

**CONTRATO DE CONSULTORÍA Y ASISTENCIA
PARA LA REALIZACIÓN DE PRUEBAS DE CARGA
PARA LA RECEPCIÓN DE PUENTES DE LA
LINEA DE ALTA VELOCIDAD
MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA.
TRAMO: VILAFRANCA DEL PENEDES- BARCELONA**



INFORME DE PRUEBA DE CARGA

**TRAMO: SANT VICENÇ HORTS - SANTA COLOMA CERVELLO.
VIADUCTO RIERA TORRELLES (MERCANCIAS)
62RMPI02
P.K. DE OBRA:604+940; DE LÍNEA:603+245**

INFORME DE RESULTADOS
PRUEBA DE CARGA DE LA ESTRUCTURA VIADUCTO RIERA
TORRELLES (MERCANCÍAS) (62RMPI02)

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UNIDAD DE CONSTRUCCIÓN

INFORME DE RESULTADOS
PRUEBA DE CARGA DE LA ESTRUCTURA
VIADUCTO RIERA TORRELLES (MERCANCÍAS) (62RMPI02)

PC-LL-07-13

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ANEJOS:

- I. DOCUMENTACIÓN FACILITADA POR EL ADIF**
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1. INTRODUCCIÓN.

A instancias del ADIF, se redacta el presente documento, "Informe de Resultados", que recoge toda la información obtenida en la prueba de carga referente a la estructura: Viaducto Riera Torrelles (Mercancías) (62RMPI02) de la línea de alta velocidad Madrid-Zaragoza-Barcelona-Frontera Francesa, Tramo: Vilafranca del Penedés - Barcelona, subtramo: VIb, de acuerdo con las especificaciones del Contrato AV 004/07 suscrito con dicho Organismo, cuyo alcance es la realización de las preceptivas pruebas de carga en los puentes y estructuras a recibir por el ADIF, previamente a su puesta en servicio.

La redacción del presente documento atiende a las especificaciones de la "Instrucción relativa a las acciones a considerar en el Proyecto de Puentes de Ferrocarril", y se ha realizado siguiendo las directrices recogidas en la publicación del Ministerio de Fomento **"Instrucción sobre las inspecciones técnicas en los puentes de ferrocarril (ITPF-05)**, así como las indicadas en el Plan de Actuación de dichas pruebas, redactado por el ADIF, e incluido en el Pliego de Bases, con objeto de desarrollar las especificaciones del Contrato.

2. OBJETO DEL DOCUMENTO.

El objeto del presente Informe es explicar las actividades realizadas en la obra de referencia, exponer los resultados obtenidos en la Prueba de Carga y, a partir de un análisis de los mismos, emitir las conclusiones y recomendaciones oportunas.

En cuanto a las actividades desarrolladas en la estructura que nos ocupa, podemos agruparlas en las siguientes fases:

- Inspección preliminar: Realizada el día 14 de Noviembre de 2006.
- Análisis del Proyecto de la estructura y realización del Proyecto de Prueba de Carga.
- Realización de la Prueba de Carga: 3 y 4 de Enero de 2007.
- Análisis de resultados y realización del Informe Final.

3. DESCRIPCIÓN DE LA OBRA.

La estructura objeto de la prueba, 62RMPI02, pertenece a la línea de alta velocidad Madrid-Zaragoza-Barcelona-Frontera Francesa, Tramo: Vilafranca del Penedés - Barcelona, subtramo: VIb. P.K. Obra: 604+940; P.K. Línea: 603+245

El paso inferior permite el cruce de la línea de alta velocidad y de la línea de mercancías sobre la riera de Torrelles, con una longitud total de 48 m. El puente está constituido por dos tableros paralelos, uno para la línea de alta velocidad y otro para la línea de mercancías, de similares características de hormigón postesado con un esquema longitudinal de tres vanos de 14,5+19+14,5 m de luz. La plataforma tiene 14 m de ancho para ubicar la capa de balasto del ferrocarril, dos canaletas para el paso de cables y las barandillas con sus impostas. El desarrollo en planta de la estructura es prácticamente recto, presentando un ligero esviaje en planta de 16g. Al tratarse de una estructura de poca longitud y una altura sobre el cauce del río de unos 7 m, se ha proyectado un tablero de hormigón in situ constituido por una losa aligerada de 1,24 m de canto constante (sobre el eje del tablero) y con bombeo del 2 % (canto sobre el borde del tablero igual a 1,10 m).

Vano	Luz de cálculo (m)	Ancho del Tablero (m)	Sección Transversal
V-1	14,50	14,00	Losa Aligerada
V-2	19,00	14,00	Losa Aligerada
V-3	14,50	14,00	Losa Aligerada

Directamente sobre la losa se encuentra situado el balasto, las vías y las barandillas de protección.

4. INSPECCIÓN PRELIMINAR.

La inspección previa a la ejecución de la Prueba de Carga fue realizada por el ingeniero de OFITECO Sr. Juan Carlos Garrido Baro. Dicha inspección se efectuó en fecha 14 de Noviembre de 2006, siguiéndose las directrices del Plan de Actuación mencionado en el Apartado 1 del presente Informe, así como la publicación del Ministerio de Fomento *"Instrucción sobre las inspecciones técnicas en los puentes de ferrocarril (ITPF-05)*, comprobándose en la misma la coincidencia geométrica de la obra con la especificada en la documentación de Proyecto facilitada.

Asimismo, se comprobó que la estructura no presentaba daños, defectos ni aspectos anómalos de carácter estructural de importancia. Tan sólo hay que comentar la existencia de algún golpe en la viga, la cual aparece indicada en la ficha de seguimiento de la misma.

Con los datos recogidos en las inspecciones realizadas se procedió a la cumplimentación de la ficha de seguimiento de la estructura para el Sistema de Gestión de Mantenimiento que está implementando el ADIF, utilizando para ello el formato informático de ficha facilitado por dicho Organismo.

En el anejo nº VII de este documento se adjuntan una copia de la mencionada ficha de seguimiento y, la documentación fotográfica correspondiente a las inspecciones realizadas.

5. ANALISIS DEL PROYECTO DE LA ESTRUCTURA.

La documentación del Proyecto, facilitada por el ADIF, consta de los siguientes documentos:

- a) Planos del Paso Inferior Riera de Torrelles del Proyecto de Construcción de Plataforma. Línea de Alta Velocidad Madrid – Zaragoza – Barcelona – Frontera francesa. Tramo: Vilafranca del Penedés - Barcelona, subtramo: V1b
- b) Anejo de Cálculo del Paso Inferior Riera de Torrelles del Proyecto de Construcción de Plataforma. Línea de Alta Velocidad Madrid – Zaragoza – Barcelona – Frontera francesa. Tramo: Vilafranca del Penedés - Barcelona, subtramo: V1b (Documento nº1: Memoria y Anejos, Anejo 6: Estructuras, Riera de Torrelles)

Como anejo nº I a este documento, se acompaña copia de la documentación facilitada referente a la estructura objeto de estudio.

6. PLAN DE PRUEBA.

Debido a que el Proyecto de la estructura no incluye el Plan de Prueba de la misma, fue necesaria la elaboración posterior de un Proyecto de Prueba de Carga, con objeto de evaluar las tensiones y deformaciones de la estructura bajo las sollicitaciones de un tren de cargas constituido por dos (2) locomotoras y dos (2) tolvas cargadas con balasto, distribuidas en las vías de la línea mixta.

Dicho Proyecto de Prueba de Carga fue realizado por OFITECO, exponiéndose en los apartados siguientes un resumen del mismo.

6.1. ACCIONES REPRODUCIDAS.

La materialización de la sobrecarga en el Proyecto de Prueba se realizó de acuerdo con la solicitud cursada a través del ADIF, mediante la prestación de una (1) locomotora y una (1) tolvas por cada vía, cuyas dimensiones se detallan en el croquis incluido en el anejo nº III.

Con estos medios, las acciones a reproducir son las propias de la utilización de la estructura, y consisten, dada la naturaleza de la misma, en cuatro (4) hipótesis de sobrecarga de tipo estático, cargando dos vanos alternos para obtener los máximos momentos flectores positivos en centros de vano (2 pruebas) y cargando dos vanos consecutivos para obtener los máximos momentos flectores negativos en pilas(2 pruebas), así como las correspondientes hipótesis de sobrecarga dotadas del impacto dinámico que le proporcionan tanto la velocidad como el frenado.

Así pues, el desarrollo de la Prueba de Carga se programó del siguiente modo.

6.1.1. Pruebas estáticas.

Se realizará una (1) prueba estática para cada hipótesis de carga, resultando un total de cuatro (4) pruebas estáticas, cargando dos vanos alternos para obtener los máximos momentos flectores positivos en centros de vano y cargando dos vanos consecutivos para obtener los máximos momentos flectores negativos. Las cargas aplicadas en cada hipótesis corresponden a las de la tabla siguiente:

Hipótesis	Vano	Vías	Sobrecargas
H-1	V-2	1 y 2	2 Tolvas +2 Locomotoras
H-2	V-1	1 y 2	2 Tolvas
	V-3	1 y 2	2 Locomotoras
H-3	V-1	1 y 2	2 Tolvas
	V-2	1 y 2	2 Locomotoras
H-4	V-2	1 y 2	2 Tolvas
	V-3	1 y 2	2 Locomotoras

En el Anejo nº III se adjuntan las mencionadas posiciones de las sobrecargas para cada vano.

Para cada vano, el ensayo de prueba de carga estática se realizará atendiendo a los siguientes escalones:

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- Escalón 0: Verificación de conexión y funcionamiento de todos los instrumentos de medida, equilibrado y puesta a cero.
- Escalón 1: Determinación de las lecturas origen estabilizadas de todos los sensores, sin carga en la estructura.
- Escalón 2: Situación o posicionamiento de la carga de prueba, realizándose medidas continuas en intervalos de tiempo entre 5-15 seg.
- Escalón 3: Estabilización de las medidas con la carga de prueba situada, realizándose la medida continua de todos los equipos en intervalos de tiempo entre 5-15 seg hasta su total estabilización, durante un tiempo no inferior a 10 minutos.
- Escalón 4: Descarga de la estructura retirando los vehículos que constituyen el tren de carga. Se realizarán lecturas de forma continua, cada 5-15 seg, de todos los sensores.
- Escalón 5: Estabilización final de las medidas, con la estructura totalmente descargada, realizándose la medida continua de todos los sensores, cada 5-15 seg, hasta alcanzar una recuperación no inferior al 85%, en un intervalo de tiempo no superior al de mantenimiento de la carga de prueba.

En los escalones de estabilización de carga (Escalón 3) y estabilización de descarga (Escalón 5), aparte de los tiempos indicados, y simultáneamente, se seguirán los siguientes criterios de estabilización:

- En 10 minutos no habrá variaciones superiores al 5% de la medida anterior.
- Se esperará a obtener recuperaciones finales superiores al 85 % y sirviendo los criterios anteriores. En caso de no alcanzarse dicho tanto por ciento se procederá a realizar un segundo ciclo de carga.

6.1.2. Pruebas dinámicas.

En cada vano, a continuación de la correspondiente prueba estática, se realizarán cuatro (4) pruebas de carácter dinámico, realizándose cargando dos (2) vías en la prueba causi estática y el resto solo por una vía , con el mismo tren de carga que el utilizado en la prueba estática en dicha vía. Dichas pruebas dinámicas serán las siguientes:

- **Prueba D-1:** Prueba cuasi-estática ($V = 5 \text{ Km/h}$).
- **Prueba D-2:** Prueba a velocidad media ($V = 30 \text{ Km/h}$).
- **Prueba D-3:** Prueba a máxima velocidad.
- **Prueba D-4:** Prueba de frenado a máxima velocidad.

6.2. PUNTOS DE MEDIDA.

La disposición de los puntos de medida puede observarse en el anejo nº III, resultando unos totales de:

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Vano	Flexímetros		Bandas	Geófonos
	Apoyos	$\frac{1}{2}Lc$	$\frac{1}{2}Lc$	
1	2	2	2	1
2	2	2	2	1
3	2	2	2	1
Totales	12		6	3

6.3. EQUIPOS DE MEDIDA.

6.3.1. Parámetros de control.

Las medidas realizadas durante el ensayo de prueba de carga fueron de tres (3) tipos:

- Descensos verticales (flechas).
- Deformaciones unitarias (tensiones en el hormigón).
- Frecuencia de vibración en el centro del vano.

6.3.2. Sensores.

Para la obtención de dichas medidas se utilizaron los siguientes equipos o sensores:

- Para el control de flechas verticales en el centro del vano se utilizaron flexímetros equipados con un sensor lineal potenciométrico de desplazamiento y salida 4:20 mA,

utilizando como elemento de transmisión de flechas un hilo de acero inoxidable de 2 mm de diámetro fijado a la cara inferior del tablero. El rango de medida es de 50 mm con una precisión del 0.1%.

- Para el control de flechas verticales en los apoyos de los tableros se utilizaron los mismos sensores lineales potenciométricos de desplazamiento lineal y salida 4:20 mA, montados sobre unos angulares metálicos y palpando directamente sobre las vigas. El rango de medida es también.
- La medición de las deformaciones unitarias se realizó mediante bandas extensométricas directamente adheridas al hormigón, en la fibra inferior del dintel y según la dirección longitudinal del mismo.
- El control de vibraciones se realizó mediante geófonos verticales situados en la sección media del tablero.
- Por último, como medidas auxiliares, se realizó un control continuo de los parámetros meteorológicos más significativos: Temperatura, presión atmosférica y humedad relativa.

En el anejo nº VIII se encuentran las fichas técnicas de los distintos equipos utilizados durante la prueba.

6.3.3. Unidad de adquisición.

La unidad de adquisición empleada en el ensayo de prueba de carga, está basada en un ordenador industrial de las siguientes características:

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- Ordenador PC2000 Pentium III a 800 MHz.
- Memoria RAM 128Mb.
- Disco duro de 20 Gb.
- Controladora ATI XPERT con 8 Mb.
- CD ROM 52x.
- IOMEGA interno 100 Mb.
- Disquetera 3 1/2 (1.4 Mb).
- Monitor color de 17".
- Puertos serie y paralelo.
- Teclado y ratón.

En el Bus del ordenador central se alojan dos (2) tarjetas conversoras de 16 bits, de 32 canales analógicos y 100.000 muestras/seg cada una de ellas, que se encarga de comandar 64 tarjetas acondicionadoras donde se recogen las señales de los distintos sensores a la frecuencia deseada.

Las características fundamentales de las tarjetas conversoras son:

- 32 canales de adquisición cada una de ellas (total 64 canales disponibles).
- Acondicionamiento de las señales a +/- 10 VDC.
- Amplificación seleccionable por software (1, 10, 100, y 1000).
- Filtros de señal.

Por su parte las tarjetas acondicionadoras (64) permiten la conexión y adquisición indistinta de cualquier tipo de sensor, tanto flexímetros y bandas extensométricas como geófonos.

El conjunto de tarjetas de acondicionamiento (64 en total) se encuentran repartidas en dos (2) cajas externas al ordenador central, disponiéndose de treinta y dos (32) canales en cada

una de ellas, que a su vez reciben las acometidas, mediante mangueras multiconductoras, de los distintos sensores instalados, centralizados previamente en cajas de conexión intermedias. El equilibrio y ajuste de señal de los distintos canales se realiza de forma automática.

La alimentación general del Sistema se realiza a 220V 50 Hz, mediante un grupo eléctrico y una fuente de alimentación ininterrumpida con salida estabilizada y autonomía de 1 hora. La excitación de los sensores se realiza a B.T. (24 VDC) con fuentes de alimentación estabilizadas y perfectamente apantalladas. El sistema tiene todas las masas interconectadas a tierra, materializándose dicha conexión con una pica externa.

El sistema de adquisición, así como el de transmisión de datos, están concebidos para evitar la influencia de las líneas de medida sobre las señales de los distintos sensores.

Así pues, las señales que nos proporcionan los flexímetros resistivos se convierten en señales 4-20 mA en los puntos de medida y luego, son llevadas a las tarjetas acondicionadoras donde se convierten en tensión, sin utilizar ningún tipo de amplificación.

Por otro lado, cada una de las bandas extensométricas forma parte de un circuito extensométrico diseñado especialmente por OFITECO, con compensación absoluta de las líneas de medida, alimentado a 24 VDC y corriente constante de 5-10 mA, midiéndose las deformaciones producidas como desequilibrios o variaciones de la tensión de salida del mismo en tarjetas amplificadoras, amplificando por 10, 100 ó 1000 la señal recibida. Todos los circuitos llevan un sistema automático de ajuste inicial de cero. La lectura de las bandas se realiza a tres hilos.

Por ultimo, los geófonos para control de vibraciones proporcionan señales entre ± 10 V que se llevan directamente a las tarjetas mencionadas, utilizando normalmente amplificaciones de 1 y 10 para su registro.

El programa de adquisición, "**PCESTRUCTURAS**", desarrollado íntegramente por OFITECO en entorno Windows, se ocupa de realizar las funciones de adquisición y análisis, permitiendo la realización simultánea de ambas funciones con las siguientes prestaciones:

ADQUISICIÓN:

Programación software de todos los parámetros de configuración de las pruebas, tanto estáticas como dinámicas, teniendo como variables los siguientes parámetros:

- Parámetros de identificación.
- Número de canales y tipo.
- Filtros software.
- Constantes de los sensores.
- Valores teóricos esperados en la prueba.
- Canales asociados entre sí (para cálculo de valores netos en flechas en secciones que no sean apoyos)
- Factores de amplificación.

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- Velocidad de muestreo (hasta 100.000 muestras/segundo).
- Duración (sólo para las dinámicas, hasta 5 minutos a velocidad máxima de adquisición).
- Estabilización y ajuste automático de medidas iniciales, visualizándose los valores absolutos y rangos disponibles de los canales configurados.
- Adquisición de datos según la configuración adoptada:
 - En las pruebas estáticas se visualizan, en tiempo real y directamente en mm o en deformaciones unitarias, según se trate de flechas o de bandas extensométricas, la totalidad de los canales configurados, los valores teóricos estimados de los mismos y el porcentaje que frente a estos últimos representan, así como los porcentajes de recuperación durante el proceso de descarga. En las flechas de secciones que no sean apoyos podrán visualizarse también directamente los valores netos correspondientes. Por último, en cualquier momento durante la prueba podrá visualizarse la representación gráfica de los canales que se seleccionen.
 - En las pruebas dinámicas se permite escoger varios canales de los existentes para su visualización gráfica en tiempo real, así como el control automático de disparo de la unidad, mediante un algoritmo de nivel con un preevento establecido.
- Almacenamiento en tiempo real (DMA) en soporte magnético de los datos. Generación de ficheros compatibles con los módulos de representación gráfica y análisis.
- Enlace directo con los módulos de representación gráfica y análisis.

Enlazando con los módulos de **ANÁLISIS Y REPRESENTACIÓN GRÁFICA**, los datos almacenados se pueden tratar de forma inmediata para obtener:

- Listado de datos en monitor o impresora.
- Generación de salidas gráficas en monitor, impresora o plotter. Gráficos temporales independientes y multicanales.
- Zoom de ventanas gráficas seleccionadas y chequeo de gráficos mediante cursor.
- Cálculo de porcentajes alcanzados en las pruebas y valores de recuperación.
- Coeficientes de impacto dinámico.
- Análisis FFT en tiempo real, modos y frecuencias de vibración.
- Decremento logarítmico y amortiguamiento.

Así pues, en cualquier momento de la prueba, el sistema de adquisición permitirá conocer los valores de las magnitudes obtenidas en cualquiera de los sensores de control, con el fin de poder establecer la comparación directa y rápida de los resultados de cada ensayo, así como dictaminar sobre la necesidad de adoptar medidas precautorias especiales.

Finalmente, como prestaciones generales del sistema de adquisición, podemos enumerar las siguientes:

- Capacidad simultánea de 64 canales (posibilidad inmediata de 2 sistemas de 32 canales).

- Velocidad de muestreo hasta 100.000 muestras/segundo.
- Tiempo máximo de muestreo (sólo para las dinámicas), hasta 5 minutos a velocidad máxima de adquisición.
- Deriva máxima, en un intervalo de quince minutos, inferior a la resolución del sistema.
- Resolución global del sistema:
 - 0,01 mm para flechas.
 - 0,01 $\mu\epsilon$ para deformaciones.

6.3.4. Equipos auxiliares.

Además se contó con los siguientes medios y materiales auxiliares:

- Mangueras de conexión multicanal (16 canales) entre el Sistema de Adquisición y cajas de conexión intermedias.
- Cajas de conexión multicanal (15 canales) intermedias.
- Mangueras de conexión de sensores, mono y multicanales, empalmables entre sí.
- Equipos auxiliares de verificación y comprobación de las señales de los sensores: polímetros de precisión, medidores de aislamiento, osciloscopio, etc.
- Furgoneta Mercedes- Benz Sprinter carrozada interiormente.
- Emisoras portátiles de comunicación por radio, que permiten mantener una perfecta comunicación entre la zona de adquisición y la de aplicación de cargas.

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- Teléfono móvil.
- Repuestos básicos: disco duro, sensores, cajas de conexión, mangueras, fuentes de alimentación, tarjetas de adquisición, etc.
- Grupos eléctricos de 2000 W.
- Fuente de alimentación ininterrumpida (UPS) de 2000 W y 1 hora de autonomía.
- Focos halógenos y materiales auxiliares para iluminación exterior en pruebas nocturnas (hasta una potencia de 1500 W).
- Escalera de dos cuerpos, extensible hasta 5.5 m.
- Cámara fotográfica digital.
- Cintas métricas de diferentes longitudes.
- Distanciómetro digital de rango mínimo de 10 metros.

6.4. PREVISION DE RESULTADOS.

Los valores previstos, para la prueba estática, de las medidas a realizar, en cuanto a flechas y deformaciones unitarias se refiere, obtenidos de acuerdo con el tren de cargas del Proyecto de Prueba y con la localización de los sensores que se observa en el croquis correspondiente del anejo nº III, son los siguientes, (flechas negativas indican descenso y deformaciones unitarias positivas indican tracción):

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H-1: VANO 2

Vano	Sección	Flecha (mm)	Deformación (με)
V-1	1/2	0,19	-2
	P-1	-	-59
V-2	1/2	-1,97	55
	P-2	-	-66
V-3	1/2	-0,08	8

H-2: VANOS 1 Y 3

Sección	Zona	Flecha (mm)	Deformación (με)
V-1	1/2	-1,02	40
	P-1	-	-10
V-2	1/2	0,96	-15
	P-2	-	-21
V-3	1/2	-1,35	52

H-3: VANOS 1 Y 2

Sección	Zona	Flecha (mm)	Deformación (με)
V-1	1/2	-0,16	7
	P-1	-	-62
V-2	1/2	-1,63	33
	P-2	-	-35
V-3	1/2	-0,64	-18

H-4: VANOS 2 Y 3

Sección	Zona	Flecha (mm)	Deformación (με)
V-1	1/2	0,41	-11
	P-1	-	-23
V-2	1/2	-1,16	30

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	P-2	-	-57
V-3	1/2	-0,39	16

PRUEBAS DINÁMICAS

- FRECUENCIAS

La frecuencia natural de vibración de los cuatro (4) primeros modos de vibración, son los siguientes:

Modo 1: 5.0Hz

Modo 2: 8.0 Hz

Modo 3: 10.0 Hz

7. PRUEBA DE CARGA.

7.1. DESCRIPCIÓN DEL ENSAYO.

El ensayo de Prueba de Carga fue realizado por un equipo de personal especializado de OFITECO, bajo la dirección del Ingeniero D. Juan Carlos Garrido Baro, los días 3 y 4 de Enero de 2007.

La instrumentación y la realización del ensayo se efectuaron de acuerdo a lo estipulado en el Proyecto de prueba.

Las locomotoras fueron las previstas en el Proyecto de Prueba, cuyas características y dimensiones son las siguientes:

- Locomotora S/316:

- Peso total: 109.5 t
- Seis (6) ejes, transmitiendo cada eje 18.25 t, divididos en dos (2) bogies con tres (3) ejes cada uno.
- Separación entre ejes de un mismo bogie: 2.07/2.12m.
- Separación entre el tercer eje del primer bogie y el primer eje del segundo bogie es de: 5.01m
- Longitud total de la locomotora entre topes: 17.87m
- Distancia entre pivotes de bogies: 13.39
- Distancia entre bogies: 4.40

- Tolva cargada con balasto :

- Peso total de 80 T
- Dos (2) bogies de dos (2) ejes, transmitiendo cada eje 20 T
- Separación entre ejes intermedios de los dos (2) bogies: 7.4 m
- Separación entre ejes de un mismo bogie: 1.80 m

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En el Anejo nº III se adjuntan esquemas del tren de cargas.

La secuencia de realización de las pruebas fue la siguiente:

Vano	Prueba	Fecha	Hora	Duración(s)	Fichero
2	ESTÁTICA E-1	03/01/07	23:23:05	900	ESTATICA -1
1 y 3	ESTÁTICA E-2	03/01/07	22:55:41	1260	ESTATICA -2
1 y 2	ESTÁTICA E-3	03/01/07	22:21:46	900	ESTATICA -3
2 y 3	ESTÁTICA E-4	03/01/07	22:39:29	900	ESTATICA -4
1	PRUEBA D-1 V-1	03/01/07	21:58:08	100	PRUEBA D-1 V-1
1	PRUEBA D-2 V-1	03/01/07	22:06:15	70	PRUEBA D-2 V-1
1	PRUEBA D-3 V-1	03/01/07	22:10:40	32	PRUEBA D-3 V-1
1	PRUEBA D-4 V-1	03/01/07	22:15:53	32	PRUEBA D-4 V-1
Vano	Prueba	Fecha	Hora	Duración(s)	Fichero
2	PRUEBA D-1 V-2	03/01/07	21:58:08	100	PRUEBA D-1 V-2
2	PRUEBA D-2 V-2	03/01/07	22:06:15	70	PRUEBA D-2 V-2
2	PRUEBA D-3 V-2	03/01/07	22:10:40	32	PRUEBA D-3 V-2
2	PRUEBA D-4 V-2	03/01/07	22:18:12	32	PRUEBA D-4 V-2
3	PRUEBA D-1 V-3	03/01/07	21:58:08	100	PRUEBA D-1 V-3
3	PRUEBA D-2 V-3	03/01/07	22:06:15	70	PRUEBA D-2 V-3
3	PRUEBA D-3 V-3	03/01/07	22:10:40	32	PRUEBA D-3 V-3
3	PRUEBA D-4 V-3	03/01/07	22:26:29	32	PRUEBA D-4 V-3

Correspondiendo la nomenclatura utilizada a las siguientes pruebas:

Oficina Técnica de Estudios y Control de Obras, S.A. - OFITECO	MARZO - 2007

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- **Estática:** Prueba estática con una (1) locomotora y una (1) tolva cargadas de balastro por vía
- **Prueba D-1:** Prueba cuasi-estática ($V = 5 \text{ Km/h}$).
- **Prueba D-2:** Prueba a velocidad media ($V = 30 \text{ Km/h}$).
- **Prueba D-3:** Prueba a máxima velocidad ($V = 80 \text{ Km/h}$).
- **Prueba D-4:** Prueba de frenado a máxima velocidad ($V = 80 \text{ Km/h}$).

Realizándose todas ellas según las especificaciones y condiciones expresadas en el Proyecto de Prueba de Carga.

Los datos climatológicos medidos durante la realización de las pruebas fueron:

Prueba	Temperatura (°C)	Presión (mbar)	Humedad (%)
ESTATICA 1	7.3	1034	68
ESTATICA 2	7.5	1033	67
ESTATICA 3	7.4	1033	67
ESTATICA 4	6.8	1033	69
PRUEBA D-1 V-1	7.7	1032	65
PRUEBA D-2 V-1	7.2	1032	66
PRUEBA D-3 V-1	7.4	1032	65
PRUEBA D-4 V-1	7.0	1032	67
PRUEBA D-1 V-2	7.7	1032	65
PRUEBA D-2 V-2	7.2	1032	66

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PRUEBA D-3 V-2	7.4	1032	65
PRUEBA D-4 V-2	7.2	1032	67
PRUEBA D-1 V-3	7.7	1032	65
PRUEBA D-2 V-3	7.2	1032	66
PRUEBA D-3 V-3	7.4	1032	65
PRUEBA D-4 V-3	7.2	1032	66

Por último, decir que no se produjeron incidencias durante la realización de la prueba de carga.

7.2. RESULTADOS OBTENIDOS.

A continuación se presentan los resúmenes tabulados de los resultados obtenidos en las pruebas realizadas en la estructura, estáticas y dinámicas.

Como complemento a este apartado, en el anejo nº IV, se presentan los registros obtenidos durante los diferentes ensayos de que constaron las pruebas.

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PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES

FLECHAS PRUEBA ESTÁTICA

HIPOTESIS 1

Sensor	Vano	Posición	Valor Teórico (mm)	Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Porcentaje Alcanzado %	Valor en Descarga Bruto (mm)	Valor en Descarga Neto (mm)	Recuperación Alcanzada %
F5	V2	Pila	-	-0.18	-0.18	-	0.00	0.00	100.00
F6	V2	1/2Lc	-1.97	-1.42	-1.33	67.26	-0.03	-0.03	97.74
F7	V2	1/2Lc	-1.97	-1.45	-1.36	68.78	0.08	0.08	>100
F8	V2	Pila	-	-0.01	-0.01	-	0.00	0.00	100.00
Flecha máxima alcanzada (mm)			-1.36	Porcentaje medio alcanzado (%)		68.02	Recuperación media (%)		99.25

NOTA: Los valores marcados con un "***" se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este informe.

PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES

BANDAS PRUEBA ESTÁTICA

HIPOTESIS 1

Sensor	Vano	Posición	Valor Teórico (uE)	Valor en Carga (uE)	Porcentaje Alcanzado %	Valor en Descarga (uE)	Recuperación Alcanzada %
B2	V2	1/2Lc	55.00	34.50	62.73	-2.11	>100
B3	V2	1/2Lc	55.00	36.97	67.22	-1.12	>100
Deformación máxima alcanzada (uE)			36.97	Porcentaje medio alcanzado (%)	Vano 2	67.22	Recuperación media (%)
						Vano 2	>100

NOTA: Los valores marcados con un "***" se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este

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PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES

FLECHAS PRUEBA ESTÁTICA

HIPOTESIS 2

Sensor	Vano	Posición	Valor Teórico (mm)	Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Porcentaje Alcanzado %	Valor en Descarga Bruto (mm)	Valor en Descarga Neto (mm)	Recuperación Alcanzada %
F1	V1	Estribo	-	-0.03	-0.03	-	0.02	0.02	>100
F2	V1	1/2Lc	-1.02	-1.02	-0.93	90.69	0.18	0.17	>100
F3	V1	1/2Lc	-1.02	*	*	*	*	*	*
F4	V1	Pila	-	-0.16	-0.16	-	0.00	0.00	100.00
F5	V2	Pila	-	0.13	0.13	-	-0.02	-0.02	>100
F6	V2	1/2Lc	0.96	0.88	0.82	85.42	0.11	0.12	85.37
F7	V2	1/2Lc	0.96	0.80	0.74	77.08	-0.02	-0.01	>100
F8	V2	Pila	-	-0.01	-0.01	-	0.00	0.00	100.00
F9	V3	Pila	-	-0.13	-0.13	-	0.00	0.00	100.00
F10	V3	1/2Lc	-1.35	-1.32	-1.19	87.78	-0.09	-0.09	92.41
F11	V3	1/2Lc	-1.35	-1.40	-1.27	93.70	-0.15	-0.15	88.14
F12	V3	Estribo	-	-0.14	-0.14	-	0.00	0.00	100.00
Flecha máxima alcanzada (mm)			-1.27	Porcentaje medio alcanzado (%)	Vano 1	90.69	Recuperación media (%)	Vano 1	100.00
					Vano 2	81.25		Vano 2	92.68
					Vano 3	90.74		Vano 3	95.14

NOTA: Los valores marcados con un "***" se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este informe.

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**PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES
BANDAS PRUEBA ESTÁTICA
HIPOTESIS 2**

Sensor	Vano	Posición	Valor Teórico (uE)	Valor en Carga (uE)		Porcentaje Alcanzado %	Valor en Descarga (uE)		Recuperación Alcanzada %
B1	V1	1/2Lc	40.00	31.57		78.93	1.29		95.91
B2	V1	1/2 Lc	40.00	30.93		77.33	0.23		99.26
B3	V2	1/2 Lc	-15.00	-16.50		110.00	-5.16		68.73
B4	V2	1/2 Lc	-15.00	-15.51		103.40	-5.28		65.96
B5	V3	1/2 Lc	52.00	33.85		65.10	0.35		98.97
B6	V3	1/2Lc	52.00	38.32		73.69	0.00		100.00
Deformación máxima alcanzada (uE)			38.32	Porcentaje medio alcanzado (%)	Vano 1	78.13	Recuperación media (%)	Vano 1	97.59
					Vano 3	69.39		Vano 3	99.48

NOTA: Los valores marcados con un "*" se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este

**PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES
FLECHAS PRUEBA ESTÁTICA
HIPOTESIS 3**

Sensor	Vano	Posición	Valor Teórico (mm)	Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Porcentaje Alcanzado %	Valor en Descarga Bruto (mm)	Valor en Descarga Neto (mm)	Recuperación Alcanzada %
F1	V1	Estribo	-	-0.08	-0.08	-	0.00	0.00	100.00
F2	V1	1/2Lc	-0.16	-0.20	-0.14	84.38	-0.03	-0.03	77.78
F3	V1	1/2Lc	-0.16	-0.19	-0.13	78.13	-0.01	-0.01	92.00
F4	V1	Pila	-	-0.05	-0.05	-	0.00	0.00	100.00
F5	V2	Pila	-	-0.15	-0.15	-	-0.01	-0.01	93.33
F6	V2	1/2Lc	-1.63	-1.14	-0.99	60.74	-0.02	-0.01	98.99
F7	V2	1/2Lc	-1.63	-1.72	-1.57	96.32	-0.03	-0.02	98.73
F8	V2	Pila	-	*	*	*	*	*	*
Flecha máxima alcanzada (mm)			-1.57	Porcentaje medio alcanzado (%)	Vano 1	81.25	Recuperación media (%)	Vano 1	92.44
					Vano 2	78.53		Vano 2	97.02

NOTA: Los valores marcados con un "*" se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este informe.

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BANDAS PRUEBA ESTÁTICA
HIPOTESIS 3**

Sensor	Vano	Posición	Valor Teórico (uE)	Valor en Carga (uE)		Porcentaje Alcanzado %	Valor en Descarga (uE)		Recuperación Alcanzada %
B1	V1	1/2Lc	7.00	4.77		68.14	0.19		96.02
B2	V1	1/2Lc	7.00	4.18		59.71	0.05		98.80
B3	V2	1/2Lc	33.00	22.61		68.52	0.35		98.45
B4	V2	1/2Lc	33.00	24.87		75.36	0.18		99.28
Deformación máxima alcanzada (uE)			24.87	Porcentaje medio alcanzado (%)	Vano 1	63.93	Recuperación media (%)	Vano 1	97.41
					Vano 2	71.94		Vano 2	98.86

NOTA: Los valores marcados con un *** se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este

PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES

FLECHAS PRUEBA ESTÁTICA

HIPOTESIS 4

Sensor	Vano	Posición	Valor Teórico (mm)	Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Porcentaje Alcanzado %	Valor en Descarga Bruto (mm)	Valor en Descarga Neto (mm)	Recuperación Alcanzada %
F5	V1	Estribo	-	-0.25	-0.25	-	-0.02	-0.02	92.00
F6	V1	1/2Lc	-1.16	-1.16	-0.96	82.76	-0.06	-0.05	94.79
F7	V1	1/2Lc	-1.16	-1.34	-1.14	98.28	-0.12	-0.11	90.35
F8	V1	Pila	-	-0.15	-0.15	-	0.00	0.00	100.00
F9	V2	Pila	-	-0.14	-0.14	-	-0.07	-0.07	50.00
F10	V2	1/2Lc	-0.39	-0.50	-0.36	92.31	-0.16	-0.09	75.00
F11	V2	1/2Lc	-0.39	-0.49	-0.37	93.59	-0.05	0.00	100.00
F12	V2	Pila	-	-0.11	-0.11	-	-0.03	-0.03	72.73
Flecha máxima alcanzada (mm)			-1.14	Porcentaje medio alcanzado (%)	Vano 2	90.52	Recuperación media (%)	Vano 2	94.29
					Vano 3	92.95		Vano 3	74.43

NOTA: Los valores marcados con un *** se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este informe.

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BANDAS PRUEBA ESTÁTICA
HIPOTESIS 4**

Sensor	Vano	Posición	Valor Teórico (uE)	Valor en Carga (uE)		Porcentaje Alcanzado %	Valor en Descarga (uE)		Recuperación Alcanzada %
B3	V2	1/2Lc	30.00	25.60		85.33	0.39		98.48
B4	V2	1/2Lc	30.00	23.07		76.90	-0.14		>100
B5	V3	1/2Lc	16.00	10.15		63.44	0.19		98.13
B6	V3	1/2Lc	16.00	13.49		84.31	-0.24		>100
Deformación máxima alcanzada (uE)			25.60	Porcentaje medio alcanzado (%)	Vano 2	81.12	Recuperación media (%)	Vano 2	98.48
					Vano 3	73.88		Vano 3	98.13

NOTA: Los valores marcados con un "***" se corresponden con valores anómalos que serán debidamente explicados en el desarrollo de este

**PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES
FLECHAS PRUEBAS DINÁMICAS**

Sensor	Vano	Posición	DINÁMICA 5Km		DINÁMICA 30Km			DINÁMICA 50Km			FRENADO 50Km		
			Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Impacto Dinámico	Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Impacto Dinámico	Valor en Carga Bruto (mm)	Valor en Carga Neto (mm)	Impacto Dinámico
F1	V1	Estribo	-0.30	-0.30	-0.26	-0.26	0.87	-0.24	-0.24	0.80	-0.31	-0.31	1.03
F2	V1	1/2Lc	-3.34	-2.94	-3.12	-2.75	0.94	-3.03	-2.67	0.91	-3.12	-2.76	0.94
F3	V1	1/2Lc	-1.71	-1.31	-1.53	-1.16	0.89	-1.55	-1.19	0.91	-1.68	-1.32	1.01
F4	V1	Pila	-0.51	-0.51	-0.49	-0.49	0.96	-0.48	-0.48	0.94	-0.42	-0.42	0.82
F5	V2	Pila	-0.25	-0.25	-0.21	-0.21	0.84	-0.19	-0.23	0.92	-0.24	-0.24	0.96
F6	V2	1/2Lc	-3.09	-2.71	-2.53	-2.22	0.82	-2.50	-2.17	0.80	-2.53	-2.17	0.80
F7	V2	1/2Lc	-1.53	-1.15	-1.24	-0.93	0.81	-1.28	-0.95	0.83	-1.36	-1.00	0.87
F8	V2	Pila	-0.52	-0.52	-0.42	-0.42	0.81	-0.47	-0.47	0.90	-0.49	-0.49	0.94
F9	V3	Pila	-0.37	-0.37	-0.29	-0.29	0.78	-0.31	-0.31	0.84	-0.29	-0.29	0.78
F10	V3	1/2Lc	-3.29	-2.81	-2.86	-2.46	0.87	-2.94	-2.52	0.90	-3.15	-2.72	0.97
F11	V3	1/2Lc	-1.59	-1.11	-1.46	-1.06	0.95	-1.47	-1.05	0.94	-1.53	-1.10	0.99
F12	V3	Estribo	-0.59	-0.59	-0.52	-0.52	0.88	-0.54	-0.54	0.92	-0.58	-0.58	0.98
			Impacto medio		0.87		Impacto medio	0.88		Impacto medio	0.92		

NOTA: Los impactos marcados con un "***" en cada prueba no se han tenido en cuenta para el cálculo del impacto medio correspondiente

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**PRUEBA DE CARGA DE LA ESTRUCTURA VTO TORRELLES
BANDAS PRUEBAS DINÁMICAS**

Sensor	Vano	Posición	DINAMICA 5Km	DINAMICA 30Km		DINAMICA 50Km		FRENADO 50Km	
			Valor en Carga (uE)	Valor en Carga (uE)	Impacto Dinámico	Valor en Carga (uE)	Impacto Dinámico	Valor en Carga (uE)	Impacto Dinámico
B1	V1	1/2Lc	65.38	62.21	0.95	63.62	0.97	64.91	0.99
B2	V1	1/2Lc	17.25	16.43	0.95	16.90	0.98	16.90	0.98
B3	V2	1/2Lc	61.39	60.10	0.98	63.03	1.03	62.21	1.01
B4	V2	1/2Lc	18.31	18.55	1.01	17.88	0.98	20.54	1.12
B5	V3	1/2Lc	56.69	56.11	0.99	*	*	56.93	1.00
B6	V3	1/2Lc	18.96	18.19	0.96	20.66	1.09	17.72	0.93
				Impacto dinamico	0.97	Impacto dinamico	1.01	Impacto dinamico	1.01

NOTA: Los impactos marcados con un "*" en cada prueba no se han tenido en cuenta para el cálculo del impacto medio correspondiente

PRUEBAS DINÁMICAS

FRECUENCIAS PROPIAS DE VIBRACIÓN

La frecuencia natural de vibración obtenida es:

Vano 1: 6.3 Hz

Vano 2: 6.3 Hz

Vano 3: 6.3 Hz

8. ANÁLISIS DE LOS RESULTADOS OBTENIDOS.

A la vista de los resultados obtenidos, expresados en las tablas precedentes, se considera oportuno realizar los siguientes comentarios:

- Antes de comenzar, hay que decir que el análisis del comportamiento de la estructura que se expone a continuación, ha sido realizado en base a considerar como resultados previstos, y por tanto como comportamiento teórico esperado, el obtenido mediante el cálculo del Proyecto de Prueba, calculado con el programa SAP-2000, el cual permite realizar el análisis estático y dinámico de estructuras tridimensionales.
- Los registros obtenidos, en general, no presenta anomalías dignas de tenerse en consideración. En la hipótesis 2 la flecha F3 y en la hipótesis 3 la flecha F8 no las hemos tenido en cuenta a la hora del cálculo de la media alcanzada debido a que los registros obtenidos estaban cerca del rango de error de los instrumentos por lo que no son valores fiables.

Sobre los resultados obtenidos cabe realizar el siguiente análisis:

8.1. PRUEBAS ESTÁTICAS.

- Incidencias.

Durante la prueba estática, no se han producido incidencias destacables, teniendo en cuenta los fallos de las dos flechas comentadas anteriormente.

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- Porcentajes alcanzados.

Los resultados obtenidos en la prueba estática alcanzan los siguientes valores de porcentaje frente a los previstos en el Proyecto de Prueba de Carga:

% ALCANZADO EN FLECHAS

Prueba	% Mínimo	% Máximo	% Medio
ESTÁTICA H-1	67.26	68.78	68.02
ESTÁTICA H-2	77.08	93.70	87.56
ESTÁTICA H-3	60.74	96.32	79.89
ESTÁTICA H-4	82.76	98.28	91.73

% ALCANZADO EN DEFORMACIONES

Prueba	% Mínimo	% Máximo	% Medio
ESTÁTICA H-1	62.73	67.22	67.22
ESTÁTICA H-2	65.10	110.00	84.74
ESTÁTICA H-3	59.71	75.36	67.93
ESTÁTICA H-4	63.44	85.33	77.50

Así pues, se obtienen los siguientes porcentajes medios, para flechas y deformaciones, frente a los valores previstos en el Proyecto de Prueba:

% ALCANZADO

Prueba	Flechas	Deformaciones
ESTÁTICA	81.8	74.35

A la vista de los menores porcentajes alcanzados en flechas y deformaciones frente a los teóricos esperados, cabe realizar los siguientes comentarios:

- La estructura presenta una rigidez longitudinal sensiblemente superior a la supuesta en la elaboración del Proyecto de Prueba, es decir, los módulos de elasticidad reales, o más bien las características reales de deformación en la estructura (E, I) deben ser superiores a las utilizadas en el Proyecto, además, la constante de rigidez del muelle utilizado para modelizar el empotramiento elástico de los hastiales del pórtico debe ser sensiblemente superior a la utilizada en el Proyecto.

A pesar de todo, estos porcentajes, son perfectamente admisibles y, junto a las elevadas y prácticamente instantáneas recuperaciones obtenidas (tal como veremos en el apartado correspondiente), indican un comportamiento de la estructura correcto y esencialmente elástico durante la realización de la prueba.

- **Valores máximos de flecha.**

Las flechas máximas medidas en los vanos laterales, en la prueba estática, fueron:

Flecha máxima (mm)	Luz de cálculo por cada vano (m)	Relación con la luz de cálculo
-1.27	14.5	18415

Dichos valores son perfectamente admisibles.

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Las flechas máximas medidas en los vanos centrales, en la prueba estática, fueron:

Flecha máxima (mm)	Luz de cálculo por cada vano (m)	Relación con la luz de cálculo
-1.36	19	25840

Dichos valores son perfectamente admisibles.

- **Recuperaciones.**

Las recuperaciones en el proceso de descarga se producen de forma casi instantánea, tal como puede observarse en los gráficos correspondientes, alcanzando porcentajes perfectamente admisibles frente a los exigidos en el Proyecto de Prueba de Carga.

Así pues, los porcentajes medios de recuperación son los siguientes:

% RECUPERACIÓN EN FLECHAS

Prueba	% Mínimo	% Máximo	% Medio
ESTÁTICA H-1	97.74	100.00	99.25
ESTÁTICA H-2	85.37	100.00	95.94
ESTÁTICA H-3	77.78	100.00	94.40
ESTÁTICA H-4	50.00	100.00	84.36

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% RECUPERACIÓN EN DEFORMACIONES

Prueba	% Mínimo	% Máximo	% Medio
ESTÁTICA H-1	100.00	100.00	100.00
ESTÁTICA H-2	65.16	100.00	88.13
ESTÁTICA H-3	96.02	99.28	98.13
ESTÁTICA H-4	98.13	100.00	100.00

Por lo que tomando por válidos los valores medios obtenidos, resultan los siguientes porcentajes:

% RECUPERACIÓN

Prueba	Flechas	Deformaciones
ESTÁTICA	93.49	95.56

Estas recuperaciones permiten considerar el comportamiento de la estructura como esencialmente elástico.

8.2. PRUEBAS DINÁMICAS.

- Incidencias.

Las pruebas dinámicas, se realizaron sin ninguna incidencia.

- Frecuencia propia de vibración.

Del análisis de frecuencia realizado sobre la señal obtenida con los geófonos en las distintas pruebas dinámicas se obtiene como frecuencia del primer modo de vibración de la estructura el siguiente valor:

Prueba	Frecuencia Teórica (Hz)	Frecuencia medida (Hz)
FRENADO VANO 1	5.0	6.3
FRENADO VANO 2	5.0	6.3
FRENADO VANO 3	5.0	6.3

Como se observa, este valor es sensiblemente superior al teórico calculado, lo que denota una rigidez real de la estructura superior a la considerada en el modelo de calculo empleado el en proyecto de prueba de carga, siendo al mismo tiempo perfectamente admisibles para las características y tipología de la estructura, y conforme a los valores de flechas y deformaciones unitarias medidas. En el anejo nº IV se incluye el registro de geófono más representativo de la frecuencia de vibración del puente.

- **Coefficientes de impacto.**

Las flechas y deformaciones, en las pruebas dinámicas, se midieron sobre los mismos canales instrumentados en la prueba estática.

Estas flechas medidas, en especial las flechas netas medidas en los respectivos vanos (descontado los descensos en los apoyos correspondientes) y estas deformaciones, se compararán con unos valores de referencia (dividiéndolas por dichos valores), para

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obtener así lo coeficientes de impacto dinámicos de la estructura frente a las acciones de velocidad y frenado.

Tal como ya se ha visto anteriormente, para el establecimiento de dichos valores de referencia se ha utilizado el método de determinación práctica de los mismos, consistente en realizar una prueba **CUASIESTÁTICA** (a velocidad = Cte. = 5 km/h) con una (2) locomotoras circulando por ambas vías. Una vez realizada esta prueba, los valores netos medidos se han usado como valores de referencia.

Antes de analizar los resultados obtenidos, podemos decir que en puentes de ferrocarril situados en líneas de alta velocidad, los valores de coeficientes de impacto obtenidos son próximos a la unidad.

Así pues, realizados los comentarios anteriores, el resultado de los coeficientes de impacto obtenidos en las pruebas dinámicas realizadas son los siguientes:

IMPACTOS EN FLECHAS

Vano	Prueba	Coefficiente de impacto
V1	DINÁMICA 30 Km/h	0.91
V1	DINÁMICA 80 Km/h	0.89
V1	FRENADO 80 Km/h	0.95
V2	DINÁMICA 30 Km/h	0.82
V2	DINÁMICA 80 Km/h	0.86
V2	FRENADO 80 Km/h	0.89
V3	DINÁMICA 30 Km/h	0.87
V3	DINÁMICA 80 Km/h	0.90
V3	FRENADO 80 Km/h	0.93

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IMPACTOS EN BANDAS

Vano	Prueba	Coefficiente de impacto
V1	DINÁMICA 30 Km/h	0.95
V1	DINÁMICA 50 Km/h	0.97
V1	FRENADO 50 Km/h	0.98
V2	DINÁMICA 30 Km/h	0.99
V2	DINÁMICA 50 Km/h	1.00
V2	FRENADO 50 Km/h	1.06
V3	DINÁMICA 30 Km/h	0.97
V3	DINÁMICA 50 Km/h	1.09
V3	FRENADO 50 Km/h	0.96

Estos valores son perfectamente admisibles para el tipo de prueba realizada.

- **Amortiguamiento de la estructura.**

Se calcula a través del llamado Decremento Logarítmico “ δ ”, que tiene la siguiente expresión:

$$\delta = \frac{1}{n} \ln\left(\frac{A_0}{A_n}\right)$$

Siendo: n = N° de ciclos del intervalo considerado, a la frecuencia fundamental.

A_0 = Amplitud de respuesta dinámica al inicio de dicho intervalo.

A_n = Amplitud de la respuesta dinámica al final del intervalo.

También se puede expresar el amortiguamiento, como fracción del amortiguamiento crítico, a través del índice de amortiguamiento ζ , que se define mediante la siguiente expresión y suele expresarse en tanto por cien:

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$$\xi = \frac{\delta}{2\pi}$$

Los valores obtenidos son los siguientes:

Vano	Amortiguamiento δ	Índice de amortiguamiento $\xi(\%)$
1	0.10	1.6
2	0.09	1.4
3	0.07	1.2

Estos valores se consideran perfectamente admisibles, ya que se consideran valores normales del amortiguamiento, los comprendidos entre 0,03 y 0,12 y del índice de amortiguamiento, los comprendidos entre 0,5% y 2%, tal y como ocurre en este caso.

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9. CONCLUSIONES Y RECOMENDACIONES.

De acuerdo con lo expuesto en los apartados precedentes, pueden extraerse las siguientes conclusiones y recomendaciones:

- Durante las pruebas no se detectó ningún tipo de comportamiento anómalo de la estructura, así como tampoco se presentaron incidencias que nos hagan dudar de la fiabilidad de los resultados obtenidos, por lo que se consideran estos perfectamente correctos además de admisibles.
- Los valores de flechas y deformaciones unitarias obtenidas son perfectamente admisibles, indicando un comportamiento correcto y esencialmente elástico de la estructura frente al previsto en el Proyecto de Prueba de Carga. Los porcentajes medios obtenidos en las pruebas estáticas son los siguientes:

Prueba	Flechas	Deformaciones
ESTÁTICA	81.80	74.35

- Los valores máximos de flecha obtenidos en las pruebas estáticas fueron los siguientes:

Vano	Flecha máxima (mm)	Luz de cálculo por cada vano (m)	Relación con la luz de cálculo
1	-0.93	14.50	13485
2	-1.36	19.00	25840
3	-1.27	14.50	18415

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- Las recuperaciones obtenidas han sido siempre superiores al 80% y de forma casi instantánea (tal y como se observa en las gráficas del anejo nº IV), lo cual permite considerar el comportamiento de la estructura como esencialmente elástico.
- Durante la realización de las pruebas no se detectó la aparición de daños en las zonas objeto del ensayo.

Por todo ello, se considera que el comportamiento de la obra en estudio, durante la realización de la prueba de carga, ha sido correcto y esencialmente elástico, aunque con una rigidez claramente superior a la prevista en el Proyecto de Prueba de carga.

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El presente informe consta de 45 hojas correlativamente numeradas, así como de nueve Anejos sin numerar titulados:

- I. DOCUMENTACIÓN FACILITADA POR EL ADIF
- II. PROYECTO DE PRUEBA DE CARGA
- III. ESQUEMA DE INSTRUMENTACIÓN Y TREN DE CARGA
- IV. REGISTRO DE MEDIDAS
- V. REPORTAJE FOTOGRÁFICO
- VI. ACTA DE PRUEBA DE CARGA
- VII. FICHA DE SEGUIMIENTO
- VIII. PLANIMETRÍA Y NIVELACIÓN
- IX. INSPECCIÓN DEL CAUCE

Madrid, Marzo de 2007



Fdo. Juan Carlos Garrido
Ingeniero de Caminos, Canales y Puertos
Dpto. Instrumentación y Sistemas
OFITECO

CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

ANEJOS

CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

I. DOCUMENTACIÓN FACILITADA POR EL ADIF

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1 GEOMETRÍA

1.1 GEOMETRÍA Y ESQUEMA ESTRUCTURAL

El paso inferior permite el cruce de la línea de alta velocidad y de la línea de mercancías sobre la riera de Torrelles, con una longitud total de 48 m. El puente está constituido por dos tableros paralelos, uno para la línea de alta velocidad y otro para la línea de mercancías, de similares características de hormigón postesado con un esquema longitudinal de tres vanos de 14,5+19+14,5 m de luz. La plataforma tiene 14 m de ancho para ubicar la capa de balasto del ferrocarril, dos canaletas para el paso de cables y las barandillas con sus impostas. El desarrollo en planta de la estructura es prácticamente recto, presentando un ligero esviaje en planta de 16º.

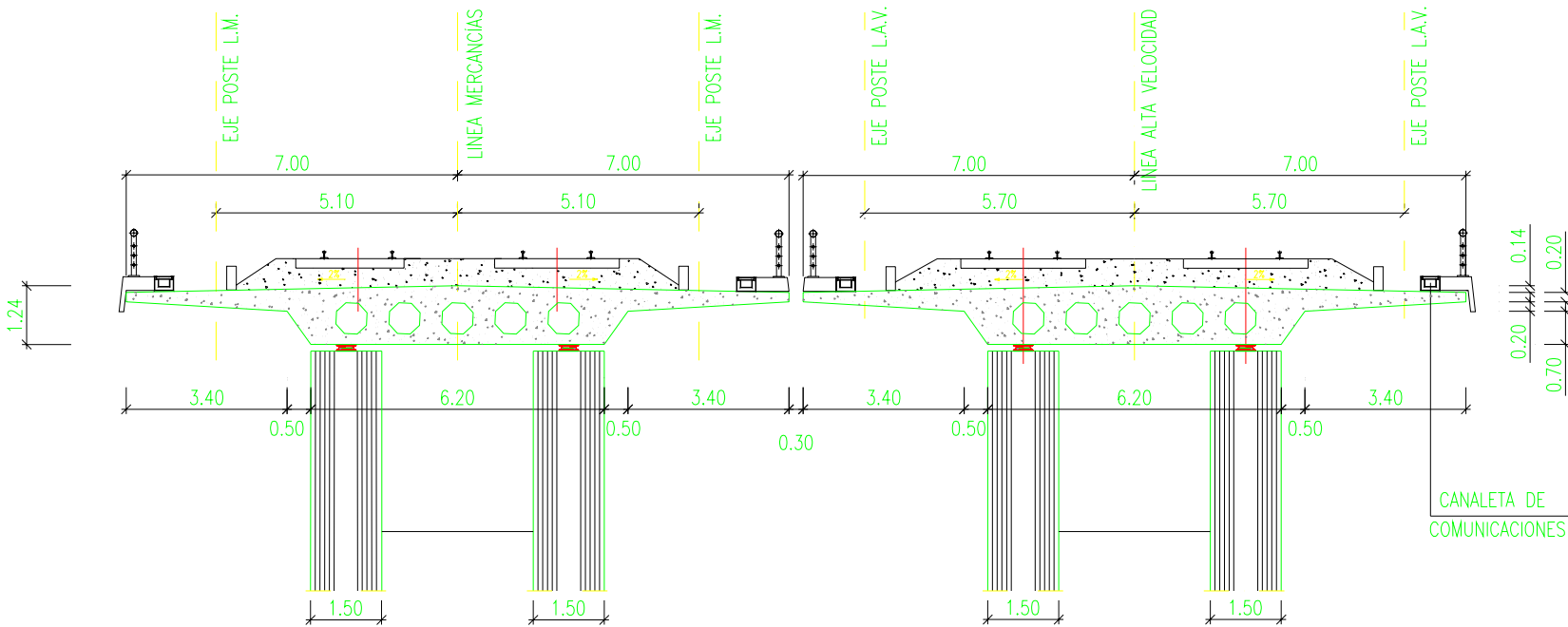
Al tratarse de un estructura de poca longitud y una altura sobre el cauce del río de unos 7 m, se ha proyectado un tablero de hormigón in situ constituido por una losa aligerada de 1,24 m de canto constante (sobre el eje del tablero). La esbeltez del tablero es $L_{max}/15.3$. La construcción del tablero podrá realizarse sobre cimbra apoyada en el terreno. La sección del dintel es un losa aligerada de inercia concentrada postesada longitudinalmente mediante 12 unidades de 24 ϕ 0,6”.

El tablero se ancla a uno de los estribos (estribo fijo) para transmitir los eventuales empujes de frenado y arranque sobre el mismo. El resto de apoyos no toman fuerzas horizontales, salvo las inducidas por el rozamiento entre el apoyo y el tablero a través de los apoyos de neopreno tipo POT. Las pilas están constituidas por un dos fustes de sección hexagonal.

Las cargas del tablero se transmiten a los estribos mediante aparatos de apoyo tipo “POT” de neopreno confinado (fijos, unidireccionales o bidireccionales, dependiendo de su posición). Las cimentaciones son profundas mediante pilotes, dimensionadas de acuerdo con las indicaciones del estudio geotécnico.

1.2 SECCIÓN TIPO

La sección transversal del tablero tiene un ancho de plataforma de 14 m y está constituida por una sección losa aligerada de hormigón postesado e inercia concentrada con un canto constante de 1,24 m sobre el eje del tablero y con bombeo del 2 % (canto sobre el borde del tablero igual a 1,10 m).



Proyecto Construido de Plataforma. Línea de Alt:

2 ACCIONES, MATERIALES, COEFICIENTES DE SEGURIDAD Y NORMATIVAS

2.1 ACCIONES

En el cálculo de los elementos estructurales se han considerado las siguientes acciones:

Acciones permanentes (G):

g1, PESO PROPIO.

El peso propio de los distintos elementos se ha calculado a partir de su geometría (secciones transversales) adoptando una densidad de valor $\gamma = 2,5 \text{ T/m}^3$ para la losa de hormigón.

