497.68	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63140.00	498.28	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63160.00	498.88	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63180.00	499.48	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63200.00	500.08	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63220.00	500.68	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63240.00	501.28	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63260.00	501.88	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63280.00	502.48	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63300.00	503.08	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63320.00	503.68	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63340.00	504.28	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63360.00	504.88	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63380.00	505.48	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63400.00	506.08	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63420.00	506.68	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63440.00	507.28	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
63460.00	507.88	120.00	120.00	120.00	0.00	-4.999	25.24	0.12	0	0.000	9.76
63480.00	508.48	120.00	120.00	120.00	0.00	-7.399	27.13	0.10	0	0.000	7.88
63500.00	509.08	120.00	120.00	120.00	0.00	-9.799	29.01	0.08	0	0.000	5.99
63520.00	509.68	120.00	120.00	120.00	0.00	-12.199	30.89	0.05	0	0.000	4.11
63540.00	510.28	120.00	120.00	120.00	0.00	-14.599	32.77	0.03	0	0.000	2.23
63560.00	510.88	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63580.00	511.48	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63600.00	512.08	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63620.00	512.68	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63640.00	513.28	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63660.00	513.88	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63680.00	514.48	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63700.00	515.08	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63720.00	515.68	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63740.00	516.28	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63760.00	516.88	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91



Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
63780.00	517.48	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
63800.00	518.08	120.00	120.00	120.00	-151731.84	-15.000	33.09	0.02	-1	0.004	1.92
63820.00	518.68	120.00	120.00	120.00	-3730.95	-15.000	32.92	0.03	-23	0.170	2.08
63840.00	519.28	120.00	120.00	120.00	-1888.69	-15.000	32.76	0.03	-45	0.336	2.24
63860.00	519.88	120.00	120.00	120.00	-1264.38	-15.000	32.59	0.03	-67	0.502	2.41
63880.00	520.48	120.00	120.00	120.00	-950.26	-15.000	32.43	0.03	-89	0.668	2.57
63900.00	521.08	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
63920.00	521.68	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
63940.00	522.28	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
63960.00	522.88	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
63980.00	523.48	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64000.00	524.08	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64020.00	524.68	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64040.00	525.28	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64060.00	525.88	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64080.00	526.48	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64100.00	527.08	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64120.00	527.68	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64140.00	528.28	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64160.00	528.88	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64180.00	529.48	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64200.00	530.08	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64220.00	530.68	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64240.00	531.28	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64260.00	531.88	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64280.00	532.48	120.00	120.00	120.00	-765.00	-15.000	32.27	0.03	-110	0.830	2.73
64300.00	533.08	120.00	120.00	120.00	-767.49	-15.000	32.27	0.03	-110	0.827	2.73
64320.00	533.68	120.00	120.00	120.00	-960.15	-15.000	32.44	0.03	-88	0.661	2.56
64340.00	534.28	120.00	120.00	120.00	-1281.94	-15.000	32.60	0.03	-66	0.495	2.40
64360.00	534.88	120.00	120.00	120.00	-1928.17	-15.000	32.76	0.03	-44	0.329	2.24
64380.00	535.48	120.00	120.00	120.00	-3888.19	-15.000	32.93	0.03	-22	0.163	2.07
64400.00	536.08	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
64420.00	536.68	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
64440.00	537.28	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
64460.00	537.88	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
64480.00	538.48	120.00	120.00	120.00	0.00	-15.000	33.09	0.02	0	0.000	1.91
64500.00	539.08	120.00	120.00	120.00	0.00	-14.500	32.70	0.03	0	0.000	2.30
64520.00	539.68	120.00	120.00	120.00	0.00	-12.192	30.89	0.05	0	0.000	4.11
64540.00	540.28	120.00	120.00	120.00	0.00	-9.885	29.08	0.07	0	0.000	5.93
64560.00	540.88	120.00	120.00	120.00	0.00	-7.577	27.27	0.10	0	0.000	7.74
64580.00	541.48	120.00	120.00	120.00	0.00	-5.269	25.45	0.12	0	0.000	9.55
64600.00	542.08	119.99	120.00	120.00	0.00	-2.961	23.64	0.14	0	0.000	11.36
64620.00	542.68	119.99	120.00	120.00	0.00	-1.153	22.22	0.16	0	0.000	12.78
64640.00	543.28	119.99	120.00	120.00	0.00	-1.153	22.22	0.16	0	0.000	12.78
64660.00	543.88	119.99	120.00	120.00	0.00	-1.153	22.22	0.16	0	0.000	12.78
64680.00	544.48	119.99	120.00	120.00	0.00	-1.153	22.22	0.16	0	0.000	12.78
64700.00	545.08	119.99	120.00	120.00	0.00	-1.153	22.22	0.16	0	0.000	12.78
64720.00	545.68	119.99	120.00	120.00	0.00	-1.153	22.22	0.16	0	0.000	12.78
64740.00	546.28	119.99	120.00	120.00	-84838.19	-1.153	22.22	0.16	-5	-0.013	12.78
64760.00	546.88	119.99	120.00	120.00	-14092.70	-1.153	22.18	0.16	-28	-0.078	12.82
64780.00	547.48	119.99	120.00	120.00	-7684.60	-1.153	22.14	0.16	-51	-0.143	12.86
64800.00	548.08	119.99	120.00	120.00	-5282.57	-1.153	22.11	0.16	-74	-0.208	12.90
64820.00	548.68	119.99	120.00	120.00	-4024.57	-1.153	22.07	0.16	-97	-0.272	12.93
64840.00	549.28	119.99	120.00	120.00	-3250.50	-1.153	22.03	0.16	-120	-0.337	12.97
64860.00	549.88	119.99	120.00	120.00	-2726.16	-1.153	21.99	0.16	-143	-0.402	13.01
64880.00	550.48	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
64900.00	551.08	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
64920.00	551.68	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
64940.00	552.28	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
64960.00	552.88	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
64980.00	553.48	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
65000.00	554.08	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
65020.00	554.68	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
65040.00	555.28	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
65060.00	555.88	119.99	120.00	120.00	-2600.00	-1.153	21.98	0.16	-150	-0.422	13.02
65080.00	556.48	119.99	120.00	120.00	-2600.00	-2.145	22.76	0.15	-150	-0.422	12.24
65100.00	557.08	120.00	120.00	120.00	-2744.77	-4.119	24.32	0.13	-142	-0.400	10.68
65120.00	557.68	120.00	120.00	120.00	-3276.99	-6.094	25.91	0.11	-119	-0.335	9.09
65140.00	558.28	120.00	120.00	120.00	-4065.27	-8.068	27.50	0.09	-96	-0.270	7.51
65160.00	558.88	120.00	120.00	120.00	-5352.90	-10.043	29.08	0.07	-73	-0.205	5.92

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
65180.00	559.48	120.00	120.00	120.00	-7834.34	-12.017	30.67	0.05	-50	-0.140	4.33
65200.00	560.08	120.00	120.00	120.00	-14604.60	-13.000	31.48	0.04	-27	-0.075	3.52
65220.00	560.68	120.00	120.00	120.00	-107527.16	-13.000	31.51	0.04	-4	-0.010	3.49
65240.00	561.28	120.00	120.00	120.00	5784.08	-13.000	31.41	0.04	17	0.097	3.59
65260.00	561.88	120.00	120.00	120.00	2645.39	-13.000	31.28	0.05	37	0.211	3.72
65280.00	562.48	120.00	120.00	120.00	1714.84	-13.000	31.15	0.05	57	0.326	3.85
65300.00	563.08	120.00	120.00	120.00	1268.60	-13.000	31.03	0.05	77	0.441	3.98
65320.00	563.68	120.00	120.00	120.00	1006.64	-13.000	30.90	0.05	97	0.555	4.10
65340.00	564.28	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65360.00	564.88	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65380.00	565.48	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65400.00	566.08	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65420.00	566.68	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65440.00	567.28	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65460.00	567.88	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65480.00	568.48	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65500.00	569.08	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65520.00	569.68	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65540.00	570.28	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65560.00	570.88	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65580.00	571.48	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65600.00	572.08	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65620.00	572.68	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65640.00	573.28	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65660.00	573.88	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65680.00	574.48	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65700.00	575.08	120.00	120.00	120.00	975.00	-13.000	30.88	0.05	100	0.573	4.12
65720.00	575.68	120.00	120.00	120.00	975.00	-11.820	29.95	0.06	100	0.573	5.05
65740.00	576.28	120.00	120.00	120.00	975.00	-10.153	28.64	0.08	100	0.573	6.36
65760.00	576.88	120.00	120.00	120.00	1174.22	-8.487	27.44	0.09	83	0.476	7.56
65780.00	577.48	120.00	120.00	120.00	1546.79	-6.820	26.27	0.11	63	0.361	8.74
65800.00	578.08	120.00	120.00	120.00	2265.66	-5.153	25.09	0.12	43	0.247	9.92
65820.00	578.68	120.00	120.00	120.00	4232.89	-3.487	23.91	0.14	23	0.132	11.09
65840.00	579.28	119.99	120.00	120.00	32136.97	-3.000	23.65	0.14	3	0.017	11.35
65860.00	579.88	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
65880.00	580.48	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
65900.00	581.08	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
65920.00	581.68	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
65940.00	582.28	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
65960.00	582.88	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
65980.00	583.48	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66000.00	584.08	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66020.00	584.68	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66040.00	585.28	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66060.00	585.88	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66080.00	586.48	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66100.00	587.08	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66120.00	587.68	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66140.00	588.28	119.99	120.00	120.00	0.00	-3.000	23.67	0.14	0	0.000	11.33
66160.00	588.88	120.00	120.00	120.00	0.00	-3.477	24.05	0.14	0	0.000	10.95
66180.00	589.48	120.00	120.00	120.00	0.00	-5.117	25.34	0.12	0	0.000	9.67
66200.00	590.08	120.00	120.00	120.00	0.00	-6.757	26.62	0.11	0	0.000	8.38
66220.00	590.68	120.00	120.00	120.00	0.00	-8.397	27.91	0.09	0	0.000	7.09
66240.00	591.28	120.00	120.00	120.00	0.00	-10.037	29.20	0.07	0	0.000	5.81
66260.00	591.88	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66280.00	592.48	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66300.00	593.08	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66320.00	593.68	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66340.00	594.28	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66360.00	594.88	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66380.00	595.48	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66400.00	596.08	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66420.00	596.68	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66440.00	597.28	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66460.00	597.88	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66480.00	598.48	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66500.00	599.08	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66520.00	599.68	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66540.00	600.28	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66560.00	600.88	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
66580.00	601.48	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66600.00	602.08	120.00	120.00	120.00	0.00	-11.200	30.11	0.06	0	0.000	4.89
66620.00	602.68	120.00	120.00	120.00	-14583.65	-11.200	30.06	0.06	-19	-0.032	4.94
66640.00	603.28	120.00	120.00	120.00	-5166.09	-11.200	29.99	0.06	-54	-0.092	5.01
66660.00	603.88	120.00	120.00	120.00	-3139.03	-11.200	29.91	0.06	-89	-0.151	5.09
66680.00	604.48	120.00	120.00	120.00	-2254.44	-11.200	29.83	0.06	-124	-0.210	5.17
66700.00	605.08	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66720.00	605.68	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66740.00	606.28	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66760.00	606.88	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66780.00	607.48	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66800.00	608.08	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66820.00	608.68	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66840.00	609.28	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66860.00	609.88	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66880.00	610.48	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66900.00	611.08	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66920.00	611.68	120.00	120.00	120.00	-2000.00	-11.200	29.79	0.07	-140	-0.237	5.21
66940.00	612.28	120.00	120.00	120.00	-2000.00	-12.051	30.46	0.06	-140	-0.237	4.54
66960.00	612.88	120.00	120.00	120.00	-2000.00	-13.251	31.40	0.05	-140	-0.237	3.60
66980.00	613.48	120.00	120.00	120.00	-2000.00	-14.451	32.34	0.03	-140	-0.237	2.66
67000.00	614.08	120.00	120.00	120.00	-2000.00	-15.651	33.29	0.02	-140	-0.237	1.71
67020.00	614.68	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67040.00	615.28	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67060.00	615.88	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67080.00	616.48	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67100.00	617.08	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67120.00	617.68	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67140.00	618.28	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67160.00	618.88	120.00	120.00	120.00	-2000.00	-16.000	33.56	0.02	-140	-0.237	1.44
67180.00	619.48	120.00	120.00	120.00	-2000.00	-13.997	31.99	0.04	-140	-0.237	3.01
67200.00	620.08	120.00	120.00	120.00	-2000.00	-11.775	30.25	0.06	-140	-0.237	4.76
67220.00	620.68	120.00	120.00	120.00	-2301.95	-9.552	28.54	0.08	-122	-0.206	6.46
67240.00	621.28	120.00	120.00	120.00	-3231.90	-7.330	26.88	0.10	-87	-0.147	8.12
67260.00	621.88	120.00	120.00	120.00	-5422.55	-5.108	25.21	0.12	-52	-0.087	9.79

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
67280.00	622.48	119.99	120.00	120.00	-16830.73	-2.886	23.55	0.14	-17	-0.028	11.46
67300.00	623.08	119.99	120.00	120.00	0.00	-1.000	22.10	0.16	0	0.000	12.90
67320.00	623.68	119.99	120.00	120.00	0.00	-1.000	22.10	0.16	0	0.000	12.90
67340.00	624.28	119.99	120.00	120.00	0.00	-1.000	22.10	0.16	0	0.000	12.90
67360.00	624.88	119.99	120.00	120.00	5006.18	-1.000	21.98	0.16	29	0.060	13.02
67380.00	625.48	119.99	120.00	120.00	2254.00	-1.000	21.83	0.16	64	0.133	13.18
67400.00	626.08	119.99	120.00	120.00	2050.00	-1.000	21.80	0.17	70	0.146	13.20
67420.00	626.68	119.99	120.00	120.00	2050.00	-1.000	21.80	0.17	70	0.146	13.20
67440.00	627.28	119.99	120.00	120.00	2050.00	-2.140	22.69	0.15	70	0.146	12.31
67460.00	627.88	120.00	120.00	120.00	2050.00	-3.997	24.15	0.14	70	0.146	10.85
67480.00	628.48	120.00	120.00	120.00	3176.94	-5.854	25.72	0.12	45	0.094	9.29
67500.00	629.08	120.00	120.00	120.00	14111.24	-7.710	27.33	0.10	10	0.021	7.68
67520.00	629.68	120.00	120.00	120.00	-7047.70	-9.567	28.74	0.08	-25	0.017	6.26
67540.00	630.28	120.00	120.00	120.00	-2924.91	-11.213	29.90	0.06	-60	0.041	5.10
67560.00	630.88	120.00	120.00	120.00	-2500.00	-11.213	29.87	0.06	-70	0.048	5.13
67580.00	631.48	120.00	120.00	120.00	-2500.00	-11.213	29.87	0.06	-70	0.048	5.13
67600.00	632.08	120.00	120.00	120.00	-2500.00	-11.213	29.87	0.06	-70	0.048	5.13
67620.00	632.68	120.00	120.00	120.00	-4103.23	-11.213	29.97	0.06	-43	0.029	5.04
67640.00	633.28	120.00	120.00	120.00	-22877.77	-11.213	30.09	0.06	-8	0.005	4.91
67660.00	633.88	120.00	120.00	120.00	0.00	-11.213	30.12	0.06	0	0.000	4.88
67680.00	634.48	120.00	120.00	120.00	0.00	-11.213	30.12	0.06	0	0.000	4.88
67700.00	635.08	120.00	120.00	120.00	0.00	-11.213	30.12	0.06	0	0.000	4.88
67720.00	635.68	120.00	120.00	120.00	0.00	-11.213	30.12	0.06	0	0.000	4.88
67740.00	636.28	120.00	120.00	120.00	0.00	-11.213	30.12	0.06	0	0.000	4.88
67760.00	636.88	120.00	120.00	120.00	0.00	-11.213	30.12	0.06	0	0.000	4.88
67780.00	637.48	120.00	120.00	120.00	0.00	-11.213	30.12	0.06	0	0.000	4.88
67800.00	638.08	120.00	120.00	120.00	0.00	-9.732	28.96	0.07	0	0.000	6.04
67820.00	638.68	120.00	120.00	120.00	0.00	-5.811	25.88	0.11	0	0.000	9.12
67840.00	639.28	119.99	120.00	120.00	-28412.52	-1.889	22.78	0.15	0	0.039	12.22
67860.00	639.88	119.99	120.00	120.00	-13996.00	2.032	19.68	0.19	0	0.079	15.32
67880.00	640.48	120.00	120.00	120.00	-13996.00	5.954	16.60	0.02	0	0.079	18.40
67900.00	641.08	120.00	120.00	120.00	-13996.00	9.876	13.52	0.10	0	0.079	21.48
67920.00	641.68	120.00	120.00	120.00	-16568.06	13.797	10.45	0.04	0	0.067	24.55
67940.00	642.28	119.99	120.00	120.00	0.00	17.282	7.76	0.10	0	0.000	27.24
67960.00	642.88	119.58	120.00	120.00	0.00	17.282	7.98	-0.60	0	0.000	27.21



Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
67980.00	643.49	118.27	120.00	120.00	0.00	17.282	8.67	-0.60	0	0.000	27.09
68000.00	644.10	116.95	120.00	120.00	0.00	17.282	9.37	-0.60	0	0.000	26.97
68020.00	644.72	115.61	120.00	120.00	0.00	17.282	10.06	-0.60	0	0.000	26.85
68040.00	645.34	114.26	120.00	120.00	0.00	17.282	10.76	-0.60	0	0.000	26.73
68060.00	645.98	112.89	120.00	120.00	0.00	17.282	11.46	-0.60	0	0.000	26.61
68080.00	646.62	111.50	120.00	120.00	8436.40	17.282	12.08	-0.60	0	0.114	26.57
68100.00	647.27	110.10	120.00	120.00	2448.65	17.282	12.59	-0.60	0	0.382	26.63
68120.00	647.93	108.67	120.00	120.00	2300.00	17.282	13.25	-0.60	0	0.396	26.53
68140.00	648.59	107.23	120.00	120.00	2300.00	17.282	13.90	-0.60	0	0.386	26.41
68160.00	649.27	105.77	120.00	120.00	1995.18	17.282	14.49	-0.60	0	0.433	26.33
68180.00	649.96	104.29	120.00	120.00	1191.98	17.282	14.93	-0.60	0	0.704	26.42
68200.00	650.65	102.79	120.00	120.00	849.85	17.282	15.41	-0.60	0	0.959	26.51
68220.00	651.36	101.26	120.00	120.00	660.32	17.282	15.97	-0.60	0	1.198	26.61
68240.00	652.07	100.00	100.00	120.00	560.00	17.282	16.52	0.00	0	1.378	26.68
68260.00	652.79	99.87	100.00	120.00	560.00	17.282	16.60	-0.60	0	1.374	26.67
68280.00	653.52	98.30	100.00	120.00	560.00	17.282	17.62	-0.60	0	1.331	26.55
68300.00	654.26	96.71	100.00	120.00	650.80	14.635	20.96	-0.60	0	1.109	24.24
68320.00	655.01	95.08	100.00	120.00	861.59	10.825	25.49	-0.60	0	0.810	20.86
68340.00	655.77	93.43	100.00	120.00	1274.37	7.016	30.02	-0.60	0	0.529	17.52
68360.00	656.55	91.75	100.00	120.00	2446.43	3.206	34.57	-0.60	0	0.266	14.20
68380.00	657.34	90.04	100.00	120.00	30469.66	0.000	38.68	-0.60	0	0.021	11.29
68400.00	658.15	88.30	100.00	120.00	0.00	0.000	39.92	-0.60	0	0.000	11.15
68420.00	658.97	86.52	120.00	120.00	0.00	0.000	41.13	-0.60	0	0.000	11.03
68440.00	659.82	84.70	120.00	120.00	0.00	0.000	42.31	-0.60	0	0.000	10.91
68460.00	660.67	82.84	120.00	120.00	0.00	-1.379	44.50	-0.60	0	0.000	9.75
68480.00	661.55	80.94	120.00	120.00	34192.10	-6.085	49.35	-0.60	0	0.015	5.95
68500.00	662.45	79.00	120.00	120.00	5212.46	-10.791	54.18	-0.60	0	0.092	2.21
68520.00	663.38	77.00	120.00	120.00	4100.00	-15.497	59.06	-0.60	0	0.112	-1.56
68540.00	664.32	74.96	120.00	120.00	4100.00	-17.006	61.58	-0.60	0	0.106	-2.88
68560.00	665.30	72.85	120.00	120.00	4100.00	-17.006	63.04	-0.60	0	0.100	-3.00
68580.00	666.30	70.68	120.00	120.00	4100.00	-17.006	64.65	-0.60	0	0.094	-3.12
68600.00	667.34	68.45	120.00	120.00	4100.00	-17.006	66.49	-0.60	0	0.088	-3.24
68620.00	668.41	66.14	120.00	120.00	4278.58	-17.006	68.66	-0.60	0	0.079	-3.36
68640.00	669.52	63.74	120.00	120.00	14060.55	-17.006	71.39	-0.60	0	0.022	-3.58
68660.00	670.67	61.25	120.00	120.00	0.00	-17.006	74.38	-0.60	0	0.000	-3.75

Istram 22.04.04.22 14/09/23 13:54:27 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68901.091  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
68680.00	671.87	58.66	120.00	120.00	0.00	-17.006	77.67	-0.60	0	0.000	-3.87
68700.00	673.13	55.94	120.00	120.00	0.00	-17.006	81.38	-0.60	0	0.000	-3.99
68720.00	674.45	53.09	120.00	120.00	0.00	-17.006	85.67	-0.60	0	0.000	-4.11
68740.00	675.84	50.07	120.00	120.00	0.00	-13.425	87.86	-0.60	0	0.000	-1.43
68760.00	677.33	46.86	120.00	120.00	0.00	-8.162	89.87	-0.60	0	0.000	2.58
68780.00	678.92	43.41	120.00	120.00	0.00	-2.898	93.54	-0.60	0	0.000	6.59
68800.00	680.66	39.67	120.00	120.00	0.00	0.008	101.24	-0.60	0	0.000	8.76
68820.00	682.57	35.53	120.00	120.00	0.00	0.008	101.36	-0.60	0	0.000	8.64
68840.00	684.74	30.84	120.00	120.00	0.00	0.008	101.48	-0.60	0	0.000	8.52
68860.00	687.31	25.29	120.00	120.00	0.00	0.008	101.60	-0.60	0	0.000	8.40
68880.00	690.62	18.12	120.00	120.00	0.00	0.008	101.72	-0.60	0	0.000	8.28
68890.00	692.93	13.14	120.00	120.00	0.00	0.008	101.78	-0.59	0	0.000	8.22
68900.00	697.12	4.05	120.00	120.00	0.00	0.008	101.84	-0.52	0	0.000	8.16
68901.09	698.66	2.16	120.00	-0.00	0.00	0.008	101.85	0.00	0	0.000	8.15
68901.09	698.67	1.44	120.00	-0.00	0.00	0.008	101.85	-59.97	0	0.000	8.15

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
68901.09	0.00	0.00	120.00	-0.00	0.00	-0.008	0.00	0.00	-0	0.000	0.00
68901.09	3.61	0.00	120.00	-0.00	0.00	-0.008	101.86	0.00	-0	0.000	8.14
68890.00	9.71	18.57	120.00	120.00	0.00	-0.008	101.73	1.20	-0	0.000	8.27
68880.00	11.34	25.61	120.00	120.00	0.00	-0.008	101.60	1.20	-0	0.000	8.40
68860.00	13.69	35.75	120.00	120.00	0.00	-0.008	101.36	1.20	-0	0.000	8.64
68840.00	15.51	43.54	120.00	120.00	0.00	-0.008	91.02	1.14	-0	0.000	8.88
68820.00	17.05	49.41	120.00	120.00	0.00	-0.008	78.59	0.98	-0	0.000	9.09
68800.00	18.44	54.07	120.00	120.00	0.00	-0.008	70.83	0.89	-0	0.000	9.27
68780.00	19.73	57.97	120.00	120.00	0.00	2.898	63.00	0.79	-0	0.000	11.71
68760.00	20.93	61.16	120.00	120.00	0.00	8.162	54.79	0.68	-0	0.000	15.97
68740.00	22.09	63.81	120.00	120.00	0.00	13.425	47.50	0.59	-0	0.000	20.25
68720.00	23.20	66.03	120.00	120.00	0.00	17.006	42.27	0.53	-0	0.000	23.18
68700.00	24.27	68.02	120.00	120.00	0.00	17.006	40.34	0.50	-0	0.000	23.28
68680.00	25.31	69.88	120.00	120.00	0.00	17.006	38.74	0.48	-0	0.000	23.38
68660.00	26.33	71.62	120.00	120.00	0.00	17.006	37.40	0.47	-0	0.000	23.47
68640.00	27.32	73.27	120.00	120.00	14060.55	17.006	36.17	0.45	-0	0.029	23.61
68620.00	28.30	74.82	120.00	120.00	4278.58	17.006	35.00	0.44	-0	0.101	23.80
68600.00	29.25	76.30	120.00	120.00	4100.00	17.006	34.03	0.43	-0	0.110	23.89
68580.00	30.18	77.72	120.00	120.00	4100.00	17.006	33.14	0.41	-0	0.114	23.98
68560.00	31.10	79.07	120.00	120.00	4100.00	17.006	32.30	0.40	-0	0.118	24.06
68540.00	32.01	80.36	120.00	120.00	4100.00	17.006	31.50	0.39	-0	0.122	24.14
68520.00	32.90	81.62	120.00	120.00	4100.00	15.497	31.88	0.40	-0	0.125	23.07
68500.00	33.77	82.93	120.00	120.00	5212.46	10.791	34.81	0.44	-0	0.102	19.41
68480.00	34.63	84.33	120.00	120.00	34192.10	6.085	37.74	0.47	-0	0.016	15.69
68460.00	35.48	85.82	120.00	120.00	0.00	1.379	40.48	0.51	-0	0.000	12.10
68440.00	36.31	87.36	120.00	120.00	0.00	-0.000	40.59	0.51	-0	0.000	11.09
68420.00	37.13	88.83	120.00	120.00	0.00	-0.000	39.57	0.49	-0	0.000	11.19
68400.00	37.93	90.24	120.00	120.00	0.00	-0.000	38.55	0.48	-0	0.000	11.28
68380.00	38.72	91.60	100.00	120.00	30469.66	-0.000	37.49	0.47	-0	0.021	11.40
68360.00	39.50	92.93	100.00	120.00	2446.43	-3.206	38.71	0.48	-0	0.272	9.22
68340.00	40.27	94.30	100.00	120.00	1274.37	-7.016	40.34	0.50	-0	0.538	6.59
68320.00	41.03	95.70	100.00	120.00	861.59	-10.825	41.98	0.52	-0	0.820	3.93
68300.00	41.78	97.14	100.00	120.00	650.80	-14.635	43.64	0.55	-0	1.119	1.28
68280.00	42.51	98.61	100.00	120.00	560.00	-17.282	44.55	0.56	-0	1.340	-0.55
68260.00	43.24	100.00	100.00	120.00	560.00	-17.282	43.64	0.00	-0	1.378	-0.44

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
68240.00	43.96	100.00	100.00	120.00	560.00	-17.282	43.64	0.00	-0	1.378	-0.44
68220.00	44.67	101.11	113.30	120.00	660.32	-17.282	43.19	0.54	-0	1.195	-0.53
68200.00	45.38	102.47	120.00	120.00	849.85	-17.282	42.70	0.53	-0	0.953	-0.63
68180.00	46.08	103.81	120.00	120.00	1191.98	-17.282	42.28	0.53	-0	0.698	-0.74
68160.00	46.77	105.11	120.00	120.00	1995.18	-17.282	41.91	0.52	-0	0.427	-0.85
68140.00	47.45	106.39	120.00	120.00	2300.00	-17.282	41.39	0.52	-0	0.380	-0.79
68120.00	48.12	107.64	120.00	120.00	2300.00	-17.282	40.85	0.51	-0	0.389	-0.69
68100.00	48.79	108.85	120.00	120.00	2448.65	-17.282	40.32	0.50	-0	0.373	-0.60
68080.00	49.45	110.04	120.00	120.00	8436.40	-17.282	39.94	0.50	-0	0.111	-0.68
68060.00	50.10	111.20	120.00	120.00	0.00	-17.282	39.43	0.49	-0	0.000	-0.66
68040.00	50.74	112.34	120.00	120.00	0.00	-17.282	38.87	0.49	-0	0.000	-0.56
68020.00	51.38	113.44	120.00	120.00	0.00	-17.282	38.31	0.48	-0	0.000	-0.47
68000.00	52.01	114.53	120.00	120.00	0.00	-17.282	37.75	0.47	-0	0.000	-0.37
67980.00	52.64	115.58	120.00	120.00	0.00	-17.282	37.21	0.47	-0	0.000	-0.28
67960.00	53.26	116.61	120.00	120.00	0.00	-17.282	36.67	0.46	-0	0.000	-0.19
67940.00	53.87	117.62	120.00	120.00	0.00	-17.282	36.15	0.45	-0	0.000	-0.10
67920.00	54.48	118.57	120.00	120.00	-16568.06	-13.797	32.93	0.41	-0	0.065	2.71
67900.00	55.09	119.42	120.00	120.00	-13996.00	-9.876	29.36	0.37	-0	0.079	5.90
67880.00	55.69	120.00	120.00	120.00	-13996.00	-5.954	25.95	0.11	-0	0.079	9.05
67860.00	56.29	119.99	120.00	120.00	-13996.00	-2.032	22.87	0.15	-0	0.079	12.13
67840.00	56.89	119.99	120.00	120.00	-28412.52	1.889	19.82	0.19	-0	0.039	15.19
67820.00	57.49	119.99	120.00	120.00	0.00	5.811	16.76	0.21	-0	0.000	18.24
67800.00	58.09	119.99	120.00	120.00	0.00	9.732	13.68	0.17	-0	0.000	21.32
67780.00	58.69	119.99	120.00	120.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67760.00	59.29	119.99	120.00	120.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67740.00	59.89	119.99	120.00	120.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67720.00	60.49	119.99	120.00	120.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67700.00	61.09	119.99	120.00	120.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67680.00	61.69	119.99	120.00	120.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67660.00	62.29	119.99	120.00	120.00	0.00	11.213	12.52	0.16	0	0.000	22.48
67640.00	62.89	119.99	120.00	120.00	-22877.77	11.213	12.49	0.16	-9	-0.003	22.51
67620.00	63.49	119.99	120.00	120.00	-4103.23	11.213	12.37	0.15	-51	-0.016	22.64
67600.00	64.09	119.99	120.00	120.00	-2500.00	11.213	12.27	0.15	-83	-0.025	22.73
67580.00	64.69	119.99	120.00	120.00	-2500.00	11.213	12.27	0.15	-83	-0.025	22.73
67560.00	65.29	119.99	120.00	120.00	-2500.00	11.213	12.27	0.15	-83	-0.025	22.73