El peso del tablero es: Sección aligerada $g1 = 21,66 \text{ T/m}$
 Sección maciza $g1 = 26,48 \text{ T/m}$

g2, PESO DEL BALASTO Y CARGAS MUERTAS

Las cargas permanentes distintas del propio peso del tablero son las siguientes:

- Balasto
- Vías y traviesas
- Conductos de cableado y paseos
- Soportes de catenarias
- Impostas y barandillas

El peso de balasto sobre el tablero se calcula a partir de la plataforma en la estructura de vía tomando como densidad $\gamma = 1,6 \text{ t/m}^3$.

Para la plataforma sobre el puente se obtiene $g_{2, \text{ balasto}} = 9,29 \text{ T/m}$.

De acuerdo a las Bases de Cálculo se adoptarán para esta carga los siguientes valores característicos superior e inferior:

valor inferior (0.70 x peso medio) $g_{2, \text{ bal inf}} = 6,50 \text{ T/m}$ de tablero
valor superior (1.3 x peso medio) $g_{2, \text{ bal, sup}} = 12,08 \text{ T/m}$ de tablero

Se consideran dos hipótesis de desbalastado.

- 50% de una vía en toda su longitud.
- 100% de una vía sobre 15 metros.

El peso de vías y traviesas para la plataforma con doble vía es:

$g_{2, \text{ vías+traviesas}} = 2 \times (0,52 + 0,12) = 2 \times 0,64 = 1,28 \text{ t/ml}$
(trav) + (carril)

El peso de los conductos para cableados y zona de paseos es:

$g_{2, \text{ conductos}} = 0,3 \text{ t/ml}$ (peso de hormigón $\gamma = 2,5 \text{ t/m}^3$) (peso de 1 canaleta)

$q_{\text{ paseos}} = 0,50 \text{ t/m}^2$ (esta carga en paseos se ha tratado como sobrecarga y no como carga permanente pudiendo actuar en las dos zonas extremas de paseo de 1,45 m de ancho).

$q_{\text{conductos + paseos}} = 2 \times (0,30 + 0,50 \times 1,45) = 2,05 \text{ t/m}$

El peso de la imposta y barandilla es:

Se toma $g_{2, \text{ imposta+barandilla}} = 1,08 \text{ T/m}$, de acuerdo a la sección tipo de plataforma.

El peso de los soportes de catenarias se tienen en cuenta sólo para efectos locales de anclaje de la catenaria y armado local de losa, pero no para el cálculo general del tablero.

	g2, medio	g2, inf	g2, sup
	(T/m)	(T/m)	(T/m)
Balasto	9,29	6,50	12,08
Vías y traviesas	1,28	1,28	1,28
Conductos cableado	0,60	0,60	0,60
Imposta y barandillas	1,08	1,08	1,08
TOTAL	12,25 T/m	9,46 T/m	15,04 T/m

Tabla 1. Carga permanente, g2

Coeficiente de envejecimiento para el hormigón a tiempo infinito $\chi = 0.80$

Las acciones indirectas derivadas de las deformaciones impuestas se estiman de acuerdo con la rigidez de los elementos de apoyo. En los aparatos de apoyo tipo POT se considera el efecto de rozamiento de acuerdo con los criterios indicados en el apartado 8 de este anejo.

Acciones permanentes de valor no constante (G*):

PRETENSADO

Las fuerzas del pretensado se calculan para cada fase de construcción de acuerdo con las especificaciones de la normativa vigente para el proyecto con hormigón estructural (EHE).

Para la determinación de las pérdidas de pretensado se han utilizado los siguientes valores de los parámetros de cálculo:

El efecto de la relajación del acero de pretensado a 1000 horas es: $\rho_{1000\text{horas}} = 2 \%$ y la relajación a tiempo infinito ($\rho_f = \rho_{1000000\text{horas}}$).

Tensión inicial	0.60 fmax	0.70 fmax	0.80 fmax
$\rho_{1000\text{horas}} (\%)$	1.0	2.0	5.5
$\rho_f (1000000\text{horas}) (\%)$	2.9	5.8	16

ACCIONES REOLÓGICAS.

Las acciones reolológicas se han determinado de acuerdo con las especificaciones de la normativa vigente para hormigón (EHE) diferenciando la retracción y la fluencia del hormigón.

RETRACCIÓN

$\epsilon_{cs}(t,ts)= \epsilon_{cso} \beta_s (t-ts)$
 $\epsilon_{cso} = \beta_{HR} (570-5 fck) 10^{-6}$ (fck en MPa)
 $\beta_{HR} = -1.55 (1-(HR/100)^3)$

$\beta_s = \sqrt{\frac{t - ts}{0.035 e^2 + (t - ts)}}$ $e = \frac{2 Ac}{u}$

- t = edad del hormigón en el instante de evaluación (en días)
- ts = edad del hormigón al comienzo de la retracción (en días)
- εcso = coeficiente básico de retracción
- HR = humedad relativa
- βs = coeficiente que define la evolución de la retracción en el tiempo
- e = espesor medio en mm
- Ac = área de la sección transversal
- u = perímetro en contacto con la atmósfera

Los valores de la sección transversal tipo del tablero son los siguientes:

En la zona de construcción de las estructuras HR= 70 %

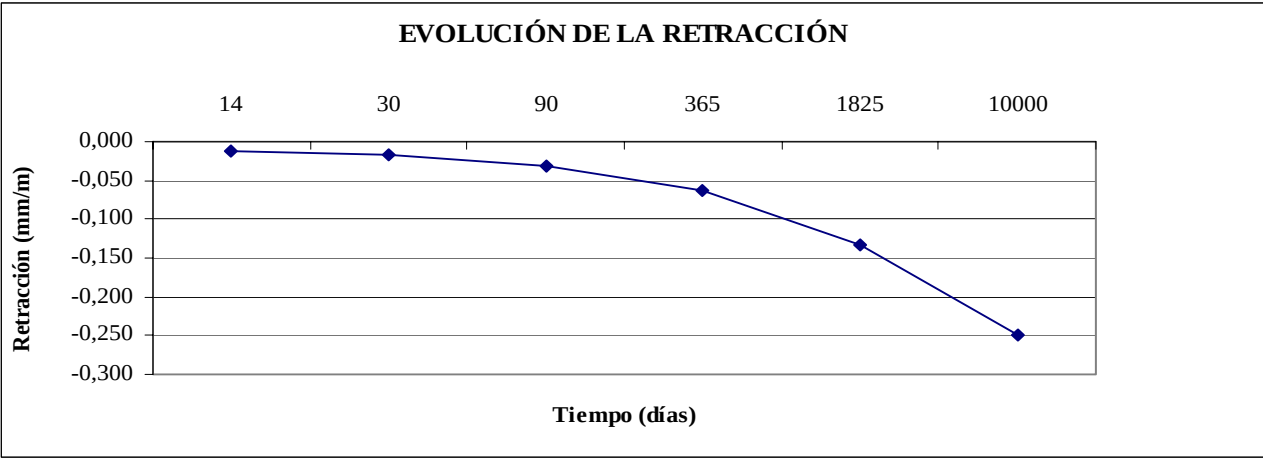
Sección transversal tipo : Ac= 8.66 m² u=28.73m e=603 mm

Cálculo del valor de la retracción en el tablero:

$\beta_{HR}=-1.018$ $\epsilon_{cso}=3.77 \cdot 10^{-4}$ $\beta_s(10.000 \text{ días}) = 0.66$ $\epsilon_{cs}(t,ts)= 2.5 \cdot 10^{-4}$

$\epsilon_c(t, to) = \sigma (to) \left[\frac{1}{Eo , to} + \frac{\varphi (t, to)}{Eo , 28} \right]$

$\varphi(t,to) = \varphi_o \beta_c(t - to)$
 $\varphi_o = \varphi_{HR} \beta(fcm) \beta(to)$
 $\varphi_{HR} = 1 + \frac{100 - HR}{9.9e^{1/3}}$
 $\beta(fcm) = \frac{16.8}{\sqrt{fck + 8}}$
 $\beta_{to} = \frac{1}{0.1 + to^{0.2}}$
 $\beta_c(t - to) = \left[\frac{t - to}{\beta_H + (t - to)} \right]^{0.3}$
 $\beta_H = 1.5e \left[1 + (0.012 HR)^{18} \right] + 250 > / 1500$



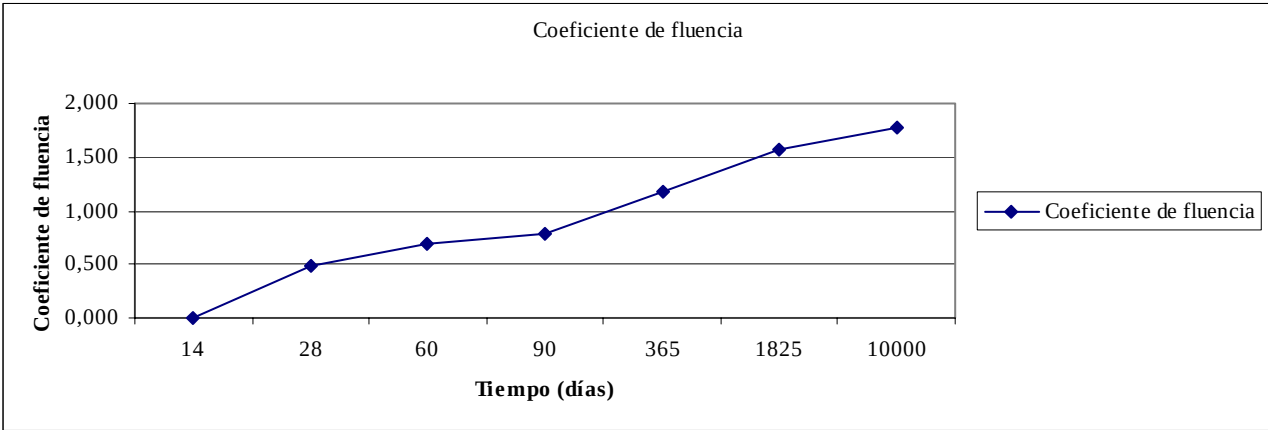
FLUENCIA

σ_c = tensión media en el hormigón aplicada en el tiempo t_0
 E_{o,t_0} = módulo de deformación en el tiempo t_0
 $\varphi(t,t_0)$ = coeficiente de fluencia
 φ_0 = coeficiente básico de fluencia

En el caso del tablero, adoptando un valor de aplicación de la fuerza de postesado $t_0= 14$ días tenemos

un coeficiente de fluencia a tiempo infinito (10000 días) $\varphi_f=1.77$

$\varphi_{HR}=1.36$
 $\beta_H = 1194$ $\beta_{ct}(10000-14)=1.217$ $\beta_{t_0}=0.56$ $\beta(f_{cm})=2.425$
 $\varphi_0=1.835$



ACCIONES DEBIDAS AL TERRENO

Carga sobre zapatas y empuje de las tierras en alzados de estribos y aletas, con una densidad 2,0 T/m³ y un ángulo de rozamiento interno de 30 ° (con presiones horizontales correspondientes a un empuje con coeficiente Ka= 0,33).

ASIENTOS DIFERENCIALES

Al estar cimentada la estructura sobre un terreno granular y mediante cimentación profunda no se prevé la existencia de asientos diferenciales significativos, por lo cual no se han tenido en cuenta en los cálculos.

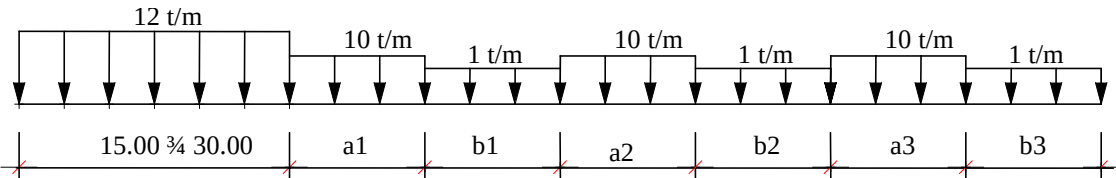
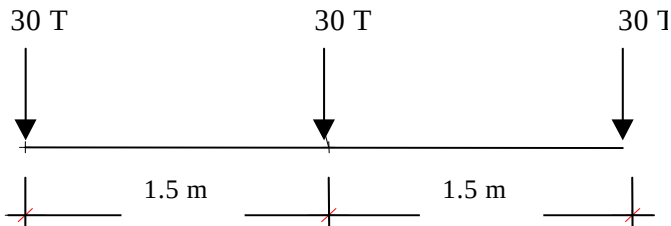
SOBRECARGAS DE USO. COMPONENTES VERTICALES.

En el cálculo de esfuerzos se ha empleado la envolvente de esfuerzos debidos a los trenes de carga de IPF-75 y del Eurocódigo 1 (parte 3, acciones en puentes) EC1-3 tomando como coeficiente de impacto correspondiente en cada caso.

Los coeficientes de impacto no afectan al cálculo de apoyos, pilas y estribos, salvo aquellos casos en que la unión tablero-estructura fuera rígido. Esto conduciría a que el coeficiente de impacto afectaría a la subestructura para las fuerzas de frenado, transmitida al estribo a través del tope rígido longitudinal, y fuerza centrífuga, transmitida a través de apoyos tipo POT guiados. No obstante, la presencia del balasto supone una liberación en la rigidez de la transmisión de las fuerzas horizontales a los apoyos y topes, por lo que no se considera el coeficiente de impacto para estas acciones.

De acuerdo con la normativa IPF-75 Existen dos trenes de carga

Tipo A Por cada vía: Q_A = 3 ejes de 30 T separados 1.50 m



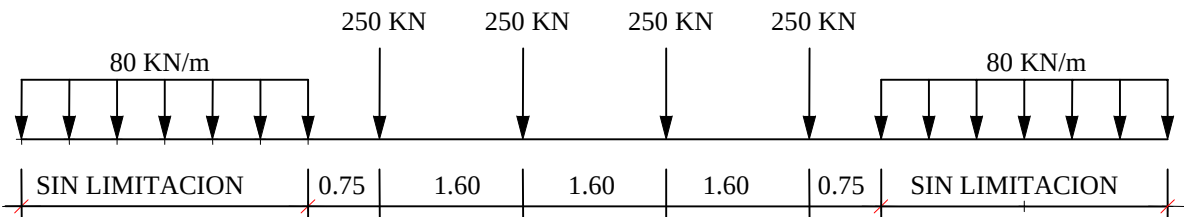
Tipo B Por cada vía: Sobrecarga uniforme de 12 T/m sobre 15 ó 30 metros, más un conjunto de cuchillos de carga de 10 T/m y 1 T/m de longitud arbitraria.

El tren tipo A suele condicionar el trabajo local de reparto de la losa y el tren tipo B condiciona el dimensionamiento general de la mayor parte de los Estados Límites Últimos o de Servicio.

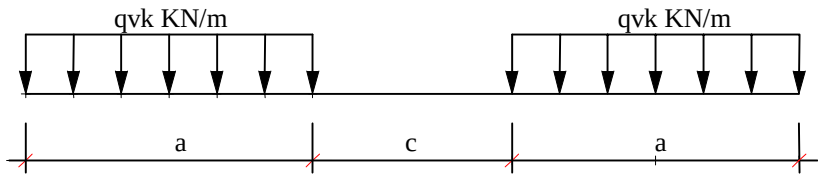
De acuerdo con las especificaciones de la IPF, no se admite reducción de cargas por simultaneidad entre ambas vías. En cualquier caso se debe contemplar la posibilidad de un ripado de la vía respecto al eje teórico de 0.30 m.

El tren de cargas de Eurocódigo 1 (parte 3, acciones en puentes) EC1-3 se define de acuerdo con las configuraciones indicadas en las 2 figuras siguientes. En ambos casos, a efectos de cálculo se contemplará un eventual ripado de la vía de 0.30 m.

Tren tipo 71



Modelo de carga SW



Se considera adicionalmente un tren pesado equivalente al siguiente esquema de cargas (SW/0) ó (SW2) en una de las vías y el tren tipo 71 en la otra vía.

	SW0	SW2
Q _{vk} (kN)	133	150
a (m)	15	25
c (m)	5,3	7

De acuerdo con la IPF-75, para algunas comprobaciones específicas asociadas a combinaciones de carga con viento transversal se considerará un tren sin carga de 12.5 KN/m.

Coeficientes de mayoración por impacto

De acuerdo con la normativa IPF75, se aplica la formulación siguiente:

$$I = 65 \frac{\mu}{1 - \mu + \mu^2}$$

Para una luz de cálculo de valor L= 19,0 m se obtiene: I = 18 %

De acuerdo con el Eurocódigo EC-1, para vías de mantenimiento cuidadoso.

$$\phi_2 = \frac{1,44}{\sqrt{L\phi} - 0,20} + 0,82 = 1,15 \leq 1,17$$

$$L\phi = K * L_m = 20,8 \text{ m}$$

Este valor se debe emplear en el cálculo longitudinal del tablero. Los coeficientes a aplicar en el cálculo local se estudiarán en el apartado correspondiente.

En las zonas del tablero destinadas a mantenimiento (zonas de paseo) se considera una sobrecarga de 0.5 T/m², considerándose concomitante con las sobrecargas ferroviario un 50 % de dicha carga.

SOBRECARGAS DE USO. COMPONENTES HORIZONTALES.

EFFECTO LAZO

En la estructura se considerará una única fuerza transversal concomitante con la sobrecarga vertical para contemplar el efecto lazo. El valor de dicha carga (que no debe ser mayorada con el coeficiente de impacto) es el siguiente:

Según IPF-75 H_T = 5 T para el conjunto de ambas vías, aplicada a cota superior del carril.

Según EC1 H_T = 10,2 T para el conjunto de ambas vías, aplicada a cota superior del carril.

FUERZA CENTRÍFUGA

En puentes de trazado curvo en planta se debe considerar la fuerza centrífuga, cuyo valor se puede obtener mediante la expresión siguiente:

$$\text{IPF 75: } F_c = Q \times \frac{V^2}{127R}$$

El Eurocódigo 1 permite una reducción de la fuerza centrífuga en función de la longitud cargada. Se constata que la IPF-75 da un valor mayor de fuerza centrífuga que el EC1 y por tanto, si el puente es curvo se tomará dicho valor, combinado con el efecto del peralte. Se supondrá la carga actuando 1,80 m por encima del carril.

El puente está ubicado en una clotoide con un radio de curvatura muy alto $R=13\ 000$ a $80\ 000$ m. Para un valor medio del radio de curvatura de $20\ 000$ m obtenemos una fuerza centrífuga de valor $0,22$ T/m.

EFFECTOS DE FRENADO Y ARRANQUE

En el presente proyecto se adoptan las acciones especificadas en el Eurocódigo EC-1 más desfavorables que las propuestas por la IPF-75 (1/8 de la carga frente a 1/4). Esta fuerza se considerará actuando sobre la cota superior del carril y no se multiplica por el coeficiente de impacto.

Fuerzas de arranque (por vía) LM71 y SW

$F_a = 33 \text{ (KN/m)} \times L(\text{m}) \leq 1.000 \text{ KN}$ Se tomará $F_a = 639.90 \text{ KN/vía}$

Fuerzas de frenado (por vía)

$F_f = 20 \text{ (KN/m)} \times L(\text{m}) \leq 6.000 \text{ (KN)}$ LM71 y SW0
 $F_f = 35 \text{ (KN/m)} \times L(\text{m})$ SW2
 $H_f = 0,082 L^{0,9} K^{0,4} = 279 \text{ KN}$

La parte de estas acciones que se transmite al apoyo fijo del tablero puede reducirse debido a la continuidad del carril entre las zonas sobre la estructura y en los accesos. El valor de la fuerza de frenado por vía resulta ser:

Donde:

L es la longitud del puente en metros.
K es la rigidez del estribo por metro de ancho y por vía.

Estos valores se reducirán al 50% si se consideran concomitantes con la fuerza centrífuga.

$H_{Tf} = (0,34 + 0,013k) L_T^{0,9} K^{0,25} = 516 \text{ kN}$
ACCIONES TÉRMICAS VÍA-ESTRUCTURA

La parte de estas acciones que se transmite al apoyo fijo del tablero se calcula como:

Donde:

L_T es la longitud de cálculo a efectos térmicos en metros.
k es la resistencia plástica a rasante en el contacto entre vía y estructura.
K es la rigidez del estribo por metro de ancho y por vía.

EMPUJE SOBRE BARANDILLAS.

En el elemento superior de la barandilla se considera una fuerza horizontal de valor 1.5 kN/m actuando de modo simultáneo con la sobrecarga uniforme.

DESCARRILAMIENTO

El efecto de descarrilamiento se estudiará como una situación accidental, mayorándose las acciones por un coeficiente de seguridad γ_f =1,0 y minorándose los parámetros mecánicos de los materiales por los coeficientes indicados en el apartado 2.2.

Para el estudio del Estado Límite Último de estabilidad se empleará, según el Eurocódigo, una carga vertical de 80 KN/m en una longitud total de 20,00 m a una distancia máxima del eje de la vía de 1,5 veces el ancho.

Para el análisis local de elementos estructurales se tomarán 2 cargas verticales a cada lado del eje de vía de 5 T/m en 6.4 m y separadas entre sí 1.4 m

Acciones climáticas

VIENTO

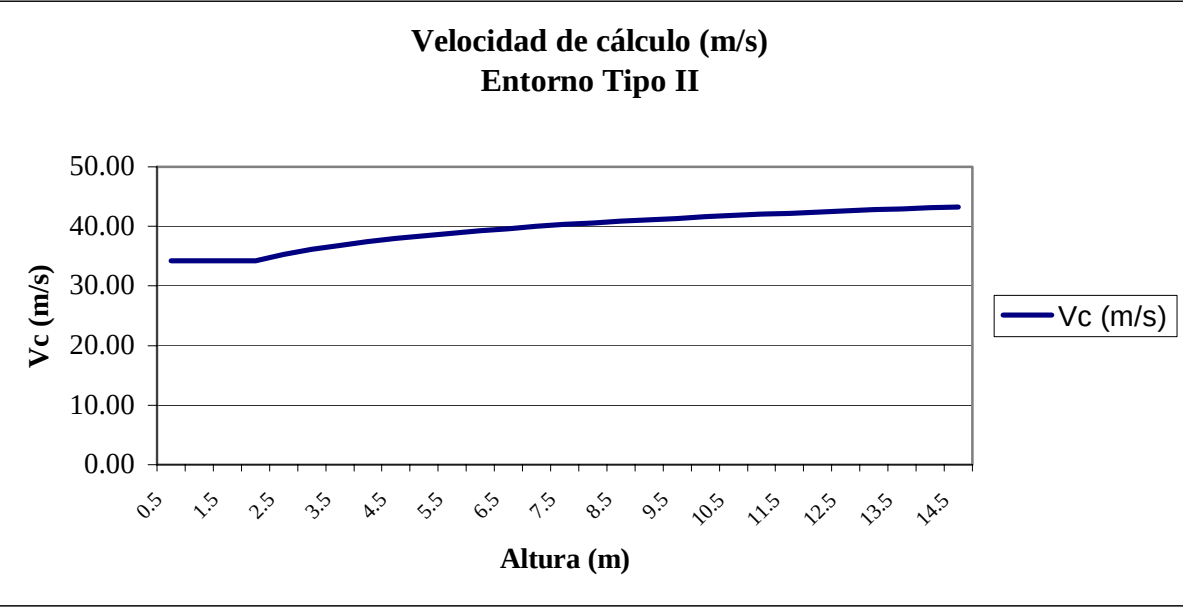
Al estar la estructura ubicada junto a la población de Sant Vicenç dels Horts la velocidad de cálculo se puede determinar a partir de una velocidad de referencia de vref=28 m/s corregida con los siguientes parámetros multiplicadores:

- Ct = factor de topografía
- Cr = factor de riesgo (se toma un periodo de retorno de 100 años)
- Cz = factor de altura (se adopta un entorno Tipo II, zona plana con algunos obstáculos)
- Cg = factor de ráfaga

$$C_z = K_z \ln\left(\frac{z}{z_0}\right) \quad \text{si } z \geq z_{min}$$
$$C_z = K_z \ln\left(\frac{z_{min}}{z_0}\right) \quad \text{si } z \leq z_{min}$$

$$C_g = \sqrt{1 + \frac{7K_z}{C_z C_t}}$$

Vref=28 m/s, Ct=1.0 y Cr=1.04



Para un entorno Tipo II

$K_z = 0.19$ $z_0 = 0.05\text{m}$ $z_{min} = 4\text{ m}$

Para determinar el empuje de viento sobre el tablero, la velocidad de cálculo es:

$V_c = C_t \cdot C_r \cdot C_z \cdot C_g \cdot V_{ref} = 42.5\text{ m/s}$

Esta velocidad de viento da lugar a una presión de 0.147 T/m².

Las situaciones consideradas han sido:

- Puente sin sobrecarga
- Puente con tren en una vía
- Puente con trenes en ambas vías

Se tiene en cuenta en el cálculo del empuje total del viento sobre el tablero los coeficientes de ocultamiento entre zonas expuestas, obteniéndose los siguientes valores:

- Puente sin sobrecarga $F = 0.596\text{ T/m}$
- Puente con tren en una vía $F = 0.722\text{ T/m}$
- Puente con trenes en ambas vías $F = 0.743\text{ T/m}$

Cuando se combina con la sobrecarga se reduce en un 50% esta acción.

NIEVE

Según al IAP se debe aplicar una carga de nieve sobre la superficie de tablero en la que no se considere sobrecarga de uso. Para el cálculo del tablero se considera la posibilidad de tener sobrecarga en toda su superficie, por lo tanto no es necesario aplicar la sobrecarga de nieve.

Acciones Térmicas

VARIACIÓN UNIFORME DE TEMPERATURA

El puente está emplazado en la región climática V (Figura 7 de la IAP)

Por ser una losa aligerada de hormigón, la variación uniforme de temperatura viene dada por:

$$\Delta T = K \cdot z^a \cdot h^b \cdot s^c = 29,13 \cdot 4^{0,301} \cdot 1.2^{-0,148} \cdot 1^0 = 38.07^{\circ} = \pm 19^{\circ} C$$

GRADIENTE TÉRMICO

$$\nabla T_{si,ref} = 12^{\circ} C$$

$$K_1 = 0.80$$

$$K_3 = 1.06$$

$$K_4 = 1.19$$

Vertical positivo $\nabla T_{SI} = (K_1 \cdot K_3 \cdot K_4) \cdot \nabla T_{SI,ref} = 7,30^{\circ} C$

Vertical negativo $\nabla T_{SI} = 0^{\circ} C$ (tablero de hormigón con pavimento bituminoso)

Transversal $\nabla T_T = 2.5^{\circ} C$ si la estructura tiene dirección Este-Oeste (+/- 25 g)

ACCIÓN SÍSMICA

La aceleración sísmica básica de la zona, según la normativa vigente, es $a_b = 0,04 \text{ g}$.

La categoría de la estructura puede considerarse de especial importancia, lo que es equivalente a un factor de nivel de daño $\gamma_1 = 1.3$.

La aceleración de cálculo es: $a_c = \gamma_1 \cdot a_b = 0.052 \text{ g}$

Las acciones sísmicas en puentes sólo se consideran, de acuerdo con la IAP, para aceleraciones de cálculo superiores a 0.06g, por lo tanto no es preciso realizar el análisis sísmico del puente.

2.2 COEFICIENTES DE SEGURIDAD, MATERIALES, NIVELES DE CONTROL Y NORMATIVAS

HORMIGONES

- Hormigón de Limpieza..... HM-15
- Cimentaciones y estribos..... HA-25 / B / 20 / IIa
- Alzados de pilas HA-25 / B / 20 / IIa
- Tablero HP-40 / B / 20 / IIa

Control del hormigón ESTADÍSTICO

γc= 1.50 (Situación persistente o transitoria)
γc= 1.30 (Situación accidental)

El módulo de elasticidad se ha evaluado en todos los casos de acuerdo a la expresión de EHE:

$E_c = 8500 \sqrt[3]{f_{ck} + 8} \text{ (Nw/mm}^2\text{)}$

Los límites establecidos para la consistencia en la puesta en obra podrán superarse con el empleo de aditivos superfluidificantes, siempre que el valor de la relación agua-cemento cumpla los requisitos prefijados en EHE.

ACEROS

- Acero corrugado para la armadura pasiva B500S, con f_{yk} > 500 MPa (5100 Kp/cm²)
- Acero de pretensado tipo 170/190 con tendones de 0,6 " (Y 1860 S7 15.2).

Control de los aceros NORMAL

γs= 1.15 (Situación persistente o transitoria)
γs= 1.0 (Situación accidental)

CONTROL DE EJECUCIÓN

El control de ejecución será INTENSO (γ_g= 1.35 y γ_{tq}= 1.5) en tablero y estribos de acuerdo con las especificaciones de la normativa EHE.

NORMAS UTILIZADAS

Para el establecimiento de acciones y las combinaciones necesarias para la obtención de las solicitaciones de cálculo que se emplearán en la comprobación de los diferentes Estados Límite se realizarán los cálculos empleando la normativa IPF-75 y los criterios especificados en los Eurocódigos, adoptándose el más desfavorable de ambos.

Cálculo según IPF-75

Para el cálculo de las acciones se utilizarán las siguientes instrucciones.

- Instrucción relativa a las acciones a considerar en el Proyecto de Puentes de Ferrocarril", correspondiente a la O.M. 25 de Junio de 1.975 (IPF-75).
- Norma de construcción Sismorresistente: Parte general y edificación (NCSE-94)” R.D. 29 de Diciembre de 1.994.

Para el cálculo de las acciones ambientales se utilizará la siguiente instrucción.

- Instrucción relativa a las acciones a considerar en el proyecto de Puentes de Carreteras I.A.P. 12 de Febrero de 1998.

Para establecer las hipótesis y combinaciones de cálculo y sus correspondientes coeficientes de ponderación se utilizarán las siguientes Instrucciones:

- Instrucción de Hormigón Estructural (EHE) R.D. 2661/1998 de 11 de Diciembre.

Cálculo según Eurocódigos y EHE

- Eurocódigo 1: *Bases de proyecto y acciones. Parte 3. Cargas de tráfico en puentes.* UNE-ENV 1991-3. Octubre 1997. (EC1.1.3.)

Para establecer las hipótesis y combinaciones de cálculo y sus correspondientes coeficientes de ponderación se utilizarán las siguientes Instrucciones:

- Eurocódigo 1: *Bases de proyecto y acciones en estructuras. Parte 1; Bases de proyecto.* UNE-ENV 1991-1, Octubre 1997 (EC1.1)

Para dimensionamiento y comprobación de secciones se actuará, en todo momento, de acuerdo con la normativa española;

- Instrucción de Hormigón Estructural EHE. R.D. 2661/1998 de 11 de Diciembre

El estudio de la fatiga de los materiales se hará de acuerdo con la siguiente norma:

- Eurocódigo 2: *Proyecto de estructuras de hormigón. Parte 2: Puentes de hormigón.* ENV 1992.2: Septiembre 1996. (EC2.2).

La comprobación de flechas, deformaciones y vibraciones se hará de acuerdo con la norma:

- Eurocódigo 1: *Bases de proyecto y acciones en estructuras. Parte 3: Cargas de tráfico en puentes* UNE-ENV 1991-3. Octubre 1997. (EC1.1.3).

Para el análisis de la interacción vía-estructura se empleará la siguiente norma:

- Norma U.I.C. Ficha 774.3 R. 1ª edición. Febrero 1999 (U.I.C. 774.3).

Subsidiariamente, y en lo no contemplado en las normas anteriores se emplearán las siguientes:

- Norma UIC. Ficha 776.1. 3ª edición. 1 de Julio de 1.979. (U.I.C. 776.1)
- Norma UIC. Ficha 774-2. 1ª Edición. 1 de Julio de 1.974. (U.I.C. 774.2)
- Norma UIC. Ficha 702.0. 2ª Edición. 1 de Enero de 1.974. (U.I.C. 702.0)

2.3 AMBIENTES, RECUBRIMIENTOS, FISURACIÓN Y CUANTÍAS MÍNIMAS

De acuerdo con la normativa EHE se consideran los ambientes indicados en la tabla siguiente.

Elemento	Ambiente	Recubrimiento de Armadura pasiva (mm)	Límite de abertura de fisura Wmax (mm)	
			Hormigón armado	Hormigón postesado
Tablero	Iia	35	-	Descompresion bajo comb. cuasipermanente
Alzados de pilas y estribos	Iia	30	0.2	-

Cimentaciones	Iia	30	0.1	-
Pilotes/Pantallas	Iia	75	0.1	-

Para las armaduras postesas el recubrimiento es el máximo de los siguientes valores: 4 cm o el diámetro de la vaina.

Las cuantías mínimas de armadura pasiva B500S serán las expuestas en la siguiente tabla (EHE, art. 4.3.5)

Elemento	Posición	Tipo	Cuantía geométrica o/oo
Zapatas	cara superior o inferior	transversal o longitudinal	0.90
Pilotes	vertical	-	4.0
Pilas	vertical	-	4.0
Alzados de estribos y aletas (1)	horizontal	lado tierras	1.07
		lado visto	2.13
	vertical	lado tierras	0.90
		lado visto	0.30
Tablero	cara superior o inferior	transversal o longitudinal	0.90

(1) las cuantías geométricas horizontales se pueden reducir un 50 % si se colocan juntas de contracción distanciadas menos de 7,5 m.

2.4 HIPÓTESIS DE COMBINACIÓN DE ESFUERZOS

Se han considerado las combinaciones de hipótesis de las acciones recogidas en la Normativas IAP y EHE, basados en la teoría de Estados Límites, para las distintas situaciones de cálculo de la estructura.

2.4.1 ESTADOS LÍMITES ÚLTIMOS

Las hipótesis de cálculo consideradas son:

- Situaciones persistentes o transitorias

$$\sum_{j \geq 1} \gamma_{Gj} G_{kj} + \sum_{j \geq 1} \gamma_{Gj} G^*_{kj} + \gamma_{Q1} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{0i} Q_{ki}$$

- Situaciones accidentales

$$\sum_{j \geq 1} \gamma_{Gaj} G_{kj} + \sum_{j \geq 1} \gamma_{Gj} G^*_{kj} + \gamma_A A_k + \Psi_{11} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

- Situaciones accidentales de sismo

$$\sum_{j \geq 1} G_{kj} + \sum_{j \geq 1} \gamma_{Gj} G^*_{kj} + \gamma_i A_{Ed} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

donde:

- G = Valor característico de las cargas permanentes.
- G* = Valor característico de las cargas permanentes de valor no constante.
- Q_{k1} = Valor característico de la carga variable dominante.
- A_k = Valor característico de la acción accidental
- A_{eq} = Valor característico de la acción sísmica, calculado según la Norma Sismorresistente.

Los coeficientes de seguridad y de combinación de acciones empleados se definen en la EHE para control de ejecución intenso.

2.4.2 ESTADOS LÍMITES DE SERVICIO

Las hipótesis de cálculo consideradas son:

- Combinación característica

$$\sum_{j \geq 1} \gamma_{Gj} G_{kj} + \sum_{j \geq 1} \gamma_{Gj} G^*_{kj} + \gamma_{Q1} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{0i} Q_{ki}$$

- Combinación frecuente

$$\sum_{j \geq 1} \gamma_{Gaj} G_{kj} + \sum_{j \geq 1} \gamma_{Gj} G^*_{kj} + \Psi_{11} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

- Combinación casi permanente

$$\sum_{j \geq 1} G_{kj} + \sum_{j \geq 1} \gamma_{Gj} G^*_{kj} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

3 CÁLCULO ESTRUCTURAL DEL TABLERO

3.1 CÁLCULO ESTRUCTURAL CON MODELO DE VIGA CONTINUA

3.1.1 DISCRETIZACIÓN Y CARACTERÍSTICAS MECÁNICAS

Se modela el tablero mediante un emparrillado plano constituido por dos nervios longitudinales, coincidente con los ejes de viga en planta, con 3 grados de libertad por nudo (desplazamiento vertical, giro de flexión longitudinal de la barra y giro a torsión). Los nervios longitudinales se han dividido para cada uno de los vanos del tablero en 20 barras de igual longitud asignando las características mecánicas en cada uno de los extremos de la barra. Las propiedades mecánicas de la barra se obtienen como media de las características de sus secciones extremas. En la zona de estribos se ha simulado la riostra de apoyo mediante 2 barras transversales, una a cada lado del nervio longitudinal, con su extremo final coincidente con la posición real de los apoyos de neopreno. En las barras transversales de las riostras de apoyo se ha despreciado su rigidez a torsión. En los apoyos se han prescrito únicamente los movimientos verticales del nudo.

La numeración de nudos y barras es correlativa, tomando como origen el extremo izquierdo del nervio longitudinal, en último lugar se numeran las barras y nudos que permiten simular las riostras de apoyo en los dos estribos. La discretización adoptada aparece en las hojas y esquemas adjuntos.

En los listados aparece la siguiente información:

- 1. Datos generales.
- 2. Discretización: numeración de barras y nudos, coordenadas de los nudos condiciones de vinculación.
- 3. Cargas en los nudos para cada hipótesis de carga.
- 4. Reacciones para cada hipótesis de carga.
- 5. Esfuerzos en extremo de barra para cada hipótesis de carga.

3.1.2 CÁLCULO DE ESFUERZOS LONGITUDINALES

El cálculo de esfuerzos longitudinales con el modelo de análisis estructural expuesto se detalla a continuación.

La notación adoptada para cada una de las hipótesis de carga es la siguiente:

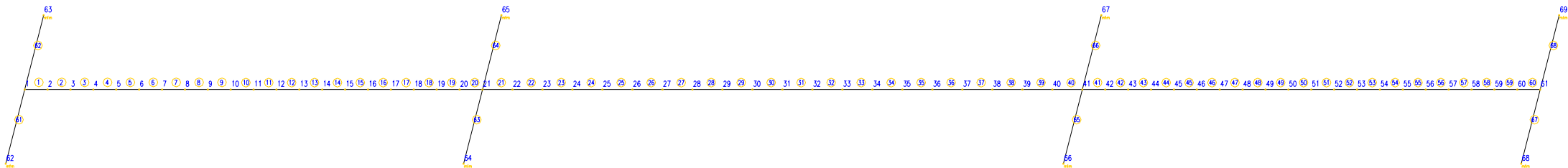
- **g₁** Peso propio de la estructura.
- **g₂** Carga permanente.
- **q** Sobrecarga uniforme de ferrocarril.
- **ΔT** Gradiente de temperatura.
- **P_{ii}** Pretensado inicial de descimbrado (pretensado parcial con pérdidas iniciales).
- **P_i** Pretensado inicial (con pérdidas iniciales).
- **P_∞** Pretensado final (con pérdidas iniciales y diferidas).

**CÁLCULO ESTRUCTURAL DEL TABLERO CON MODELO DE
EMPARRILLADO**

MODELO DE CALCULO

② Numeración de barras

J Numeración de nudos



PEDELTA, S.L.- INGENIERIA DE ESTRUCTURAS, BARCELONA

Vinf (m) = 0.69200

Referencia del Proyecto:

Paso Inferior Riera de Torrelles

DATOS GENERALES DEL EMPARRILLADO

No. de Barras = 68
No. de Nudos = 69
No. de Nudos con condiciones impuestas = 8
No. de Materiales = 3
No. de Hipotesis de carga = 1

Propiedades de barras =1, de secciones =0

TIPO DE PROPIEDADES = 0

PROPIEDADES DE LOS MATERIALES

MATERIAL/SECCION	3		
Inercia a Flexion	(m4)	=	1.0000000
Modulo de Torsion	(m4)	=	0.0000100
Area a Cortante	(m2)	=	0.0000000
Modulo de elasticidad (T/m2)		=	2850000.00
Coeficiente de Poisson		=	0.16
Canto	(m)	=	1.10000
Vsup	(m)	=	0.55000
Vinf	(m)	=	0.55000

PROPIEDADES DE LOS MATERIALES

MATERIAL/SECCION 1

Inercia a Flexion (m4) = 1.1212699
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Coeficiente de Poisson = 0.16
Canto (m) = 1.24000
Vsup (m) = 0.51700
Vinf (m) = 0.72300

MATERIAL/SECCION 2

Inercia a Flexion (m4) = 1.2274500
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Coeficiente de Poisson = 0.16
Canto (m) = 1.24000
Vsup (m) = 0.54800

DISCRETIZACION. DATOS DE LAS BARRAS
=====

Barra	Nudo 1	Nudo 2	No.de Secc Nud.1 Nud.2	No. MAT	
=====					
1	1	2	2	2	1
2	2	3	2	2	1
3	3	4	1	1	2
4	4	5	1	1	2
5	5	6	1	1	2
6	6	7	1	1	2
7	7	8	1	1	2
8	8	9	1	1	2
9	9	10	1	1	2
10	10	11	1	1	2
11	11	12	1	1	2
12	12	13	1	1	2
13	13	14	1	1	2
14	14	15	1	1	2
15	15	16	1	1	2
16	16	17	1	1	2
17	17	18	1	1	2
18	18	19	1	1	2
19	19	20	2	2	1
20	20	21	2	2	1
21	21	22	2	2	1
22	22	23	2	1	3
23	23	24	1	1	2
24	24	25	1	1	2
25	25	26	1	1	2
26	26	27	1	1	2
27	27	28	1	1	2
28	28	29	1	1	2
29	29	30	1	1	2
30	30	31	1	1	2
31	31	32	1	1	2
32	32	33	1	1	2
33	33	34	1	1	2
34	34	35	1	1	2
35	35	36	1	1	2
36	36	37	1	1	2
37	37	38	1	1	2
38	38	39	1	1	2
39	39	40	1	2	3
40	40	41	2	2	1
41	41	42	2	2	1
42	42	43	2	2	1
43	43	44	1	1	2
44	44	45	1	1	2
45	45	46	1	1	2
46	46	47	1	1	2
47	47	48	1	1	2

DISCRETIZACION. DATOS DE LAS BARRAS
=====

Barra	Nudo 1	Nudo 2	No.de Secc Nud.1 Nud.2	No. MAT	
=====					
48	48	49	1	1	2
49	49	50	1	1	2
50	50	51	1	1	2
51	51	52	1	1	2
52	52	53	1	1	2
53	53	54	1	1	2
54	54	55	1	1	2
55	55	56	1	1	2
56	56	57	1	1	2
57	57	58	1	1	2
58	58	59	1	1	2
59	59	60	2	2	1
60	60	61	2	2	1
61	1	62	3	3	4
62	1	63	3	3	4
63	21	64	3	3	4
64	21	65	3	3	4
65	41	66	3	3	4
66	41	67	3	3	4
67	61	68	3	3	4
68	61	69	3	3	4

PROPIEDADES DE LAS BARRAS
=====

MATERIAL 1

Inercia a Flexion (m4) = 1.2274500
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.24000
Vsup (m) = 0.54800
Vinf (m) = 0.69200

MATERIAL 2

Inercia a Flexion (m4) = 1.1212699
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.24000
Vsup (m) = 0.51700
Vinf (m) = 0.72300

MATERIAL 3

Inercia a Flexion (m4) = 1.1743600
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.24000
Vsup (m) = 0.53250
Vinf (m) = 0.70750

MATERIAL 4

Inercia a Flexion (m4) = 1.0000000
Modulo de Torsion (m4) = 0.0000100
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.10000
Vsup (m) = 0.55000
Vinf (m) = 0.55000

COORDENADAS DE LOS NUDOS
=====

Nudo	X	Y
1	0.000	0.000
2	0.725	0.000
3	1.450	0.000
4	2.175	0.000
5	2.900	0.000
6	3.625	0.000
7	4.350	0.000
8	5.075	0.000
9	5.800	0.000
10	6.525	0.000
11	7.250	0.000
12	7.975	0.000
13	8.700	0.000
14	9.425	0.000
15	10.150	0.000
16	10.875	0.000
17	11.600	0.000
18	12.325	0.000
19	13.050	0.000
20	13.775	0.000
21	14.500	0.000
22	15.225	0.000
23	16.000	0.000
24	16.750	0.000
25	17.500	0.000
26	18.250	0.000
27	19.000	0.000
28	19.750	0.000
29	20.500	0.000
30	21.250	0.000
31	22.000	0.000
32	22.750	0.000
33	23.500	0.000
34	24.250	0.000
35	25.000	0.000
36	25.750	0.000
37	26.500	0.000
38	27.250	0.000
39	28.000	0.000
40	28.750	0.000
41	29.500	0.000
42	30.250	0.000
43	31.000	0.000
44	31.750	0.000

45	36.400	0.000
46	37.125	0.000
47	37.850	0.000
48	38.575	0.000

COORDENADAS DE LOS NUDOS		
=====		
Nudo	X	Y
=====		
49	39.300	0.000
50	40.025	0.000
51	40.750	0.000
52	41.475	0.000
53	42.200	0.000
54	42.925	0.000
55	43.650	0.000
56	44.375	0.000
57	45.100	0.000
58	45.825	0.000
59	46.550	0.000
60	47.275	0.000
61	48.000	0.000
62	-0.600	-2.350
63	0.600	2.350º
64	13.900	-2.350
65	15.100	2.350
66	32.900	-2.350
67	34.100	2.350
68	47.400	-2.350
69	48.600	2.350

CONDICIONES DE VINCULACION				
=====				
Nudo	Codigo	RX	RZ	RY
=====				
62	0 1 0	0.000	0.000	0.000
63	0 1 0	0.000	0.000	0.000
64	0 1 0	0.000	0.000	0.000
65	0 1 0	0.000	0.000	0.000
66	0 1 0	0.000	0.000	0.000
67	0 1 0	0.000	0.000	0.000
68	0 1 0	0.000	0.000	0.000
69	0 1 0	0.000	0.000	0.000

Ancho de banda = 189

HIPOTESIS 1 PESO PROPIO

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	62.26733	0.00000
63	0.00000	70.32077	0.00000
64	0.00000	213.22035	0.00000
65	0.00000	209.39070	0.00000
66	0.00000	209.34145	0.00000
67	0.00000	213.15686	0.00000
68	0.00000	70.28559	0.00000
69	0.00000	62.24726	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 1110.230
Suma Momentos Torsores = 0.000

HIPOTESIS 1 PESO PROPIO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-4.83	120.46	18.93	-75.55	-101.27	-18.93
2	75.55	101.26	18.93	-142.01	-82.07	-18.93
3	142.01	82.07	18.93	-195.82	-66.36	-18.93
4	195.82	66.37	18.93	-238.25	-50.66	-18.93
5	238.25	50.66	18.93	-269.28	-34.96	-18.93
6	269.28	34.98	18.93	-288.94	-19.27	-18.93
7	288.93	19.24	18.93	-297.19	-3.54	-18.93
8	297.20	3.52	18.93	-294.05	12.19	-18.93
9	294.06	-12.17	18.93	-279.55	27.87	-18.93
10	279.55	-27.89	18.93	-253.64	43.60	-18.93
11	253.65	-43.60	18.93	-216.35	59.31	-18.93
12	216.35	-59.33	18.93	-167.64	75.04	-18.93
13	167.64	-75.00	18.93	-107.57	90.70	-18.93
14	107.57	-90.72	18.93	-36.11	106.43	-18.93
15	36.11	-106.44	18.93	46.75	122.14	-18.93
16	-46.75	-122.14	18.93	141.00	137.85	-18.93
17	-140.99	-137.85	18.93	246.63	153.56	-18.93
18	-246.63	-153.56	18.93	363.66	169.27	-18.93
19	-363.66	-169.27	18.93	493.33	188.47	-18.93
20	-493.34	-188.46	18.93	636.93	207.66	-18.93
21	-634.63	214.95	9.92	442.37	-189.80	-9.92

22	-442.37	189.80	9.92	274.01	-164.65	-9.92
23	-274.00	164.64	9.92	127.37	-144.06	-9.92
24	-127.37	144.06	9.92	0.29	-123.48	-9.92

HIPOTESIS 1 PESO PROPIO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	-0.29	123.48	9.92	-107.25	-102.90	-9.92
26	107.25	102.92	9.92	-195.23	-82.34	-9.92
27	195.23	82.33	9.92	-263.65	-61.75	-9.92
28	263.65	61.74	9.92	-312.52	-41.16	-9.92
29	312.52	41.18	9.92	-341.87	-20.60	-9.92
30	341.87	20.58	9.92	-351.65	0.00	-9.92
31	351.65	0.01	9.92	-341.88	20.57	-9.92
32	341.88	-20.54	9.92	-312.59	41.12	-9.92
33	312.59	-41.12	9.92	-263.74	61.70	-9.92
34	263.74	-61.72	9.92	-195.33	82.30	-9.92
35	195.33	-82.31	9.92	-107.36	102.89	-9.92
36	107.37	-102.88	9.92	0.15	123.46	-9.92
37	-0.15	-123.48	9.92	127.22	144.06	-9.92
38	-127.22	-144.05	9.92	273.85	164.63	-9.92
39	-273.85	-164.63	9.92	442.19	189.78	-9.92
40	-442.19	-189.78	9.92	634.43	214.93	-9.92
41	-636.72	207.57	18.89	493.19	-188.38	-18.89
42	-493.20	188.38	18.89	363.58	-169.18	-18.89
43	-363.58	169.17	18.89	246.62	-153.47	-18.89
44	-246.62	153.48	18.89	141.04	-137.77	-18.89
45	-141.04	137.78	18.89	46.85	-122.07	-18.89
46	-46.85	122.07	18.89	-35.95	-106.37	-18.89
47	35.95	106.38	18.89	-107.37	-90.67	-18.89
48	107.37	90.69	18.89	-167.43	-74.99	-18.89
49	167.42	74.99	18.89	-216.10	-59.28	-18.89
50	216.08	59.31	18.89	-253.39	-43.61	-18.89
51	253.37	43.62	18.89	-279.30	-27.91	-18.89
52	279.27	27.90	18.89	-293.81	-12.19	-18.89
53	293.80	12.21	18.89	-296.95	3.50	-18.89
54	296.95	-3.52	18.89	-288.70	19.23	-18.89
55	288.72	-19.21	18.89	-269.10	34.92	-18.89
56	269.10	-34.92	18.89	-238.10	50.62	-18.89
57	238.09	-50.61	18.89	-195.71	66.32	-18.89
58	195.71	-66.32	18.89	-141.93	82.03	-18.89
59	141.94	-82.02	18.89	-75.52	101.21	-18.89
60	75.51	-101.21	18.89	4.82	120.40	-18.89
61	143.67	-56.20	0.00	0.00	62.27	0.00
62	163.20	-64.26	0.00	0.00	70.32	0.00
63	517.14	-213.22	0.00	0.00	213.22	0.00
64	507.85	-209.39	0.00	0.00	209.39	0.00
65	507.73	-209.34	0.00	0.00	209.34	0.00

66	516.99	-213.16	0.00	0.00	213.16	0.00
67	163.12	-64.22	0.00	0.00	70.29	0.00
68	143.62	-56.18	0.00	0.00	62.25	0.00

HIPOTESIS 1 CARGA PERMANENTE

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	36.81569	0.00000
63	0.00000	42.33951	0.00000
64	0.00000	142.22897	0.00000
65	0.00000	139.60217	0.00000
66	0.00000	139.56870	0.00000
67	0.00000	142.18568	0.00000
68	0.00000	42.31549	0.00000
69	0.00000	36.80199	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 721.858
Suma Momentos Torsores = 0.000

HIPOTESIS 1 CARGA PERMANENTE

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-3.31	79.15	12.98	-50.12	-68.25	-12.98
2	50.12	68.25	12.98	-95.65	-57.35	-12.98
3	95.65	57.35	12.98	-133.28	-46.44	-12.98
4	133.28	46.45	12.98	-163.00	-35.54	-12.98
5	163.00	35.53	12.98	-184.81	-24.63	-12.98
6	184.82	24.64	12.98	-198.73	-13.73	-12.98
7	198.72	13.74	12.98	-204.73	-2.84	-12.98
8	204.72	2.83	12.98	-202.83	8.07	-12.98
9	202.83	-8.07	12.98	-193.02	18.98	-12.98
10	193.02	-18.99	12.98	-175.30	29.89	-12.98
11	175.31	-29.89	12.98	-149.68	40.80	-12.98
12	149.68	-40.81	12.98	-116.14	51.71	-12.98
13	116.14	-51.71	12.98	-74.70	62.61	-12.98
14	74.70	-62.62	12.98	-25.35	73.52	-12.98
15	25.36	-73.53	12.98	31.90	84.43	-12.98
16	-31.90	-84.43	12.98	97.06	95.33	-12.98
17	-97.06	-95.33	12.98	170.13	106.24	-12.98
18	-170.13	-106.24	12.98	251.10	117.14	-12.98
19	-251.10	-117.14	12.98	339.98	128.04	-12.98
20	-339.99	-128.04	12.98	436.77	138.95	-12.98
21	-435.19	142.88	6.81	306.24	-128.59	-6.81

22	-306.24	128.59	6.81	190.86	-114.31	-6.81
23	-190.87	114.30	6.81	89.06	-100.02	-6.81
24	-89.06	100.01	6.81	0.84	-85.72	-6.81

HIPOTESIS 1 CARGA PERMANENTE

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	-0.84	85.73	6.81	-73.82	-71.44	-6.81
26	73.82	71.43	6.81	-134.89	-57.15	-6.81
27	134.90	57.14	6.81	-182.40	-42.86	-6.81
28	182.39	42.88	6.81	-216.33	-28.59	-6.81
29	216.33	28.59	6.81	-236.70	-14.30	-6.81
30	236.70	14.28	6.81	-243.49	0.01	-6.81
31	243.49	0.00	6.81	-236.71	14.29	-6.81
32	236.71	-14.27	6.81	-216.36	28.56	-6.81
33	216.37	-28.55	6.81	-182.46	42.84	-6.81
34	182.46	-42.86	6.81	-134.96	57.14	-6.81
35	134.96	-57.13	6.81	-73.90	71.42	-6.81
36	73.90	-71.43	6.81	0.75	85.72	-6.81
37	-0.75	-85.72	6.81	88.96	100.01	-6.81
38	-88.96	-100.01	6.81	190.76	114.29	-6.81
39	-190.76	-114.29	6.81	306.12	128.58	-6.81
40	-306.12	-128.58	6.81	435.06	142.87	-6.81
41	-436.63	138.89	12.96	339.89	-127.98	-12.96
42	-339.89	127.99	12.96	251.05	-117.08	-12.96
43	-251.05	117.08	12.96	170.12	-106.18	-12.96
44	-170.12	106.18	12.96	97.09	-95.27	-12.96
45	-97.09	95.27	12.96	31.97	-84.37	-12.96
46	-31.97	84.37	12.96	-25.25	-73.47	-12.96
47	25.25	73.46	12.96	-74.56	-62.56	-12.96
48	74.57	62.58	12.96	-115.98	-51.68	-12.96
49	115.99	51.67	12.96	-149.50	-40.77	-12.96
50	149.51	40.78	12.96	-175.12	-29.87	-12.96
51	175.11	29.90	12.96	-192.84	-19.00	-12.96
52	192.84	18.97	12.96	-202.64	-8.07	-12.96
53	202.65	8.09	12.96	-204.56	2.82	-12.96
54	204.56	-2.80	12.96	-198.58	13.70	-12.96
55	198.58	-13.71	12.96	-184.69	24.61	-12.96
56	184.69	-24.60	12.96	-162.90	35.51	-12.96
57	162.90	-35.51	12.96	-133.20	46.42	-12.96
58	133.20	-46.40	12.96	-95.61	57.31	-12.96
59	95.60	-57.31	12.96	-50.10	68.21	-12.96
60	50.10	-68.21	12.96	3.31	79.12	-12.96
61	89.29	-36.82	0.00	0.00	36.82	0.00
62	102.69	-42.34	0.00	0.00	42.34	0.00
63	344.96	-142.23	0.00	0.00	142.23	0.00
64	338.59	-139.60	0.00	0.00	139.60	0.00
65	338.51	-139.57	0.00	0.00	139.57	0.00

66	344.86	-142.19	0.00	0.00	142.19	0.00
67	102.63	-42.32	0.00	0.00	42.32	0.00
68	89.26	-36.80	0.00	0.00	36.80	0.00

HIPOTESIS 1 GRADIENTE TERMICO, AT= 8 C

REACCIONES
=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	13.09889	0.00000
63	0.00000	3.65886	0.00000
64	0.00000	-14.74649	0.00000
65	0.00000	-2.03953	0.00000
66	0.00000	-2.00702	0.00000
67	0.00000	-14.70539	0.00000
68	0.00000	3.67987	0.00000
69	0.00000	13.11114	0.00000

SUMA DE REACCIONES
=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 0.050
Suma Momentos Torsores = 0.000

HIPOTESIS 1 GRADIENTE TERMICO, AT= 8 C

ESFUERZOS EN EXTREMO DE BARRA
=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	5.66	16.76	-22.18	-17.81	-16.76	22.18
2	17.81	16.76	-22.18	-29.96	-16.76	22.18
3	29.95	16.76	-22.18	-42.10	-16.76	22.18
4	42.10	16.75	-22.18	-54.25	-16.75	22.18
5	54.25	16.75	-22.18	-66.39	-16.75	22.18
6	66.40	16.74	-22.18	-78.53	-16.74	22.18
7	78.54	16.75	-22.18	-90.69	-16.75	22.18
8	90.69	16.76	-22.18	-102.84	-16.76	22.18
9	102.83	16.77	-22.18	-114.99	-16.77	22.18
10	114.98	16.77	-22.18	-127.13	-16.77	22.18
11	127.13	16.76	-22.18	-139.28	-16.76	22.18
12	139.28	16.77	-22.18	-151.45	-16.77	22.18
13	151.44	16.76	-22.18	-163.60	-16.76	22.18
14	163.60	16.77	-22.18	-175.75	-16.77	22.18
15	175.75	16.78	-22.18	-187.91	-16.78	22.18
16	187.91	16.77	-22.18	-200.07	-16.77	22.18
17	200.07	16.78	-22.18	-212.24	-16.78	22.18
18	212.24	16.78	-22.18	-224.40	-16.78	22.18
19	224.40	16.78	-22.18	-236.57	-16.78	22.18
20	236.57	16.77	-22.18	-248.73	-16.77	22.18
21	241.11	-0.01	7.68	-241.10	0.01	-7.68

22	241.10	-0.01	7.68	-241.09	0.01	-7.68
23	241.09	-0.01	7.68	-241.09	0.01	-7.68
24	241.09	-0.01	7.68	-241.08	0.01	-7.68

HIPOTESIS 1 GRADIENTE TERMICO, AT= 8 C

ESFUERZOS EN EXTREMO DE BARRA
=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	241.08	-0.01	7.68	-241.07	0.01	-7.68
26	241.07	-0.01	7.68	-241.06	0.01	-7.68
27	241.06	-0.01	7.68	-241.06	0.01	-7.68
28	241.06	-0.01	7.68	-241.05	0.01	-7.68
29	241.05	-0.01	7.68	-241.04	0.01	-7.68
30	241.04	-0.01	7.68	-241.04	0.01	-7.68
31	241.04	-0.01	7.68	-241.03	0.01	-7.68
32	241.03	0.00	7.68	-241.03	0.00	-7.68
33	241.03	-0.01	7.68	-241.02	0.01	-7.68
34	241.02	0.00	7.68	-241.02	0.00	-7.68
35	241.02	-0.01	7.68	-241.01	0.01	-7.68
36	241.01	-0.01	7.68	-241.01	0.01	-7.68
37	241.01	-0.01	7.68	-241.00	0.01	-7.68
38	241.00	-0.01	7.68	-240.99	0.01	-7.68
39	240.99	-0.01	7.68	-240.99	0.01	-7.68
40	240.99	-0.01	7.68	-240.98	0.01	-7.68
41	248.60	-16.72	-22.16	-236.48	16.72	22.16
42	236.48	-16.72	-22.16	-224.36	16.72	22.16
43	224.35	-16.72	-22.16	-212.23	16.72	22.16
44	212.23	-16.73	-22.16	-200.10	16.73	22.16
45	200.10	-16.72	-22.16	-187.98	16.72	22.16
46	187.97	-16.72	-22.16	-175.85	16.72	22.16
47	175.85	-16.73	-22.16	-163.72	16.73	22.16
48	163.71	-16.74	-22.16	-151.58	16.74	22.16
49	151.58	-16.74	-22.16	-139.44	16.74	22.16
50	139.44	-16.76	-22.16	-127.29	16.76	22.16
51	127.29	-16.75	-22.16	-115.15	16.75	22.16
52	115.14	-16.76	-22.16	-102.99	16.76	22.16
53	103.00	-16.78	-22.16	-90.83	16.78	22.16
54	90.83	-16.77	-22.16	-78.67	16.77	22.16
55	78.67	-16.78	-22.16	-66.50	16.78	22.16
56	66.50	-16.76	-22.16	-54.34	16.76	22.16
57	54.34	-16.79	-22.16	-42.17	16.79	22.16
58	42.17	-16.78	-22.16	-30.00	16.78	22.16
59	30.00	-16.79	-22.16	-17.83	16.79	22.16
60	17.83	-16.79	-22.16	-5.66	16.79	22.16
61	31.77	-13.10	0.00	0.00	13.10	0.00
62	8.87	-3.66	0.00	0.00	3.66	0.00
63	-35.77	14.75	0.00	0.00	-14.75	0.00
64	-4.95	2.04	0.00	0.00	-2.04	0.00
65	-4.87	2.01	0.00	0.00	-2.01	0.00
66	-35.67	14.71	0.00	0.00	-14.71	0.00

67	8.92	-3.68	0.00	0.00	3.68	0.00
68	31.80	-13.11	0.00	0.00	13.11	0.00

HIPOTESIS 1 PRETENSADO: PRIMER TESADO

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	43.78411	0.00000
63	0.00000	21.82740	0.00000
64	0.00000	-41.02703	0.00000
65	0.00000	-24.27980	0.00000
66	0.00000	-24.98618	0.00000
67	0.00000	-41.36550	0.00000
68	0.00000	22.30260	0.00000
69	0.00000	43.88968	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 0.145
Suma Momentos Torsores = 0.000

HIPOTESIS 1 PRETENSADO: PRIMER TESADO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-215.69	65.61	-51.60	306.57	-65.61	51.60
2	-306.57	65.62	-51.60	487.31	-65.62	51.60
3	-487.32	65.61	-51.60	560.76	-65.61	51.60
4	-560.76	65.61	-51.60	612.72	-65.61	51.60
5	-612.71	65.59	-51.60	643.28	-65.59	51.60
6	-643.28	65.60	-51.60	652.47	-65.60	51.60
7	-652.47	65.64	-51.60	640.28	-65.64	51.60
8	-640.28	65.63	-51.60	606.67	-65.63	51.60
9	-606.68	65.64	-51.60	553.73	-65.64	51.60
10	-553.73	65.64	-51.60	484.75	-65.64	51.60
11	-484.76	65.65	-51.60	399.50	-65.65	51.60
12	-399.48	65.65	-51.60	297.73	-65.65	51.60
13	-297.73	65.67	-51.60	179.17	-65.67	51.60
14	-179.19	65.64	-51.60	43.55	-65.64	51.60
15	-43.56	65.68	-51.60	-109.48	-65.68	51.60
16	109.48	65.67	-51.60	-280.17	-65.67	51.60
17	280.17	65.67	-51.60	-466.87	-65.67	51.60
18	466.87	65.67	-51.60	-751.03	-65.67	51.60
19	751.04	65.67	-51.60	-883.50	-65.67	51.60
20	883.50	65.67	-51.60	-959.20	-65.67	51.60
21	949.15	0.36	-12.24	-873.90	-0.36	12.24

22	873.90	0.37	-12.24	-559.23	-0.37	12.24
23	559.23	0.37	-12.24	-268.50	-0.37	12.24
24	268.50	0.37	-12.24	-21.22	-0.37	12.24

HIPOTESIS 1 PRETENSADO: PRIMER TESADO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	21.21	0.38	-12.24	182.30	-0.38	12.24
26	-182.31	0.38	-12.24	343.73	-0.38	12.24
27	-343.75	0.40	-12.24	464.95	-0.40	12.24
28	-464.96	0.38	-12.24	547.86	-0.38	12.24
29	-547.87	0.34	-12.24	594.06	-0.34	12.24
30	-594.06	0.37	-12.24	604.76	-0.37	12.24
31	-604.74	0.32	-12.24	593.38	-0.32	12.24
32	-593.37	0.31	-12.24	546.53	-0.31	12.24
33	-546.53	0.33	-12.24	462.97	-0.33	12.24
34	-462.95	0.32	-12.24	341.06	-0.32	12.24
35	-341.05	0.32	-12.24	178.99	-0.32	12.24
36	-178.98	0.33	-12.24	-25.22	-0.33	12.24
37	25.22	0.35	-12.24	-273.18	-0.35	12.24
38	273.18	0.34	-12.24	-564.01	-0.34	12.24
39	564.01	0.34	-12.24	-879.82	-0.34	12.24
40	879.82	0.34	-12.24	-955.83	-0.34	12.24
41	965.66	-66.01	-50.73	-889.75	66.01	50.73
42	889.75	-66.01	-50.73	-661.08	66.01	50.73
43	661.08	-66.00	-50.73	-473.09	66.00	50.73
44	473.09	-66.01	-50.73	-285.65	66.01	50.73
45	285.64	-66.01	-50.73	-114.69	66.01	50.73
46	114.69	-66.02	-50.73	38.59	66.02	50.73
47	-38.59	-66.04	-50.73	174.50	66.04	50.73
48	-174.51	-66.06	-50.73	293.35	66.06	50.73
49	-293.34	-66.08	-50.73	395.41	66.08	50.73
50	-395.39	-66.11	-50.73	480.99	66.11	50.73
51	-480.98	-66.13	-50.73	550.32	66.13	50.73
52	-550.31	-66.11	-50.73	603.60	66.11	50.73
53	-603.63	-66.05	-50.73	637.56	66.05	50.73
54	-637.59	-66.15	-50.73	650.16	66.15	50.73
55	-650.16	-66.20	-50.73	641.40	66.20	50.73
56	-641.39	-66.19	-50.73	611.27	66.19	50.73
57	-611.24	-66.19	-50.73	560.85	66.19	50.73
58	-560.85	-66.21	-50.73	396.61	66.21	50.73
59	-396.60	-66.18	-50.73	306.79	66.18	50.73
60	-306.78	-66.20	-50.73	215.91	66.20	50.73
61	106.19	-43.78	0.00	0.00	43.78	0.00
62	52.94	-21.83	0.00	0.00	21.83	0.00
63	-99.51	41.03	0.00	0.00	-41.03	0.00
64	-58.89	24.28	0.00	0.00	-24.28	0.00
65	-60.60	24.99	0.00	0.00	-24.99	0.00

66	-100.33	41.37	0.00	0.00	-41.37	0.00
67	54.09	-22.30	0.00	0.00	22.30	0.00
68	106.45	-43.89	0.00	0.00	43.89	0.00

HIPOTESIS 1 PRETENSADO INICIAL

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	74.25537	0.00000
63	0.00000	35.73052	0.00000
64	0.00000	-70.12151	0.00000
65	0.00000	-39.36417	0.00000
66	0.00000	-40.54156	0.00000
67	0.00000	-70.66792	0.00000
68	0.00000	36.53395	0.00000
69	0.00000	74.42496	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 0.250
Suma Momentos Torsores = 0.000

HIPOTESIS 1 PRETENSADO INICIAL

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-366.80	109.98	-90.53	522.91	-109.98	90.53
2	-522.92	110.00	-90.53	832.11	-110.00	90.53
3	-832.12	109.98	-90.53	958.42	-109.98	90.53
4	-958.43	109.96	-90.53	1048.15	-109.96	90.53
5	-1048.15	109.99	-90.53	1101.36	-109.99	90.53
6	-1101.37	109.96	-90.53	1118.19	-109.96	90.53
7	-1118.17	109.96	-90.53	1098.60	-109.96	90.53
8	-1098.58	109.97	-90.53	1042.50	-109.97	90.53
9	-1042.50	109.97	-90.53	953.55	-109.97	90.53
10	-953.54	110.03	-90.53	837.24	-110.03	90.53
11	-837.26	110.05	-90.53	693.24	-110.05	90.53
12	-693.21	110.01	-90.53	521.15	-110.01	90.53
13	-521.12	110.03	-90.53	324.25	-110.03	90.53
14	-324.26	110.06	-90.53	88.00	-110.06	90.53
15	-88.01	110.08	-90.53	-176.09	-110.08	90.53
16	176.09	110.09	-90.53	-468.10	-110.09	90.53
17	468.09	110.08	-90.53	-787.12	-110.08	90.53
18	787.12	110.08	-90.53	-1261.18	-110.08	90.53
19	1261.19	110.09	-90.53	-1482.42	-110.09	90.53
20	1482.43	110.09	-90.53	-1609.05	-110.09	90.53
21	1590.60	0.61	-18.25	-1465.17	-0.61	18.25

22	1465.17	0.61	-18.25	-940.72	-0.61	18.25
23	940.71	0.61	-18.25	-456.17	-0.61	18.25
24	456.18	0.61	-18.25	-44.03	-0.61	18.25

HIPOTESIS 1 PRETENSADO INICIAL

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	44.04	0.59	-18.25	295.19	-0.59	18.25
26	-295.18	0.62	-18.25	564.23	-0.62	18.25
27	-564.23	0.62	-18.25	766.28	-0.62	18.25
28	-766.26	0.62	-18.25	904.45	-0.62	18.25
29	-904.44	0.56	-18.25	981.45	-0.56	18.25
30	-981.42	0.56	-18.25	999.29	-0.56	18.25
31	-999.27	0.58	-18.25	980.29	-0.58	18.25
32	-980.30	0.57	-18.25	902.21	-0.57	18.25
33	-902.23	0.51	-18.25	762.97	-0.51	18.25
34	-762.93	0.52	-18.25	559.81	-0.52	18.25
35	-559.79	0.55	-18.25	289.67	-0.55	18.25
36	-289.67	0.57	-18.25	-50.68	-0.57	18.25
37	50.68	0.55	-18.25	-463.93	-0.55	18.25
38	463.94	0.57	-18.25	-948.64	-0.57	18.25
39	948.65	0.56	-18.25	-1475.00	-0.56	18.25
40	1475.00	0.57	-18.25	-1601.68	-0.57	18.25
41	1619.76	-110.64	-89.05	-1492.80	110.64	89.05
42	1492.80	-110.64	-89.05	-1111.22	110.64	89.05
43	1111.22	-110.64	-89.05	-797.45	110.64	89.05
44	797.45	-110.64	-89.05	-477.20	110.64	89.05
45	477.20	-110.68	-89.05	-184.77	110.68	89.05
46	184.79	-110.67	-89.05	79.76	110.67	89.05
47	-79.74	-110.71	-89.05	316.45	110.71	89.05
48	-316.46	-110.70	-89.05	513.83	110.70	89.05
49	-513.81	-110.82	-89.05	686.45	110.82	89.05
50	-686.42	-110.74	-89.05	830.92	110.74	89.05
51	-830.95	-110.76	-89.05	947.81	110.76	89.05
52	-947.79	-110.86	-89.05	1037.39	110.86	89.05
53	-1037.40	-110.81	-89.05	1094.08	110.81	89.05
54	-1094.08	-110.92	-89.05	1114.34	110.92	89.05
55	-1114.34	-110.95	-89.04	1098.24	110.95	89.04
56	-1098.24	-110.91	-89.05	1045.69	110.91	89.05
57	-1045.68	-110.95	-89.05	958.64	110.95	89.05
58	-958.65	-110.93	-89.04	677.57	110.93	89.04
59	-677.57	-110.97	-89.04	523.31	110.97	89.04
60	-523.30	-110.96	-89.04	367.17	110.96	89.04
61	180.10	-74.26	0.00	0.00	74.26	0.00
62	86.66	-35.73	0.00	0.00	35.73	0.00
63	-170.07	70.12	0.00	0.00	-70.12	0.00
64	-95.47	39.36	0.00	0.00	-39.36	0.00
65	-98.33	40.54	0.00	0.00	-40.54	0.00

66	-171.40	70.67	0.00	0.00	-70.67	0.00
67	88.61	-36.53	0.00	0.00	36.53	0.00
68	180.51	-74.42	0.00	0.00	74.42	0.00

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.9586	-8.9084	-11.5887	2.7506	75.6119	203.9413
2	2.7506	75.6119	203.9413	49.1379	68.0235	193.8632
3	49.1379	68.0235	193.8632	93.2054	38.0249	114.3632
4	93.2054	38.0249	114.3632	129.0643	60.5728	182.4345
5	129.0643	60.5728	182.4345	154.2266	30.5671	102.9346
6	154.2266	30.5671	102.9346	177.9605	23.2840	90.2343
7	177.9605	23.2840	90.2343	194.8382	23.2855	90.2343
8	194.8382	23.2855	90.2343	204.3229	16.2264	76.3459
9	204.3229	16.2264	76.3459	215.3350	-13.7701	-3.1540
10	215.3350	-13.7701	-3.1540	212.4171	9.4193	61.3529
11	212.4171	9.4193	61.3529	204.9955	-20.5929	-18.1471
12	204.9955	-20.5929	-18.1471	197.7380	-27.0681	-34.1614
13	197.7380	-27.0681	-34.1614	182.4125	-3.1930	28.3867
14	182.4125	-3.1930	28.3867	160.5983	-33.1954	-51.1132
15	160.5983	-33.1954	-51.1132	138.7329	-38.9361	-68.9191
16	138.7329	-38.9361	-68.9191	113.8878	-44.2249	-87.4957
17	113.8878	-44.2249	-87.4957	82.2076	-19.0380	-27.2524
18	82.2076	-19.0380	-27.2524	51.9047	-49.0368	-106.7524
19	51.9047	-49.0368	-106.7524	25.3120	1.8965	3.3118
20	25.3120	1.8965	3.3118	27.8228	-2.4499	-1.1356
21	27.8228	-2.4499	-1.1356	22.5014	-6.7966	-5.5829
22	22.5014	-6.7966	-5.5829	21.8753	54.4686	133.6675
23	21.8753	54.4686	133.6675	63.5526	50.4267	124.8469
24	63.5526	50.4267	124.8469	103.1492	45.9644	115.6290
25	103.1492	45.9644	115.6290	139.2440	41.1558	106.0089
26	139.2440	41.1558	106.0089	170.5718	36.0408	95.9863
27	170.5718	36.0408	95.9863	196.1167	30.6996	85.5611
28	196.1167	30.6996	85.5611	215.0977	25.2080	74.7334
29	215.0977	25.2080	74.7334	227.0070	19.6137	63.5032
30	227.0070	19.6137	63.5032	231.5452	13.9856	51.8705
31	231.5452	13.9856	51.8705	231.3327	-16.0104	-27.6296
32	231.3327	-16.0104	-27.6296	224.6761	-21.6139	-39.6648
33	224.6761	-21.6139	-39.6648	210.9341	-27.1120	-52.1022
34	210.9341	-27.1120	-52.1022	190.6234	-32.4489	-64.9423
35	190.6234	-32.4489	-64.9423	164.5400	-37.5525	-78.1847
36	164.5400	-37.5525	-78.1847	133.6894	-42.3731	-91.8297
37	133.6894	-42.3731	-91.8297	99.3378	-46.8337	-105.8766
38	99.3378	-46.8337	-105.8766	62.9148	-50.8720	-120.3204
39	62.9148	-50.8720	-120.3204	27.7896	8.1628	-14.7481
40	27.7896	8.1628	-14.7481	33.2100	2.9833	-5.6054
41	33.2100	2.9833	-5.6054	29.2832	-2.1961	3.5374
42	29.2832	-2.1961	3.5374	27.6914	-2.1959	3.5374
43	27.6914	-2.1959	3.5374	40.4238	49.8586	118.7759
44	40.4238	49.8586	118.7759	76.5721	49.8610	118.7758
45	76.5721	49.8610	118.7758	109.9759	39.5780	96.5784
46	109.9759	39.5780	96.5784	138.6648	39.5825	96.5784
47	138.6648	39.5825	96.5784	165.1264	9.5980	17.0783
48	165.1264	9.5980	17.0783	189.2587	33.8605	84.2419
49	189.2587	33.8605	84.2419	205.8719	27.7611	70.9687
50	205.8719	27.7611	70.9687	218.4978	-2.2355	-8.5312
51	218.4978	-2.2355	-8.5312	231.6277	21.3470	56.6763
52	231.6277	21.3470	56.6763	229.7965	14.6796	41.2803
53	229.7965	14.6796	41.2803	227.6925	-15.3091	-38.2199
54	227.6925	-15.3091	-38.2199	220.8636	-22.1926	-54.8023

55	220.8636	-22.1926	-54.8023	204.7718	-22.1946	-54.8022
56	204.7718	-22.1946	-54.8022	185.6718	-52.2053	-134.3022
57	185.6718	-52.2053	-134.3022	162.5390	-29.2825	-72.6551
58	162.5390	-29.2825	-72.6551	126.6788	-36.5016	-91.8573
59	126.6788	-36.5016	-91.8573	91.9637	-66.5016	-171.3573
60	91.9637	-66.5016	-171.3573	49.0098	-43.8084	-112.4571

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-54.2861	53.2928	133.1195	-17.8825	1.6323	-4.8257
2	-17.8825	1.6323	-4.8257	-16.6991	1.6322	-4.8257
3	-16.6991	1.6322	-4.8257	-16.8640	-9.1112	-11.5856
4	-16.8640	-9.1112	-11.5856	-23.4704	-9.1105	-11.5856
5	-23.4704	-9.1105	-11.5856	-30.0769	-9.1117	-11.5856
6	-30.0769	-9.1117	-11.5856	-36.6840	-9.1163	-11.5856
7	-36.6840	-9.1163	-11.5856	-43.2921	-9.1174	-11.5856
8	-43.2921	-9.1174	-11.5856	-49.8981	-9.1132	-11.5856
9	-49.8981	-9.1132	-11.5856	-56.5042	-9.1122	-11.5856
10	-56.5042	-9.1122	-11.5856	-63.1099	-9.1107	-11.5856
11	-63.1099	-9.1107	-11.5856	-69.7139	-9.1035	-11.5856
12	-69.7139	-9.1035	-11.5856	-76.3117	-9.1025	-11.5856
13	-76.3117	-9.1025	-11.5856	-82.9133	-9.1069	-11.5856
14	-82.9133	-9.1069	-11.5856	-89.5188	-9.1034	-11.5856
15	-89.5188	-9.1034	-11.5856	-96.1160	-9.0994	-11.5856
16	-96.1160	-9.0994	-11.5856	-102.7135	-9.1015	-11.5856
17	-102.7135	-9.1015	-11.5856	-109.3128	-9.1011	-11.5856
18	-109.3128	-9.1011	-11.5856	-115.9072	-9.0977	-11.5856
19	-115.9072	-9.0977	-11.5856	-122.5019	-9.0978	-11.5856
20	-122.5019	-9.0978	-11.5856	-150.5714	25.8437	76.9930
21	-150.5714	25.8437	76.9930	-118.9899	55.2040	154.2335
22	-118.9899	55.2040	154.2335	-104.0603	8.1650	-14.7481
23	-104.0603	8.1650	-14.7481	-96.3020	8.1656	-14.7481
24	-96.3020	8.1656	-14.7481	-88.5437	8.1665	-14.7481
25	-88.5437	8.1665	-14.7481	-80.7851	8.1668	-14.7481
26	-80.7851	8.1668	-14.7481	-73.0265	8.1651	-14.7481
27	-73.0265	8.1651	-14.7481	-65.2690	8.1661	-14.7481
28	-65.2690	8.1661	-14.7481	-57.5081	8.1669	-14.7481
29	-57.5081	8.1669	-14.7481	-49.7533	8.1656	-14.7481
30	-49.7533	8.1656	-14.7481	-41.9959	8.1653	-14.7481
31	-41.9959	8.1653	-14.7481	-42.0656	-6.7972	-5.5829
32	-42.0656	-6.7972	-5.5829	-48.5266	-6.8025	-5.5829
33	-48.5266	-6.8025	-5.5829	-54.9894	-6.8025	-5.5829
34	-54.9894	-6.8025	-5.5829	-61.4474	-6.8003	-5.5829
35	-61.4474	-6.8003	-5.5829	-67.9086	-6.7999	-5.5829
36	-67.9086	-6.7999	-5.5829	-74.3671	-6.7980	-5.5829
37	-74.3671	-6.7980	-5.5829	-80.8244	-6.7972	-5.5829
38	-80.8244	-6.7972	-5.5829	-87.2832	-6.7976	-5.5829
39	-87.2832	-6.7976	-5.5829	-93.7408	-6.7979	-5.5829
40	-93.7408	-6.7979	-5.5829	-147.8820	-22.7529	-78.6842
41	-147.8820	-22.7529	-78.6842	-152.9770	11.6076	-25.7661
42	-152.9770	11.6076	-25.7661	-144.5623	11.6076	-25.7661
43	-144.5623	11.6076	-25.7661	-136.1466	11.6067	-25.7661
44	-136.1466	11.6067	-25.7661	-127.7340	11.6082	-25.7661
45	-127.7340	11.6082	-25.7661	-119.3176	11.6037	-25.7662
46	-119.3176	11.6037	-25.7662	-110.9072	11.5981	-25.7663
47	-110.9072	11.5981	-25.7663	-102.4980	11.5948	-25.7663

48	-102.4980	11.5948	-25.7663	-94.0958	11.5869	-25.7663
49	-94.0958	11.5869	-25.7663	-85.6949	11.5816	-25.7663
50	-85.6949	11.5816	-25.7663	-77.2972	11.5783	-25.7663
51	-77.2972	11.5783	-25.7663	-68.9015	11.5778	-25.7663
52	-68.9015	11.5778	-25.7663	-60.5061	11.5756	-25.7664
53	-60.5061	11.5756	-25.7664	-52.1155	11.5714	-25.7664
54	-52.1155	11.5714	-25.7664	-43.7280	11.5624	-25.7664
55	-43.7280	11.5624	-25.7664	-35.3449	11.5594	-25.7664
56	-35.3449	11.5594	-25.7664	-26.9588	11.5634	-25.7664
57	-26.9588	11.5634	-25.7664	-18.5738	11.5642	-25.7664
58	-18.5738	11.5642	-25.7664	-10.1891	11.5646	-25.7664
59	-10.1891	11.5646	-25.7664	-1.8596	11.3597	-24.9697
60	-1.8596	11.3597	-24.9697	-0.9034	-2.1879	3.5375

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-52.0697	75.6125	203.9413	2.7506	75.6119	203.9413
2	2.7506	75.6119	203.9413	49.1379	68.0235	193.8632
3	49.1379	68.0235	193.8632	85.1542	60.5697	182.4344
4	85.1542	60.5697	182.4344	129.0643	60.5728	182.4345
5	129.0643	60.5728	182.4345	149.8274	53.2870	169.7343
6	149.8274	53.2870	169.7343	161.2989	46.2251	155.8458
7	161.2989	46.2251	155.8458	164.1593	39.4308	140.8527
8	164.1593	39.4308	140.8527	192.7487	39.4190	140.8528
9	192.7487	39.4190	140.8528	183.1089	32.9448	124.8383
10	183.1089	32.9448	124.8383	166.8727	26.8116	107.8864
11	166.8727	26.8116	107.8864	186.3092	26.8063	107.8866
12	186.3092	26.8063	107.8866	160.4073	21.0680	90.0806
13	160.4073	21.0680	90.0806	130.5726	15.7807	71.5042
14	130.5726	15.7807	71.5042	98.1004	10.9683	52.2476
15	98.1004	10.9683	52.2476	106.0533	10.9669	52.2476
16	106.0533	10.9669	52.2476	68.6909	6.6797	34.7934
17	68.6909	6.6797	34.7934	31.1869	2.9314	19.5708
18	31.1869	2.9314	19.5708	23.9370	1.8962	3.3118
19	23.9370	1.8962	3.3118	25.3120	1.8965	3.3118
20	25.3120	1.8965	3.3118	-69.6350	40.7806	107.4972
21	-69.6350	40.7806	107.4972	-48.7584	80.4269	204.3469
22	-48.7584	80.4269	204.3469	-2.1869	75.9682	195.1291
23	-2.1869	75.9682	195.1291	41.5601	71.1523	185.5090
24	41.5601	71.1523	185.5090	81.0968	66.0399	175.4864
25	81.0968	66.0399	175.4864	115.2853	60.7039	165.0611
26	115.2853	60.7039	165.0611	143.2213	55.1998	154.2334
27	143.2213	55.1998	154.2334	164.2510	49.6067	143.0031
28	164.2510	49.6067	143.0031	177.9836	43.9883	131.3704
29	177.9836	43.9883	131.3704	184.2727	38.3819	119.3353
30	184.2727	38.3819	119.3353	183.1905	32.8846	106.8977
31	183.1905	32.8846	106.8977	214.4341	32.8886	106.8976
32	214.4341	32.8886	106.8976	201.2702	27.5585	94.0576
33	201.2702	27.5585	94.0576	181.8951	22.4419	80.8151
34	181.8951	22.4419	80.8151	157.1976	17.6263	67.1703
35	157.1976	17.6263	67.1703	128.3212	13.1704	53.1235
36	128.3212	13.1704	53.1235	96.5719	9.1290	38.6796
37	96.5719	9.1290	38.6796	12.2800	8.1628	-14.7481
38	12.2800	8.1628	-14.7481	20.0349	8.1627	-14.7481
39	20.0349	8.1627	-14.7481	27.7896	8.1628	-14.7481
40	27.7896	8.1628	-14.7481	-63.5115	40.9200	105.1703

41	-63.5115	40.9200	105.1703	-55.1216	79.8584	198.2761
42	-55.1216	79.8584	198.2761	2.7765	79.8589	198.2760
43	2.7765	79.8589	198.2760	33.9222	74.9424	187.5621
44	33.9222	74.9424	187.5621	63.2714	69.5849	176.0786
45	63.2714	69.5849	176.0786	89.4053	63.8268	163.7420
46	89.4053	63.8268	163.7420	135.6781	63.8421	163.7419
47	135.6781	63.8421	163.7419	152.8883	57.7494	150.4691
48	152.8883	57.7494	150.4691	164.2141	51.3296	136.1766
49	164.2141	51.3296	136.1766	168.6389	44.6615	120.7809
50	168.6389	44.6615	120.7809	201.0331	44.6718	120.7809
51	201.0331	44.6718	120.7809	192.6945	37.7609	104.1982
52	192.6945	37.7609	104.1982	175.7223	30.6838	86.3454
53	175.7223	30.6838	86.3454	197.9738	30.6958	86.3451
54	197.9738	30.6958	86.3451	166.5408	23.4834	67.1430
55	166.5408	23.4834	67.1430	125.3270	16.1883	46.5415
56	125.3270	16.1883	46.5415	-26.9588	11.5634	-25.7664
57	-26.9588	11.5634	-25.7664	-18.5738	11.5642	-25.7664
58	-18.5738	11.5642	-25.7664	-10.1891	11.5646	-25.7664
59	-10.1891	11.5646	-25.7664	-1.8048	11.5634	-25.7664
60	-1.8048	11.5634	-25.7664	6.5786	11.5621	-25.7664

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.9579	-9.1125	-11.5856	-3.6490	-9.1130	-11.5856
2	-3.6490	-9.1130	-11.5856	-10.2566	-9.1132	-11.5856
3	-10.2566	-9.1132	-11.5856	-16.8640	-9.1112	-11.5856
4	-16.8640	-9.1112	-11.5856	-23.4704	-9.1105	-11.5856
5	-23.4704	-9.1105	-11.5856	-30.0769	-9.1117	-11.5856
6	-30.0769	-9.1117	-11.5856	110.3538	-14.3854	-34.5585
7	110.3538	-14.3854	-34.5585	153.9771	-21.9848	-44.6367
8	153.9771	-21.9848	-44.6367	138.0383	-21.9852	-44.6367
9	138.0383	-21.9852	-44.6367	166.3668	-29.4384	-56.0653
10	166.3668	-29.4384	-56.0653	185.4796	-36.7222	-68.7656
11	185.4796	-36.7222	-68.7656	158.8515	-36.7234	-68.7655
12	158.8515	-36.7234	-68.7655	164.3419	-43.7863	-82.6539
13	164.3419	-43.7863	-82.6539	162.3911	-50.5909	-97.6470
14	162.3911	-50.5909	-97.6470	153.9908	-57.0859	-113.6611
15	153.9908	-57.0859	-113.6611	112.6102	-57.0817	-113.6611
16	112.6102	-57.0817	-113.6611	94.4471	-63.2091	-130.6131
17	94.4471	-63.2091	-130.6131	72.5229	-68.9432	-148.4193
18	72.5229	-68.9432	-148.4193	48.2570	-74.2328	-166.9958
19	48.2570	-74.2328	-166.9958	-5.5616	-74.2310	-166.9958
20	-5.5616	-74.2310	-166.9958	-56.3355	-36.8465	-99.5477
21	-56.3355	-36.8465	-99.5477	22.5014	-6.7966	-5.5829
22	22.5014	-6.7966	-5.5829	16.0447	-6.7969	-5.5829
23	16.0447	-6.7969	-5.5829	9.5877	-6.7965	-5.5829
24	9.5877	-6.7965	-5.5829	3.1316	-6.7957	-5.5829
25	3.1316	-6.7957	-5.5829	99.3605	-9.5738	-34.1533
26	99.3605	-9.5738	-34.1533	133.4846	-14.0307	-43.3712
27	133.4846	-14.0307	-43.3712	163.4247	-18.8489	-52.9910
28	163.4247	-18.8489	-52.9910	188.0449	-23.9544	-63.0137
29	188.0449	-23.9544	-63.0137	206.4546	-29.2901	-73.4389
30	206.4546	-29.2901	-73.4389	217.9943	-34.7865	-84.2666
31	217.9943	-34.7865	-84.2666	184.9472	-34.7877	-84.2666
32	184.9472	-34.7877	-84.2666	183.9074	-40.3711	-95.4969
33	183.9074	-40.3711	-95.4969	175.4132	-46.0022	-107.1295

34	175.4132	-46.0022	-107.1295	159.6177	-51.6021	-119.1646
35	159.6177	-51.6021	-119.1646	136.9223	-57.1113	-131.6021
36	136.9223	-57.1113	-131.6021	107.9750	-62.4472	-144.4423
37	107.9750	-62.4472	-144.4423	73.6778	-67.5596	-157.6848
38	73.6778	-67.5596	-157.6848	35.1741	-72.3740	-171.3298
39	35.1741	-72.3740	-171.3298	-6.1446	-76.8322	-185.3766
40	-6.1446	-76.8322	-185.3766	-71.7729	-36.9891	-109.6137
41	-71.7729	-36.9891	-109.6137	29.2832	-2.1961	3.5374
42	29.2832	-2.1961	3.5374	27.6914	-2.1959	3.5374
43	27.6914	-2.1959	3.5374	26.0989	-2.1960	3.5374
44	26.0989	-2.1960	3.5374	24.5070	-2.1960	3.5374
45	24.5070	-2.1960	3.5374	69.4897	-5.7021	-30.1897
46	69.4897	-5.7021	-30.1897	65.3560	-5.7009	-30.1898
47	65.3560	-5.7009	-30.1898	105.5234	-10.1250	-40.2243
48	105.5234	-10.1250	-40.2243	143.6117	-15.0310	-50.9382
49	143.6117	-15.0310	-50.9382	178.3038	-20.3797	-62.4221
50	178.3038	-20.3797	-62.4221	163.5348	-20.3748	-62.4221
51	163.5348	-20.3748	-62.4221	189.4100	-26.1135	-74.7587
52	189.4100	-26.1135	-74.7587	209.2548	-32.2208	-88.0318
53	209.2548	-32.2208	-88.0318	185.9035	-32.2155	-88.0318
54	185.9035	-32.2155	-88.0318	194.0963	-38.6199	-102.3242
55	194.0963	-38.6199	-102.3242	194.2602	-45.2993	-117.7200
56	194.2602	-45.2993	-117.7200	185.6718	-52.2053	-134.3022
57	185.6718	-52.2053	-134.3022	147.8231	-52.2012	-134.3023
58	147.8231	-52.2012	-134.3023	124.8076	-59.2817	-152.1552
59	124.8076	-59.2817	-152.1552	91.9637	-66.5016	-171.3573
60	91.9637	-66.5016	-171.3573	43.7504	-66.5014	-171.3573

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-52.0697	75.6125	203.9413	2.7506	75.6119	203.9413
2	2.7506	75.6119	203.9413	49.1379	68.0235	193.8632
3	49.1379	68.0235	193.8632	85.1542	60.5697	182.4344
4	85.1542	60.5697	182.4344	129.0643	60.5728	182.4345
5	129.0643	60.5728	182.4345	149.8274	53.2870	169.7343
6	149.8274	53.2870	169.7343	161.2989	46.2251	155.8458
7	161.2989	46.2251	155.8458	164.1593	39.4308	140.8527
8	164.1593	39.4308	140.8527	192.7487	39.4190	140.8528
9	192.7487	39.4190	140.8528	183.1089	32.9448	124.8383
10	183.1089	32.9448	124.8383	166.8727	26.8116	107.8864
11	166.8727	26.8116	107.8864	186.3092	26.8063	107.8866
12	186.3092	26.8063	107.8866	160.4073	21.0680	90.0806
13	160.4073	21.0680	90.0806	130.5726	15.7807	71.5042
14	130.5726	15.7807	71.5042	98.1004	10.9683	52.2476
15	98.1004	10.9683	52.2476	106.0533	10.9669	52.2476
16	106.0533	10.9669	52.2476	68.6909	6.6797	34.7934
17	68.6909	6.6797	34.7934	31.1869	2.9314	19.5708
18	31.1869	2.9314	19.5708	-5.7380	-0.2591	9.2551
19	-5.7380	-0.2591	9.2551	-5.9264	-0.2589	9.2551
20	-5.9264	-0.2589	9.2551	-69.6350	40.7806	107.4972
21	-69.6350	40.7806	107.4972	-48.7584	80.4269	204.3469
22	-48.7584	80.4269	204.3469	-2.1869	75.9682	195.1291
23	-2.1869	75.9682	195.1291	41.5601	71.1523	185.5090
24	41.5601	71.1523	185.5090	81.0968	66.0399	175.4864
25	81.0968	66.0399	175.4864	115.2853	60.7039	165.0611
26	115.2853	60.7039	165.0611	143.2213	55.1998	154.2334
27	143.2213	55.1998	154.2334	164.2510	49.6067	143.0031
28	164.2510	49.6067	143.0031	177.9836	43.9883	131.3704
29	177.9836	43.9883	131.3704	184.2727	38.3819	119.3353
30	184.2727	38.3819	119.3353	183.1905	32.8846	106.8977
31	183.1905	32.8846	106.8977	214.4341	32.8886	106.8976
32	214.4341	32.8886	106.8976	201.2702	27.5585	94.0576
33	201.2702	27.5585	94.0576	181.8951	22.4419	80.8151
34	181.8951	22.4419	80.8151	157.1976	17.6263	67.1703
35	157.1976	17.6263	67.1703	128.3212	13.1704	53.1235
36	128.3212	13.1704	53.1235	96.5719	9.1290	38.6796
37	96.5719	9.1290	38.6796	62.9269	5.5271	25.7230
38	62.9269	5.5271	25.7230	28.7389	2.3991	14.5336
39	28.7389	2.3991	14.5336	-5.1937	-0.2716	7.1739
40	-5.1937	-0.2716	7.1739	-63.5115	40.9200	105.1703
41	-63.5115	40.9200	105.1703	-55.1216	79.8584	198.2761
42	-55.1216	79.8584	198.2761	2.7765	79.8589	198.2760
43	2.7765	79.8589	198.2760	33.9222	74.9424	187.5621
44	33.9222	74.9424	187.5621	63.2714	69.5849	176.0786
45	63.2714	69.5849	176.0786	89.4053	63.8268	163.7420
46	89.4053	63.8268	163.7420	135.6781	63.8421	163.7419
47	135.6781	63.8421	163.7419	152.8883	57.7494	150.4691
48	152.8883	57.7494	150.4691	164.2141	51.3296	136.1766
49	164.2141	51.3296	136.1766	168.6389	44.6615	120.7809
50	168.6389	44.6615	120.7809	201.0331	44.6718	120.7809
51	201.0331	44.6718	120.7809	192.6945	37.7609	104.1982
52	192.6945	37.7609	104.1982	175.7223	30.6838	86.3454
53	175.7223	30.6838	86.3454	166.5408	23.4834	67.1430
54	166.5408	23.4834	67.1430			

55	166.5408	23.4834	67.1430	125.3270	16.1883	46.5415
56	125.3270	16.1883	46.5415	80.6907	9.5798	27.9012
57	80.6907	9.5798	27.9012	87.6355	9.5804	27.9011
58	87.6355	9.5804	27.9011	2.2691	-2.1878	3.5375
59	2.2691	-2.1878	3.5375	0.6829	-2.1879	3.5375
60	0.6829	-2.1879	3.5375	-0.9034	-2.1879	3.5375

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.9586	-8.9084	-11.5887	-3.5003	-8.9090	-11.5887
2	-3.5003	-8.9090	-11.5887	-9.9599	-8.9094	-11.5887
3	-9.9599	-8.9094	-11.5887	31.4101	-3.1968	-15.5002
4	31.4101	-3.1968	-15.5002	29.0928	-3.1961	-15.5002
5	29.0928	-3.1961	-15.5002	56.4015	-6.7079	-25.8805
6	56.4015	-6.7079	-25.8805	110.3538	-14.3854	-34.5585
7	110.3538	-14.3854	-34.5585	153.9771	-21.9848	-44.6367
8	153.9771	-21.9848	-44.6367	138.0383	-21.9852	-44.6367
9	138.0383	-21.9852	-44.6367	166.3668	-29.4384	-56.0653
10	166.3668	-29.4384	-56.0653	185.4796	-36.7222	-68.7656
11	185.4796	-36.7222	-68.7656	158.8515	-36.7234	-68.7655
12	158.8515	-36.7234	-68.7655	164.3419	-43.7863	-82.6539
13	164.3419	-43.7863	-82.6539	162.3911	-50.5909	-97.6470
14	162.3911	-50.5909	-97.6470	153.9908	-57.0859	-113.6611
15	153.9908	-57.0859	-113.6611	112.6102	-57.0817	-113.6611
16	112.6102	-57.0817	-113.6611	94.4471	-63.2091	-130.6131
17	94.4471	-63.2091	-130.6131	72.5229	-68.9432	-148.4193
18	72.5229	-68.9432	-148.4193	48.2570	-74.2328	-166.9958
19	48.2570	-74.2328	-166.9958	-5.5616	-74.2310	-166.9958
20	-5.5616	-74.2310	-166.9958	-56.3355	-36.8465	-99.5477
21	-56.3355	-36.8465	-99.5477	-110.6872	8.0803	-15.1118
22	-110.6872	8.0803	-15.1118	-103.0110	8.0820	-15.1118
23	-103.0110	8.0820	-15.1118	24.4571	-1.9895	-18.6847
24	24.4571	-1.9895	-18.6847	62.3639	-5.5335	-25.3326
25	62.3639	-5.5335	-25.3326	99.3605	-9.5738	-34.1533
26	99.3605	-9.5738	-34.1533	133.4846	-14.0307	-43.3712
27	133.4846	-14.0307	-43.3712	163.4247	-18.8489	-52.9910
28	163.4247	-18.8489	-52.9910	188.0449	-23.9544	-63.0137
29	188.0449	-23.9544	-63.0137	206.4546	-29.2901	-73.4389
30	206.4546	-29.2901	-73.4389	217.9943	-34.7865	-84.2666
31	217.9943	-34.7865	-84.2666	184.9472	-34.7877	-84.2666
32	184.9472	-34.7877	-84.2666	183.9074	-40.3711	-95.4969
33	183.9074	-40.3711	-95.4969	175.4132	-46.0022	-107.1295
34	175.4132	-46.0022	-107.1295	159.6177	-51.6021	-119.1646
35	159.6177	-51.6021	-119.1646	136.9223	-57.1113	-131.6021
36	136.9223	-57.1113	-131.6021	107.9750	-62.4472	-144.4423
37	107.9750	-62.4472	-144.4423	73.6778	-67.5596	-157.6848
38	73.6778	-67.5596	-157.6848	35.1741	-72.3740	-171.3298
39	35.1741	-72.3740	-171.3298	-6.1446	-76.8322	-185.3766
40	-6.1446	-76.8322	-185.3766	-71.7729	-36.9891	-109.6137
41	-71.7729	-36.9891	-109.6137	-151.2616	11.4879	-25.9770
42	-151.2616	11.4879	-25.9770	-142.9344	11.4879	-25.9771
43	-142.9344	11.4879	-25.9771	-134.6060	11.4873	-25.9771
44	-134.6060	11.4873	-25.9771	-126.2811	11.4878	-25.9771
45	-126.2811	11.4878	-25.9771	69.4897	-5.7021	-30.1897
46	69.4897	-5.7021	-30.1897	65.3560	-5.7009	-30.1898

47	65.3560	-5.7009	-30.1898	105.5234	-10.1250	-40.2243
48	105.5234	-10.1250	-40.2243	143.6117	-15.0310	-50.9382
49	143.6117	-15.0310	-50.9382	178.3038	-20.3797	-62.4221
50	178.3038	-20.3797	-62.4221	163.5348	-20.3748	-62.4221
51	163.5348	-20.3748	-62.4221	189.4100	-26.1135	-74.7587
52	189.4100	-26.1135	-74.7587	209.2548	-32.2208	-88.0318
53	209.2548	-32.2208	-88.0318	185.9035	-32.2155	-88.0318
54	185.9035	-32.2155	-88.0318	194.0963	-38.6199	-102.3242
55	194.0963	-38.6199	-102.3242	194.2602	-45.2993	-117.7200
56	194.2602	-45.2993	-117.7200	185.6718	-52.2053	-134.3022
57	185.6718	-52.2053	-134.3022	147.8231	-52.2012	-134.3023
58	147.8231	-52.2012	-134.3023	124.8076	-59.2817	-152.1552
59	124.8076	-59.2817	-152.1552	91.9637	-66.5016	-171.3573
60	91.9637	-66.5016	-171.3573	43.7504	-66.5014	-171.3573

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-1.9066	0.1633	-0.4826	-1.3682	8.1050	20.4235
2	-1.3682	8.1050	20.4235	9.3212	16.6296	53.7854
3	9.3212	16.6296	53.7854	20.8528	13.6306	45.8354
4	20.8528	13.6306	45.8354	30.7375	13.6571	46.1413
5	30.7375	13.6571	46.1413	38.7641	10.6591	38.1913
6	38.7641	10.6591	38.1913	45.4431	7.6572	30.2413
7	45.4431	7.6572	30.2413	50.7672	4.6576	22.2913
8	50.7672	4.6576	22.2913	54.1455	4.6606	22.2913
9	54.1455	4.6606	22.2913	55.9468	1.6579	14.3414
10	55.9468	1.6579	14.3414	56.3973	-1.3463	6.3913
11	56.3973	-1.3463	6.3913	55.4202	-1.3503	6.3913
12	55.4202	-1.3503	6.3913	52.3411	-4.3478	-1.5586
13	52.3411	-4.3478	-1.5586	47.9139	-7.3423	-9.5086
14	47.9139	-7.3423	-9.5086	42.1394	-10.3465	-17.4585
15	42.1394	-10.3465	-17.4585	34.6340	-10.3519	-17.4585
16	34.6340	-10.3519	-17.4585	25.3297	-13.3520	-25.4086
17	25.3297	-13.3520	-25.4086	14.6754	-16.3536	-33.3586
18	14.6754	-16.3536	-33.3586	2.6681	-19.3542	-41.3086
19	2.6681	-19.3542	-41.3086	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	0.3970	0.0704	-0.2318
21	0.3970	0.0704	-0.2318	0.3115	-0.0226	0.0190
22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
24	0.2685	-0.0226	0.0190	9.6187	16.5478	48.9699
25	9.6187	16.5478	48.9699	24.6461	13.6901	40.8700
26	24.6461	13.6901	40.8700	37.0515	10.6898	32.9200
27	37.0515	10.6898	32.9200	46.7540	7.6873	24.9700
28	46.7540	7.6873	24.9700	53.8883	4.9226	16.9541
29	53.8883	4.9226	16.9541	58.6622	2.5956	8.7875
30	58.6622	2.5956	8.7875	62.1538	1.5646	-0.0538
31	62.1538	1.5646	-0.0538	63.7719	1.8512	-0.3284
32	63.7719	1.8512	-0.3284	62.8493	-0.9520	-8.6139
33	62.8493	-0.9520	-8.6139	59.3960	-3.9520	-16.5639
34	59.3960	-3.9520	-16.5639	53.2401	-6.9545	-24.5139
35	53.2401	-6.9545	-24.5139	44.3834	-9.9540	-32.4639
36	44.3834	-9.9540	-32.4639	32.8280	-12.9534	-40.4139
37	32.8280	-12.9534	-40.4139	18.5705	-15.9541	-48.3639
38	18.5705	-15.9541	-48.3639	6.4554	2.6333	-5.5397
39	6.4554	2.6333	-5.5397	8.9574	2.6335	-5.5397
40	8.9574	2.6335	-5.5397	10.6546	0.9657	-2.0031

41	10.6546	0.9657	-2.0031	9.3502	-0.7010	1.1151
42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
45	7.8256	-0.7007	1.1151	7.3177	-0.7004	1.1151
46	7.3177	-0.7004	1.1151	6.8097	-0.7007	1.1151
47	6.8097	-0.7007	1.1151	7.0174	15.2519	17.4713
48	7.0174	15.2519	17.4713	17.1766	12.2533	9.5214
49	17.1766	12.2533	9.5214	25.9860	9.2544	1.5713
50	25.9860	9.2544	1.5713	32.6964	9.2544	1.5713
51	32.6964	9.2544	1.5713	37.9819	6.2554	-6.3787
52	37.9819	6.2554	-6.3787	41.9178	3.2592	-14.3289
53	41.9178	3.2592	-14.3289	44.2808	3.2622	-14.3290
54	44.2808	3.2622	-14.3290	44.6949	0.2648	-22.2790
55	44.6949	0.2648	-22.2790	43.7606	-2.7350	-30.2290
56	43.7606	-2.7350	-30.2290	41.4756	-5.7377	-38.1791
57	41.4756	-5.7377	-38.1791	37.3148	-5.7374	-38.1791
58	37.3148	-5.7374	-38.1791	31.5060	-8.7371	-46.1291
59	31.5060	-8.7371	-46.1291	24.3463	-11.7374	-54.0790
60	24.3463	-11.7374	-54.0790	15.8989	-11.6245	-54.3223

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-17.9003	19.5890	62.1597	-5.0615	16.3779	58.3804
2	-5.0615	16.3779	58.3804	-1.6699	0.1632	-0.4826
3	-1.6699	0.1632	-0.4826	-1.5516	0.1632	-0.4826
4	-1.5516	0.1632	-0.4826	-1.4332	0.1632	-0.4826
5	-1.4332	0.1632	-0.4826	-1.3149	0.1632	-0.4826
6	-1.3149	0.1632	-0.4826	-1.1965	0.1632	-0.4826
7	-1.1965	0.1632	-0.4826	-1.0782	0.1633	-0.4826
8	-1.0782	0.1633	-0.4826	-0.9599	0.1633	-0.4826
9	-0.9599	0.1633	-0.4826	-0.8415	0.1632	-0.4826
10	-0.8415	0.1632	-0.4826	-2.5356	-3.4927	-0.7878
11	-2.5356	-3.4927	-0.7878	-5.0676	-3.4924	-0.7878
12	-5.0676	-3.4924	-0.7878	-8.2993	-4.4925	-3.4378
13	-8.2993	-4.4925	-3.4378	-11.9815	-5.4926	-6.0878
14	-11.9815	-5.4926	-6.0878	-16.1137	-6.4922	-8.7378
15	-16.1137	-6.4922	-8.7378	-20.8202	-6.4919	-8.7378
16	-20.8202	-6.4919	-8.7378	-26.1271	-7.4917	-11.3878
17	-26.1271	-7.4917	-11.3878	-31.8835	-8.4916	-14.0378
18	-31.8835	-8.4916	-14.0378	-42.3662	-22.7014	-43.8706
19	-42.3662	-22.7014	-43.8706	-58.8248	-22.7011	-43.8706
20	-58.8248	-22.7011	-43.8706	-93.3215	3.1978	12.9540
21	-93.3215	3.1978	12.9540	-80.7182	29.0966	69.7786
22	-80.7182	29.0966	69.7786	-54.2761	26.0958	61.8286
23	-54.2761	26.0958	61.8286	-31.0781	2.6348	-5.5397
24	-31.0781	2.6348	-5.5397	-28.5751	2.6348	-5.5397
25	-28.5751	2.6348	-5.5397	-26.0718	2.6349	-5.5397
26	-26.0718	2.6349	-5.5397	-23.5688	2.6346	-5.5397
27	-23.5688	2.6346	-5.5397	-21.0657	2.6344	-5.5397
28	-21.0657	2.6344	-5.5397	-18.5627	2.6346	-5.5397
29	-18.5627	2.6346	-5.5397	-16.0595	2.6340	-5.5397
30	-16.0595	2.6340	-5.5397	-13.5580	2.6335	-5.5397
31	-13.5580	2.6335	-5.5397	-11.0556	2.6331	-5.5397
32	-11.0556	2.6331	-5.5397	-8.5546	2.6328	-5.5397

33	-8.5546	2.6328	-5.5397	-6.0533	2.6314	-5.1213
34	-6.0533	2.6314	-5.1213	-3.5530	2.6321	-5.1213
35	-3.5530	2.6321	-5.1213	-1.0526	2.6326	-5.1213
36	-1.0526	2.6326	-5.1213	-0.0108	-0.0226	0.0190
37	-0.0108	-0.0226	0.0190	-9.2871	-19.1660	-44.6521
38	-9.2871	-19.1660	-44.6521	-29.4181	-22.3903	-53.4256
39	-29.4181	-22.3903	-53.4256	-52.3405	-25.3911	-61.3756
40	-52.3405	-25.3911	-61.3756	-94.0036	0.9421	-6.4986
41	-94.0036	0.9421	-6.4986	-88.7697	27.2757	48.3783
42	-88.7697	27.2757	48.3783	-68.9945	27.2758	48.3782
43	-68.9945	27.2758	48.3782	-51.4653	23.9147	39.0783
44	-51.4653	23.9147	39.0783	-44.7953	4.1013	-10.4860
45	-44.7953	4.1013	-10.4860	-41.8215	4.0990	-10.4860
46	-41.8215	4.0990	-10.4860	-38.8489	4.0992	-10.4860
47	-38.8489	4.0992	-10.4860	-35.8760	4.0989	-10.4861
48	-35.8760	4.0989	-10.4861	-32.9066	4.0968	-10.4861
49	-32.9066	4.0968	-10.4861	-29.9375	4.0958	-10.4861
50	-29.9375	4.0958	-10.4861	-26.9690	4.0929	-10.4861
51	-26.9690	4.0929	-10.4861	-24.0019	4.0917	-10.4861
52	-24.0019	4.0917	-10.4861	-21.0344	4.0901	-10.4861
53	-21.0344	4.0901	-10.4861	-18.0693	4.0890	-10.4861
54	-18.0693	4.0890	-10.4861	-15.1047	4.0889	-10.4861
55	-15.1047	4.0889	-10.4861	-12.1413	4.0900	-10.4861
56	-12.1413	4.0900	-10.4861	-9.1976	4.0445	-9.9073
57	-9.1976	4.0445	-9.9073	-6.2656	4.0447	-9.9073
58	-6.2656	4.0447	-9.9073	-3.3336	4.0443	-9.9073
59	-3.3336	4.0443	-9.9073	-0.4319	3.6845	-8.7696
60	-0.4319	3.6845	-8.7696	-0.2847	-0.6982	1.1151

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-17.8700	19.6567	62.0413	-3.6182	19.6565	62.0413
2	-3.6182	19.6565	62.0413	9.2836	16.6572	54.0913
3	9.2836	16.6572	54.0913	20.8362	13.6572	46.1413
4	20.8362	13.6572	46.1413	30.7375	13.6571	46.1413
5	30.7375	13.6571	46.1413	38.7641	10.6591	38.1913
6	38.7641	10.6591	38.1913	45.4431	7.6572	30.2413
7	45.4431	7.6572	30.2413	50.7672	4.6576	22.2913
8	50.7672	4.6576	22.2913	54.1455	4.6606	22.2913
9	54.1455	4.6606	22.2913	55.9468	1.6579	14.3414
10	55.9468	1.6579	14.3414	-0.7232	0.1632	-0.4826
11	-0.7232	0.1632	-0.4826	-0.6048	0.1633	-0.4826
12	-0.6048	0.1633	-0.4826	-0.4863	0.1633	-0.4826
13	-0.4863	0.1633	-0.4826	-0.3679	0.1633	-0.4826
14	-0.3679	0.1633	-0.4826	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-65.1129	9.0987	30.6412
21	-65.1129	9.0987	30.6412	-80.0576	29.1325	70.4714
22	-80.0576	29.1325	70.4714	-53.5817	26.1324	62.5214
23	-53.5817	26.1324	62.5214	-29.8064	23.1324	54.5714
24	-29.8064	23.1324	54.5714	-8.7310	20.1320	46.6214
25	-8.7310	20.1320	46.6214	9.6442	17.1300	38.6713
26	9.6442	17.1300	38.6713	25.3179	14.1294	30.7213

27	25.3179	14.1294	30.7213	38.2929	11.1300	22.7713
28	38.2929	11.1300	22.7713	48.5666	8.1328	14.8213
29	48.5666	8.1328	14.8213	56.1460	5.1336	6.8713
30	56.1460	5.1336	6.8713	-13.5580	2.6335	-5.5397
31	-13.5580	2.6335	-5.5397	-11.0556	2.6331	-5.5397
32	-11.0556	2.6331	-5.5397	-8.5546	2.6328	-5.5397
33	-8.5546	2.6328	-5.5397	-6.0533	2.6336	-5.5397
34	-6.0533	2.6336	-5.5397	-3.5514	2.6335	-5.5397
35	-3.5514	2.6335	-5.5397	-1.0500	2.6330	-5.5397
36	-1.0500	2.6330	-5.5397	1.4517	2.6332	-5.5397
37	1.4517	2.6332	-5.5397	3.9536	2.6332	-5.5397
38	3.9536	2.6332	-5.5397	6.4554	2.6333	-5.5397
39	6.4554	2.6333	-5.5397	8.9574	2.6335	-5.5397
40	8.9574	2.6335	-5.5397	-91.9648	1.2211	-5.1088
41	-91.9648	1.2211	-5.1088	-88.1130	27.3635	49.0283
42	-88.1130	27.3635	49.0283	-68.2746	27.3635	49.0282
43	-68.2746	27.3635	49.0282	-50.4613	24.3633	41.0782
44	-50.4613	24.3633	41.0782	-33.9981	21.3642	33.1282
45	-33.9981	21.3642	33.1282	-18.8840	18.3647	25.1781
46	-18.8840	18.3647	25.1781	-5.5707	18.3647	25.1781
47	-5.5707	18.3647	25.1781	6.0189	15.3647	17.2281
48	6.0189	15.3647	17.2281	16.2591	12.3652	9.2780
49	16.2591	12.3652	9.2780	25.1506	9.3657	1.3280
50	25.1506	9.3657	1.3280	31.9423	9.3661	1.3280
51	31.9423	9.3661	1.3280	37.3094	6.3677	-6.6221
52	37.3094	6.3677	-6.6221	-21.0344	4.0901	-10.4861
53	-21.0344	4.0901	-10.4861	-18.0693	4.0890	-10.4861
54	-18.0693	4.0890	-10.4861	-15.1047	4.0889	-10.4861
55	-15.1047	4.0889	-10.4861	-12.1413	4.0900	-10.4861
56	-12.1413	4.0900	-10.4861	-9.1763	4.0900	-10.4861
57	-9.1763	4.0900	-10.4861	-6.2128	4.0885	-10.4861
58	-6.2128	4.0885	-10.4861	-3.2497	4.0877	-10.4861
59	-3.2497	4.0877	-10.4861	-0.2861	4.0873	-10.4861
60	-0.2861	4.0873	-10.4861	2.6774	4.0872	-10.4861

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265
6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754
12	24.7634	-5.7960	-12.5754	23.1167	-7.8779	-4.6945
13	23.1167	-7.8779	-4.6945	16.1316	-10.8766	-12.6445
14	16.1316	-10.8766	-12.6445	7.7952	-13.8796	-20.5945
15	7.7952	-13.8796	-20.5945	-2.2677	-13.8804	-20.5945
16	-2.2677	-13.8804	-20.5945	-14.1300	-16.8796	-28.5444
17	-14.1300	-16.8796	-28.5444	-27.3424	-19.8804	-36.4944
18	-27.3424	-19.8804	-36.4944	-41.9059	-22.8806	-44.4445

19	-41.9059	-22.8806	-44.4445	-58.4943	-22.8801	-44.4445
20	-58.4943	-22.8801	-44.4445	-32.8969	-9.8739	-27.3428
21	-32.8969	-9.8739	-27.3428	0.3115	-0.0226	0.0190
22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
24	0.2685	-0.0226	0.0190	0.2470	-0.0226	0.0190
25	0.2470	-0.0226	0.0190	0.2255	-0.0226	0.0190
26	0.2255	-0.0226	0.0190	0.2040	-0.0226	0.0190
27	0.2040	-0.0226	0.0190	3.5727	-0.2226	-14.2709
28	3.5727	-0.2226	-14.2709	11.8983	-1.2869	-16.8876
29	11.8983	-1.2869	-16.8876	19.7457	-2.5372	-19.8719
30	19.7457	-2.5372	-19.8719	26.6926	-3.9778	-23.2373
31	26.6926	-3.9778	-23.2373	22.9133	-3.9773	-23.2374
32	22.9133	-3.9773	-23.2374	26.9831	-5.6063	-26.9971
33	26.9831	-5.6063	-26.9971	45.6636	-7.4813	-14.2654
34	45.6636	-7.4813	-14.2654	36.1553	-10.4796	-22.2154
35	36.1553	-10.4796	-22.2154	23.9501	-13.4790	-30.1654
36	23.9501	-13.4790	-30.1654	9.0419	-16.4810	-38.1154
37	9.0419	-16.4810	-38.1154	-8.5662	-19.4818	-46.0654
38	-8.5662	-19.4818	-46.0654	-28.8746	-22.4818	-54.0154
39	-28.8746	-22.4818	-54.0154	-51.8827	-25.4825	-61.9654
40	-51.8827	-25.4825	-61.9654	-48.1974	-10.4033	-41.2680
41	-48.1974	-10.4033	-41.2680	9.3502	-0.7010	1.1151
42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
45	7.8256	-0.7007	1.1151	7.3177	-0.7004	1.1151
46	7.3177	-0.7004	1.1151	6.8097	-0.7007	1.1151
47	6.8097	-0.7007	1.1151	6.3017	-0.7003	1.1151
48	6.3017	-0.7003	1.1151	5.7944	-0.6998	1.1151
49	5.7944	-0.6998	1.1151	5.2870	-0.6996	1.1151
50	5.2870	-0.6996	1.1151	4.7801	-0.6995	1.1151
51	4.7801	-0.6995	1.1151	4.2729	-0.6993	1.1151
52	4.2729	-0.6993	1.1151	14.0367	-1.1830	-28.1339
53	14.0367	-1.1830	-28.1339	13.1796	-1.1823	-28.1339
54	13.1796	-1.1823	-28.1339	20.3209	-2.7731	-32.3395
55	20.3209	-2.7731	-32.3395	26.1926	-4.6129	-37.0938
56	26.1926	-4.6129	-37.0938	30.2928	-6.7094	-42.4273
57	30.2928	-6.7094	-42.4273	25.4278	-6.7109	-42.4273
58	25.4278	-6.7109	-42.4273	25.5099	-9.0749	-48.3723
59	25.5099	-9.0749	-48.3723	24.3463	-11.7374	-54.0790
60	24.3463	-11.7374	-54.0790	15.8370	-11.7370	-54.0789