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
67540.00	65.89	119.99	120.00	120.00	-2924.91	11.213	12.31	0.15	-71	-0.022	22.70
67520.00	66.49	119.99	120.00	120.00	-7047.70	9.567	13.72	0.17	-29	-0.009	21.28
67500.00	67.09	119.99	120.00	120.00	14111.24	7.710	15.23	0.19	13	0.005	19.78
67480.00	67.69	119.99	120.00	120.00	3176.94	5.854	16.53	0.21	58	0.021	18.47
67460.00	68.29	119.99	120.00	120.00	2050.00	3.997	17.88	0.21	90	0.032	17.13
67440.00	68.89	119.99	120.00	120.00	2050.00	2.140	19.34	0.20	90	0.032	15.67
67420.00	69.49	119.99	120.00	120.00	2050.00	1.000	20.23	0.18	90	0.032	14.77
67400.00	70.09	119.99	120.00	120.00	2050.00	1.000	20.23	0.18	90	0.032	14.77
67380.00	70.69	119.99	120.00	120.00	2254.00	1.000	20.26	0.18	82	0.030	14.75
67360.00	71.29	119.99	120.00	120.00	5006.18	1.000	20.41	0.18	37	0.013	14.59
67340.00	71.89	119.99	120.00	120.00	0.00	1.000	20.54	0.18	0	0.000	14.47
67320.00	72.49	119.99	120.00	120.00	0.00	1.000	20.54	0.18	0	0.000	14.47
67300.00	73.09	119.99	120.00	120.00	0.00	1.000	20.54	0.18	0	0.000	14.47
67280.00	73.69	119.99	120.00	120.00	-16830.73	2.886	19.02	0.20	-17	-0.028	15.98
67260.00	74.29	120.00	120.00	120.00	-5422.55	5.108	-17.81	-0.22	-52	-0.087	17.81
67240.00	74.89	120.00	120.00	120.00	-3231.90	7.330	15.37	0.05	-87	-0.147	19.63
67220.00	75.49	120.00	120.00	120.00	-2301.95	9.552	13.55	0.10	-122	-0.206	21.45
67200.00	76.09	119.99	120.00	120.00	-2000.00	11.775	11.77	0.14	-140	-0.237	23.24
67180.00	76.69	120.00	120.00	120.00	-2000.00	13.997	-24.98	-0.31	-140	-0.237	24.98
67160.00	77.29	120.00	120.00	120.00	-2000.00	16.000	-26.55	-0.33	-140	-0.237	26.55
67140.00	77.89	120.00	120.00	120.00	-2000.00	16.000	8.45	0.02	-140	-0.237	26.55
67120.00	78.49	120.00	120.00	120.00	-2000.00	16.000	8.45	0.02	-140	-0.237	26.55
67100.00	79.09	120.00	120.00	120.00	-2000.00	16.000	8.45	0.02	-140	-0.237	26.55
67080.00	79.69	120.00	120.00	120.00	-2000.00	16.000	8.45	0.02	-140	-0.237	26.55
67060.00	80.29	120.00	120.00	120.00	-2000.00	16.000	8.45	0.02	-140	-0.237	26.55
67040.00	80.89	120.00	120.00	120.00	-2000.00	16.000	8.45	0.02	-140	-0.237	26.55
67020.00	81.49	120.00	120.00	120.00	-2000.00	16.000	8.45	0.02	-140	-0.237	26.55
67000.00	82.09	120.00	120.00	120.00	-2000.00	15.651	8.72	0.00	-140	-0.237	26.28
66980.00	82.69	120.00	120.00	120.00	-2000.00	14.451	9.66	0.08	-140	-0.237	25.34
66960.00	83.29	120.00	120.00	120.00	-2000.00	13.251	10.60	0.04	-140	-0.237	24.40
66940.00	83.89	120.00	120.00	120.00	-2000.00	12.051	11.55	0.01	-140	-0.237	23.45
66920.00	84.49	120.00	120.00	120.00	-2000.00	11.200	-22.79	-0.28	-140	-0.237	22.79
66900.00	85.09	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66880.00	85.69	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66860.00	86.29	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
66840.00	86.89	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66820.00	87.49	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66800.00	88.09	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66780.00	88.69	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66760.00	89.29	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66740.00	89.89	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66720.00	90.49	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66700.00	91.09	120.00	120.00	120.00	-2000.00	11.200	12.22	0.13	-140	-0.237	22.79
66680.00	91.69	120.00	120.00	120.00	-2254.44	11.200	12.25	0.13	-124	-0.210	22.75
66660.00	92.29	120.00	120.00	120.00	-3139.03	11.200	12.33	0.13	-89	-0.151	22.67
66640.00	92.89	120.00	120.00	120.00	-5166.09	11.200	12.41	0.13	-54	-0.092	22.59
66620.00	93.49	120.00	120.00	120.00	-14583.65	11.200	12.49	0.13	-19	-0.033	22.52
66600.00	94.09	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66580.00	94.69	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66560.00	95.29	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66540.00	95.89	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66520.00	96.49	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66500.00	97.09	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66480.00	97.69	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66460.00	98.29	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66440.00	98.89	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66420.00	99.49	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66400.00	100.09	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66380.00	100.69	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66360.00	101.29	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66340.00	101.89	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66320.00	102.49	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66300.00	103.09	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66280.00	103.69	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66260.00	104.29	120.00	120.00	120.00	0.00	11.200	12.53	0.12	0	0.000	22.47
66240.00	104.89	120.00	120.00	120.00	0.00	10.037	13.44	0.10	0	0.000	21.56
66220.00	105.49	120.00	120.00	120.00	0.00	8.397	14.73	0.07	0	0.000	20.27
66200.00	106.09	120.00	120.00	120.00	0.00	6.757	16.01	0.04	0	0.000	18.99
66180.00	106.69	120.00	120.00	120.00	0.00	5.117	17.30	0.01	0	0.000	17.70
66160.00	107.29	120.00	120.00	120.00	0.00	3.477	-16.41	-0.21	0	0.000	16.41



Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
66140.00	107.89	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
66120.00	108.49	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
66100.00	109.09	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
66080.00	109.69	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
66060.00	110.29	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
66040.00	110.89	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
66020.00	111.49	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
66000.00	112.09	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65980.00	112.69	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65960.00	113.29	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65940.00	113.89	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65920.00	114.49	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65900.00	115.09	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65880.00	115.69	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65860.00	116.29	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
65840.00	116.89	119.99	120.00	120.00	32136.97	3.000	18.95	0.20	3	0.017	16.06
65820.00	117.49	119.99	120.00	120.00	4232.89	3.487	18.44	0.21	23	0.132	16.57
65800.00	118.09	120.00	120.00	120.00	2265.66	5.153	-18.00	-0.23	43	0.247	18.00
65780.00	118.69	120.00	120.00	120.00	1546.79	6.820	15.56	0.05	63	0.361	19.44
65760.00	119.29	120.00	120.00	120.00	1174.22	8.487	14.12	0.08	83	0.476	20.88
65740.00	119.89	120.00	120.00	120.00	975.00	10.153	12.71	0.12	100	0.573	22.29
65720.00	120.49	120.00	120.00	120.00	975.00	11.820	11.40	0.01	100	0.574	23.60
65700.00	121.09	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65680.00	121.69	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65660.00	122.29	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65640.00	122.89	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65620.00	123.49	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65600.00	124.09	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65580.00	124.69	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65560.00	125.29	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65540.00	125.89	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65520.00	126.49	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65500.00	127.09	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65480.00	127.69	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65460.00	128.29	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
65440.00	128.89	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65420.00	129.49	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65400.00	130.09	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65380.00	130.69	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65360.00	131.29	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65340.00	131.89	120.00	120.00	120.00	975.00	13.000	10.47	0.04	100	0.574	24.53
65320.00	132.49	120.00	120.00	120.00	1006.64	13.000	10.49	0.04	97	0.555	24.51
65300.00	133.09	120.00	120.00	120.00	1268.60	13.000	10.62	0.04	77	0.441	24.38
65280.00	133.69	120.00	120.00	120.00	1714.84	13.000	10.75	0.03	57	0.326	24.25
65260.00	134.29	120.00	120.00	120.00	2645.39	13.000	10.88	0.03	37	0.211	24.12
65240.00	134.89	120.00	120.00	120.00	5784.08	13.000	11.01	0.02	17	0.097	23.99
65220.00	135.49	120.00	120.00	120.00	-107527.16	13.000	11.11	0.02	-4	-0.010	23.89
65200.00	136.09	120.00	120.00	120.00	-14604.60	13.000	11.07	0.02	-27	-0.075	23.93
65180.00	136.69	120.00	120.00	120.00	-7834.34	12.017	-23.19	-0.29	-50	-0.140	23.19
65160.00	137.29	120.00	120.00	120.00	-5352.90	10.043	13.32	0.11	-73	-0.205	21.68
65140.00	137.89	120.00	120.00	120.00	-4065.27	8.068	14.83	0.07	-96	-0.270	20.17
65120.00	138.49	120.00	120.00	120.00	-3276.99	6.094	16.34	0.03	-119	-0.335	18.66
65100.00	139.09	120.00	120.00	120.00	-2744.77	4.119	-17.14	-0.21	-142	-0.400	17.14
65080.00	139.69	119.99	120.00	120.00	-2600.00	2.145	19.40	0.20	-150	-0.422	15.61
65060.00	140.29	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
65040.00	140.89	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
65020.00	141.49	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
65000.00	142.09	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
64980.00	142.69	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
64960.00	143.29	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
64940.00	143.89	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
64920.00	144.49	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
64900.00	145.09	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
64880.00	145.69	119.99	120.00	120.00	-2600.00	1.153	20.17	0.19	-150	-0.422	14.83
64860.00	146.29	119.99	120.00	120.00	-2726.16	1.153	20.19	0.19	-143	-0.402	14.82
64840.00	146.89	119.99	120.00	120.00	-3250.50	1.153	20.22	0.18	-120	-0.337	14.78
64820.00	147.49	119.99	120.00	120.00	-4024.57	1.153	20.26	0.18	-97	-0.272	14.74
64800.00	148.09	119.99	120.00	120.00	-5282.57	1.153	20.30	0.18	-74	-0.208	14.71
64780.00	148.69	119.99	120.00	120.00	-7684.60	1.153	20.33	0.18	-51	-0.143	14.67
64760.00	149.29	119.99	120.00	120.00	-14092.70	1.153	20.37	0.18	-28	-0.078	14.63

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
64740.00	149.89	119.99	120.00	120.00	-84838.19	1.153	20.41	0.18	-5	-0.013	14.59
64720.00	150.49	119.99	120.00	120.00	0.00	1.153	20.42	0.18	0	0.000	14.59
64700.00	151.09	119.99	120.00	120.00	0.00	1.153	20.42	0.18	0	0.000	14.59
64680.00	151.69	119.99	120.00	120.00	0.00	1.153	20.42	0.18	0	0.000	14.59
64660.00	152.29	119.99	120.00	120.00	0.00	1.153	20.42	0.18	0	0.000	14.59
64640.00	152.89	119.99	120.00	120.00	0.00	1.153	20.42	0.18	0	0.000	14.59
64620.00	153.49	119.99	120.00	120.00	0.00	1.153	20.42	0.18	0	0.000	14.59
64600.00	154.09	119.99	120.00	120.00	0.00	2.961	19.00	0.20	0	0.000	16.01
64580.00	154.69	120.00	120.00	120.00	0.00	5.269	-17.82	-0.22	0	0.000	17.82
64560.00	155.29	120.00	120.00	120.00	0.00	7.577	15.37	0.05	0	0.000	19.63
64540.00	155.89	120.00	120.00	120.00	0.00	9.885	13.56	0.10	0	0.000	21.44
64520.00	156.49	119.99	120.00	120.00	0.00	12.192	11.75	0.14	0	0.000	23.25
64500.00	157.09	120.00	120.00	120.00	0.00	14.500	-25.06	-0.31	0	0.000	25.06
64480.00	157.69	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
64460.00	158.29	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
64440.00	158.89	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
64420.00	159.49	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
64400.00	160.09	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
64380.00	160.69	120.00	120.00	120.00	-3888.19	15.000	9.39	0.09	-22	0.163	25.62
64360.00	161.29	120.00	120.00	120.00	-1928.17	15.000	9.22	0.09	-44	0.329	25.78
64340.00	161.89	120.00	120.00	120.00	-1281.94	15.000	9.06	0.10	-66	0.495	25.94
64320.00	162.49	120.00	120.00	120.00	-960.15	15.000	8.89	0.10	-88	0.661	26.11
64300.00	163.09	119.99	120.00	120.00	-767.49	15.000	8.73	0.11	-110	0.827	26.27
64280.00	163.69	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64260.00	164.29	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64240.00	164.89	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64220.00	165.49	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64200.00	166.09	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64180.00	166.69	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64160.00	167.29	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64140.00	167.89	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64120.00	168.49	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64100.00	169.09	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64080.00	169.69	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64060.00	170.29	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
64040.00	170.89	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64020.00	171.49	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
64000.00	172.09	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
63980.00	172.69	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
63960.00	173.29	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
63940.00	173.89	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
63920.00	174.49	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
63900.00	175.09	119.99	120.00	120.00	-765.00	15.000	8.73	0.11	-110	0.830	26.27
63880.00	175.69	120.00	120.00	120.00	-950.26	15.000	8.89	0.10	-89	0.668	26.12
63860.00	176.29	120.00	120.00	120.00	-1264.38	15.000	9.05	0.10	-67	0.502	25.95
63840.00	176.89	120.00	120.00	120.00	-1888.69	15.000	9.21	0.09	-45	0.336	25.79
63820.00	177.49	120.00	120.00	120.00	-3730.95	15.000	9.38	0.09	-23	0.170	25.62
63800.00	178.09	120.00	120.00	120.00	-151731.84	15.000	9.54	0.08	-1	0.004	25.46
63780.00	178.69	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63760.00	179.29	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63740.00	179.89	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63720.00	180.49	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63700.00	181.09	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63680.00	181.69	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63660.00	182.29	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63640.00	182.89	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63620.00	183.49	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63600.00	184.09	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63580.00	184.69	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63560.00	185.29	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
63540.00	185.89	120.00	120.00	120.00	0.00	14.599	9.86	0.07	0	0.000	25.14
63520.00	186.49	120.00	120.00	120.00	0.00	12.199	-23.26	-0.29	0	0.000	23.26
63500.00	187.09	120.00	120.00	120.00	0.00	9.799	13.63	0.10	0	0.000	21.37
63480.00	187.69	120.00	120.00	120.00	0.00	7.399	15.51	0.05	0	0.000	19.49
63460.00	188.29	120.00	120.00	120.00	0.00	4.999	17.39	0.00	0	0.000	17.61
63440.00	188.89	120.00	120.00	120.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
63420.00	189.49	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63400.00	190.09	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63380.00	190.69	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63360.00	191.29	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
63340.00	191.89	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63320.00	192.49	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63300.00	193.09	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63280.00	193.69	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63260.00	194.29	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63240.00	194.89	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63220.00	195.49	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63200.00	196.09	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63180.00	196.69	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63160.00	197.29	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63140.00	197.89	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63120.00	198.49	119.99	120.00	120.00	0.00	3.000	18.97	0.20	0	0.000	16.04
63100.00	199.09	119.99	120.00	120.00	0.00	5.235	17.21	0.22	0	0.000	17.79
63080.00	199.69	119.99	120.00	120.00	0.00	8.110	14.96	0.19	0	0.000	20.05
63060.00	200.29	119.99	120.00	120.00	0.00	10.985	12.70	0.16	0	0.000	22.30
63040.00	200.89	120.00	120.00	120.00	0.00	13.860	10.44	0.04	0	0.000	24.56
63020.00	201.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
63000.00	202.09	120.00	120.00	120.00	6079.16	14.500	9.84	0.07	11	0.122	25.17
62980.00	202.69	120.00	120.00	120.00	2261.04	14.500	9.66	0.07	29	0.329	25.34
62960.00	203.29	120.00	120.00	120.00	1388.79	14.500	9.49	0.08	47	0.536	25.51
62940.00	203.89	120.00	120.00	120.00	1002.18	14.500	9.31	0.09	65	0.743	25.69
62920.00	204.49	120.00	120.00	120.00	783.94	14.500	9.14	0.09	83	0.949	25.86
62900.00	205.09	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62880.00	205.69	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62860.00	206.29	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62840.00	206.89	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62820.00	207.49	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62800.00	208.09	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62780.00	208.69	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62760.00	209.29	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62740.00	209.89	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62720.00	210.49	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62700.00	211.09	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62680.00	211.69	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62660.00	212.29	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
62640.00	212.89	120.00	120.00	120.00	720.00	14.500	9.07	0.10	90	1.034	25.93
62620.00	213.49	120.00	120.00	120.00	720.70	14.500	9.07	0.10	90	1.033	25.93
62600.00	214.09	120.00	120.00	120.00	901.10	14.500	9.24	0.09	72	0.826	25.76
62580.00	214.69	120.00	120.00	120.00	1201.95	14.500	9.42	0.08	54	0.619	25.58
62560.00	215.29	120.00	120.00	120.00	1804.40	14.500	9.59	0.08	36	0.412	25.41
62540.00	215.89	120.00	120.00	120.00	3617.62	14.500	9.77	0.07	18	0.206	25.24
62520.00	216.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62500.00	217.09	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62480.00	217.69	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62460.00	218.29	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62440.00	218.89	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62420.00	219.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62400.00	220.09	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62380.00	220.69	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62360.00	221.29	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62340.00	221.89	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62320.00	222.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62300.00	223.09	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62280.00	223.69	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62260.00	224.29	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62240.00	224.89	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62220.00	225.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62200.00	226.09	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62180.00	226.69	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62160.00	227.29	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62140.00	227.89	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62120.00	228.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62100.00	229.09	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62080.00	229.69	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62060.00	230.29	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62040.00	230.89	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62020.00	231.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
62000.00	232.09	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
61980.00	232.69	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
61960.00	233.29	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06



Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
61940.00	233.89	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
61920.00	234.49	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
61900.00	235.09	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
61880.00	235.69	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
61860.00	236.29	120.00	120.00	120.00	0.00	14.500	9.94	0.06	0	0.000	25.06
61840.00	236.89	120.00	120.00	120.00	0.00	14.113	10.24	0.06	0	0.000	24.76
61820.00	237.49	119.99	120.00	120.00	0.00	11.413	12.37	0.15	0	0.000	22.64
61800.00	238.09	119.99	120.00	120.00	0.00	8.713	14.48	0.18	0	0.000	20.52
61780.00	238.69	119.99	120.00	120.00	35926.74	6.013	16.58	0.21	2	0.020	18.42
61760.00	239.29	119.99	120.00	120.00	3272.12	3.313	18.53	0.21	22	0.215	16.47
61740.00	239.89	119.99	120.00	120.00	1714.12	1.000	20.17	0.19	42	0.410	14.83
61720.00	240.49	119.99	120.00	120.00	1161.21	1.000	20.00	0.19	62	0.606	15.01
61700.00	241.09	119.99	120.00	120.00	878.01	1.000	19.82	0.19	82	0.801	15.18
61680.00	241.69	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61660.00	242.29	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61640.00	242.89	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61620.00	243.49	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61600.00	244.09	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61580.00	244.69	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61560.00	245.29	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61540.00	245.89	119.99	120.00	120.00	720.00	1.000	19.66	0.19	100	0.977	15.34
61520.00	246.49	119.99	120.00	120.00	720.00	3.025	18.08	0.21	100	0.977	16.93
61500.00	247.09	119.99	120.00	120.00	720.00	5.825	15.88	0.20	100	0.977	19.13
61480.00	247.69	119.99	120.00	120.00	720.00	8.625	13.68	0.17	100	0.977	21.32
61460.00	248.29	119.99	120.00	120.00	816.68	11.425	11.59	0.14	88	0.861	23.42
61440.00	248.89	119.99	120.00	120.00	1056.31	14.225	9.57	0.12	68	0.666	25.44
61420.00	249.49	119.99	120.00	120.00	1494.96	15.000	9.13	0.11	48	0.470	25.87
61400.00	250.09	119.99	120.00	120.00	2556.66	15.000	9.31	0.12	28	0.275	25.70
61380.00	250.69	119.99	120.00	120.00	8821.62	15.000	9.48	0.12	8	0.080	25.53
61360.00	251.29	119.99	120.00	120.00	-6081.99	15.000	9.45	0.12	-12	0.116	25.56
61340.00	251.89	119.99	120.00	120.00	-2261.43	15.000	9.27	0.12	-32	0.311	25.73
61320.00	252.49	119.99	120.00	120.00	-1388.94	15.000	9.10	0.11	-52	0.506	25.91
61300.00	253.09	119.99	120.00	120.00	-1002.25	15.000	8.92	0.11	-72	0.702	26.08
61280.00	253.69	119.99	120.00	120.00	-783.99	15.000	8.75	0.11	-92	0.897	26.25
61260.00	254.29	119.99	120.00	120.00	-720.00	15.000	8.68	0.11	-100	0.977	26.33

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
61240.00	254.89	119.99	120.00	120.00	-720.00	15.000	8.68	0.11	-100	0.977	26.33
61220.00	255.49	119.99	120.00	120.00	-720.00	15.000	8.68	0.11	-100	0.977	26.33
61200.00	256.09	119.99	120.00	120.00	-720.00	15.000	8.68	0.11	-100	0.977	26.33
61180.00	256.69	119.99	120.00	120.00	-720.00	15.000	8.68	0.11	-100	0.977	26.33
61160.00	257.29	119.99	120.00	120.00	-720.00	15.000	8.68	0.11	-100	0.977	26.33
61140.00	257.89	120.00	120.00	120.00	-830.12	15.000	-26.21	-0.33	-87	0.848	26.21
61120.00	258.49	120.00	120.00	120.00	-1078.91	15.000	8.97	0.10	-67	0.652	26.04
61100.00	259.09	120.00	120.00	120.00	-1540.63	15.000	9.14	0.09	-47	0.457	25.86
61080.00	259.69	120.00	120.00	120.00	-2693.18	15.000	9.31	0.09	-27	0.261	25.69
61060.00	260.29	120.00	120.00	120.00	-10691.74	15.000	9.49	0.08	-7	0.066	25.51
61040.00	260.89	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
61020.00	261.49	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
61000.00	262.09	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60980.00	262.69	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60960.00	263.29	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60940.00	263.89	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60920.00	264.49	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60900.00	265.09	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60880.00	265.69	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60860.00	266.29	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60840.00	266.89	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60820.00	267.49	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60800.00	268.09	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60780.00	268.69	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60760.00	269.30	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60740.00	269.90	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60720.00	270.50	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60700.00	271.10	120.00	120.00	120.00	0.00	15.000	9.55	0.08	0	0.000	25.45
60680.00	271.70	120.00	120.00	120.00	-7152.02	15.000	9.46	0.08	-8	0.108	25.54
60660.00	272.30	120.00	120.00	120.00	-2101.04	15.000	9.25	0.09	-28	0.369	25.75
60640.00	272.90	120.00	120.00	120.00	-1231.39	15.000	9.04	0.10	-48	0.629	25.96
60620.00	273.50	120.00	120.00	120.00	-870.91	15.000	8.83	0.11	-68	0.889	26.18
60600.00	274.10	120.00	120.00	120.00	-673.69	15.000	8.61	0.01	-88	1.149	26.39
60580.00	274.70	120.00	120.00	120.00	-595.00	15.000	8.49	0.01	-100	1.301	26.51
60560.00	275.30	120.00	120.00	120.00	-595.00	15.000	8.49	0.01	-100	1.301	26.51

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
60540.00	275.90	120.00	120.00	120.00	-595.00	15.000	8.49	0.01	-100	1.301	26.51
60520.00	276.50	120.00	120.00	120.00	-595.00	15.000	8.49	0.01	-100	1.301	26.51
60500.00	277.10	120.00	120.00	120.00	-595.00	15.000	8.49	0.01	-100	1.301	26.51
60480.00	277.70	120.00	120.00	120.00	-595.00	15.000	8.49	0.01	-100	1.301	26.51
60460.00	278.30	120.00	120.00	120.00	-595.00	15.000	8.49	0.01	-100	1.301	26.51
60440.00	278.90	120.00	120.00	120.00	-595.00	14.980	8.51	0.01	-100	1.301	26.49
60420.00	279.50	119.99	120.00	120.00	-595.00	14.360	9.00	0.11	-100	1.301	26.01
60400.00	280.10	119.99	120.00	120.00	-595.00	13.740	9.48	0.12	-100	1.301	25.52
60380.00	280.70	119.99	120.00	120.00	-595.00	13.120	9.97	0.12	-100	1.301	25.03
60360.00	281.30	119.99	120.00	120.00	-595.00	12.500	10.46	0.13	-100	1.301	24.55
60340.00	281.90	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60320.00	282.50	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60300.00	283.10	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60280.00	283.70	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60260.00	284.30	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60240.00	284.90	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60220.00	285.50	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60200.00	286.10	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60180.00	286.70	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60160.00	287.30	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60140.00	287.90	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60120.00	288.50	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60100.00	289.10	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60080.00	289.70	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60060.00	290.30	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60040.00	290.90	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60020.00	291.50	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
60000.00	292.10	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
59980.00	292.70	119.99	120.00	120.00	-595.00	11.900	10.93	0.14	-100	1.301	24.08
59960.00	293.30	119.99	120.00	120.00	-630.53	11.900	10.99	0.14	-94	1.228	24.02
59940.00	293.90	119.99	120.00	120.00	-800.11	11.900	11.20	0.14	-74	0.967	23.81
59920.00	294.50	119.99	120.00	120.00	-1094.45	11.900	11.41	0.14	-54	0.707	23.59
59900.00	295.10	119.99	120.00	120.00	-1731.40	11.900	11.62	0.15	-34	0.447	23.38
59880.00	295.70	120.00	120.00	120.00	-4141.96	11.900	-23.17	-0.29	-14	0.187	23.17
59860.00	296.30	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
59840.00	296.90	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59820.00	297.50	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59800.00	298.10	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59780.00	298.70	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59760.00	299.30	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59740.00	299.90	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59720.00	300.50	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59700.00	301.10	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59680.00	301.70	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59660.00	302.30	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59640.00	302.90	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59620.00	303.50	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59600.00	304.10	119.99	120.00	120.00	-6455.87	11.900	11.88	0.14	-23	0.042	23.12
59580.00	304.70	119.99	120.00	120.00	-2530.76	11.900	11.73	0.14	-58	0.108	23.27
59560.00	305.30	120.00	120.00	120.00	-1573.87	11.900	-23.42	-0.29	-94	0.174	23.42
59540.00	305.90	120.00	120.00	120.00	-1142.05	11.900	11.43	0.01	-130	0.239	23.57
59520.00	306.50	120.00	120.00	120.00	-925.00	11.900	11.30	0.01	-160	0.295	23.70
59500.00	307.10	120.00	120.00	120.00	-925.00	11.900	11.30	0.01	-160	0.295	23.70
59480.00	307.70	120.00	120.00	120.00	-925.00	11.900	11.30	0.01	-160	0.295	23.70
59460.00	308.30	120.00	120.00	120.00	-925.00	11.900	11.30	0.01	-160	0.295	23.70
59440.00	308.90	120.00	120.00	120.00	-925.00	11.900	11.30	0.01	-160	0.295	23.70
59420.00	309.50	120.00	120.00	120.00	-925.00	11.900	11.30	0.01	-160	0.295	23.70
59400.00	310.10	120.00	120.00	120.00	-967.07	11.900	11.33	0.01	-153	0.283	23.67
59380.00	310.70	120.00	120.00	120.00	-1259.74	11.900	11.48	0.01	-117	0.217	23.52
59360.00	311.30	120.00	120.00	120.00	-1806.45	11.900	11.63	0.00	-82	0.151	23.37
59340.00	311.90	119.99	120.00	120.00	-3191.50	11.900	11.78	0.14	-46	0.086	23.22
59320.00	312.50	120.00	120.00	120.00	-13681.40	11.900	11.93	0.14	-11	0.020	23.07
59300.00	313.10	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59280.00	313.70	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59260.00	314.30	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59240.00	314.90	120.00	120.00	120.00	0.00	11.900	11.98	0.14	0	0.000	23.02
59220.00	315.50	119.64	120.00	120.00	0.00	11.900	12.17	-0.60	0	0.000	22.99
59200.00	316.10	118.33	120.00	120.00	19553.86	11.900	12.83	-0.60	8	0.007	22.90
59180.00	316.71	117.01	120.00	120.00	3950.06	11.900	13.40	-0.60	42	0.031	22.91
59160.00	317.33	115.67	120.00	120.00	2196.93	11.900	13.97	-0.60	75	0.045	22.92