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-17.9003	19.5890	62.1597	-3.6979	19.5886	62.1597
2	-3.6979	19.5886	62.1597	9.1544	16.5886	54.2097
3	9.1544	16.5886	54.2097	20.6565	13.5894	46.2597
4	20.6565	13.5894	46.2597	30.5086	13.5893	46.2597
5	30.5086	13.5893	46.2597	38.4866	10.5886	38.3097
6	38.4866	10.5886	38.3097	45.1133	7.5880	30.3597
7	45.1133	7.5880	30.3597	20.3023	3.0038	23.0326
8	20.3023	3.0038	23.0326	22.4794	3.0020	23.0326
9	22.4794	3.0020	23.0326	18.0889	0.9373	16.8073
10	18.0889	0.9373	16.8073	12.8349	-0.9611	10.9268
11	12.8349	-0.9611	10.9268	12.1379	-0.9612	10.9268
12	12.1379	-0.9612	10.9268	5.0363	-2.7010	5.4078

13	5.0363	-2.7010	5.4078	-2.3027	-4.2940	0.2655
14	-2.3027	-4.2940	0.2655	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-65.1129	9.0987	30.6412
21	-65.1129	9.0987	30.6412	-51.4893	25.5473	72.8200
22	-51.4893	25.5473	72.8200	-29.1289	22.5157	65.2347
23	-29.1289	22.5157	65.2347	-10.6279	19.6061	57.8745
24	-10.6279	19.6061	57.8745	4.2353	16.8296	50.7480
25	4.2353	16.8296	50.7480	15.7221	14.1889	43.8609
26	15.7221	14.1889	43.8609	28.6012	11.1880	35.9109
27	28.6012	11.1880	35.9109	38.7807	8.1877	27.9608
28	38.7807	8.1877	27.9608	46.2593	5.1888	20.0108
29	46.2593	5.1888	20.0108	51.0412	2.1904	12.0608
30	51.0412	2.1904	12.0608	53.1220	-0.8080	4.1108
31	53.1220	-0.8080	4.1108	52.3534	-0.8054	4.1108
32	52.3534	-0.8054	4.1108	0.0751	0.0751	0.0190
33	0.0751	-0.0226	0.0190	0.0537	-0.0226	0.0190
34	0.0537	-0.0226	0.0190	0.0322	-0.0226	0.0190
35	0.0322	-0.0226	0.0190	0.0107	-0.0226	0.0190
36	0.0107	-0.0226	0.0190	-0.0108	-0.0226	0.0190
37	-0.0108	-0.0226	0.0190	-0.0322	-0.0226	0.0190
38	-0.0322	-0.0226	0.0190	-0.0537	-0.0226	0.0190
39	-0.0537	-0.0226	0.0190	-0.0752	-0.0226	0.0190
40	-0.0752	-0.0226	0.0190	-0.0928	-0.0082	0.0040
41	-0.0928	-0.0082	0.0040	-86.6228	27.2502	49.2716
42	-86.6228	27.2502	49.2716	-66.8663	27.2502	49.2715
43	-66.8663	27.2502	49.2715	-49.1350	24.2504	41.3215
44	-49.1350	24.2504	41.3215	-32.7534	21.2507	33.3715
45	-32.7534	21.2507	33.3715	-17.7215	18.2508	25.4214
46	-17.7215	18.2508	25.4214	-4.4898	18.2509	25.4214
47	-4.4898	18.2509	25.4214	7.0174	15.2519	17.4713
48	7.0174	15.2519	17.4713	17.1766	12.2533	9.5214
49	17.1766	12.2533	9.5214	25.9860	9.2544	1.5713
50	25.9860	9.2544	1.5713	32.6964	9.2544	1.5713
51	32.6964	9.2544	1.5713	4.2729	-0.6993	1.1151
52	4.2729	-0.6993	1.1151	3.7661	-0.6988	1.1151
53	3.7661	-0.6988	1.1151	3.2595	-0.6987	1.1151
54	3.2595	-0.6987	1.1151	2.7529	-0.6982	1.1151
55	2.7529	-0.6982	1.1151	2.2469	-0.6983	1.1151
56	2.2469	-0.6983	1.1151	1.7403	-0.6987	1.1151
57	1.7403	-0.6987	1.1151	1.2341	-0.6984	1.1151
58	1.2341	-0.6984	1.1151	0.7278	-0.6984	1.1151
59	0.7278	-0.6984	1.1151	0.2215	-0.6982	1.1151
60	0.2215	-0.6982	1.1151	-0.2847	-0.6982	1.1151

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265

6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665	=====							
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112		1	-1.9066	0.1633	-0.4826	-1.3682	8.1050	20.4235
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112		2	-1.3682	8.1050	20.4235	10.3969	16.5503	54.4130
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014		3	10.3969	16.5503	54.4130	21.8713	13.5494	46.4630
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754		4	21.8713	13.5494	46.4630	31.6931	13.5481	46.4630
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754		5	31.6931	13.5481	46.4630	39.6412	10.5495	38.5130
12	24.7634	-5.7960	-12.5754	27.7316	-7.6011	-16.0686		6	39.6412	10.5495	38.5130	46.2401	7.5482	30.5630
13	27.7316	-7.6011	-16.0686	29.2324	-9.6173	-20.1137		7	46.2401	7.5482	30.5630	51.4864	4.5472	22.6130
14	29.2324	-9.6173	-20.1137	28.9407	-11.8316	-24.7406		8	51.4864	4.5472	22.6130	54.7843	4.5477	22.6130
15	28.9407	-11.8316	-24.7406	20.3623	-11.8344	-24.7406		9	54.7843	4.5477	22.6130	56.5075	1.5484	14.6630
16	20.3623	-11.8344	-24.7406	16.2604	-14.2321	-29.9762		10	56.5075	1.5484	14.6630	56.8793	-1.4546	6.7131
17	16.2604	-14.2321	-29.9762	-24.7955	-19.6261	-37.0194		11	56.8793	-1.4546	6.7131	55.8240	-1.4597	6.7131
18	-24.7955	-19.6261	-37.0194	-39.1758	-22.6271	-44.9694		12	55.8240	-1.4597	6.7131	52.6666	-4.4590	-1.2369
19	-39.1758	-22.6271	-44.9694	-55.5807	-22.6274	-44.9694		13	52.6666	-4.4590	-1.2369	48.1594	-7.4578	-9.1869
20	-55.5807	-22.6274	-44.9694	-32.8969	-9.8739	-27.3428		14	48.1594	-7.4578	-9.1869	42.3039	-10.4581	-17.1369
21	-32.8969	-9.8739	-27.3428	-36.0834	2.6343	-5.5397		15	42.3039	-10.4581	-17.1369	34.7216	-10.4591	-17.1368
22	-36.0834	2.6343	-5.5397	-32.1380	2.5241	-6.2323		16	34.7216	-10.4591	-17.1368	25.3386	-13.4602	-25.0868
23	-32.1380	2.5241	-6.2323	-26.8353	2.2857	-7.2122		17	25.3386	-13.4602	-25.0868	14.6047	-16.4609	-33.0368
24	-26.8353	2.2857	-7.2122	-20.3477	1.9038	-8.4925		18	14.6047	-16.4609	-33.0368	2.5191	-19.4617	-40.9869
25	-20.3477	1.9038	-8.4925	-12.9118	1.3652	-10.0868		19	2.5191	-19.4617	-40.9869	0.3426	0.1634	-0.4826
26	-12.9118	1.3652	-10.0868	-4.8241	0.6594	-12.0085		20	0.3426	0.1634	-0.4826	0.3970	0.0704	-0.2318
27	-4.8241	0.6594	-12.0085	3.5727	-0.2226	-14.2709		21	0.3970	0.0704	-0.2318	0.3115	-0.0226	0.0190
28	3.5727	-0.2226	-14.2709	11.8983	-1.2869	-16.8876		22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
29	11.8983	-1.2869	-16.8876	19.7457	-2.5372	-19.8719		23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
30	19.7457	-2.5372	-19.8719	26.6926	-3.9778	-23.2373		24	0.2685	-0.0226	0.0190	9.8360	17.3045	44.6148
31	26.6926	-3.9778	-23.2373	22.9133	-3.9773	-23.2374		25	9.8360	17.3045	44.6148	25.6518	14.8075	38.9604
32	22.9133	-3.9773	-23.2374	26.9831	-5.6063	-26.9971		26	25.6518	14.8075	38.9604	39.1179	11.8061	31.0104
33	26.9831	-5.6063	-26.9971	29.1199	-7.4219	-31.1648		27	39.1179	11.8061	31.0104	49.9902	9.2350	25.0638
34	29.1199	-7.4219	-31.1648	28.9146	-9.4197	-35.7538		28	49.9902	9.2350	25.0638	58.4650	6.2373	17.1138
35	28.9146	-9.4197	-35.7538	25.9893	-11.5942	-40.7775		29	58.4650	6.2373	17.1138	64.2433	3.2380	9.1639
36	25.9893	-11.5942	-40.7775	20.0008	-13.9365	-46.2494		30	64.2433	3.2380	9.1639	67.5351	0.6285	2.9204
37	20.0008	-13.9365	-46.2494	10.6731	-16.4218	-52.1954		31	67.5351	0.6285	2.9204	68.1308	0.6305	2.9203
38	10.6731	-16.4218	-52.1954	-2.3047	-19.0815	-58.5650		32	68.1308	0.6305	2.9203	66.0324	-2.3668	-5.0297
39	-2.3047	-19.0815	-58.5650	-19.1959	-21.9018	-65.3715		33	66.0324	-2.3668	-5.0297	61.4172	-4.9932	-11.5739
40	-19.1959	-21.9018	-65.3715	-48.1974	-10.4033	-41.2680		34	61.4172	-4.9932	-11.5739	54.2701	-7.9929	-19.5238
41	-48.1974	-10.4033	-41.2680	-53.7172	4.1026	-10.4859		35	54.2701	-7.9929	-19.5238	44.4267	-10.9928	-27.4739
42	-53.7172	4.1026	-10.4859	-50.7430	4.1026	-10.4860		36	44.4267	-10.9928	-27.4739	32.0716	-13.6150	-34.1348
43	-50.7430	4.1026	-10.4860	-46.6591	4.0301	-11.3798		37	32.0716	-13.6150	-34.1348	17.1858	-16.6165	-42.0848
44	-46.6591	4.0301	-11.3798	-41.0402	3.8218	-12.6046		38	17.1858	-16.6165	-42.0848	6.4913	2.6487	-5.5524
45	-41.0402	3.8218	-12.6046	-33.9725	3.4646	-14.1795		39	6.4913	2.6487	-5.5524	9.0076	2.6487	-5.5524
46	-33.9725	3.4646	-14.1795	-31.4610	3.4639	-14.1795		40	9.0076	2.6487	-5.5524	10.6750	0.9751	-2.2283
47	-31.4610	3.4639	-14.1795	-23.4800	2.9316	-16.1258		41	10.6750	0.9751	-2.2283	9.3502	-0.7010	1.1151
48	-23.4800	2.9316	-16.1258	-14.5515	2.2170	-18.4671		42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
49	-14.5515	2.2170	-18.4671	-4.9516	1.3017	-21.2297		43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
50	-4.9516	1.3017	-21.2297	-4.0072	1.3016	-21.2297		44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
51	-4.0072	1.3016	-21.2297	5.1145	0.1727	-24.4417		45	7.8256	-0.7007	1.1151	11.6422	15.3771	32.4481
52	5.1145	0.1727	-24.4417	14.0367	-1.1830	-28.1339		46	11.6422	15.3771	32.4481	22.7906	15.3884	32.0951
53	14.0367	-1.1830	-28.1339	13.1796	-1.1823	-28.1339		47	22.7906	15.3884	32.0951	32.2224	12.3923	24.1451
54	13.1796	-1.1823	-28.1339	20.3209	-2.7731	-32.3395		48	32.2224	12.3923	24.1451	40.3103	9.3964	16.1950
55	20.3209	-2.7731	-32.3395	26.1926	-4.6129	-37.0938		49	40.3103	9.3964	16.1950	47.0464	6.3965	8.2449
56	26.1926	-4.6129	-37.0938	30.2928	-6.7094	-42.4273		50	47.0464	6.3965	8.2449	51.6837	6.4023	8.2449
57	30.2928	-6.7094	-42.4273	25.4278	-6.7109	-42.4273		51	51.6837	6.4023	8.2449	54.8997	3.4044	0.2949
58	25.4278	-6.7109	-42.4273	25.5099	-9.0749	-48.3723		52	54.8997	3.4044	0.2949	56.7661	0.3988	-7.6551
59	25.5099	-9.0749	-48.3723	22.5270	-11.7128	-54.9725		53	56.7661	0.3988	-7.6551	57.0560	0.4020	-7.6553
60	22.5270	-11.7128	-54.9725	14.0352	-11.7122	-54.9725		54	57.0560	0.4020	-7.6553	55.4029	-2.5914	-15.6053
ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 1								55	55.4029	-2.5914	-15.6053	52.3993	-5.5919	-23.5553
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2		56	52.3993	-5.5919	-23.5553	48.0452	-8.5911	-31.5053
								57	48.0452	-8.5911	-31.5053	41.8160	-8.5894	-31.5053

58	41.8160	-8.5894	-31.5053	33.9388	-11.5901	-39.4554
59	33.9388	-11.5901	-39.4554	24.7112	-14.5914	-47.4054
60	24.7112	-14.5914	-47.4054	14.1319	-14.5919	-47.4053

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-17.7921	19.6296	61.7354	-3.5605	19.6294	61.7354
2	-3.5605	19.6294	61.7354	-1.6699	0.1632	-0.4826
3	-1.6699	0.1632	-0.4826	-1.5516	0.1632	-0.4826
4	-1.5516	0.1632	-0.4826	-1.4332	0.1632	-0.4826
5	-1.4332	0.1632	-0.4826	-1.3149	0.1632	-0.4826
6	-1.3149	0.1632	-0.4826	-1.1965	0.1632	-0.4826
7	-1.1965	0.1632	-0.4826	-1.0782	0.1633	-0.4826
8	-1.0782	0.1633	-0.4826	-0.9599	0.1633	-0.4826
9	-0.9599	0.1633	-0.4826	-2.7883	-2.8888	0.7775
10	-2.7883	-2.8888	0.7775	-5.1326	-3.8885	-1.8725
11	-5.1326	-3.8885	-1.8725	-7.9523	-3.8882	-1.8725
12	-7.9523	-3.8882	-1.8725	-11.4709	-4.8883	-4.5225
13	-11.4709	-4.8883	-4.5225	-15.4403	-5.8885	-7.1725
14	-15.4403	-5.8885	-7.1725	-19.8597	-6.8881	-9.8225
15	-19.8597	-6.8881	-9.8225	-24.8535	-6.8877	-9.8225
16	-24.8535	-6.8877	-9.8225	-30.4471	-7.8877	-12.4725
17	-30.4471	-7.8877	-12.4725	-36.4908	-8.8878	-15.1225
18	-36.4908	-8.8878	-15.1225	-42.9839	-9.8874	-17.7725
19	-42.9839	-9.8874	-17.7725	-50.1521	-9.8871	-17.7725
20	-50.1521	-9.8871	-17.7725	-69.3782	7.6755	24.8457
21	-69.3782	7.6755	24.8457	-56.4747	23.6276	63.8705
22	-56.4747	23.6276	63.8705	-34.9473	20.9997	57.3261
23	-34.9473	20.9997	57.3261	-31.2571	2.6495	-5.5523
24	-31.2571	2.6495	-5.5523	-28.7400	2.6502	-5.5524
25	-28.7400	2.6502	-5.5524	-26.2221	2.6501	-5.5524
26	-26.2221	2.6501	-5.5524	-23.7050	2.6496	-5.5524
27	-23.7050	2.6496	-5.5524	-21.1873	2.6502	-5.5524
28	-21.1873	2.6502	-5.5524	-18.6697	2.6501	-5.5524
29	-18.6697	2.6501	-5.5524	-16.1532	2.6493	-5.5524
30	-16.1532	2.6493	-5.5524	-13.6365	2.6486	-5.5524
31	-13.6365	2.6486	-5.5524	-11.1203	2.6484	-5.5524
32	-11.1203	2.6484	-5.5524	-8.6044	2.6485	-5.5524
33	-8.6044	2.6485	-5.5524	-6.0890	2.6487	-5.5524
34	-6.0890	2.6487	-5.5524	-3.5728	2.6484	-5.5524
35	-3.5728	2.6484	-5.5524	-7.2035	-5.4277	-12.4741
36	-7.2035	-5.4277	-12.4741	-13.0599	-6.4277	-15.1242
37	-13.0599	-6.4277	-15.1242	-19.8162	-7.4277	-17.7742
38	-19.8162	-7.4277	-17.7742	-27.4725	-8.4277	-20.4242
39	-27.4725	-8.4277	-20.4242	-36.0289	-9.4277	-23.0742
40	-36.0289	-9.4277	-23.0742	-57.2867	3.1491	2.8223
41	-57.2867	3.1491	2.8223	-56.7388	4.3167	-10.1996
42	-56.7388	4.3167	-10.1996	-53.6094	4.3181	-10.1996
43	-53.6094	4.3181	-10.1996	-50.4787	4.3181	-10.1996
44	-50.4787	4.3181	-10.1996	-47.3498	4.3156	-10.1996
45	-47.3498	4.3156	-10.1996	-44.2213	4.3168	-10.1996
46	-44.2213	4.3168	-10.1996	-41.0917	4.3176	-10.1996
47	-41.0917	4.3176	-10.1996	-37.9631	4.3105	-10.1997
48	-37.9631	4.3105	-10.1997	-34.8397	4.3057	-10.1997
49	-34.8397	4.3057	-10.1997	-31.7160	4.3067	-10.1997

50	-31.7160	4.3067	-10.1997	-28.5915	4.3064	-10.1997
51	-28.5915	4.3064	-10.1997	-25.4683	4.3040	-10.1997
52	-25.4683	4.3040	-10.1997	-22.3480	4.3032	-10.1997
53	-22.3480	4.3032	-10.1997	-19.2262	4.3036	-10.1997
54	-19.2262	4.3036	-10.1997	-16.1069	4.3019	-10.1997
55	-16.1069	4.3019	-10.1997	-12.9881	4.3009	-10.1997
56	-12.9881	4.3009	-10.1997	-9.8696	4.3013	-10.1997
57	-9.8696	4.3013	-10.1997	-6.7504	4.3013	-10.1997
58	-6.7504	4.3013	-10.1997	-3.6546	4.2655	-9.9147
59	-3.6546	4.2655	-9.9147	-0.5771	4.1158	-9.4270
60	-0.5771	4.1158	-9.4270	-0.2847	-0.6982	1.1151

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-17.7921	19.6296	61.7354	-3.5605	19.6294	61.7354
2	-3.5605	19.6294	61.7354	9.3212	16.6296	53.7854
3	9.3212	16.6296	53.7854	18.4536	13.6325	47.6547
4	18.4536	13.6325	47.6547	28.3374	13.6322	47.6547
5	28.3374	13.6322	47.6547	32.2365	10.8310	40.3974
6	32.2365	10.8310	40.3974	33.5665	8.1503	33.2859
7	33.5665	8.1503	33.2859	32.6340	5.5984	26.3751
8	32.6340	5.5984	26.3751	36.6949	5.5989	26.3751
9	36.6949	5.5989	26.3751	32.0831	3.1963	19.7161
10	32.0831	3.1963	19.7161	25.9819	0.9365	13.3552
11	25.9819	0.9365	13.3552	26.6597	0.9355	13.3552
12	26.6597	0.9355	13.3552	-0.4863	0.1633	-0.4826
13	-0.4863	0.1633	-0.4826	-0.3679	0.1633	-0.4826
14	-0.3679	0.1633	-0.4826	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-67.6293	9.2994	28.2692
21	-67.6293	9.2994	28.2692	-55.2080	26.8064	70.7605
22	-55.2080	26.8064	70.7605	-32.8838	24.2379	64.8139
23	-32.8838	24.2379	64.8139	-13.2835	21.6260	58.5704
24	-13.2835	21.6260	58.5704	3.3517	18.9997	52.0261
25	3.3517	18.9997	52.0261	16.8624	16.3800	45.3652
26	16.8624	16.3800	45.3652	27.1745	13.7908	38.7994
27	27.1745	13.7908	38.7994	34.3211	11.2531	32.3611
28	34.3211	11.2531	32.3611	38.4264	8.7946	26.0821
29	38.4264	8.7946	26.0821	39.6857	6.4180	19.9914
30	39.6857	6.4180	19.9914	38.3552	4.1553	14.1166
31	38.3552	4.1553	14.1166	42.3032	4.1540	14.1165
32	42.3032	4.1540	14.1165	-8.6044	2.6485	-5.5524
33	-8.6044	2.6485	-5.5524	-6.0890	2.6487	-5.5524
34	-6.0890	2.6487	-5.5524	-3.5728	2.6484	-5.5524
35	-3.5728	2.6484	-5.5524	-1.0574	2.6480	-5.5524
36	-1.0574	2.6480	-5.5524	1.4589	2.6486	-5.5524
37	1.4589	2.6486	-5.5524	3.9751	2.6487	-5.5524
38	3.9751	2.6487	-5.5524	6.4913	2.6487	-5.5524
39	6.4913	2.6487	-5.5524	9.0076	2.6487	-5.5524
40	9.0076	2.6487	-5.5524	-56.7223	8.4865	19.1609
41	-56.7223	8.4865	19.1609	-48.9640	24.3866	55.9452
42	-48.9640	24.3866	55.9452	-31.2835	24.3870	55.9452
43	-31.2835	24.3870	55.9452	-15.6277	21.3870	47.9951

44	-15.6277	21.3870	47.9951	-1.3216	18.3860	40.0452
45	-1.3216	18.3860	40.0452	11.6339	15.3875	32.0951
46	11.6339	15.3875	32.0951	22.7906	15.3884	32.0951
47	22.7906	15.3884	32.0951	32.2224	12.3923	24.1451
48	32.2224	12.3923	24.1451	40.3103	9.3964	16.1950
49	40.3103	9.3964	16.1950	47.0464	6.3965	8.2449
50	47.0464	6.3965	8.2449	51.6837	6.4023	8.2449
51	51.6837	6.4023	8.2449	-25.4683	4.3040	-10.1997
52	-25.4683	4.3040	-10.1997	-22.3480	4.3032	-10.1997
53	-22.3480	4.3032	-10.1997	-19.2262	4.3036	-10.1997
54	-19.2262	4.3036	-10.1997	-16.1069	4.3019	-10.1997
55	-16.1069	4.3019	-10.1997	-12.9881	4.3009	-10.1997
56	-12.9881	4.3009	-10.1997	-9.8696	4.3013	-10.1997
57	-9.8696	4.3013	-10.1997	-6.7504	4.3013	-10.1997
58	-6.7504	4.3013	-10.1997	-3.6326	4.3013	-10.1997
59	-3.6326	4.3013	-10.1997	-0.5140	4.3018	-10.1997
60	-0.5140	4.3018	-10.1997	2.6046	4.3017	-10.1997

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265
6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754
12	24.7634	-5.7960	-12.5754	27.7316	-7.6011	-16.0686
13	27.7316	-7.6011	-16.0686	29.2324	-9.6173	-20.1137
14	29.2324	-9.6173	-20.1137	28.9407	-11.8316	-24.7406
15	28.9407	-11.8316	-24.7406	20.3623	-11.8344	-24.7406
16	20.3623	-11.8344	-24.7406	16.2604	-14.2321	-29.9762
17	16.2604	-14.2321	-29.9762	9.7519	-16.8022	-35.8450
18	9.7519	-16.8022	-35.8450	0.6941	-19.5245	-42.3684
19	0.6941	-19.5245	-42.3684	-13.4627	-19.5261	-42.3684
20	-13.4627	-19.5261	-42.3684	-32.8969	-9.8739	-27.3428
21	-32.8969	-9.8739	-27.3428	0.3115	-0.0226	0.0190
22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
24	0.2685	-0.0226	0.0190	0.2470	-0.0226	0.0190
25	0.2470	-0.0226	0.0190	0.2255	-0.0226	0.0190
26	0.2255	-0.0226	0.0190	0.2040	-0.0226	0.0190
27	0.2040	-0.0226	0.0190	7.9212	-0.7676	-13.3219
28	7.9212	-0.7676	-13.3219	16.9597	-2.0071	-15.6356
29	16.9597	-2.0071	-15.6356	25.2504	-3.4431	-18.2930
30	25.2504	-3.4431	-18.2930	32.3025	-5.0695	-21.3172
31	32.3025	-5.0695	-21.3172	27.4861	-5.0694	-21.3171
32	27.4861	-5.0694	-21.3171	31.1100	-6.8793	-24.7322
33	31.1100	-6.8793	-24.7322	32.4241	-8.8618	-28.5638
34	32.4241	-8.8618	-28.5638	31.0441	-11.0059	-32.8391
35	31.0441	-11.0059	-32.8391	26.6604	-13.2887	-37.5864

36	26.6604	-13.2887	-37.5864	19.0351	-15.6910	-42.8352
37	19.0351	-15.6910	-42.8352	8.0159	-18.1924	-48.4897
38	8.0159	-18.1924	-48.4897	-6.4430	-20.7589	-54.4362
39	-6.4430	-20.7589	-54.4362	-24.2723	-23.3687	-60.6796
40	-24.2723	-23.3687	-60.6796	-52.5888	-10.8399	-38.7118
41	-52.5888	-10.8399	-38.7118	9.3502	-0.7010	1.1151
42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
45	7.8256	-0.7007	1.1151	7.3177	-0.7004	1.1151
46	7.3177	-0.7004	1.1151	6.8097	-0.7007	1.1151
47	6.8097	-0.7007	1.1151	6.3017	-0.7003	1.1151
48	6.3017	-0.7003	1.1151	5.7944	-0.6998	1.1151
49	5.7944	-0.6998	1.1151	5.2870	-0.6996	1.1151
50	5.2870	-0.6996	1.1151	4.7801	-0.6995	1.1151
51	4.7801	-0.6995	1.1151	15.1390	-1.5112	-20.7282
52	15.1390	-1.5112	-20.7282	24.4151	-3.1659	-23.7752
53	24.4151	-3.1659	-23.7752	22.1203	-3.1665	-23.7752
54	22.1203	-3.1665	-23.7752	28.8996	-5.0378	-27.3539
55	28.8996	-5.0378	-27.3539	33.9059	-7.1330	-31.5208
56	33.9059	-7.1330	-31.5208	36.6648	-9.4447	-36.3371
57	36.6648	-9.4447	-36.3371	29.8180	-9.4436	-36.3371
58	29.8180	-9.4436	-36.3371	28.0377	-11.9636	-41.8685
59	28.0377	-11.9636	-41.8685	22.9471	-14.6831	-48.1846
60	22.9471	-14.6831	-48.1846	12.3018	-14.6831	-48.1846

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-16.5990	19.5485	62.3630	-2.4264	19.5490	62.3630
2	-2.4264	19.5490	62.3630	9.5940	16.5427	54.9978
3	9.5940	16.5427	54.9978	18.4536	13.6325	47.6547
4	18.4536	13.6325	47.6547	28.3374	13.6322	47.6547
5	28.3374	13.6322	47.6547	32.2365	10.8310	40.3974
6	32.2365	10.8310	40.3974	33.5665	8.1503	33.2859
7	33.5665	8.1503	33.2859	32.6340	5.5984	26.3751
8	32.6340	5.5984	26.3751	36.6949	5.5989	26.3751
9	36.6949	5.5989	26.3751	32.0831	3.1963	19.7161
10	32.0831	3.1963	19.7161	25.9819	0.9365	13.3552
11	25.9819	0.9365	13.3552	26.6597	0.9355	13.3552
12	26.6597	0.9355	13.3552	17.8790	-1.1699	7.3342
13	17.8790	-1.1699	7.3342	8.3938	-3.1215	1.6904
14	8.3938	-3.1215	1.6904	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-67.6293	9.2994	28.2692
21	-67.6293	9.2994	28.2692	-55.2080	26.8064	70.7605
22	-55.2080	26.8064	70.7605	-32.8838	24.2379	64.8139
23	-32.8838	24.2379	64.8139	-13.2835	21.6260	58.5704
24	-13.2835	21.6260	58.5704	3.3517	18.9997	52.0261
25	3.3517	18.9997	52.0261	16.8624	16.3800	45.3652
26	16.8624	16.3800	45.3652	27.1745	13.7908	38.7994
27	27.1745	13.7908	38.7994	34.3211	11.2531	32.3611
28	34.3211	11.2531	32.3611	38.4264	8.7946	26.0821
29	38.4264	8.7946	26.0821	39.6857	6.4180	19.9914

30	39.6857	6.4180	19.9914	38.3552	4.1553	14.1166	22	-36.2911	2.6493	-5.5524	-32.0991	2.5208	-6.2063
31	38.3552	4.1553	14.1166	42.3032	4.1540	14.1165	23	-32.0991	2.5208	-6.2063	-26.1970	2.2311	-7.0959
32	42.3032	4.1540	14.1165	36.6445	2.0080	8.4827	24	-26.1970	2.2311	-7.0959	-18.8654	1.7663	-8.2356
33	36.6445	2.0080	8.4827	29.1579	-0.0134	3.1129	25	-18.8654	1.7663	-8.2356	-10.4563	1.1168	-9.6414
34	29.1579	-0.0134	3.1129	0.0322	-0.0226	0.0190	26	-10.4563	1.1168	-9.6414	-1.3770	0.2731	-11.3306
35	0.0322	-0.0226	0.0190	0.0107	-0.0226	0.0190	27	-1.3770	0.2731	-11.3306	7.9212	-0.7676	-13.3219
36	0.0107	-0.0226	0.0190	-0.0108	-0.0226	0.0190	28	7.9212	-0.7676	-13.3219	16.9597	-2.0071	-15.6356
37	-0.0108	-0.0226	0.0190	-0.0322	-0.0226	0.0190	29	16.9597	-2.0071	-15.6356	25.2504	-3.4431	-18.2930
38	-0.0322	-0.0226	0.0190	-0.0537	-0.0226	0.0190	30	25.2504	-3.4431	-18.2930	32.3025	-5.0695	-21.3172
39	-0.0537	-0.0226	0.0190	-0.0752	-0.0226	0.0190	31	32.3025	-5.0695	-21.3172	27.4861	-5.0694	-21.3171
40	-0.0752	-0.0226	0.0190	-56.7223	8.4865	19.1609	32	27.4861	-5.0694	-21.3171	31.1100	-6.8793	-24.7322
41	-56.7223	8.4865	19.1609	-48.9301	24.3779	56.2981	33	31.1100	-6.8793	-24.7322	32.4241	-8.8618	-28.5638
42	-48.9301	24.3779	56.2981	-31.2554	24.3771	56.2981	34	32.4241	-8.8618	-28.5638	31.0441	-11.0059	-32.8391
43	-31.2554	24.3771	56.2981	-15.6071	21.3764	48.3481	35	31.0441	-11.0059	-32.8391	26.6604	-13.2887	-37.5864
44	-15.6071	21.3764	48.3481	-1.3075	18.3765	40.3981	36	26.6604	-13.2887	-37.5864	19.0351	-15.6910	-42.8352
45	-1.3075	18.3765	40.3981	11.6422	15.3771	32.4481	37	19.0351	-15.6910	-42.8352	8.0159	-18.1924	-48.4897
46	11.6422	15.3771	32.4481	22.7906	15.3808	32.4481	38	8.0159	-18.1924	-48.4897	-6.4430	-20.7589	-54.4362
47	22.7906	15.3808	32.4481	32.2179	12.3857	24.4979	39	-6.4430	-20.7589	-54.4362	-24.2723	-23.3687	-60.6796
48	32.2179	12.3857	24.4979	40.2983	9.3883	16.5479	40	-24.2723	-23.3687	-60.6796	-52.5888	-10.8399	-38.7118
49	40.2983	9.3883	16.5479	47.0285	6.3873	8.5979	41	-52.5888	-10.8399	-38.7118	-55.2990	4.2174	-10.4856
50	47.0285	6.3873	8.5979	51.6599	6.3867	8.5979	42	-55.2990	4.2174	-10.4856	-52.2417	4.2178	-10.4856
51	51.6599	6.3867	8.5979	4.2729	-0.6993	1.1151	43	-52.2417	4.2178	-10.4856	-45.9621	3.9668	-11.0145
52	4.2729	-0.6993	1.1151	3.7661	-0.6988	1.1151	44	-45.9621	3.9668	-11.0145	-38.0322	3.5455	-11.8057
53	3.7661	-0.6988	1.1151	3.2595	-0.6987	1.1151	45	-38.0322	3.5455	-11.8057	-28.6499	2.9432	-12.8843
54	3.2595	-0.6987	1.1151	2.7529	-0.6982	1.1151	46	-28.6499	2.9432	-12.8843	-26.5161	2.9430	-12.8843
55	2.7529	-0.6982	1.1151	2.2469	-0.6983	1.1151	47	-26.5161	2.9430	-12.8843	-16.5228	2.1447	-14.2797
56	2.2469	-0.6983	1.1151	1.7403	-0.6987	1.1151	48	-16.5228	2.1447	-14.2797	-5.8109	1.1395	-16.0257
57	1.7403	-0.6987	1.1151	1.2341	-0.6984	1.1151	49	-5.8109	1.1395	-16.0257	5.2462	-0.0768	-18.1609
58	1.2341	-0.6984	1.1151	0.7278	-0.6984	1.1151	50	5.2462	-0.0768	-18.1609	5.1904	-0.0766	-18.1609
59	0.7278	-0.6984	1.1151	0.2215	-0.6982	1.1151	51	5.1904	-0.0766	-18.1609	15.1390	-1.5112	-20.7282
60	0.2215	-0.6982	1.1151	-0.2847	-0.6982	1.1151	52	15.1390	-1.5112	-20.7282	24.4151	-3.1659	-23.7752
ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 1							53	24.4151	-3.1659	-23.7752	22.1203	-3.1665	-23.7752
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	22.1203	-3.1665	-23.7752	28.8996	-5.0378	-27.3539
=====							55	28.8996	-5.0378	-27.3539	33.9059	-7.1330	-31.5208
1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826	56	33.9059	-7.1330	-31.5208	36.6648	-9.4447	-36.3371
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822	57	36.6648	-9.4447	-36.3371	29.8180	-9.4436	-36.3371
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472	58	29.8180	-9.4436	-36.3371	28.0377	-11.9636	-41.8685
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472	59	28.0377	-11.9636	-41.8685	22.9471	-14.6831	-48.1846
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265	60	22.9471	-14.6831	-48.1846	12.3018	-14.6831	-48.1846
6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665	ENVOL. MAX. FLECTORES TREN TREN LM 71, EC-1 en via 1						
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112	=====						
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014	1	1.5514	-4.7033	-6.0765	1.2648	31.0639	83.2554
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754	2	1.2648	31.0639	83.2554	23.4023	24.3381	71.5794
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754	3	23.4023	24.3381	71.5794	45.8026	32.5257	97.6794
12	24.7634	-5.7960	-12.5754	27.7316	-7.6011	-16.0686	4	45.8026	32.5257	97.6794	60.8426	20.3242	65.3495
13	27.7316	-7.6011	-16.0686	29.2324	-9.6173	-20.1137	5	60.8426	20.3242	65.3495	75.5767	20.3252	65.3495
14	29.2324	-9.6173	-20.1137	28.9407	-11.8316	-24.7406	6	75.5767	20.3252	65.3495	87.2430	16.4146	58.4352
15	28.9407	-11.8316	-24.7406	20.3623	-11.8344	-24.7406	7	87.2430	16.4146	58.4352	95.7840	4.2079	26.1052
16	20.3623	-11.8344	-24.7406	16.2604	-14.2321	-29.9762	8	95.7840	4.2079	26.1052	103.1572	6.5142	34.7161
17	16.2604	-14.2321	-29.9762	9.7519	-16.8022	-35.8450	9	103.1572	6.5142	34.7161	103.4557	0.4123	18.5511
18	9.7519	-16.8022	-35.8450	0.6941	-19.5245	-42.3684	10	103.4557	0.4123	18.5511	103.7880	-3.2344	10.4025
19	0.6941	-19.5245	-42.3684	-13.4627	-19.5261	-42.3684	11	103.7880	-3.2344	10.4025	101.4384	-3.2399	10.4025
20	-13.4627	-19.5261	-42.3684	-32.8969	-9.8739	-27.3428	12	101.4384	-3.2399	10.4025	95.4492	-6.7213	1.7050
21	-32.8969	-9.8739	-27.3428	-36.2911	2.6493	-5.5524	13	95.4492	-6.7213	1.7050	90.2748	-18.9182	-30.6250
							14	90.2748	-18.9182	-30.6250	79.1333	-10.0064	-7.4965
							15	79.1333	-10.0064	-7.4965	66.0829	-22.2076	-39.8265

16	66.0829	-22.2076	-39.8265	53.4998	-25.2709	-49.4867	8	-22.8549	-4.8061	-6.0636	-26.3415	-4.8064	-6.0636
17	53.4998	-25.2709	-49.4867	38.6104	-15.9004	-27.2272	9	-26.3415	-4.8064	-6.0636	-29.8270	-4.8054	-6.0636
18	38.6104	-15.9004	-27.2272	20.4499	-18.4601	-36.6877	10	-29.8270	-4.8054	-6.0636	-33.3122	-4.8039	-6.0636
19	20.4499	-18.4601	-36.6877	13.2031	0.9894	1.7292	11	-33.3122	-4.8039	-6.0636	-36.7952	-4.8040	-6.0636
20	13.2031	0.9894	1.7292	14.5066	-1.2778	-0.5665	12	-36.7952	-4.8040	-6.0636	-40.2787	-4.8038	-6.0636
21	14.5066	-1.2778	-0.5665	11.7251	-3.5450	-2.8622	13	-40.2787	-4.8038	-6.0636	-43.7614	-4.8048	-6.0636
22	11.7251	-3.5450	-2.8622	8.3573	-3.5450	-2.8622	14	-43.7614	-4.8048	-6.0636	-47.2456	-4.8040	-6.0636
23	8.3573	-3.5450	-2.8622	24.8275	28.5768	72.7760	15	-47.2456	-4.8040	-6.0636	-50.7275	-4.8003	-6.0636
24	24.8275	28.5768	72.7760	46.3884	25.9786	67.5379	16	-50.7275	-4.8003	-6.0636	-54.2087	-4.7998	-6.0636
25	46.3884	25.9786	67.5379	65.5753	13.7762	35.2079	17	-54.2087	-4.7998	-6.0636	-57.6901	-4.7994	-6.0636
26	65.5753	13.7762	35.2079	82.7043	11.0238	29.7516	18	-57.6901	-4.7994	-6.0636	-61.1701	-4.7991	-6.0636
27	82.7043	11.0238	29.7516	96.7113	8.1476	24.0770	19	-61.1701	-4.7991	-6.0636	-64.6495	-4.7998	-6.0636
28	96.7113	8.1476	24.0770	107.1997	5.1922	18.1842	20	-64.6495	-4.7998	-6.0636	-79.6008	13.8975	41.4785
29	107.1997	5.1922	18.1842	113.8833	2.1834	12.0731	21	-79.6008	13.8975	41.4785	-62.7200	29.5894	82.8442
30	113.8833	2.1834	12.0731	116.6322	-0.8354	5.7437	22	-62.7200	29.5894	82.8442	-54.4400	4.2713	-7.8144
31	116.6322	-0.8354	5.7437	115.8382	-0.8391	5.7437	23	-54.4400	4.2713	-7.8144	-50.3816	4.2723	-7.8144
32	115.8382	-0.8391	5.7437	111.7865	-3.8354	-0.8038	24	-50.3816	4.2723	-7.8144	-46.3229	4.2719	-7.8144
33	111.7865	-3.8354	-0.8038	103.9755	-6.7794	-7.5694	25	-46.3229	4.2719	-7.8144	-42.2643	4.2715	-7.8144
34	103.9755	-6.7794	-7.5694	92.6851	-9.6306	-14.5534	26	-42.2643	4.2715	-7.8144	-38.2063	4.2722	-7.8144
35	92.6851	-9.6306	-14.5534	79.2624	-21.8307	-46.8835	27	-38.2063	4.2722	-7.8144	-34.1467	4.2720	-7.8144
36	79.2624	-21.8307	-46.8835	62.9526	-24.5639	-54.0857	28	-34.1467	4.2720	-7.8144	-30.0882	4.2707	-7.8144
37	62.9526	-24.5639	-54.0857	44.3151	-27.1271	-61.5059	29	-30.0882	4.2707	-7.8144	-26.0312	4.2703	-7.8144
38	44.3151	-27.1271	-61.5059	24.0466	-29.4931	-69.1421	30	-26.0312	4.2703	-7.8144	-21.9735	4.2690	-7.8144
39	24.0466	-29.4931	-69.1421	14.5321	4.2701	-7.8144	31	-21.9735	4.2690	-7.8144	-21.9520	-3.5459	-2.8622
40	14.5321	4.2701	-7.8144	17.3558	1.5617	-2.9856	32	-21.9520	-3.5459	-2.8622	-25.3214	-3.5468	-2.8622
41	17.3558	1.5617	-2.9856	15.2914	-1.1467	1.8433	33	-25.3214	-3.5468	-2.8622	-28.6916	-3.5473	-2.8622
42	15.2914	-1.1467	1.8433	14.4602	-1.1468	1.8433	34	-28.6916	-3.5473	-2.8622	-32.0604	-3.5464	-2.8622
43	14.4602	-1.1468	1.8433	16.1053	30.6238	74.2977	35	-32.0604	-3.5464	-2.8622	-35.4296	-3.5468	-2.8622
44	16.1053	30.6238	74.2977	34.1694	27.9516	68.4086	36	-35.4296	-3.5468	-2.8622	-38.7992	-3.5469	-2.8622
45	34.1694	27.9516	68.4086	51.0294	25.0485	62.0993	37	-38.7992	-3.5469	-2.8622	-42.1673	-3.5466	-2.8622
46	51.0294	25.0485	62.0993	68.5770	12.8517	29.7694	38	-42.1673	-3.5466	-2.8622	-45.5358	-3.5464	-2.8622
47	68.5770	12.8517	29.7694	81.8606	21.9371	55.3230	39	-45.5358	-3.5464	-2.8622	-48.9042	-3.5459	-2.8622
48	81.8606	21.9371	55.3230	91.8045	18.6375	48.0345	40	-48.9042	-3.5459	-2.8622	-77.9270	-12.5204	-42.9767
49	91.8045	18.6375	48.0345	102.5686	6.4354	15.7045	41	-77.9270	-12.5204	-42.9767	-80.9421	6.1432	-13.7238
50	102.5686	6.4354	15.7045	109.4051	15.1698	40.1884	42	-80.9421	6.1432	-13.7238	-76.4887	6.1438	-13.7239
51	109.4051	15.1698	40.1884	112.1745	2.9689	7.8583	43	-76.4887	6.1438	-13.7239	-72.0343	6.1441	-13.7239
52	112.1745	2.9689	7.8583	114.3195	2.9628	7.8583	44	-72.0343	6.1441	-13.7239	-67.5805	6.1412	-13.7239
53	114.3195	2.9628	7.8583	112.5856	-0.6422	-0.5906	45	-67.5805	6.1412	-13.7239	-63.1293	6.1404	-13.7239
54	112.5856	-0.6422	-0.5906	109.0739	-12.8383	-32.9207	46	-63.1293	6.1404	-13.7239	-58.6762	6.1411	-13.7239
55	109.0739	-12.8383	-32.9207	103.1279	-4.3685	-9.6872	47	-58.6762	6.1411	-13.7239	-54.2245	6.1375	-13.7239
56	103.1279	-4.3685	-9.6872	91.4185	-16.5713	-42.0172	48	-54.2245	6.1375	-13.7239	-49.7794	6.1336	-13.7239
57	91.4185	-16.5713	-42.0172	79.4090	-16.5681	-42.0173	49	-49.7794	6.1336	-13.7239	-45.3315	6.1283	-13.7240
58	79.4090	-16.5681	-42.0173	63.2519	-20.3951	-51.8056	50	-45.3315	6.1283	-13.7240	-40.8892	6.1272	-13.7240
59	63.2519	-20.3951	-51.8056	45.1109	-32.5938	-84.1357	51	-40.8892	6.1272	-13.7240	-36.4441	6.1297	-13.7240
60	45.1109	-32.5938	-84.1357	24.1643	-24.2929	-62.3163	52	-36.4441	6.1297	-13.7240	-32.0010	6.1263	-13.7240
ENVOL. MIN. FLECTORES TREN TREN LM 71, EC-1 en vía 1							53	-32.0010	6.1263	-13.7240	-27.5614	6.1245	-13.7240
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	-27.5614	6.1245	-13.7240	-23.1220	6.1247	-13.7240
=====	=====	=====	=====	=====	=====	=====	55	-23.1220	6.1247	-13.7240	-18.6842	6.1241	-13.7240
1	-27.9375	40.6278	109.4224	-7.2723	0.6637	-1.9624	56	-18.6842	6.1241	-13.7240	-14.2450	6.1213	-13.7240
2	-7.2723	0.6637	-1.9624	-6.7910	0.6638	-1.9625	57	-14.2450	6.1213	-13.7240	-9.8083	6.1198	-13.7240
3	-6.7910	0.6638	-1.9625	-8.9105	-4.8087	-6.0637	58	-9.8083	6.1198	-13.7240	-5.3706	6.1210	-13.7240
4	-8.9105	-4.8087	-6.0637	-12.3966	-4.8089	-6.0636	59	-5.3706	6.1210	-13.7240	-0.9726	6.0455	-13.3582
5	-12.3966	-4.8089	-6.0636	-15.8829	-4.8088	-6.0636	60	-0.9726	6.0455	-13.3582	-0.4707	-1.1423	1.8433
6	-15.8829	-4.8088	-6.0636	-19.3695	-4.8070	-6.0636	ENVOL. MAX. CORTANTES TREN TREN LM 71, EC-1 en vía 1						
7	-19.3695	-4.8070	-6.0636	-22.8549	-4.8061	-6.0636	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
							=====	=====	=====	=====	=====	=====	=====
							1	-27.9375	40.6278	109.4224	-0.0387	36.5382	103.9095

2	-0.0387	36.5382	103.9095	22.2209	32.5238	97.6794
3	22.2209	32.5238	97.6794	45.8026	32.5257	97.6794
4	45.8026	32.5257	97.6794	59.7908	28.6070	90.7651
5	59.7908	28.6070	90.7651	68.7064	24.8171	83.2110
6	68.7064	24.8171	83.2110	72.9106	21.1651	75.0625
7	72.9106	21.1651	75.0625	88.2541	21.1632	75.0625
8	88.2541	21.1632	75.0625	85.6515	17.6847	66.3649
9	85.6515	17.6847	66.3649	79.3976	14.4035	57.1633
10	79.3976	14.4035	57.1633	70.0847	11.3342	47.5032
11	70.0847	11.3342	47.5032	78.3004	11.3358	47.5032
12	78.3004	11.3358	47.5032	64.5049	8.5098	37.4326
13	64.5049	8.5098	37.4326	48.9257	5.9462	27.9723
14	48.9257	5.9462	27.9723	53.2367	5.9444	27.9724
15	53.2367	5.9444	27.9724	34.8819	3.6586	19.3078
16	34.8819	3.6586	19.3078	16.1428	1.6609	12.3307
17	16.1428	1.6609	12.3307	11.7687	0.9897	1.7292
18	11.7687	0.9897	1.7292	12.4860	0.9895	1.7292
19	12.4860	0.9895	1.7292	13.2031	0.9894	1.7292
20	13.2031	0.9894	1.7292	-51.6976	20.2923	54.5198
21	-51.6976	20.2923	54.5198	-38.6187	40.7770	105.1060
22	-38.6187	40.7770	105.1060	-12.7279	38.1779	99.8680
23	-12.7279	38.1779	99.8680	11.0323	35.4215	94.4117
24	11.0323	35.4215	94.4117	32.0152	32.5463	88.7370
25	32.0152	32.5463	88.7370	49.7147	29.5891	82.8441
26	49.7147	29.5891	82.8441	63.7547	26.5788	76.7330
27	63.7547	26.5788	76.7330	89.0027	26.5784	76.7330
28	89.0027	26.5784	76.7330	96.2663	23.5527	70.4037
29	96.2663	23.5527	70.4037	99.5484	20.5579	63.8562
30	99.5484	20.5579	63.8562	98.9014	17.6104	57.0904
31	98.9014	17.6104	57.0904	94.5242	14.7680	50.1064
32	94.5242	14.7680	50.1064	86.7437	12.0407	42.9043
33	86.7437	12.0407	42.9043	76.0216	9.4777	35.4841
34	76.0216	9.4777	35.4841	62.9238	7.1080	27.8479
35	62.9238	7.1080	27.8479	47.9466	4.9531	20.7618
36	47.9466	4.9531	20.7618	2.3622	4.2709	-7.8144
37	2.3622	4.2709	-7.8144	6.4193	4.2705	-7.8144
38	6.4193	4.2705	-7.8144	10.4755	4.2698	-7.8144
39	10.4755	4.2698	-7.8144	14.5321	4.2701	-7.8144
40	14.5321	4.2701	-7.8144	-45.4100	20.3476	53.2209
41	-45.4100	20.3476	53.2209	-38.5238	40.1520	100.7387
42	-38.5238	40.1520	100.7387	-9.4135	40.1524	100.7387
43	-9.4135	40.1524	100.7387	8.3073	37.2415	94.4294
44	8.3073	37.2415	94.4294	24.4104	34.1251	87.6531
45	24.4104	34.1251	87.6531	49.1509	34.1261	87.6531
46	49.1509	34.1261	87.6531	60.5266	30.8146	80.3645
47	60.5266	30.8146	80.3645	68.8144	27.3517	72.5186
48	68.8144	27.3517	72.5186	73.4594	23.7444	64.0699
49	73.4594	23.7444	64.0699	90.6749	23.7439	64.0697
50	90.6749	23.7439	64.0697	88.4865	20.0163	54.9730
51	88.4865	20.0163	54.9730	81.6761	16.1891	45.1848
52	81.6761	16.1891	45.1848	69.9157	12.2915	34.6733
53	69.9157	12.2915	34.6733	78.8307	12.2955	34.6732
54	78.8307	12.2955	34.6732	61.2668	8.6606	24.7924
55	61.2668	8.6606	24.7924	-18.6842	6.1241	-13.7240
56	-18.6842	6.1241	-13.7240	-14.2450	6.1213	-13.7240
57	-14.2450	6.1213	-13.7240	-9.8083	6.1198	-13.7240
58	-9.8083	6.1198	-13.7240	-5.3706	6.1210	-13.7240
59	-5.3706	6.1210	-13.7240	-0.9329	6.1197	-13.7240
60	-0.9329	6.1197	-13.7240	3.5038	6.1187	-13.7240

ENVOL. MIN. CORTANTES TREN TREN LM 71, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	1.5480	-4.8080	-6.0636	-1.9379	-4.8082	-6.0636
2	-1.9379	-4.8082	-6.0636	-5.4243	-4.8085	-6.0637
3	-5.4243	-4.8085	-6.0637	-8.9105	-4.8087	-6.0637
4	-8.9105	-4.8087	-6.0637	-12.3966	-4.8089	-6.0636
5	-12.3966	-4.8089	-6.0636	-15.8829	-4.8088	-6.0636
6	-15.8829	-4.8088	-6.0636	42.5033	-5.5348	-13.7346
7	42.5033	-5.5348	-13.7346	57.4726	-8.1730	-19.8975
8	57.4726	-8.1730	-19.8975	51.5472	-8.1749	-19.8975
9	51.5472	-8.1749	-19.8975	69.1482	-12.2629	-25.4105
10	69.1482	-12.2629	-25.4105	81.5419	-16.2831	-31.6404
11	81.5419	-16.2831	-31.6404	69.7374	-16.2895	-31.6404
12	69.7374	-16.2895	-31.6404	74.4191	-20.2008	-38.5547
13	74.4191	-20.2008	-38.5547	74.7430	-23.9910	-46.1087
14	74.7430	-23.9910	-46.1087	71.2035	-27.6450	-54.2572
15	71.2035	-27.6450	-54.2572	51.1597	-27.6490	-54.2572
16	51.1597	-27.6490	-54.2572	41.7971	-31.1319	-62.9550
17	41.7971	-31.1319	-62.9550	29.9174	-34.4104	-72.1566
18	29.9174	-34.4104	-72.1566	16.2421	-37.4747	-81.8167
19	16.2421	-37.4747	-81.8167	-10.9277	-37.4747	-81.8167
20	-10.9277	-37.4747	-81.8167	-38.4802	-18.4693	-49.6205
21	-38.4802	-18.4693	-49.6205	11.7251	-3.5450	-2.8622
22	11.7251	-3.5450	-2.8622	8.3573	-3.5450	-2.8622
23	8.3573	-3.5450	-2.8622	4.9896	-3.5448	-2.8622
24	4.9896	-3.5448	-2.8622	1.6224	-3.5446	-2.8622
25	1.6224	-3.5446	-2.8622	-1.7448	-3.5449	-2.8622
26	-1.7448	-3.5449	-2.8622	53.3863	-5.6150	-19.1926
27	53.3863	-5.6150	-19.1926	69.3629	-8.0223	-24.2141
28	69.3629	-8.0223	-24.2141	82.8770	-10.6243	-29.4522
29	82.8770	-10.6243	-29.4522	93.3759	-13.3716	-34.9084
30	93.3759	-13.3716	-34.9084	100.4178	-16.2447	-40.5830
31	100.4178	-16.2447	-40.5830	84.9864	-16.2440	-40.5831
32	84.9864	-16.2440	-40.5831	85.4538	-19.2081	-46.4758
33	85.4538	-19.2081	-46.4758	81.9348	-22.2126	-52.5869
34	81.9348	-22.2126	-52.5869	74.4168	-25.2334	-58.9163
35	74.4168	-25.2334	-58.9163	63.0344	-28.2356	-65.4637
36	63.0344	-28.2356	-65.4637	48.0443	-31.1818	-72.2294
37	48.0443	-31.1818	-72.2294	29.8411	-34.0350	-79.2135
38	29.8411	-34.0350	-79.2135	8.9605	-36.7633	-86.4157
39	8.9605	-36.7633	-86.4157	-13.9354	-39.3259	-93.8359
40	-13.9354	-39.3259	-93.8359	-49.5721	-18.6350	-56.5106
41	-49.5721	-18.6350	-56.5106	15.2914	-1.1467	1.8433
42	15.2914	-1.1467	1.8433	14.4602	-1.1468	1.8433
43	14.4602	-1.1468	1.8433	13.6285	-1.1467	1.8433
44	13.6285	-1.1467	1.8433	12.7971	-1.1453	1.8433
45	12.7971	-1.1453	1.8433	18.7898	-1.3975	-14.2866
46	18.7898	-1.3975	-14.2866	17.7763	-1.3956	-14.2866
47	17.7763	-1.3956	-14.2866	37.8958	-3.5469	-17.7345
48	37.8958	-3.5469	-17.7345	57.5973	-5.9645	-22.6924
49	57.5973	-5.9645	-22.6924	76.0488	-8.6308	-28.5816
50	76.0488	-8.6308	-28.5816	69.7901	-8.6315	-28.5816
51	69.7901	-8.6315	-28.5816	84.0872	-11.5279	-34.8909
52	84.0872	-11.5279	-34.8909	95.5337	-14.6546	-41.6674

53	95.5337	-14.6546	-41.6674	84.9131	-14.6483	-41.6674
54	84.9131	-14.6483	-41.6674	90.5457	-17.9464	-48.9560
55	90.5457	-17.9464	-48.9560	92.1319	-21.4145	-56.8019
56	92.1319	-21.4145	-56.8019	89.2468	-25.0303	-65.2505
57	89.2468	-25.0303	-65.2505	71.1011	-25.0333	-65.2506
58	71.1011	-25.0333	-65.2506	60.6905	-28.7673	-74.3474
59	60.6905	-28.7673	-74.3474	45.1109	-32.5938	-84.1357
60	45.1109	-32.5938	-84.1357	21.4815	-32.5926	-84.1357

ENVOL. MAX. TORSORES TREN TREN LM 71, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-27.9375	40.6278	109.4224	-0.0387	36.5382	103.9095
2	-0.0387	36.5382	103.9095	22.2209	32.5238	97.6794
3	22.2209	32.5238	97.6794	45.8026	32.5257	97.6794
4	45.8026	32.5257	97.6794	59.7908	28.6070	90.7651
5	59.7908	28.6070	90.7651	68.7064	24.8171	83.2110
6	68.7064	24.8171	83.2110	72.9106	21.1651	75.0625
7	72.9106	21.1651	75.0625	88.2541	21.1632	75.0625
8	88.2541	21.1632	75.0625	85.6515	17.6847	66.3649
9	85.6515	17.6847	66.3649	79.3976	14.4035	57.1633
10	79.3976	14.4035	57.1633	70.0847	11.3342	47.5032
11	70.0847	11.3342	47.5032	78.3004	11.3358	47.5032
12	78.3004	11.3358	47.5032	64.5049	8.5098	37.4326
13	64.5049	8.5098	37.4326	48.9257	5.9462	27.9723
14	48.9257	5.9462	27.9723	53.2367	5.9444	27.9724
15	53.2367	5.9444	27.9724	34.8819	3.6586	19.3078
16	34.8819	3.6586	19.3078	16.1428	1.6609	12.3307
17	16.1428	1.6609	12.3307	-2.1449	-0.0453	6.2349
18	-2.1449	-0.0453	6.2349	-2.1779	-0.0453	6.2349
19	-2.1779	-0.0453	6.2349	-20.6175	-1.4631	1.7338
20	-20.6175	-1.4631	1.7338	-51.6976	20.2923	54.5198
21	-51.6976	20.2923	54.5198	-38.6187	40.7770	105.1060
22	-38.6187	40.7770	105.1060	-12.7279	38.1779	99.8680
23	-12.7279	38.1779	99.8680	11.0323	35.4215	94.4117
24	11.0323	35.4215	94.4117	32.0152	32.5463	88.7370
25	32.0152	32.5463	88.7370	49.7147	29.5891	82.8441
26	49.7147	29.5891	82.8441	63.7547	26.5788	76.7330
27	63.7547	26.5788	76.7330	89.0027	26.5784	76.7330
28	89.0027	26.5784	76.7330	96.2663	23.5527	70.4037
29	96.2663	23.5527	70.4037	99.5484	20.5579	63.8562
30	99.5484	20.5579	63.8562	98.9014	17.6104	57.0904
31	98.9014	17.6104	57.0904	94.5242	14.7680	50.1064
32	94.5242	14.7680	50.1064	86.7437	12.0407	42.9043
33	86.7437	12.0407	42.9043	76.0216	9.4777	35.4841
34	76.0216	9.4777	35.4841	62.9238	7.1080	27.8479
35	62.9238	7.1080	27.8479	47.9466	4.9531	20.7618
36	47.9466	4.9531	20.7618	31.7695	3.0342	14.3394
37	31.7695	3.0342	14.3394	14.9631	1.3556	9.2562
38	14.9631	1.3556	9.2562	-1.5820	-0.0575	4.8586
39	-1.5820	-0.0575	4.8586	-17.3414	-1.2167	1.6923
40	-17.3414	-1.2167	1.6923	-45.4100	20.3476	53.2209
41	-45.4100	20.3476	53.2209	-38.5238	40.1520	100.7387
42	-38.5238	40.1520	100.7387	-9.4135	40.1524	100.7387
43	-9.4135	40.1524	100.7387	8.3073	37.2415	94.4294
44	8.3073	37.2415	94.4294	24.4104	34.1251	87.6531
45	24.4104	34.1251	87.6531	49.1509	34.1261	87.6531
46	49.1509	34.1261	87.6531	60.5266	30.8146	80.3645