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
59140.00	317.96	114.32	120.00	120.00	1521.60	11.900	14.54	-0.60	108	0.049	22.92
59120.00	318.59	112.95	120.00	120.00	1163.84	11.900	15.11	-0.60	142	0.043	22.93
59100.00	319.23	111.56	120.00	120.00	1100.00	11.900	15.78	-0.60	150	0.024	22.84
59080.00	319.88	110.16	120.00	120.00	1100.00	11.900	16.47	-0.60	150	0.002	22.73
59060.00	320.54	108.74	120.00	120.00	1100.00	11.900	17.15	-0.60	150	-0.020	22.61
59040.00	321.21	107.30	120.00	120.00	1100.00	11.900	17.79	-0.60	150	-0.042	22.49
59020.00	321.88	105.84	120.00	120.00	1100.00	11.900	18.43	-0.60	150	-0.063	22.37
59000.00	322.57	104.36	120.00	120.00	1100.00	11.900	19.08	-0.60	150	-0.085	22.25
58980.00	323.26	102.86	120.00	120.00	1100.00	11.900	19.77	-0.60	150	-0.107	22.13
58960.00	323.97	101.33	120.00	120.00	1144.79	11.900	20.56	-0.60	144	-0.124	21.99
58940.00	324.68	99.79	120.00	120.00	1489.19	11.900	21.57	-0.60	111	-0.111	21.74
58920.00	325.41	98.21	120.00	120.00	2130.00	11.900	22.72	-0.60	77	-0.089	21.50
58900.00	326.15	96.62	120.00	120.00	3738.83	11.900	24.00	-0.60	44	-0.057	21.25
58880.00	326.90	94.99	120.00	120.00	15280.41	11.900	25.41	-0.60	11	-0.016	21.00
58860.00	327.67	93.34	120.00	120.00	0.00	11.900	26.77	-0.60	0	0.000	20.84
58840.00	328.45	91.66	120.00	120.00	0.00	11.900	28.11	-0.60	0	0.000	20.72
58820.00	329.24	89.95	120.00	120.00	0.00	11.900	29.43	-0.60	0	0.000	20.60
58800.00	330.05	88.20	120.00	120.00	0.00	11.900	30.65	-0.60	0	0.000	20.49
58780.00	330.87	86.42	120.00	120.00	0.00	11.900	31.85	-0.60	0	0.000	20.37
58760.00	331.71	84.60	120.00	120.00	0.00	11.900	33.04	-0.60	0	0.000	20.25
58740.00	332.57	82.74	120.00	120.00	0.00	11.900	34.19	-0.60	0	0.000	20.13
58720.00	333.45	80.84	120.00	120.00	0.00	11.900	35.36	-0.60	0	0.000	20.01
58700.00	334.36	78.89	120.00	120.00	0.00	11.900	36.56	-0.60	0	0.000	19.89
58680.00	335.28	76.89	120.00	120.00	0.00	11.900	37.80	-0.60	0	0.000	19.77
58660.00	336.23	74.84	120.00	120.00	0.00	11.900	39.12	-0.60	0	0.000	19.65
58640.00	337.21	72.74	120.00	120.00	0.00	9.309	42.60	-0.60	0	0.000	17.51
58620.00	338.21	70.56	120.00	120.00	0.00	5.342	47.34	-0.60	0	0.000	14.28
58600.00	339.25	68.32	120.00	120.00	0.00	1.376	52.30	-0.60	0	0.000	11.05
58580.00	340.32	66.01	120.00	120.00	0.00	-0.000	55.62	-0.60	0	0.000	9.83
58560.00	341.43	63.61	120.00	120.00	0.00	-0.000	58.27	-0.60	0	0.000	9.71
58540.00	342.58	61.11	120.00	120.00	0.00	-0.000	61.20	-0.60	0	0.000	9.59
58520.00	343.79	58.51	120.00	120.00	0.00	-0.000	64.50	-0.60	0	0.000	9.47
58500.00	345.05	55.79	120.00	120.00	0.00	-0.000	68.23	-0.60	0	0.000	9.35
58480.00	346.37	52.93	120.00	120.00	0.00	-0.000	72.55	-0.60	0	0.000	9.23
58460.00	347.77	49.90	120.00	120.00	0.00	-0.000	77.61	-0.60	0	0.000	9.11

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
58440.00	349.26	46.68	120.00	120.00	0.00	-0.000	83.86	-0.60	0	0.000	8.99
58420.00	350.87	43.22	120.00	120.00	4020.90	-0.000	91.62	-0.60	30	-0.133	9.03
58400.00	352.61	39.45	120.00	120.00	1650.59	-0.000	100.87	-0.60	73	-0.339	9.13
58380.00	354.53	35.29	120.00	120.00	1038.44	-0.000	100.76	-0.60	116	-0.562	9.24
58360.00	356.72	30.56	120.00	120.00	800.00	-0.000	100.70	-0.60	150	-0.759	9.30
58340.00	359.32	24.95	120.00	120.00	800.00	-0.000	100.83	-0.60	150	-0.789	9.17
58320.00	362.70	17.65	120.00	120.00	800.00	-0.000	100.95	-0.59	150	-0.819	9.05
58310.00	365.09	12.47	120.00	120.00	800.00	-0.000	101.01	-0.59	150	-0.834	8.99
58300.00	370.52	0.00	120.00	0.00	800.00	-0.000	101.07	-59.97	150	-0.849	8.93
58300.00	430.52	0.00	120.00	0.00	800.00	-0.000	101.07	0.00	0	0.000	8.93
58290.00	436.40	17.64	120.00	120.00	800.00	-0.000	100.95	1.20	150	-0.819	9.05
58280.00	438.09	24.94	120.00	120.00	800.00	-0.000	100.83	1.20	150	-0.789	9.17
58260.00	440.48	35.27	120.00	120.00	800.00	-0.000	100.58	1.20	150	-0.729	9.42
58240.00	442.32	43.16	120.00	120.00	800.00	-0.000	91.22	1.14	150	-0.669	9.65
58220.00	443.88	49.07	120.00	120.00	800.00	-0.000	78.45	0.98	150	-0.617	9.86
58200.00	445.28	53.75	120.00	120.00	1117.50	-0.000	70.79	0.88	107	-0.408	9.83
58180.00	446.57	57.70	120.00	120.00	1859.72	-0.000	65.28	0.82	65	-0.227	9.77
58160.00	447.78	61.14	120.00	120.00	5537.96	-0.000	61.06	0.76	22	-0.071	9.71
58140.00	448.93	64.21	120.00	120.00	0.00	-0.000	57.60	0.72	0	0.000	9.74
58120.00	450.02	66.98	120.00	120.00	0.00	-0.000	54.65	0.68	0	0.000	9.88
58100.00	451.08	69.51	120.00	120.00	5000.00	-0.000	52.25	0.65	0	0.075	10.14
58080.00	452.10	71.86	120.00	120.00	5000.00	-0.000	50.43	0.63	0	0.080	10.27
58060.00	453.08	74.07	120.00	120.00	0.00	-0.000	49.00	0.61	0	0.000	10.26
58040.00	454.04	76.16	120.00	120.00	0.00	-0.000	47.63	0.60	0	0.000	10.38
58020.00	454.98	78.13	120.00	120.00	0.00	-0.000	46.38	0.58	0	0.000	10.50
58000.00	455.89	80.01	120.00	120.00	0.00	-0.000	45.21	0.57	0	0.000	10.62
57980.00	456.78	81.80	120.00	120.00	0.00	-0.130	44.20	0.55	0	0.000	10.66
57960.00	457.65	83.57	120.00	120.00	3598.40	-4.130	46.09	0.58	24	0.013	7.77
57940.00	458.50	85.37	120.00	120.00	1605.83	-8.130	47.87	0.60	54	0.043	4.97
57920.00	459.33	87.20	120.00	120.00	1033.53	-12.000	49.51	0.62	84	0.091	2.27
57900.00	460.15	88.99	120.00	120.00	761.97	-12.000	48.05	0.60	114	0.156	2.60
57880.00	460.95	90.70	120.00	120.00	725.00	-12.000	46.76	0.58	120	0.196	2.76
57860.00	461.74	92.33	120.00	120.00	725.00	-12.000	45.49	0.57	120	0.228	2.88
57840.00	462.51	93.89	120.00	120.00	725.00	-12.000	44.23	0.55	120	0.259	2.99
57820.00	463.27	95.39	120.00	120.00	725.00	-12.000	43.03	0.54	120	0.289	3.10



Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
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 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
57800.00	464.02	96.82	120.00	120.00	725.00	-12.000	41.94	0.52	120	0.318	3.20
57780.00	464.76	98.20	120.00	120.00	725.00	-12.000	40.94	0.51	120	0.347	3.31
57760.00	465.49	99.52	120.00	120.00	725.00	-12.000	40.07	0.50	120	0.375	3.41
57740.00	466.21	100.81	120.00	120.00	725.00	-12.000	39.30	0.49	120	0.402	3.51
57720.00	466.92	102.05	120.00	120.00	725.00	-12.000	38.64	0.48	120	0.429	3.60
57700.00	467.62	103.26	120.00	120.00	725.00	-12.000	38.04	0.48	120	0.456	3.70
57680.00	468.31	104.44	120.00	120.00	725.00	-12.000	37.51	0.47	120	0.482	3.79
57660.00	469.00	105.59	120.00	120.00	725.00	-11.739	36.81	0.46	120	0.507	4.09
57640.00	469.68	106.70	120.00	120.00	725.00	-11.239	35.94	0.45	120	0.532	4.57
57620.00	470.35	107.77	120.00	120.00	725.00	-10.739	35.07	0.44	120	0.557	5.05
57600.00	471.01	108.81	120.00	120.00	725.00	-10.239	34.21	0.43	120	0.581	5.53
57580.00	471.67	109.81	120.00	120.00	725.00	-9.739	33.35	0.42	120	0.604	6.00
57560.00	472.32	110.78	120.00	120.00	725.00	-9.500	32.67	0.41	120	0.627	6.28
57540.00	472.97	111.72	120.00	120.00	725.00	-9.500	32.21	0.40	120	0.649	6.36
57520.00	473.61	112.65	120.00	120.00	903.75	-9.500	31.91	0.40	96	0.538	6.27
57500.00	474.25	113.56	120.00	120.00	1312.91	-9.500	31.66	0.40	66	0.383	6.13
57480.00	474.88	114.45	120.00	120.00	2399.00	-9.500	31.42	0.39	36	0.216	5.99
57460.00	475.51	115.34	120.00	120.00	13886.58	-9.500	31.18	0.39	6	0.038	5.85
57440.00	476.13	116.20	120.00	120.00	-4550.25	-9.500	30.64	0.38	-24	0.095	6.02
57420.00	476.75	117.04	120.00	120.00	-2009.86	-9.500	30.03	0.38	-54	0.222	6.27
57400.00	477.36	117.86	120.00	120.00	-1289.78	-9.500	29.42	0.37	-84	0.357	6.52
57380.00	477.97	118.66	120.00	120.00	-949.58	-9.500	28.83	0.36	-114	0.500	6.76
57360.00	478.57	119.44	120.00	120.00	-751.38	-9.500	28.24	0.35	-144	0.651	7.01
57340.00	479.17	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57320.00	479.77	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57300.00	480.37	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57280.00	480.97	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57260.00	481.57	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57240.00	482.17	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57220.00	482.77	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57200.00	483.37	120.00	120.00	120.00	-720.00	-9.500	27.90	0.09	-150	0.694	7.10
57180.00	483.97	120.00	120.00	120.00	-742.72	-9.500	27.93	0.09	-145	0.673	7.07
57160.00	484.57	120.00	120.00	120.00	-935.78	-9.500	28.10	0.09	-115	0.534	6.90
57140.00	485.17	120.00	120.00	120.00	-1264.46	-9.500	28.28	0.08	-85	0.395	6.72
57120.00	485.77	120.00	120.00	120.00	-1949.05	-9.500	28.45	0.08	-55	0.256	6.55

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
57100.00	486.37	120.00	120.00	120.00	-4250.01	-9.500	28.63	0.08	-25	0.118	6.37
57080.00	486.97	120.00	120.00	120.00	26480.29	-9.500	28.75	0.08	5	0.013	6.25
57060.00	487.57	120.00	120.00	120.00	3512.75	-9.500	28.60	0.08	38	0.099	6.41
57040.00	488.17	120.00	120.00	120.00	1881.15	-9.500	28.44	0.08	72	0.184	6.56
57020.00	488.77	120.00	120.00	120.00	1284.51	-9.500	28.29	0.08	105	0.270	6.72
57000.00	489.37	120.00	120.00	120.00	975.21	-9.500	28.13	0.09	138	0.356	6.87
56980.00	489.97	120.00	120.00	120.00	900.00	-9.500	28.08	0.09	150	0.385	6.92
56960.00	490.57	120.00	120.00	120.00	900.00	-9.500	28.08	0.09	150	0.385	6.92
56940.00	491.17	120.00	120.00	120.00	900.00	-9.500	28.08	0.09	150	0.385	6.92
56920.00	491.78	120.00	120.00	120.00	900.00	-9.500	28.08	0.09	150	0.385	6.92
56900.00	492.38	120.00	120.00	120.00	900.00	-9.500	28.08	0.09	150	0.385	6.92
56880.00	492.98	120.00	120.00	120.00	900.00	-9.500	28.08	0.09	150	0.385	6.92
56860.00	493.58	120.00	120.00	120.00	1037.41	-9.500	28.17	0.09	130	0.334	6.83
56840.00	494.18	120.00	120.00	120.00	1394.66	-9.500	28.32	0.08	97	0.249	6.68
56820.00	494.78	120.00	120.00	120.00	2127.16	-9.500	28.48	0.08	63	0.163	6.52
56800.00	495.38	120.00	120.00	120.00	4480.37	-9.500	28.63	0.08	30	0.077	6.37
56780.00	495.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56760.00	496.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56740.00	497.18	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56720.00	497.78	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56700.00	498.38	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56680.00	498.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56660.00	499.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56640.00	500.18	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56620.00	500.78	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56600.00	501.38	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56580.00	501.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56560.00	502.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56540.00	503.18	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56520.00	503.78	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56500.00	504.38	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56480.00	504.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56460.00	505.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56440.00	506.18	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56420.00	506.78	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
56400.00	507.38	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56380.00	507.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56360.00	508.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56340.00	509.18	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56320.00	509.78	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56300.00	510.38	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56280.00	510.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56260.00	511.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56240.00	512.18	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56220.00	512.78	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56200.00	513.38	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56180.00	513.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56160.00	514.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56140.00	515.18	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56120.00	515.78	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56100.00	516.38	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56080.00	516.98	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56060.00	517.58	120.00	120.00	120.00	0.00	-9.500	28.77	0.08	0	0.000	6.23
56040.00	518.18	120.00	120.00	120.00	-8138.63	-9.500	28.70	0.08	-11	0.075	6.30
56020.00	518.78	120.00	120.00	120.00	-2165.19	-9.500	28.48	0.08	-41	0.282	6.52
56000.00	519.38	120.00	120.00	120.00	-1248.69	-9.500	28.27	0.08	-71	0.489	6.73
55980.00	519.98	120.00	120.00	120.00	-877.33	-9.500	28.06	0.09	-101	0.695	6.94
55960.00	520.58	120.00	120.00	120.00	-676.22	-9.925	28.18	0.09	-131	0.902	6.82
55940.00	521.18	120.00	120.00	120.00	-590.00	-12.025	29.69	0.07	-150	1.034	5.31
55920.00	521.78	120.00	120.00	120.00	-590.00	-14.125	31.34	0.05	-150	1.034	3.66
55900.00	522.38	120.00	120.00	120.00	-590.00	-16.225	32.99	0.03	-150	1.034	2.01
55880.00	522.98	120.00	120.00	120.00	-590.00	-18.325	34.63	0.00	-150	1.034	0.37
55860.00	523.58	120.00	120.00	120.00	-590.00	-20.000	0.95	0.00	-150	1.034	-0.95
55840.00	524.18	120.00	120.00	120.00	-590.00	-20.000	0.95	0.00	-150	1.034	-0.95
55820.00	524.78	120.00	120.00	120.00	-590.00	-20.000	0.95	0.00	-150	1.034	-0.95
55800.00	525.38	120.00	120.00	120.00	-731.13	-20.000	1.15	0.00	-121	0.835	-1.15
55780.00	525.98	120.00	120.00	120.00	-972.03	-20.000	1.36	0.00	-91	0.628	-1.36
55760.00	526.58	120.00	120.00	120.00	-1449.72	-20.000	1.58	0.00	-61	0.421	-1.58
55740.00	527.18	119.51	120.00	120.00	-2850.58	-20.000	37.05	-0.60	-31	0.211	-1.84
55720.00	527.78	118.20	120.00	120.00	-84586.73	-20.000	37.95	-0.60	-1	0.007	-2.17

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
55700.00	528.39	116.88	120.00	120.00	0.00	-20.000	38.66	-0.60	0	0.000	-2.30
55680.00	529.01	115.54	120.00	120.00	0.00	-20.000	39.35	-0.60	0	0.000	-2.41
55660.00	529.64	114.18	120.00	120.00	0.00	-20.000	40.05	-0.60	0	0.000	-2.53
55640.00	530.27	112.81	120.00	120.00	0.00	-20.000	40.75	-0.60	0	0.000	-2.65
55620.00	530.92	111.43	120.00	120.00	0.00	-20.000	41.45	-0.60	0	0.000	-2.77
55600.00	531.57	110.02	120.00	120.00	0.00	-20.000	42.15	-0.60	0	0.000	-2.89
55580.00	532.22	110.00	110.00	120.00	0.00	-20.000	42.16	0.00	0	0.000	-2.89
55560.00	532.88	110.00	110.00	120.00	0.00	-20.000	42.16	0.00	0	0.000	-2.89
55540.00	533.53	110.00	110.00	120.00	0.00	-20.000	42.16	0.00	0	0.000	-2.89
55520.00	534.19	109.45	110.00	120.00	0.00	-20.000	42.42	-0.60	0	0.000	-2.94
55500.00	534.85	108.02	110.00	120.00	0.00	-20.000	43.09	-0.60	0	0.000	-3.06
55480.00	535.52	106.57	110.00	119.46	-8095.23	-20.000	43.64	-0.60	-7	0.066	-3.10
55460.00	536.20	105.10	110.00	118.92	-2479.85	-20.000	44.11	-0.60	-24	0.206	-3.05
55440.00	536.89	103.61	110.00	118.38	-1464.19	-20.000	44.59	-0.60	-41	0.332	-2.99
55420.00	537.59	102.10	110.00	117.84	-1038.76	-20.000	45.15	-0.60	-58	0.445	-2.93
55400.00	538.30	100.56	110.00	117.30	-804.89	-20.000	45.79	-0.60	-75	0.544	-2.88
55380.00	539.02	99.00	110.00	116.76	-656.97	-20.000	46.57	-0.60	-92	0.630	-2.82
55360.00	539.75	97.42	103.87	116.22	-554.98	-20.000	47.50	-0.60	-109	0.702	-2.76
55340.00	540.50	95.81	103.41	115.68	-550.00	-20.000	48.69	-0.60	-110	0.665	-2.87
55320.00	541.26	94.17	103.41	115.14	-550.00	-20.000	49.99	-0.60	-110	0.621	-2.99
55300.00	542.03	92.50	103.41	114.59	-550.00	-20.000	51.34	-0.60	-110	0.578	-3.11
55280.00	542.82	90.81	103.41	114.05	-550.00	-20.000	52.67	-0.60	-110	0.534	-3.23
55260.00	543.62	89.08	103.41	113.51	-550.00	-20.000	53.94	-0.60	-110	0.491	-3.35
55240.00	544.43	87.31	103.41	112.97	-550.00	-20.000	55.16	-0.60	-110	0.447	-3.47
55220.00	545.27	85.51	103.41	112.43	-550.00	-20.000	56.34	-0.60	-110	0.403	-3.59
55200.00	546.12	83.68	103.41	111.89	-550.00	-20.000	57.51	-0.60	-110	0.360	-3.71
55180.00	546.99	81.80	103.41	111.35	-550.00	-20.000	58.67	-0.60	-110	0.316	-3.83
55160.00	547.88	79.87	103.41	110.81	-550.00	-20.000	59.85	-0.60	-110	0.272	-3.95
55140.00	548.79	77.90	103.41	110.27	-550.00	-20.000	61.07	-0.60	-110	0.229	-4.07
55120.00	549.73	75.88	103.41	109.73	-550.00	-20.000	62.35	-0.60	-110	0.185	-4.19
55100.00	550.69	73.80	103.41	109.19	-550.00	-20.000	63.74	-0.60	-110	0.141	-4.31
55080.00	551.68	71.66	103.41	108.65	-550.00	-20.000	65.26	-0.60	-110	0.098	-4.43
55060.00	552.70	69.45	103.41	108.11	-550.00	-20.000	66.97	-0.60	-110	0.054	-4.54
55040.00	553.75	67.18	103.41	107.57	-550.00	-20.000	68.97	-0.60	-110	0.010	-4.66
55020.00	554.84	64.82	110.00	107.03	-634.59	-20.000	71.57	-0.60	-95	-0.029	-4.94

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
55000.00	555.98	62.37	110.00	106.49	-771.54	-20.000	74.58	-0.60	-78	-0.055	-5.23
54980.00	557.15	59.83	110.00	105.95	-983.87	-19.769	77.70	-0.60	-61	-0.067	-5.35
54960.00	558.39	57.17	110.00	105.41	-1357.46	-18.436	80.36	-0.60	-45	-0.067	-4.60
54940.00	559.68	54.38	110.00	104.86	-2188.42	-17.103	83.49	-0.60	-28	-0.052	-3.84
54920.00	561.04	51.44	110.00	104.32	-5642.34	-15.769	87.28	-0.60	-11	-0.025	-3.09
54900.00	562.48	48.32	110.00	103.78	8870.14	-14.436	91.84	-0.60	8	-0.028	-2.21
54880.00	564.02	44.98	110.00	103.24	2378.52	-14.000	98.24	-0.60	32	-0.113	-1.79
54860.00	565.69	41.38	110.00	102.70	1373.40	-14.000	107.36	-0.60	55	-0.213	-1.72
54840.00	567.52	37.43	110.00	102.16	965.42	-14.000	111.65	-0.60	78	-0.328	-1.65
54820.00	569.56	33.01	110.00	101.62	744.32	-14.000	111.57	-0.60	101	-0.457	-1.57
54800.00	571.93	27.90	110.00	101.08	605.62	-14.000	111.50	-0.60	124	-0.602	-1.50
54780.00	574.84	21.61	110.00	100.54	510.49	-14.000	111.43	-0.60	147	-0.761	-1.43
54760.00	579.06	12.47	110.00	100.00	500.00	-14.000	111.52	-0.59	150	-0.825	-1.52
54750.00	584.49	0.00	110.00	0.00	500.00	-14.000	111.59	-59.97	150	-0.849	-1.59
54750.00	644.49	0.00	110.00	0.00	500.00	-14.000	111.59	0.00	0	0.000	-1.59
54740.00	650.37	17.64	110.00	100.00	500.00	-14.000	111.46	1.20	150	-0.801	-1.46
54720.00	653.36	30.55	110.00	100.00	500.00	-14.000	111.22	1.20	150	-0.705	-1.22
54700.00	655.42	39.44	110.00	100.00	500.00	-14.000	110.98	1.20	150	-0.609	-0.98
54680.00	657.09	46.65	110.00	100.00	500.00	-14.000	93.68	1.17	150	-0.513	-0.74
54660.00	658.54	52.40	110.00	100.00	500.00	-14.000	83.13	1.04	150	-0.425	-0.52
54640.00	659.86	57.12	110.00	100.00	500.00	-14.766	76.77	0.96	150	-0.346	-0.92
54620.00	661.08	61.20	110.00	100.00	500.00	-15.966	72.40	0.91	150	-0.271	-1.68
54600.00	662.22	64.83	110.00	100.00	500.00	-17.166	69.07	0.86	150	-0.200	-2.44
54580.00	663.30	68.14	110.00	100.00	500.00	-18.366	66.74	0.83	150	-0.133	-3.22
54560.00	664.33	71.20	110.00	100.00	500.00	-19.566	65.16	0.81	150	-0.067	-3.99
54540.00	665.33	74.07	110.00	100.00	500.00	-20.000	63.44	0.79	150	-0.002	-4.18
54520.00	666.28	76.76	110.00	100.00	500.00	-20.000	61.68	0.77	150	0.060	-4.02
54500.00	667.20	79.29	110.00	100.00	500.00	-20.000	60.10	0.75	150	0.121	-3.87
54480.00	668.10	81.68	110.00	100.00	536.03	-20.000	58.72	0.73	140	0.168	-3.80
54460.00	668.97	83.95	110.00	100.00	641.90	-20.000	57.51	0.72	117	0.186	-3.85
54440.00	669.81	86.12	110.00	100.00	799.88	-20.000	56.31	0.70	94	0.185	-3.91
54420.00	670.64	88.19	110.00	100.00	1061.02	-20.000	55.12	0.69	71	0.165	-3.96
54400.00	671.45	90.17	110.00	100.00	1575.30	-20.000	53.91	0.67	48	0.129	-4.02
54380.00	672.24	92.07	110.00	100.00	3057.11	-20.000	52.63	0.66	25	0.075	-4.08
54360.00	673.01	93.88	110.00	100.00	51507.86	-20.000	51.37	0.64	1	0.005	-4.14

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
54340.00	673.77	95.61	110.00	100.00	0.00	-20.000	50.02	0.63	0	0.000	-4.03
54320.00	674.52	97.27	110.00	100.00	0.00	-20.000	48.75	0.61	0	0.000	-3.91
54300.00	675.25	98.86	110.00	100.00	0.00	-20.000	47.63	0.60	0	0.000	-3.79
54280.00	675.97	100.00	110.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54260.00	676.69	100.00	110.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54240.00	677.41	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54220.00	678.13	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54200.00	678.85	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54180.00	679.57	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54160.00	680.29	100.00	120.00	100.00	-11685.78	-20.000	46.85	0.00	-8	0.022	-3.65
54140.00	681.01	100.00	120.00	100.00	-2387.16	-20.000	46.64	0.00	-38	0.110	-3.44
54120.00	681.73	100.00	120.00	100.00	-1329.36	-20.000	46.43	0.00	-68	0.197	-3.23
54100.00	682.45	100.00	120.00	100.00	-921.17	-20.000	46.22	0.00	-98	0.285	-3.02
54080.00	683.17	100.00	120.00	100.00	-704.77	-20.000	46.01	0.00	-128	0.372	-2.81
54060.00	683.89	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
54040.00	684.61	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
54020.00	685.33	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
54000.00	686.05	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
53980.00	686.77	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
53960.00	687.49	100.00	120.00	100.00	-610.60	-20.000	45.87	0.00	-147	0.429	-2.67
53940.00	688.21	100.00	120.00	100.00	-766.63	-20.000	46.08	0.00	-117	0.342	-2.88
53920.00	688.93	100.00	120.00	100.00	-1029.78	-20.000	46.29	0.00	-87	0.255	-3.09
53900.00	689.65	100.00	120.00	100.00	-1568.02	-20.000	46.50	0.00	-57	0.167	-3.30
53880.00	690.37	100.00	120.00	100.00	-3285.01	-20.000	46.71	0.00	-27	0.080	-3.51
53860.00	691.09	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53840.00	691.81	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53820.00	692.53	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53800.00	693.25	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53780.00	693.97	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53760.00	694.69	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53740.00	695.41	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53720.00	696.13	100.00	120.00	100.00	40781.84	-20.000	46.89	0.00	2	0.006	-3.69
53700.00	696.85	100.00	120.00	100.00	3559.59	-20.000	46.73	0.00	25	0.074	-3.53
53680.00	697.57	100.00	120.00	100.00	1861.01	-20.000	46.56	0.00	48	0.141	-3.36
53660.00	698.29	100.00	120.00	100.00	1259.84	-20.000	46.40	0.00	71	0.208	-3.20



Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
53640.00	699.01	100.00	120.00	100.00	952.23	-20.000	46.24	0.00	95	0.275	-3.04
53620.00	699.73	100.00	120.00	100.00	765.36	-20.000	46.08	0.00	118	0.343	-2.88
53600.00	700.45	100.00	120.00	100.00	639.80	-20.000	45.92	0.00	141	0.410	-2.72
53580.00	701.17	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53560.00	701.89	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53540.00	702.61	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53520.00	703.33	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53500.00	704.05	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53480.00	704.77	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53460.00	705.49	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53440.00	706.21	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53420.00	706.93	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	150	0.437	-2.65
53400.00	707.65	100.00	120.00	100.00	665.43	-20.000	45.95	0.00	135	0.394	-2.75
53380.00	708.37	100.00	120.00	100.00	802.33	-20.000	46.11	0.00	112	0.327	-2.91
53360.00	709.09	100.00	120.00	100.00	1010.15	-20.000	46.28	0.00	89	0.260	-3.08
53340.00	709.81	99.79	120.00	100.00	1363.24	-20.000	46.57	-0.60	66	0.190	-3.26
53320.00	710.54	98.21	120.00	100.00	2095.84	-20.000	47.75	-0.60	43	0.112	-3.53
53300.00	711.28	96.62	120.00	100.00	4530.51	-20.000	49.07	-0.60	20	0.047	-3.81
53280.00	712.03	94.99	120.00	100.00	0.00	-20.000	50.48	-0.60	0	0.000	-4.07
53260.00	712.80	93.34	120.00	100.00	0.00	-20.000	51.81	-0.60	0	0.000	-4.19
53240.00	713.58	91.66	120.00	100.00	0.00	-20.000	53.14	-0.60	0	0.000	-4.31
53220.00	714.37	89.95	120.00	100.00	0.00	-20.000	54.46	-0.60	0	0.000	-4.43
53200.00	715.18	88.20	90.00	100.00	0.00	-20.000	55.68	-0.60	0	0.000	-4.55
53180.00	716.00	86.42	90.00	100.00	2314.54	-20.000	56.62	-0.60	23	0.121	-4.40
53160.00	716.84	84.60	90.00	100.00	801.04	-20.000	57.29	-0.60	66	0.318	-4.01
53140.00	717.70	82.74	90.00	100.00	484.33	-20.000	57.93	-0.60	108	0.477	-3.61
53120.00	718.58	80.84	90.00	100.00	350.00	-20.000	58.60	-0.60	150	0.592	-3.24
53100.00	719.49	78.89	90.00	100.00	350.00	-20.000	59.80	-0.60	150	0.523	-3.35
53080.00	720.41	76.89	90.00	100.00	350.00	-20.000	61.04	-0.60	150	0.454	-3.47
53060.00	721.36	74.84	90.00	100.00	350.00	-20.000	62.37	-0.60	150	0.386	-3.59
53040.00	722.34	72.74	90.00	100.00	350.00	-20.000	63.82	-0.60	150	0.317	-3.71
53020.00	723.34	70.56	90.00	100.00	350.00	-18.711	64.45	-0.60	150	0.249	-2.84
53000.00	724.38	68.32	90.00	100.00	397.37	-13.711	62.60	-0.60	132	0.159	0.75
52980.00	725.45	66.01	90.00	100.00	588.15	-8.711	61.39	-0.60	89	0.066	4.06
52960.00	726.56	63.61	90.00	100.00	1131.32	-3.711	60.63	-0.60	46	0.013	7.35

Istram 22.04.04.22 14/09/23 13:54:29 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 32 : Alt1

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68901.091  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
52940.00	727.71	61.11	90.00	100.00	14793.58	-0.000	61.15	-0.60	4	-0.001	9.64
52920.00	728.92	58.51	90.00	100.00	0.00	-0.000	64.50	-0.60	0	0.000	9.47
52900.00	730.18	55.79	90.00	100.00	0.00	-0.000	68.23	-0.60	0	0.000	9.35
52880.00	731.50	52.93	90.00	100.00	0.00	-0.000	72.55	-0.60	0	0.000	9.23
52860.00	732.90	49.90	90.00	100.00	0.00	-0.000	77.61	-0.60	0	0.000	9.11
52840.00	734.39	46.68	90.00	100.00	0.00	-0.000	83.86	-0.60	0	0.000	8.99
52820.00	736.00	43.22	100.00	100.00	0.00	-0.000	91.77	-0.60	0	0.000	8.87
52800.00	737.74	39.45	100.00	100.00	0.00	-0.000	101.25	-0.60	0	0.000	8.75
52780.00	739.66	35.29	100.00	100.00	0.00	-0.000	101.37	-0.60	0	0.000	8.63
52760.00	741.85	30.56	100.00	100.00	0.00	-0.000	101.49	-0.60	0	0.000	8.51
52740.00	744.45	24.95	100.00	100.00	0.00	-0.000	101.61	-0.60	0	0.000	8.39
52720.00	747.83	17.65	100.00	100.00	0.00	-0.000	101.73	-0.59	0	0.000	8.27
52710.00	750.22	12.47	100.00	100.00	2302.94	-0.000	101.52	-0.59	23	-0.123	8.48
52700.00	755.65	1.95	100.00	-0.00	1144.44	-1.219	102.26	-59.97	45	-0.257	7.74