47	60.5266	30.8146	80.3645	68.8144	27.3517	72.5186
48	68.8144	27.3517	72.5186	73.4594	23.7444	64.0699
49	73.4594	23.7444	64.0699	90.6749	23.7439	64.0697
50	90.6749	23.7439	64.0697	88.4865	20.0163	54.9730
51	88.4865	20.0163	54.9730	81.6761	16.1891	45.1848
52	81.6761	16.1891	45.1848	69.9157	12.2915	34.6733
53	69.9157	12.2915	34.6733	78.8307	12.2955	34.6732
54	78.8307	12.2955	34.6732	61.2668	8.6606	24.7924
55	61.2668	8.6606	24.7924	82.3396	0.1046	2.3433
56	82.3396	0.1046	2.3433	2.8422	-1.1425	1.8433
57	2.8422	-1.1425	1.8433	2.0138	-1.1423	1.8433
58	2.0138	-1.1423	1.8433	1.1858	-1.1421	1.8433
59	1.1858	-1.1421	1.8433	0.3575	-1.1423	1.8433
60	0.3575	-1.1423	1.8433	-0.4707	-1.1423	1.8433

ENVOL. MIN. TORSORES TREN TREN LM 71, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	1.5514	-4.7033	-6.0765	-1.8588	-4.7033	-6.0765
2	-1.8588	-4.7033	-6.0765	-5.2689	-4.7035	-6.0765
3	-5.2689	-4.7035	-6.0765	11.7600	-1.1947	-6.2161
4	11.7600	-1.1947	-6.2161	10.8940	-1.1942	-6.2161
5	10.8940	-1.1942	-6.2161	27.4172	-3.2869	-8.4555
6	27.4172	-3.2869	-8.4555	42.5033	-5.5348	-13.7346
7	42.5033	-5.5348	-13.7346	57.4726	-8.1730	-19.8975
8	57.4726	-8.1730	-19.8975	51.5472	-8.1749	-19.8975
9	51.5472	-8.1749	-19.8975	69.1482	-12.2629	-25.4105
10	69.1482	-12.2629	-25.4105	81.5419	-16.2831	-31.6404
11	81.5419	-16.2831	-31.6404	69.7374	-16.2895	-31.6404
12	69.7374	-16.2895	-31.6404	74.4191	-20.2008	-38.5547
13	74.4191	-20.2008	-38.5547	74.7430	-23.9910	-46.1087
14	74.7430	-23.9910	-46.1087	71.2035	-27.6450	-54.2572
15	71.2035	-27.6450	-54.2572	51.1597	-27.6490	-54.2572
16	51.1597	-27.6490	-54.2572	41.7971	-31.1319	-62.9550
17	41.7971	-31.1319	-62.9550	29.9174	-34.4104	-72.1566
18	29.9174	-34.4104	-72.1566	16.2421	-37.4747	-81.8167
19	16.2421	-37.4747	-81.8167	-10.9277	-37.4747	-81.8167
20	-10.9277	-37.4747	-81.8167	-38.4802	-18.4693	-49.6205
21	-38.4802	-18.4693	-49.6205	-57.3437	4.1858	-7.9562
22	-57.3437	4.1858	-7.9562	-53.3674	4.1856	-7.9562
23	-53.3674	4.1856	-7.9562	-1.2333	0.1363	-9.4353
24	-1.2333	0.1363	-9.4353	17.2425	-1.5078	-11.5967
25	17.2425	-1.5078	-11.5967	35.7182	-3.4307	-14.8247
26	35.7182	-3.4307	-14.8247	53.3863	-5.6150	-19.1926
27	53.3863	-5.6150	-19.1926	69.3629	-8.0223	-24.2141
28	69.3629	-8.0223	-24.2141	82.8770	-10.6243	-29.4522
29	82.8770	-10.6243	-29.4522	93.3759	-13.3716	-34.9084
30	93.3759	-13.3716	-34.9084	100.4178	-16.2447	-40.5830
31	100.4178	-16.2447	-40.5830	84.9864	-16.2440	-40.5831
32	84.9864	-16.2440	-40.5831	85.4538	-19.2081	-46.4758
33	85.4538	-19.2081	-46.4758	81.9348	-22.2126	-52.5869
34	81.9348	-22.2126	-52.5869	74.4168	-25.2334	-58.9163
35	74.4168	-25.2334	-58.9163	63.0344	-28.2356	-65.4637
36	63.0344	-28.2356	-65.4637	48.0443	-31.1818	-72.2294
37	48.0443	-31.1818	-72.2294	29.8411	-34.0350	-79.2135
38	29.8411	-34.0350	-79.2135	8.9605	-36.7633	-86.4157

39	8.9605	-36.7633	-86.4157	-13.9354	-39.3259	-93.8359
40	-13.9354	-39.3259	-93.8359	-49.5721	-18.6350	-56.5106
41	-49.5721	-18.6350	-56.5106	-79.4976	6.0391	-13.7679
42	-79.4976	6.0391	-13.7679	-75.1194	6.0396	-13.7679
43	-75.1194	6.0396	-13.7679	-70.7406	6.0364	-13.7679
44	-70.7406	6.0364	-13.7679	-66.3642	6.0344	-13.7679
45	-66.3642	6.0344	-13.7679	18.7898	-1.3975	-14.2866
46	18.7898	-1.3975	-14.2866	17.7763	-1.3956	-14.2866
47	17.7763	-1.3956	-14.2866	37.8958	-3.5469	-17.7345
48	37.8958	-3.5469	-17.7345	57.5973	-5.9645	-22.6924
49	57.5973	-5.9645	-22.6924	76.0488	-8.6308	-28.5816
50	76.0488	-8.6308	-28.5816	69.7901	-8.6315	-28.5816
51	69.7901	-8.6315	-28.5816	84.0872	-11.5279	-34.8909
52	84.0872	-11.5279	-34.8909	95.5337	-14.6546	-41.6674
53	95.5337	-14.6546	-41.6674	84.9131	-14.6483	-41.6674
54	84.9131	-14.6483	-41.6674	90.5457	-17.9464	-48.9560
55	90.5457	-17.9464	-48.9560	92.1319	-21.4145	-56.8019
56	92.1319	-21.4145	-56.8019	89.2468	-25.0303	-65.2505
57	89.2468	-25.0303	-65.2505	71.1011	-25.0333	-65.2506
58	71.1011	-25.0333	-65.2506	60.6905	-28.7673	-74.3474
59	60.6905	-28.7673	-74.3474	45.1109	-32.5938	-84.1357
60	45.1109	-32.5938	-84.1357	21.4815	-32.5926	-84.1357
ENVOL. MAX. FLECTORES TREN TREN SW/0, EC-1 en via 1						

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.1212	-10.6662	-8.3088	-5.6121	-10.6665	-8.3088
2	-5.6121	-10.6665	-8.3088	47.9859	72.8210	242.4688
3	47.9859	72.8210	242.4688	98.4541	59.5249	207.2238
4	98.4541	59.5249	207.2238	141.6090	59.5261	207.2240
5	141.6090	59.5261	207.2240	176.4478	46.2311	171.9790
6	176.4478	46.2311	171.9790	205.3124	32.9181	136.7340
7	205.3124	32.9181	136.7340	228.1687	19.6164	101.4890
8	228.1687	19.6164	101.4890	242.4028	19.6226	101.4892
9	242.4028	19.6226	101.4892	249.6419	6.3118	66.2442
10	249.6419	6.3118	66.2442	250.8950	-6.9948	30.9991
11	250.8950	-6.9948	30.9991	245.8188	-7.0086	30.9992
12	245.8188	-7.0086	30.9992	232.0466	-19.2720	-6.9098
13	232.0466	-19.2720	-6.9098	212.4250	-32.5727	-42.1547
14	212.4250	-32.5727	-42.1547	186.8154	-45.8899	-77.3996
15	186.8154	-45.8899	-77.3996	153.5445	-45.8941	-77.3996
16	153.5445	-45.8941	-77.3996	112.2960	-59.1909	-112.6446
17	112.2960	-59.1909	-112.6446	65.0585	-72.4982	-147.8896
18	65.0585	-72.4982	-147.8896	11.8308	-85.8003	-183.1347
19	11.8308	-85.8003	-183.1347	1.5188	0.7242	-2.1394
20	1.5188	0.7242	-2.1394	1.7600	0.3119	-1.0276
21	1.7600	0.3119	-1.0276	1.3809	-0.1003	0.0841
22	1.3809	-0.1003	0.0841	1.2857	-0.1003	0.0841
23	1.2857	-0.1003	0.0841	25.9100	76.6497	230.5130
24	25.9100	76.6497	230.5130	90.7406	63.3498	195.2679
25	90.7406	63.3498	195.2679	143.6072	50.0481	160.0228
26	143.6072	50.0481	160.0228	184.4987	36.7459	124.7778
27	184.4987	36.7459	124.7778	213.4234	23.4383	89.5328
28	213.4234	23.4383	89.5328	235.1519	28.8368	61.1441
29	235.1519	28.8368	61.1441	261.8947	15.5430	25.8991
30	261.8947	15.5430	25.8991	278.0798	5.0459	-2.9506
31	278.0798	5.0459	-2.9506	282.8907	5.0501	-2.9506
32	282.8907	5.0501	-2.9506	277.0187	-5.5786	-32.7164

33	277.0187	-5.5786	-32.7164	260.4164	-18.8776	-67.9612
34	260.4164	-18.8776	-67.9612	233.0641	-29.5796	-98.5551
35	233.0641	-29.5796	-98.5551	194.9924	-42.8788	-133.8001
36	194.9924	-42.8788	-133.8001	146.3854	-53.5970	-164.2888
37	146.3854	-53.5970	-164.2888	86.8139	-66.9026	-199.5339
38	86.8139	-66.9026	-199.5339	28.6199	11.6763	-24.5594
39	28.6199	11.6763	-24.5594	39.7111	11.6754	-24.5594
40	39.7111	11.6754	-24.5594	47.2354	4.2807	-8.8804
41	47.2354	4.2807	-8.8804	41.4525	-3.1079	4.9437
42	41.4525	-3.1079	4.9437	39.1998	-3.1080	4.9437
43	39.1998	-3.1080	4.9437	36.9464	-3.1070	4.9437
44	36.9464	-3.1070	4.9437	34.6936	-3.1052	4.9437
45	34.6936	-3.1052	4.9437	32.4423	-3.1066	4.9437
46	32.4423	-3.1066	4.9437	46.2493	67.7684	113.6581
47	46.2493	67.7684	113.6581	88.7699	57.9255	86.4815
48	88.7699	57.9255	86.4815	126.7905	44.6544	51.2365
49	126.7905	44.6544	51.2365	159.1039	33.9562	20.4387
50	159.1039	33.9562	20.4387	183.7188	33.9525	20.4385
51	183.7188	33.9525	20.4385	202.0255	20.6746	-14.8067
52	202.0255	20.6746	-14.8067	214.3607	7.3804	-50.0521
53	214.3607	7.3804	-50.0521	219.7104	7.3819	-50.0523
54	219.7104	7.3819	-50.0523	217.4446	-4.0997	-84.7132
55	217.4446	-4.0997	-84.7132	209.4931	-17.3950	-119.9583
56	209.4931	-17.3950	-119.9583	195.5425	-30.7015	-155.2034
57	195.5425	-30.7015	-155.2034	173.2830	-30.7011	-155.2035
58	173.2830	-30.7011	-155.2035	143.7157	-43.9957	-190.4486
59	143.7157	-43.9957	-190.4486	108.1603	-57.2939	-225.6934
60	108.1603	-57.2939	-225.6934	67.1329	-55.9738	-227.7006

ENVOL. MIN. FLECTORES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-79.2232	87.1475	275.0496	-16.0406	87.1468	275.0497
2	-16.0406	87.1468	275.0497	-13.3458	-10.6665	-8.3088
3	-13.3458	-10.6665	-8.3088	-21.0794	-10.6665	-8.3088
4	-21.0794	-10.6665	-8.3088	-28.8125	-10.6670	-8.3088
5	-28.8125	-10.6670	-8.3088	-36.5473	-10.6655	-8.3088
6	-36.5473	-10.6655	-8.3088	-44.2801	-10.6652	-8.3088
7	-44.2801	-10.6652	-8.3088	-52.0133	-10.6625	-8.3088
8	-52.0133	-10.6625	-8.3088	-59.7457	-10.6628	-8.3088
9	-59.7457	-10.6628	-8.3088	-67.4794	-10.6637	-8.3088
10	-67.4794	-10.6637	-8.3088	-75.2104	-10.6632	-8.3088
11	-75.2104	-10.6632	-8.3088	-82.9389	-10.6607	-8.3088
12	-82.9389	-10.6607	-8.3088	-90.6632	-10.6593	-8.3088
13	-90.6632	-10.6593	-8.3088	-98.3923	-10.6602	-8.3088
14	-98.3923	-10.6602	-8.3088	-106.1196	-10.6561	-8.3088
15	-106.1196	-10.6561	-8.3088	-113.8447	-10.6511	-8.3088
16	-113.8447	-10.6511	-8.3088	-136.3087	-55.4218	-97.6763
17	-136.3087	-55.4218	-97.6763	-176.4901	-55.4223	-97.6763
18	-176.4901	-55.4223	-97.6763	-222.5677	-65.4949	-119.2413
19	-222.5677	-65.4949	-119.2413	-273.3278	-75.8443	-142.4640
20	-273.3278	-75.8443	-142.4640	-383.5457	8.4519	43.1302
21	-383.5457	8.4519	43.1302	-340.6607	92.6945	223.4062
22	-340.6607	92.6945	223.4062	-255.8328	82.0232	194.0851
23	-255.8328	82.0232	194.0851	-182.0421	71.3814	166.0284
24	-182.0421	71.3814	166.0284	-126.6826	11.6794	-24.5594

25	-126.6826	11.6794	-24.5594	-115.5851	11.6781	-24.5594
26	-115.5851	11.6781	-24.5594	-104.4915	11.6798	-24.5594
27	-104.4915	11.6798	-24.5594	-93.3913	11.6861	-24.5595
28	-93.3913	11.6861	-24.5595	-82.2919	11.6824	-24.5595
29	-82.2919	11.6824	-24.5595	-71.1991	11.6752	-24.5594
30	-71.1991	11.6752	-24.5594	-60.1077	11.6763	-24.5594
31	-60.1077	11.6763	-24.5594	-49.0147	11.6782	-24.5594
32	-49.0147	11.6782	-24.5594	-37.9235	11.6755	-24.5594
33	-37.9235	11.6755	-24.5594	-26.8365	11.6754	-24.5594
34	-26.8365	11.6754	-24.5594	-15.7512	11.6670	-22.7046
35	-15.7512	11.6670	-22.7046	-15.8238	-48.6232	-111.9899
36	-15.8238	-48.6232	-111.9899	-62.1099	-59.1906	-134.6477
37	-62.1099	-59.1906	-134.6477	-118.3437	-59.1918	-134.6478
38	-118.3437	-59.1918	-134.6478	-183.8191	-69.6384	-157.1822
39	-183.8191	-69.6384	-157.1822	-249.9765	-69.6394	-157.1821
40	-249.9765	-69.6394	-157.1821	-370.1251	30.2579	54.2748
41	-370.1251	30.2579	54.2748	-332.7446	116.8590	230.4865
42	-332.7446	116.8590	230.4865	-248.0217	116.8580	230.4864
43	-248.0217	116.8580	230.4864	-206.5403	17.6698	-41.8862
44	-206.5403	17.6698	-41.8862	-193.7343	17.6677	-41.8863
45	-193.7343	17.6677	-41.8863	-180.9315	17.6701	-41.8864
46	-180.9315	17.6701	-41.8864	-168.1217	17.6627	-41.8865
47	-168.1217	17.6627	-41.8865	-155.3263	17.6395	-41.8865
48	-155.3263	17.6395	-41.8865	-142.5394	17.6296	-41.8866
49	-142.5394	17.6296	-41.8866	-129.7538	17.6378	-41.8866
50	-129.7538	17.6378	-41.8866	-116.9707	17.6448	-41.8866
51	-116.9707	17.6448	-41.8866	-104.1852	17.6259	-41.8866
52	-104.1852	17.6259	-41.8866	-91.4160	17.6063	-41.8867
53	-91.4160	17.6063	-41.8867	-78.6444	17.6041	-41.8867
54	-78.6444	17.6041	-41.8867	-65.8763	17.5968	-41.8867
55	-65.8763	17.5968	-41.8867	-53.1173	17.5966	-41.8867
56	-53.1173	17.5966	-41.8867	-40.3514	17.6018	-41.8867
57	-40.3514	17.6018	-41.8867	-27.5897	17.6021	-41.8867
58	-27.5897	17.6021	-41.8867	-14.8273	17.6026	-41.8867
59	-14.8273	17.6026	-41.8867	-2.2464	16.3256	-37.5573
60	-2.2464	16.3256	-37.5573	-1.2624	-3.0957	4.9437

ENVOL. MAX. CORTANTES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-79.2232	87.1475	275.0496	-16.0406	87.1468	275.0497
2	-16.0406	87.1468	275.0497	41.1580	73.8521	239.8046
3	41.1580	73.8521	239.8046	92.3732	60.5548	204.5595
4	92.3732	60.5548	204.5595	136.2708	60.5562	204.5596
5	136.2708	60.5562	204.5596	128.0105	48.2063	183.0284
6	128.0105	48.2063	183.0284	123.7019	37.4588	153.6188
7	123.7019	37.4588	153.6188	109.5667	28.1733	130.9995
8	109.5667	28.1733	130.9995	128.6377	27.7158	125.8020
9	128.6377	27.7158	125.8020	108.5584	20.8156	106.9590
10	108.5584	20.8156	106.9590	81.9308	14.2743	84.6110
11	81.9308	14.2743	84.6110	76.3950	10.0455	69.3263
12	76.3950	10.0455	69.3263	19.3878	3.5721	45.8065
13	19.3878	3.5721	45.8065	21.9780	3.5731	45.8065
14	21.9780	3.5731	45.8065	-1.1064	0.7240	-2.1394
15	-1.1064	0.7240	-2.1394	-0.5813	0.7240	-2.1394
16	-0.5813	0.7240	-2.1394	-0.0564	0.7240	-2.1394
17	-0.0564	0.7240	-2.1394	0.4686	0.7242	-2.1394
18	0.4686	0.7242	-2.1394	0.9937	0.7243	-2.1394

19	0.9937	0.7243	-2.1394	1.5188	0.7242	-2.1394
20	1.5188	0.7242	-2.1394	-196.4376	52.9517	163.9697
21	-196.4376	52.9517	163.9697	-309.7048	124.7477	314.2548
22	-309.7048	124.7477	314.2548	-220.5160	114.1102	284.4890
23	-220.5160	114.1102	284.4890	-142.6569	103.3994	253.8948
24	-142.6569	103.3994	253.8948	-76.4909	92.6910	223.4060
25	-76.4909	92.6910	223.4060	-22.0729	82.0240	194.0849
26	-22.0729	82.0240	194.0849	21.3905	71.3797	166.0282
27	21.3905	71.3797	166.0282	55.8161	60.6180	138.2847
28	55.8161	60.6180	138.2847	81.0654	49.7504	110.9435
29	81.0654	49.7504	110.9435	97.0657	38.8114	84.0724
30	97.0657	38.8114	84.0724	103.7716	27.8222	57.7202
31	103.7716	27.8222	57.7202	130.2057	27.8247	57.7201
32	130.2057	27.8247	57.7201	117.1255	16.8067	31.9174
33	117.1255	16.8067	31.9174	-26.8365	11.6754	-24.5594
34	-26.8365	11.6754	-24.5594	-15.7441	11.6758	-24.5594
35	-15.7441	11.6758	-24.5594	-4.6552	11.6753	-24.5594
36	-4.6552	11.6753	-24.5594	6.4358	11.6763	-24.5594
37	6.4358	11.6763	-24.5594	17.5270	11.6764	-24.5594
38	17.5270	11.6764	-24.5594	28.6199	11.6763	-24.5594
39	28.6199	11.6763	-24.5594	39.7111	11.6754	-24.5594
40	39.7111	11.6754	-24.5594	-370.1251	30.2579	54.2748
41	-370.1251	30.2579	54.2748	-332.7446	116.8590	230.4865
42	-332.7446	116.8590	230.4865	-248.0217	116.8580	230.4864
43	-248.0217	116.8580	230.4864	-172.2800	103.5542	195.2413
44	-172.2800	103.5542	195.2413	-102.5203	90.2549	159.9962
45	-102.5203	90.2549	159.9962	-38.7466	76.9558	124.7511
46	-38.7466	76.9558	124.7511	17.0466	76.9607	124.7509
47	17.0466	76.9607	124.7509	65.2023	63.6699	89.5057
48	65.2023	63.6699	89.5057	107.3782	50.3729	54.2607
49	107.3782	50.3729	54.2607	143.5693	37.0732	19.0154
50	143.5693	37.0732	19.0154	170.4565	37.0741	19.0154
51	170.4565	37.0741	19.0154	191.0297	23.7791	-16.2299
52	191.0297	23.7791	-16.2299	-91.4160	17.6063	-41.8867
53	-91.4160	17.6063	-41.8867	-78.6444	17.6041	-41.8867
54	-78.6444	17.6041	-41.8867	-65.8763	17.5968	-41.8867
55	-65.8763	17.5968	-41.8867	-53.1173	17.5966	-41.8867
56	-53.1173	17.5966	-41.8867	-40.3514	17.6018	-41.8867
57	-40.3514	17.6018	-41.8867	-27.5897	17.6021	-41.8867
58	-27.5897	17.6021	-41.8867	-14.8273	17.6026	-41.8867
59	-14.8273	17.6026	-41.8867	-2.0658	17.6019	-41.8866
60	-2.0658	17.6019	-41.8866	10.6946	17.6011	-41.8866

ENVOL. MIN. CORTANTES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.1212	-10.6662	-8.3088	-5.6121	-10.6665	-8.3088
2	-5.6121	-10.6665	-8.3088	-13.3458	-10.6665	-8.3088
3	-13.3458	-10.6665	-8.3088	-21.0794	-10.6665	-8.3088
4	-21.0794	-10.6665	-8.3088	-28.8125	-10.6670	-8.3088
5	-28.8125	-10.6670	-8.3088	-36.5473	-10.6655	-8.3088
6	-36.5473	-10.6655	-8.3088	-44.2801	-10.6652	-8.3088
7	-44.2801	-10.6652	-8.3088	49.3040	-17.1919	-7.8363
8	49.3040	-17.1919	-7.8363	55.7182	-26.5044	-31.6077
9	55.7182	-26.5044	-31.6077	36.5031	-26.5047	-31.6077
10	36.5031	-26.5047	-31.6077	34.6860	-35.9602	-54.4660

11	34.6860	-35.9602	-54.4660	30.8647	-45.5884	-76.4659
12	30.8647	-45.5884	-76.4659	24.4137	-48.7719	-80.0539
13	24.4137	-48.7719	-80.0539	-15.7664	-55.4216	-97.6763
14	-15.7664	-55.4216	-97.6763	-32.6339	-65.4953	-119.2413
15	-32.6339	-65.4953	-119.2413	-53.3838	-75.8422	-142.4641
16	-53.3838	-75.8422	-142.4641	-108.3676	-75.8408	-142.4641
17	-108.3676	-75.8408	-142.4641	-141.5973	-86.4980	-167.6345
18	-141.5973	-86.4980	-167.6345	-180.5633	-97.4702	-194.9792
19	-180.5633	-97.4702	-194.9792	-225.9044	-108.7592	-224.6953
20	-225.9044	-108.7592	-224.6953	-145.8433	-43.7762	-121.2200
21	-145.8433	-43.7762	-121.2200	1.3809	-0.1003	0.0841
22	1.3809	-0.1003	0.0841	1.2857	-0.1003	0.0841
23	1.2857	-0.1003	0.0841	1.1904	-0.1003	0.0841
24	1.1904	-0.1003	0.0841	1.0951	-0.1002	0.0841
25	1.0951	-0.1002	0.0841	0.9999	-0.1002	0.0841
26	0.9999	-0.1002	0.0841	0.9046	-0.1003	0.0841
27	0.9046	-0.1003	0.0841	36.3223	-3.5553	-58.7599
28	36.3223	-3.5553	-58.7599	77.8410	-9.2738	-68.7121
29	77.8410	-9.2738	-68.7121	114.5541	-16.2016	-42.1688
30	114.5541	-16.2016	-42.1688	126.7489	-27.1078	-65.8400
31	126.7489	-27.1078	-65.8400	129.4727	-37.9174	-89.0869
32	129.4727	-37.9174	-89.0869	122.7421	-48.6106	-111.9899
33	122.7421	-48.6106	-111.9899	106.5882	-59.1926	-134.6478
34	106.5882	-59.1926	-134.6478	80.8084	-69.6403	-157.1818
35	80.8084	-69.6403	-157.1818	14.6522	-69.6360	-157.1820
36	14.6522	-69.6360	-157.1820	-51.5000	-69.6349	-157.1821
37	-51.5000	-69.6349	-157.1821	40.2677	-77.5545	-220.8156
38	40.2677	-77.5545	-220.8156	-18.5956	-88.0406	-249.6654
39	-18.5956	-88.0406	-249.6654	-90.5696	-98.6802	-279.4311
40	-90.5696	-98.6802	-279.4311	-209.0909	-45.9133	-176.3741
41	-209.0909	-45.9133	-176.3741	41.4525	-3.1079	4.9437
42	41.4525	-3.1079	4.9437	39.1998	-3.1080	4.9437
43	39.1998	-3.1080	4.9437	36.9464	-3.1070	4.9437
44	36.9464	-3.1070	4.9437	34.6936	-3.1052	4.9437
45	34.6936	-3.1052	4.9437	32.4423	-3.1066	4.9437
46	32.4423	-3.1066	4.9437	30.1887	-3.1068	4.9437
47	30.1887	-3.1068	4.9437	27.9375	-3.1047	4.9437
48	27.9375	-3.1047	4.9437	25.6881	-3.1023	4.9437
49	25.6881	-3.1023	4.9437	23.4402	-3.1020	4.9437
50	23.4402	-3.1020	4.9437	21.1912	-3.1028	4.9437
51	21.1912	-3.1028	4.9437	72.2113	-7.5167	-90.9659
52	72.2113	-7.5167	-90.9659	108.4500	-14.0343	-106.0576
53	108.4500	-14.0343	-106.0576	98.2733	-21.3731	-123.8284
54	98.2733	-21.3731	-123.8284	144.0187	-29.5625	-144.4998
55	144.0187	-29.5625	-144.4998	154.8088	-38.5720	-168.3033
56	154.8088	-38.5720	-168.3033	126.8473	-38.5681	-168.3036
57	126.8473	-38.5681	-168.3036	120.1144	-48.4095	-195.4803
58	120.1144	-48.4095	-195.4803	100.6163	-59.0896	-226.2780
59	100.6163	-59.0896	-226.2780	57.7727	-59.0928	-226.2780

ENVOL. MAX. TORSORES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-70.9045	86.1192	277.7139	-8.4672	86.1197	277.7139
2	-8.4672	86.1197	277.7139	42.6001	72.5889	245.4091
3	42.6001	72.5889	245.4091	75.7829	59.9350	213.7325

4	75.7829	59.9350	213.7325	119.2363	59.9323	213.7326
5	119.2363	59.9323	213.7326	117.7325	45.3893	183.2860
6	117.7325	45.3893	183.2860	118.2337	36.3673	156.5168
7	118.2337	36.3673	156.5168	109.5667	28.1733	130.9995
8	109.5667	28.1733	130.9995	128.6377	27.7158	125.8020
9	128.6377	27.7158	125.8020	108.5584	20.8156	106.9590
10	108.5584	20.8156	106.9590	81.9308	14.2743	84.6110
11	81.9308	14.2743	84.6110	76.3950	10.0455	69.3263
12	76.3950	10.0455	69.3263	57.8922	1.8824	46.5389
13	57.8922	1.8824	46.5389	21.9780	3.5731	45.8065
14	21.9780	3.5731	45.8065	-14.0897	-0.6394	29.7339
15	-14.0897	-0.6394	29.7339	-49.0595	-4.1284	16.1211
16	-49.0595	-4.1284	16.1211	-52.0527	-4.1282	16.1211
17	-52.0527	-4.1282	16.1211	-86.8524	-6.9323	5.1364
18	-86.8524	-6.9323	5.1364	0.9937	0.7243	-2.1394
19	0.9937	0.7243	-2.1394	1.5188	0.7242	-2.1394
20	1.5188	0.7242	-2.1394	-196.4376	52.9517	163.9697
21	-196.4376	52.9517	163.9697	-309.7048	124.7477	314.2548
22	-309.7048	124.7477	314.2548	-220.5160	114.1102	284.4890
23	-220.5160	114.1102	284.4890	-142.6569	103.3994	253.8948
24	-142.6569	103.3994	253.8948	-76.4909	92.6910	223.4060
25	-76.4909	92.6910	223.4060	-22.0729	82.0240	194.0849
26	-22.0729	82.0240	194.0849	21.3905	71.3797	166.0282
27	21.3905	71.3797	166.0282	55.8161	60.6180	138.2847
28	55.8161	60.6180	138.2847	81.0654	49.7504	110.9435
29	81.0654	49.7504	110.9435	97.0657	38.8114	84.0724
30	97.0657	38.8114	84.0724	103.7716	27.8222	57.7202
31	103.7716	27.8222	57.7202	130.2057	27.8247	57.7201
32	130.2057	27.8247	57.7201	117.1255	117.1255	16.8067
33	117.1255	16.8067	31.9174	94.7366	5.7787	6.6757
34	94.7366	5.7787	6.6757	0.1427	-0.1002	0.0841
35	0.1427	-0.1002	0.0841	0.0475	-0.1002	0.0841
36	0.0475	-0.1002	0.0841	-0.0477	-0.1002	0.0841
37	-0.0477	-0.1002	0.0841	-0.1429	-0.1002	0.0841
38	-0.1429	-0.1002	0.0841	-0.2382	-0.1002	0.0841
39	-0.2382	-0.1002	0.0841	-0.3334	-0.1002	0.0841
40	-0.3334	-0.1002	0.0841	-370.1251	30.2579	54.2748
41	-370.1251	30.2579	54.2748	-315.0299	115.5293	232.4942
42	-315.0299	115.5293	232.4942	-231.2697	115.5296	232.4940
43	-231.2697	115.5296	232.4940	-156.4892	102.2294	197.2489
44	-156.4892	102.2294	197.2489	-87.6904	88.9293	162.0038
45	-87.6904	88.9293	162.0038	-24.8759	75.6238	126.7586
46	-24.8759	75.6238	126.7586	29.9540	75.6262	126.7584
47	29.9540	75.6262	126.7584	77.1459	62.3449	91.5132
48	77.1459	62.3449	91.5132	118.3631	49.0607	56.2681
49	118.3631	49.0607	56.2681	153.5984	35.7677	21.0229
50	153.5984	35.7677	21.0229	179.5258	35.7661	21.0226
51	179.5258	35.7661	21.0226	18.9429	-3.1010	4.9437
52	18.9429	-3.1010	4.9437	16.6967	-3.0995	4.9437
53	16.6967	-3.0995	4.9437	14.4497	-3.0981	4.9437
54	14.4497	-3.0981	4.9437	12.2047	-3.0956	4.9437
55	12.2047	-3.0956	4.9437	9.9607	-3.0957	4.9437
56	9.9607	-3.0957	4.9437	7.7157	-3.0978	4.9437
57	7.7157	-3.0978	4.9437	5.4704	-3.0972	4.9437
58	5.4704	-3.0972	4.9437	3.2264	-3.0957	4.9437
59	3.2264	-3.0957	4.9437	0.9821	-3.0954	4.9437
60	0.9821	-3.0954	4.9437	-1.2624	-3.0957	4.9437

ENVOL. MIN. TORSORES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	2.1212	-10.6662	-8.3088	-5.6121	-10.6665	-8.3088
2	-5.6121	-10.6665	-8.3088	-13.3458	-10.6665	-8.3088
3	-13.3458	-10.6665	-8.3088	12.5790	-1.2668	-9.5194
4	12.5790	-1.2668	-9.5194	11.6608	-1.2673	-9.5194
5	11.6608	-1.2673	-9.5194	33.3006	-3.9678	-15.1908
6	33.3006	-3.9678	-15.1908	59.8713	-7.7871	-22.4617
7	59.8713	-7.7871	-22.4617	89.1044	-12.7024	-31.5262
8	89.1044	-12.7024	-31.5262	55.7182	-26.5044	-31.6077
9	55.7182	-26.5044	-31.6077	105.3006	-18.6801	-42.5662
10	105.3006	-18.6801	-42.5662	128.4165	-25.6985	-55.7510
11	128.4165	-25.6985	-55.7510	30.8647	-45.5884	-76.4659
12	30.8647	-45.5884	-76.4659	24.4137	-48.7719	-80.0539
13	24.4137	-48.7719	-80.0539	-15.7664	-55.4216	-97.6763
14	-15.7664	-55.4216	-97.6763	-32.6339	-65.4953	-119.2413
15	-32.6339	-65.4953	-119.2413	-53.3838	-75.8422	-142.4641
16	-53.3838	-75.8422	-142.4641	-108.3676	-75.8408	-142.4641
17	-108.3676	-75.8408	-142.4641	-141.5973	-86.4980	-167.6345
18	-141.5973	-86.4980	-167.6345	-180.5633	-97.4702	-194.9792
19	-180.5633	-97.4702	-194.9792	-225.9044	-108.7592	-224.6953
20	-225.9044	-108.7592	-224.6953	-145.8433	-43.7762	-121.2200
21	-145.8433	-43.7762	-121.2200	-159.9703	11.6778	-24.5592
22	-159.9703	11.6778	-24.5592	-143.7633	11.2893	-27.7141
23	-143.7633	11.2893	-27.7141	-118.7337	10.1112	-31.8007
24	-118.7337	10.1112	-31.8007	-86.3063	8.0779	-36.8769
25	-86.3063	8.0779	-36.8769	-48.2543	5.1411	-43.0097
26	-48.2543	5.1411	-43.0097	-6.6277	1.2682	-50.2756
27	-6.6277	1.2682	-50.2756	36.3223	-3.5553	-58.7599
28	36.3223	-3.5553	-58.7599	77.8410	-9.2738	-68.7121
29	77.8410	-9.2738	-68.7121	114.6539	-15.7057	-80.4249
30	114.6539	-15.7057	-80.4249	145.0329	-22.8288	-94.0068
31	145.0329	-22.8288	-94.0068	123.3431	-22.8231	-94.0068
32	123.3431	-22.8231	-94.0068	122.7421	-48.6106	-111.9899
33	122.7421	-48.6106	-111.9899	106.5882	-59.1926	-134.6478
34	106.5882	-59.1926	-134.6478	80.8084	-69.6403	-157.1818
35	80.8084	-69.6403	-157.1818	117.6324	-57.4296	-169.1936
36	117.6324	-57.4296	-169.1936	85.6671	-67.3129	-193.7471
37	85.6671	-67.3129	-193.7471	40.2677	-77.5545	-220.8156
38	40.2677	-77.5545	-220.8156	-18.5956	-88.0406	-249.6654
39	-18.5956	-88.0406	-249.6654	-90.5696	-98.6802	-279.4311
40	-90.5696	-98.6802	-279.4311	-209.0909	-45.9133	-176.3741
41	-209.0909	-45.9133	-176.3741	-220.6436	16.8585	-43.5461
42	-220.6436	16.8585	-43.5461	-208.4212	16.8582	-43.5461
43	-208.4212	16.8582	-43.5461	-179.0340	15.5049	-45.4506
44	-179.0340	15.5049	-45.4506	-143.2878	13.4501	-48.5937
45	-143.2878	13.4501	-48.5937	-102.8503	10.7365	-53.2855
46	-102.8503	10.7365	-53.2855	-95.0676	10.7307	-53.2857
47	-95.0676	10.7307	-53.2857	-53.4471	7.2985	-59.6898
48	-53.4471	7.2985	-59.6898	-9.8769	3.1323	-67.9802
49	-9.8769	3.1323	-67.9802	34.3098	-1.7973	-78.3410
50	34.3098	-1.7973	-78.3410	33.0062	-1.7972	-78.3410
51	33.0062	-1.7972	-78.3410	72.2113	-7.5167	-90.9659
52	72.2113	-7.5167	-90.9659	108.4500	-14.0343	-106.0576
53	108.4500	-14.0343	-106.0576	98.2733	-14.0322	-106.0576
54	98.2733	-14.0322	-106.0576	124.5893	-21.3731	-123.8284
55	124.5893	-21.3731	-123.8284	144.0187	-29.5625	-144.4998

56	144.0187	-29.5625	-144.4998	154.8088	-38.5720	-168.3033
57	154.8088	-38.5720	-168.3033	126.8473	-38.5681	-168.3036
58	126.8473	-38.5681	-168.3036	120.1144	-48.4095	-195.4803
59	120.1144	-48.4095	-195.4803	107.7167	-55.9750	-227.7009
60	107.7167	-55.9750	-227.7009	67.1329	-55.9738	-227.7006
ENVOL. MAX. FLECTORES TREN TREN SW/2, EC-1 en via 1						

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-9.5330	0.8161	-2.4128	-6.8407	40.5245	102.1175
2	-6.8407	40.5245	102.1175	46.6050	83.1515	268.9271
3	46.6050	83.1515	268.9271	104.2662	68.1509	229.1771
4	104.2662	68.1509	229.1771	153.6900	68.2856	230.7064
5	153.6900	68.2856	230.7064	193.8216	53.2798	190.9564
6	193.8216	53.2798	190.9564	227.2133	38.2691	151.2065
7	227.2133	38.2691	151.2065	253.8365	23.2699	111.4565
8	253.8365	23.2699	111.4565	270.7242	23.2792	111.4566
9	270.7242	23.2792	111.4566	279.7344	8.2703	71.7067
10	279.7344	8.2703	71.7067	281.9860	-6.7420	31.9566
11	281.9860	-6.7420	31.9566	277.0977	-6.7452	31.9567
12	277.0977	-6.7452	31.9567	261.7098	-21.7344	-7.7930
13	261.7098	-21.7344	-7.7930	239.5774	-36.7420	-47.5428
14	239.5774	-36.7420	-47.5428	210.6873	-51.7505	-87.2928
15	210.6873	-51.7505	-87.2928	173.1718	-51.7511	-87.2928
16	173.1718	-51.7511	-87.2928	126.6485	-66.7533	-127.0428
17	126.6485	-66.7533	-127.0428	73.3797	-81.7648	-166.7927
18	73.3797	-81.7648	-166.7927	13.3392	-96.7697	-206.5427
19	13.3392	-96.7697	-206.5427	1.7129	0.8168	-2.4128
20	1.7129	0.8168	-2.4128	1.9850	0.3519	-1.1590
21	1.9850	0.3519	-1.1590	1.5574	-0.1131	0.0949
22	1.5574	-0.1131	0.0949	1.4500	-0.1131	0.0949
23	1.4500	-0.1131	0.0949	1.3425	-0.1131	0.0949
24	1.3425	-0.1131	0.0949	47.0977	89.6416	249.2441
25	47.0977	89.6416	249.2441	128.5780	75.7056	209.5358
26	128.5780	75.7056	209.5358	197.4924	60.7077	169.7859
27	197.4924	60.7077	169.7859	252.9218	45.7118	130.0359
28	252.9218	45.7118	130.0359	294.8414	30.7053	90.2856
29	294.8414	30.7053	90.2856	324.4999	17.0165	49.7971
30	324.4999	17.0165	49.7971	340.6550	1.9905	10.0473
31	340.6550	1.9905	10.0473	343.3990	3.3903	8.4982
32	343.3990	3.3903	8.4982	333.1401	-11.5984	-31.2514
33	333.1401	-11.5984	-31.2514	309.6154	-25.2695	-73.3996
34	309.6154	-25.2695	-73.3996	273.6036	-40.2720	-113.1496
35	273.6036	-40.2720	-113.1496	224.0849	-55.2739	-152.8994
36	224.0849	-55.2739	-152.8994	161.0679	-70.2864	-192.6495
37	161.0679	-70.2864	-192.6495	85.3427	-84.1541	-235.6928
38	85.3427	-84.1541	-235.6928	32.2775	13.1676	-27.6985
39	32.2775	13.1676	-27.6985	44.7871	13.1670	-27.6985
40	44.7871	13.1670	-27.6985	53.2730	4.8280	-10.0156
41	53.2730	4.8280	-10.0156	46.7509	-3.5046	5.5756
42	46.7509	-3.5046	5.5756	44.2104	-3.5049	5.5756
43	44.2104	-3.5049	5.5756	41.6694	-3.5055	5.5756
44	41.6694	-3.5055	5.5756	39.1284	-3.5050	5.5756
45	39.1284	-3.5050	5.5756	36.5891	-3.5058	5.5756
46	36.5891	-3.5058	5.5756	56.9961	83.0150	143.4522
47	56.9961	83.0150	143.4522	108.5455	68.0112	103.7018
48	108.5455	68.0112	103.7018	153.3625	53.0172	63.9516
49	153.3625	53.0172	63.9516	191.4231	38.0312	24.2013

50	191.4231	38.0312	24.2013	219.0020	38.0480	24.2010
51	219.0020	38.0480	24.2010	239.4551	23.0478	-15.5489
52	239.4551	23.0478	-15.5489	253.1657	8.0411	-55.2991
53	253.1657	8.0411	-55.2991	258.9984	8.0661	-55.2994
54	258.9984	8.0661	-55.2994	255.1133	-6.9173	-95.0497
55	255.1133	-6.9173	-95.0497	244.4666	-21.9354	-134.8000
56	244.4666	-21.9354	-134.8000	227.0642	-36.9197	-174.5500
57	227.0642	-36.9197	-174.5500	200.3060	-36.9064	-174.5501
58	200.3060	-36.9064	-174.5501	165.2896	-51.9144	-214.3003
59	165.2896	-51.9144	-214.3003	123.5251	-66.9129	-254.0500
60	123.5251	-66.9129	-254.0500	75.7800	-65.4937	-257.0667

ENVOL. MIN. FLECTORES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-89.5006	97.9420	310.7982	-24.8311	5.1983	72.2654
2	-24.8311	5.1983	72.2654	-21.0624	5.1983	72.2654
3	-21.0624	5.1983	72.2654	-19.9721	-1.2916	46.4676
4	-19.9721	-1.2916	46.4676	-20.9086	-1.2917	46.4676
5	-20.9086	-1.2917	46.4676	-21.8456	-1.2914	46.4677
6	-21.8456	-1.2914	46.4677	-25.5044	-7.9002	22.2917
7	-25.5044	-7.9002	22.2917	-31.2320	-7.8992	22.2917
8	-31.2320	-7.8992	22.2917	-36.9597	-7.8959	22.2919
9	-36.9597	-7.8959	22.2919	-46.4238	-14.6985	-0.3972
10	-46.4238	-14.6985	-0.3972	-57.0825	-14.6977	-0.3973
11	-57.0825	-14.6977	-0.3973	-68.8205	-21.7640	-21.7350
12	-68.8205	-21.7640	-21.7350	-84.5985	-21.7653	-21.7350
13	-84.5985	-21.7653	-21.7350	-100.3802	-21.7668	-21.7349
14	-100.3802	-21.7668	-21.7349	-121.3921	-29.1740	-41.8538
15	-121.3921	-29.1740	-41.8538	-142.8950	-36.9954	-60.8830
16	-142.8950	-36.9954	-60.8830	-169.7185	-36.9964	-60.8830
17	-169.7185	-36.9964	-60.8830	-199.3504	-45.2972	-78.9518
18	-199.3504	-45.2972	-78.9518	-232.9420	-54.1371	-97.3850
19	-232.9420	-54.1371	-97.3850	-272.1915	-54.1367	-97.3851
20	-272.1915	-54.1367	-97.3851	-434.7231	15.3097	59.7326
21	-434.7231	15.3097	59.7326	-373.3458	139.2762	327.1800
22	-373.3458	139.2762	327.1800	-252.0539	70.3985	182.5081
23	-252.0539	70.3985	182.5081	-191.0154	59.9272	152.0797
24	-191.0154	59.9272	152.0797	-142.8754	13.1763	-27.6986
25	-142.8754	13.1763	-27.6986	-130.3614	13.1765	-27.6986
26	-130.3614	13.1765	-27.6986	-117.8446	13.1772	-27.6986
27	-117.8446	13.1772	-27.6986	-105.3273	13.1770	-27.6986
28	-105.3273	13.1770	-27.6986	-92.8112	13.1718	-27.6985
29	-92.8112	13.1718	-27.6985	-80.3011	13.1669	-27.6986
30	-80.3011	13.1669	-27.6986	-67.7917	13.1693	-27.6986
31	-67.7917	13.1693	-27.6986	-55.2762	13.1683	-27.6986
32	-55.2762	13.1683	-27.6986	-42.7735	13.1655	-27.6986
33	-42.7735	13.1655	-27.6986	-30.2661	13.1585	-25.6067
34	-30.2661	13.1585	-25.6067	-17.7651	13.1606	-25.6067
35	-17.7651	13.1606	-25.6067	-5.2625	13.1612	-25.6067
36	-5.2625	13.1612	-25.6067	-0.0538	-0.1130	0.0949
37	-0.0538	-0.1130	0.0949	-21.6772	-75.0687	-205.6703
38	-21.6772	-75.0687	-205.6703	-107.3789	-98.4057	-261.7929
39	-107.3789	-98.4057	-261.7929	-210.7306	-116.4681	-306.5163
40	-210.7306	-116.4681	-306.5163	-405.9595	3.6996	-44.3546
41	-405.9595	3.6996	-44.3546	-385.7388	123.8696	217.8071

42	-385.7388	123.8696	217.8071	-299.3152	112.9999	179.4034
43	-299.3152	112.9999	179.4034	-256.6015	22.0057	-54.8586
44	-256.6015	22.0057	-54.8586	-240.6491	21.9975	-54.8586
45	-240.6491	21.9975	-54.8586	-224.7018	21.9946	-54.8587
46	-224.7018	21.9946	-54.8587	-208.7522	21.9981	-54.8589
47	-208.7522	21.9981	-54.8589	-192.8048	21.9833	-54.8589
48	-192.8048	21.9833	-54.8589	-176.8766	21.9679	-54.8589
49	-176.8766	21.9679	-54.8589	-160.9472	21.9639	-54.8589
50	-160.9472	21.9639	-54.8589	-145.0266	21.9625	-54.8590
51	-145.0266	21.9625	-54.8590	-129.1075	21.9577	-54.8591
52	-129.1075	21.9577	-54.8591	-113.1882	21.9382	-54.8591
53	-113.1882	21.9382	-54.8591	-97.2847	21.9267	-54.8591
54	-97.2847	21.9267	-54.8591	-81.3839	21.9303	-54.8591
55	-81.3839	21.9303	-54.8591	-65.4855	21.9431	-54.8591
56	-65.4855	21.9431	-54.8591	-49.5790	21.9429	-54.8591
57	-49.5790	21.9429	-54.8591	-33.6824	21.9298	-54.8591
58	-33.6824	21.9298	-54.8591	-18.0186	21.5230	-51.6656
59	-18.0186	21.5230	-51.6656	-2.4610	20.5456	-48.6976
60	-2.4610	20.5456	-48.6976	-1.4236	-3.4912	5.5756

ENVOL. MAX. CORTANTES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-89.3500	98.2860	310.2063	-18.0903	98.2875	310.2063
2	-18.0903	98.2875	310.2063	46.4187	83.2923	270.4563
3	46.4187	83.2923	270.4563	104.1799	68.2955	230.7064
4	104.1799	68.2955	230.7064	153.6900	68.2856	230.7064
5	153.6900	68.2856	230.7064	193.8216	53.2798	190.9564
6	193.8216	53.2798	190.9564	227.2133	38.2691	151.2065
7	227.2133	38.2691	151.2065	253.8365	23.2699	111.4565
8	253.8365	23.2699	111.4565	270.7242	23.2792	111.4566
9	270.7242	23.2792	111.4566	50.4247	11.6278	99.7461
10	50.4247	11.6278	99.7461	9.0877	5.1988	72.2655
11	9.0877	5.1988	72.2655	12.8568	5.1988	72.2656
12	12.8568	5.1988	72.2656	-2.4317	0.8167	-2.4128
13	-2.4317	0.8167	-2.4128	-1.8397	0.8167	-2.4128
14	-1.8397	0.8167	-2.4128	-1.2478	0.8166	-2.4128
15	-1.2478	0.8166	-2.4128	-0.6557	0.8167	-2.4128
16	-0.6557	0.8167	-2.4128	-0.0636	0.8167	-2.4128
17	-0.0636	0.8167	-2.4128	0.5285	0.8167	-2.4128
18	0.5285	0.8167	-2.4128	1.1207	0.8168	-2.4128
19	1.1207	0.8168	-2.4128	1.7129	0.8168	-2.4128
20	1.7129	0.8168	-2.4128	-359.7660	51.6337	163.4691
21	-359.7660	51.6337	163.4691	-363.3062	141.7054	348.1289
22	-363.3062	141.7054	348.1289	-234.6855	126.7052	308.3788
23	-234.6855	126.7052	308.3788	-119.5666	111.7074	268.6287
24	-119.5666	111.7074	268.6287	-17.9483	96.7104	228.8785
25	-17.9483	96.7104	228.8785	70.1701	81.7074	189.1284
26	70.1701	81.7074	189.1284	15.4569	70.4001	182.5078
27	15.4569	70.4001	182.5078	36.7073	59.9270	152.0796
28	36.7073	59.9270	152.0796	48.9246	50.1055	123.1711
29	48.9246	50.1055	123.1711	53.9743	40.8101	94.8793
30	53.9743	40.8101	94.8793	92.7444	25.8098	55.1294
31	92.7444	25.8098	55.1294	117.2661	25.8112	55.1293
32	117.2661	25.8112	55.1293	-42.7735	13.1655	-27.6986
33	-42.7735	13.1655	-27.6986	-30.2649	13.1667	-27.6986
34	-30.2649	13.1667	-27.6986	-17.7579	13.1659	-27.6985
35	-17.7579	13.1659	-27.6985	-5.2496	13.1651	-27.6985

36	-5.2496	13.1651	-27.6985	7.2579	13.1668	-27.6985
37	7.2579	13.1668	-27.6985	19.7680	13.1682	-27.6985
38	19.7680	13.1682	-27.6985	32.2775	13.1676	-27.6985
39	32.2775	13.1676	-27.6985	44.7871	13.1670	-27.6985
40	44.7871	13.1670	-27.6985	-346.7766	16.9004	-0.0838
41	-346.7766	16.9004	-0.0838	-359.4114	130.0056	254.3340
42	-359.4114	130.0056	254.3340	-265.1555	130.0057	254.3338
43	-265.1555	130.0057	254.3338	-181.0273	115.0033	214.5838
44	-181.0273	115.0033	214.5838	-103.6492	100.0105	174.8337
45	-103.6492	100.0105	174.8337	-33.0114	85.0072	135.0836
46	-33.0114	85.0072	135.0836	28.6103	85.0133	135.0833
47	28.6103	85.0133	135.0833	81.6295	70.0359	95.3331
48	81.6295	70.0359	95.3331	127.9002	55.0432	55.5830
49	127.9002	55.0432	55.5830	167.4344	40.0342	15.8329
50	167.4344	40.0342	15.8329	196.4534	40.0331	15.8323
51	196.4534	40.0331	15.8323	218.3611	25.0583	-23.9180
52	218.3611	25.0583	-23.9180	-113.1882	21.9382	-54.8591
53	-113.1882	21.9382	-54.8591	-97.2847	21.9267	-54.8591
54	-97.2847	21.9267	-54.8591	-81.3839	21.9303	-54.8591
55	-81.3839	21.9303	-54.8591	-65.4855	21.9431	-54.8591
56	-65.4855	21.9431	-54.8591	-49.5790	21.9429	-54.8591
57	-49.5790	21.9429	-54.8591	-33.6824	21.9298	-54.8591
58	-33.6824	21.9298	-54.8591	-17.7855	21.9221	-54.8591
59	-17.7855	21.9221	-54.8591	-1.8911	21.9216	-54.8591
60	-1.8911	21.9216	-54.8591	14.0073	21.9262	-54.8591

ENVOL. MIN. CORTANTES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-9.5330	0.8161	-2.4128	-8.9412	0.8162	-2.4128
2	-8.9412	0.8162	-2.4128	-19.0354	-1.2917	46.4676
3	-19.0354	-1.2917	46.4676	-8.3214	-7.9014	22.2915
4	-8.3214	-7.9014	22.2915	-14.0497	-7.9003	22.2916
5	-14.0497	-7.9003	22.2916	-3.7894	-14.7019	-0.3974
6	-3.7894	-14.7019	-0.3974	10.0967	-21.7703	-21.7351
7	10.0967	-21.7703	-21.7351	26.6944	-29.1819	-41.8540
8	26.6944	-29.1819	-41.8540	5.5378	-29.1799	-41.8540
9	5.5378	-29.1799	-41.8540	18.0592	-37.0015	-60.8832
10	18.0592	-37.0015	-60.8832	30.5466	-45.2994	-78.9521
11	30.5466	-45.2994	-78.9521	-2.2962	-45.3004	-78.9520
12	-2.2962	-45.3004	-78.9520	2.5565	-54.1390	-97.3851
13	2.5565	-54.1390	-97.3851	4.4967	-63.5662	-117.6712
14	4.4967	-63.5662	-117.6712	1.9381	-73.6281	-140.1410
15	1.9381	-73.6281	-140.1410	-51.4423	-73.6292	-140.1410
16	-51.4423	-73.6292	-140.1410	-67.8316	-84.3455	-165.1011
17	-67.8316	-84.3455	-165.1011	-103.7438	-96.7578	-176.9279
18	-103.7438	-96.7578	-176.9279	-174.6451	-111.7579	-216.6779
19	-174.6451	-111.7579	-216.6779	-255.6709	-111.7570	-216.6779
20	-255.6709	-111.7570	-216.6779	-164.4841	-49.3698	-136.7142
21	-164.4841	-49.3698	-136.7142	1.5574	-0.1131	0.0949
22	1.5574	-0.1131	0.0949	1.4500	-0.1131	0.0949
23	1.4500	-0.1131	0.0949	1.3425	-0.1131	0.0949
24	1.3425	-0.1131	0.0949	1.2351	-0.1131	0.0949
25	1.2351	-0.1131	0.0949	1.1276	-0.1131	0.0949
26	1.1276	-0.1131	0.0949	1.0202	-0.1131	0.0949
27	1.0202	-0.1131	0.0949	17.8634	-1.1131	-71.3544

28	17.8634	-1.1131	-71.3544	59.4911	-6.4368	-84.4380
29	59.4911	-6.4368	-84.4380	98.7297	-12.6880	-99.3595
30	98.7297	-12.6880	-99.3595	133.4606	-19.8885	-116.1864
31	133.4606	-19.8885	-116.1864	114.5692	-19.8878	-116.1866
32	114.5692	-19.8878	-116.1866	134.9145	-28.0280	-134.9856
33	134.9145	-28.0280	-134.9856	145.3296	-36.9929	-155.9189
34	145.3296	-36.9929	-155.9189	144.5856	-47.1244	-178.5738
35	144.5856	-47.1244	-178.5738	172.9462	-61.4105	-150.6102
36	172.9462	-61.4105	-150.6102	104.1050	-76.4190	-190.3602
37	104.1050	-76.4190	-190.3602	21.7430	-91.4254	-230.1104
38	21.7430	-91.4254	-230.1104	-74.1058	-106.4232	-269.8604
39	-74.1058	-106.4232	-269.8604	-183.4597	-121.4263	-309.6103
40	-183.4597	-121.4263	-309.6103	-260.7074	-53.7733	-203.3040
41	-260.7074	-53.7733	-203.3040	46.7509	-3.5046	5.5756
42	46.7509	-3.5046	5.5756	44.2104	-3.5049	5.5756
43	44.2104	-3.5049	5.5756	41.6694	-3.5055	5.5756
44	41.6694	-3.5055	5.5756	39.1284	-3.5050	5.5756
45	39.1284	-3.5050	5.5756	36.5891	-3.5058	5.5756
46	36.5891	-3.5058	5.5756	34.0476	-3.5054	5.5756
47	34.0476	-3.5054	5.5756	31.5082	-3.5015	5.5756
48	31.5082	-3.5015	5.5756	28.9716	-3.4981	5.5756
49	28.9716	-3.4981	5.5756	26.4359	-3.4985	5.5756
50	26.4359	-3.4985	5.5756	23.8995	-3.4969	5.5756
51	23.8995	-3.4969	5.5756	21.3643	-3.4928	5.5756
52	21.3643	-3.4928	5.5756	75.9377	-6.9962	-138.5981
53	75.9377	-6.9962	-138.5981	70.8649	-6.9941	-138.5984
54	70.8649	-6.9941	-138.5984	109.3188	-15.8587	-157.9116
55	109.3188	-15.8587	-157.9116	140.4454	-26.0950	-179.6956
56	140.4454	-26.0950	-179.6956	161.3922	-37.6725	-204.1901
57	161.3922	-37.6725	-204.1901	134.0785	-37.6762	-204.1903
58	134.0785	-37.6762	-204.1903	165.2896	-51.9144	-214.3003
59	165.2896	-51.9144	-214.3003	123.5251	-66.9129	-254.0500
60	123.5251	-66.9129	-254.0500	75.0116	-66.9126	-254.0497

ENVOL. MAX. TORSORES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-89.5006	97.9420	310.7982	-18.4927	97.9457	310.7982
2	-18.4927	97.9457	310.7982	45.7711	82.9470	271.0483
3	45.7711	82.9470	271.0483	103.2822	67.9485	231.2983
4	103.2822	67.9485	231.2983	152.5443	67.9429	231.2984
5	152.5443	67.9429	231.2984	192.4312	52.9315	191.5483
6	192.4312	52.9315	191.5483	90.5989	30.0678	157.4644
7	90.5989	30.0678	157.4644	69.8546	20.1692	127.3924
8	69.8546	20.1692	127.3924	84.4772	20.1702	127.3924
9	84.4772	20.1702	127.3924	50.4247	11.6278	99.7461
10	50.4247	11.6278	99.7461	9.0877	5.1988	72.2655
11	9.0877	5.1988	72.2655	12.8568	5.1988	72.2656
12	12.8568	5.1988	72.2656	-28.3947	-1.2880	46.4678
13	-28.3947	-1.2880	46.4678	-65.5833	-7.8954	22.2920
14	-65.5833	-7.8954	22.2920	-99.7023	-14.6912	-0.3970
15	-99.7023	-14.6912	-0.3970	-110.3531	-14.6924	-0.3970
16	-110.3531	-14.6924	-0.3970	-0.0636	0.8167	-2.4128
17	-0.0636	0.8167	-2.4128	0.5285	0.8167	-2.4128
18	0.5285	0.8167	-2.4128	1.1207	0.8168	-2.4128
19	1.1207	0.8168	-2.4128	1.7129	0.8168	-2.4128
20	1.7129	0.8168	-2.4128	-359.7660	51.6337	163.4691
21	-359.7660	51.6337	163.4691	-282.1307	135.7156	368.5361

22	-282.1307	135.7156	368.5361	-159.2021	120.7171	328.7860	14	4.4967	-63.5662	-117.6712	1.9381	-73.6281	-140.1410
23	-159.2021	120.7171	328.7860	-49.7710	105.7162	289.0360	15	1.9381	-73.6281	-140.1410	-51.4423	-73.6292	-140.1410
24	-49.7710	105.7162	289.0360	-63.0295	93.5224	249.9835	16	-51.4423	-73.6292	-140.1410	-67.8316	-84.3455	-165.1011
25	-63.0295	93.5224	249.9835	-17.0652	81.5858	215.2071	17	-67.8316	-84.3455	-165.1011	-92.2184	-95.7197	-192.8289
26	-17.0652	81.5858	215.2071	15.4569	70.4001	182.5078	18	-92.2184	-95.7197	-192.8289	-125.8884	-107.7531	-223.5710
27	15.4569	70.4001	182.5078	36.7073	59.9270	152.0796	19	-125.8884	-107.7531	-223.5710	-204.0110	-107.7514	-223.5710
28	36.7073	59.9270	152.0796	48.9246	50.1055	123.1711	20	-204.0110	-107.7514	-223.5710	-164.4841	-49.3698	-136.7142
29	48.9246	50.1055	123.1711	53.9743	40.8101	94.8793	21	-164.4841	-49.3698	-136.7142	-180.4180	13.1715	-27.6985
30	53.9743	40.8101	94.8793	92.7444	25.8098	55.1294	22	-180.4180	13.1715	-27.6985	-160.6898	12.6212	-31.1616
31	92.7444	25.8098	55.1294	117.2661	25.8112	55.1293	23	-160.6898	12.6212	-31.1616	-134.1786	11.4307	-36.0607
32	117.2661	25.8112	55.1293	128.2891	10.8156	15.3794	24	-134.1786	11.4307	-36.0607	-101.7377	9.5191	-42.4624
33	128.2891	10.8156	15.3794	0.2684	-0.1131	0.0949	25	-101.7377	9.5191	-42.4624	-64.5595	6.8244	-50.4339
34	0.2684	-0.1131	0.0949	0.1610	-0.1130	0.0949	26	-64.5595	6.8244	-50.4339	-24.1201	3.2980	-60.0424
35	0.1610	-0.1130	0.0949	0.0536	-0.1130	0.0949	27	-24.1201	3.2980	-60.0424	17.8634	-1.1131	-71.3544
36	0.0536	-0.1130	0.0949	-0.0538	-0.1130	0.0949	28	17.8634	-1.1131	-71.3544	59.4911	-6.4368	-84.4380
37	-0.0538	-0.1130	0.0949	-0.1612	-0.1130	0.0949	29	59.4911	-6.4368	-84.4380	98.7297	-12.6880	-99.3595
38	-0.1612	-0.1130	0.0949	-0.2686	-0.1130	0.0949	30	98.7297	-12.6880	-99.3595	133.4606	-19.8885	-116.1864
39	-0.2686	-0.1130	0.0949	-0.3760	-0.1130	0.0949	31	133.4606	-19.8885	-116.1864	114.5692	-19.8878	-116.1866
40	-0.3760	-0.1130	0.0949	-0.4642	-0.0406	0.0199	32	114.5692	-19.8878	-116.1866	134.9145	-28.0280	-134.9856
41	-0.4642	-0.0406	0.0199	-323.7292	127.9906	262.7029	33	134.9145	-28.0280	-134.9856	145.3296	-36.9929	-155.9189
42	-323.7292	127.9906	262.7029	-230.9353	127.9895	262.7028	34	145.3296	-36.9929	-155.9189	144.5856	-47.1244	-178.5738
43	-230.9353	127.9895	262.7028	-148.2695	112.9890	222.9527	35	144.5856	-47.1244	-178.5738	130.0867	-58.3701	-203.0157
44	-148.2695	112.9890	222.9527	-72.3478	97.9908	183.2023	36	130.0867	-58.3701	-203.0157	99.4040	-70.7137	-229.3201
45	-72.3478	97.9908	183.2023	-3.1830	83.0070	143.4523	37	99.4040	-70.7137	-229.3201	50.4101	-84.0545	-257.5732
46	-3.1830	83.0070	143.4523	56.9961	83.0150	143.4522	38	50.4101	-84.0545	-257.5732	-18.6273	-98.2850	-287.8715
47	56.9961	83.0150	143.4522	108.5455	68.0112	103.7018	39	-18.6273	-98.2850	-287.8715	-109.0009	-113.3178	-320.3215
48	108.5455	68.0112	103.7018	153.3625	53.0172	63.9516	40	-109.0009	-113.3178	-320.3215	-260.7074	-53.7733	-203.3040
49	153.3625	53.0172	63.9516	191.4231	38.0312	24.2013	41	-260.7074	-53.7733	-203.3040	-288.5121	22.0052	-54.8584
50	191.4231	38.0312	24.2013	219.0020	38.0480	24.2010	42	-288.5121	22.0052	-54.8584	-272.5584	22.0056	-54.8585
51	219.0020	38.0480	24.2010	21.3643	-3.4928	5.5756	43	-272.5584	22.0056	-54.8585	-252.0947	21.7327	-59.4639
52	21.3643	-3.4928	5.5756	18.8312	-3.4938	5.5756	44	-252.0947	21.7327	-59.4639	-222.6463	20.6732	-65.5482
53	18.8312	-3.4938	5.5756	16.2969	-3.4944	5.5756	45	-222.6463	20.6732	-65.5482	-184.8203	18.7444	-73.1962
54	16.2969	-3.4944	5.5756	13.7650	-3.4922	5.5756	46	-184.8203	18.7444	-73.1962	-171.2229	18.7553	-73.1962
55	13.7650	-3.4922	5.5756	11.2337	-3.4915	5.5756	47	-171.2229	18.7553	-73.1962	-128.0512	15.8439	-82.5059
56	11.2337	-3.4915	5.5756	8.7015	-3.4917	5.5756	48	-128.0512	15.8439	-82.5059	-79.5028	11.9005	-93.5895
57	8.7015	-3.4917	5.5756	6.1703	-3.4918	5.5756	49	-79.5028	11.9005	-93.5895	-27.2108	6.8331	-106.5754
58	6.1703	-3.4918	5.5756	3.6389	-3.4922	5.5756	50	-27.2108	6.8331	-106.5754	-22.2558	6.8297	-106.5755
59	3.6389	-3.4922	5.5756	1.1075	-3.4918	5.5756	51	-22.2558	6.8297	-106.5755	27.4049	0.5563	-121.5466
60	1.1075	-3.4918	5.5756	-1.4236	-3.4912	5.5756	52	27.4049	0.5563	-121.5466	75.9377	-6.9962	-138.5981
							53	75.9377	-6.9962	-138.5981	70.8649	-6.9941	-138.5984
							54	70.8649	-6.9941	-138.5984	109.3188	-15.8587	-157.9116
							55	109.3188	-15.8587	-157.9116	140.4454	-26.0950	-179.6956
							56	140.4454	-26.0950	-179.6956	161.3922	-37.6725	-204.1901
							57	161.3922	-37.6725	-204.1901	134.0785	-37.6762	-204.1903
							58	134.0785	-37.6762	-204.1903	132.5540	-50.6233	-231.6661
							59	132.5540	-50.6233	-231.6661	114.0603	-64.9165	-262.4191
							60	114.0603	-64.9165	-262.4191	66.9994	-64.9123	-262.4191
ENVOL. MAX. FLECTORES TREN TREN SIN CARGA, EC-1 en via 1													
							Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
							=====						
1	-9.5330	0.8161	-2.4128	-8.9412	0.8162	-2.4128							
2	-8.9412	0.8162	-2.4128	-3.2977	0.3386	-5.9111							
3	-3.2977	0.3386	-5.9111	14.1870	-1.4282	-10.7362							
4	14.1870	-1.4282	-10.7362	13.1509	-1.4286	-10.7362							
5	13.1509	-1.4286	-10.7362	37.5563	-4.4753	-17.1325							
6	37.5563	-4.4753	-17.1325	67.5245	-8.7805	-25.3328							
7	67.5245	-8.7805	-25.3328	26.6944	-29.1819	-41.8540							
8	26.6944	-29.1819	-41.8540	5.5378	-29.1799	-41.8540							
9	5.5378	-29.1799	-41.8540	18.0592	-37.0015	-60.8832							
10	18.0592	-37.0015	-60.8832	30.5466	-45.2994	-78.9521							
11	30.5466	-45.2994	-78.9521	-2.2962	-45.3004	-78.9520							
12	-2.2962	-45.3004	-78.9520	2.5565	-54.1390	-97.3851							
13	2.5565	-54.1390	-97.3851	4.4967	-63.5662	-117.6712							

8	21.1535	1.9405	9.2881	22.5606	1.9402	9.2881								
9	22.5606	1.9402	9.2881	23.3111	0.6891	5.9756		1	-7.4584	8.1618	25.8998	-2.1603	6.6987	24.1696
10	23.3111	0.6891	5.9756	23.4985	-0.5610	2.6631		2	-2.1603	6.6987	24.1696	-0.6958	0.0680	-0.2011
11	23.4985	-0.5610	2.6631	23.0919	-0.5616	2.6631		3	-0.6958	0.0680	-0.2011	-0.6465	0.0680	-0.2011
12	23.0919	-0.5616	2.6631	21.8088	-1.8119	-0.6494		4	-0.6465	0.0680	-0.2011	-0.5972	0.0680	-0.2011
13	21.8088	-1.8119	-0.6494	19.9650	-3.0615	-3.9619		5	-0.5972	0.0680	-0.2011	-0.5479	0.0680	-0.2011
14	19.9650	-3.0615	-3.9619	17.5578	-4.3125	-7.2744		6	-0.5479	0.0680	-0.2011	-0.4986	0.0680	-0.2011
15	17.5578	-4.3125	-7.2744	14.4307	-4.3140	-7.2744		7	-0.4986	0.0680	-0.2011	-0.4493	0.0680	-0.2011
16	14.4307	-4.3140	-7.2744	10.5541	-5.5643	-10.5869		8	-0.4493	0.0680	-0.2011	-0.3999	0.0680	-0.2011
17	10.5541	-5.5643	-10.5869	6.1144	-6.8140	-13.8994		9	-0.3999	0.0680	-0.2011	-0.3506	0.0680	-0.2011
18	6.1144	-6.8140	-13.8994	1.1120	-8.0642	-17.2119		10	-0.3506	0.0680	-0.2011	-0.3013	0.0680	-0.2011
19	1.1120	-8.0642	-17.2119	0.1427	0.0681	-0.2011		11	-0.3013	0.0680	-0.2011	-0.2520	0.0680	-0.2011
20	0.1427	0.0681	-0.2011	0.1654	0.0293	-0.0966		12	-0.2520	0.0680	-0.2011	-0.2026	0.0680	-0.2011
21	0.1654	0.0293	-0.0966	0.1298	-0.0094	0.0079		13	-0.2026	0.0680	-0.2011	-0.1533	0.0680	-0.2011
22	0.1298	-0.0094	0.0079	0.1208	-0.0094	0.0079		14	-0.1533	0.0680	-0.2011	-0.1040	0.0680	-0.2011
23	0.1208	-0.0094	0.0079	0.1119	-0.0094	0.0079		15	-0.1040	0.0680	-0.2011	-1.3616	-5.8029	-8.9553
24	0.1119	-0.0094	0.0079	0.1029	-0.0094	0.0079		16	-1.3616	-5.8029	-8.9553	-6.3191	-7.0532	-12.2678
25	0.1029	-0.0094	0.0079	3.4637	7.0503	15.3370		17	-6.3191	-7.0532	-12.2678	-11.8388	-8.3032	-15.5803
26	3.4637	7.0503	15.3370	10.0401	5.9455	12.6935		18	-11.8388	-8.3032	-15.5803	-17.9214	-9.5534	-18.8928
27	10.0401	5.9455	12.6935	15.5023	4.7053	9.4753		19	-17.9214	-9.5534	-18.8928	-24.8477	-9.5534	-18.8928
28	15.5023	4.7053	9.4753	19.8466	3.4547	6.1628		20	-24.8477	-9.5534	-18.8928	-39.4034	1.3256	5.2288
29	19.8466	3.4547	6.1628	23.0665	2.2042	2.8503		21	-39.4034	1.3256	5.2288	-34.1883	12.2049	29.3503
30	23.0665	2.2042	2.8503	25.1615	0.9553	-0.4622		22	-34.1883	12.2049	29.3503	-23.0936	10.9548	26.0378
31	25.1615	0.9553	-0.4622	26.0695	0.9562	-0.4622		23	-23.0936	10.9548	26.0378	-13.1244	9.7048	22.7253
32	26.0695	0.9562	-0.4622	25.8538	-0.2941	-3.7747		24	-13.1244	9.7048	22.7253	-11.9062	1.0975	-2.3082
33	25.8538	-0.2941	-3.7747	24.5123	-1.5445	-7.0872		25	-11.9062	1.0975	-2.3082	-10.8635	1.0977	-2.3082
34	24.5123	-1.5445	-7.0872	22.0461	-2.7939	-10.3997		26	-10.8635	1.0977	-2.3082	-9.8204	1.0979	-2.3082
35	22.0461	-2.7939	-10.3997	18.4547	-4.0435	-13.7122		27	-9.8204	1.0979	-2.3082	-8.7774	1.0979	-2.3082
36	18.4547	-4.0435	-13.7122	13.7381	-5.2938	-17.0247		28	-8.7774	1.0979	-2.3082	-7.7343	1.0977	-2.3082
37	13.7381	-5.2938	-17.0247	7.8959	-6.5440	-20.3372		29	-7.7343	1.0977	-2.3082	-6.6918	1.0975	-2.3082
38	7.8959	-6.5440	-20.3372	2.6898	1.0973	-2.3082		30	-6.6918	1.0975	-2.3082	-5.6490	1.0974	-2.3082
39	2.6898	1.0973	-2.3082	3.7322	1.0973	-2.3082		31	-5.6490	1.0974	-2.3082	-4.6066	1.0970	-2.3082
40	3.7322	1.0973	-2.3082	4.4395	0.4023	-0.8346		32	-4.6066	1.0970	-2.3082	-3.5645	1.0971	-2.3082
41	4.4395	0.4023	-0.8346	3.8959	-0.2921	0.4646		33	-3.5645	1.0971	-2.3082	-2.5221	1.0965	-2.1339
42	3.8959	-0.2921	0.4646	3.6842	-0.2921	0.4646		34	-2.5221	1.0965	-2.1339	-1.4803	1.0965	-2.1339
43	3.6842	-0.2921	0.4646	3.4724	-0.2921	0.4646		35	-1.4803	1.0965	-2.1339	-0.4386	1.0966	-2.1339
44	3.4724	-0.2921	0.4646	3.2607	-0.2920	0.4646		36	-0.4386	1.0966	-2.1339	-0.0045	-0.0094	0.0079
45	3.2607	-0.2920	0.4646	3.0490	-0.2919	0.4646		37	-0.0045	-0.0094	0.0079	-2.9927	-7.4581	-20.9640
46	3.0490	-0.2919	0.4646	2.8373	-0.2919	0.4646		38	-2.9927	-7.4581	-20.9640	-10.8279	-8.7078	-24.2765
47	2.8373	-0.2919	0.4646	3.6266	6.2789	7.3249		39	-10.8279	-8.7078	-24.2765	-19.7874	-9.9577	-27.5890
48	3.6266	6.2789	7.3249	7.8048	5.0297	4.0124		40	-19.7874	-9.9577	-27.5890	-36.8669	0.6602	-3.5070
49	7.8048	5.0297	4.0124	11.4204	3.7795	0.6998		41	-36.8669	0.6602	-3.5070	-35.0596	11.2782	20.5750
50	11.4204	3.7795	0.6998	14.1609	3.7801	0.6998		42	-35.0596	11.2782	20.5750	-26.8827	11.2780	20.5750
51	14.1609	3.7801	0.6998	16.3086	2.5306	-2.6127		43	-26.8827	11.2780	20.5750	-19.5703	1.6811	-4.3239
52	16.3086	2.5306	-2.6127	17.8937	1.2807	-5.9252		44	-19.5703	1.6811	-4.3239	-18.3515	1.6812	-4.3239
53	17.8937	1.2807	-5.9252	18.8232	1.2815	-5.9253		45	-18.3515	1.6812	-4.3239	-17.1332	1.6813	-4.3239
54	18.8232	1.2815	-5.9253	18.9407	0.0328	-9.2378		46	-17.1332	1.6813	-4.3239	-15.9143	1.6808	-4.3239
55	18.9407	0.0328	-9.2378	18.4967	-1.2169	-12.5502		47	-15.9143	1.6808	-4.3239	-14.6990	1.6737	-4.1033
56	18.4967	-1.2169	-12.5502	17.4892	-2.4662	-15.8628		48	-14.6990	1.6737	-4.1033	-13.4871	1.6731	-4.1033
57	17.4892	-2.4662	-15.8628	15.7013	-2.4657	-15.8628		49	-13.4871	1.6731	-4.1033	-12.2739	1.6737	-4.1033
58	15.7013	-2.4657	-15.8628	13.2258	-3.7164	-19.1753		50	-12.2739	1.6737	-4.1033	-11.0609	1.6722	-4.1033
59	13.2258	-3.7164	-19.1753	10.1875	-4.9665	-22.4878		51	-11.0609	1.6722	-4.1033	-9.8494	1.6710	-4.1033
60	10.1875	-4.9665	-22.4878	6.5873	-4.9660	-22.4878		52	-9.8494	1.6710	-4.1033	-8.6376	1.6712	-4.1033
								53	-8.6376	1.6712	-4.1033	-7.4261	1.6707	-4.1033
								54	-7.4261	1.6707	-4.1033	-6.2153	1.6698	-4.1033
ENVOL. MIN. FLECTORES TREN TREN SIN CARGA, EC-1 en via 1								55	-6.2153	1.6698	-4.1033	-5.0051	1.6702	-4.1033
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2		56	-5.0051	1.6702	-4.1033	-3.7938	1.6701	-4.1033
=====								57	-3.7938	1.6701	-4.1033	-2.5837	1.6695	-4.1033
								58	-2.5837	1.6695	-4.1033	-1.3730	1.6695	-4.1033

ENVOL. MIN. FLECTORES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						

59 -1.3730 1.6695 -4.1033 -0.1798 1.5347 -3.6539
 60 -0.1798 1.5347 -3.6539 -0.1186 -0.2909 0.4646
 ENVOL. MAX. CORTANTES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====
1	-7.4459	8.1906	25.8505	-1.5076	8.1906	25.8505
2	-1.5076	8.1906	25.8505	3.8682	6.9409	22.5380
3	3.8682	6.9409	22.5380	8.6818	5.6908	19.2255
4	8.6818	5.6908	19.2255	12.8075	5.6902	19.2255
5	12.8075	5.6902	19.2255	16.1518	4.4406	15.9130
6	16.1518	4.4406	15.9130	18.9345	3.1909	12.6005
7	18.9345	3.1909	12.6005	21.1535	1.9405	9.2881
8	21.1535	1.9405	9.2881	22.5606	1.9402	9.2881
9	22.5606	1.9402	9.2881	23.3111	0.6891	5.9756
10	23.3111	0.6891	5.9756	-0.3013	0.0680	-0.2011
11	-0.3013	0.0680	-0.2011	-0.2520	0.0680	-0.2011
12	-0.2520	0.0680	-0.2011	-0.2026	0.0680	-0.2011
13	-0.2026	0.0680	-0.2011	-0.1533	0.0680	-0.2011
14	-0.1533	0.0680	-0.2011	-0.1040	0.0680	-0.2011
15	-0.1040	0.0680	-0.2011	-0.0547	0.0680	-0.2011
16	-0.0547	0.0680	-0.2011	-0.0053	0.0681	-0.2011
17	-0.0053	0.0681	-0.2011	0.0440	0.0681	-0.2011
18	0.0440	0.0681	-0.2011	0.0934	0.0681	-0.2011
19	0.0934	0.0681	-0.2011	0.1427	0.0681	-0.2011
20	0.1427	0.0681	-0.2011	-39.4034	1.3256	5.2288
21	-39.4034	1.3256	5.2288	-34.1883	12.2049	29.3503
22	-34.1883	12.2049	29.3503	-23.0936	10.9548	26.0378
23	-23.0936	10.9548	26.0378	-13.1244	9.7048	22.7253
24	-13.1244	9.7048	22.7253	-4.2801	8.4549	19.4128
25	-4.2801	8.4549	19.4128	3.4390	7.2046	16.1003
26	3.4390	7.2046	16.1003	10.0330	5.9549	12.7878
27	10.0330	5.9549	12.7878	15.5023	4.7053	9.4753
28	15.5023	4.7053	9.4753	19.8466	3.4547	6.1628
29	19.8466	3.4547	6.1628	23.0665	2.2042	2.8503
30	23.0665	2.2042	2.8503	-5.6490	1.0974	-2.3082
31	-5.6490	1.0974	-2.3082	-4.6066	1.0970	-2.3082
32	-4.6066	1.0970	-2.3082	-3.5645	1.0971	-2.3082
33	-3.5645	1.0971	-2.3082	-2.5221	1.0974	-2.3082
34	-2.5221	1.0974	-2.3082	-1.4797	1.0974	-2.3082
35	-1.4797	1.0974	-2.3082	-0.4374	1.0971	-2.3082
36	-0.4374	1.0971	-2.3082	0.6048	1.0970	-2.3082
37	0.6048	1.0970	-2.3082	1.6472	1.0972	-2.3082
38	1.6472	1.0972	-2.3082	2.6898	1.0973	-2.3082
39	2.6898	1.0973	-2.3082	3.7322	1.0973	-2.3082
40	3.7322	1.0973	-2.3082	-36.8669	0.6602	-3.5070
41	-36.8669	0.6602	-3.5070	-35.0596	11.2782	20.5750
42	-35.0596	11.2782	20.5750	-26.8827	11.2780	20.5750
43	-26.8827	11.2780	20.5750	-19.5498	10.0280	17.2624
44	-19.5498	10.0280	17.2624	-12.7792	8.7785	13.9499
45	-12.7792	8.7785	13.9499	-6.5710	7.5283	10.6374
46	-6.5710	7.5283	10.6374	-1.1130	7.5280	10.6374
47	-1.1130	7.5280	10.6374	3.6266	6.2789	7.3249
48	3.6266	6.2789	7.3249	7.8048	5.0297	4.0124
49	7.8048	5.0297	4.0124	11.4204	3.7795	0.6998
50	11.4204	3.7795	0.6998	14.1609	3.7801	0.6998
51	14.1609	3.7801	0.6998	16.3086	2.5306	-2.6127
52	16.3086	2.5306	-2.6127	-8.6143	1.6764	-4.3239

53 -8.6143 1.6764 -4.3239 -7.3986 1.6772 -4.3239
 54 -7.3986 1.6772 -4.3239 -6.1833 1.6764 -4.3239
 55 -6.1833 1.6764 -4.3239 -4.9690 1.6758 -4.3239
 56 -4.9690 1.6758 -4.3239 -3.7542 1.6758 -4.3239
 57 -3.7542 1.6758 -4.3239 -2.5394 1.6755 -4.3239
 58 -2.5394 1.6755 -4.3239 -1.3249 1.6751 -4.3239
 59 -1.3249 1.6751 -4.3239 -0.1106 1.6750 -4.3239
 60 -0.1106 1.6750 -4.3239 1.1040 1.6752 -4.3239

ENVOL. MIN. CORTANTES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====
1	-0.7944	0.0680	-0.2011	-0.7451	0.0680	-0.2011
2	-0.7451	0.0680	-0.2011	-0.2748	0.0282	-0.4926
3	-0.2748	0.0282	-0.4926	1.1823	-0.1190	-0.8947
4	1.1823	-0.1190	-0.8947	1.0959	-0.1190	-0.8947
5	1.0959	-0.1190	-0.8947	3.1297	-0.3731	-1.4277
6	3.1297	-0.3731	-1.4277	5.6270	-0.7317	-2.1111
7	5.6270	-0.7317	-2.1111	8.3745	-1.1939	-2.9630
8	8.3745	-1.1939	-2.9630	7.5093	-1.1941	-2.9630
9	7.5093	-1.1941	-2.9630	9.8967	-1.7557	-4.0006
10	9.8967	-1.7557	-4.0006	12.0690	-2.4150	-5.2397
11	12.0690	-2.4150	-5.2397	10.3182	-2.4155	-5.2397
12	10.3182	-2.4155	-5.2397	9.2589	-3.3028	-2.3303
13	9.2589	-3.3028	-2.3303	6.3336	-4.5532	-5.6428
14	6.3336	-4.5532	-5.6428	2.8452	-5.8032	-8.9553
15	2.8452	-5.8032	-8.9553	-1.3616	-5.8029	-8.9553
16	-1.3616	-5.8029	-8.9553	-6.3191	-7.0532	-12.2678
17	-6.3191	-7.0532	-12.2678	-11.8388	-8.3032	-15.5803
18	-11.8388	-8.3032	-15.5803	-17.9214	-9.5534	-18.8928
19	-17.9214	-9.5534	-18.8928	-24.8477	-9.5534	-18.8928
20	-24.8477	-9.5534	-18.8928	-13.7071	-4.1142	-11.3928
21	-13.7071	-4.1142	-11.3928	0.1298	-0.0094	0.0079
22	0.1298	-0.0094	0.0079	0.1208	-0.0094	0.0079
23	0.1208	-0.0094	0.0079	0.1119	-0.0094	0.0079
24	0.1119	-0.0094	0.0079	0.1029	-0.0094	0.0079
25	0.1029	-0.0094	0.0079	0.0940	-0.0094	0.0079
26	0.0940	-0.0094	0.0079	0.0850	-0.0094	0.0079
27	0.0850	-0.0094	0.0079	1.4886	-0.0928	-5.9462
28	1.4886	-0.0928	-5.9462	4.9575	-0.5362	-7.0365
29	4.9575	-0.5362	-7.0365	8.2274	-1.0573	-8.2800
30	8.2274	-1.0573	-8.2800	11.1218	-1.6575	-9.6822
31	11.1218	-1.6575	-9.6822	9.5473	-1.6574	-9.6822
32	9.5473	-1.6574	-9.6822	11.2430	-2.3353	-11.2488
33	11.2430	-2.3353	-11.2488	12.1332	-3.0925	-12.9853
34	12.1332	-3.0925	-12.9853	12.0475	-3.9255	-14.8974
35	12.0475	-3.9255	-14.8974	9.3021	-4.9576	-17.6515
36	9.3021	-4.9576	-17.6515	3.7168	-6.2084	-20.9640
37	3.7168	-6.2084	-20.9640	-2.9927	-7.4581	-24.2765
38	-2.9927	-7.4581	-24.2765	-8.7078	-9.9577	-27.5890
39	-8.7078	-9.9577	-27.5890	-19.7874	-4.3137	-17.2361
40	-19.7874	-4.3137	-17.2361	3.8959	-0.2921	0.4646
41	3.8959	-0.2921	0.4646	3.6842	-0.2921	0.4646
42	3.6842	-0.2921	0.4646	3.4724	-0.2921	0.4646
43	3.4724	-0.2921	0.4646	3.2607	-0.2920	0.4646
44	3.2607	-0.2920	0.4646			

45	3.2607	-0.2920	0.4646	3.0490	-0.2919	0.4646
46	3.0490	-0.2919	0.4646	2.8373	-0.2919	0.4646
47	2.8373	-0.2919	0.4646	2.6258	-0.2916	0.4646
48	2.6258	-0.2916	0.4646	2.4144	-0.2914	0.4646
49	2.4144	-0.2914	0.4646	2.2029	-0.2914	0.4646
50	2.2029	-0.2914	0.4646	1.9917	-0.2912	0.4646
51	1.9917	-0.2912	0.4646	1.7805	-0.2912	0.4646
52	1.7805	-0.2912	0.4646	6.8011	-0.6696	-11.4374
53	6.8011	-0.6696	-11.4374	6.3158	-0.6691	-11.4374
54	6.3158	-0.6691	-11.4374	9.2084	-1.3438	-13.1726
55	9.2084	-1.3438	-13.1726	11.5375	-2.1161	-15.1460
56	11.5375	-2.1161	-15.1460	13.1017	-2.9880	-17.3757
57	13.1017	-2.9880	-17.3757	10.9352	-2.9876	-17.3757
58	10.9352	-2.9876	-17.3757	10.8205	-3.9610	-19.8811
59	10.8205	-3.9610	-19.8811	9.4435	-5.0373	-22.6826
60	9.4435	-5.0373	-22.6826	5.7912	-5.0373	-22.6826

ENVOL. MAX. TORSORES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-7.4584	8.1618	25.8998	-1.5410	8.1620	25.8998
2	-1.5410	8.1620	25.8998	3.8143	6.9123	22.5873
3	3.8143	6.9123	22.5873	8.6068	5.6624	19.2748
4	8.6068	5.6624	19.2748	12.7120	5.6622	19.2748
5	12.7120	5.6622	19.2748	16.0355	4.4127	15.9624
6	16.0355	4.4127	15.9624	18.7976	3.1624	12.6499
7	18.7976	3.1624	12.6499	20.9957	1.9122	9.3374
8	20.9957	1.9122	9.3374	22.3823	1.9121	9.3374
9	22.3823	1.9121	9.3374	23.1118	0.6614	6.0249
10	23.1118	0.6614	6.0249	23.2789	-0.5890	2.7124
11	23.2789	-0.5890	2.7124	22.8516	-0.5904	2.7124
12	22.8516	-0.5904	2.7124	-0.2026	0.0680	-0.2011
13	-0.2026	0.0680	-0.2011	-0.1533	0.0680	-0.2011
14	-0.1533	0.0680	-0.2011	-0.1040	0.0680	-0.2011
15	-0.1040	0.0680	-0.2011	-0.0547	0.0680	-0.2011
16	-0.0547	0.0680	-0.2011	-0.0053	0.0681	-0.2011
17	-0.0053	0.0681	-0.2011	0.0440	0.0681	-0.2011
18	0.0440	0.0681	-0.2011	0.0934	0.0681	-0.2011
19	0.0934	0.0681	-0.2011	0.1427	0.0681	-0.2011
20	0.1427	0.0681	-0.2011	-38.8086	1.2719	5.2744
21	-38.8086	1.2719	5.2744	-33.9590	12.1278	29.3947
22	-33.9590	12.1278	29.3947	-22.9376	10.8778	26.0822
23	-22.9376	10.8778	26.0822	-13.0414	9.6279	22.7697
24	-13.0414	9.6279	22.7697	-4.2703	8.3780	19.4572
25	-4.2703	8.3780	19.4572	3.3760	7.1277	16.1447
26	3.3760	7.1277	16.1447	9.8968	5.8778	12.8322
27	9.8968	5.8778	12.8322	15.2932	4.6273	9.5197
28	15.2932	4.6273	9.5197	19.5641	3.3769	6.2072
29	19.5641	3.3769	6.2072	22.7101	2.1284	2.8947
30	22.7101	2.1284	2.8947	0.0492	-0.0094	0.0079
31	0.0492	-0.0094	0.0079	0.0403	-0.0094	0.0079
32	0.0403	-0.0094	0.0079	0.0313	-0.0094	0.0079
33	0.0313	-0.0094	0.0079	0.0224	-0.0094	0.0079
34	0.0224	-0.0094	0.0079	0.0134	-0.0094	0.0079
35	0.0134	-0.0094	0.0079	0.0045	-0.0094	0.0079
36	0.0045	-0.0094	0.0079	-0.0045	-0.0094	0.0079
37	-0.0045	-0.0094	0.0079	-0.0134	-0.0094	0.0079
38	-0.0134	-0.0094	0.0079	-0.0224	-0.0094	0.0079

39	-0.0224	-0.0094	0.0079	-0.0313	-0.0094	0.0079
40	-0.0313	-0.0094	0.0079	-0.0387	-0.0034	0.0016
41	-0.0387	-0.0034	0.0016	-35.0596	11.2782	20.5750
42	-35.0596	11.2782	20.5750	-26.8827	11.2780	20.5750
43	-26.8827	11.2780	20.5750	-19.5498	10.0280	17.2624
44	-19.5498	10.0280	17.2624	-12.7792	8.7785	13.9499
45	-12.7792	8.7785	13.9499	-6.5710	7.5283	10.6374
46	-6.5710	7.5283	10.6374	-1.1130	7.5280	10.6374
47	-1.1130	7.5280	10.6374	3.6266	6.2789	7.3249
48	3.6266	6.2789	7.3249	7.8048	5.0297	4.0124
49	7.8048	5.0297	4.0124	11.4204	3.7795	0.6998
50	11.4204	3.7795	0.6998	14.1609	3.7801	0.6998
51	14.1609	3.7801	0.6998	1.7805	-0.2912	0.4646
52	1.7805	-0.2912	0.4646	1.5693	-0.2914	0.4646
53	1.5693	-0.2914	0.4646	1.3581	-0.2914	0.4646
54	1.3581	-0.2914	0.4646	1.1470	-0.2910	0.4646
55	1.1470	-0.2910	0.4646	0.9362	-0.2909	0.4646
56	0.9362	-0.2909	0.4646	0.7251	-0.2911	0.4646
57	0.7251	-0.2911	0.4646	0.5142	-0.2909	0.4646
58	0.5142	-0.2909	0.4646	0.3033	-0.2909	0.4646
59	0.3033	-0.2909	0.4646	0.0923	-0.2910	0.4646
60	0.0923	-0.2910	0.4646	-0.1186	-0.2909	0.4646

ENVOL. MIN. TORSORES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-0.7944	0.0680	-0.2011	-0.7451	0.0680	-0.2011
2	-0.7451	0.0680	-0.2011	-0.2748	0.0282	-0.4926
3	-0.2748	0.0282	-0.4926	1.1823	-0.1190	-0.8947
4	1.1823	-0.1190	-0.8947	1.0959	-0.1190	-0.8947
5	1.0959	-0.1190	-0.8947	3.1297	-0.3731	-1.4277
6	3.1297	-0.3731	-1.4277	5.6270	-0.7317	-2.1111
7	5.6270	-0.7317	-2.1111	8.3745	-1.1939	-2.9630
8	8.3745	-1.1939	-2.9630	7.5093	-1.1941	-2.9630
9	7.5093	-1.1941	-2.9630	9.8967	-1.7557	-4.0006
10	9.8967	-1.7557	-4.0006	12.0690	-2.4150	-5.2397
11	12.0690	-2.4150	-5.2397	10.3182	-2.4155	-5.2397
12	10.3182	-2.4155	-5.2397	11.5552	-3.1670	-6.6953
13	11.5552	-3.1670	-6.6953	12.1804	-4.0062	-8.3807
14	12.1804	-4.0062	-8.3807	12.0588	-4.9304	-10.3085
15	12.0588	-4.9304	-10.3085	8.4837	-4.9302	-10.3085
16	8.4837	-4.9302	-10.3085	6.7755	-5.9307	-12.4901
17	6.7755	-5.9307	-12.4901	-11.8388	-8.3032	-15.5803
18	-11.8388	-8.3032	-15.5803	-17.9214	-9.5534	-18.8928
19	-17.9214	-9.5534	-18.8928	-24.8477	-9.5534	-18.8928
20	-24.8477	-9.5534	-18.8928	-13.7071	-4.1142	-11.3928
21	-13.7071	-4.1142	-11.3928	-15.0348	1.0975	-2.3082
22	-15.0348	1.0975	-2.3082	-13.3908	1.0517	-2.5968
23	-13.3908	1.0517	-2.5968	-11.1815	0.9525	-3.0051
24	-11.1815	0.9525	-3.0051	-8.4781	0.7932	-3.5385
25	-8.4781	0.7932	-3.5385	-5.3800	0.5688	-4.2028
26	-5.3800	0.5688	-4.2028	-2.0100	0.2747	-5.0035
27	-2.0100	0.2747	-5.0035	1.4886	-0.0928	-5.9462
28	1.4886	-0.0928	-5.9462	4.9575	-0.5362	-7.0365
29	4.9575	-0.5362	-7.0365	8.2274	-1.0573	-8.2800
30	8.2274	-1.0573	-8.2800	11.1218	-1.6575	-9.6822

31	11.1218	-1.6575	-9.6822	9.5473	-1.6574	-9.6822
32	9.5473	-1.6574	-9.6822	11.2430	-2.3353	-11.2488
33	11.2430	-2.3353	-11.2488	12.1332	-3.0925	-12.9853
34	12.1332	-3.0925	-12.9853	12.0475	-3.9255	-14.8974
35	12.0475	-3.9255	-14.8974	10.8290	-4.8312	-16.9906
36	10.8290	-4.8312	-16.9906	8.3335	-5.8066	-19.2705
37	8.3335	-5.8066	-19.2705	4.4383	-6.8486	-21.7428
38	4.4383	-6.8486	-21.7428	-0.9559	-7.9486	-24.4129
39	-0.9559	-7.9486	-24.4129	-19.7874	-9.9577	-27.5890
40	-19.7874	-9.9577	-27.5890	-19.8485	-4.3137	-17.2361
41	-19.8485	-4.3137	-17.2361	-22.0079	1.6811	-4.3239
42	-22.0079	1.6811	-4.3239	-20.7892	1.6810	-4.3239
43	-20.7892	1.6810	-4.3239	-18.9232	1.6358	-4.6710
44	-18.9232	1.6358	-4.6710	-16.4136	1.5318	-5.1522
45	-16.4136	1.5318	-5.1522	-13.3076	1.3619	-5.7764
46	-13.3076	1.3619	-5.7764	-12.3200	1.3619	-5.7764
47	-12.3200	1.3619	-5.7764	-8.8670	1.1201	-6.5538
48	-8.8670	1.1201	-6.5538	-5.0468	0.8010	-7.4956
49	-5.0468	0.8010	-7.4956	-0.9829	0.3994	-8.6142
50	-0.9829	0.3994	-8.6142	-0.6934	0.3993	-8.6142
51	-0.6934	0.3993	-8.6142	3.1168	-0.0895	-9.9232
52	3.1168	-0.0895	-9.9232	6.8011	-0.6696	-11.4374
53	6.8011	-0.6696	-11.4374	6.3158	-0.6691	-11.4374
54	6.3158	-0.6691	-11.4374	9.2084	-1.3438	-13.1726
55	9.2084	-1.3438	-13.1726	11.5375	-2.1161	-15.1460
56	11.5375	-2.1161	-15.1460	13.1017	-2.9880	-17.3757
57	13.1017	-2.9880	-17.3757	10.9352	-2.9876	-17.3757
58	10.9352	-2.9876	-17.3757	10.8205	-3.9610	-19.8811
59	10.8205	-3.9610	-19.8811	9.4435	-5.0373	-22.6826
60	9.4435	-5.0373	-22.6826	5.7912	-5.0373	-22.6826

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	37.3138	44.9014	-84.6439	81.8807	67.5574	-128.8521
2	81.8807	67.5574	-128.8521	117.3618	37.5559	-67.3521
3	117.3618	37.5559	-67.3521	154.7574	30.3052	-51.4604
4	154.7574	30.3052	-51.4604	179.3622	53.1914	-98.4192
5	179.3622	53.1914	-98.4192	199.1717	23.1924	-36.9193
6	199.1717	23.1924	-36.9193	215.9836	23.1870	-36.9193
7	215.9836	23.1870	-36.9193	224.1566	16.2262	-23.6497
8	224.1566	16.2262	-23.6497	226.9298	-13.7730	37.8502
9	226.9298	-13.7730	37.8502	229.9920	-20.4862	49.9315
10	229.9920	-20.4862	49.9315	218.0204	3.0526	-0.5917
11	218.0204	3.0526	-0.5917	205.9761	-26.9592	60.9082
12	205.9761	-26.9592	60.9082	190.3934	-33.1087	70.8636
13	190.3934	-33.1087	70.8636	167.2220	-8.8904	18.3814
14	167.2220	-8.8904	18.3814	141.2718	-38.8997	79.8813
15	141.2718	-38.8997	79.8813	113.0602	-38.9057	79.8813
16	113.0602	-38.9057	79.8813	80.8291	-49.2571	95.4384
17	80.8291	-49.2571	95.4384	45.1202	-49.2590	95.4384
18	45.1202	-49.2590	95.4384	27.1978	2.1495	3.5074
19	27.1978	2.1495	3.5074	28.7565	2.1497	3.5074
20	28.7565	2.1497	3.5074	32.5052	-2.9194	-5.0696
21	32.5052	-2.9194	-5.0696	27.1061	-7.9886	-13.6467
22	27.1061	-7.9886	-13.6467	58.3020	51.2743	-91.5656
23	58.3020	51.2743	-91.5656	95.3229	47.2339	-79.7551

24	95.3229	47.2339	-79.7551	130.2644	42.7744	-68.3416
25	130.2644	42.7744	-68.3416	161.7054	37.9602	-57.3304
26	161.7054	37.9602	-57.3304	188.3820	32.8455	-46.7219
27	188.3820	32.8455	-46.7219	209.2678	27.5110	-36.5159
28	209.2678	27.5110	-36.5159	223.5969	22.0074	-26.7127
29	223.5969	22.0074	-26.7127	230.8473	16.4137	-17.3118
30	230.8473	16.4137	-17.3118	231.4483	-13.5791	44.1882
31	231.4483	-13.5791	44.1882	227.4923	-19.1994	53.1867
32	227.4923	-19.1994	53.1867	216.1793	-24.7961	61.7827
33	216.1793	-24.7961	61.7827	197.7864	-30.3085	69.9762
34	197.7864	-30.3085	69.9762	172.8286	-40.7459	85.1559
35	172.8286	-40.7459	85.1559	106.5860	-45.5646	92.1421
36	142.0882	-45.5646	92.1421	67.5820	-50.0219	98.7264
37	106.5860	-50.0219	98.7264	26.5078	-54.0623	104.9137
38	67.5820	-54.0623	104.9137	23.0391	6.9311	-6.5372
39	26.5078	6.9311	-6.5372	28.3640	2.4995	-1.6042
40	23.0391	2.4995	-1.6042	25.7037	-1.9318	3.3288
41	28.3640	-1.9318	3.3288	46.4852	-80.0985	-80.0985
42	25.7037	-80.0985	77.1940	19.5969	-18.5984	-18.5984
43	46.4852	77.1940	109.6256	44.8290	-64.1621	-64.1621
44	77.1940	109.6256	44.8290	135.2751	-48.9053	-48.9053
45	109.6256	44.8290	-48.9053	157.9927	-34.4180	-34.4180
46	135.2751	-48.9053	157.9927	180.3098	-20.7837	-20.7837
47	157.9927	-34.4180	180.3098	196.6154	-8.0856	-8.0856
48	180.3098	-20.7837	196.6154	204.9024	-8.6157	-8.6157
49	196.6154	-8.0856	204.9024	212.9005	-15.3560	-15.3560
50	204.9024	-8.6157	212.9005	216.9863	-22.3627	-22.3627
51	212.9005	-15.3560	216.9863	14.6470	-22.3549	-22.3549
52	216.9863	-22.3627	216.9863	159.8438	-29.5911	-29.5911
53	206.6015	-22.3549	216.9863	135.3840	-59.5949	-59.5949
54	198.3934	-29.5911	216.9863	101.0015	-37.0049	-37.0049
55	182.1871	-59.5949	216.9863	57.6710	-67.0033	-67.0033
56	159.8438	-37.0049	216.9863	12.8387	-74.5636	-74.5636
57	135.3840	-67.0033	216.9863	3.3425	9.3522	9.3522
58	101.0015	-74.5636	216.9863			
59	57.6710	9.3522	216.9863			
60	12.8387		216.9863			

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-0.8955	2.1537	3.5074	-2.0731	-11.1236	-23.4670
2	-2.0731	-11.1236	-23.4670	-10.2228	-11.2964	-24.1159
3	-10.2228	-11.2964	-24.1159	-18.4131	-11.2983	-24.1159
4	-18.4131	-11.2983	-24.1159	-26.6038	-11.2969	-24.1159
5	-26.6038	-11.2969	-24.1159	-34.7909	-11.3014	-24.1159
6	-34.7909	-11.3014	-24.1159	-42.9866	-11.2998	-24.1159
7	-42.9866	-11.2998	-24.1159	-51.1736	-11.2931	-24.1159
8	-51.1736	-11.2931	-24.1159	-59.3628	-11.2928	-24.1159
9	-59.3628	-11.2928	-24.1159	-67.5521	-11.2894	-24.1159
10	-67.5521	-11.2894	-24.1159	-75.7412	-11.2850	-24.1159
11	-75.7412	-11.2850	-24.1159	-83.9238	-11.2872	-24.1159
12	-83.9238	-11.2872	-24.1159	-92.1087	-11.2891	-24.1159
13	-92.1087	-11.2891	-24.1159	-100.2899	-11.2842	-24.1159
14	-100.2899	-11.2842	-24.1159	-108.4758	-11.2829	-24.1160
15	-108.4758	-11.2829	-24.1160	-116.6541	-11.2856	-24.1159
16	-116.6541	-11.2856	-24.1159	-124.8357	-11.2860	-24.1159

17	-124.8357	-11.2860	-24.1159	-133.0149	-11.2778	-24.1160
18	-133.0149	-11.2778	-24.1160	-141.1882	-11.2766	-24.1160
19	-141.1882	-11.2766	-24.1160	-149.3654	-11.2791	-24.1160
20	-149.3654	-11.2791	-24.1160	-148.1067	23.1175	-61.0661
21	-148.1067	23.1175	-61.0661	-95.4983	6.9326	-6.5372
22	-95.4983	6.9326	-6.5372	-88.9124	6.9335	-6.5372
23	-88.9124	6.9335	-6.5372	-82.3249	6.9349	-6.5372
24	-82.3249	6.9349	-6.5372	-75.7370	6.9359	-6.5372
25	-75.7370	6.9359	-6.5372	-69.1495	6.9344	-6.5372
26	-69.1495	6.9344	-6.5372	-62.5622	6.9334	-6.5372
27	-62.5622	6.9334	-6.5372	-55.9734	6.9323	-6.5372
28	-55.9734	6.9323	-6.5372	-49.3884	6.9338	-6.5372
29	-49.3884	6.9338	-6.5372	-42.8006	6.9355	-6.5372
30	-42.8006	6.9355	-6.5372	-41.1933	-7.9913	-13.6467
31	-41.1933	-7.9913	-13.6467	-48.7831	-7.9924	-13.6467
32	-48.7831	-7.9924	-13.6467	-56.3773	-7.9946	-13.6467
33	-56.3773	-7.9946	-13.6467	-63.9707	-7.9953	-13.6467
34	-63.9707	-7.9953	-13.6467	-71.5636	-7.9956	-13.6467
35	-71.5636	-7.9956	-13.6467	-79.1577	-7.9932	-13.6467
36	-79.1577	-7.9932	-13.6467	-86.7479	-7.9908	-13.6467
37	-86.7479	-7.9908	-13.6467	-94.3387	-7.9901	-13.6467
38	-94.3387	-7.9901	-13.6467	-101.9292	-7.9893	-13.6467
39	-101.9292	-7.9893	-13.6467	-115.2642	-7.9893	-13.6467
40	-115.2642	-54.8061	123.2826	-150.3343	-25.4817	59.3738
41	-150.3343	-25.4817	59.3738	-125.7042	9.3884	-13.0910
42	-125.7042	9.3884	-13.0910	-118.8986	9.3891	-13.0910
43	-118.8986	9.3891	-13.0910	-112.0912	9.3893	-13.0910
44	-112.0912	9.3893	-13.0910	-105.2863	9.3894	-13.0910
45	-105.2863	9.3894	-13.0910	-98.4812	9.3877	-13.0910
46	-98.4812	9.3877	-13.0910	-91.6774	9.3857	-13.0911
47	-91.6774	9.3857	-13.0911	-84.8725	9.3773	-13.0911
48	-84.8725	9.3773	-13.0911	-78.0800	9.3673	-13.0911
49	-78.0800	9.3673	-13.0911	-71.2882	9.3699	-13.0911
50	-71.2882	9.3699	-13.0911	-64.4921	9.3705	-13.0911
51	-64.4921	9.3705	-13.0911	-57.6999	9.3602	-13.0911
52	-57.6999	9.3602	-13.0911	-50.9136	9.3542	-13.0911
53	-50.9136	9.3542	-13.0911	-44.1280	9.3543	-13.0911
54	-44.1280	9.3543	-13.0911	-37.3453	9.3540	-13.0911
55	-37.3453	9.3540	-13.0911	-30.5629	9.3550	-13.0911
56	-30.5629	9.3550	-13.0911	-23.7808	9.3538	-13.0911
57	-23.7808	9.3538	-13.0911	-16.9990	9.3517	-13.0911
58	-16.9990	9.3517	-13.0911	-10.2450	9.3051	-12.7286
59	-10.2450	9.3051	-12.7286	-4.7390	-52.2110	105.3118
60	-4.7390	-52.2110	105.3118	-42.5914	-52.2104	105.3112

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	32.8988	67.5597	-128.8521	81.8807	67.5574	-128.8521
2	81.8807	67.5574	-128.8521	116.2838	60.3004	-112.9603
3	116.2838	60.3004	-112.9603	140.8052	53.1883	-98.4191
4	140.8052	53.1883	-98.4191	179.3622	53.1914	-98.4192
5	179.3622	53.1914	-98.4192	189.3584	46.2551	-85.1497
6	189.3584	46.2551	-85.1497	190.5559	39.5174	-73.0683
7	190.5559	39.5174	-73.0683	183.6198	33.0499	-62.0917
8	183.6198	33.0499	-62.0917	207.5910	33.0569	-62.0918
9	207.5910	33.0569	-62.0918	188.8893	26.9003	-52.1362
10	188.8893	26.9003	-52.1362	164.0842	21.0998	-43.1184

11	164.0842	21.0998	-43.1184	179.3821	21.0942	-43.1185
12	179.3821	21.0942	-43.1185	145.6391	15.7050	-34.9548
13	145.6391	15.7050	-34.9548	108.4483	10.7519	-27.5616
14	108.4483	10.7519	-27.5616	69.1135	6.2766	-20.8483
15	69.1135	6.2766	-20.8483	73.6640	6.2778	-20.8483
16	73.6640	6.2778	-20.8483	31.0609	2.3101	-16.4676
17	31.0609	2.3101	-16.4676	25.6392	2.1497	3.5074
18	25.6392	2.1497	3.5074	27.1978	2.1495	3.5074
19	27.1978	2.1495	3.5074	28.7565	2.1497	3.5074
20	28.7565	2.1497	3.5074	-71.4904	37.4272	-85.0381
21	-71.4904	37.4272	-85.0381	-10.9208	77.2350	-141.2552
22	-10.9208	77.2350	-141.2552	30.9963	72.7751	-129.8418
23	30.9963	72.7751	-129.8418	70.0891	67.9604	-118.8306
24	70.0891	67.9604	-118.8306	104.9723	62.8470	-108.2220
25	104.9723	62.8470	-108.2220	134.5031	57.5113	-98.0160
26	134.5031	57.5113	-98.0160	157.7841	52.0058	-88.2126
27	157.7841	52.0058	-88.2126	174.1630	46.4090	-78.8117
28	174.1630	46.4090	-78.8117	183.2443	40.7918	-69.8133
29	183.2443	40.7918	-69.8133	184.8767	35.1834	-61.2174
30	184.8767	35.1834	-61.2174	179.1490	29.6934	-53.0238
31	179.1490	29.6934	-53.0238	207.3530	29.6935	-53.0238
32	207.3530	29.6935	-53.0238	189.5430	24.3653	-45.2327
33	189.5430	24.3653	-45.2327	165.5110	19.2507	-37.8442
34	165.5110	19.2507	-37.8442	136.1566	14.4408	-30.8580
35	136.1566	14.4408	-30.8580	102.6277	9.9795	-24.2737
36	102.6277	9.9795	-24.2737	3.2855	6.9303	-6.5372
37	3.2855	6.9303	-6.5372	9.8703	6.9309	-6.5372
38	9.8703	6.9309	-6.5372	16.4547	6.9311	-6.5372
39	16.4547	6.9311	-6.5372	23.0391	6.9311	-6.5372
40	23.0391	6.9311	-6.5372	-57.0856	37.2914	-76.3767
41	-57.0856	37.2914	-76.3767	-11.1192	74.8242	-125.6623
42	-11.1192	74.8242	-125.6623	43.1302	74.8227	-125.6622
43	43.1302	74.8227	-125.6622	68.1397	69.5721	-110.4054
44	68.1397	69.5721	-110.4054	90.8660	63.8812	-95.9182
45	90.8660	63.8812	-95.9182	109.8951	57.7931	-82.2840
46	109.8951	57.7931	-82.2840	151.7877	57.7938	-82.2840
47	151.7877	57.7938	-82.2840	161.1478	51.3620	-69.5858
48	161.1478	51.3620	-69.5858	164.1606	44.6250	-57.9075
49	164.1606	44.6250	-57.9075	159.7865	37.6208	-47.3322
50	159.7865	37.6208	-47.3322	187.0586	37.6152	-47.3322
51	187.0586	37.6152	-47.3322	169.1854	30.3842	-37.9437
52	169.1854	30.3842	-37.9437	142.1810	22.9800	-29.8256
53	142.1810	22.9800	-29.8256	158.8407	22.9823	-29.8255
54	158.8407	22.9823	-29.8255	116.6397	15.4356	-23.0569
55	116.6397	15.4356	-23.0569	-30.5629	9.3550	-13.0911
56	-30.5629	9.3550	-13.0911	-23.7808	9.3538	-13.0911
57	-23.7808	9.3538	-13.0911	-16.9990	9.3517	-13.0911
58	-16.9990	9.3517	-13.0911	-10.2191	9.3518	-13.0910
59	-10.2191	9.3518	-13.0910	-3.4381	9.3529	-13.0910
60	-3.4381	9.3529	-13.0910	3.3425	9.3522	-13.0910

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	6.1571	-11.2959	-24.1159	-2.0329	-11.2959	-24.1159
2	-2.0329	-11.2959	-24.1159	-10.2228	-11.2964	-24.1159

3	-10.2228	-11.2964	-24.1159	-18.4131	-11.2983	-24.1159
4	-18.4131	-11.2983	-24.1159	-26.6038	-11.2969	-24.1159
5	-26.6038	-11.2969	-24.1159	117.5894	-15.0972	38.3561
6	117.5894	-15.0972	38.3561	160.2896	-22.4407	55.6478
7	160.2896	-22.4407	55.6478	193.1454	-29.7042	71.5394
8	193.1454	-29.7042	71.5394	171.6127	-29.7076	71.5394
9	171.6127	-29.7076	71.5394	189.9012	-36.8232	86.0806
10	189.9012	-36.8232	86.0806	199.4699	-43.7709	99.3501
11	199.4699	-43.7709	99.3501	167.7347	-43.7749	99.3501
12	167.7347	-43.7749	99.3501	164.4068	-50.5032	111.4314
13	164.4068	-50.5032	111.4314	154.1283	-56.9641	122.4080
14	154.1283	-56.9641	122.4080	137.8871	-63.1129	132.3634
15	137.8871	-63.1129	132.3634	92.1245	-63.1221	132.3634
16	92.1245	-63.1221	132.3634	66.8529	-68.9051	141.3813
17	66.8529	-68.9051	141.3813	38.3066	-74.3096	149.5452
18	38.3066	-74.3096	149.5452	7.9079	-79.2587	156.9385
19	7.9079	-79.2587	156.9385	-49.5547	-79.2590	156.9384
20	-49.5547	-79.2590	156.9384	-62.7435	-40.4691	81.9974
21	-62.7435	-40.4691	81.9974	27.1061	-7.9886	-13.6467
22	27.1061	-7.9886	-13.6467	19.5172	-7.9886	-13.6467
23	19.5172	-7.9886	-13.6467	11.9280	-7.9876	-13.6467
24	11.9280	-7.9876	-13.6467	92.7204	-8.7241	31.4344
25	92.7204	-8.7241	31.4344	125.0628	-12.7702	43.2450
26	125.0628	-12.7702	43.2450	154.5356	-17.2256	54.6584
27	154.5356	-17.2256	54.6584	179.8210	-22.0442	65.6695
28	179.8210	-22.0442	65.6695	199.7897	-27.1446	76.2781
29	199.7897	-27.1446	76.2781	213.5468	-32.4854	86.4839
30	213.5468	-32.4854	86.4839	220.4263	-37.9872	96.2874
31	220.4263	-37.9872	96.2874	184.3427	-37.9818	96.2874
32	184.3427	-37.9818	96.2874	178.6595	-43.5739	105.6882
33	178.6595	-43.5739	105.6882	165.5061	-49.2018	114.6866
34	165.5061	-49.2018	114.6866	145.0603	-54.7946	123.2825
35	145.0603	-54.7946	123.2825	117.7131	-60.3044	131.4761
36	117.7131	-60.3044	131.4761	84.1117	-65.6423	139.2672
37	84.1117	-65.6423	139.2672	45.1597	-70.7496	146.6559
38	45.1597	-70.7496	146.6559	2.0058	-75.5670	153.6422
39	2.0058	-75.5670	153.6422	-43.9635	-80.0235	160.2264
40	-43.9635	-80.0235	160.2264	-69.8958	-40.3490	82.9197
41	-69.8958	-40.3490	82.9197	25.7037	-1.9318	3.3288
42	25.7037	-1.9318	3.3288	24.3036	-1.9324	3.3288
43	24.3036	-1.9324	3.3288	25.8811	-2.4251	15.2818
44	25.8811	-2.4251	15.2818	63.8658	-6.1434	28.2401
45	63.8658	-6.1434	28.2401	101.8648	-10.3967	42.9016
46	101.8648	-10.3967	42.9016	94.3253	-10.3919	42.9018
47	94.3253	-10.3919	42.9018	127.6276	-15.1612	58.8382
48	127.6276	-15.1612	58.8382	158.3652	-20.4005	74.0949
49	158.3652	-20.4005	74.0949	185.2283	-26.0900	88.5822
50	185.2283	-26.0900	88.5822	166.3130	-26.0840	88.5824
51	166.3130	-26.0840	88.5824	183.6258	-32.1640	102.2166
52	183.6258	-32.1640	102.2166	194.4261	-38.5977	114.9147
53	194.4261	-38.5977	114.9147	166.4408	-38.5917	114.9147
54	166.4408	-38.5917	114.9147	164.8558	-45.3284	126.5932
55	164.8558	-45.3284	126.5932	154.7355	-52.3438	137.1682
56	154.7355	-52.3438	137.1682	135.3840	-59.5949	146.5565
57	135.3840	-59.5949	146.5565	92.1839	-59.5858	146.5566
58	92.1839	-59.5858	146.5566	57.6710	-67.0033	154.6747
59	57.6710	-67.0033	154.6747	12.8387	-74.5636	161.4432
60	12.8387	-74.5636	161.4432	-41.2195	-74.5622	161.4432