2. ALTERNATIVA 2

Istram 23.05.05.10 19/02/24 12:52:49 200356

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final.....: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
52700.00	0.00	0.00	100.00	-0.00	1144.44	1.219	0.00	0.00	45	-0.257	0.00
52710.00	5.89	17.64	100.00	100.00	2302.94	0.000	101.46	1.20	23	-0.117	8.54
52720.00	7.58	24.94	100.00	100.00	0.00	0.000	101.61	1.20	0	0.000	8.39
52740.00	9.97	35.27	100.00	100.00	0.00	0.000	101.37	1.20	0	0.000	8.63
52760.00	11.81	43.17	100.00	100.00	0.00	0.000	91.97	1.15	0	0.000	8.87
52780.00	13.37	49.13	100.00	100.00	0.00	0.000	79.12	0.99	0	0.000	9.08
52800.00	14.76	53.84	100.00	100.00	0.00	0.000	71.21	0.89	0	0.000	9.27
52820.00	16.05	57.80	100.00	100.00	0.00	0.000	65.51	0.82	0	0.000	9.44
52840.00	17.26	61.24	90.00	100.00	0.00	0.000	61.08	0.76	0	0.000	9.60
52860.00	18.41	64.30	90.00	100.00	0.00	0.000	57.49	0.72	0	0.000	9.74
52880.00	19.51	67.06	90.00	100.00	0.00	0.000	54.56	0.68	0	0.000	9.88
52900.00	20.56	69.59	90.00	100.00	0.00	0.000	52.31	0.65	0	0.000	10.02
52920.00	21.58	71.94	90.00	100.00	0.00	0.000	50.50	0.63	0	0.000	10.14
52940.00	22.56	74.15	90.00	100.00	14793.59	0.000	48.91	0.61	4	0.009	10.31
52960.00	23.52	76.17	90.00	100.00	1131.32	3.711	44.19	0.55	46	0.133	13.82
52980.00	24.45	77.91	90.00	100.00	588.15	8.711	38.63	0.48	89	0.291	18.37
53000.00	25.37	79.39	90.00	100.00	397.37	13.711	33.28	0.42	132	0.476	22.89
53020.00	26.27	80.64	90.00	100.00	350.00	18.711	28.40	0.35	150	0.584	27.09
53040.00	27.16	81.72	90.00	100.00	350.00	20.000	26.68	0.33	150	0.623	28.21
53060.00	28.03	82.76	90.00	100.00	350.00	20.000	26.04	0.33	150	0.661	28.28
53080.00	28.90	83.76	90.00	100.00	350.00	20.000	25.41	0.32	150	0.698	28.34
53100.00	29.75	84.73	90.00	100.00	350.00	20.000	24.81	0.31	150	0.733	28.40
53120.00	30.60	85.66	90.00	100.00	350.00	20.000	24.21	0.30	150	0.768	28.46
53140.00	31.43	86.57	90.00	100.00	484.33	20.000	24.11	0.30	108	0.580	28.03
53160.00	32.26	87.46	90.00	100.00	801.04	20.000	24.04	0.30	66	0.366	27.58
53180.00	33.08	88.35	90.00	100.00	2314.54	20.000	23.93	0.30	23	0.132	27.13
53200.00	33.89	89.22	90.00	100.00	0.00	20.000	23.59	0.29	0	0.000	26.91
53220.00	34.69	90.00	90.00	100.00	0.00	20.000	23.04	0.00	0	0.000	26.96
53240.00	35.49	90.80	120.00	100.00	0.00	20.000	22.43	0.28	0	0.000	27.02
53260.00	36.28	91.59	120.00	100.00	0.00	20.000	21.83	0.27	0	0.000	27.07
53280.00	37.06	92.35	120.00	100.00	0.00	20.000	21.22	0.27	0	0.000	27.13
53300.00	37.84	93.08	120.00	100.00	4530.51	20.000	20.50	0.26	15	0.065	27.32
53320.00	38.61	93.78	120.00	100.00	2095.84	20.000	19.77	0.25	31	0.146	27.53
53340.00	39.37	94.45	120.00	100.00	1363.24	20.000	19.08	0.24	48	0.231	27.74
53360.00	40.13	95.09	120.00	100.00	1010.15	20.000	18.41	0.23	65	0.321	27.94

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final.....: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
53380.00	40.89	95.70	120.00	100.00	802.33	20.000	17.76	0.22	82	0.415	28.15
53400.00	41.64	96.29	120.00	100.00	665.43	20.000	17.14	0.21	99	0.514	28.36
53420.00	42.38	96.85	120.00	100.00	600.00	20.000	16.61	0.21	110	0.584	28.50
53440.00	43.13	97.40	120.00	100.00	600.00	20.000	16.21	0.20	110	0.597	28.54
53460.00	43.86	97.93	120.00	100.00	600.00	20.000	15.82	0.20	110	0.611	28.58
53480.00	44.60	98.45	120.00	100.00	600.00	20.000	15.47	0.19	110	0.624	28.62
53500.00	45.33	98.95	120.00	100.00	600.00	20.000	15.13	0.19	110	0.636	28.66
53520.00	46.05	99.44	120.00	100.00	600.00	20.000	14.82	0.19	110	0.649	28.70
53540.00	46.77	99.92	120.00	100.00	600.00	20.000	14.51	0.18	110	0.661	28.73
53560.00	47.49	100.00	120.00	100.00	600.00	20.000	14.46	0.00	110	0.663	28.74
53580.00	48.21	100.00	120.00	100.00	600.00	20.000	14.46	0.00	110	0.663	28.74
53600.00	48.93	100.00	120.00	100.00	639.80	20.000	14.52	0.00	103	0.622	28.68
53620.00	49.65	100.00	120.00	100.00	765.36	20.000	14.68	0.00	86	0.520	28.52
53640.00	50.37	100.00	120.00	100.00	952.23	20.000	14.85	0.00	69	0.418	28.35
53660.00	51.09	100.00	120.00	100.00	1259.84	20.000	15.01	0.00	52	0.316	28.19
53680.00	51.81	100.00	120.00	100.00	1861.01	20.000	15.17	0.00	35	0.214	28.03
53700.00	52.53	100.00	120.00	100.00	3559.59	20.000	15.33	0.00	19	0.112	27.87
53720.00	53.25	100.00	120.00	100.00	40781.77	20.000	15.49	0.00	2	0.010	27.71
53740.00	53.97	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53760.00	54.69	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53780.00	55.41	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53800.00	56.13	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53820.00	56.85	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53840.00	57.57	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53860.00	58.29	100.00	120.00	100.00	0.00	20.000	15.51	0.00	0	0.000	27.69
53880.00	59.01	100.00	120.00	100.00	-3285.01	20.000	15.32	0.00	-27	0.080	27.88
53900.00	59.73	100.00	120.00	100.00	-1568.02	20.000	15.11	0.00	-57	0.167	28.09
53920.00	60.45	100.00	120.00	100.00	-1029.78	20.000	14.90	0.00	-87	0.255	28.30
53940.00	61.17	100.00	120.00	100.00	-766.63	20.000	14.69	0.00	-117	0.342	28.51
53960.00	61.89	100.00	120.00	100.00	-610.60	20.000	14.48	0.00	-147	0.429	28.72
53980.00	62.61	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54000.00	63.33	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54020.00	64.05	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54040.00	64.77	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74
54060.00	65.49	100.00	120.00	100.00	-600.00	20.000	14.46	0.00	-150	0.437	28.74

Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68544.791  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
54080.00	66.21	100.00	120.00	100.00	-704.77	20.000	14.61	0.00	-128	0.372	28.59
54100.00	66.93	100.00	120.00	100.00	-921.17	20.000	14.82	0.00	-98	0.285	28.38
54120.00	67.66	99.00	120.00	100.00	-1329.36	20.000	15.66	-0.60	-68	0.186	28.09
54140.00	68.39	97.42	120.00	100.00	-2387.16	20.000	16.97	-0.60	-38	0.093	27.76
54160.00	69.13	95.81	120.00	100.00	-11685.78	20.000	18.39	-0.60	-8	0.017	27.43
54180.00	69.89	94.17	120.00	100.00	0.00	20.000	19.74	-0.60	0	0.000	27.26
54200.00	70.66	92.50	120.00	100.00	0.00	20.000	21.09	-0.60	0	0.000	27.14
54220.00	71.45	90.81	120.00	100.00	0.00	20.000	22.42	-0.60	0	0.000	27.02
54240.00	72.25	89.08	120.00	100.00	0.00	20.000	23.68	-0.60	0	0.000	26.90
54260.00	73.07	87.31	110.00	100.00	0.00	20.000	24.91	-0.60	0	0.000	26.78
54280.00	73.90	85.51	110.00	100.00	0.00	20.000	26.09	-0.60	0	0.000	26.66
54300.00	74.75	83.68	110.00	100.00	0.00	20.000	27.26	-0.60	0	0.000	26.54
54320.00	75.62	81.80	110.00	100.00	0.00	20.000	28.42	-0.60	0	0.000	26.42
54340.00	76.51	79.87	110.00	100.00	0.00	20.000	29.60	-0.60	0	0.000	26.30
54360.00	77.42	77.90	110.00	100.00	51507.85	20.000	30.81	-0.60	1	0.001	26.20
54380.00	78.36	75.88	110.00	100.00	3057.11	20.000	31.90	-0.60	25	0.006	26.27
54400.00	79.32	73.80	110.00	100.00	1575.30	20.000	33.09	-0.60	48	-0.003	26.34
54420.00	80.31	71.66	110.00	100.00	1061.02	20.000	34.42	-0.60	71	-0.027	26.42
54440.00	81.33	69.45	110.00	100.00	799.88	20.000	35.94	-0.60	94	-0.065	26.49
54460.00	82.39	67.18	110.00	100.00	641.90	20.000	37.74	-0.60	117	-0.119	26.56
54480.00	83.48	64.82	110.00	100.00	536.03	20.000	39.99	-0.60	140	-0.187	26.64
54500.00	84.61	62.37	110.00	100.00	500.00	20.000	42.74	-0.60	150	-0.249	26.60
54520.00	85.79	59.83	110.00	100.00	500.00	20.000	45.87	-0.60	150	-0.297	26.48
54540.00	87.02	57.17	110.00	100.00	500.00	20.000	49.40	-0.60	150	-0.345	26.36
54560.00	88.31	54.38	110.00	100.00	500.00	20.000	53.40	-0.60	150	-0.393	26.24
54580.00	89.67	51.44	110.00	100.00	500.00	20.000	58.06	-0.60	150	-0.441	26.12
54600.00	91.12	48.32	110.00	100.00	500.00	20.000	63.63	-0.60	150	-0.489	26.00
54620.00	92.66	44.98	110.00	100.00	500.00	20.000	70.57	-0.60	150	-0.537	25.88
54640.00	94.33	41.38	110.00	100.00	500.00	20.000	79.88	-0.60	150	-0.585	25.76
54660.00	96.15	37.43	110.00	100.00	500.00	20.000	84.36	-0.60	150	-0.633	25.64
54680.00	98.20	33.01	110.00	100.00	500.00	20.000	84.48	-0.60	150	-0.681	25.52
54700.00	100.56	27.90	110.00	100.00	500.00	20.000	84.60	-0.60	150	-0.729	25.40
54720.00	103.47	21.61	110.00	100.00	500.00	20.000	84.72	-0.60	150	-0.777	25.28
54740.00	107.70	12.47	110.00	100.00	500.00	20.000	84.84	-0.60	150	-0.825	25.16
54750.00	113.07	0.00	110.00	0.00	500.00	20.000	84.90	0.00	150	-0.849	25.10

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68544.791  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
54750.00	143.07	0.00	110.00	0.00	500.00	20.000	84.90	0.00	0	0.000	25.10
54760.00	149.21	16.58	110.00	100.00	500.00	20.000	84.79	1.06	150	-0.807	25.21
54780.00	152.39	28.70	110.00	101.43	510.49	20.000	84.61	1.06	147	-0.707	25.39
54800.00	154.58	37.04	110.00	102.86	605.62	20.000	84.59	1.06	124	-0.526	25.41
54820.00	156.36	43.58	110.00	104.29	744.32	20.000	84.36	0.93	101	-0.374	25.42
54840.00	157.93	48.42	110.00	105.71	965.42	20.000	84.06	0.80	78	-0.252	25.40
54860.00	159.36	52.32	110.00	107.14	1373.40	20.000	84.06	0.72	55	-0.155	25.36
54880.00	160.69	55.61	110.00	108.57	2378.52	20.000	84.06	0.66	32	-0.078	25.30
54900.00	161.95	58.49	110.00	110.00	8870.14	20.000	84.06	0.61	8	-0.018	25.24
54920.00	163.16	61.04	110.00	111.43	-5642.34	20.000	84.06	0.57	-11	-0.010	25.39
54940.00	164.31	63.34	110.00	112.86	-2188.42	20.000	84.06	0.53	-28	-0.015	25.68
54960.00	165.43	65.42	110.00	114.29	-1357.46	20.000	84.06	0.50	-45	-0.009	25.96
54980.00	166.52	67.32	110.00	115.71	-983.87	20.000	84.06	0.47	-61	0.007	26.23
55000.00	167.57	69.08	110.00	117.14	-771.54	20.000	84.06	0.45	-78	0.033	26.50
55020.00	168.60	70.73	110.00	118.57	-634.59	20.000	84.06	0.43	-95	0.069	26.76
55040.00	169.61	72.27	103.41	120.00	-550.00	20.000	84.06	0.42	-110	0.110	27.00
55060.00	170.60	73.73	103.41	121.43	-550.00	20.000	84.06	0.41	-110	0.140	27.08
55080.00	171.56	75.12	103.41	122.86	-550.00	20.000	84.06	0.39	-110	0.169	27.16
55100.00	172.51	76.45	103.41	124.29	-550.00	20.000	84.06	0.38	-110	0.197	27.24
55120.00	173.45	77.72	103.41	125.71	-550.00	20.000	84.06	0.37	-110	0.225	27.31
55140.00	174.37	78.93	103.41	127.14	-550.00	20.000	84.06	0.36	-110	0.251	27.39
55160.00	175.27	80.10	103.41	128.57	-550.00	20.000	84.06	0.35	-110	0.277	27.46
55180.00	176.16	81.22	103.41	130.00	-550.00	20.000	84.06	0.35	-110	0.303	27.53
55200.00	177.04	82.31	103.41	131.43	-550.00	20.000	84.06	0.34	-110	0.328	27.60
55220.00	177.91	83.35	103.41	132.86	-550.00	20.000	84.06	0.33	-110	0.352	27.66
55240.00	178.77	84.35	103.41	134.29	-550.00	20.000	84.06	0.32	-110	0.376	27.73
55260.00	179.62	85.32	103.41	135.71	-550.00	20.000	84.06	0.31	-110	0.399	27.79
55280.00	180.46	86.26	103.41	137.14	-550.00	20.000	84.06	0.31	-110	0.421	27.85
55300.00	181.29	87.16	103.41	138.57	-550.00	20.000	84.06	0.30	-110	0.443	27.91
55320.00	182.11	88.03	103.41	140.00	-550.00	20.000	84.06	0.29	-110	0.465	27.97
55340.00	182.93	88.88	103.41	141.43	-550.00	20.000	84.06	0.28	-110	0.485	28.03
55360.00	183.73	89.69	103.87	142.86	-554.98	20.000	84.06	0.28	-109	0.501	28.07
55380.00	184.53	90.48	110.00	144.29	-656.97	20.000	84.06	0.27	-92	0.440	27.95
55400.00	185.32	91.25	110.00	145.71	-804.89	20.000	84.06	0.27	-75	0.373	27.83
55420.00	186.11	91.99	110.00	147.14	-1038.76	20.000	84.06	0.26	-58	0.299	27.71



Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
55440.00	186.89	92.72	110.00	148.57	-1464.19	20.000	20.50	0.26	-41	0.219	27.58
55460.00	187.66	93.42	110.00	150.00	-2479.85	20.000	20.10	0.25	-24	0.133	27.46
55480.00	188.43	94.11	110.00	151.43	-8095.23	20.000	19.73	0.25	-7	0.042	27.33
55500.00	189.19	94.78	110.00	152.86	0.00	20.000	19.26	0.24	0	0.000	27.30
55520.00	189.95	95.43	110.00	154.29	0.00	20.000	18.75	0.23	0	0.000	27.35
55540.00	190.70	96.06	110.00	155.71	0.00	20.000	18.26	0.23	0	0.000	27.40
55560.00	191.45	96.66	110.00	157.14	0.00	20.000	17.80	0.22	0	0.000	27.44
55580.00	192.19	97.25	110.00	158.57	-9291.17	20.000	17.30	0.22	-21	-0.042	27.55
55600.00	192.93	97.81	110.00	160.00	-4460.72	20.000	16.82	0.21	-44	-0.086	27.67
55620.00	193.66	98.36	160.00	160.00	-2934.88	20.000	16.36	0.20	-67	-0.128	27.78
55640.00	194.39	98.89	160.00	160.00	-2186.85	20.000	15.92	0.20	-91	-0.167	27.90
55660.00	195.12	99.42	160.00	160.00	-1742.68	19.042	16.26	0.20	-114	-0.206	27.26
55680.00	195.84	99.95	160.00	160.00	-1448.48	17.730	16.88	0.21	-137	-0.242	26.34
55700.00	196.56	100.51	160.00	160.00	-1320.00	16.417	17.54	0.22	-150	-0.259	25.41
55720.00	197.28	101.09	160.00	160.00	-1320.00	15.105	18.25	0.23	-150	-0.252	24.42
55740.00	197.99	101.68	160.00	160.00	-1320.00	13.792	18.97	0.24	-150	-0.245	23.43
55760.00	198.69	102.29	160.00	160.00	-1320.00	12.480	19.68	0.25	-150	-0.237	22.45
55780.00	199.39	102.93	160.00	160.00	-1320.00	11.167	20.41	0.26	-150	-0.230	21.47
55800.00	200.09	103.58	160.00	160.00	-1320.00	9.855	21.13	0.26	-150	-0.222	20.50
55820.00	200.78	104.24	160.00	160.00	-1320.00	9.500	21.11	0.26	-150	-0.214	20.26
55840.00	201.47	104.89	160.00	160.00	-1320.00	9.500	20.83	0.26	-150	-0.206	20.31
55860.00	202.16	105.53	160.00	160.00	-1320.00	9.500	20.55	0.26	-150	-0.198	20.36
55880.00	202.84	106.15	160.00	160.00	-1320.00	9.500	20.28	0.25	-150	-0.190	20.41
55900.00	203.51	106.77	160.00	160.00	-1320.00	9.500	20.01	0.25	-150	-0.183	20.46
55920.00	204.19	107.37	160.00	160.00	-1320.00	9.500	19.75	0.25	-150	-0.175	20.51
55940.00	204.85	107.96	160.00	160.00	-1320.00	9.500	19.49	0.24	-150	-0.168	20.56
55960.00	205.52	108.54	160.00	160.00	-1320.00	9.500	19.23	0.24	-150	-0.160	20.61
55980.00	206.18	109.11	160.00	160.00	-1320.00	9.500	18.97	0.24	-150	-0.153	20.66
56000.00	206.84	109.66	160.00	160.00	-1320.00	9.500	18.70	0.23	-150	-0.146	20.70
56020.00	207.49	110.21	160.00	160.00	-1320.00	9.500	18.43	0.23	-150	-0.139	20.75
56040.00	208.15	110.75	160.00	160.00	-1320.00	9.500	18.17	0.23	-150	-0.132	20.80
56060.00	208.79	111.27	160.00	160.00	-1320.00	9.500	17.91	0.22	-150	-0.125	20.84
56080.00	209.44	111.79	160.00	160.00	-1412.19	9.500	17.68	0.22	-140	-0.111	20.85
56100.00	210.08	112.30	160.00	160.00	-1690.41	9.500	17.49	0.22	-117	-0.087	20.82
56120.00	210.72	112.80	160.00	160.00	-2105.17	9.500	17.32	0.22	-94	-0.066	20.79

Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
56140.00	211.36	113.29	160.00	160.00	-2789.62	9.500	17.14	0.21	-71	-0.047	20.76
56160.00	211.99	113.78	160.00	160.00	-4133.57	9.500	16.96	0.21	-48	-0.029	20.73
56180.00	212.63	114.26	160.00	160.00	-7976.30	9.500	16.79	0.21	-25	-0.014	20.70
56200.00	213.25	114.73	160.00	160.00	-113362.25	9.500	16.62	0.21	-2	-0.001	20.67
56220.00	213.88	115.20	160.00	160.00	0.00	9.500	16.39	0.20	0	0.000	20.71
56240.00	214.50	115.65	160.00	160.00	0.00	9.500	16.15	0.20	0	0.000	20.75
56260.00	215.13	116.10	160.00	160.00	0.00	9.500	15.92	0.20	0	0.000	20.79
56280.00	215.74	116.54	160.00	160.00	0.00	9.500	15.69	0.20	0	0.000	20.82
56300.00	216.36	116.98	160.00	160.00	0.00	9.500	15.47	0.19	0	0.000	20.86
56320.00	216.98	117.40	160.00	160.00	0.00	9.500	15.24	0.19	0	0.000	20.90
56340.00	217.59	117.82	160.00	160.00	0.00	9.500	15.02	0.19	0	0.000	20.94
56360.00	218.20	118.23	160.00	160.00	0.00	9.500	14.81	0.19	0	0.000	20.98
56380.00	218.81	118.63	160.00	160.00	0.00	9.500	14.60	0.18	0	0.000	21.01
56400.00	219.41	119.02	160.00	160.00	0.00	9.500	14.39	0.18	0	0.000	21.05
56420.00	220.02	119.41	160.00	160.00	0.00	9.500	14.18	0.18	0	0.000	21.08
56440.00	220.62	119.79	160.00	160.00	0.00	9.500	13.97	0.17	0	0.000	21.12
56460.00	221.22	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56480.00	221.82	119.99	160.00	160.00	0.00	9.500	13.87	0.17	0	0.000	21.14
56500.00	222.42	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56520.00	223.02	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56540.00	223.62	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56560.00	224.22	119.99	160.00	160.00	0.00	9.500	13.87	0.17	0	0.000	21.14
56580.00	224.82	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56600.00	225.42	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56620.00	226.02	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56640.00	226.62	119.99	160.00	160.00	0.00	9.500	13.87	0.17	0	0.000	21.14
56660.00	227.22	120.01	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56680.00	227.82	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56700.00	228.42	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56720.00	229.02	119.99	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56740.00	229.62	120.01	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56760.00	230.22	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56780.00	230.82	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56800.00	231.42	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56820.00	232.02	119.99	160.00	160.00	0.00	9.500	13.87	0.17	0	0.000	21.14

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
56840.00	232.62	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56860.00	233.22	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56880.00	233.82	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56900.00	234.42	119.99	160.00	160.00	0.00	9.500	13.87	0.17	0	0.000	21.14
56920.00	235.02	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56940.00	235.62	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
56960.00	236.22	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
56980.00	236.82	119.99	160.00	160.00	0.00	9.500	13.87	0.17	0	0.000	21.14
57000.00	237.42	120.01	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
57020.00	238.02	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
57040.00	238.62	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
57060.00	239.22	119.99	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
57080.00	239.82	120.01	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
57100.00	240.42	120.00	160.00	160.00	0.00	9.500	-21.14	-0.26	0	0.000	21.14
57120.00	241.02	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
57140.00	241.62	120.00	160.00	160.00	0.00	9.500	13.86	0.17	0	0.000	21.14
57160.00	242.22	119.99	160.00	160.00	46635.51	9.500	13.85	0.17	5	-0.005	21.15
57180.00	242.82	120.00	160.00	160.00	7403.06	9.500	-21.22	-0.27	32	-0.033	21.22
57200.00	243.42	120.00	160.00	160.00	4020.66	9.500	13.71	0.17	60	-0.062	21.29
57220.00	244.02	120.00	160.00	160.00	2759.75	9.500	-21.37	-0.27	87	-0.090	21.37
57240.00	244.62	119.99	160.00	160.00	2100.89	9.500	13.57	0.17	114	-0.118	21.44
57260.00	245.22	119.99	160.00	160.00	1695.99	9.500	13.49	0.17	142	-0.146	21.51
57280.00	245.82	120.00	160.00	160.00	1600.00	9.500	13.47	0.17	150	-0.155	21.53
57300.00	246.42	120.00	160.00	160.00	1600.00	9.500	13.47	0.17	150	-0.155	21.53
57320.00	247.02	120.00	160.00	160.00	1600.00	9.500	13.47	0.17	150	-0.155	21.53
57340.00	247.62	120.00	160.00	160.00	1600.00	9.500	-21.53	-0.27	150	-0.155	21.53
57360.00	248.22	120.00	160.00	160.00	1873.13	9.500	-21.47	-0.27	128	-0.132	21.47
57380.00	248.82	119.64	160.00	160.00	2379.65	9.500	13.79	-0.60	101	-0.107	21.37
57400.00	249.42	118.33	160.00	160.00	3261.65	9.500	14.55	-0.60	74	-0.085	21.18
57420.00	250.04	117.01	160.00	160.00	5182.50	9.500	15.32	-0.60	46	-0.058	20.99
57440.00	250.65	115.67	160.00	160.00	12607.05	9.500	16.08	-0.60	19	-0.026	20.80
57460.00	251.28	114.32	160.00	160.00	0.00	9.500	16.83	-0.60	0	0.000	20.63
57480.00	251.91	112.95	160.00	160.00	0.00	9.500	17.53	-0.60	0	0.000	20.51
57500.00	252.56	111.56	160.00	160.00	0.00	9.500	18.23	-0.60	0	0.000	20.39
57520.00	253.21	110.16	160.00	160.00	0.00	9.500	18.92	-0.60	0	0.000	20.27

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
57540.00	253.86	108.74	160.00	160.00	0.00	9.500	19.60	-0.60	0	0.000	20.15
57560.00	254.53	107.30	120.00	160.00	0.00	9.956	19.89	-0.60	0	0.000	20.39
57580.00	255.21	105.84	120.00	160.00	0.00	10.456	20.14	-0.60	0	0.000	20.66
57600.00	255.89	104.36	120.00	160.00	0.00	10.956	20.39	-0.60	0	0.000	20.93
57620.00	256.59	102.86	120.00	160.00	0.00	11.456	20.69	-0.60	0	0.000	21.21
57640.00	257.29	101.33	120.00	160.00	17647.75	11.956	21.03	-0.60	6	0.012	21.51
57660.00	258.01	99.79	120.00	160.00	2490.71	12.000	21.66	-0.60	41	0.078	21.65
57680.00	258.73	98.21	120.00	160.00	1339.91	12.000	22.48	-0.60	76	0.127	21.75
57700.00	259.47	96.62	120.00	160.00	916.47	12.000	23.41	-0.60	111	0.159	21.84
57720.00	260.22	94.99	120.00	160.00	725.00	12.000	24.50	-0.60	140	0.168	21.91
57740.00	260.99	93.34	120.00	160.00	725.00	12.000	25.83	-0.60	140	0.135	21.79
57760.00	261.77	91.66	120.00	160.00	725.00	12.000	27.16	-0.60	140	0.102	21.67
57780.00	262.56	89.95	120.00	160.00	725.00	12.000	28.48	-0.60	140	0.069	21.55
57800.00	263.37	88.20	120.00	160.00	725.00	12.000	29.70	-0.60	140	0.035	21.43
57820.00	264.19	86.42	120.00	160.00	725.00	12.000	30.91	-0.60	140	0.002	21.31
57840.00	265.04	84.60	120.00	160.00	725.00	12.000	32.09	-0.60	140	-0.031	21.19
57860.00	265.90	82.74	120.00	160.00	725.00	12.000	33.25	-0.60	140	-0.064	21.07
57880.00	266.78	80.84	120.00	160.00	725.00	12.000	34.42	-0.60	140	-0.097	20.95
57900.00	267.68	78.89	120.00	160.00	860.97	12.000	35.75	-0.60	118	-0.110	20.70
57920.00	268.60	76.89	120.00	160.00	1224.51	10.380	38.46	-0.60	83	-0.097	19.10
57940.00	269.55	74.84	120.00	160.00	2119.43	6.380	43.13	-0.60	48	-0.067	15.64
57960.00	270.53	72.74	120.00	160.00	7874.17	2.380	47.95	-0.60	13	-0.021	12.16
57980.00	271.53	70.56	120.00	160.00	0.00	0.000	51.54	-0.60	0	0.000	10.07
58000.00	272.57	68.32	120.00	160.00	0.00	0.000	53.40	-0.60	0	0.000	9.95
58020.00	273.64	66.01	120.00	160.00	0.00	0.000	55.62	-0.60	0	0.000	9.83
58040.00	274.75	63.61	120.00	160.00	0.00	0.000	58.27	-0.60	0	0.000	9.71
58060.00	275.91	61.11	120.00	160.00	0.00	0.000	61.20	-0.60	0	0.000	9.59
58080.00	277.11	58.51	120.00	160.00	5000.00	0.000	64.37	-0.60	0	0.053	9.60
58100.00	278.37	55.79	120.00	160.00	5000.00	0.000	68.11	-0.60	0	0.048	9.48
58120.00	279.69	52.93	120.00	160.00	0.00	0.000	72.55	-0.60	0	0.000	9.23
58140.00	281.09	49.90	120.00	160.00	0.00	0.000	77.61	-0.60	0	0.000	9.11
58160.00	282.59	46.68	120.00	160.00	2968.55	0.000	83.65	-0.60	32	-0.126	9.20
58180.00	284.19	43.22	120.00	160.00	1440.91	0.000	91.34	-0.60	67	-0.277	9.31
58200.00	285.93	39.45	120.00	160.00	951.34	0.000	100.59	-0.60	101	-0.445	9.41
58220.00	287.86	35.29	120.00	160.00	800.00	0.000	100.58	-0.60	120	-0.559	9.42

Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
58240.00	290.04	30.56	120.00	160.00	800.00	0.000	100.70	-0.60	120	-0.589	9.30
58260.00	292.64	24.95	120.00	160.00	800.00	0.000	100.83	-0.60	120	-0.619	9.17
58280.00	296.02	17.64	120.00	160.00	800.00	0.000	100.95	-0.61	120	-0.649	9.05
58300.00	303.78	0.00	120.00	0.00	800.00	0.000	101.07	0.00	120	-0.679	8.93
58300.00	333.78	0.00	120.00	0.00	800.00	0.000	101.07	0.00	0	0.000	8.93
58310.00	339.66	17.64	120.00	160.00	800.00	0.000	100.95	1.20	120	-0.649	9.05
58320.00	341.36	24.94	120.00	160.00	800.00	0.000	100.83	1.20	120	-0.619	9.17
58340.00	343.75	35.27	120.00	160.00	800.00	0.000	100.58	1.20	120	-0.559	9.42
58360.00	345.58	43.16	120.00	160.00	859.23	0.000	91.28	1.14	112	-0.465	9.60
58380.00	347.14	49.08	120.00	160.00	1239.63	0.000	78.71	0.98	77	-0.288	9.59
58400.00	348.54	53.78	120.00	160.00	2224.45	0.000	71.03	0.89	43	-0.144	9.55
58420.00	349.83	57.74	120.00	160.00	10821.66	0.000	65.50	0.82	9	-0.026	9.49
58440.00	351.04	61.19	120.00	160.00	0.00	0.000	61.12	0.76	0	0.000	9.59
58460.00	352.19	64.25	120.00	160.00	0.00	0.000	57.55	0.72	0	0.000	9.74
58480.00	353.29	67.01	120.00	160.00	0.00	0.000	54.61	0.68	0	0.000	9.88
58500.00	354.34	69.55	120.00	160.00	0.00	0.000	52.35	0.65	0	0.000	10.01
58520.00	355.36	71.90	120.00	160.00	0.00	0.000	50.53	0.63	0	0.000	10.14
58540.00	356.34	74.11	120.00	160.00	0.00	0.000	48.98	0.61	0	0.000	10.27
58560.00	357.30	76.19	120.00	160.00	0.00	0.000	47.61	0.60	0	0.000	10.39
58580.00	358.24	78.17	120.00	160.00	0.00	0.000	46.36	0.58	0	0.000	10.50
58600.00	359.15	80.08	120.00	160.00	0.00	-3.187	47.67	0.60	0	0.000	8.12
58620.00	360.03	82.02	120.00	160.00	0.00	-7.154	49.57	0.62	0	0.000	5.16
58640.00	360.90	84.00	120.00	160.00	0.00	-11.120	51.46	0.64	0	0.000	2.17
58660.00	361.75	85.96	160.00	160.00	0.00	-11.900	50.85	0.64	0	0.000	1.65
58680.00	362.58	87.83	160.00	160.00	0.00	-11.900	49.61	0.62	0	0.000	1.78
58700.00	363.39	89.62	160.00	160.00	0.00	-11.900	48.34	0.60	0	0.000	1.90
58720.00	364.18	91.33	160.00	160.00	0.00	-11.900	47.07	0.59	0	0.000	2.02
58740.00	364.97	92.96	160.00	160.00	0.00	-11.900	45.77	0.57	0	0.000	2.14
58760.00	365.73	94.52	160.00	160.00	0.00	-11.900	44.52	0.56	0	0.000	2.25
58780.00	366.49	96.01	160.00	160.00	0.00	-11.900	43.34	0.54	0	0.000	2.36
58800.00	367.23	97.45	160.00	160.00	0.00	-11.900	42.26	0.53	0	0.000	2.46
58820.00	367.97	98.82	160.00	160.00	0.00	-11.900	41.30	0.52	0	0.000	2.57
58840.00	368.69	100.16	160.00	160.00	0.00	-11.900	40.46	0.51	0	0.000	2.67
58860.00	369.41	101.44	160.00	160.00	0.00	-11.900	39.74	0.50	0	0.000	2.77
58880.00	370.11	102.70	160.00	160.00	0.00	-11.900	39.10	0.49	0	0.000	2.87

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
58900.00	370.81	103.89	160.00	160.00	0.00	-9.805	36.92	0.46	0	0.000	4.59
58920.00	371.50	105.00	160.00	160.00	0.00	-7.625	34.72	0.43	0	0.000	6.38
58940.00	372.18	106.03	160.00	160.00	0.00	-5.445	32.54	0.41	0	0.000	8.19
58960.00	372.86	106.99	160.00	160.00	0.00	-3.265	30.43	0.38	0	0.000	9.97
58980.00	373.53	107.88	160.00	160.00	0.00	-1.085	28.31	0.35	0	0.000	11.77
59000.00	374.19	108.71	160.00	160.00	0.00	-1.000	27.86	0.35	0	0.000	11.91
59020.00	374.85	109.54	160.00	160.00	0.00	-1.000	27.48	0.34	0	0.000	11.98
59040.00	375.50	110.34	160.00	160.00	0.00	-1.000	27.09	0.34	0	0.000	12.05
59060.00	376.16	111.13	160.00	160.00	0.00	-1.000	26.69	0.33	0	0.000	12.11
59080.00	376.80	111.90	160.00	160.00	0.00	-1.000	26.31	0.33	0	0.000	12.18
59100.00	377.44	112.65	160.00	160.00	0.00	-1.000	25.93	0.32	0	0.000	12.24
59120.00	378.08	113.39	160.00	160.00	0.00	-1.000	25.56	0.32	0	0.000	12.31
59140.00	378.71	114.11	160.00	160.00	0.00	-1.000	25.19	0.31	0	0.000	12.37
59160.00	379.34	114.82	160.00	160.00	0.00	-1.000	24.83	0.31	0	0.000	12.43
59180.00	379.97	115.51	160.00	160.00	-31317.38	-1.000	24.45	0.31	-6	-0.003	12.51
59200.00	380.59	116.19	160.00	160.00	-6734.86	-1.000	24.02	0.30	-29	-0.012	12.65
59220.00	381.21	116.85	160.00	160.00	-3773.14	-1.000	23.61	0.30	-52	-0.018	12.78
59240.00	381.82	117.50	160.00	160.00	-2620.67	-1.000	23.19	0.29	-76	-0.021	12.91
59260.00	382.43	118.13	160.00	160.00	-2007.50	-1.000	22.78	0.28	-99	-0.022	13.04
59280.00	383.04	118.75	160.00	160.00	-1626.86	-1.000	22.39	0.28	-122	-0.020	13.17
59300.00	383.64	119.35	160.00	160.00	-1367.56	-1.000	21.99	0.27	-145	-0.016	13.30
59320.00	384.25	119.97	160.00	160.00	-1320.00	-3.210	23.37	0.29	-150	-0.008	11.64
59340.00	384.85	120.01	160.00	160.00	-1320.00	-5.432	25.08	0.31	-150	-0.007	9.92
59360.00	385.45	120.00	160.00	160.00	-1320.00	-7.655	-8.18	-0.10	-150	-0.007	8.18
59380.00	386.05	120.01	160.00	160.00	-1320.00	-9.877	-6.44	-0.08	-150	-0.007	6.44
59400.00	386.65	120.00	160.00	160.00	-1320.00	-12.099	-4.69	-0.06	-150	-0.007	4.69
59420.00	387.25	120.01	160.00	160.00	-1320.00	-14.321	-2.95	-0.04	-150	-0.007	2.95
59440.00	387.85	120.01	160.00	160.00	-1320.00	-16.543	-1.21	-0.02	-150	-0.007	1.21
59460.00	388.45	120.01	160.00	160.00	-1320.00	-18.766	0.54	0.01	-150	-0.007	-0.54
59480.00	389.05	120.04	160.00	160.00	-1320.00	-20.000	1.53	0.02	-150	-0.007	-1.53
59500.00	389.65	120.08	160.00	160.00	-1320.00	-20.000	1.53	0.02	-150	-0.006	-1.53
59520.00	390.24	120.12	160.00	160.00	-1320.00	-20.000	1.53	0.02	-150	-0.006	-1.53
59540.00	390.84	120.16	160.00	160.00	-1320.00	-20.000	1.52	0.02	-150	-0.005	-1.52
59560.00	391.44	120.20	160.00	160.00	-1320.00	-20.000	1.52	0.02	-150	-0.004	-1.52
59580.00	392.04	120.24	160.00	160.00	-1320.00	-20.000	1.51	0.02	-150	-0.004	-1.51



Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68544.791  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
59600.00	392.64	120.29	160.00	160.00	-1320.00	-20.000	1.51	0.02	-150	-0.003	-1.51
59620.00	393.24	120.33	160.00	160.00	-1320.00	-20.000	1.51	0.02	-150	-0.003	-1.51
59640.00	393.84	120.37	160.00	160.00	-1320.00	-20.000	1.50	0.02	-150	-0.002	-1.50
59660.00	394.44	120.41	160.00	160.00	-1320.00	-20.000	1.50	0.02	-150	-0.002	-1.50
59680.00	395.03	120.45	160.00	160.00	-1320.00	-20.000	1.50	0.02	-150	-0.001	-1.50
59700.00	395.63	120.49	160.00	160.00	-1320.00	-20.000	1.49	0.02	-150	-0.001	-1.49
59720.00	396.23	120.53	160.00	160.00	-1320.00	-20.000	1.49	0.02	-150	0.000	-1.49
59740.00	396.83	120.57	160.00	160.00	-1320.00	-20.000	1.49	0.02	-150	0.001	-1.49
59760.00	397.42	120.61	160.00	160.00	-1320.00	-20.000	1.48	0.02	-150	0.001	-1.48
59780.00	398.02	120.65	160.00	160.00	-1320.00	-20.000	1.48	0.02	-150	0.002	-1.48
59800.00	398.62	120.69	160.00	160.00	-1320.00	-20.000	1.47	0.02	-150	0.002	-1.47
59820.00	399.21	120.73	160.00	160.00	-1320.00	-20.000	1.47	0.02	-150	0.003	-1.47
59840.00	399.81	120.77	160.00	160.00	-1320.00	-20.000	1.47	0.02	-150	0.003	-1.47
59860.00	400.41	120.80	160.00	160.00	-1320.00	-20.000	1.46	0.02	-150	0.004	-1.46
59880.00	401.00	120.84	160.00	160.00	-1320.00	-20.000	1.46	0.02	-150	0.005	-1.46
59900.00	401.60	120.88	160.00	160.00	-1320.00	-20.000	1.46	0.02	-150	0.005	-1.46
59920.00	402.19	120.92	160.00	160.00	-1320.00	-20.000	1.45	0.02	-150	0.006	-1.45
59940.00	402.79	120.96	160.00	160.00	-1320.00	-20.000	1.45	0.02	-150	0.006	-1.45
59960.00	403.38	121.00	160.00	160.00	-1320.00	-20.000	1.45	0.02	-150	0.007	-1.45
59980.00	403.98	121.04	160.00	160.00	-1320.00	-20.000	1.44	0.02	-150	0.007	-1.44
60000.00	404.57	121.08	160.00	160.00	-1320.00	-20.000	1.44	0.02	-150	0.008	-1.44
60020.00	405.17	121.12	160.00	160.00	-1320.00	-20.000	1.43	0.02	-150	0.008	-1.43
60040.00	405.76	121.15	160.00	160.00	-1320.00	-20.000	1.43	0.02	-150	0.009	-1.43
60060.00	406.36	121.19	160.00	160.00	-1320.00	-20.000	1.43	0.02	-150	0.009	-1.43
60080.00	406.95	121.23	160.00	160.00	-1320.00	-20.000	1.42	0.02	-150	0.010	-1.42
60100.00	407.54	121.27	160.00	160.00	-1320.00	-20.000	1.42	0.02	-150	0.011	-1.42
60120.00	408.14	121.31	160.00	160.00	-1320.00	-20.000	1.42	0.02	-150	0.011	-1.42
60140.00	408.73	121.34	160.00	160.00	-1320.00	-20.000	1.41	0.02	-150	0.012	-1.41
60160.00	409.32	121.38	160.00	160.00	-1320.00	-20.000	1.41	0.02	-150	0.012	-1.41
60180.00	409.92	121.41	160.00	160.00	-1320.00	-19.135	0.73	0.01	-150	0.013	-0.73
60200.00	410.51	121.42	160.00	160.00	-1320.00	-17.477	-0.57	-0.01	-150	0.013	0.57
60220.00	411.10	121.38	160.00	160.00	-1320.00	-15.819	-1.87	-0.02	-150	0.012	1.87
60240.00	411.70	121.32	160.00	160.00	-1320.00	-14.161	-3.16	-0.04	-150	0.011	3.16
60260.00	412.29	121.22	160.00	160.00	-1320.00	-13.368	-3.78	-0.05	-150	0.010	3.78
60280.00	412.88	121.12	160.00	160.00	-1320.00	-13.368	-3.77	-0.05	-150	0.008	3.77

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final.....: 68544.791  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
60300.00	413.48	121.02	160.00	160.00	-1320.00	-13.368	-3.76	-0.05	-150	0.007	3.76
60320.00	414.07	120.92	160.00	160.00	-1320.00	-13.368	-3.75	-0.05	-150	0.006	3.75
60340.00	414.67	120.82	160.00	160.00	-1320.00	-13.368	-3.74	-0.05	-150	0.004	3.74
60360.00	415.27	120.72	160.00	160.00	-1320.00	-13.368	-3.73	-0.05	-150	0.003	3.73
60380.00	415.86	120.62	160.00	160.00	-1320.00	-13.368	-3.72	-0.05	-150	0.001	3.72
60400.00	416.46	120.52	160.00	160.00	-1320.00	-13.368	-3.72	-0.05	-150	-0.000	3.72
60420.00	417.06	120.42	160.00	160.00	-1320.00	-13.368	-3.71	-0.05	-150	-0.001	3.71
60440.00	417.66	120.32	160.00	160.00	-1320.00	-13.368	-3.70	-0.05	-150	-0.003	3.70
60460.00	418.25	120.22	160.00	160.00	-1320.00	-13.368	-3.69	-0.05	-150	-0.004	3.69
60480.00	418.85	120.12	160.00	160.00	-1320.00	-13.368	-3.68	-0.05	-150	-0.006	3.68
60500.00	419.45	120.02	160.00	160.00	-1320.00	-13.368	-3.67	-0.05	-150	-0.007	3.67
60520.00	420.05	120.00	160.00	160.00	-1320.00	-13.368	-3.67	-0.05	-150	-0.007	3.67
60540.00	420.65	120.01	160.00	160.00	-1320.00	-13.368	-3.67	-0.05	-150	-0.007	3.67
60560.00	421.25	120.01	160.00	160.00	-1320.00	-13.368	-3.67	-0.05	-150	-0.007	3.67
60580.00	421.85	120.00	160.00	160.00	-1320.00	-13.368	-3.67	-0.05	-150	-0.007	3.67
60600.00	422.45	120.01	160.00	160.00	-1320.00	-13.368	31.33	0.39	-150	-0.007	3.67
60620.00	423.05	120.01	160.00	160.00	-1338.16	-13.368	-3.66	-0.05	-148	-0.007	3.66
60640.00	423.65	120.00	160.00	160.00	-1585.43	-13.368	-3.59	-0.04	-125	-0.006	3.59
60660.00	424.25	120.00	160.00	160.00	-1944.79	-13.368	-3.52	-0.04	-102	-0.005	3.52
60680.00	424.85	120.00	160.00	160.00	-2514.80	-13.368	-3.44	-0.04	-79	-0.004	3.44
60700.00	425.45	120.01	160.00	160.00	-3557.51	-13.368	-3.37	-0.04	-56	-0.003	3.37
60720.00	426.05	120.01	160.00	160.00	-6077.36	-13.368	-3.30	-0.04	-33	-0.002	3.30
60740.00	426.65	120.00	160.00	160.00	-20835.52	-13.368	-3.22	-0.04	-10	-0.000	3.22
60760.00	427.25	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60780.00	427.85	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60800.00	428.45	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60820.00	429.05	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60840.00	429.65	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60860.00	430.25	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60880.00	430.85	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60900.00	431.45	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60920.00	432.05	120.01	160.00	160.00	0.00	-13.368	31.81	0.40	0	0.000	3.19
60940.00	432.65	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60960.00	433.25	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
60980.00	433.85	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
61000.00	434.45	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61020.00	435.05	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61040.00	435.65	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61060.00	436.25	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61080.00	436.85	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61100.00	437.45	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61120.00	438.05	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61140.00	438.65	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61160.00	439.25	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61180.00	439.85	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61200.00	440.45	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61220.00	441.05	120.01	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61240.00	441.65	120.00	160.00	160.00	0.00	-13.368	-3.19	-0.04	0	0.000	3.19
61260.00	442.25	120.01	160.00	160.00	0.00	-13.368	31.81	0.40	0	0.000	3.19
61280.00	442.85	120.01	160.00	160.00	0.00	-13.447	-3.13	-0.04	0	0.000	3.13
61300.00	443.45	120.00	160.00	160.00	0.00	-13.678	-2.95	-0.04	0	0.000	2.95
61320.00	444.05	120.00	160.00	160.00	0.00	-13.908	-2.77	-0.03	0	0.000	2.77
61340.00	444.65	120.01	160.00	160.00	0.00	-14.138	-2.59	-0.03	0	0.000	2.59
61360.00	445.25	120.01	160.00	160.00	0.00	-14.369	-2.41	-0.03	0	0.000	2.41
61380.00	445.85	120.01	160.00	160.00	0.00	-14.599	-2.23	-0.03	0	0.000	2.23
61400.00	446.45	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61420.00	447.05	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61440.00	447.65	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61460.00	448.25	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61480.00	448.85	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61500.00	449.45	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61520.00	450.05	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61540.00	450.65	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61560.00	451.25	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61580.00	451.85	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61600.00	452.45	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61620.00	453.05	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61640.00	453.65	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61660.00	454.25	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61680.00	454.85	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11

Istram 23.05.05.10 19/02/24 12:52:49 200356

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
61700.00	455.45	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61720.00	456.05	120.01	160.00	160.00	0.00	-14.750	32.89	0.41	0	0.000	2.11
61740.00	456.65	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61760.00	457.25	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61780.00	457.85	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61800.00	458.45	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61820.00	459.05	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61840.00	459.65	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61860.00	460.25	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61880.00	460.85	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61900.00	461.45	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61920.00	462.05	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61940.00	462.65	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61960.00	463.25	120.01	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
61980.00	463.85	120.01	160.00	160.00	0.00	-14.750	32.89	0.41	0	0.000	2.11
62000.00	464.45	120.00	160.00	160.00	0.00	-14.750	-2.11	-0.03	0	0.000	2.11
62020.00	465.05	120.01	160.00	160.00	10895.71	-14.750	-2.16	-0.03	18	-0.001	2.16
62040.00	465.65	120.01	160.00	160.00	4800.09	-14.750	32.76	0.41	41	-0.002	2.24
62060.00	466.25	120.00	160.00	160.00	3078.06	-14.750	-2.31	-0.03	64	-0.003	2.31
62080.00	466.85	120.00	160.00	160.00	2265.37	-14.750	-2.38	-0.03	87	-0.004	2.38
62100.00	467.45	120.01	160.00	160.00	1792.18	-14.750	-2.46	-0.03	110	-0.005	2.46
62120.00	468.05	120.01	160.00	160.00	1482.51	-14.750	-2.53	-0.03	134	-0.006	2.53
62140.00	468.65	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62160.00	469.25	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62180.00	469.85	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62200.00	470.45	120.01	160.00	160.00	1320.00	-14.750	32.42	0.41	150	-0.007	2.58
62220.00	471.05	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62240.00	471.65	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62260.00	472.25	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62280.00	472.85	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62300.00	473.45	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62320.00	474.05	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62340.00	474.65	120.01	160.00	160.00	1320.00	-14.750	32.42	0.41	150	-0.007	2.58
62360.00	475.25	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62380.00	475.85	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58

Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
62400.00	476.45	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62420.00	477.05	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62440.00	477.65	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62460.00	478.25	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62480.00	478.85	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62500.00	479.45	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62520.00	480.05	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62540.00	480.65	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62560.00	481.25	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62580.00	481.85	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62600.00	482.45	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62620.00	483.05	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62640.00	483.65	120.01	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62660.00	484.25	120.00	160.00	160.00	1320.00	-14.750	-2.58	-0.03	150	-0.007	2.58
62680.00	484.85	120.00	160.00	160.00	1320.00	-13.849	-3.27	-0.04	150	-0.007	3.27
62700.00	485.45	120.01	160.00	160.00	1320.00	-11.890	-4.80	-0.06	150	-0.007	4.80
62720.00	486.05	120.01	160.00	160.00	1320.00	-9.932	28.66	0.36	150	-0.007	6.34
62740.00	486.65	120.01	160.00	160.00	1525.98	-7.974	27.19	0.34	130	-0.006	7.81
62760.00	487.25	120.00	160.00	160.00	1856.09	-6.015	-9.28	-0.12	107	-0.005	9.28
62780.00	487.85	120.00	160.00	160.00	2368.46	-4.057	-10.74	-0.13	84	-0.004	10.74
62800.00	488.45	120.01	160.00	160.00	3271.55	-3.000	23.48	0.29	61	-0.003	11.52
62820.00	489.05	119.99	160.00	160.00	5287.77	-3.000	-11.45	-0.14	37	-0.002	11.45
62840.00	489.65	120.00	160.00	160.00	13780.65	-3.000	-11.38	-0.14	14	-0.001	11.38
62860.00	490.25	120.01	160.00	160.00	0.00	-3.000	23.67	0.30	0	0.000	11.33
62880.00	490.85	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
62900.00	491.45	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
62920.00	492.05	120.01	160.00	160.00	0.00	-3.000	23.67	0.30	0	0.000	11.33
62940.00	492.65	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
62960.00	493.25	120.01	160.00	160.00	0.00	-3.000	23.67	0.30	0	0.000	11.33
62980.00	493.85	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
63000.00	494.45	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
63020.00	495.05	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
63040.00	495.65	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
63060.00	496.25	120.01	160.00	160.00	0.00	-3.000	23.67	0.30	0	0.000	11.33
63080.00	496.85	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33

Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
63100.00	497.45	120.01	160.00	160.00	0.00	-3.000	23.67	0.30	0	0.000	11.33
63120.00	498.05	120.00	160.00	160.00	0.00	-4.841	-9.91	-0.12	0	0.000	9.91
63140.00	498.65	120.01	160.00	160.00	0.00	-6.891	26.70	0.33	0	0.000	8.30
63160.00	499.25	120.00	160.00	160.00	0.00	-8.941	-6.69	-0.08	0	0.000	6.69
63180.00	499.85	120.01	160.00	160.00	0.00	-10.991	29.92	0.37	0	0.000	5.08
63200.00	500.45	120.01	160.00	160.00	0.00	-13.041	-3.48	-0.04	0	0.000	3.48
63220.00	501.05	120.01	160.00	160.00	0.00	-15.091	33.13	0.41	0	0.000	1.87
63240.00	501.65	120.00	160.00	160.00	0.00	-15.300	-1.68	-0.02	0	0.000	1.68
63260.00	502.25	120.00	160.00	160.00	0.00	-15.300	-1.68	-0.02	0	0.000	1.68
63280.00	502.85	120.00	160.00	160.00	0.00	-15.300	-1.68	-0.02	0	0.000	1.68
63300.00	503.45	120.01	160.00	160.00	0.00	-15.300	-1.68	-0.02	0	0.000	1.68
63320.00	504.05	120.01	160.00	160.00	0.00	-15.300	-1.68	-0.02	0	0.000	1.68
63340.00	504.65	120.01	160.00	160.00	0.00	-15.300	-1.68	-0.02	0	0.000	1.68
63360.00	505.25	120.01	160.00	160.00	-9790.04	-15.300	-1.74	-0.02	-17	0.016	1.74
63380.00	505.85	120.01	160.00	160.00	-4021.48	-15.300	-1.83	-0.02	-42	0.040	1.83
63400.00	506.45	120.01	160.00	160.00	-2530.46	-15.300	-1.92	-0.02	-66	0.063	1.92
63420.00	507.05	120.00	160.00	160.00	-1846.02	-15.300	-2.01	-0.03	-91	0.087	2.01
63440.00	507.65	120.01	160.00	160.00	-1453.01	-15.300	-2.11	-0.03	-116	0.110	2.11
63460.00	508.25	120.01	152.61	160.00	-1197.97	-15.300	32.80	0.41	-140	0.134	2.20
63480.00	508.85	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.152	2.27
63500.00	509.45	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63520.00	510.05	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63540.00	510.65	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63560.00	511.25	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63580.00	511.85	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63600.00	512.45	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63620.00	513.05	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63640.00	513.65	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63660.00	514.25	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.152	2.27
63680.00	514.85	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63700.00	515.45	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63720.00	516.05	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63740.00	516.65	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63760.00	517.25	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63780.00	517.85	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27

Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
63800.00	518.45	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63820.00	519.05	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63840.00	519.65	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63860.00	520.25	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.152	2.27
63880.00	520.85	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63900.00	521.45	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63920.00	522.05	120.00	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63940.00	522.65	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63960.00	523.25	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
63980.00	523.85	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
64000.00	524.45	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
64020.00	525.05	120.01	160.00	160.00	-1050.00	-15.300	-2.27	-0.03	-160	0.153	2.27
64040.00	525.65	120.01	160.00	160.00	-1113.58	-15.300	32.76	0.41	-151	0.144	2.24
64060.00	526.25	120.00	160.00	160.00	-1330.70	-15.300	-2.15	-0.03	-126	0.120	2.15
64080.00	526.85	120.01	160.00	160.00	-1652.99	-15.300	-2.06	-0.03	-102	0.097	2.06
64100.00	527.45	120.00	160.00	160.00	-2181.29	-15.300	-1.97	-0.02	-77	0.073	1.97
64120.00	528.05	120.01	160.00	160.00	-3205.91	-15.300	-1.87	-0.02	-52	0.050	1.87
64140.00	528.65	120.01	160.00	160.00	-6045.80	-14.873	-2.09	-0.03	-28	0.027	2.09
64160.00	529.25	120.01	160.00	160.00	-52955.02	-12.697	-3.70	-0.05	-3	0.003	3.70
64180.00	529.85	120.01	160.00	160.00	0.00	-10.520	29.60	0.37	0	0.000	5.40
64200.00	530.45	120.00	160.00	160.00	0.00	-8.344	-7.11	-0.09	0	0.000	7.11
64220.00	531.05	120.01	160.00	160.00	0.00	-6.168	-8.82	-0.11	0	0.000	8.82
64240.00	531.65	120.00	160.00	160.00	0.00	-3.991	-10.52	-0.13	0	0.000	10.52
64260.00	532.25	120.00	160.00	160.00	0.00	-1.815	-12.23	-0.15	0	0.000	12.23
64280.00	532.85	120.01	160.00	160.00	0.00	-1.153	22.22	0.28	0	0.000	12.78
64300.00	533.45	120.01	160.00	160.00	0.00	-1.153	22.22	0.28	0	0.000	12.78
64320.00	534.05	120.00	160.00	160.00	0.00	-1.153	-12.78	-0.16	0	0.000	12.78
64340.00	534.65	120.00	160.00	160.00	0.00	-1.153	-12.78	-0.16	0	0.000	12.78
64360.00	535.25	120.00	160.00	160.00	0.00	-1.153	-12.78	-0.16	0	0.000	12.78
64380.00	535.85	120.00	160.00	160.00	0.00	-1.153	-12.78	-0.16	0	0.000	12.78
64400.00	536.45	120.00	160.00	160.00	0.00	-1.153	-12.78	-0.16	0	0.000	12.78
64420.00	537.05	120.00	160.00	160.00	0.00	-1.153	-12.78	-0.16	0	0.000	12.78
64440.00	537.65	120.00	160.00	160.00	0.00	-1.153	-12.78	-0.16	0	0.000	12.78
64460.00	538.25	120.01	160.00	160.00	0.00	-1.153	22.22	0.28	0	0.000	12.78
64480.00	538.85	120.01	160.00	160.00	0.00	-1.153	22.22	0.28	0	0.000	12.78

Istram 23.05.05.10 19/02/24 12:52:49 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. crecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 52700.000  
 P.K. Final...: 68544.791  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
64500.00	539.45	120.01	160.00	160.00	-206140.64	-1.153	22.22	0.28	-2	-0.005	12.78
64520.00	540.05	120.01	160.00	160.00	-12228.81	-1.153	22.17	0.28	-32	-0.090	12.83
64540.00	540.65	120.01	160.00	160.00	-6301.31	-1.153	22.12	0.28	-62	-0.174	12.88
64560.00	541.25	120.01	160.00	160.00	-4244.12	-1.153	22.08	0.28	-92	-0.258	12.92
64580.00	541.85	120.00	160.00	160.00	-3199.56	-1.153	-12.97	-0.16	-122	-0.343	12.97
64600.00	542.45	120.00	160.00	160.00	-2600.00	-1.153	-13.02	-0.16	-150	-0.422	13.02
64620.00	543.05	119.99	160.00	160.00	-2600.00	-1.153	-13.02	-0.16	-150	-0.422	13.02
64640.00	543.65	120.01	160.00	160.00	-2600.00	-1.153	21.98	0.27	-150	-0.422	13.02
64660.00	544.25	120.00	160.00	160.00	-2600.00	-1.153	-13.02	-0.16	-150	-0.422	13.02
64680.00	544.85	120.00	160.00	160.00	-2600.00	-1.153	-13.02	-0.16	-150	-0.422	13.02
64700.00	545.45	120.01	160.00	160.00	-2600.00	-1.153	21.98	0.27	-150	-0.422	13.02
64720.00	546.05	120.00	160.00	160.00	-2600.00	-1.169	-13.02	-0.16	-150	-0.422	13.02
64740.00	546.65	120.00	160.00	160.00	-2600.00	-3.143	-11.48	-0.14	-150	-0.422	11.48
64760.00	547.25	120.00	160.00	160.00	-3009.44	-5.118	-9.90	-0.12	-130	-0.364	9.90
64780.00	547.85	120.00	160.00	160.00	-3915.96	-7.092	-8.30	-0.10	-100	-0.280	8.30
64800.00	548.45	120.00	160.00	160.00	-5604.06	-9.067	-6.71	-0.08	-70	-0.196	6.71
64820.00	549.05	120.00	160.00	160.00	-9850.38	-11.041	-5.11	-0.06	-40	-0.111	5.11
64840.00	549.65	120.01	160.00	160.00	-40657.22	-13.000	31.49	0.39	-10	-0.027	3.51
64860.00	550.25	120.01	160.00	160.00	12612.94	-13.000	31.47	0.39	16	-0.001	3.53
64880.00	550.85	120.01	160.00	160.00	5106.37	-13.000	-3.60	-0.05	39	-0.002	3.60
64900.00	551.45	120.01	160.00	160.00	3201.19	-13.000	-3.68	-0.05	62	-0.003	3.68
64920.00	552.05	120.00	160.00	160.00	2331.36	-13.000	-3.75	-0.05	85	-0.004	3.75
64940.00	552.65	120.01	160.00	160.00	1833.23	-13.000	-3.82	-0.05	108	-0.005	3.82
64960.00	553.25	120.00	160.00	160.00	1510.50	-13.000	-3.90	-0.05	131	-0.006	3.90
64980.00	553.85	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65000.00	554.45	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65020.00	555.05	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65040.00	555.65	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65060.00	556.25	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65080.00	556.85	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65100.00	557.45	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65120.00	558.05	120.01	160.00	160.00	1320.00	-13.000	31.04	0.39	150	-0.007	3.96
65140.00	558.65	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65160.00	559.25	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65180.00	559.85	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96



PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

\*\*\*\*\*  
\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
65200.00	560.45	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65220.00	561.05	120.01	160.00	160.00	1320.00	-13.000	31.04	0.39	150	-0.007	3.96
65240.00	561.65	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65260.00	562.25	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65280.00	562.85	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65300.00	563.45	120.01	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65320.00	564.05	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65340.00	564.65	120.00	160.00	160.00	1320.00	-13.000	-3.96	-0.05	150	-0.007	3.96
65360.00	565.25	120.01	160.00	160.00	1320.00	-12.807	-4.09	-0.05	150	-0.007	4.09
65380.00	565.85	120.00	160.00	160.00	1320.00	-11.141	-5.39	-0.07	150	-0.007	5.39
65400.00	566.45	120.00	160.00	160.00	1320.00	-9.474	-6.70	-0.08	150	-0.007	6.70
65420.00	567.05	120.00	160.00	160.00	1320.00	-7.807	-8.01	-0.10	150	-0.007	8.01
65440.00	567.65	120.01	160.00	160.00	1320.00	-6.141	-9.32	-0.12	150	-0.007	9.32
65460.00	568.25	120.00	160.00	160.00	1320.00	-4.474	-10.63	-0.13	150	-0.007	10.63
65480.00	568.85	120.00	160.00	160.00	1320.00	-3.000	-11.80	-0.15	150	-0.007	11.80
65500.00	569.45	119.99	160.00	160.00	1376.45	-3.000	-11.79	-0.15	144	-0.007	11.79
65520.00	570.05	120.01	160.00	160.00	1639.45	-3.000	23.29	0.29	121	-0.006	11.71
65540.00	570.65	120.01	160.00	160.00	2026.72	-3.000	23.36	0.29	98	-0.005	11.64
65560.00	571.25	120.01	160.00	160.00	2653.51	-3.000	23.43	0.29	75	-0.004	11.57
65580.00	571.85	120.00	160.00	160.00	3841.59	-3.000	-11.49	-0.14	52	-0.003	11.49
65600.00	572.45	120.00	160.00	160.00	6956.11	-3.000	-11.42	-0.14	28	-0.001	11.42
65620.00	573.05	120.00	160.00	160.00	36753.29	-3.000	-11.35	-0.14	5	-0.000	11.35
65640.00	573.65	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
65660.00	574.25	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
65680.00	574.85	120.01	160.00	160.00	0.00	-3.000	23.67	0.30	0	0.000	11.33
65700.00	575.45	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
65720.00	576.05	120.01	160.00	160.00	0.00	-3.000	23.67	0.30	0	0.000	11.33
65740.00	576.65	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
65760.00	577.25	120.00	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
65780.00	577.85	120.01	160.00	160.00	0.00	-3.000	-11.33	-0.14	0	0.000	11.33
65800.00	578.45	120.01	160.00	160.00	0.00	-4.164	24.57	0.31	0	0.000	10.43
65820.00	579.05	120.01	160.00	160.00	0.00	-5.498	25.62	0.32	0	0.000	9.39
65840.00	579.65	120.01	160.00	160.00	0.00	-6.831	-8.34	-0.10	0	0.000	8.34
65860.00	580.25	120.00	160.00	160.00	0.00	-8.164	-7.29	-0.09	0	0.000	7.29
65880.00	580.85	120.01	160.00	160.00	0.00	-9.498	-6.25	-0.08	0	0.000	6.25

PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
65900.00	581.45	120.01	160.00	160.00	0.00	-10.831	-5.20	-0.07	0	0.000	5.20
65920.00	582.05	120.00	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
65940.00	582.65	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
65960.00	583.25	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
65980.00	583.85	120.00	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66000.00	584.45	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66020.00	585.05	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66040.00	585.65	120.00	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66060.00	586.25	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66080.00	586.85	120.01	160.00	160.00	0.00	-11.000	29.95	0.37	0	0.000	5.05
66100.00	587.45	120.00	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66120.00	588.05	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66140.00	588.65	120.01	160.00	160.00	0.00	-11.000	29.95	0.37	0	0.000	5.05
66160.00	589.25	120.00	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66180.00	589.85	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66200.00	590.45	120.01	160.00	160.00	0.00	-11.000	29.95	0.37	0	0.000	5.05
66220.00	591.05	120.00	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66240.00	591.65	120.01	160.00	160.00	0.00	-11.000	-5.05	-0.06	0	0.000	5.05
66260.00	592.25	120.01	160.00	160.00	-22016.93	-11.000	29.92	0.37	-14	-0.027	5.08
66280.00	592.85	120.00	160.00	160.00	-5867.87	-11.000	-5.16	-0.06	-51	-0.100	5.16
66300.00	593.45	120.00	160.00	160.00	-3385.02	-11.000	-5.23	-0.07	-89	-0.173	5.23
66320.00	594.05	120.00	160.00	160.00	-2378.58	-11.000	-5.31	-0.07	-126	-0.247	5.31
66340.00	594.64	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66360.00	595.24	120.01	160.00	160.00	-2000.00	-11.000	29.64	0.37	-150	-0.293	5.36
66380.00	595.84	120.01	160.00	160.00	-2000.00	-11.000	-5.37	-0.07	-150	-0.293	5.37
66400.00	596.44	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66420.00	597.04	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66440.00	597.64	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66460.00	598.24	120.01	160.00	160.00	-2000.00	-11.000	29.64	0.37	-150	-0.293	5.36
66480.00	598.84	120.01	160.00	160.00	-2000.00	-11.000	-5.37	-0.07	-150	-0.293	5.37
66500.00	599.44	120.01	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66520.00	600.04	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66540.00	600.64	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66560.00	601.24	120.01	160.00	160.00	-2000.00	-11.000	29.64	0.37	-150	-0.293	5.36
66580.00	601.84	120.01	160.00	160.00	-2000.00	-11.000	-5.37	-0.07	-150	-0.293	5.37

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

\*\*\*\*\*  
\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
66600.00	602.44	120.01	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.293	5.36
66620.00	603.04	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66640.00	603.64	120.00	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.294	5.36
66660.00	604.24	120.01	160.00	160.00	-2000.00	-11.000	29.64	0.37	-150	-0.293	5.36
66680.00	604.84	120.01	160.00	160.00	-2000.00	-11.000	-5.37	-0.07	-150	-0.293	5.37
66700.00	605.44	120.01	160.00	160.00	-2000.00	-11.000	-5.36	-0.07	-150	-0.293	5.36
66720.00	606.04	120.00	160.00	160.00	-2000.00	-10.580	-5.68	-0.07	-150	-0.294	5.68
66740.00	606.64	120.01	160.00	160.00	-2000.00	-9.884	28.77	0.36	-150	-0.293	6.23
66760.00	607.24	120.01	160.00	160.00	-2000.00	-9.188	28.22	0.35	-150	-0.293	6.78
66780.00	607.84	120.01	160.00	160.00	-2000.00	-8.492	-7.32	-0.09	-150	-0.293	7.32
66800.00	608.44	120.01	160.00	160.00	-2000.00	-7.796	-7.87	-0.10	-150	-0.293	7.87
66820.00	609.04	120.01	160.00	160.00	-2000.00	-7.100	26.59	0.33	-150	-0.293	8.42
66840.00	609.64	120.01	160.00	160.00	-2000.00	-6.650	26.22	0.33	-150	-0.293	8.78
66860.00	610.24	120.01	160.00	160.00	-2185.48	-6.650	26.25	0.33	-137	-0.269	8.75
66880.00	610.84	120.01	160.00	160.00	-3006.93	-6.650	26.33	0.33	-100	-0.195	8.67
66900.00	611.44	120.00	160.00	160.00	-4817.76	-6.650	-8.60	-0.11	-62	-0.122	8.60
66920.00	612.04	120.00	160.00	160.00	-12111.60	-6.650	-8.52	-0.11	-25	-0.048	8.52
66940.00	612.64	120.01	160.00	160.00	0.00	-6.650	26.54	0.33	0	0.000	8.46
66960.00	613.24	120.00	160.00	160.00	0.00	-6.650	-8.46	-0.11	0	0.000	8.46
66980.00	613.84	120.01	160.00	160.00	22803.23	-6.892	26.69	0.33	6	0.013	8.31
67000.00	614.44	120.00	160.00	160.00	5457.73	-7.722	-7.75	-0.10	26	0.055	7.75
67020.00	615.04	120.00	160.00	160.00	3099.82	-8.552	-7.18	-0.09	46	0.096	7.18
67040.00	615.64	120.01	160.00	160.00	2164.63	-9.381	-6.62	-0.08	66	0.138	6.62
67060.00	616.24	120.01	160.00	160.00	2050.00	-10.211	-5.99	-0.07	70	0.146	5.99
67080.00	616.84	120.01	160.00	160.00	2050.00	-11.041	29.66	0.37	70	0.146	5.34
67100.00	617.44	120.00	160.00	160.00	2358.33	-11.213	-5.15	-0.06	61	0.127	5.15
67120.00	618.04	120.00	160.00	160.00	3513.01	-11.213	-5.06	-0.06	41	0.085	5.06
67140.00	618.64	120.01	160.00	160.00	6883.10	-11.213	-4.98	-0.06	21	0.043	4.98
67160.00	619.24	120.00	160.00	160.00	169191.44	-11.213	-4.89	-0.06	1	0.002	4.89
67180.00	619.84	120.01	160.00	160.00	-5221.43	-11.213	-5.00	-0.06	-34	0.023	5.00
67200.00	620.44	120.00	160.00	160.00	-2554.16	-11.213	-5.13	-0.06	-69	0.047	5.13
67220.00	621.04	120.00	160.00	160.00	-2500.00	-11.213	-5.13	-0.06	-70	0.048	5.13
67240.00	621.64	120.01	160.00	160.00	-2500.00	-11.213	-5.13	-0.06	-70	0.048	5.13
67260.00	622.24	120.01	160.00	160.00	-3007.48	-11.213	-5.09	-0.06	-58	0.040	5.09
67280.00	622.84	120.00	160.00	160.00	-7546.94	-11.213	-4.97	-0.06	-23	0.016	4.97

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
67300.00	623.44	120.01	160.00	160.00	0.00	-11.213	-4.88	-0.06	0	0.000	4.88
67320.00	624.04	120.00	160.00	160.00	0.00	-11.213	-4.88	-0.06	0	0.000	4.88
67340.00	624.64	120.01	160.00	160.00	0.00	-11.213	30.12	0.38	0	0.000	4.88
67360.00	625.24	120.01	160.00	160.00	0.00	-11.213	-4.88	-0.06	0	0.000	4.88
67380.00	625.84	120.00	160.00	160.00	0.00	-11.213	-4.88	-0.06	0	0.000	4.88
67400.00	626.44	120.01	160.00	160.00	0.00	-11.213	-4.88	-0.06	0	0.000	4.88
67420.00	627.04	120.00	160.00	160.00	0.00	-11.213	-4.88	-0.06	0	0.000	4.88
67440.00	627.64	120.01	160.00	160.00	0.00	-10.454	29.57	0.37	0	0.000	5.43
67460.00	628.24	120.00	160.00	160.00	0.00	-6.532	-8.51	-0.11	0	0.000	8.51
67480.00	628.84	120.01	160.00	160.00	-56968.47	-2.611	23.41	0.29	0	0.020	11.59
67500.00	629.44	120.00	160.00	160.00	-13996.00	1.311	-14.71	-0.18	0	0.079	14.71
67520.00	630.04	120.00	160.00	160.00	-13996.00	5.233	17.22	0.22	0	0.079	17.78
67540.00	630.64	120.00	160.00	160.00	-13996.00	9.154	14.09	0.18	0	0.079	20.91
67560.00	631.24	119.99	160.00	160.00	-13996.00	13.076	11.01	0.14	0	0.079	23.99
67580.00	631.84	120.00	160.00	160.00	0.00	16.997	7.98	0.10	0	0.000	27.02
67600.00	632.44	120.00	160.00	160.00	0.00	17.275	-27.24	-0.34	0	0.000	27.24
67620.00	633.04	119.95	160.00	160.00	0.00	17.275	7.79	-0.60	0	0.000	27.24
67640.00	633.65	118.64	160.00	160.00	0.00	17.275	8.48	-0.60	0	0.000	27.12
67660.00	634.26	117.32	160.00	160.00	0.00	17.275	9.18	-0.60	0	0.000	27.00
67680.00	634.87	115.99	160.00	160.00	0.00	17.275	9.87	-0.60	0	0.000	26.88
67700.00	635.50	114.64	160.00	160.00	0.00	17.275	10.57	-0.60	0	0.000	26.76
67720.00	636.13	113.28	160.00	160.00	15404.07	17.275	11.23	-0.60	0	0.064	26.68
67740.00	636.77	111.89	160.00	160.00	2818.70	17.275	11.74	-0.60	0	0.343	26.74
67760.00	637.42	110.50	160.00	160.00	2300.00	17.275	12.38	-0.60	0	0.410	26.68
67780.00	638.07	109.08	160.00	160.00	2300.00	17.275	13.07	-0.60	0	0.399	26.56
67800.00	638.74	107.64	160.00	160.00	2279.27	17.275	13.72	-0.60	0	0.392	26.44
67820.00	639.41	106.19	160.00	160.00	1287.88	17.275	14.14	-0.60	0	0.676	26.53
67840.00	640.09	104.71	152.89	160.00	897.50	17.275	14.57	-0.60	0	0.943	26.62
67860.00	640.79	103.22	133.93	160.00	688.74	17.275	15.04	-0.60	0	1.194	26.72
67880.00	641.49	101.70	117.32	160.00	560.00	17.275	15.58	-0.60	0	1.425	26.81
67900.00	642.20	100.16	117.32	160.00	560.00	17.275	16.43	-0.60	0	1.382	26.69
67920.00	642.93	98.59	117.32	160.00	560.00	17.275	17.43	-0.60	0	1.339	26.57
67940.00	643.66	97.00	123.70	160.00	622.62	15.359	20.14	-0.60	0	1.166	24.86
67960.00	644.41	95.39	141.34	160.00	812.89	11.549	24.59	-0.60	0	0.864	21.52
67980.00	645.17	93.74	160.00	160.00	1170.63	7.739	29.18	-0.60	0	0.579	18.15

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

\*\*\*\*\*  
\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. crecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 52700.000  
P.K. Final...: 68544.791  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
68000.00	645.95	92.07	160.00	160.00	2090.74	3.930	33.73	-0.60	0	0.313	14.82
68020.00	646.74	90.36	160.00	160.00	9769.51	0.120	38.25	-0.60	0	0.064	11.49
68040.00	647.54	88.62	160.00	160.00	0.00	0.000	39.70	-0.60	0	0.000	11.17
68060.00	648.36	86.85	160.00	160.00	0.00	0.000	40.92	-0.60	0	0.000	11.05
68080.00	649.20	85.04	160.00	160.00	0.00	0.000	42.09	-0.60	0	0.000	10.94
68100.00	650.06	83.19	160.00	160.00	0.00	-0.512	43.62	-0.60	0	0.000	10.44
68120.00	650.93	81.30	160.00	160.00	0.00	-5.218	48.49	-0.60	0	0.000	6.62
68140.00	651.83	79.36	160.00	160.00	6181.58	-9.924	53.26	-0.60	0	0.079	2.92
68160.00	652.75	77.38	100.00	160.00	4100.00	-14.630	58.12	-0.60	0	0.113	-0.84
68180.00	653.69	75.34	100.00	160.00	4100.00	-17.004	61.34	-0.60	0	0.107	-2.85
68200.00	654.66	73.25	100.00	160.00	4100.00	-17.004	62.75	-0.60	0	0.101	-2.97
68220.00	655.66	71.09	100.00	160.00	4100.00	-17.004	64.32	-0.60	0	0.095	-3.09
68240.00	656.69	68.87	100.00	160.00	4100.00	-17.004	66.11	-0.60	0	0.089	-3.21
68260.00	657.75	66.57	100.00	160.00	4100.00	-17.004	68.23	-0.60	0	0.083	-3.33
68280.00	658.85	64.19	100.00	160.00	9881.61	-17.004	70.87	-0.60	0	0.032	-3.54
68300.00	659.99	61.72	100.00	160.00	0.00	-17.004	73.79	-0.60	0	0.000	-3.72
68320.00	661.19	59.14	100.00	160.00	0.00	-17.004	77.04	-0.60	0	0.000	-3.84
68340.00	662.43	56.45	100.00	160.00	0.00	-17.004	80.67	-0.60	0	0.000	-3.96
68360.00	663.74	53.63	100.00	160.00	0.00	-17.004	84.82	-0.60	0	0.000	-4.08
68380.00	665.12	50.64	100.00	160.00	0.00	-14.401	87.66	-0.60	0	0.000	-2.16
68400.00	666.59	47.47	100.00	160.00	0.00	-9.138	89.35	-0.60	0	0.000	1.83
68420.00	668.16	44.07	120.00	160.00	0.00	-3.875	92.74	-0.60	0	0.000	5.85
68440.00	669.87	40.39	120.00	160.00	0.00	0.008	99.97	-0.60	0	0.000	8.79
68460.00	671.74	36.33	120.00	160.00	0.00	0.008	101.33	-0.60	0	0.000	8.67
68480.00	673.86	31.76	120.00	160.00	0.00	0.008	101.45	-0.60	0	0.000	8.55
68500.00	676.33	26.41	120.00	160.00	0.00	0.008	101.57	-0.60	0	0.000	8.43
68520.00	679.46	19.64	120.00	160.00	0.00	0.008	101.70	-0.61	0	0.000	8.30
68534.00	682.55	12.96	120.00	160.00	0.00	0.008	101.78	-0.60	0	0.000	8.22
68540.00	684.55	8.62	120.00	160.00	0.00	0.008	101.82	-0.62	0	0.000	8.18
68544.79	688.21	2.16	120.00	-0.00	0.00	0.008	101.85	0.00	0	0.000	8.15
68544.79	688.21	1.44	120.00	-0.00	0.00	0.008	101.85	-59.97	0	0.000	8.15

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

\*\*\*\*\*  
\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. decrecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 68544.791  
P.K. Final...: 52700.000  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
68544.79	0.00	0.00	120.00	-0.00	0.00	-0.008	0.00	0.00	-0	0.000	0.00
68544.79	3.61	0.00	120.00	-0.00	0.00	-0.008	101.86	0.00	-0	0.000	8.14
68534.00	9.66	18.32	120.00	160.00	0.00	-0.008	101.73	1.20	-0	0.000	8.27
68520.00	11.84	27.77	120.00	160.00	0.00	-0.008	101.56	1.20	-0	0.000	8.44
68500.00	14.05	37.32	120.00	160.00	0.00	-0.008	101.32	1.20	-0	0.000	8.68
68480.00	15.81	44.76	120.00	160.00	0.00	-0.008	88.10	1.10	-0	0.000	8.92
68460.00	17.32	50.34	120.00	160.00	0.00	-0.008	76.88	0.96	-0	0.000	9.12
68440.00	18.69	54.85	120.00	160.00	0.00	-0.008	69.68	0.87	-0	0.000	9.30
68420.00	19.96	58.60	120.00	160.00	0.00	3.875	61.40	0.77	-0	0.000	12.49
68400.00	21.15	61.69	120.00	160.00	0.00	9.138	53.36	0.67	-0	0.000	16.77
68380.00	22.29	64.25	100.00	160.00	0.00	14.401	46.24	0.58	-0	0.000	21.03
68360.00	23.40	66.41	100.00	160.00	0.00	17.004	41.87	0.52	-0	0.000	23.20
68340.00	24.46	68.37	100.00	160.00	0.00	17.004	40.04	0.50	-0	0.000	23.30
68320.00	25.50	70.21	100.00	160.00	0.00	17.004	38.49	0.48	-0	0.000	23.39
68300.00	26.52	71.93	100.00	160.00	0.00	17.004	37.15	0.46	-0	0.000	23.49
68280.00	27.51	73.56	100.00	160.00	9881.61	17.004	35.96	0.45	-0	0.042	23.64
68260.00	28.47	75.10	100.00	160.00	4100.00	17.004	34.82	0.44	-0	0.106	23.82
68240.00	29.42	76.57	100.00	160.00	4100.00	17.004	33.87	0.42	-0	0.110	23.91
68220.00	30.36	77.97	100.00	160.00	4100.00	17.004	32.98	0.41	-0	0.114	23.99
68200.00	31.27	79.31	100.00	160.00	4100.00	17.004	32.15	0.40	-0	0.118	24.07
68180.00	32.17	80.60	100.00	160.00	4100.00	17.004	31.35	0.39	-0	0.122	24.15
68160.00	33.06	81.85	100.00	160.00	4100.00	14.630	32.43	0.41	-0	0.126	22.39
68140.00	33.93	83.18	160.00	160.00	6181.58	9.924	35.36	0.44	-0	0.086	18.72
68120.00	34.79	84.60	160.00	160.00	0.00	5.218	38.25	0.48	-0	0.000	15.04
68100.00	35.63	86.11	160.00	160.00	0.00	0.512	40.99	0.51	-0	0.000	11.42
68080.00	36.46	87.63	160.00	160.00	0.00	-0.000	40.41	0.51	-0	0.000	11.11
68060.00	37.28	89.10	160.00	160.00	0.00	-0.000	39.38	0.49	-0	0.000	11.21
68040.00	38.08	90.50	160.00	160.00	0.00	-0.000	38.36	0.48	-0	0.000	11.30
68020.00	38.87	91.84	160.00	160.00	9769.51	-0.120	37.33	0.47	-0	0.067	11.40
68000.00	39.65	93.18	160.00	160.00	2090.74	-3.930	39.01	0.49	-0	0.320	8.74
67980.00	40.41	94.56	160.00	160.00	1170.63	-7.739	40.66	0.51	-0	0.589	6.08
67960.00	41.17	95.97	141.34	160.00	812.89	-11.549	42.30	0.53	-0	0.874	3.42
67940.00	41.91	97.41	123.70	160.00	622.62	-15.359	43.97	0.55	-0	1.176	0.77
67920.00	42.65	98.88	117.32	160.00	560.00	-17.275	44.36	0.55	-0	1.347	-0.53
67900.00	43.37	100.31	117.32	160.00	560.00	-17.275	43.46	0.54	-0	1.386	-0.42

Istram 23.05.05.10 19/02/24 12:52:51 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:51 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
67880.00	44.08	101.69	117.32	160.00	560.00	-17.275	42.70	0.53	-0	1.425	-0.31
67860.00	44.79	103.04	133.93	160.00	688.74	-17.275	42.24	0.53	-0	1.189	-0.41
67840.00	45.48	104.35	152.89	160.00	897.50	-17.275	41.86	0.52	-0	0.936	-0.52
67820.00	46.17	105.64	160.00	160.00	1287.88	-17.275	41.50	0.52	-0	0.669	-0.63
67800.00	46.84	106.90	160.00	160.00	2279.27	-17.275	41.17	0.51	-0	0.387	-0.74
67780.00	47.51	108.13	160.00	160.00	2300.00	-17.275	40.64	0.51	-0	0.392	-0.64
67760.00	48.18	109.33	160.00	160.00	2300.00	-17.275	40.08	0.50	-0	0.401	-0.54
67740.00	48.83	110.50	160.00	160.00	2818.70	-17.275	39.56	0.49	-0	0.334	-0.49
67720.00	49.48	111.65	160.00	160.00	15404.07	-17.275	39.17	0.49	-0	0.062	-0.57
67700.00	50.12	112.78	160.00	160.00	0.00	-17.275	38.64	0.48	-0	0.000	-0.52
67680.00	50.76	113.87	160.00	160.00	0.00	-17.275	38.09	0.48	-0	0.000	-0.42
67660.00	51.39	114.94	160.00	160.00	0.00	-17.275	37.54	0.47	-0	0.000	-0.33
67640.00	52.01	115.99	160.00	160.00	0.00	-17.275	36.99	0.46	-0	0.000	-0.24
67620.00	52.63	117.01	160.00	160.00	0.00	-17.275	36.47	0.46	-0	0.000	-0.15
67600.00	53.24	118.01	160.00	160.00	0.00	-17.275	35.94	0.45	-0	0.000	-0.06
67580.00	53.85	118.98	160.00	160.00	0.00	-16.997	35.24	0.44	-0	0.000	0.21
67560.00	54.45	119.89	160.00	160.00	-13996.00	-13.076	31.61	0.40	-0	0.079	3.44
67540.00	55.05	120.01	160.00	160.00	-13996.00	-9.154	-6.54	-0.08	-0	0.079	6.54
67520.00	55.65	120.01	160.00	160.00	-13996.00	-5.233	25.43	0.32	-0	0.079	9.57
67500.00	56.25	120.01	160.00	160.00	-13996.00	-1.311	22.35	0.28	-0	0.079	12.65
67480.00	56.85	120.00	160.00	160.00	-56968.47	2.611	19.31	0.24	-0	0.020	15.69
67460.00	57.45	120.00	160.00	160.00	0.00	6.532	16.19	0.20	-0	0.000	18.81
67440.00	58.05	120.00	160.00	160.00	0.00	10.454	13.11	0.16	-0	0.000	21.89
67420.00	58.65	119.99	160.00	160.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67400.00	59.25	120.00	160.00	160.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67380.00	59.85	119.99	160.00	160.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67360.00	60.45	120.00	160.00	160.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67340.00	61.05	120.00	160.00	160.00	0.00	11.213	-22.48	-0.28	-0	0.000	22.48
67320.00	61.65	120.00	160.00	160.00	0.00	11.213	12.52	0.16	-0	0.000	22.48
67300.00	62.25	120.00	160.00	160.00	0.00	11.213	-22.48	-0.28	0	0.000	22.48
67280.00	62.85	119.99	160.00	160.00	-7546.94	11.213	12.44	0.16	-27	-0.008	22.57
67260.00	63.45	120.00	160.00	160.00	-3007.48	11.213	12.31	0.15	-69	-0.021	22.69
67240.00	64.05	120.00	160.00	160.00	-2500.00	11.213	12.27	0.15	-83	-0.025	22.73
67220.00	64.65	120.00	160.00	160.00	-2500.00	11.213	12.27	0.15	-83	-0.025	22.73
67200.00	65.25	120.00	160.00	160.00	-2554.16	11.213	12.27	0.15	-81	-0.025	22.73

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
67180.00	65.85	120.00	160.00	160.00	-5221.43	11.213	-22.60	-0.28	-40	-0.012	22.60
67160.00	66.45	119.99	160.00	160.00	169191.44	11.213	12.52	0.16	1	0.000	22.49
67140.00	67.05	120.00	160.00	160.00	6883.10	11.213	12.43	0.16	27	0.010	22.57
67120.00	67.65	120.00	160.00	160.00	3513.01	11.213	-22.66	-0.28	53	0.019	22.66
67100.00	68.25	120.00	160.00	160.00	2358.33	11.213	-22.75	-0.28	78	0.028	22.75
67080.00	68.85	120.00	160.00	160.00	2050.00	11.041	-22.65	-0.28	90	0.033	22.65
67060.00	69.45	120.00	160.00	160.00	2050.00	10.211	13.00	0.16	90	0.033	22.00
67040.00	70.05	119.99	160.00	160.00	2164.63	9.381	13.67	0.17	85	0.031	21.33
67020.00	70.65	120.00	160.00	160.00	3099.82	8.552	14.41	0.18	60	0.021	20.60
67000.00	71.25	120.00	160.00	160.00	5457.73	7.722	-19.86	-0.25	34	0.012	19.86
66980.00	71.85	119.99	160.00	160.00	22803.23	6.892	15.88	0.20	8	0.003	19.12
66960.00	72.45	120.00	160.00	160.00	0.00	6.650	-18.90	-0.24	0	0.000	18.90
66940.00	73.05	120.00	160.00	160.00	0.00	6.650	16.10	0.20	0	0.000	18.90
66920.00	73.65	120.01	160.00	160.00	-12111.60	6.650	-18.95	-0.24	-15	0.006	18.95
66900.00	74.25	120.00	160.00	160.00	-4817.76	6.650	15.97	0.20	-38	0.014	19.03
66880.00	74.85	120.00	160.00	160.00	-3006.93	6.650	-19.11	-0.24	-61	0.023	19.11
66860.00	75.45	120.00	160.00	160.00	-2185.48	6.650	-19.19	-0.24	-84	0.032	19.19
66840.00	76.05	120.00	160.00	160.00	-2000.00	6.650	-19.22	-0.24	-92	0.035	19.22
66820.00	76.65	120.00	160.00	160.00	-2000.00	7.100	-19.57	-0.24	-92	0.035	19.57
66800.00	77.25	120.00	160.00	160.00	-2000.00	7.796	-20.12	-0.25	-92	0.035	20.12
66780.00	77.85	120.00	160.00	160.00	-2000.00	8.492	-20.66	-0.26	-92	0.035	20.66
66760.00	78.45	120.01	160.00	160.00	-2000.00	9.188	-21.21	-0.27	-92	0.035	21.21
66740.00	79.05	119.99	160.00	160.00	-2000.00	9.884	13.25	0.17	-92	0.035	21.75
66720.00	79.65	120.00	160.00	160.00	-2000.00	10.580	12.70	0.16	-92	0.035	22.30
66700.00	80.25	120.00	160.00	160.00	-2000.00	11.000	-22.63	-0.28	-92	0.035	22.63
66680.00	80.85	119.99	160.00	160.00	-2000.00	11.000	12.38	0.15	-92	0.035	22.63
66660.00	81.45	119.99	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66640.00	82.05	120.00	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66620.00	82.65	120.00	160.00	160.00	-2000.00	11.000	-22.63	-0.28	-92	0.035	22.63
66600.00	83.25	120.00	160.00	160.00	-2000.00	11.000	-22.63	-0.28	-92	0.035	22.63
66580.00	83.85	119.99	160.00	160.00	-2000.00	11.000	12.38	0.15	-92	0.035	22.63
66560.00	84.45	119.99	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66540.00	85.05	120.00	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66520.00	85.65	120.00	160.00	160.00	-2000.00	11.000	-22.63	-0.28	-92	0.035	22.63
66500.00	86.25	120.00	160.00	160.00	-2000.00	11.000	-22.63	-0.28	-92	0.035	22.63



Istram 23.05.05.10 19/02/24 12:52:51 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:51 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
66480.00	86.85	119.99	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66460.00	87.45	120.00	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66440.00	88.05	120.00	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66420.00	88.65	120.00	160.00	160.00	-2000.00	11.000	-22.63	-0.28	-92	0.035	22.63
66400.00	89.25	120.00	160.00	160.00	-2000.00	11.000	-22.63	-0.28	-92	0.035	22.63
66380.00	89.85	119.99	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66360.00	90.45	120.00	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66340.00	91.05	120.00	160.00	160.00	-2000.00	11.000	12.37	0.15	-92	0.035	22.63
66320.00	91.65	120.00	160.00	160.00	-2378.58	11.000	-22.58	-0.28	-77	0.029	22.58
66300.00	92.25	119.99	160.00	160.00	-3385.02	11.000	12.50	0.16	-54	0.021	22.50
66280.00	92.85	120.00	160.00	160.00	-5867.87	11.000	-22.42	-0.28	-31	0.012	22.42
66260.00	93.45	119.99	160.00	160.00	-22016.93	11.000	12.66	0.16	-8	0.003	22.34
66240.00	94.05	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.31
66220.00	94.65	120.00	160.00	160.00	0.00	11.000	-22.32	-0.28	0	0.000	22.32
66200.00	95.25	120.00	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
66180.00	95.85	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
66160.00	96.45	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.31
66140.00	97.05	120.00	160.00	160.00	0.00	11.000	-22.32	-0.28	0	0.000	22.32
66120.00	97.65	120.00	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
66100.00	98.25	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
66080.00	98.85	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.31
66060.00	99.45	120.00	160.00	160.00	0.00	11.000	-22.32	-0.28	0	0.000	22.32
66040.00	100.05	120.00	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
66020.00	100.65	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
66000.00	101.25	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.31
65980.00	101.85	120.00	160.00	160.00	0.00	11.000	-22.32	-0.28	0	0.000	22.32
65960.00	102.45	120.00	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
65940.00	103.05	119.99	160.00	160.00	0.00	11.000	12.69	0.16	0	0.000	22.32
65920.00	103.65	120.01	160.00	160.00	0.00	11.000	-22.32	-0.28	0	0.000	22.32
65900.00	104.25	120.00	160.00	160.00	0.00	10.831	-22.18	-0.28	0	0.000	22.18
65880.00	104.85	120.00	160.00	160.00	0.00	9.498	13.86	0.17	0	0.000	21.14
65860.00	105.45	119.99	160.00	160.00	0.00	8.164	14.91	0.19	0	0.000	20.09
65840.00	106.05	120.00	160.00	160.00	0.00	6.831	-19.04	-0.24	0	0.000	19.04
65820.00	106.65	120.00	160.00	160.00	0.00	5.498	-18.00	-0.22	0	0.000	18.00
65800.00	107.25	120.01	160.00	160.00	0.00	4.164	-16.95	-0.21	0	0.000	16.95

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
65780.00	107.85	120.00	160.00	160.00	0.00	3.000	18.97	0.24	0	0.000	16.04
65760.00	108.45	119.99	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
65740.00	109.05	120.00	160.00	160.00	0.00	3.000	18.97	0.24	0	0.000	16.04
65720.00	109.65	119.99	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
65700.00	110.25	120.00	160.00	160.00	0.00	3.000	18.97	0.24	0	0.000	16.04
65680.00	110.85	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
65660.00	111.45	120.00	160.00	160.00	0.00	3.000	18.97	0.24	0	0.000	16.04
65640.00	112.05	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
65620.00	112.65	120.00	160.00	160.00	36753.29	3.000	18.95	0.24	5	-0.000	16.05
65600.00	113.25	119.99	160.00	160.00	6956.11	3.000	-16.13	-0.20	28	-0.001	16.13
65580.00	113.85	120.00	160.00	160.00	3841.59	3.000	-16.20	-0.20	52	-0.003	16.20
65560.00	114.45	120.00	160.00	160.00	2653.51	3.000	18.73	0.23	75	-0.004	16.27
65540.00	115.05	120.00	160.00	160.00	2026.72	3.000	18.66	0.23	98	-0.005	16.35
65520.00	115.65	120.00	160.00	160.00	1639.45	3.000	-16.42	-0.21	121	-0.006	16.42
65500.00	116.25	120.00	160.00	160.00	1376.45	3.000	-16.49	-0.21	144	-0.007	16.49
65480.00	116.85	119.99	160.00	160.00	1320.00	3.000	-16.51	-0.21	150	-0.007	16.51
65460.00	117.45	120.01	160.00	160.00	1320.00	4.474	17.35	0.22	150	-0.007	17.65
65440.00	118.05	120.00	160.00	160.00	1320.00	6.141	16.02	0.20	150	-0.007	18.98
65420.00	118.65	120.01	160.00	160.00	1320.00	7.807	-20.29	-0.25	150	-0.007	20.29
65400.00	119.25	119.99	160.00	160.00	1320.00	9.474	13.41	0.17	150	-0.007	21.59
65380.00	119.85	119.99	160.00	160.00	1320.00	11.141	12.10	0.15	150	-0.007	22.90
65360.00	120.45	120.00	160.00	160.00	1320.00	12.807	10.79	0.13	150	-0.007	24.21
65340.00	121.05	120.00	160.00	160.00	1320.00	13.000	-24.36	-0.30	150	-0.007	24.36
65320.00	121.65	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65300.00	122.25	120.00	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65280.00	122.85	120.00	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65260.00	123.45	120.00	160.00	160.00	1320.00	13.000	-24.36	-0.30	150	-0.007	24.36
65240.00	124.05	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65220.00	124.65	120.00	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65200.00	125.25	120.00	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65180.00	125.85	120.00	160.00	160.00	1320.00	13.000	-24.36	-0.30	150	-0.007	24.36
65160.00	126.45	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65140.00	127.05	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65120.00	127.65	120.00	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65100.00	128.25	120.00	160.00	160.00	1320.00	13.000	-24.36	-0.30	150	-0.007	24.36

Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
65080.00	128.85	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65060.00	129.45	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65040.00	130.05	120.00	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
65020.00	130.65	120.00	160.00	160.00	1320.00	13.000	-24.36	-0.30	150	-0.007	24.36
65000.00	131.25	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
64980.00	131.85	119.99	160.00	160.00	1320.00	13.000	10.64	0.13	150	-0.007	24.36
64960.00	132.45	120.00	160.00	160.00	1510.50	13.000	10.70	0.13	131	-0.006	24.30
64940.00	133.05	120.00	160.00	160.00	1833.23	13.000	-24.23	-0.30	108	-0.005	24.23
64920.00	133.65	120.00	160.00	160.00	2331.36	13.000	10.85	0.14	85	-0.004	24.15
64900.00	134.25	119.99	160.00	160.00	3201.19	13.000	10.92	0.14	62	-0.003	24.08
64880.00	134.85	120.00	160.00	160.00	5106.37	13.000	-24.01	-0.30	39	-0.002	24.01
64860.00	135.45	120.00	160.00	160.00	12612.94	13.000	-23.94	-0.30	16	-0.001	23.94
64840.00	136.05	120.00	160.00	160.00	-40657.22	13.000	-23.90	-0.30	-10	-0.027	23.90
64820.00	136.65	119.99	160.00	160.00	-9850.38	11.041	12.59	0.16	-40	-0.111	22.41
64800.00	137.25	120.00	160.00	160.00	-5604.06	9.067	-20.91	-0.26	-70	-0.196	20.91
64780.00	137.85	120.00	160.00	160.00	-3915.96	7.092	15.59	0.19	-100	-0.280	19.41
64760.00	138.45	120.00	160.00	160.00	-3009.44	5.118	17.09	0.21	-130	-0.364	17.91
64740.00	139.05	120.00	160.00	160.00	-2600.00	3.143	-16.39	-0.20	-150	-0.422	16.39
64720.00	139.65	120.01	160.00	160.00	-2600.00	1.169	20.13	0.25	-150	-0.422	14.87
64700.00	140.25	120.00	160.00	160.00	-2600.00	1.153	-14.83	-0.19	-150	-0.422	14.83
64680.00	140.85	119.99	160.00	160.00	-2600.00	1.153	-14.83	-0.19	-150	-0.422	14.83
64660.00	141.45	120.00	160.00	160.00	-2600.00	1.153	20.17	0.25	-150	-0.422	14.83
64640.00	142.05	120.00	160.00	160.00	-2600.00	1.153	-14.83	-0.19	-150	-0.422	14.83
64620.00	142.65	120.01	160.00	160.00	-2600.00	1.153	20.17	0.25	-150	-0.422	14.83
64600.00	143.25	120.00	160.00	160.00	-2600.00	1.153	-14.83	-0.19	-150	-0.422	14.83
64580.00	143.85	119.99	160.00	160.00	-3199.56	1.153	-14.78	-0.18	-122	-0.343	14.78
64560.00	144.45	120.00	160.00	160.00	-4244.12	1.153	20.27	0.25	-92	-0.258	14.74
64540.00	145.05	120.00	160.00	160.00	-6301.31	1.153	-14.69	-0.18	-62	-0.174	14.69
64520.00	145.65	120.00	160.00	160.00	-12228.81	1.153	-14.64	-0.18	-32	-0.090	14.64
64500.00	146.25	120.00	160.00	160.00	-206140.64	1.153	-14.59	-0.18	-2	-0.005	14.59
64480.00	146.85	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64460.00	147.45	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64440.00	148.05	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64420.00	148.65	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64400.00	149.25	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
 \*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
64380.00	149.85	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64360.00	150.45	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64340.00	151.05	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64320.00	151.65	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64300.00	152.25	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64280.00	152.85	120.00	160.00	160.00	0.00	1.153	-14.59	-0.18	0	0.000	14.59
64260.00	153.45	119.99	160.00	160.00	0.00	1.815	-15.08	-0.19	0	0.000	15.08
64240.00	154.05	120.01	160.00	160.00	0.00	3.991	18.21	0.23	0	0.000	16.79
64220.00	154.65	120.00	160.00	160.00	0.00	6.168	-18.52	-0.23	0	0.000	18.52
64200.00	155.25	120.00	160.00	160.00	0.00	8.344	14.77	0.18	0	0.000	20.23
64180.00	155.85	120.00	160.00	160.00	0.00	10.520	13.06	0.16	0	0.000	21.94
64160.00	156.45	120.00	160.00	160.00	-52955.02	12.697	11.34	0.14	-3	0.003	23.66
64140.00	157.05	119.99	160.00	160.00	-6045.80	14.873	9.54	0.12	-28	0.026	25.46
64120.00	157.65	119.99	160.00	160.00	-3205.91	15.300	9.12	0.11	-52	0.050	25.89
64100.00	158.25	120.00	160.00	160.00	-2181.29	15.300	9.02	0.11	-77	0.073	25.98
64080.00	158.85	119.99	160.00	160.00	-1652.99	15.300	8.94	0.11	-102	0.097	26.07
64060.00	159.45	119.99	160.00	160.00	-1330.70	15.300	8.84	0.11	-126	0.120	26.16
64040.00	160.05	119.99	160.00	160.00	-1113.58	15.300	8.75	0.11	-151	0.144	26.25
64020.00	160.65	119.99	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
64000.00	161.25	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63980.00	161.85	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63960.00	162.45	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63940.00	163.05	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63920.00	163.65	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63900.00	164.25	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.153	26.29
63880.00	164.85	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.153	26.29
63860.00	165.45	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.153	26.29
63840.00	166.05	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.153	26.29
63820.00	166.65	120.00	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
63800.00	167.25	120.00	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
63780.00	167.85	120.00	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
63760.00	168.45	120.00	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
63740.00	169.05	120.00	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
63720.00	169.65	120.00	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
63700.00	170.25	119.99	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. decrecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 68544.791  
P.K. Final.....: 52700.000  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
63680.00	170.85	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63660.00	171.45	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63640.00	172.05	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63620.00	172.65	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63600.00	173.25	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63580.00	173.85	119.99	160.00	160.00	-1050.00	15.300	8.72	0.11	-160	0.152	26.29
63560.00	174.45	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.153	26.29
63540.00	175.05	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.153	26.29
63520.00	175.65	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.153	26.29
63500.00	176.25	120.00	160.00	160.00	-1050.00	15.300	-26.29	-0.33	-160	0.152	26.29
63480.00	176.85	120.00	160.00	160.00	-1050.00	15.300	8.71	0.11	-160	0.152	26.29
63460.00	177.45	120.00	152.61	160.00	-1197.97	15.300	8.79	0.11	-140	0.134	26.21
63440.00	178.05	120.00	160.00	160.00	-1453.01	15.300	-26.12	-0.33	-116	0.110	26.12
63420.00	178.65	119.99	160.00	160.00	-1846.02	15.300	8.97	0.11	-91	0.087	26.03
63400.00	179.25	120.00	160.00	160.00	-2530.46	15.300	9.06	0.11	-66	0.063	25.94
63380.00	179.85	119.99	160.00	160.00	-4021.48	15.300	9.16	0.11	-42	0.040	25.85
63360.00	180.45	120.00	160.00	160.00	-9790.04	15.300	-25.75	-0.32	-17	0.016	25.75
63340.00	181.05	120.00	160.00	160.00	0.00	15.300	-25.69	-0.32	0	0.000	25.69
63320.00	181.65	120.00	160.00	160.00	0.00	15.300	-25.69	-0.32	0	0.000	25.69
63300.00	182.25	120.00	160.00	160.00	0.00	15.300	-25.69	-0.32	0	0.000	25.69
63280.00	182.85	120.00	160.00	160.00	0.00	15.300	-25.69	-0.32	0	0.000	25.69
63260.00	183.45	120.00	160.00	160.00	0.00	15.300	9.31	0.12	0	0.000	25.69
63240.00	184.05	120.00	160.00	160.00	0.00	15.300	9.31	0.12	0	0.000	25.69
63220.00	184.65	120.00	160.00	160.00	0.00	15.091	9.47	0.12	0	0.000	25.53
63200.00	185.25	119.99	160.00	160.00	0.00	13.041	11.09	0.14	0	0.000	23.92
63180.00	185.85	120.00	160.00	160.00	0.00	10.991	12.69	0.16	0	0.000	22.31
63160.00	186.45	120.00	160.00	160.00	0.00	8.941	-20.70	-0.26	0	0.000	20.70
63140.00	187.05	120.00	160.00	160.00	0.00	6.891	15.91	0.20	0	0.000	19.09
63120.00	187.65	119.99	160.00	160.00	0.00	4.841	17.52	0.22	0	0.000	17.48
63100.00	188.25	120.00	160.00	160.00	0.00	3.000	18.96	0.24	0	0.000	16.04
63080.00	188.85	120.01	160.00	160.00	0.00	3.000	18.96	0.24	0	0.000	16.04
63060.00	189.45	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
63040.00	190.05	120.01	160.00	160.00	0.00	3.000	18.96	0.24	0	0.000	16.04
63020.00	190.65	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
63000.00	191.25	120.01	160.00	160.00	0.00	3.000	18.96	0.24	0	0.000	16.04

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

\*\*\*\*\*  
\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. decrecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 68544.791  
P.K. Final.....: 52700.000  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
62980.00	191.85	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
62960.00	192.45	120.01	160.00	160.00	0.00	3.000	18.96	0.24	0	0.000	16.04
62940.00	193.05	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
62920.00	193.65	120.01	160.00	160.00	0.00	3.000	18.96	0.24	0	0.000	16.04
62900.00	194.25	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
62880.00	194.85	120.01	160.00	160.00	0.00	3.000	18.96	0.24	0	0.000	16.04
62860.00	195.45	120.00	160.00	160.00	0.00	3.000	-16.04	-0.20	0	0.000	16.04
62840.00	196.05	120.01	160.00	160.00	13780.65	3.000	18.92	0.24	14	-0.001	16.08
62820.00	196.65	120.00	160.00	160.00	5287.77	3.000	-16.16	-0.20	37	-0.002	16.16
62800.00	197.25	120.00	160.00	160.00	3271.55	3.000	18.78	0.23	61	-0.003	16.23
62780.00	197.85	120.00	160.00	160.00	2368.46	4.057	-17.11	-0.21	84	-0.004	17.11
62760.00	198.45	120.00	160.00	160.00	1856.09	6.015	16.29	0.20	107	-0.005	18.71
62740.00	199.05	119.99	160.00	160.00	1525.98	7.974	14.65	0.18	130	-0.006	20.35
62720.00	199.65	119.99	160.00	160.00	1320.00	9.932	13.05	0.16	150	-0.007	21.95
62700.00	200.25	119.99	160.00	160.00	1320.00	11.890	11.51	0.14	150	-0.007	23.49
62680.00	200.85	120.00	160.00	160.00	1320.00	13.849	9.97	0.12	150	-0.007	25.03
62660.00	201.45	120.00	160.00	160.00	1320.00	14.750	-25.73	-0.32	150	-0.007	25.73
62640.00	202.05	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62620.00	202.65	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62600.00	203.25	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62580.00	203.85	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62560.00	204.45	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62540.00	205.05	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62520.00	205.65	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.008	25.73
62500.00	206.25	120.00	160.00	160.00	1320.00	14.750	-25.73	-0.32	150	-0.007	25.73
62480.00	206.85	120.00	160.00	160.00	1320.00	14.750	-25.73	-0.32	150	-0.007	25.73
62460.00	207.45	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62440.00	208.05	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62420.00	208.65	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62400.00	209.25	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62380.00	209.85	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62360.00	210.45	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62340.00	211.05	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.008	25.73
62320.00	211.65	120.00	160.00	160.00	1320.00	14.750	-25.73	-0.32	150	-0.007	25.73
62300.00	212.25	120.00	160.00	160.00	1320.00	14.750	-25.73	-0.32	150	-0.007	25.73

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 68544.791  
P.K. Final...: 52700.000  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
62280.00	212.85	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62260.00	213.45	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62240.00	214.05	120.00	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62220.00	214.65	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62200.00	215.25	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62180.00	215.85	119.99	160.00	160.00	1320.00	14.750	9.27	0.12	150	-0.007	25.73
62160.00	216.45	120.00	160.00	160.00	1320.00	14.750	-25.73	-0.32	150	-0.007	25.73
62140.00	217.05	120.00	160.00	160.00	1320.00	14.750	-25.73	-0.32	150	-0.007	25.73
62120.00	217.65	120.00	160.00	160.00	1482.51	14.750	-25.68	-0.32	134	-0.007	25.68
62100.00	218.25	120.00	160.00	160.00	1792.18	14.750	-25.61	-0.32	110	-0.005	25.61
62080.00	218.85	120.00	160.00	160.00	2265.37	14.750	-25.54	-0.32	87	-0.004	25.54
62060.00	219.45	119.99	160.00	160.00	3078.06	14.750	9.54	0.12	64	-0.003	25.46
62040.00	220.05	120.00	160.00	160.00	4800.09	14.750	9.61	0.12	41	-0.002	25.39
62020.00	220.65	119.99	160.00	160.00	10895.71	14.750	9.69	0.12	18	-0.001	25.32
62000.00	221.25	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61980.00	221.85	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61960.00	222.45	119.99	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61940.00	223.05	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61920.00	223.65	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61900.00	224.25	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61880.00	224.85	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61860.00	225.45	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61840.00	226.05	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61820.00	226.65	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61800.00	227.25	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61780.00	227.85	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61760.00	228.45	119.99	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61740.00	229.05	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61720.00	229.65	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61700.00	230.25	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61680.00	230.85	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61660.00	231.45	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61640.00	232.05	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61620.00	232.65	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61600.00	233.25	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26

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PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. decrecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 68544.791  
P.K. Final...: 52700.000  
Equidistancia...: 20.000  
Vel. Inicial...: 0.00  
T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
61580.00	233.85	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61560.00	234.45	119.99	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61540.00	235.05	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61520.00	235.65	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61500.00	236.25	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61480.00	236.85	119.99	160.00	160.00	0.00	14.750	9.75	0.12	0	0.000	25.26
61460.00	237.45	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61440.00	238.05	120.00	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61420.00	238.65	119.99	160.00	160.00	0.00	14.750	9.74	0.12	0	0.000	25.26
61400.00	239.25	120.00	160.00	160.00	0.00	14.750	-25.26	-0.32	0	0.000	25.26
61380.00	239.85	120.00	160.00	160.00	0.00	14.599	-25.14	-0.31	0	0.000	25.14
61360.00	240.45	120.00	160.00	160.00	0.00	14.369	-24.96	-0.31	0	0.000	24.96
61340.00	241.05	119.99	160.00	160.00	0.00	14.138	10.23	0.13	0	0.000	24.78
61320.00	241.65	120.00	160.00	160.00	0.00	13.908	-24.60	-0.31	0	0.000	24.60
61300.00	242.25	120.00	160.00	160.00	0.00	13.678	-24.42	-0.31	0	0.000	24.42
61280.00	242.85	119.99	160.00	160.00	0.00	13.447	10.77	0.13	0	0.000	24.24
61260.00	243.45	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61240.00	244.05	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61220.00	244.65	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17
61200.00	245.25	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61180.00	245.85	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17
61160.00	246.45	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61140.00	247.05	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61120.00	247.65	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61100.00	248.25	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61080.00	248.85	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17
61060.00	249.45	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61040.00	250.05	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17
61020.00	250.65	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
61000.00	251.25	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17
60980.00	251.85	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60960.00	252.45	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60940.00	253.05	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60920.00	253.65	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60900.00	254.25	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17



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 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
60880.00	254.85	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60860.00	255.45	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17
60840.00	256.05	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60820.00	256.65	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60800.00	257.25	120.00	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60780.00	257.85	119.99	160.00	160.00	0.00	13.368	10.83	0.14	0	0.000	24.17
60760.00	258.45	120.00	160.00	160.00	0.00	13.368	-24.17	-0.30	0	0.000	24.17
60740.00	259.05	119.99	160.00	160.00	-20835.52	13.368	10.80	0.13	-10	-0.000	24.20
60720.00	259.65	120.00	160.00	160.00	-6077.36	13.368	-24.28	-0.30	-33	-0.002	24.28
60700.00	260.25	119.99	160.00	160.00	-3557.51	13.368	10.66	0.13	-56	-0.003	24.35
60680.00	260.85	119.99	160.00	160.00	-2514.80	13.368	10.58	0.13	-79	-0.004	24.42
60660.00	261.45	119.99	160.00	160.00	-1944.79	13.368	10.51	0.13	-102	-0.005	24.50
60640.00	262.05	119.99	160.00	160.00	-1585.43	13.368	10.43	0.13	-125	-0.006	24.57
60620.00	262.65	119.99	160.00	160.00	-1338.16	13.368	10.36	0.13	-148	-0.007	24.64
60600.00	263.25	120.00	160.00	160.00	-1320.00	13.368	-24.65	-0.31	-150	-0.007	24.65
60580.00	263.85	120.00	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60560.00	264.45	119.99	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60540.00	265.05	119.99	160.00	160.00	-1320.00	13.368	10.36	0.13	-150	-0.007	24.65
60520.00	265.65	120.00	160.00	160.00	-1320.00	13.368	-24.65	-0.31	-150	-0.007	24.65
60500.00	266.25	120.00	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60480.00	266.85	119.99	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60460.00	267.45	119.99	160.00	160.00	-1320.00	13.368	10.36	0.13	-150	-0.007	24.65
60440.00	268.05	120.00	160.00	160.00	-1320.00	13.368	-24.65	-0.31	-150	-0.007	24.65
60420.00	268.65	120.00	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60400.00	269.25	119.99	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60380.00	269.85	119.99	160.00	160.00	-1320.00	13.368	10.36	0.13	-150	-0.008	24.65
60360.00	270.45	120.00	160.00	160.00	-1320.00	13.368	-24.65	-0.31	-150	-0.007	24.65
60340.00	271.05	120.00	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60320.00	271.65	119.99	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60300.00	272.25	119.99	160.00	160.00	-1320.00	13.368	10.36	0.13	-150	-0.008	24.65
60280.00	272.85	120.00	160.00	160.00	-1320.00	13.368	-24.65	-0.31	-150	-0.007	24.65
60260.00	273.45	120.00	160.00	160.00	-1320.00	13.368	10.35	0.13	-150	-0.007	24.65
60240.00	274.05	119.99	160.00	160.00	-1320.00	14.161	9.73	0.12	-150	-0.008	25.27
60220.00	274.65	120.00	160.00	160.00	-1320.00	15.819	8.43	0.11	-150	-0.007	26.57
60200.00	275.25	119.99	160.00	160.00	-1320.00	17.477	7.13	0.09	-150	-0.008	27.87

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
60180.00	275.85	119.99	160.00	160.00	-1320.00	19.135	5.83	0.07	-150	-0.007	29.18
60160.00	276.45	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
60140.00	277.05	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
60120.00	277.65	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
60100.00	278.25	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
60080.00	278.85	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
60060.00	279.45	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
60040.00	280.05	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
60020.00	280.65	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
60000.00	281.25	120.00	160.00	160.00	-1320.00	20.000	-29.85	-0.37	-150	-0.007	29.85
59980.00	281.85	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59960.00	282.45	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59940.00	283.06	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59920.00	283.66	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59900.00	284.26	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
59880.00	284.86	120.00	160.00	160.00	-1320.00	20.000	-29.85	-0.37	-150	-0.007	29.85
59860.00	285.46	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59840.00	286.06	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59820.00	286.66	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59800.00	287.26	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59780.00	287.86	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
59760.00	288.46	120.00	160.00	160.00	-1320.00	20.000	-29.85	-0.37	-150	-0.007	29.85
59740.00	289.06	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59720.00	289.66	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59700.00	290.26	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59680.00	290.86	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
59660.00	291.46	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
59640.00	292.06	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59620.00	292.66	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59600.00	293.26	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59580.00	293.86	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59560.00	294.46	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.008	29.85
59540.00	295.06	120.00	160.00	160.00	-1320.00	20.000	-29.85	-0.37	-150	-0.007	29.85
59520.00	295.66	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59500.00	296.26	120.00	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85

PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 68544.791  
P.K. Final.....: 52700.000  
Equidistancia..: 20.000  
Vel. Inicial...: 0.00  
T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
59480.00	296.86	119.99	160.00	160.00	-1320.00	20.000	5.15	0.06	-150	-0.007	29.85
59460.00	297.46	120.00	160.00	160.00	-1320.00	18.766	6.12	0.08	-150	-0.007	28.89
59440.00	298.06	120.00	160.00	160.00	-1320.00	16.543	7.86	0.10	-150	-0.007	27.14
59420.00	298.66	120.00	160.00	160.00	-1320.00	14.321	9.60	0.12	-150	-0.007	25.40
59400.00	299.26	120.00	160.00	160.00	-1320.00	12.099	11.35	0.14	-150	-0.007	23.65
59380.00	299.86	119.99	160.00	160.00	-1320.00	9.877	13.09	0.16	-150	-0.007	21.91
59360.00	300.46	119.99	160.00	160.00	-1320.00	7.655	14.84	0.19	-150	-0.007	20.17
59340.00	301.06	120.01	160.00	160.00	-1320.00	5.432	-18.42	-0.23	-150	-0.007	18.42
59320.00	301.66	120.01	160.00	160.00	-1320.00	3.210	-16.68	-0.21	-150	-0.007	16.68
59300.00	302.26	120.00	160.00	160.00	-1367.56	1.000	20.06	0.25	-145	-0.007	14.95
59280.00	302.86	120.00	160.00	160.00	-1626.86	1.000	-14.86	-0.19	-122	-0.006	14.86
59260.00	303.46	120.00	160.00	160.00	-2007.50	1.000	20.22	0.25	-99	-0.005	14.78
59240.00	304.06	120.00	160.00	160.00	-2620.67	1.000	-14.71	-0.18	-76	-0.004	14.71
59220.00	304.66	119.64	160.00	160.00	-3773.14	1.000	20.56	-0.60	-52	-0.004	14.60
59200.00	305.26	118.33	160.00	160.00	-6734.86	1.000	21.32	-0.60	-29	-0.006	14.41
59180.00	305.87	117.01	160.00	160.00	-31317.38	1.000	22.10	-0.60	-6	-0.002	14.22
59160.00	306.49	115.67	160.00	160.00	0.00	1.000	22.80	-0.60	0	0.000	14.08
59140.00	307.12	114.32	160.00	160.00	0.00	1.000	23.50	-0.60	0	0.000	13.96
59120.00	307.75	112.95	160.00	160.00	0.00	1.000	24.20	-0.60	0	0.000	13.84
59100.00	308.39	111.56	160.00	160.00	0.00	1.000	24.90	-0.60	0	0.000	13.72
59080.00	309.04	110.16	160.00	160.00	0.00	1.000	25.59	-0.60	0	0.000	13.60
59060.00	309.70	108.74	160.00	160.00	0.00	1.000	26.27	-0.60	0	0.000	13.48
59040.00	310.37	107.30	160.00	160.00	0.00	1.000	26.92	-0.60	0	0.000	13.36
59020.00	311.04	105.84	160.00	160.00	0.00	1.000	27.55	-0.60	0	0.000	13.24
59000.00	311.73	104.36	160.00	160.00	0.00	1.000	28.20	-0.60	0	0.000	13.12
58980.00	312.42	102.86	160.00	160.00	0.00	1.085	28.84	-0.60	0	0.000	13.06
58960.00	313.13	101.33	160.00	160.00	0.00	3.265	27.90	-0.60	0	0.000	14.65
58940.00	313.84	99.79	160.00	160.00	0.00	5.445	27.07	-0.60	0	0.000	16.24
58920.00	314.57	98.21	160.00	160.00	0.00	7.625	26.39	-0.60	0	0.000	17.83
58900.00	315.31	96.62	160.00	160.00	0.00	9.805	25.84	-0.60	0	0.000	19.42
58880.00	316.06	94.99	160.00	160.00	0.00	11.900	25.45	-0.60	0	0.000	20.96
58860.00	316.83	93.34	160.00	160.00	0.00	11.900	26.77	-0.60	0	0.000	20.84
58840.00	317.60	91.66	160.00	160.00	0.00	11.900	28.11	-0.60	0	0.000	20.72
58820.00	318.40	89.95	160.00	160.00	0.00	11.900	29.43	-0.60	0	0.000	20.60
58800.00	319.21	88.20	160.00	160.00	0.00	11.900	30.65	-0.60	0	0.000	20.49

PROYECTO :  
GRUPO : 12 : Diagr. Vel.  
C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
EJE : 33 : Alt 2A (P1749fin33.vol)

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\* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
\* \* \* PK. decrecientes \* \* \*  
\*\*\*\*\*