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO A en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====
1	14.7828	-1.3329	3.6015	13.8167	-1.3328	3.6015
2	13.8167	-1.3328	3.6015	37.6057	-3.8073	10.0873
3	37.6057	-3.8073	10.0873	81.2953	-8.8453	22.9960
4	81.2953	-8.8453	22.9960	74.8828	-8.8467	22.9959
5	74.8828	-8.8467	22.9959	117.5894	-15.0972	38.3561
6	117.5894	-15.0972	38.3561	160.2896	-22.4407	55.6478
7	160.2896	-22.4407	55.6478	193.1454	-29.7042	71.5394
8	193.1454	-29.7042	71.5394	171.6127	-29.7076	71.5394
9	171.6127	-29.7076	71.5394	189.9012	-36.8232	86.0806
10	189.9012	-36.8232	86.0806	199.4699	-43.7709	99.3501
11	199.4699	-43.7709	99.3501	167.7347	-43.7749	99.3501
12	167.7347	-43.7749	99.3501	164.4068	-50.5032	111.4314
13	164.4068	-50.5032	111.4314	154.1283	-56.9641	122.4080
14	154.1283	-56.9641	122.4080	137.8871	-63.1129	132.3634
15	137.8871	-63.1129	132.3634	92.1245	-63.1221	132.3634
16	92.1245	-63.1221	132.3634	66.8529	-68.9051	141.3813
17	66.8529	-68.9051	141.3813	38.3066	-74.3096	149.5452
18	38.3066	-74.3096	149.5452	7.9079	-79.2587	156.9385
19	7.9079	-79.2587	156.9385	-49.5547	-79.2590	156.9384
20	-49.5547	-79.2590	156.9384	-62.7435	-40.4691	81.9974
21	-62.7435	-40.4691	81.9974	-9.9938	0.6339	4.9263
22	-9.9938	0.6339	4.9263	24.0350	-2.0114	11.3110
23	24.0350	-2.0114	11.3110	58.5877	-5.1299	20.6964
24	58.5877	-5.1299	20.6964	92.7204	-8.7241	31.4344
25	92.7204	-8.7241	31.4344	125.0628	-12.7702	43.2450
26	125.0628	-12.7702	43.2450	154.5356	-17.2256	54.6584
27	154.5356	-17.2256	54.6584	179.8210	-22.0442	65.6695
28	179.8210	-22.0442	65.6695	199.7897	-27.1446	76.2781
29	199.7897	-27.1446	76.2781	213.5468	-32.4854	86.4839
30	213.5468	-32.4854	86.4839	220.4263	-37.9872	96.2874
31	220.4263	-37.9872	96.2874	184.3427	-37.9818	96.2874
32	184.3427	-37.9818	96.2874	178.6595	-43.5739	105.6882
33	178.6595	-43.5739	105.6882	165.5061	-49.2018	114.6866
34	165.5061	-49.2018	114.6866	145.0603	-54.7946	123.2825
35	145.0603	-54.7946	123.2825	117.7131	-60.3044	131.4761
36	117.7131	-60.3044	131.4761	84.1117	-65.6423	139.2672
37	84.1117	-65.6423	139.2672	45.1597	-70.7496	146.6559
38	45.1597	-70.7496	146.6559	2.0058	-75.5670	153.6422
39	2.0058	-75.5670	153.6422	-43.9635	-80.0235	160.2264
40	-43.9635	-80.0235	160.2264	-69.8958	-40.3490	82.9197
41	-69.8958	-40.3490	82.9197	-11.7983	0.7404	6.1742
42	-11.7983	0.7404	6.1742	-11.2593	0.7421	6.1742
43	-11.2593	0.7421	6.1742	25.8811	-2.4251	15.2818
44	25.8811	-2.4251	15.2818	63.8658	-6.1434	28.2401
45	63.8658	-6.1434	28.2401	101.8648	-10.3967	42.9016
46	101.8648	-10.3967	42.9016	94.3253	-10.3919	42.9018
47	94.3253	-10.3919	42.9018	127.6276	-15.1612	58.8382
48	127.6276	-15.1612	58.8382	158.3652	-20.4005	74.0949
49	158.3652	-20.4005	74.0949	185.2283	-26.0900	88.5822
50	185.2283	-26.0900	88.5822	166.3130	-26.0840	88.5824
51	166.3130	-26.0840	88.5824	183.6258	-32.1640	102.2166
52	183.6258	-32.1640	102.2166	194.4261	-38.5977	114.9147
53	194.4261	-38.5977	114.9147	166.4408	-38.5917	114.9147
54	166.4408	-38.5917	114.9147	164.8558	-45.3284	126.5932
55	164.8558	-45.3284	126.5932	154.7355	-52.3438	137.1682

56	154.7355	-52.3438	137.1682	135.3840	-59.5949	146.5565
57	135.3840	-59.5949	146.5565	92.1839	-59.5858	146.5566
58	92.1839	-59.5858	146.5566	57.6710	-67.0033	154.6747
59	57.6710	-67.0033	154.6747	12.8387	-74.5636	161.4432
60	12.8387	-74.5636	161.4432	-41.2195	-74.5622	161.4432

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	32.8988	67.5597	-128.8521	81.8807	67.5574	-128.8521
2	81.8807	67.5574	-128.8521	116.2838	60.3004	-112.9603
3	116.2838	60.3004	-112.9603	140.8052	53.1883	-98.4191
4	140.8052	53.1883	-98.4191	179.3622	53.1914	-98.4192
5	179.3622	53.1914	-98.4192	189.3584	46.2551	-85.1497
6	189.3584	46.2551	-85.1497	190.5559	39.5174	-73.0683
7	190.5559	39.5174	-73.0683	183.6198	33.0499	-62.0917
8	183.6198	33.0499	-62.0917	207.5910	33.0569	-62.0918
9	207.5910	33.0569	-62.0918	188.8893	26.9003	-52.1362
10	188.8893	26.9003	-52.1362	164.0842	21.0998	-43.1184
11	164.0842	21.0998	-43.1184	179.3821	21.0942	-43.1185
12	179.3821	21.0942	-43.1185	145.6391	15.7050	-34.9548
13	145.6391	15.7050	-34.9548	108.4483	10.7519	-27.5616
14	108.4483	10.7519	-27.5616	-106.9095	-11.1314	-24.1789
15	-106.9095	-11.1314	-24.1789	-114.9792	-11.1300	-24.1789
16	-114.9792	-11.1300	-24.1789	-123.0495	-11.1288	-24.1789
17	-123.0495	-11.1288	-24.1789	-131.1156	-11.1257	-24.1789
18	-131.1156	-11.1257	-24.1789	-139.1815	-11.1257	-24.1789
19	-139.1815	-11.1257	-24.1789	-147.2467	-11.1255	-24.1789
20	-147.2467	-11.1255	-24.1789	-71.4904	37.4272	-85.0381
21	-71.4904	37.4272	-85.0381	-10.9208	77.2350	-141.2552
22	-10.9208	77.2350	-141.2552	30.9963	72.7751	-129.8418
23	30.9963	72.7751	-129.8418	70.0891	67.9604	-118.8306
24	70.0891	67.9604	-118.8306	104.9723	62.8470	-108.2220
25	104.9723	62.8470	-108.2220	134.5031	57.5113	-98.0160
26	134.5031	57.5113	-98.0160	157.7841	52.0058	-88.2126
27	157.7841	52.0058	-88.2126	174.1630	46.4090	-78.8117
28	174.1630	46.4090	-78.8117	183.2443	40.7918	-69.8133
29	183.2443	40.7918	-69.8133	184.8767	35.1834	-61.2174
30	184.8767	35.1834	-61.2174	179.1490	29.6934	-53.0238
31	179.1490	29.6934	-53.0238	207.3530	29.6935	-53.0238
32	207.3530	29.6935	-53.0238	189.5430	24.3653	-45.2327
33	189.5430	24.3653	-45.2327	165.5110	19.2507	-37.8442
34	165.5110	19.2507	-37.8442	136.1566	14.4408	-30.8580
35	136.1566	14.4408	-30.8580	102.6277	9.9795	-24.2737
36	102.6277	9.9795	-24.2737	66.2289	5.9395	-18.0863
37	66.2289	5.9395	-18.0863	-92.9087	-7.8644	-13.8633
38	-92.9087	-7.8644	-13.8633	-100.3806	-7.8646	-13.8633
39	-100.3806	-7.8646	-13.8633	-107.8532	-7.8652	-13.8633
40	-107.8532	-7.8652	-13.8633	-57.0856	37.2914	-76.3767
41	-57.0856	37.2914	-76.3767	-11.1192	74.8242	-125.6623
42	-11.1192	74.8242	-125.6623	43.1302	74.8227	-125.6622
43	43.1302	74.8227	-125.6622	68.1397	69.5721	-110.4054
44	68.1397	69.5721	-110.4054	90.8660	63.8812	-95.9182
45	90.8660	63.8812	-95.9182	109.8951	57.7931	-82.2840
46	109.8951	57.7931	-82.2840	151.7877	57.7938	-82.2840
47	151.7877	57.7938	-82.2840	161.1478	51.3620	-69.5858

48	161.1478	51.3620	-69.5858	164.1606	44.6250	-57.9075
49	164.1606	44.6250	-57.9075	159.7865	37.6208	-47.3322
50	159.7865	37.6208	-47.3322	187.0586	37.6152	-47.3322
51	187.0586	37.6152	-47.3322	169.1854	30.3842	-37.9437
52	169.1854	30.3842	-37.9437	142.1810	22.9800	-29.8256
53	142.1810	22.9800	-29.8256	158.8407	22.9823	-29.8255
54	158.8407	22.9823	-29.8255	116.6397	15.4356	-23.0569
55	116.6397	15.4356	-23.0569	64.1714	7.7913	-17.6876
56	64.1714	7.7913	-17.6876	-23.7808	9.3538	-13.0911
57	-23.7808	9.3538	-13.0911	-16.9990	9.3517	-13.0911
58	-16.9990	9.3517	-13.0911	-10.2191	9.3518	-13.0910
59	-10.2191	9.3518	-13.0910	-3.4381	9.3529	-13.0910
60	-3.4381	9.3529	-13.0910	3.3425	9.3522	-13.0910

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	12.2209	12.0383	-41.7148	21.6562	16.2575	-32.5092
2	21.6562	16.2575	-32.5092	32.1435	13.3586	-25.9792
3	32.1435	13.3586	-25.9792	41.3028	10.3587	-19.8292
4	41.3028	10.3587	-19.8292	48.8136	10.3584	-19.8292
5	48.8136	10.3584	-19.8292	54.4492	7.3569	-13.6792
6	54.4492	7.3569	-13.6792	58.7329	4.3577	-7.5293
7	58.7329	4.3577	-7.5293	61.6667	1.3604	-1.3793
8	61.6667	1.3604	-1.3793	62.6548	1.3535	-1.3793
9	62.6548	1.3535	-1.3793	62.0601	-1.6500	4.7708
10	62.0601	-1.6500	4.7708	60.1188	-4.6431	10.9207
11	60.1188	-4.6431	10.9207	56.7527	-4.6476	10.9207
12	56.7527	-4.6476	10.9207	51.2796	-7.6527	17.0707
13	51.2796	-7.6527	17.0707	44.4599	-10.6481	23.2206
14	44.4599	-10.6481	23.2206	36.2922	-13.6474	29.3706
15	36.2922	-13.6474	29.3706	26.3946	-13.6483	29.3706
16	26.3946	-13.6483	29.3706	14.6997	-16.6508	35.5206
17	14.6997	-16.6508	35.5206	1.6513	-19.6533	41.6706
18	1.6513	-19.6533	41.6706	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-0.4052	-0.0546	0.1678
21	-0.4052	-0.0546	0.1678	-0.3331	0.0242	-0.0245
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
23	-0.3100	0.0242	-0.0245	7.7436	16.9991	-37.0918
24	7.7436	16.9991	-37.0918	22.9918	13.9995	-30.9417
25	22.9918	13.9995	-30.9417	35.6395	11.1615	-24.4149
26	35.6395	11.1615	-24.4149	45.6437	8.1608	-18.2649
27	45.6437	8.1608	-18.2649	53.0110	5.4130	-11.7561
28	53.0110	5.4130	-11.7561	57.9631	2.7421	-5.2574
29	57.9631	2.7421	-5.2574	61.3807	1.7903	2.5371
30	61.3807	1.7903	2.5371	63.4659	-0.5696	9.1815
31	63.4659	-0.5696	9.1815	62.9313	-0.3760	9.3382
32	62.9313	-0.3760	9.3382	59.8741	-3.3754	15.4882
33	59.8741	-3.3754	15.4882	54.1189	-6.3730	21.6381
34	54.1189	-6.3730	21.6381	45.6639	-9.3747	27.7881
35	45.6639	-9.3747	27.7881	34.5056	-12.3748	33.9381
36	34.5056	-12.3748	33.9381	20.6493	-15.3741	40.0881
37	20.6493	-15.3741	40.0881	4.0912	-18.3770	46.2381
38	4.0912	-18.3770	46.2381	5.2428	2.2340	-1.8791
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791
40	7.3653	2.2342	-1.8791	9.1101	0.8059	-0.3994
41	9.1101	0.8059	-0.3994	8.2809	-0.6225	1.0803

42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803
43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803
44	7.3781	-0.6224	1.0803	6.9269	-0.6221	1.0803
45	6.9269	-0.6221	1.0803	6.4759	-0.6221	1.0804
46	6.4759	-0.6221	1.0804	9.9325	13.9587	-15.5280
47	9.9325	13.9587	-15.5280	18.3263	10.9613	-9.3779
48	18.3263	10.9613	-9.3779	25.3745	7.9627	-3.2279
49	25.3745	7.9627	-3.2279	31.0714	4.9624	2.9221
50	31.0714	4.9624	2.9221	34.6700	4.9634	2.9221
51	34.6700	4.9634	2.9221	36.8428	1.9650	9.0722
52	36.8428	1.9650	9.0722	37.6683	-1.0322	15.2222
53	37.6683	-1.0322	15.2222	36.9199	-1.0316	15.2222
54	36.9199	-1.0316	15.2222	34.4122	-3.7203	21.4888
55	34.4122	-3.7203	21.4888	30.5902	-6.7176	27.6388
56	30.5902	-6.7176	27.6388	25.4186	-9.7171	33.7887
57	25.4186	-9.7171	33.7887	18.3717	-9.7183	33.7887
58	18.3717	-9.7183	33.7887	9.6756	-12.7192	39.9388
59	9.6756	-12.7192	39.9388	0.1738	-0.6202	1.0804
60	0.1738	-0.6202	1.0804	0.9555	2.9985	-3.7426

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
2	1.3817	-0.1332	0.3602	1.2851	-0.1332	0.3602
3	1.2851	-0.1332	0.3602	1.1885	-0.1332	0.3602
4	1.1885	-0.1332	0.3602	1.0919	-0.1332	0.3602
5	1.0919	-0.1332	0.3602	0.9954	-0.1332	0.3602
6	0.9954	-0.1332	0.3602	0.8988	-0.1332	0.3602
7	0.8988	-0.1332	0.3602	0.8022	-0.1332	0.3602
8	0.8022	-0.1332	0.3602	0.1256	-3.5432	-9.9270
9	0.1256	-3.5432	-9.9270	-2.9679	-4.5431	-7.8770
10	-2.9679	-4.5431	-7.8770	-6.5114	-5.5428	-5.8270
11	-6.5114	-5.5428	-5.8270	-10.5299	-5.5416	-5.8271
12	-10.5299	-5.5416	-5.8271	-15.2470	-6.5422	-3.7771
13	-15.2470	-6.5422	-3.7771	-20.4151	-7.5434	-1.7271
14	-20.4151	-7.5434	-1.7271	-26.0333	-8.5429	0.3229
15	-26.0333	-8.5429	0.3229	-32.2261	-8.5418	0.3229
16	-32.2261	-8.5418	0.3229	-39.0180	-9.5411	2.3729
17	-39.0180	-9.5411	2.3729	-51.3437	-23.4558	29.5644
18	-51.3437	-23.4558	29.5644	-68.6342	-26.8302	36.8855
19	-68.6342	-26.8302	36.8855	-88.0862	-26.8300	36.8855
20	-88.0862	-26.8300	36.8855	-96.9673	-0.0921	-4.2416
21	-96.9673	-0.0921	-4.2416	-58.0834	26.6458	-45.3685
22	-58.0834	26.6458	-45.3685	-33.9694	23.6452	-39.2185
23	-33.9694	23.6452	-39.2185	-26.5986	2.2350	-1.8791
24	-26.5986	2.2350	-1.8791	-24.4750	2.2347	-1.8791
25	-24.4750	2.2347	-1.8791	-22.3516	2.2342	-1.8791
26	-22.3516	2.2342	-1.8791	-20.2282	2.2343	-1.8791
27	-20.2282	2.2343	-1.8791	-18.1044	2.2341	-1.8791
28	-18.1044	2.2341	-1.8791	-15.9813	2.2343	-1.8791
29	-15.9813	2.2343	-1.8791	-13.8580	2.2341	-1.8791
30	-13.8580	2.2341	-1.8791	-11.7352	2.2335	-1.8791
31	-11.7352	2.2335	-1.8791	-9.6165	2.2243	-1.7164
32	-9.6165	2.2243	-1.7164	-7.5037	2.2240	-1.7164
33	-7.5037	2.2240	-1.7164	-5.3901	2.2244	-1.7164

34	-5.3901	2.2244	-1.7164	-3.2767	2.2242	-1.7164
35	-3.2767	2.2242	-1.7164	-1.1801	2.1193	-1.2740
36	-1.1801	2.1193	-1.2740	-7.6715	-18.7903	34.6143
37	-7.6715	-18.7903	34.6143	-27.4948	-21.9883	41.6604
38	-27.4948	-21.9883	41.6604	-50.1837	-24.9878	47.8105
39	-50.1837	-24.9878	47.8105	-75.5723	-27.9877	53.9605
40	-75.5723	-27.9877	53.9605	-90.9314	-2.3979	10.2511
41	-90.9314	-2.3979	10.2511	-59.8868	23.1935	-33.4583
42	-59.8868	23.1935	-33.4583	-43.0709	23.1943	-33.4583
43	-43.0709	23.1943	-33.4583	-37.5533	3.1291	-3.5658
44	-37.5533	3.1291	-3.5658	-35.2854	3.1287	-3.5658
45	-35.2854	3.1287	-3.5658	-33.0187	3.1273	-3.5658
46	-33.0187	3.1273	-3.5658	-30.7512	3.1270	-3.5658
47	-30.7512	3.1270	-3.5658	-28.4845	3.1255	-3.5658
48	-28.4845	3.1255	-3.5658	-26.2206	3.1242	-3.5658
49	-26.2206	3.1242	-3.5658	-23.9559	3.1221	-3.5658
50	-23.9559	3.1221	-3.5658	-21.6938	3.1209	-3.5658
51	-21.6938	3.1209	-3.5658	-19.4307	3.1220	-3.5658
52	-19.4307	3.1220	-3.5658	-17.1681	3.1196	-3.5658
53	-17.1681	3.1196	-3.5658	-14.9075	3.1179	-3.5658
54	-14.9075	3.1179	-3.5658	-12.6469	3.1182	-3.5658
55	-12.6469	3.1182	-3.5658	-10.3876	3.1185	-3.5658
56	-10.3876	3.1185	-3.5658	-8.1273	3.1185	-3.5658
57	-8.1273	3.1185	-3.5658	-5.8674	3.1175	-3.5658
58	-5.8674	3.1175	-3.5658	-3.6134	3.0219	-3.0123
59	-3.6134	3.0219	-3.0123	-2.2868	-2.2211	15.2640
60	-2.2868	-2.2211	15.2640	-13.3076	-16.0279	45.9722

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	9.7734	16.3580	-32.1292	21.6333	16.3585	-32.1292
2	21.6333	16.3585	-32.1292	32.1435	13.3586	-25.9792
3	32.1435	13.3586	-25.9792	41.3028	10.3587	-19.8292
4	41.3028	10.3587	-19.8292	48.8136	10.3584	-19.8292
5	48.8136	10.3584	-19.8292	54.4492	7.3569	-13.6792
6	54.4492	7.3569	-13.6792	58.7329	4.3577	-7.5293
7	58.7329	4.3577	-7.5293	61.6667	1.3604	-1.3793
8	61.6667	1.3604	-1.3793	62.6548	1.3535	-1.3793
9	62.6548	1.3535	-1.3793	0.6090	-0.1333	0.3602
10	0.6090	-0.1333	0.3602	0.5124	-0.1333	0.3602
11	0.5124	-0.1333	0.3602	0.4157	-0.1333	0.3602
12	0.4157	-0.1333	0.3602	0.3191	-0.1332	0.3602
13	0.3191	-0.1332	0.3602	0.2224	-0.1332	0.3602
14	0.2224	-0.1332	0.3602	0.1258	-0.1333	0.3602
15	0.1258	-0.1333	0.3602	0.0291	-0.1334	0.3602
16	0.0291	-0.1334	0.3602	-0.0676	-0.1333	0.3602
17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-62.4284	6.7517	-23.3439
21	-62.4284	6.7517	-23.3439	-57.5425	26.7013	-45.7957
22	-57.5425	26.7013	-45.7957	-33.3763	23.7013	-39.6458
23	-33.3763	23.7013	-39.6458	-11.9108	20.7005	-33.4958
24	-11.9108	20.7005	-33.4958	6.8534	17.7003	-27.3457
25	6.8534	17.7003	-27.3457	22.9195	14.7001	-21.1957
26	22.9195	14.7001	-21.1957	36.2820	11.7018	-15.0457
27	36.2820	11.7018	-15.0457	46.9495	8.7025	-8.8957

28	46.9495	8.7025	-8.8957	54.9132	5.7007	-2.7457	20	-87.6087	-27.0013	37.7346	-39.9857	-11.7134	26.1271
29	54.9132	5.7007	-2.7457	60.1798	2.7024	3.4043	21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245
30	60.1798	2.7024	3.4043	-11.7352	2.2335	-1.8791	22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
31	-11.7352	2.2335	-1.8791	-9.6128	2.2335	-1.8791	23	-0.3100	0.0242	-0.0245	-0.2870	0.0242	-0.0245
32	-9.6128	2.2335	-1.8791	-7.4907	2.2336	-1.8791	24	-0.2870	0.0242	-0.0245	-0.2640	0.0242	-0.0245
33	-7.4907	2.2336	-1.8791	-5.3688	2.2338	-1.8791	25	-0.2640	0.0242	-0.0245	-0.2409	0.0242	-0.0245
34	-5.3688	2.2338	-1.8791	-3.2464	2.2337	-1.8791	26	-0.2409	0.0242	-0.0245	3.0813	-0.3868	6.8762
35	-3.2464	2.2337	-1.8791	-1.1246	2.2338	-1.8791	27	3.0813	-0.3868	6.8762	10.9495	-1.3755	9.6006
36	-1.1246	2.2338	-1.8791	0.9978	2.2343	-1.8791	28	10.9495	-1.3755	9.6006	18.4904	-2.5466	12.6586
37	0.9978	2.2343	-1.8791	3.1206	2.2341	-1.8791	29	18.4904	-2.5466	12.6586	25.2978	-3.9039	16.0365
38	3.1206	2.2341	-1.8791	5.2428	2.2340	-1.8791	30	25.2978	-3.9039	16.0365	30.9475	-5.4492	19.7212
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791	31	30.9475	-5.4492	19.7212	25.7703	-5.4499	19.7212
40	7.3653	2.2342	-1.8791	9.1101	0.8059	-0.3994	32	25.7703	-5.4499	19.7212	28.1863	-7.1827	23.6991
41	9.1101	0.8059	-0.3994	-59.3733	23.2672	-33.8616	33	28.1863	-7.1827	23.6991	37.1766	-10.0501	17.7619
42	-59.3733	23.2672	-33.8616	-42.5041	23.2677	-33.8616	34	37.1766	-10.0501	17.7619	25.2269	-13.0501	23.9119
43	-42.5041	23.2677	-33.8616	-27.6604	20.2670	-27.7115	35	25.2269	-13.0501	23.9119	10.5792	-16.0514	30.0619
44	-27.6604	20.2670	-27.7115	-14.1669	17.2684	-21.5615	36	10.5792	-16.0514	30.0619	-6.7719	-19.0531	36.2119
45	-14.1669	17.2684	-21.5615	-2.0216	14.2691	-15.4115	37	-6.7719	-19.0531	36.2119	-26.8216	-22.0529	42.3619
46	-2.0216	14.2691	-15.4115	8.3221	14.2684	-15.4115	38	-26.8216	-22.0529	42.3619	-49.5722	-25.0526	48.5119
47	8.3221	14.2684	-15.4115	16.9421	11.2710	-9.2615	39	-49.5722	-25.0526	48.5119	-75.0219	-28.0523	54.6619
48	16.9421	11.2710	-9.2615	24.2141	8.2738	-3.1115	40	-75.0219	-28.0523	54.6619	-53.0699	-12.1240	30.5612
49	24.2141	8.2738	-3.1115	30.1372	5.2747	3.0385	41	-53.0699	-12.1240	30.5612	8.2809	-0.6225	1.0803
50	30.1372	5.2747	3.0385	33.9597	5.2767	3.0386	42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803
51	33.9597	5.2767	3.0386	-19.4307	3.1220	-3.5658	43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803
52	-19.4307	3.1220	-3.5658	-17.1681	3.1196	-3.5658	44	7.3781	-0.6224	1.0803	6.9269	-0.6221	1.0803
53	-17.1681	3.1196	-3.5658	-14.9075	3.1179	-3.5658	45	6.9269	-0.6221	1.0803	6.4759	-0.6221	1.0804
54	-14.9075	3.1179	-3.5658	-12.6469	3.1182	-3.5658	46	6.4759	-0.6221	1.0804	6.0245	-0.6222	1.0804
55	-12.6469	3.1182	-3.5658	-10.3876	3.1185	-3.5658	47	6.0245	-0.6222	1.0804	5.5735	-0.6215	1.0804
56	-10.3876	3.1185	-3.5658	-8.1273	3.1185	-3.5658	48	5.5735	-0.6215	1.0804	5.1230	-0.6213	1.0804
57	-8.1273	3.1185	-3.5658	-5.8674	3.1175	-3.5658	49	5.1230	-0.6213	1.0804	4.0219	-0.8651	11.2671
58	-5.8674	3.1175	-3.5658	-3.6084	3.1164	-3.5658	50	4.0219	-0.8651	11.2671	3.3947	-0.8651	11.2671
59	-3.6084	3.1164	-3.5658	-1.3489	3.1164	-3.5658	51	3.3947	-0.8651	11.2671	10.5984	-2.2224	15.2639
60	-1.3489	3.1164	-3.5658	0.9105	3.1164	-3.5658	52	10.5984	-2.2224	15.2639	17.1245	-3.8201	19.6486
ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 2							53	17.1245	-3.8201	19.6486	14.3556	-3.8194	19.6486
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	14.3556	-3.8194	19.6486	18.4111	-5.6649	24.3881
=====							55	18.4111	-5.6649	24.3881	20.6520	-7.7724	29.4466
1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602	56	20.6520	-7.7724	29.4466	20.5422	-10.1449	34.7801
2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689	57	20.5422	-10.1449	34.7801	13.1869	-10.1444	34.7801
3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779	58	13.1869	-10.1444	34.7801	8.5842	-13.0284	39.8223
4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779	59	8.5842	-13.0284	39.8223	-1.6867	-16.0276	45.9723
5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384	60	-1.6867	-16.0276	45.9723	-13.3076	-16.0279	45.9722
6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037	ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 2						
7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301	=====						
9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765	1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
10	30.7973	-6.0536	14.4765	30.0706	-8.9977	0.8347	2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689
11	30.0706	-8.9977	0.8347	23.5457	-9.0009	0.8347	3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779
12	23.5457	-9.0009	0.8347	14.9198	-12.0018	6.9847	4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779
13	14.9198	-12.0018	6.9847	4.9447	-15.0007	13.1346	5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384
14	4.9447	-15.0007	13.1346	-6.3799	-18.0002	19.2846	6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037
15	-6.3799	-18.0002	19.2846	-19.4302	-18.0006	19.2846	7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301
16	-19.4302	-18.0006	19.2846	-34.2809	-21.0009	25.4346	8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301
17	-34.2809	-21.0009	25.4346	-50.4816	-24.0011	31.5846	9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765
18	-50.4816	-24.0011	31.5846	-68.0325	-27.0013	37.7346	10	30.7973	-6.0536	14.4765	34.9349	-7.8547	18.4049
19	-68.0325	-27.0013	37.7346	-87.6087	-27.0013	37.7346	11	34.9349	-7.8547	18.4049	29.2394	-7.8575	18.4048
							12	29.2394	-7.8575	18.4048	30.5310	-9.8671	22.6796
							13	30.5310	-9.8671	22.6796	29.9425	-12.0772	27.2681

14	29.9425	-12.0772	27.2681	27.1665	-14.4799	32.1406	6	29.9849	4.1198	-27.2536	26.6283	1.8805	-22.8564
15	27.1665	-14.4799	32.1406	16.6691	-14.4806	32.1406	7	26.6283	1.8805	-22.8564	21.9927	-0.1829	-18.7323
16	16.6691	-14.4806	32.1406	9.5929	-17.0539	37.2699	8	21.9927	-0.1829	-18.7323	21.8602	-0.1831	-18.7323
17	9.5929	-17.0539	37.2699	-0.2242	-19.7833	42.6317	9	21.8602	-0.1831	-18.7323	14.9005	-2.0781	-14.8619
18	-0.2242	-19.7833	42.6317	-12.9020	-22.6566	48.2047	10	14.9005	-2.0781	-14.8619	7.4011	-3.8141	-11.2274
19	-12.9020	-22.6566	48.2047	-29.3289	-22.6574	48.2047	11	7.4011	-3.8141	-11.2274	4.6357	-3.8145	-11.2274
20	-29.3289	-22.6574	48.2047	-39.9857	-11.7134	26.1271	12	4.6357	-3.8145	-11.2274	-4.2997	-5.4028	-7.8122
21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245	13	-4.2997	-5.4028	-7.8122	-13.2000	-6.8547	-4.6008
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245	14	-13.2000	-6.8547	-4.6008	-21.8916	-8.1825	-1.5791
23	-0.3100	0.0242	-0.0245	-18.8823	1.5587	0.8380	15	-21.8916	-8.1825	-1.5791	-27.8230	-8.1818	-1.5791
24	-18.8823	1.5587	0.8380	-12.1539	1.0702	2.4814	16	-27.8230	-8.1818	-1.5791	-0.0676	-0.1333	0.3602
25	-12.1539	1.0702	2.4814	-4.7343	0.4255	4.4987	17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
26	-4.7343	0.4255	4.4987	3.0813	-0.3868	6.8762	18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
27	3.0813	-0.3868	6.8762	10.9495	-1.3755	9.6006	19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
28	10.9495	-1.3755	9.6006	18.4904	-2.5466	12.6586	20	-0.3576	-0.1334	0.3602	-62.4284	6.7517	-23.3439
29	18.4904	-2.5466	12.6586	25.2978	-3.9039	16.0365	21	-62.4284	6.7517	-23.3439	-31.3504	22.9450	-49.8882
30	25.2978	-3.9039	16.0365	30.9475	-5.4492	19.7212	22	-31.3504	22.9450	-49.8882	-12.3456	20.0096	-44.4395
31	30.9475	-5.4492	19.7212	25.7703	-5.4499	19.7212	23	-12.3456	20.0096	-44.4395	3.0013	17.2081	-39.1856
32	25.7703	-5.4499	19.7212	28.1863	-7.1827	23.6991	24	3.0013	17.2081	-39.1856	14.9417	14.5495	-34.1179
33	28.1863	-7.1827	23.6991	28.4123	-9.1063	27.9568	25	14.9417	14.5495	-34.1179	23.7453	11.9793	-29.3126
34	28.4123	-9.1063	27.9568	26.0419	-11.2103	32.4809	26	23.7453	11.9793	-29.3126	34.5243	8.9782	-23.1626
35	26.0419	-11.2103	32.4809	20.6947	-13.4904	37.2581	27	34.5243	8.9782	-23.1626	42.6030	5.9802	-17.0126
36	20.6947	-13.4904	37.2581	12.0266	-15.9411	42.2747	28	42.6030	5.9802	-17.0126	47.9829	2.9825	-10.8626
37	12.0266	-15.9411	42.2747	-0.2813	-18.5618	47.5340	29	47.9829	2.9825	-10.8626	50.6648	-0.0171	-4.7127
38	-0.2813	-18.5618	47.5340	-16.5353	-21.3534	53.0315	30	50.6648	-0.0171	-4.7127	-11.3291	2.1627	-1.9235
39	-16.5353	-21.3534	53.0315	-36.9792	-24.2956	58.7542	31	-11.3291	2.1627	-1.9235	-9.2750	2.1624	-1.9235
40	-36.9792	-24.2956	58.7542	-53.0699	-12.1240	30.5612	32	-9.2750	2.1624	-1.9235	-7.2208	2.1623	-1.9235
41	-53.0699	-12.1240	30.5612	8.2422	-0.6197	1.0807	33	-7.2208	2.1623	-1.9235	-5.1668	2.1623	-1.9235
42	8.2422	-0.6197	1.0807	7.7929	-0.6197	1.0807	34	-5.1668	2.1623	-1.9235	-3.1126	2.1623	-1.9235
43	7.7929	-0.6197	1.0807	7.3436	-0.6197	1.0807	35	-3.1126	2.1623	-1.9235	-1.0586	2.1622	-1.9235
44	7.3436	-0.6197	1.0807	6.8945	-0.6198	1.0807	36	-1.0586	2.1622	-1.9235	0.9959	2.1622	-1.9235
45	6.8945	-0.6198	1.0807	-21.1370	1.9040	1.8994	37	0.9959	2.1622	-1.9235	3.0503	2.1621	-1.9235
46	-21.1370	1.9040	1.8994	-19.7565	1.9039	1.8994	38	3.0503	2.1621	-1.9235	5.1047	2.1625	-1.9235
47	-19.7565	1.9039	1.8994	-12.2936	1.1837	4.5577	39	5.1047	2.1625	-1.9235	7.1593	2.1628	-1.9235
48	-12.2936	1.1837	4.5577	-4.2653	0.2654	7.6889	40	7.1593	2.1628	-1.9235	8.2948	0.7311	-0.4489
49	-4.2653	0.2654	7.6889	4.0219	-0.8651	11.2671	41	8.2948	0.7311	-0.4489	-58.0365	23.0606	-34.1248
50	4.0219	-0.8651	11.2671	3.3947	-0.8651	11.2671	42	-58.0365	23.0606	-34.1248	-41.3172	23.0606	-34.1248
51	3.3947	-0.8651	11.2671	10.5984	-2.2224	15.2639	43	-41.3172	23.0606	-34.1248	-26.6231	20.0609	-27.9748
52	10.5984	-2.2224	15.2639	17.1245	-3.8201	19.6486	44	-26.6231	20.0609	-27.9748	-13.2782	17.0608	-21.8248
53	17.1245	-3.8201	19.6486	14.3556	-3.8194	19.6486	45	-13.2782	17.0608	-21.8248	-1.2837	14.0610	-15.6748
54	14.3556	-3.8194	19.6486	18.4111	-5.6649	24.3881	46	-1.2837	14.0610	-15.6748	8.9109	14.0624	-15.6747
55	18.4111	-5.6649	24.3881	20.6520	-7.7724	29.4466	47	8.9109	14.0624	-15.6747	17.3821	11.0642	-9.5247
56	20.6520	-7.7724	29.4466	20.5422	-10.1449	34.7801	48	17.3821	11.0642	-9.5247	-25.1535	3.0045	-3.7426
57	20.5422	-10.1449	34.7801	13.1869	-10.1444	34.7801	49	-25.1535	3.0045	-3.7426	-22.9753	3.0022	-3.7426
58	13.1869	-10.1444	34.7801	8.2501	-12.7945	40.3420	50	-22.9753	3.0022	-3.7426	-20.7976	3.0027	-3.7426
59	8.2501	-12.7945	40.3420	-0.3714	-15.7191	46.0888	51	-20.7976	3.0027	-3.7426	-18.6196	3.0026	-3.7426
60	-0.3714	-15.7191	46.0888	-11.7674	-15.7184	46.0888	52	-18.6196	3.0026	-3.7426	-16.4427	3.0022	-3.7426
ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 2							53	-16.4427	3.0022	-3.7426	-14.2663	3.0013	-3.7426
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	-14.2663	3.0013	-3.7426	-12.0914	2.9991	-3.7426
=====	=====	=====	=====	=====	=====	=====	55	-12.0914	2.9991	-3.7426	-9.9173	2.9994	-3.7426
1	11.3017	12.0024	-42.2151	20.0037	12.0026	-42.2151	56	-9.9173	2.9994	-3.7426	-7.7420	3.0001	-3.7426
2	20.0037	12.0026	-42.2151	24.7733	9.1731	-36.9143	57	-7.7420	3.0001	-3.7426	-5.5673	2.9992	-3.7426
3	24.7733	9.1731	-36.9143	26.9645	6.5471	-31.9354	58	-5.5673	2.9992	-3.7426	-3.3931	2.9990	-3.7426
4	26.9645	6.5471	-31.9354	31.7113	6.5474	-31.9354	59	-3.3931	2.9990	-3.7426	-1.2187	2.9987	-3.7426
5	31.7113	6.5474	-31.9354	29.9849	4.1198	-27.2536	60	-1.2187	2.9987	-3.7426	0.9555	2.9985	-3.7426
							ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 2						
							Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
							=====	=====	=====	=====	=====	=====	=====

1	9.7734	16.3580	-32.1292	21.6333	16.3585	-32.1292	59	12.3011	-15.0616	42.9602	0.5559	-18.0616	49.1102
2	21.6333	16.3585	-32.1292	32.1435	13.3586	-25.9792	60	0.5559	-18.0616	49.1102	1.1139	3.3392	-4.3619
3	32.1435	13.3586	-25.9792	41.3028	10.3587	-19.8292	ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 2						
4	41.3028	10.3587	-19.8292	48.8136	10.3584	-19.8292	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
5	48.8136	10.3584	-19.8292	54.4492	7.3569	-13.6792	=====	=====	=====	=====	=====	=====	=====
6	54.4492	7.3569	-13.6792	58.7329	4.3577	-7.5293	1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
7	58.7329	4.3577	-7.5293	61.6667	1.3604	-1.3793	2	1.3817	-0.1332	0.3602	1.2851	-0.1332	0.3602
8	61.6667	1.3604	-1.3793	62.6548	1.3535	-1.3793	3	1.2851	-0.1332	0.3602	1.1885	-0.1332	0.3602
9	62.6548	1.3535	-1.3793	62.0601	-1.6500	4.7708	4	1.1885	-0.1332	0.3602	1.0919	-0.1332	0.3602
10	62.0601	-1.6500	4.7708	60.1188	-4.6431	10.9207	5	1.0919	-0.1332	0.3602	0.9954	-0.1332	0.3602
11	60.1188	-4.6431	10.9207	56.7527	-4.6476	10.9207	6	0.9954	-0.1332	0.3602	0.8988	-0.1332	0.3602
12	56.7527	-4.6476	10.9207	51.2796	-7.6527	17.0707	7	0.8988	-0.1332	0.3602	0.7931	-3.9241	-10.0522
13	51.2796	-7.6527	17.0707	44.4599	-10.6481	23.2206	8	0.7931	-3.9241	-10.0522	-2.0519	-3.9236	-10.0522
14	44.4599	-10.6481	23.2206	36.2922	-13.6474	29.3706	9	-2.0519	-3.9236	-10.0522	-5.4212	-4.9235	-8.0023
15	36.2922	-13.6474	29.3706	26.3946	-13.6483	29.3706	10	-5.4212	-4.9235	-8.0023	-9.2411	-5.9225	-5.9523
16	26.3946	-13.6483	29.3706	14.6997	-16.6508	35.5206	11	-9.2411	-5.9225	-5.9523	-13.5349	-5.9220	-5.9523
17	14.6997	-16.6508	35.5206	1.6513	-19.6533	41.6706	12	-13.5349	-5.9220	-5.9523	-18.5285	-6.9227	-3.9023
18	1.6513	-19.6533	41.6706	-0.2609	-0.1334	0.3602	13	-18.5285	-6.9227	-3.9023	-23.9726	-7.9222	-1.8523
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602	14	-23.9726	-7.9222	-1.8523	-29.8666	-8.9215	0.1977
20	-0.3576	-0.1334	0.3602	-0.4052	-0.0546	0.1678	15	-29.8666	-8.9215	0.1977	-36.3349	-8.9209	0.1977
21	-0.4052	-0.0546	0.1678	-0.3331	0.0242	-0.0245	16	-36.3349	-8.9209	0.1977	-43.4025	-9.9212	2.2477
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245	17	-43.4025	-9.9212	2.2477	-50.9208	-10.9205	4.2977
23	-0.3100	0.0242	-0.0245	5.8612	17.3431	-27.7367	18	-50.9208	-10.9205	4.2977	-58.8875	-11.9199	6.3477
24	5.8612	17.3431	-27.7367	22.0178	15.0154	-22.9892	19	-58.8875	-11.9199	6.3477	-67.5297	-11.9204	6.3476
25	22.0178	15.0154	-22.9892	35.9819	12.5715	-18.0809	20	-67.5297	-11.9204	6.3476	-69.7362	6.5593	-18.7677
26	35.9819	12.5715	-18.0809	47.4156	10.0392	-13.1329	21	-69.7362	6.5593	-18.7677	-40.5256	21.7887	-38.2804
27	47.4156	10.0392	-13.1329	56.5002	7.0375	-6.9830	22	-40.5256	21.7887	-38.2804	-28.7220	2.2348	-1.8791
28	56.5002	7.0375	-6.9830	62.8847	4.0379	-0.8330	23	-28.7220	2.2348	-1.8791	-26.5986	2.2350	-1.8791
29	62.8847	4.0379	-0.8330	66.8714	1.4364	4.0522	24	-26.5986	2.2350	-1.8791	-24.4750	2.2347	-1.8791
30	66.8714	1.4364	4.0522	68.2346	-1.5626	10.2022	25	-24.4750	2.2347	-1.8791	-22.3516	2.2342	-1.8791
31	68.2346	-1.5626	10.2022	66.7513	-1.5596	10.2022	26	-22.3516	2.2342	-1.8791	-20.2282	2.2343	-1.8791
32	66.7513	-1.5596	10.2022	62.7711	-4.2053	15.0196	27	-20.2282	2.2343	-1.8791	-18.1044	2.2341	-1.8791
33	62.7711	-4.2053	15.0196	56.2257	-7.2038	21.1696	28	-18.1044	2.2341	-1.8791	-15.9813	2.2343	-1.8791
34	56.2257	-7.2038	21.1696	46.9802	-10.2042	27.3196	29	-15.9813	2.2343	-1.8791	-13.8580	2.2341	-1.8791
35	46.9802	-10.2042	27.3196	35.0554	-12.8683	32.0655	30	-13.8580	2.2341	-1.8791	-11.7352	2.2335	-1.8791
36	35.0554	-12.8683	32.0655	20.7287	-15.8706	38.2155	31	-11.7352	2.2335	-1.8791	-9.6165	2.2243	-1.7164
37	20.7287	-15.8706	38.2155	3.7011	-18.8704	44.3655	32	-9.6165	2.2243	-1.7164	-7.5037	2.2240	-1.7164
38	3.7011	-18.8704	44.3655	5.2428	2.2340	-1.8791	33	-7.5037	2.2240	-1.7164	-5.3901	2.2244	-1.7164
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791	34	-5.3901	2.2244	-1.7164	-8.0682	-5.6387	4.2875
40	7.3653	2.2342	-1.8791	9.1101	0.8059	-0.3994	35	-8.0682	-5.6387	4.2875	-14.1751	-6.6386	6.3375
41	9.1101	0.8059	-0.3994	8.2809	-0.6225	1.0803	36	-14.1751	-6.6386	6.3375	-21.1816	-7.6385	8.3875
42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803	37	-21.1816	-7.6385	8.3875	-29.0882	-8.6383	10.4375
43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803	38	-29.0882	-8.6383	10.4375	-37.8947	-9.6384	12.4875
44	7.3781	-0.6224	1.0803	12.2730	14.9151	-18.5401	39	-37.8947	-9.6384	12.4875	-47.6013	-10.6385	14.5375
45	12.2730	14.9151	-18.5401	22.7129	11.9168	-12.3900	40	-47.6013	-10.6385	14.5375	-55.7506	-10.9150	26.9110
46	22.7129	11.9168	-12.3900	31.3536	11.9173	-12.3900	41	-55.7506	-10.9150	26.9110	-45.3462	3.3780	-4.2476
47	31.3536	11.9173	-12.3900	38.2691	8.9200	-6.2400	42	-45.3462	3.3780	-4.2476	-42.8974	3.3780	-4.2477
48	38.2691	8.9200	-6.2400	43.8385	5.9240	-0.0900	43	-42.8974	3.3780	-4.2477	-40.4479	3.3770	-4.2477
49	43.8385	5.9240	-0.0900	48.0612	2.9247	6.0601	44	-40.4479	3.3770	-4.2477	-38.0002	3.3761	-4.2477
50	48.0612	2.9247	6.0601	50.1812	2.9262	6.0601	45	-38.0002	3.3761	-4.2477	-35.5522	3.3779	-4.2477
51	50.1812	2.9262	6.0601	50.8800	-0.0715	12.2101	46	-35.5522	3.3779	-4.2477	-33.1029	3.3760	-4.2477
52	50.8800	-0.0715	12.2101	50.2280	-3.0689	18.3601	47	-33.1029	3.3760	-4.2477	-30.6562	3.3728	-4.2477
53	50.2280	-3.0689	18.3601	48.0058	-3.0682	18.3602	48	-30.6562	3.3728	-4.2477	-28.2109	3.3710	-4.2477
54	48.0058	-3.0682	18.3602	43.8316	-6.0678	24.5102	49	-28.2109	3.3710	-4.2477	-25.7664	3.3686	-4.2477
55	43.8316	-6.0678	24.5102	38.3132	-9.0659	30.6602	50	-25.7664	3.3686	-4.2477	-23.3233	3.3698	-4.2477
56	38.3132	-9.0659	30.6602	31.4419	-12.0677	36.8102							
57	31.4419	-12.0677	36.8102	22.6945	-12.0653	36.8102							
58	22.6945	-12.0653	36.8102	12.3011	-15.0616	42.9602							

51	-23.3233	3.3698	-4.2477	-20.8792	3.3706	-4.2477
52	-20.8792	3.3706	-4.2477	-18.4365	3.3679	-4.2477
53	-18.4365	3.3679	-4.2477	-15.9954	3.3650	-4.2477
54	-15.9954	3.3650	-4.2477	-13.5549	3.3644	-4.2477
55	-13.5549	3.3644	-4.2477	-11.1142	3.3640	-4.2477
56	-11.1142	3.3640	-4.2477	-8.6749	3.3640	-4.2477
57	-8.6749	3.3640	-4.2477	-6.2344	3.3647	-4.2477
58	-6.2344	3.3647	-4.2477	-3.7950	3.3649	-4.2477
59	-3.7950	3.3649	-4.2477	-1.7792	-2.1416	13.0489
60	-1.7792	-2.1416	13.0489	-13.9764	-18.1795	48.5897

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	9.7734	16.3580	-32.1292	21.6333	16.3585	-32.1292
2	21.6333	16.3585	-32.1292	28.5884	13.4087	-27.8006
3	28.5884	13.4087	-27.8006	33.5206	10.5676	-23.3684
4	33.5206	10.5676	-23.3684	41.1811	10.5672	-23.3684
5	41.1811	10.5672	-23.3684	41.4441	7.8333	-19.3888
6	41.4441	7.8333	-19.3888	39.3831	5.2262	-15.8020
7	39.3831	5.2262	-15.8020	35.3038	2.7496	-12.5527
8	35.3038	2.7496	-12.5527	37.2981	2.7490	-12.5527
9	37.2981	2.7490	-12.5527	29.8405	0.4175	-9.5902
10	29.8405	0.4175	-9.5902	0.5124	-0.1333	0.3602
11	0.5124	-0.1333	0.3602	0.4157	-0.1333	0.3602
12	0.4157	-0.1333	0.3602	0.3191	-0.1332	0.3602
13	0.3191	-0.1332	0.3602	0.2224	-0.1332	0.3602
14	0.2224	-0.1332	0.3602	0.1258	-0.1333	0.3602
15	0.1258	-0.1333	0.3602	0.0291	-0.1334	0.3602
16	0.0291	-0.1334	0.3602	-0.0676	-0.1333	0.3602
17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-68.5439	7.3549	-20.2132
21	-68.5439	7.3549	-20.2132	-38.5136	25.0390	-43.8830
22	-38.5136	25.0390	-43.8830	-18.2654	22.4349	-38.9978
23	-18.2654	22.4349	-38.9978	-0.8274	19.7895	-34.1804
24	-0.8274	19.7895	-34.1804	13.5606	17.1282	-29.4345
25	13.5606	17.1282	-29.4345	24.7686	14.4769	-24.9004
26	24.7686	14.4769	-24.9004	32.7655	11.8678	-20.6912
27	32.7655	11.8678	-20.6912	37.6224	9.3236	-16.7742
28	37.6224	9.3236	-16.7742	39.4860	6.8614	-13.1180
29	39.4860	6.8614	-13.1180	38.5854	4.5019	-9.6931
30	38.5854	4.5019	-9.6931	35.2054	2.2575	-6.4723
31	35.2054	2.2575	-6.4723	37.3511	2.2583	-6.4723
32	37.3511	2.2583	-6.4723	-7.4907	2.2336	-1.8791
33	-7.4907	2.2336	-1.8791	-5.3688	2.2338	-1.8791
34	-5.3688	2.2338	-1.8791	-3.2464	2.2337	-1.8791
35	-3.2464	2.2337	-1.8791	-1.1246	2.2338	-1.8791
36	-1.1246	2.2338	-1.8791	0.9978	2.2343	-1.8791
37	0.9978	2.2343	-1.8791	3.1206	2.2341	-1.8791
38	3.1206	2.2341	-1.8791	5.2428	2.2340	-1.8791
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791
40	7.3653	2.2342	-1.8791	-51.1465	6.0835	-10.3520
41	-51.1465	6.0835	-10.3520	-27.8185	20.9162	-30.8401
42	-27.8185	20.9162	-30.8401	-12.6538	20.9155	-30.8401
43	-12.6538	20.9155	-30.8401	0.4844	17.9138	-24.6901
44	0.4844	17.9138	-24.6901	12.2730	14.9151	-18.5401

45	12.2730	14.9151	-18.5401	22.7129	11.9168	-12.3900
46	22.7129	11.9168	-12.3900	31.3536	11.9173	-12.3900
47	31.3536	11.9173	-12.3900	38.2691	8.9200	-6.2400
48	38.2691	8.9200	-6.2400	43.8385	5.9240	-0.0900
49	43.8385	5.9240	-0.0900	-25.7664	3.3686	-4.2477
50	-25.7664	3.3686	-4.2477	-23.3233	3.3698	-4.2477
51	-23.3233	3.3698	-4.2477	-20.8792	3.3706	-4.2477
52	-20.8792	3.3706	-4.2477	-18.4365	3.3679	-4.2477
53	-18.4365	3.3679	-4.2477	-15.9954	3.3650	-4.2477
54	-15.9954	3.3650	-4.2477	-13.5549	3.3644	-4.2477
55	-13.5549	3.3644	-4.2477	-11.1142	3.3640	-4.2477
56	-11.1142	3.3640	-4.2477	-8.6749	3.3640	-4.2477
57	-8.6749	3.3640	-4.2477	-6.2344	3.3647	-4.2477
58	-6.2344	3.3647	-4.2477	-3.7950	3.3649	-4.2477
59	-3.7950	3.3649	-4.2477	-1.3551	3.3651	-4.2477
60	-1.3551	3.3651	-4.2477	1.0846	3.3649	-4.2477

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689
3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779
4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779
5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384
6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037
7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301
8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301
9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765
10	30.7973	-6.0536	14.4765	34.9349	-7.8547	18.4049
11	34.9349	-7.8547	18.4049	29.2394	-7.8575	18.4048
12	29.2394	-7.8575	18.4048	30.5310	-9.8671	22.6796
13	30.5310	-9.8671	22.6796	29.9425	-12.0772	27.2681
14	29.9425	-12.0772	27.2681	27.1665	-14.4799	32.1406
15	27.1665	-14.4799	32.1406	16.6691	-14.4806	32.1406
16	16.6691	-14.4806	32.1406	9.5929	-17.0539	37.2699
17	9.5929	-17.0539	37.2699	-0.2242	-19.7833	42.6317
18	-0.2242	-19.7833	42.6317	-13.8045	-22.6666	47.2005
19	-13.8045	-22.6666	47.2005	-30.2374	-22.6660	47.2005
20	-30.2374	-22.6660	47.2005	-39.9857	-11.7134	26.1271
21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
23	-0.3100	0.0242	-0.0245	-0.2870	0.0242	-0.0245
24	-0.2870	0.0242	-0.0245	-0.2640	0.0242	-0.0245
25	-0.2640	0.0242	-0.0245	-0.2409	0.0242	-0.0245
26	-0.2409	0.0242	-0.0245	7.2922	-0.8548	7.3416
27	7.2922	-0.8548	7.3416	15.9067	-1.9911	10.2116
28	15.9067	-1.9911	10.2116	23.9784	-3.3199	13.4212
29	23.9784	-3.3199	13.4212	31.0384	-4.8348	16.9491
30	31.0384	-4.8348	16.9491	36.6165	-6.5347	20.7722
31	36.6165	-6.5347	20.7722	30.4074	-6.5344	20.7722
32	30.4074	-6.5344	20.7722	32.2706	-8.4123	24.8662
33	32.2706	-8.4123	24.8662	31.6280	-10.4550	29.2056
34	31.6280	-10.4550	29.2056	28.1174	-12.6532	33.7633
35	28.1174	-12.6532	33.7633	21.4440	-14.9794	38.5108
36	21.4440	-14.9794	38.5108	11.3939	-17.4237	43.4190

37	11.3939	-17.4237	43.4190	-2.1558	-19.9582	48.3670
38	-2.1558	-19.9582	48.3670	-19.2286	-22.5615	53.2521
39	-19.2286	-22.5615	53.2521	-39.7579	-25.2078	58.0696
40	-39.7579	-25.2078	58.0696	-55.0606	-12.2923	29.4489
41	-55.0606	-12.2923	29.4489	8.2809	-0.6225	1.0803
42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803
43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803
44	7.3781	-0.6224	1.0803	6.9269	-0.6221	1.0803
45	6.9269	-0.6221	1.0803	6.4759	-0.6221	1.0804
46	6.4759	-0.6221	1.0804	6.0245	-0.6222	1.0804
47	6.0245	-0.6222	1.0804	5.5735	-0.6215	1.0804
48	5.5735	-0.6215	1.0804	4.3093	-0.7630	9.1031
49	4.3093	-0.7630	9.1031	13.7514	-2.1441	13.0488
50	13.7514	-2.1441	13.0488	12.1971	-2.1439	13.0488
51	12.1971	-2.1439	13.0488	19.9945	-3.7502	17.4024
52	19.9945	-3.7502	17.4024	26.6885	-5.5781	22.1164
53	26.6885	-5.5781	22.1164	22.6463	-5.5762	22.1164
54	22.6463	-5.5762	22.1164	26.2712	-7.6342	27.1385
55	26.2712	-7.6342	27.1385	27.6677	-9.9181	32.4123
56	27.6677	-9.9181	32.4123	26.3464	-12.4198	37.8766
57	26.3464	-12.4198	37.8766	17.3416	-12.4205	37.8766
58	17.3416	-12.4205	37.8766	11.0344	-15.1792	42.4398
59	11.0344	-15.1792	42.4398	-0.7961	-18.1796	48.5898
60	-0.7961	-18.1796	48.5898	-13.9764	-18.1795	48.5897

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689
3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779
4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779
5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384
6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037
7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301
8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301
9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765
10	30.7973	-6.0536	14.4765	34.9349	-7.8547	18.4049
11	34.9349	-7.8547	18.4049	29.2394	-7.8575	18.4048
12	29.2394	-7.8575	18.4048	30.5310	-9.8671	22.6796
13	30.5310	-9.8671	22.6796	29.9425	-12.0772	27.2681
14	29.9425	-12.0772	27.2681	27.1665	-14.4799	32.1406
15	27.1665	-14.4799	32.1406	16.6691	-14.4806	32.1406
16	16.6691	-14.4806	32.1406	9.5929	-17.0539	37.2699
17	9.5929	-17.0539	37.2699	-0.2242	-19.7833	42.6317
18	-0.2242	-19.7833	42.6317	-12.9020	-22.6566	48.2047
19	-12.9020	-22.6566	48.2047	-29.3289	-22.6574	48.2047
20	-29.3289	-22.6574	48.2047	-39.9857	-11.7134	26.1271
21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
23	-0.3100	0.0242	-0.0245	-17.3779	1.4318	0.9640
24	-17.3779	1.4318	0.9640	-9.7593	0.8507	2.6998
25	-9.7593	0.8507	2.6998	-1.4065	0.0910	4.8314
26	-1.4065	0.0910	4.8314	7.2922	-0.8548	7.3416
27	7.2922	-0.8548	7.3416	15.9067	-1.9911	10.2116
28	15.9067	-1.9911	10.2116	23.9784	-3.3199	13.4212
29	23.9784	-3.3199	13.4212	31.0384	-4.8348	16.9491
30	31.0384	-4.8348	16.9491	36.6165	-6.5347	20.7722