TREN: CAF. Modelo CIVIA-2  
P.K. Inicial...: 68544.791  
P.K. Final.....: 52700.000  
Equidistancia..: 20.000  
Vel. Inicial...: 0.00  
T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
58780.00	320.03	86.42	160.00	160.00	0.00	11.900	31.85	-0.60	0	0.000	20.37
58760.00	320.87	84.60	160.00	160.00	0.00	11.900	33.04	-0.60	0	0.000	20.25
58740.00	321.73	82.74	160.00	160.00	0.00	11.900	34.19	-0.60	0	0.000	20.13
58720.00	322.61	80.84	160.00	160.00	0.00	11.900	35.36	-0.60	0	0.000	20.01
58700.00	323.51	78.89	160.00	160.00	0.00	11.900	36.56	-0.60	0	0.000	19.89
58680.00	324.44	76.89	160.00	160.00	0.00	11.900	37.80	-0.60	0	0.000	19.77
58660.00	325.39	74.84	160.00	160.00	0.00	11.900	39.12	-0.60	0	0.000	19.65
58640.00	326.36	72.74	120.00	160.00	0.00	11.120	41.18	-0.60	0	0.000	18.94
58620.00	327.37	70.56	120.00	160.00	0.00	7.154	45.92	-0.60	0	0.000	15.70
58600.00	328.41	68.32	120.00	160.00	0.00	3.187	50.88	-0.60	0	0.000	12.47
58580.00	329.48	66.01	120.00	160.00	0.00	-0.000	55.62	-0.60	0	0.000	9.83
58560.00	330.59	63.61	120.00	160.00	0.00	-0.000	58.27	-0.60	0	0.000	9.71
58540.00	331.74	61.11	120.00	160.00	0.00	-0.000	61.20	-0.60	0	0.000	9.59
58520.00	332.95	58.51	120.00	160.00	0.00	-0.000	64.50	-0.60	0	0.000	9.47
58500.00	334.21	55.79	120.00	160.00	0.00	-0.000	68.23	-0.60	0	0.000	9.35
58480.00	335.53	52.93	120.00	160.00	0.00	-0.000	72.55	-0.60	0	0.000	9.23
58460.00	336.93	49.90	120.00	160.00	0.00	-0.000	77.61	-0.60	0	0.000	9.11
58440.00	338.42	46.68	120.00	160.00	0.00	-0.000	83.86	-0.60	0	0.000	8.99
58420.00	340.02	43.22	120.00	160.00	10821.66	-0.000	91.71	-0.60	9	-0.037	8.93
58400.00	341.77	39.45	120.00	160.00	2224.45	-0.000	100.97	-0.60	43	-0.190	9.03
58380.00	343.69	35.29	120.00	160.00	1239.63	-0.000	100.86	-0.60	77	-0.361	9.14
58360.00	345.88	30.56	120.00	160.00	859.23	-0.000	100.76	-0.60	112	-0.549	9.24
58340.00	348.47	24.95	120.00	160.00	800.00	-0.000	100.83	-0.60	120	-0.619	9.17
58320.00	351.85	17.65	120.00	160.00	800.00	-0.000	100.95	-0.59	120	-0.649	9.05
58310.00	354.25	12.47	120.00	160.00	800.00	-0.000	101.01	-0.59	120	-0.664	8.99
58300.00	359.68	0.00	120.00	0.00	800.00	-0.000	101.07	-59.97	120	-0.679	8.93
58300.00	419.68	0.00	120.00	0.00	800.00	-0.000	101.07	0.00	0	0.000	8.93
58280.00	427.25	24.94	120.00	160.00	800.00	-0.000	100.83	1.20	120	-0.619	9.17
58260.00	429.64	35.27	120.00	160.00	800.00	-0.000	100.58	1.20	120	-0.559	9.42
58240.00	431.48	43.16	120.00	160.00	800.00	-0.000	91.22	1.14	120	-0.500	9.65
58220.00	433.03	49.07	120.00	160.00	800.00	-0.000	78.45	0.98	120	-0.447	9.86
58200.00	434.43	53.75	120.00	160.00	951.34	-0.000	70.70	0.88	101	-0.337	9.93
58180.00	435.73	57.69	120.00	160.00	1440.91	-0.000	65.19	0.81	67	-0.199	9.87
58160.00	436.94	61.13	120.00	160.00	2968.55	-0.000	60.98	0.76	32	-0.086	9.80
58140.00	438.09	64.19	120.00	160.00	0.00	-0.000	57.61	0.72	0	0.000	9.74

Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
58120.00	439.18	66.96	120.00	160.00	0.00	-0.000	54.66	0.68	0	0.000	9.88
58100.00	440.24	69.50	120.00	160.00	5000.00	-0.000	52.26	0.65	0	0.075	10.14
58080.00	441.26	71.86	120.00	160.00	5000.00	-0.000	50.44	0.63	0	0.080	10.26
58060.00	442.24	74.06	120.00	160.00	0.00	-0.000	49.01	0.61	0	0.000	10.26
58040.00	443.20	76.15	120.00	160.00	0.00	-0.000	47.64	0.60	0	0.000	10.38
58020.00	444.14	78.12	120.00	160.00	0.00	-0.000	46.38	0.58	0	0.000	10.50
58000.00	445.05	80.00	120.00	160.00	0.00	-0.000	45.22	0.57	0	0.000	10.62
57980.00	445.94	81.79	120.00	160.00	0.00	-0.000	44.12	0.55	0	0.000	10.73
57960.00	446.81	83.52	120.00	160.00	7874.17	-2.380	44.84	0.56	13	-0.005	9.05
57940.00	447.66	85.27	120.00	160.00	2119.43	-6.380	46.65	0.58	48	-0.006	6.25
57920.00	448.50	87.06	120.00	160.00	1224.51	-10.380	48.40	0.61	83	0.008	3.45
57900.00	449.32	88.85	120.00	160.00	860.97	-12.000	48.24	0.60	118	0.040	2.50
57880.00	450.12	90.57	120.00	160.00	725.00	-12.000	46.86	0.59	140	0.081	2.76
57860.00	450.91	92.21	120.00	160.00	725.00	-12.000	45.59	0.57	140	0.112	2.87
57840.00	451.68	93.78	120.00	160.00	725.00	-12.000	44.33	0.55	140	0.143	2.98
57820.00	452.44	95.27	120.00	160.00	725.00	-12.000	43.12	0.54	140	0.174	3.09
57800.00	453.19	96.71	120.00	160.00	725.00	-12.000	42.01	0.53	140	0.203	3.20
57780.00	453.93	98.09	120.00	160.00	725.00	-12.000	41.02	0.51	140	0.232	3.30
57760.00	454.66	99.42	120.00	160.00	725.00	-12.000	40.13	0.50	140	0.260	3.40
57740.00	455.38	100.71	120.00	160.00	725.00	-12.000	39.36	0.49	140	0.287	3.50
57720.00	456.09	101.96	120.00	160.00	725.00	-12.000	38.68	0.48	140	0.314	3.60
57700.00	456.79	103.17	120.00	160.00	916.47	-12.000	38.27	0.48	111	0.269	3.51
57680.00	457.49	104.36	120.00	160.00	1339.91	-12.000	37.94	0.47	76	0.198	3.39
57660.00	458.17	105.53	120.00	160.00	2490.71	-12.000	37.65	0.47	41	0.114	3.27
57640.00	458.85	106.67	120.00	160.00	17647.75	-11.956	37.34	0.47	6	0.017	3.17
57620.00	459.52	107.79	120.00	160.00	0.00	-11.456	36.49	0.46	0	0.000	3.63
57600.00	460.19	108.87	120.00	160.00	0.00	-10.956	35.61	0.45	0	0.000	4.11
57580.00	460.84	109.91	120.00	160.00	0.00	-10.456	34.73	0.43	0	0.000	4.58
57560.00	461.50	110.91	120.00	160.00	0.00	-9.956	33.83	0.42	0	0.000	5.06
57540.00	462.14	111.89	160.00	160.00	0.00	-9.500	32.99	0.41	0	0.000	5.51
57520.00	462.78	112.83	160.00	160.00	0.00	-9.500	32.51	0.41	0	0.000	5.59
57500.00	463.42	113.75	160.00	160.00	0.00	-9.500	32.04	0.40	0	0.000	5.67
57480.00	464.05	114.66	160.00	160.00	0.00	-9.500	31.58	0.39	0	0.000	5.75
57460.00	464.68	115.54	160.00	160.00	0.00	-9.500	31.13	0.39	0	0.000	5.82
57440.00	465.30	116.40	160.00	160.00	12607.05	-9.500	30.63	0.38	19	-0.025	5.95

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s2)	H (mm)	ANC (m/s2)	R (kN)
57420.00	465.91	117.24	160.00	160.00	5182.50	-9.500	30.12	0.38	46	-0.057	6.10
57400.00	466.52	118.07	160.00	160.00	3261.65	-9.500	29.61	0.37	74	-0.087	6.24
57380.00	467.13	118.87	160.00	160.00	2379.65	-9.500	29.12	0.36	101	-0.113	6.39
57360.00	467.74	119.65	160.00	160.00	1873.13	-9.500	28.63	0.36	128	-0.136	6.53
57340.00	468.34	120.01	160.00	160.00	1600.00	-9.500	-6.62	-0.08	150	-0.155	6.62
57320.00	468.94	120.01	160.00	160.00	1600.00	-9.500	-6.62	-0.08	150	-0.155	6.62
57300.00	469.54	120.00	160.00	160.00	1600.00	-9.500	-6.62	-0.08	150	-0.155	6.62
57280.00	470.14	120.01	160.00	160.00	1600.00	-9.500	28.38	0.35	150	-0.155	6.62
57260.00	470.74	120.01	160.00	160.00	1695.99	-9.500	-6.60	-0.08	142	-0.146	6.60
57240.00	471.34	120.00	160.00	160.00	2100.89	-9.500	-6.53	-0.08	114	-0.118	6.53
57220.00	471.94	120.00	160.00	160.00	2759.75	-9.500	-6.46	-0.08	87	-0.090	6.46
57200.00	472.54	120.00	160.00	160.00	4020.66	-9.500	-6.38	-0.08	60	-0.062	6.38
57180.00	473.14	120.00	160.00	160.00	7403.06	-9.500	-6.31	-0.08	32	-0.033	6.31
57160.00	473.74	120.00	160.00	160.00	46635.51	-9.500	-6.24	-0.08	5	-0.005	6.24
57140.00	474.34	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
57120.00	474.94	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
57100.00	475.54	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
57080.00	476.14	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
57060.00	476.74	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
57040.00	477.34	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
57020.00	477.94	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
57000.00	478.54	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56980.00	479.14	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56960.00	479.74	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56940.00	480.34	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56920.00	480.94	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56900.00	481.54	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56880.00	482.14	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56860.00	482.74	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56840.00	483.34	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56820.00	483.94	120.01	160.00	160.00	0.00	-9.500	28.77	0.36	0	0.000	6.23
56800.00	484.54	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56780.00	485.14	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56760.00	485.74	120.01	160.00	160.00	0.00	-9.500	28.77	0.36	0	0.000	6.23
56740.00	486.34	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23

Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
56720.00	486.94	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56700.00	487.54	120.01	160.00	160.00	0.00	-9.500	28.77	0.36	0	0.000	6.23
56680.00	488.14	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56660.00	488.74	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56640.00	489.34	120.01	160.00	160.00	0.00	-9.500	28.77	0.36	0	0.000	6.23
56620.00	489.94	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56600.00	490.54	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56580.00	491.14	120.01	160.00	160.00	0.00	-9.500	28.77	0.36	0	0.000	6.23
56560.00	491.74	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56540.00	492.34	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56520.00	492.94	120.01	160.00	160.00	0.00	-9.500	28.77	0.36	0	0.000	6.23
56500.00	493.54	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56480.00	494.14	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56460.00	494.74	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56440.00	495.34	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56420.00	495.94	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56400.00	496.54	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56380.00	497.14	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56360.00	497.74	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56340.00	498.34	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56320.00	498.94	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56300.00	499.54	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56280.00	500.14	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56260.00	500.74	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56240.00	501.34	120.00	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56220.00	501.94	120.01	160.00	160.00	0.00	-9.500	-6.23	-0.08	0	0.000	6.23
56200.00	502.54	120.00	160.00	160.00	-113362.25	-9.500	-6.23	-0.08	-2	-0.000	6.23
56180.00	503.14	120.00	160.00	160.00	-7976.30	-9.500	-6.31	-0.08	-25	-0.001	6.31
56160.00	503.74	120.00	160.00	160.00	-4133.57	-9.500	-6.38	-0.08	-48	-0.002	6.38
56140.00	504.34	120.00	160.00	160.00	-2789.62	-9.500	-6.45	-0.08	-71	-0.003	6.45
56120.00	504.94	120.00	160.00	160.00	-2105.17	-9.500	-6.52	-0.08	-94	-0.005	6.52
56100.00	505.54	120.00	160.00	160.00	-1690.41	-9.500	-6.60	-0.08	-117	-0.006	6.60
56080.00	506.14	120.01	160.00	160.00	-1412.19	-9.500	-6.67	-0.08	-140	-0.007	6.67
56060.00	506.74	120.00	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
56040.00	507.34	120.01	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70

Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
56020.00	507.94	120.00	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
56000.00	508.53	120.01	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55980.00	509.13	120.00	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55960.00	509.73	120.01	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55940.00	510.33	120.00	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55920.00	510.93	120.01	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55900.00	511.53	120.00	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55880.00	512.13	120.01	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55860.00	512.73	120.00	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55840.00	513.33	120.01	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55820.00	513.93	120.00	160.00	160.00	-1320.00	-9.500	-6.70	-0.08	-150	-0.007	6.70
55800.00	514.53	120.01	160.00	160.00	-1320.00	-9.855	28.56	0.36	-150	-0.007	6.44
55780.00	515.13	120.01	160.00	160.00	-1320.00	-11.167	-5.41	-0.07	-150	-0.007	5.41
55760.00	515.73	120.00	160.00	160.00	-1320.00	-12.480	-4.38	-0.05	-150	-0.007	4.38
55740.00	516.34	119.51	160.00	160.00	-1320.00	-13.792	31.93	-0.60	-150	-0.014	3.29
55720.00	516.94	118.20	160.00	160.00	-1320.00	-15.105	33.64	-0.60	-150	-0.032	2.15
55700.00	517.55	116.88	160.00	160.00	-1320.00	-16.417	35.37	-0.60	-150	-0.051	1.00
55680.00	518.17	115.54	160.00	160.00	-1448.48	-17.730	37.12	-0.60	-137	-0.063	-0.18
55660.00	518.80	114.18	160.00	160.00	-1742.68	-19.042	38.93	-0.60	-114	-0.066	-1.41
55640.00	519.43	112.81	160.00	160.00	-2186.85	-20.000	40.46	-0.60	-91	-0.063	-2.37
55620.00	520.08	111.43	160.00	160.00	-2934.88	-20.000	41.24	-0.60	-67	-0.055	-2.56
55600.00	520.73	110.02	160.00	160.00	-4460.72	-20.000	42.01	-0.60	-44	-0.042	-2.75
55580.00	521.38	110.00	110.00	158.57	-9291.17	-20.000	42.10	0.00	-21	-0.020	-2.83
55560.00	522.04	110.00	110.00	157.14	0.00	-20.000	42.16	0.00	0	0.000	-2.89
55540.00	522.69	110.00	110.00	155.71	0.00	-20.000	42.16	0.00	0	0.000	-2.89
55520.00	523.35	109.45	110.00	154.29	0.00	-20.000	42.42	-0.60	0	0.000	-2.94
55500.00	524.01	108.02	110.00	152.86	0.00	-20.000	43.09	-0.60	0	0.000	-3.06
55480.00	524.68	106.57	110.00	151.43	-8095.23	-20.000	43.64	-0.60	-7	0.066	-3.10
55460.00	525.36	105.10	110.00	150.00	-2479.85	-20.000	44.11	-0.60	-24	0.206	-3.05
55440.00	526.05	103.61	110.00	148.57	-1464.19	-20.000	44.59	-0.60	-41	0.332	-2.99
55420.00	526.75	102.10	110.00	147.14	-1038.76	-20.000	45.15	-0.60	-58	0.445	-2.93
55400.00	527.46	100.56	110.00	145.71	-804.89	-20.000	45.79	-0.60	-75	0.544	-2.88
55380.00	528.18	99.00	110.00	144.29	-656.97	-20.000	46.57	-0.60	-92	0.630	-2.82
55360.00	528.91	97.42	103.87	142.86	-554.98	-20.000	47.50	-0.60	-109	0.702	-2.76
55340.00	529.66	95.81	103.41	141.43	-550.00	-20.000	48.69	-0.60	-110	0.665	-2.87



Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
55320.00	530.42	94.17	103.41	140.00	-550.00	-20.000	49.99	-0.60	-110	0.621	-2.99
55300.00	531.19	92.50	103.41	138.57	-550.00	-20.000	51.34	-0.60	-110	0.578	-3.11
55280.00	531.97	90.81	103.41	137.14	-550.00	-20.000	52.67	-0.60	-110	0.534	-3.23
55260.00	532.77	89.08	103.41	135.71	-550.00	-20.000	53.94	-0.60	-110	0.491	-3.35
55240.00	533.59	87.31	103.41	134.29	-550.00	-20.000	55.16	-0.60	-110	0.447	-3.47
55220.00	534.42	85.51	103.41	132.86	-550.00	-20.000	56.34	-0.60	-110	0.403	-3.59
55200.00	535.28	83.68	103.41	131.43	-550.00	-20.000	57.51	-0.60	-110	0.360	-3.71
55180.00	536.15	81.80	103.41	130.00	-550.00	-20.000	58.67	-0.60	-110	0.316	-3.83
55160.00	537.04	79.87	103.41	128.57	-550.00	-20.000	59.85	-0.60	-110	0.272	-3.95
55140.00	537.95	77.90	103.41	127.14	-550.00	-20.000	61.07	-0.60	-110	0.229	-4.07
55120.00	538.89	75.88	103.41	125.71	-550.00	-20.000	62.35	-0.60	-110	0.185	-4.19
55100.00	539.85	73.80	103.41	124.29	-550.00	-20.000	63.74	-0.60	-110	0.141	-4.31
55080.00	540.84	71.66	103.41	122.86	-550.00	-20.000	65.26	-0.60	-110	0.098	-4.43
55060.00	541.86	69.45	103.41	121.43	-550.00	-20.000	66.97	-0.60	-110	0.054	-4.54
55040.00	542.91	67.18	103.41	120.00	-550.00	-20.000	68.97	-0.60	-110	0.010	-4.66
55020.00	544.00	64.82	110.00	118.57	-634.59	-20.000	71.57	-0.60	-95	-0.029	-4.94
55000.00	545.14	62.37	110.00	117.14	-771.54	-20.000	74.58	-0.60	-78	-0.055	-5.23
54980.00	546.31	59.83	110.00	115.71	-983.87	-20.000	77.87	-0.60	-61	-0.067	-5.52
54960.00	547.54	57.17	110.00	114.29	-1357.46	-20.000	81.58	-0.60	-45	-0.067	-5.82
54940.00	548.84	54.38	110.00	112.86	-2188.42	-20.000	85.76	-0.60	-28	-0.052	-6.12
54920.00	550.20	51.44	110.00	111.43	-5642.34	-20.000	90.60	-0.60	-11	-0.025	-6.41
54900.00	551.64	48.32	110.00	110.00	8870.14	-20.000	96.20	-0.60	8	-0.028	-6.57
54880.00	553.18	44.98	110.00	108.57	2378.52	-20.000	102.95	-0.60	32	-0.113	-6.50
54860.00	554.85	41.38	110.00	107.14	1373.40	-20.000	112.07	-0.60	55	-0.213	-6.43
54840.00	556.68	37.43	110.00	105.71	965.42	-20.000	116.35	-0.60	78	-0.328	-6.35
54820.00	558.72	33.01	110.00	104.29	744.32	-20.000	116.28	-0.60	101	-0.457	-6.28
54800.00	561.09	27.90	110.00	102.86	605.62	-20.000	116.21	-0.60	124	-0.602	-6.21
54780.00	564.00	21.61	110.00	101.43	510.49	-20.000	116.14	-0.60	147	-0.761	-6.14
54760.00	568.22	12.47	110.00	100.00	500.00	-20.000	116.23	-0.59	150	-0.825	-6.23
54750.00	573.65	0.00	110.00	0.00	500.00	-20.000	116.30	-59.97	150	-0.849	-6.30
54750.00	633.65	0.00	110.00	0.00	500.00	-20.000	116.30	0.00	0	0.000	-6.30
54740.00	639.53	17.64	110.00	100.00	500.00	-20.000	116.17	1.20	150	-0.801	-6.17
54720.00	642.52	30.55	110.00	100.00	500.00	-20.000	115.93	1.20	150	-0.705	-5.93
54700.00	644.58	39.44	110.00	100.00	500.00	-20.000	115.69	1.20	150	-0.609	-5.69
54680.00	646.25	46.66	110.00	100.00	500.00	-20.000	98.36	1.20	150	-0.513	-5.45

Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final.....: 52700.000  
 Equidistancia..: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial.....: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
54660.00	647.70	52.68	110.00	100.00	500.00	-20.000	87.44	1.09	150	-0.421	-5.22
54640.00	649.01	57.59	110.00	100.00	500.00	-20.000	80.22	1.00	150	-0.337	-5.01
54620.00	650.21	61.80	110.00	100.00	500.00	-20.000	74.83	0.94	150	-0.260	-4.82
54600.00	651.34	65.49	110.00	100.00	500.00	-20.000	70.59	0.88	150	-0.187	-4.64
54580.00	652.41	68.82	110.00	100.00	500.00	-20.000	67.42	0.84	150	-0.118	-4.46
54560.00	653.44	71.87	110.00	100.00	500.00	-20.000	64.99	0.81	150	-0.052	-4.30
54540.00	654.42	74.70	110.00	100.00	500.00	-20.000	63.02	0.79	150	0.012	-4.14
54520.00	655.37	77.34	110.00	100.00	500.00	-20.000	61.31	0.77	150	0.074	-3.99
54500.00	656.28	79.84	110.00	100.00	500.00	-20.000	59.76	0.75	150	0.135	-3.84
54480.00	657.17	82.20	110.00	100.00	536.03	-20.000	58.41	0.73	140	0.181	-3.77
54460.00	658.04	84.45	110.00	100.00	641.90	-20.000	57.19	0.71	117	0.196	-3.82
54440.00	658.88	86.59	110.00	100.00	799.88	-20.000	56.00	0.70	94	0.193	-3.87
54420.00	659.70	88.64	110.00	100.00	1061.02	-20.000	54.80	0.68	71	0.171	-3.93
54400.00	660.50	90.60	110.00	100.00	1575.30	-20.000	53.58	0.67	48	0.133	-3.99
54380.00	661.29	92.48	110.00	100.00	3057.11	-20.000	52.31	0.65	25	0.077	-4.05
54360.00	662.06	94.27	110.00	100.00	51507.85	-20.000	51.06	0.64	1	0.005	-4.11
54340.00	662.82	95.98	110.00	100.00	0.00	-20.000	49.72	0.62	0	0.000	-4.00
54320.00	663.56	97.63	110.00	100.00	0.00	-20.000	48.48	0.61	0	0.000	-3.88
54300.00	664.29	99.21	110.00	100.00	0.00	-20.000	47.40	0.59	0	0.000	-3.76
54280.00	665.01	100.00	110.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54260.00	665.73	100.00	110.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54240.00	666.45	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54220.00	667.17	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54200.00	667.89	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54180.00	668.61	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
54160.00	669.33	100.00	120.00	100.00	-11685.78	-20.000	46.85	0.00	-8	0.022	-3.65
54140.00	670.05	100.00	120.00	100.00	-2387.16	-20.000	46.64	0.00	-38	0.110	-3.44
54120.00	670.77	100.00	120.00	100.00	-1329.36	-20.000	46.43	0.00	-68	0.197	-3.23
54100.00	671.49	100.00	120.00	100.00	-921.17	-20.000	46.22	0.00	-98	0.285	-3.02
54080.00	672.21	100.00	120.00	100.00	-704.77	-20.000	46.01	0.00	-128	0.372	-2.81
54060.00	672.93	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
54040.00	673.65	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
54020.00	674.37	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
54000.00	675.09	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65
53980.00	675.81	100.00	120.00	100.00	-600.00	-20.000	45.85	0.00	-150	0.437	-2.65

Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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Istram 23.05.05.10 19/02/24 12:52:52 200356  
 PROYECTO :  
 GRUPO : 12 : Diagr. Vel.  
 C.R.S. : ETRS89 / UTM zone 31N (HUSO 31)  
 EJE : 33 : Alt 2A (P1749fin33.vol)

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
53960.00	676.53	100.00	120.00	100.00	-610.60	-20.000	45.87	0.00	-147	0.429	-2.67
53940.00	677.25	100.00	120.00	100.00	-766.63	-20.000	46.08	0.00	-117	0.342	-2.88
53920.00	677.97	100.00	120.00	100.00	-1029.78	-20.000	46.29	0.00	-87	0.255	-3.09
53900.00	678.69	100.00	120.00	100.00	-1568.02	-20.000	46.50	0.00	-57	0.167	-3.30
53880.00	679.41	100.00	120.00	100.00	-3285.01	-20.000	46.71	0.00	-27	0.080	-3.51
53860.00	680.13	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53840.00	680.85	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53820.00	681.57	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53800.00	682.29	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53780.00	683.01	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53760.00	683.73	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53740.00	684.45	100.00	120.00	100.00	0.00	-20.000	46.90	0.00	0	0.000	-3.70
53720.00	685.17	100.00	120.00	100.00	40781.77	-20.000	46.89	0.00	2	0.010	-3.69
53700.00	685.89	100.00	120.00	100.00	3559.59	-20.000	46.73	0.00	19	0.112	-3.53
53680.00	686.61	100.00	120.00	100.00	1861.01	-20.000	46.56	0.00	35	0.214	-3.36
53660.00	687.33	100.00	120.00	100.00	1259.84	-20.000	46.40	0.00	52	0.316	-3.20
53640.00	688.05	100.00	120.00	100.00	952.23	-20.000	46.24	0.00	69	0.418	-3.04
53620.00	688.77	100.00	120.00	100.00	765.36	-20.000	46.08	0.00	86	0.520	-2.88
53600.00	689.49	100.00	120.00	100.00	639.80	-20.000	45.92	0.00	103	0.622	-2.72
53580.00	690.21	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53560.00	690.93	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53540.00	691.65	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53520.00	692.37	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53500.00	693.09	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53480.00	693.81	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53460.00	694.53	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53440.00	695.25	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53420.00	695.97	100.00	120.00	100.00	600.00	-20.000	45.85	0.00	110	0.663	-2.65
53400.00	696.69	100.00	120.00	100.00	665.43	-20.000	45.95	0.00	99	0.598	-2.75
53380.00	697.41	100.00	120.00	100.00	802.33	-20.000	46.11	0.00	82	0.496	-2.91
53360.00	698.13	100.00	120.00	100.00	1010.15	-20.000	46.28	0.00	65	0.394	-3.08
53340.00	698.85	99.79	120.00	100.00	1363.24	-20.000	46.57	-0.60	48	0.290	-3.26
53320.00	699.58	98.21	120.00	100.00	2095.84	-20.000	47.75	-0.60	31	0.177	-3.53
53300.00	700.32	96.62	120.00	100.00	4530.51	-20.000	49.07	-0.60	15	0.077	-3.81
53280.00	701.07	94.99	120.00	100.00	0.00	-20.000	50.48	-0.60	0	0.000	-4.07

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 \* \* \* DIAGRAMA DE VELOCIDADES \* \* \*  
 \* \* \* PK. decrecientes \* \* \*  
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TREN: CAF. Modelo CIVIA-2  
 P.K. Inicial...: 68544.791  
 P.K. Final...: 52700.000  
 Equidistancia...: 20.000  
 Vel. Inicial...: 0.00  
 T. Inicial...: 0.00

P.K.	t (sg)	v (km/h)	v.espec.	v.limit.	Radio	i (mm/m)	F-R (kN)	a (m/s <sup>2</sup> )	H (mm)	ANC (m/s <sup>2</sup> )	R (kN)
53260.00	701.84	93.34	120.00	100.00	0.00	-20.000	51.81	-0.60	0	0.000	-4.19
53240.00	702.61	91.66	120.00	100.00	0.00	-20.000	53.14	-0.60	0	0.000	-4.31
53220.00	703.41	89.95	120.00	100.00	0.00	-20.000	54.46	-0.60	0	0.000	-4.43
53200.00	704.22	88.20	90.00	100.00	0.00	-20.000	55.68	-0.60	0	0.000	-4.55
53180.00	705.04	86.42	90.00	100.00	2314.54	-20.000	56.62	-0.60	23	0.121	-4.40
53160.00	705.88	84.60	90.00	100.00	801.04	-20.000	57.29	-0.60	66	0.318	-4.01
53140.00	706.74	82.74	90.00	100.00	484.33	-20.000	57.93	-0.60	108	0.477	-3.61
53120.00	707.62	80.84	90.00	100.00	350.00	-20.000	58.60	-0.60	150	0.592	-3.24
53100.00	708.52	78.89	90.00	100.00	350.00	-20.000	59.80	-0.60	150	0.523	-3.35
53080.00	709.45	76.89	90.00	100.00	350.00	-20.000	61.04	-0.60	150	0.454	-3.47
53060.00	710.40	74.84	90.00	100.00	350.00	-20.000	62.37	-0.60	150	0.386	-3.59
53040.00	711.37	72.74	90.00	100.00	350.00	-20.000	63.82	-0.60	150	0.317	-3.71
53020.00	712.38	70.56	90.00	100.00	350.00	-18.711	64.45	-0.60	150	0.249	-2.84
53000.00	713.42	68.32	90.00	100.00	397.37	-13.711	62.60	-0.60	132	0.159	0.75
52980.00	714.49	66.01	90.00	100.00	588.15	-8.711	61.39	-0.60	89	0.066	4.06
52960.00	715.60	63.61	90.00	100.00	1131.32	-3.711	60.63	-0.60	46	0.013	7.35
52940.00	716.75	61.11	90.00	100.00	14793.59	-0.000	61.15	-0.60	4	-0.001	9.64
52920.00	717.96	58.51	90.00	100.00	0.00	-0.000	64.50	-0.60	0	0.000	9.47
52900.00	719.22	55.79	90.00	100.00	0.00	-0.000	68.23	-0.60	0	0.000	9.35
52880.00	720.54	52.93	90.00	100.00	0.00	-0.000	72.55	-0.60	0	0.000	9.23
52860.00	721.94	49.90	90.00	100.00	0.00	-0.000	77.61	-0.60	0	0.000	9.11
52840.00	723.43	46.68	90.00	100.00	0.00	-0.000	83.86	-0.60	0	0.000	8.99
52820.00	725.03	43.22	100.00	100.00	0.00	-0.000	91.77	-0.60	0	0.000	8.87
52800.00	726.78	39.45	100.00	100.00	0.00	-0.000	101.25	-0.60	0	0.000	8.75
52780.00	728.70	35.29	100.00	100.00	0.00	-0.000	101.37	-0.60	0	0.000	8.63
52760.00	730.89	30.56	100.00	100.00	0.00	-0.000	101.49	-0.60	0	0.000	8.51
52740.00	733.48	24.95	100.00	100.00	0.00	-0.000	101.61	-0.60	0	0.000	8.39
52720.00	736.86	17.65	100.00	100.00	0.00	-0.000	101.73	-0.59	0	0.000	8.27
52710.00	739.25	12.47	100.00	100.00	2302.94	-0.000	101.52	-0.59	23	-0.123	8.48
52700.00	744.69	1.95	100.00	-0.00	1144.44	-1.219	102.26	-59.97	45	-0.257	7.74