31	36.6165	-6.5347	20.7722	30.4074	-6.5344	20.7722
32	30.4074	-6.5344	20.7722	32.2706	-8.4123	24.8662
33	32.2706	-8.4123	24.8662	31.6280	-10.4550	29.2056
34	31.6280	-10.4550	29.2056	28.1174	-12.6532	33.7633
35	28.1174	-12.6532	33.7633	21.4440	-14.9794	38.5108
36	21.4440	-14.9794	38.5108	11.3939	-17.4237	43.4190
37	11.3939	-17.4237	43.4190	-2.1558	-19.9582	48.3670
38	-2.1558	-19.9582	48.3670	-19.2286	-22.5615	53.2521
39	-19.2286	-22.5615	53.2521	-39.7579	-25.2078	58.0696
40	-39.7579	-25.2078	58.0696	-55.0606	-12.2923	29.4489
41	-55.0606	-12.2923	29.4489	8.2422	-0.6197	1.0807
42	8.2422	-0.6197	1.0807	7.7929	-0.6197	1.0807
43	7.7929	-0.6197	1.0807	7.3436	-0.6197	1.0807
44	7.3436	-0.6197	1.0807	6.8945	-0.6198	1.0807
45	6.8945	-0.6198	1.0807	-15.3344	1.3526	2.6023
46	-15.3344	1.3526	2.6023	-14.3540	1.3521	2.6023
47	-14.3540	1.3521	2.6023	-5.1881	0.3999	5.6081
48	-5.1881	0.3999	5.6081	4.3093	-0.7630	9.1031
49	4.3093	-0.7630	9.1031	13.7514	-2.1441	13.0488
50	13.7514	-2.1441	13.0488	12.1971	-2.1439	13.0488
51	12.1971	-2.1439	13.0488	19.9945	-3.7502	17.4024
52	19.9945	-3.7502	17.4024	26.6885	-5.5781	22.1164
53	26.6885	-5.5781	22.1164	22.6463	-5.5762	22.1164
54	22.6463	-5.5762	22.1164	26.2712	-7.6342	27.1385
55	26.2712	-7.6342	27.1385	27.6677	-9.9181	32.4123
56	27.6677	-9.9181	32.4123	26.3464	-12.4198	37.8766
57	26.3464	-12.4198	37.8766	17.3416	-12.4205	37.8766
58	17.3416	-12.4205	37.8766	10.8531	-15.1381	43.4658
59	10.8531	-15.1381	43.4658	0.5559	-18.0616	49.1102
60	0.5559	-18.0616	49.1102	-12.5391	-18.0618	49.1102

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	8.8850	16.3447	-32.7494	20.7354	16.3448	-32.7494
2	20.7354	16.3448	-32.7494	28.5884	13.4087	-27.8006
3	28.5884	13.4087	-27.8006	33.5206	10.5676	-23.3684
4	33.5206	10.5676	-23.3684	41.1811	10.5672	-23.3684
5	41.1811	10.5672	-23.3684	41.4441	7.8333	-19.3888
6	41.4441	7.8333	-19.3888	39.3831	5.2262	-15.8020
7	39.3831	5.2262	-15.8020	35.3038	2.7496	-12.5527
8	35.3038	2.7496	-12.5527	37.2981	2.7490	-12.5527
9	37.2981	2.7490	-12.5527	29.8405	0.4175	-9.5902
10	29.8405	0.4175	-9.5902	21.1427	-1.7661	-6.8681
11	21.1427	-1.7661	-6.8681	19.8620	-1.7667	-6.8681
12	19.8620	-1.7667	-6.8681	8.7939	-3.7970	-4.3446
13	8.7939	-3.7970	-4.3446	-2.7246	-5.6730	-1.9822
14	-2.7246	-5.6730	-1.9822	-29.8666	-8.9215	0.1977
15	-29.8666	-8.9215	0.1977	-36.3349	-8.9209	0.1977
16	-36.3349	-8.9209	0.1977	-0.0676	-0.1333	0.3602
17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-68.5439	7.3549	-20.2132
21	-68.5439	7.3549	-20.2132	-38.5136	25.0390	-43.8830
22	-38.5136	25.0390	-43.8830	-18.2654	22.4349	-38.9978

23	-18.2654	22.4349	-38.9978	-0.8274	19.7895	-34.1804
24	-0.8274	19.7895	-34.1804	13.5606	17.1282	-29.4345
25	13.5606	17.1282	-29.4345	24.7686	14.4769	-24.9004
26	24.7686	14.4769	-24.9004	32.7655	11.8678	-20.6912
27	32.7655	11.8678	-20.6912	37.6224	9.3236	-16.7742
28	37.6224	9.3236	-16.7742	39.4860	6.8614	-13.1180
29	39.4860	6.8614	-13.1180	38.5854	4.5019	-9.6931
30	38.5854	4.5019	-9.6931	35.2054	2.2575	-6.4723
31	35.2054	2.2575	-6.4723	37.3511	2.2583	-6.4723
32	37.3511	2.2583	-6.4723	29.8169	0.1438	-3.4303
33	29.8169	0.1438	-3.4303	-5.1668	2.1623	-1.9235
34	-5.1668	2.1623	-1.9235	-3.1126	2.1623	-1.9235
35	-3.1126	2.1623	-1.9235	-1.0586	2.1622	-1.9235
36	-1.0586	2.1622	-1.9235	0.9959	2.1622	-1.9235
37	0.9959	2.1622	-1.9235	3.0503	2.1621	-1.9235
38	3.0503	2.1621	-1.9235	5.1047	2.1625	-1.9235
39	5.1047	2.1625	-1.9235	7.1593	2.1628	-1.9235
40	7.1593	2.1628	-1.9235	-51.1465	6.0835	-10.3520
41	-51.1465	6.0835	-10.3520	-28.6896	20.8824	-31.7661
42	-28.6896	20.8824	-31.7661	-13.5494	20.8825	-31.7661
43	-13.5494	20.8825	-31.7661	-0.4348	17.8816	-25.6161
44	-0.4348	17.8816	-25.6161	11.3306	14.8818	-19.4661
45	11.3306	14.8818	-19.4661	21.7456	11.8826	-13.3161
46	21.7456	11.8826	-13.3161	30.3604	11.8864	-13.3160
47	30.3604	11.8864	-13.3160	37.2544	8.8897	-7.1660
48	37.2544	8.8897	-7.1660	-27.9538	3.3468	-4.3620
49	-27.9538	3.3468	-4.3620	-25.5288	3.3442	-4.3620
50	-25.5288	3.3442	-4.3620	-23.1033	3.3426	-4.3620
51	-23.1033	3.3426	-4.3620	-20.6805	3.3429	-4.3620
52	-20.6805	3.3429	-4.3620	-18.2556	3.3432	-4.3620
53	-18.2556	3.3432	-4.3620	-15.8336	3.3414	-4.3620
54	-15.8336	3.3414	-4.3620	-13.4110	3.3401	-4.3620
55	-13.4110	3.3401	-4.3620	-10.9909	3.3382	-4.3620
56	-10.9909	3.3382	-4.3620	-8.5695	3.3381	-4.3620
57	-8.5695	3.3381	-4.3620	-6.1486	3.3382	-4.3619
58	-6.1486	3.3382	-4.3619	-3.7279	3.3386	-4.3619
59	-3.7279	3.3386	-4.3619	-1.3070	3.3391	-4.3619
60	-1.3070	3.3391	-4.3619	1.1139	3.3392	-4.3619

ENVOL. MAX. FLECTORES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	17.7749	36.2787	-69.6175	39.0573	32.3719	-61.0490
2	39.0573	32.3719	-61.0490	59.4777	20.1716	-36.0389
3	59.4777	20.1716	-36.0389	75.6564	28.5421	-53.1975
4	75.6564	28.5421	-53.1975	87.8104	16.3420	-28.1875
5	87.8104	16.3420	-28.1875	99.6565	16.3378	-28.1875
6	99.6565	16.3378	-28.1875	105.6301	12.6007	-21.0206
7	105.6301	12.6007	-21.0206	111.4118	0.4011	3.9894
8	111.4118	0.4011	3.9894	113.4913	2.8881	-1.9883
9	113.4913	2.8881	-1.9883	111.1637	-3.2109	10.5168
10	111.1637	-3.2109	10.5168	108.8396	-3.2115	10.5168
11	108.8396	-3.2115	10.5168	101.7561	-6.6744	16.4496
12	101.7561	-6.6744	16.4496	93.2458	-18.8816	41.4595
13	93.2458	-18.8816	41.4595	83.7276	-22.1736	46.8433
14	83.7276	-22.1736	46.8433	68.4789	-13.0790	26.7131
15	68.4789	-13.0790	26.7131	53.1992	-25.2819	51.7231
16	53.1992	-25.2819	51.7231	36.9074	-28.1631	56.1443

17	36.9074	-28.1631	56.1443	18.5737	-18.6050	35.1452
18	18.5737	-18.6050	35.1452	14.1914	1.1216	1.8286
19	14.1914	1.1216	1.8286	15.0047	1.1218	1.8286
20	15.0047	1.1218	1.8286	16.9663	-1.5249	-2.6687
21	16.9663	-1.5249	-2.6687	14.1515	-4.1716	-7.1658
22	14.1515	-4.1716	-7.1658	21.0111	19.2519	-32.1538
23	21.0111	19.2519	-32.1538	41.3867	17.0545	-26.1269
24	41.3867	17.0545	-26.1269	60.4881	14.6434	-19.9617
25	60.4881	14.6434	-19.9617	77.6675	12.0438	-14.0130
26	77.6675	12.0438	-14.0130	92.2713	9.2878	-8.2826
27	92.2713	9.2878	-8.2826	103.7568	6.4161	-2.7706
28	103.7568	6.4161	-2.7706	111.7187	3.4604	2.5232
29	111.7187	3.4604	2.5232	115.8850	0.4541	7.5988
30	115.8850	0.4541	7.5988	116.3127	0.4541	7.5988
31	116.3127	0.4541	7.5988	113.6689	-2.5609	12.4561
32	113.6689	-2.5609	12.4561	107.0946	-5.5703	17.0952
33	107.0946	-5.5703	17.0952	96.7574	-8.5138	21.5161
34	96.7574	-8.5138	21.5161	83.7909	-20.7147	46.5261
35	83.7909	-20.7147	46.5261	67.8795	-23.5689	50.7287
36	67.8795	-23.5689	50.7287	49.0461	-26.2904	54.7132
37	49.0461	-26.2904	54.7132	27.8859	-28.8563	58.4797
38	27.8859	-28.8563	58.4797	8.5809	3.6220	-3.3515
39	8.5809	3.6220	-3.3515	12.0220	3.6222	-3.3515
40	12.0220	3.6222	-3.3515	14.8130	1.3063	-0.8049
41	14.8130	1.3063	-0.8049	13.4307	-1.0094	1.7416
42	13.4307	-1.0094	1.7416	18.6348	18.2762	-25.7055
43	18.6348	18.2762	-25.7055	35.8711	27.8769	-42.6005
44	35.8711	27.8769	-42.6005	50.4633	25.0258	-34.4077
45	50.4633	25.0258	-34.4077	64.6416	12.8236	-9.3977
46	64.6416	12.8236	-9.3977	78.8810	9.7374	-1.6250
47	78.8810	9.7374	-1.6250	88.0322	18.6438	-19.3293
48	88.0322	18.6438	-19.3293	95.4552	6.4536	5.6807
49	95.4552	6.4536	5.6807	101.8269	2.9606	12.4741
50	101.8269	2.9606	5.6807	103.9753	2.9615	12.4742
51	103.9753	2.9615	5.6807	105.2085	-9.2376	37.4842
52	105.2085	-9.2376	37.4842	103.4892	-0.6884	18.7103
53	103.4892	-0.6884	18.7103	96.5863	-12.8845	43.7204
54	96.5863	-12.8845	43.7204	90.1356	-16.6701	49.3536
55	90.1356	-16.6701	49.3536	78.4729	-8.3918	29.3288
56	78.4729	-8.3918	49.3536	64.7424	-28.8708	74.3636
57	64.7424	-28.8708	74.3636	48.9212	-20.5858	54.3389
58	48.9212	-20.5858	74.3636	27.2845	-32.7887	79.3489
59	27.2845	-32.7887	79.3489	5.3249	-36.7990	83.6425
60	5.3249	-36.7990	83.6425	1.7501	4.9434	-6.8544

ENVOL. MIN. FLECTORES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-0.4668	1.1237	1.8285	-1.0897	-5.8850	-12.4431
2	-1.0897	-5.8850	-12.4431	-5.3991	-5.9768	-12.7881
3	-5.3991	-5.9768	-12.7881	-9.7325	-5.9762	-12.7881
4	-9.7325	-5.9762	-12.7881	-14.0637	-5.9753	-12.7881
5	-14.0637	-5.9753	-12.7881	-18.3960	-5.9760	-12.7881
6	-18.3960	-5.9760	-12.7881	-22.7286	-5.9767	-12.7881
7	-22.7286	-5.9767	-12.7881	-27.0602	-5.9754	-12.7881
8	-27.0602	-5.9754	-12.7881	-31.3921	-5.9741	-12.7881

9	-31.3921	-5.9741	-12.7881	-35.7235	-5.9747	-12.7881	3	54.9656	28.5386	-53.1975	75.6564	28.5421	-53.1975
10	-35.7235	-5.9747	-12.7881	-40.0561	-5.9735	-12.7881	4	75.6564	28.5421	-53.1975	83.6899	24.8062	-46.0304
11	-40.0561	-5.9735	-12.7881	-44.3843	-5.9711	-12.7881	5	83.6899	24.8062	-46.0304	86.9135	21.1960	-39.5032
12	-44.3843	-5.9711	-12.7881	-48.7126	-5.9688	-12.7881	6	86.9135	21.1960	-39.5032	85.6908	17.7255	-33.5703
13	-48.7126	-5.9688	-12.7881	-53.0406	-5.9693	-12.7881	7	85.6908	17.7255	-33.5703	98.5420	17.7221	-33.5703
14	-53.0406	-5.9693	-12.7881	-57.3704	-5.9690	-12.7882	8	98.5420	17.7221	-33.5703	90.9080	14.4282	-28.1866
15	-57.3704	-5.9690	-12.7882	-61.6973	-5.9677	-12.7882	9	90.9080	14.4282	-28.1866	79.8868	11.3256	-23.3068
16	-61.6973	-5.9677	-12.7882	-66.0241	-5.9684	-12.7882	10	79.8868	11.3256	-23.3068	66.0690	8.4445	-18.8855
17	-66.0241	-5.9684	-12.7882	-70.3510	-5.9661	-12.7882	11	66.0690	8.4445	-18.8855	72.1902	8.4445	-18.8855
18	-70.3510	-5.9661	-12.7882	-74.6750	-5.9636	-12.7882	12	72.1902	8.4445	-18.8855	54.2864	5.7978	-14.8747
19	-74.6750	-5.9636	-12.7882	-78.9991	-5.9643	-12.7882	13	54.2864	5.7978	-14.8747	35.2413	3.4118	-11.9353
20	-78.9991	-5.9643	-12.7882	-78.2177	12.4268	-32.7895	14	35.2413	3.4118	-11.9353	37.7158	3.4110	-11.9353
21	-78.2177	12.4268	-32.7895	-49.9264	3.6229	-3.3515	15	37.7158	3.4110	-11.9353	16.6465	1.2971	-9.8816
22	-49.9264	3.6229	-3.3515	-46.4850	3.6236	-3.3515	16	16.6465	1.2971	-9.8816	12.5646	1.1223	1.8285
23	-46.4850	3.6236	-3.3515	-43.0420	3.6244	-3.3515	17	12.5646	1.1223	1.8285	13.3783	1.1219	1.8285
24	-43.0420	3.6244	-3.3515	-39.5993	3.6234	-3.3515	18	13.3783	1.1219	1.8285	14.1914	1.1216	1.8286
25	-39.5993	3.6234	-3.3515	-36.1572	3.6235	-3.3515	19	14.1914	1.1216	1.8286	15.0047	1.1218	1.8286
26	-36.1572	3.6235	-3.3515	-32.7141	3.6245	-3.3515	20	15.0047	1.1218	1.8286	-52.1881	18.5487	-43.3788
27	-32.7141	3.6245	-3.3515	-29.2711	3.6246	-3.3515	21	-52.1881	18.5487	-43.3788	-19.0691	39.0459	-69.9818
28	-29.2711	3.6246	-3.3515	-25.8277	3.6237	-3.3515	22	-19.0691	39.0459	-69.9818	4.2983	36.4454	-64.0331
29	-25.8277	3.6237	-3.3515	-22.3858	3.6217	-3.3515	23	4.2983	36.4454	-64.0331	25.5326	33.6935	-58.3027
30	-22.3858	3.6217	-3.3515	-21.5146	-4.1743	-7.1658	24	25.5326	33.6935	-58.3027	43.9937	30.8186	-52.7907
31	-21.5146	-4.1743	-7.1658	-25.4797	-4.1735	-7.1658	25	43.9937	30.8186	-52.7907	59.1698	27.8594	-47.4968
32	-25.4797	-4.1735	-7.1658	-29.4439	-4.1728	-7.1658	26	59.1698	27.8594	-47.4968	70.6855	24.8493	-42.4212
33	-29.4439	-4.1728	-7.1658	-33.4092	-4.1733	-7.1658	27	70.6855	24.8493	-42.4212	94.2890	24.8480	-42.4212
34	-33.4092	-4.1733	-7.1658	-37.3741	-4.1743	-7.1658	28	94.2890	24.8480	-42.4212	99.0313	21.8261	-37.5639
35	-37.3741	-4.1743	-7.1658	-41.3403	-4.1740	-7.1658	29	99.0313	21.8261	-37.5639	99.7883	18.8286	-32.9248
36	-41.3403	-4.1740	-7.1658	-45.3035	-4.1728	-7.1658	30	99.7883	18.8286	-32.9248	96.6207	15.8797	-28.5039
37	-45.3035	-4.1728	-7.1658	-49.2674	-4.1726	-7.1658	31	96.6207	15.8797	-28.5039	89.7160	13.0345	-24.3012
38	-49.2674	-4.1726	-7.1658	-53.2313	-4.1728	-7.1658	32	89.7160	13.0345	-24.3012	79.4151	10.3101	-20.3167
39	-53.2313	-4.1728	-7.1658	-60.7828	-26.9691	62.4761	33	79.4151	10.3101	-20.3167	66.1686	7.7463	-16.5503
40	-60.7828	-26.9691	62.4761	-79.5067	-12.5038	30.1304	34	66.1686	7.7463	-16.5503	50.5489	5.3769	-12.9998
41	-79.5067	-12.5038	30.1304	-66.4653	4.9624	-6.8544	35	50.5489	5.3769	-12.9998	-1.7418	3.6210	-3.3515
42	-66.4653	4.9624	-6.8544	-62.8679	4.9626	-6.8544	36	-1.7418	3.6210	-3.3515	1.6984	3.6213	-3.3515
43	-62.8679	4.9626	-6.8544	-59.2696	4.9621	-6.8544	37	1.6984	3.6213	-3.3515	5.1399	3.6220	-3.3515
44	-59.2696	4.9621	-6.8544	-55.6717	4.9610	-6.8544	38	5.1399	3.6220	-3.3515	8.5809	3.6220	-3.3515
45	-55.6717	4.9610	-6.8544	-52.0753	4.9608	-6.8544	39	8.5809	3.6220	-3.3515	12.0220	3.6222	-3.3515
46	-52.0753	4.9608	-6.8544	-48.4790	4.9621	-6.8544	40	12.0220	3.6222	-3.3515	-41.0858	18.3746	-37.1273
47	-48.4790	4.9621	-6.8544	-44.8829	4.9601	-6.8544	41	-41.0858	18.3746	-37.1273	-15.8587	37.2235	-59.4178
48	-44.8829	4.9601	-6.8544	-41.2900	4.9545	-6.8544	42	-15.8587	37.2235	-59.4178	11.1287	37.2220	-59.4178
49	-41.2900	4.9545	-6.8544	-37.6998	4.9517	-6.8544	43	11.1287	37.2220	-59.4178	25.3754	34.1353	-51.6451
50	-37.6998	4.9517	-6.8544	-34.1099	4.9542	-6.8544	44	25.3754	34.1353	-51.6451	37.7425	30.8358	-44.3394
51	-34.1099	4.9542	-6.8544	-30.5184	4.9546	-6.8544	45	37.7425	30.8358	-44.3394	60.0990	30.8353	-44.3394
52	-30.5184	4.9546	-6.8544	-26.9301	4.9509	-6.8544	46	60.0990	30.8353	-44.3394	67.3412	27.3397	-37.5460
53	-26.9301	4.9509	-6.8544	-23.3427	4.9475	-6.8544	47	67.3412	27.3397	-37.5460	71.2313	23.6928	-31.3099
54	-23.3427	4.9475	-6.8544	-19.7573	4.9445	-6.8544	48	71.2313	23.6928	-31.3099	71.2234	19.9022	-25.6766
55	-19.7573	4.9445	-6.8544	-16.1723	4.9436	-6.8544	49	71.2234	19.9022	-25.6766	85.6548	19.9069	-25.6765
56	-16.1723	4.9436	-6.8544	-12.5884	4.9449	-6.8544	50	85.6548	19.9069	-25.6765	78.4141	15.9886	-20.6913
57	-12.5884	4.9449	-6.8544	-9.0022	4.9452	-6.8544	51	78.4141	15.9886	-20.6913	66.2868	11.9865	-16.3976
58	-9.0022	4.9452	-6.8544	-5.4187	4.9441	-6.8544	52	66.2868	11.9865	-16.3976	48.9398	7.9096	-12.8270
59	-5.4187	4.9441	-6.8544	-2.0034	-11.5435	40.6227	53	48.9398	7.9096	-12.8270	54.6743	7.9149	-12.8270
60	-2.0034	-11.5435	40.6227	-22.2679	-28.6824	62.2026	54	54.6743	7.9149	-12.8270	40.3437	5.3433	-8.7204
ENVOL. MAX. CORTANTES TREN TREN LM 71, EC-1 en via 2							55	40.3437	5.3433	-8.7204	-16.1723	4.9436	-6.8544
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	56	-16.1723	4.9436	-6.8544	-12.5884	4.9449	-6.8544
=====	=====	=====	=====	=====	=====	=====	57	-12.5884	4.9449	-6.8544	-9.0022	4.9452	-6.8544
1	17.7749	36.2787	-69.6175	39.0573	32.3719	-61.0490	58	-9.0022	4.9452	-6.8544	-5.4187	4.9441	-6.8544
2	39.0573	32.3719	-61.0490	54.9656	28.5386	-53.1975	59	-5.4187	4.9441	-6.8544	-1.8340	4.9439	-6.8544
							60	-1.8340	4.9439	-6.8544	1.7501	4.9434	-6.8544

ENVOL. MIN. CORTANTES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	3.2649	-5.9750	-12.7881	-1.0671	-5.9755	-12.7881
2	-1.0671	-5.9755	-12.7881	-5.3991	-5.9768	-12.7881
3	-5.3991	-5.9768	-12.7881	-9.7325	-5.9762	-12.7881
4	-9.7325	-5.9762	-12.7881	-14.0637	-5.9753	-12.7881
5	-14.0637	-5.9753	-12.7881	-18.3960	-5.9760	-12.7881
6	-18.3960	-5.9760	-12.7881	63.0205	-8.8233	21.8932
7	63.0205	-8.8233	21.8932	81.1142	-12.5226	30.4224
8	81.1142	-12.5226	30.4224	72.0372	-12.5251	30.4224
9	72.0372	-12.5251	30.4224	84.0774	-16.4238	38.9909
10	84.0774	-16.4238	38.9909	91.1763	-20.2656	46.8424
11	91.1763	-20.2656	46.8424	76.4798	-20.2678	46.8423
12	76.4798	-20.2678	46.8423	76.2626	-24.0065	54.0093
13	76.2626	-24.0065	54.0093	71.9523	-27.6091	60.5366
14	71.9523	-27.6091	60.5366	64.0399	-31.0812	66.4695
15	64.0399	-31.0812	66.4695	41.5029	-31.0842	66.4695
16	41.5029	-31.0842	66.4695	28.1666	-34.3805	71.8532
17	28.1666	-34.3805	71.8532	12.5765	-37.4848	76.7331
18	12.5765	-37.4848	76.7331	-4.5413	-40.3659	81.1544
19	-4.5413	-40.3659	81.1544	-33.8067	-40.3657	81.1544
20	-33.8067	-40.3657	81.1544	-42.6442	-20.4394	42.1977
21	-42.6442	-20.4394	42.1977	14.1515	-4.1716	-7.1658
22	14.1515	-4.1716	-7.1658	10.1883	-4.1714	-7.1658
23	10.1883	-4.1714	-7.1658	6.2255	-4.1711	-7.1658
24	6.2255	-4.1711	-7.1658	2.2629	-4.1711	-7.1658
25	2.2629	-4.1711	-7.1658	50.2556	-5.1486	17.8663
26	50.2556	-5.1486	17.8663	65.5912	-7.3438	23.8931
27	65.5912	-7.3438	23.8931	79.0433	-9.7583	30.0583
28	79.0433	-9.7583	30.0583	90.0336	-12.3535	36.0069
29	90.0336	-12.3535	36.0069	98.0106	-15.1085	41.7374
30	98.0106	-15.1085	41.7374	102.5282	-17.9825	47.2494
31	102.5282	-17.9825	47.2494	85.4487	-17.9772	47.2494
32	85.4487	-17.9772	47.2494	83.3964	-20.9324	52.5432
33	83.3964	-20.9324	52.5432	77.3553	-23.9438	57.6188
34	77.3553	-23.9438	57.6188	67.3172	-26.9637	62.4761
35	67.3172	-26.9637	62.4761	53.4097	-29.9650	67.1152
36	53.4097	-29.9650	67.1152	35.8947	-32.9154	71.5361
37	35.8947	-32.9154	71.5361	15.1698	-35.7660	75.7388
38	15.1698	-35.7660	75.7388	-8.2330	-38.4935	79.7232
39	-8.2330	-38.4935	79.7232	-33.6524	-41.0569	83.4897
40	-33.6524	-41.0569	83.4897	-48.9769	-20.3960	42.5685
41	-48.9769	-20.3960	42.5685	13.4307	-1.0094	1.7416
42	13.4307	-1.0094	1.7416	12.6991	-1.0094	1.7416
43	12.6991	-1.0094	1.7416	11.9671	-1.0096	1.7416
44	11.9671	-1.0096	1.7416	17.5994	-1.7576	10.7443
45	17.5994	-1.7576	10.7443	36.8424	-3.7965	17.0439
46	36.8424	-3.7965	17.0439	34.0891	-3.7975	17.0440
47	34.0891	-3.7975	17.0440	51.3445	-6.1179	24.3147
48	51.3445	-6.1179	24.3147	67.4035	-8.7115	32.4296
49	67.4035	-8.7115	32.4296	81.7236	-11.5602	40.6225
50	81.7236	-11.5602	40.6225	73.3446	-11.5581	40.6225
51	73.3446	-11.5581	40.6225	83.1120	-14.6424	48.3951
52	83.1120	-14.6424	48.3951	89.7714	-17.9381	55.7010
53	89.7714	-17.9381	55.7010	76.7657	-17.9351	55.7010

54	76.7657	-17.9351	55.7010	77.2094	-21.4209	62.4944
55	77.2094	-21.4209	62.4944	73.3407	-25.0695	68.7303
56	73.3407	-25.0695	68.7303	64.7424	-28.8708	74.3636
57	64.7424	-28.8708	74.3636	43.8078	-28.8727	74.3636
58	43.8078	-28.8727	74.3636	27.2845	-32.7887	79.3489
59	27.2845	-32.7887	79.3489	5.3249	-36.7990	83.6425
60	5.3249	-36.7990	83.6425	-21.3560	-36.8000	83.6425

ENVOL. MAX. TORSORES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-0.4668	1.1237	1.8285	0.3479	1.1237	1.8285
2	0.3479	1.1237	1.8285	15.2931	-1.5483	4.1022
3	15.2931	-1.5483	4.1022	32.1266	-3.4962	9.0870
4	32.1266	-3.4962	9.0870	29.5915	-3.4964	9.0870
5	29.5915	-3.4964	9.0870	42.9786	-5.4973	13.8883
6	42.9786	-5.4973	13.8883	63.0205	-8.8233	21.8932
7	63.0205	-8.8233	21.8932	81.1142	-12.5226	30.4224
8	81.1142	-12.5226	30.4224	72.0372	-12.5251	30.4224
9	72.0372	-12.5251	30.4224	84.0774	-16.4238	38.9909
10	84.0774	-16.4238	38.9909	91.1763	-20.2656	46.8424
11	91.1763	-20.2656	46.8424	76.4798	-20.2678	46.8423
12	76.4798	-20.2678	46.8423	76.2626	-24.0065	54.0093
13	76.2626	-24.0065	54.0093	71.9523	-27.6091	60.5366
14	71.9523	-27.6091	60.5366	64.0399	-31.0812	66.4695
15	64.0399	-31.0812	66.4695	41.5029	-31.0842	66.4695
16	41.5029	-31.0842	66.4695	28.1666	-34.3805	71.8532
17	28.1666	-34.3805	71.8532	12.5765	-37.4848	76.7331
18	12.5765	-37.4848	76.7331	-4.5413	-40.3659	81.1544
19	-4.5413	-40.3659	81.1544	-33.8067	-40.3657	81.1544
20	-33.8067	-40.3657	81.1544	-42.6442	-20.4394	42.1977
21	-42.6442	-20.4394	42.1977	-16.8591	1.1845	1.2171
22	-16.8591	1.1845	1.2171	-0.6052	-0.0131	4.0110
23	-0.6052	-0.0131	4.0110	16.3888	-1.4665	8.0089
24	16.3888	-1.4665	8.0089	33.6139	-3.1838	12.5471
25	33.6139	-3.1838	12.5471	50.2556	-5.1486	17.8663
26	50.2556	-5.1486	17.8663	65.5912	-7.3438	23.8931
27	65.5912	-7.3438	23.8931	79.0433	-9.7583	30.0583
28	79.0433	-9.7583	30.0583	90.0336	-12.3535	36.0069
29	90.0336	-12.3535	36.0069	98.0106	-15.1085	41.7374
30	98.0106	-15.1085	41.7374	102.5282	-17.9825	47.2494
31	102.5282	-17.9825	47.2494	85.4487	-17.9772	47.2494
32	85.4487	-17.9772	47.2494	83.3964	-20.9324	52.5432
33	83.3964	-20.9324	52.5432	77.3553	-23.9438	57.6188
34	77.3553	-23.9438	57.6188	67.3172	-26.9637	62.4761
35	67.3172	-26.9637	62.4761	53.4097	-29.9650	67.1152
36	53.4097	-29.9650	67.1152	35.8947	-32.9154	71.5361
37	35.8947	-32.9154	71.5361	15.1698	-35.7660	75.7388
38	15.1698	-35.7660	75.7388	-8.2330	-38.4935	79.7232
39	-8.2330	-38.4935	79.7232	-33.6524	-41.0569	83.4897
40	-33.6524	-41.0569	83.4897	-48.9769	-20.3960	42.5685
41	-48.9769	-20.3960	42.5685	13.4307	-1.0094	1.7416
42	13.4307	-1.0094	1.7416	12.6991	-1.0094	1.7416
43	12.6991	-1.0094	1.7416	12.6991	-1.0094	1.7416
44	-1.2175	-0.0082	5.1361	17.5994	-1.7576	10.7443
45	17.5994	-1.7576	10.7443	36.8424	-3.7965	17.0439
46	36.8424	-3.7965	17.0439	34.0891	-3.7975	17.0440
47	34.0891	-3.7975	17.0440	51.3445	-6.1179	24.3147

48	51.3445	-6.1179	24.3147	67.4035	-8.7115	32.4296
49	67.4035	-8.7115	32.4296	81.7236	-11.5602	40.6225
50	81.7236	-11.5602	40.6225	73.3446	-11.5581	40.6225
51	73.3446	-11.5581	40.6225	83.1120	-14.6424	48.3951
52	83.1120	-14.6424	48.3951	89.7714	-17.9381	55.7010
53	89.7714	-17.9381	55.7010	76.7657	-17.9351	55.7010
54	76.7657	-17.9351	55.7010	77.2094	-21.4209	62.4944
55	77.2094	-21.4209	62.4944	73.3407	-25.0695	68.7303
56	73.3407	-25.0695	68.7303	64.7424	-28.8708	74.3636
57	64.7424	-28.8708	74.3636	43.8078	-28.8727	74.3636
58	43.8078	-28.8727	74.3636	27.2845	-32.7887	79.3489
59	27.2845	-32.7887	79.3489	5.3249	-36.7990	83.6425
60	5.3249	-36.7990	83.6425	-21.3560	-36.8000	83.6425

ENVOL. MIN. TORSORES TREN TREN LM 71, EC-1 en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	17.7749	36.2787	-69.6175	39.0573	32.3719	-61.0490
2	39.0573	32.3719	-61.0490	54.9656	28.5386	-53.1975
3	54.9656	28.5386	-53.1975	75.6564	28.5421	-53.1975
4	75.6564	28.5421	-53.1975	83.6899	24.8062	-46.0304
5	83.6899	24.8062	-46.0304	86.9135	21.1960	-39.5032
6	86.9135	21.1960	-39.5032	85.6908	17.7255	-33.5703
7	85.6908	17.7255	-33.5703	98.5420	17.7221	-33.5703
8	98.5420	17.7221	-33.5703	90.9080	14.4282	-28.1866
9	90.9080	14.4282	-28.1866	79.8868	11.3256	-23.3068
10	79.8868	11.3256	-23.3068	66.0690	8.4445	-18.8855
11	66.0690	8.4445	-18.8855	72.1902	8.4445	-18.8855
12	72.1902	8.4445	-18.8855	54.2864	5.7978	-14.8747
13	54.2864	5.7978	-14.8747	-52.2436	-5.8899	-12.8196
14	-52.2436	-5.8899	-12.8196	-56.5122	-5.8868	-12.8196
15	-56.5122	-5.8868	-12.8196	-60.7774	-5.8850	-12.8196
16	-60.7774	-5.8850	-12.8196	-65.0450	-5.8837	-12.8196
17	-65.0450	-5.8837	-12.8196	-69.3090	-5.8814	-12.8196
18	-69.3090	-5.8814	-12.8196	-73.5740	-5.8814	-12.8196
19	-73.5740	-5.8814	-12.8196	-77.8371	-5.8814	-12.8196
20	-77.8371	-5.8814	-12.8196	-52.1881	18.5487	-43.3788
21	-52.1881	18.5487	-43.3788	-19.0691	39.0459	-69.9818
22	-19.0691	39.0459	-69.9818	4.2983	36.4454	-64.0331
23	4.2983	36.4454	-64.0331	25.5326	33.6935	-58.3027
24	25.5326	33.6935	-58.3027	43.9937	30.8186	-52.7907
25	43.9937	30.8186	-52.7907	59.1698	27.8594	-47.4968
26	59.1698	27.8594	-47.4968	70.6855	24.8493	-42.4212
27	70.6855	24.8493	-42.4212	94.2890	24.8480	-42.4212
28	94.2890	24.8480	-42.4212	99.0313	21.8261	-37.5639
29	99.0313	21.8261	-37.5639	99.7883	18.8286	-32.9248
30	99.7883	18.8286	-32.9248	96.6207	15.8797	-28.5039
31	96.6207	15.8797	-28.5039	89.7160	13.0345	-24.3012
32	89.7160	13.0345	-24.3012	79.4151	10.3101	-20.3167
33	79.4151	10.3101	-20.3167	66.1686	7.7463	-16.5503
34	66.1686	7.7463	-16.5503	50.5489	5.3769	-12.9998
35	50.5489	5.3769	-12.9998	33.3682	3.2443	-10.2190
36	33.3682	3.2443	-10.2190	15.3652	1.3663	-8.0943
37	15.3652	1.3663	-8.0943	-48.4913	-4.1049	-7.2808
38	-48.4913	-4.1049	-7.2808	-52.3912	-4.1049	-7.2808
39	-52.3912	-4.1049	-7.2808	-56.2908	-4.1052	-7.2808

40	-56.2908	-4.1052	-7.2808	-41.0858	18.3746	-37.1273
41	-41.0858	18.3746	-37.1273	-15.8587	37.2235	-59.4178
42	-15.8587	37.2235	-59.4178	11.1287	37.2220	-59.4178
43	11.1287	37.2220	-59.4178	25.3754	34.1353	-51.6451
44	25.3754	34.1353	-51.6451	37.7425	30.8358	-44.3394
45	37.7425	30.8358	-44.3394	60.0990	30.8353	-44.3394
46	60.0990	30.8353	-44.3394	67.3412	27.3397	-37.5460
47	67.3412	27.3397	-37.5460	71.2313	23.6928	-31.3099
48	71.2313	23.6928	-31.3099	71.2234	19.9022	-25.6766
49	71.2234	19.9022	-25.6766	85.6548	19.9069	-25.6765
50	85.6548	19.9069	-25.6765	78.4141	15.9886	-20.6913
51	78.4141	15.9886	-20.6913	66.2868	11.9865	-16.3976
52	66.2868	11.9865	-16.3976	48.9398	7.9096	-12.8270
53	48.9398	7.9096	-12.8270	54.6743	7.9149	-12.8270
54	54.6743	7.9149	-12.8270	40.3437	5.3433	-8.7204
55	40.3437	5.3433	-8.7204	-16.1723	4.9436	-6.8544
56	-16.1723	4.9436	-6.8544	-12.5884	4.9449	-6.8544
57	-12.5884	4.9449	-6.8544	-9.0022	4.9452	-6.8544
58	-9.0022	4.9452	-6.8544	-5.4187	4.9441	-6.8544
59	-5.4187	4.9441	-6.8544	-1.8340	4.9439	-6.8544
60	-1.8340	4.9439	-6.8544	1.7501	4.9434	-6.8544

ENVOL. MAX. FLECTORES TREN TREN SW/0, EC-1 en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	47.0613	58.0712	-184.3218	96.0108	72.0670	-144.1243
2	96.0108	72.0670	-144.1243	142.5015	59.2219	-115.1743
3	142.5015	59.2219	-115.1743	183.1111	45.9263	-87.9093
4	183.1111	45.9263	-87.9093	216.4065	45.9266	-87.9095
5	216.4065	45.9266	-87.9095	241.3889	32.6234	-60.6446
6	241.3889	32.6234	-60.6446	260.3844	19.3195	-33.3797
7	260.3844	19.3195	-33.3797	273.3939	6.0220	-6.1146
8	273.3939	6.0220	-6.1146	277.7628	6.0086	-6.1147
9	277.7628	6.0086	-6.1147	275.1407	-7.3006	21.1502
10	275.1407	-7.3006	21.1502	266.5321	-20.5997	48.4152
11	266.5321	-20.5997	48.4152	251.5941	-20.6003	48.4151
12	251.5941	-20.6003	48.4151	227.3383	-33.8860	75.6801
13	227.3383	-33.8860	75.6801	197.1129	-47.1892	102.9449
14	197.1129	-47.1892	102.9449	160.8983	-60.5250	130.2098
15	160.8983	-60.5250	130.2098	117.0112	-60.5302	130.2097
16	117.0112	-60.5302	130.2097	65.1667	-73.8161	157.4748
17	65.1667	-73.8161	157.4748	7.3214	-87.1256	184.7398
18	7.3214	-87.1256	184.7398	-1.1567	-0.5913	1.5967
19	-1.1567	-0.5913	1.5967	-1.5854	-0.5913	1.5967
20	-1.5854	-0.5913	1.5967	-1.7963	-0.2419	0.7439
21	-1.7963	-0.2419	0.7439	-1.4765	0.1074	-0.1088
22	-1.4765	0.1074	-0.1088	19.7178	74.9265	-170.4373
23	19.7178	74.9265	-170.4373	84.9019	64.9520	-148.5342
24	84.9019	64.9520	-148.5342	139.9900	54.9379	-126.8716
25	139.9900	54.9379	-126.8716	184.8605	41.6432	-99.6064
26	184.8605	41.6432	-99.6064	217.7700	28.3421	-72.3412
27	217.7700	28.3421	-72.3412	238.6974	15.0338	-45.0764
28	238.6974	15.0338	-45.0764	256.7650	18.3387	-0.8217
29	256.7650	18.3387	-0.8217	274.9889	7.8680	20.7499
30	274.9889	7.8680	20.7499	282.4656	-5.4265	48.0149
31	282.4656	-5.4265	48.0149	278.5159	-2.8393	42.1503
32	278.5159	-2.8393	42.1503	263.8561	-16.1376	69.4153

33	263.8561	-16.1376	69.4153	237.7525	-27.0606	90.0710
34	237.7525	-27.0606	90.0710	201.3999	-40.3736	117.3358
35	201.3999	-40.3736	117.3358	153.0576	-53.6771	144.6008
36	153.0576	-53.6771	144.6008	94.7597	-64.7249	164.5996
37	94.7597	-64.7249	164.5996	24.6217	-78.0322	191.8647
38	24.6217	-78.0322	191.8647	23.2432	9.9044	-8.3308
39	23.2432	9.9044	-8.3308	32.6530	9.9050	-8.3308
40	32.6530	9.9050	-8.3308	40.3879	3.5725	-1.7706
41	40.3879	3.5725	-1.7706	36.7117	-2.7599	4.7895
42	36.7117	-2.7599	4.7895	34.7110	-2.7596	4.7895
43	34.7110	-2.7596	4.7895	32.7101	-2.7592	4.7895
44	32.7101	-2.7592	4.7895	30.7094	-2.7583	4.7896
45	30.7094	-2.7583	4.7896	56.0321	51.4300	-50.3990
46	56.0321	51.4300	-50.3990	94.3730	54.6828	-55.0608
47	94.3730	54.6828	-55.0608	126.3750	41.4011	-27.7957
48	126.3750	41.4011	-27.7957	152.5639	30.4753	-4.7120
49	152.5639	30.4753	-4.7120	174.3257	17.1805	22.5532
50	174.3257	17.1805	22.5532	186.7888	17.1791	22.5534
51	186.7888	17.1791	22.5534	192.9296	3.8802	49.8184
52	192.9296	3.8802	49.8184	193.0857	-9.4030	77.0836
53	193.0857	-9.4030	77.0836	186.2778	-9.3837	77.0838
54	186.2778	-9.3837	77.0838	171.7744	-21.2125	100.4001
55	171.7744	-21.2125	100.4001	151.4138	-34.5124	127.6651
56	151.4138	-34.5124	127.6651	125.0565	-47.8156	154.9301
57	125.0565	-47.8156	154.9301	90.3984	-47.8096	154.9303
58	90.3984	-47.8096	154.9303	48.4245	-61.1094	182.1953
59	48.4245	-61.1094	182.1953	0.7701	-2.7498	4.7896
60	0.7701	-2.7498	4.7896	4.4575	13.3349	-17.4567

ENVOL. MIN. FLECTORES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	6.5537	-0.5909	1.5967	-1.8249	-15.1430	-35.8545
2	-1.8249	-15.1430	-35.8545	-12.8045	-15.1431	-35.8545
3	-12.8045	-15.1431	-35.8545	-23.7843	-15.1423	-35.8545
4	-23.7843	-15.1423	-35.8545	-34.7634	-15.1418	-35.8545
5	-34.7634	-15.1418	-35.8545	-45.7424	-15.1401	-35.8545
6	-45.7424	-15.1401	-35.8545	-56.7230	-15.1379	-35.8545
7	-56.7230	-15.1379	-35.8545	-67.7003	-15.1357	-35.8545
8	-67.7003	-15.1357	-35.8545	-78.6783	-15.1375	-35.8545
9	-78.6783	-15.1375	-35.8545	-89.6544	-15.1453	-35.8545
10	-89.6544	-15.1453	-35.8545	-100.6356	-15.1418	-35.8545
11	-100.6356	-15.1418	-35.8545	-111.6063	-15.1327	-35.8546
12	-111.6063	-15.1327	-35.8546	-122.5714	-15.1351	-35.8546
13	-122.5714	-15.1351	-35.8546	-133.5453	-15.1374	-35.8546
14	-133.5453	-15.1374	-35.8546	-144.5154	-15.1326	-35.8547
15	-144.5154	-15.1326	-35.8547	-160.3203	-59.7895	49.7038
16	-160.3203	-59.7895	49.7038	-203.6682	-59.7887	49.7038
17	-203.6682	-59.7887	49.7038	-254.2104	-69.9026	70.1921
18	-254.2104	-69.9026	70.1921	-309.0926	-80.2140	92.3305
19	-309.0926	-80.2140	92.3305	-369.2991	-90.7508	116.6488
20	-369.2991	-90.7508	116.6488	-396.8947	7.5794	-32.9651
21	-396.8947	7.5794	-32.9651	-267.7444	83.7867	-143.7440
22	-267.7444	83.7867	-143.7440	-189.6462	72.7547	-126.4457
23	-189.6462	72.7547	-126.4457	-120.6476	61.5819	-109.9410
24	-120.6476	61.5819	-109.9410	-108.5058	9.9073	-8.3308
25	-108.5058	9.9073	-8.3308	-99.0938	9.9083	-8.3308

26	-99.0938	9.9083	-8.3308	-89.6781	9.9109	-8.3308
27	-89.6781	9.9109	-8.3308	-80.2623	9.9100	-8.3308
28	-80.2623	9.9100	-8.3308	-70.8490	9.9079	-8.3308
29	-70.8490	9.9079	-8.3308	-61.4368	9.9050	-8.3308
30	-61.4368	9.9050	-8.3308	-52.0271	9.9028	-8.3308
31	-52.0271	9.9028	-8.3308	-42.6339	9.8636	-7.6092
32	-42.6339	9.8636	-7.6092	-33.2656	9.8614	-7.6092
33	-33.2656	9.8614	-7.6092	-23.8972	9.8627	-7.6092
34	-23.8972	9.8627	-7.6092	-15.2202	-47.8576	80.5550
35	-15.2202	-47.8576	80.5550	-60.6824	-47.8568	80.5549
36	-60.6824	-47.8568	80.5549	-114.1943	-58.0633	102.2128
37	-114.1943	-58.0633	102.2128	-175.0459	-68.0414	124.1157
38	-175.0459	-68.0414	124.1157	-246.4416	-78.0502	145.7784
39	-246.4416	-78.0502	145.7784	-320.5914	-78.0522	145.7784
40	-320.5914	-78.0522	145.7784	-353.2794	17.8411	-16.6151
41	-353.2794	17.8411	-16.6151	-232.3541	100.4342	-151.7436
42	-232.3541	100.4342	-151.7436	-174.0620	13.7062	-17.3270
43	-174.0620	13.7062	-17.3270	-164.1244	13.7104	-17.3270
44	-164.1244	13.7104	-17.3270	-154.1859	13.7109	-17.3271
45	-154.1859	13.7109	-17.3271	-144.2500	13.7010	-17.3270
46	-144.2500	13.7010	-17.3270	-134.3181	13.7002	-17.3270
47	-134.3181	13.7002	-17.3270	-124.3821	13.6927	-17.3271
48	-124.3821	13.6927	-17.3271	-114.4638	13.6835	-17.3271
49	-114.4638	13.6835	-17.3271	-104.5404	13.6751	-17.3271
50	-104.5404	13.6751	-17.3271	-94.6247	13.6627	-17.3271
51	-94.6247	13.6627	-17.3271	-84.7101	13.6613	-17.3271
52	-84.7101	13.6613	-17.3271	-74.8004	13.6690	-17.3271
53	-74.8004	13.6690	-17.3271	-64.8869	13.6697	-17.3271
54	-64.8869	13.6697	-17.3271	-54.9826	13.6582	-17.3271
55	-54.9826	13.6582	-17.3271	-45.0828	13.6561	-17.3271
56	-45.0828	13.6561	-17.3271	-35.1796	13.6579	-17.3271
57	-35.1796	13.6579	-17.3271	-25.2770	13.6570	-17.3271
58	-25.2770	13.6570	-17.3271	-15.4472	13.5468	-16.4267
59	-15.4472	13.5468	-16.4267	-7.6898	-10.3562	59.5259
60	-7.6898	-10.3562	59.5259	-59.4301	-73.8126	205.5016

ENVOL. MAX. CORTANTES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	43.3293	72.5201	-142.4394	95.9088	72.5189	-142.4394
2	95.9088	72.5189	-142.4394	142.5015	59.2219	-115.1743
3	142.5015	59.2219	-115.1743	130.9366	47.1508	-111.2372
4	130.9366	47.1508	-111.2372	165.1173	47.1460	-111.2373
5	165.1173	47.1460	-111.2373	155.8294	36.1549	-97.0362
6	155.8294	36.1549	-97.0362	135.4172	26.1254	-85.2072
7	135.4172	26.1254	-85.2072	112.8703	18.1103	-81.9423
8	112.8703	18.1103	-81.9423	118.4694	17.1044	-75.4518
9	118.4694	17.1044	-75.4518	93.6754	11.6186	-69.9820
10	93.6754	11.6186	-69.9820	57.9468	5.8677	-60.1828
11	57.9468	5.8677	-60.1828	20.2708	0.8647	-52.3387
12	20.2708	0.8647	-52.3387	1.4146	-0.5909	1.5967
13	1.4146	-0.5909	1.5967	0.9862	-0.5910	1.5967
14	0.9862	-0.5910	1.5967	0.5576	-0.5911	1.5967
15	0.5576	-0.5911	1.5967	0.1291	-0.5910	1.5967
16	0.1291	-0.5910	1.5967	-0.2994	-0.5911	1.5967
17	-0.2994	-0.5911	1.5967	-0.7280	-0.5912	1.5967
18	-0.7280	-0.5912	1.5967	-1.1567	-0.5913	1.5967
19	-1.1567	-0.5913	1.5967	-1.5854	-0.5913	1.5967

20	-1.5854	-0.5913	1.5967	-184.7534	46.5113	-135.8932
21	-184.7534	46.5113	-135.8932	-238.9406	116.8394	-203.2347
22	-238.9406	116.8394	-203.2347	-157.4687	105.9062	-182.5791
23	-157.4687	105.9062	-182.5791	-87.3445	94.8559	-162.5804
24	-87.3445	94.8559	-162.5804	-28.9576	83.7858	-143.7437
25	-28.9576	83.7858	-143.7437	17.6942	72.7512	-126.4456
26	17.6942	72.7512	-126.4456	54.8586	61.5837	-109.9409
27	54.8586	61.5837	-109.9409	81.7086	50.3812	-93.1230
28	81.7086	50.3812	-93.1230	98.3746	39.1854	-75.9030
29	98.3746	39.1854	-75.9030	105.0564	27.9903	-58.2131
30	105.0564	27.9903	-58.2131	101.9657	16.8405	-40.0039
31	101.9657	16.8405	-40.0039	117.9675	16.8432	-40.0039
32	117.9675	16.8432	-40.0039	-33.2094	9.9015	-8.3308
33	-33.2094	9.9015	-8.3308	-23.8008	9.9014	-8.3308
34	-23.8008	9.9014	-8.3308	-14.3939	9.9032	-8.3308
35	-14.3939	9.9032	-8.3308	-4.9846	9.9042	-8.3308
36	-4.9846	9.9042	-8.3308	4.4236	9.9050	-8.3308
37	4.4236	9.9050	-8.3308	13.8342	9.9053	-8.3308
38	13.8342	9.9053	-8.3308	23.2432	9.9044	-8.3308
39	23.2432	9.9044	-8.3308	32.6530	9.9050	-8.3308
40	32.6530	9.9050	-8.3308	-353.2794	17.8411	-16.6151
41	-353.2794	17.8411	-16.6151	-232.3541	100.4342	-151.7436
42	-232.3541	100.4342	-151.7436	-159.5385	100.4286	-151.7436
43	-159.5385	100.4286	-151.7436	-95.7062	87.1277	-124.4785
44	-95.7062	87.1277	-124.4785	-37.8545	73.8365	-97.2134
45	-37.8545	73.8365	-97.2134	14.0156	60.5396	-69.9485
46	14.0156	60.5396	-69.9485	57.9036	60.5400	-69.9483
47	57.9036	60.5400	-69.9483	94.1474	47.2488	-42.6831
48	94.1474	47.2488	-42.6831	124.4215	33.9542	-15.4180
49	124.4215	33.9542	-15.4180	148.7075	20.6524	11.8471
50	148.7075	20.6524	11.8471	163.6869	20.6591	11.8472
51	163.6869	20.6591	11.8472	-84.7101	13.6613	-17.3271
52	-84.7101	13.6613	-17.3271	-74.8004	13.6690	-17.3271
53	-74.8004	13.6690	-17.3271	-64.8869	13.6697	-17.3271
54	-64.8869	13.6697	-17.3271	-54.9826	13.6582	-17.3271
55	-54.9826	13.6582	-17.3271	-45.0828	13.6561	-17.3271
56	-45.0828	13.6561	-17.3271	-35.1796	13.6579	-17.3271
57	-35.1796	13.6579	-17.3271	-25.2770	13.6570	-17.3271
58	-25.2770	13.6570	-17.3271	-15.3771	13.6560	-17.3270
59	-15.3771	13.6560	-17.3270	-5.4764	13.6563	-17.3270
60	-5.4764	13.6563	-17.3270	4.4243	13.6557	-17.3270

ENVOL. MIN. CORTANTES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	9.1542	-15.1426	-35.8546	-1.8249	-15.1430	-35.8545
2	-1.8249	-15.1430	-35.8545	-12.8045	-15.1431	-35.8545
3	-12.8045	-15.1431	-35.8545	-23.7843	-15.1423	-35.8545
4	-23.7843	-15.1423	-35.8545	-34.7634	-15.1418	-35.8545
5	-34.7634	-15.1418	-35.8545	-45.7424	-15.1401	-35.8545
6	-45.7424	-15.1401	-35.8545	60.4206	-20.7094	-22.0214
7	60.4206	-20.7094	-22.0214	61.9101	-30.3265	-5.7351
8	61.9101	-30.3265	-5.7351	61.9671	-40.0317	11.6785
9	61.9671	-40.0317	11.6785	32.9444	-40.0313	11.6784
10	32.9444	-40.0313	11.6784	24.1415	-49.8425	30.1763
11	24.1415	-49.8425	30.1763	13.0712	-59.7911	49.7041
12	13.0712	-59.7911	49.7041	-0.8090	-63.2537	56.5598

13	-0.8090	-63.2537	56.5598	-51.4895	-69.9034	70.1922
14	-51.4895	-69.9034	70.1922	-76.4720	-80.2125	92.3306
15	-76.4720	-80.2125	92.3306	-106.1207	-90.7509	116.6489
16	-106.1207	-90.7509	116.6489	-171.9146	-90.7520	116.6489
17	-171.9146	-90.7520	116.6489	-214.8221	-101.5448	142.8574
18	-214.8221	-101.5448	142.8574	-264.2933	-112.6327	170.6360
19	-264.2933	-112.6327	170.6360	-321.2235	-124.0322	199.6937
20	-321.2235	-124.0322	199.6937	-177.2700	-51.9313	115.8303
21	-177.2700	-51.9313	115.8303	-1.4765	0.1074	-0.1088
22	-1.4765	0.1074	-0.1088	-1.3745	0.1075	-0.1088
23	-1.3745	0.1075	-0.1088	-1.2724	0.1075	-0.1088
24	-1.2724	0.1075	-0.1088	-1.1703	0.1074	-0.1088
25	-1.1703	0.1074	-0.1088	-1.0682	0.1075	-0.1088
26	-1.0682	0.1075	-0.1088	33.6768	-3.9415	32.6976
27	33.6768	-3.9415	32.6976	73.5891	-9.2097	45.6580
28	73.5891	-9.2097	45.6580	113.2426	-16.1175	17.9477
29	113.2426	-16.1175	17.9477	124.8448	-26.8617	38.3512
30	124.8448	-26.8617	38.3512	127.4017	-37.4530	59.2410
31	127.4017	-37.4530	59.2410	121.1707	-47.8554	80.5551
32	121.1707	-47.8554	80.5551	106.4368	-58.0608	102.2130
33	106.4368	-58.0608	102.2130	83.5018	-68.0365	124.1158
34	83.5018	-68.0365	124.1158	50.1480	-78.0394	145.7784
35	50.1480	-78.0394	145.7784	-23.9975	-78.0432	145.7784
36	-23.9975	-78.0432	145.7784	-98.1436	-78.0486	145.7784
37	-98.1436	-78.0486	145.7784	-4.8659	-85.2200	211.6048
38	-4.8659	-85.2200	211.6048	-75.5516	-95.9464	233.0053
39	-75.5516	-95.9464	233.0053	-159.9832	-106.8790	253.6609
40	-159.9832	-106.8790	253.6609	-220.8111	-52.4778	129.5260
41	-220.8111	-52.4778	129.5260	36.7117	-2.7599	4.7895
42	36.7117	-2.7599	4.7895	34.7110	-2.7596	4.7895
43	34.7110	-2.7596	4.7895	32.7101	-2.7592	4.7895
44	32.7101	-2.7592	4.7895	30.7094	-2.7583	4.7896
45	30.7094	-2.7583	4.7896	28.7096	-2.7582	4.7896
46	28.7096	-2.7582	4.7896	26.7085	-2.7580	4.7896
47	26.7085	-2.7580	4.7896	24.7094	-2.7566	4.7896
48	24.7094	-2.7566	4.7896	30.1418	-4.7238	42.7482
49	30.1418	-4.7238	42.7482	67.4258	-10.3689	59.5256
50	67.4258	-10.3689	59.5256	59.9081	-10.3650	59.5257
51	59.9081	-10.3650	59.5257	90.0712	-16.8679	77.8927
52	90.0712	-16.8679	77.8927	115.5119	-24.2353	97.6468
53	115.5119	-24.2353	97.6468	97.9509	-24.2317	97.6469
54	97.9509	-24.2317	97.6469	110.9268	-32.4680	118.5757
55	110.9268	-32.4680	118.5757	114.9449	-41.6024	140.4571
56	114.9449	-41.6024	140.4571	108.1217	-51.6486	163.0600
57	108.1217	-51.6486	163.0600	70.6839	-51.6358	163.0601
58	70.6839	-51.6358	163.0601	43.2114	-62.5749	186.1439
59	43.2114	-62.5749	186.1439	0.4638	-74.4059	209.4603
60	0.4638	-74.4059	209.4603	-53.4793	-74.4023	209.4603

ENVOL. MAX. TORSORES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	6.5537	-0.5909	1.5967	6.1253	-0.5908	1.5967
2	6.1253	-0.5908	1.5967	22.3692	-2.2785	6.0687
3	22.3692	-2.2785	6.0687	46.4066	-5.0610	13.2022
4	46.4066	-5.0610	13.2022	42.7372	-5.0619	13.2021
5	42.7372	-5.0619	13.2021	69.4687	-8.9262	22.7801

6	69.4687	-8.9262	22.7801	98.6768	-13.8594	34.5963	=====							
7	98.6768	-13.8594	34.5963	128.2025	-19.8401	48.4566								
8	128.2025	-19.8401	48.4566	113.8186	-19.8412	48.4566		1	47.0613	58.0712	-184.3218	88.8315	44.7691	-157.0567
9	113.8186	-19.8412	48.4566	136.5358	-26.8430	64.1792		2	88.8315	44.7691	-157.0567	121.2908	44.7690	-157.0565
10	136.5358	-26.8430	64.1792	154.8762	-34.8232	81.5948		3	121.2908	44.7690	-157.0565	125.8278	42.2445	-132.9927
11	154.8762	-34.8232	81.5948	129.6266	-34.8246	81.5948		4	125.8278	42.2445	-132.9927	125.8364	33.4265	-113.2180
12	129.6266	-34.8246	81.5948	135.3557	-43.7377	100.5462		5	125.8364	33.4265	-113.2180	150.0663	33.4334	-113.2180
13	135.3557	-43.7377	100.5462	132.7379	-53.5418	120.8887		6	150.0663	33.4334	-113.2180	135.0067	25.3873	-96.2793
14	132.7379	-53.5418	120.8887	120.4334	-64.1907	142.4899		7	135.0067	25.3873	-96.2793	112.8703	18.1103	-81.9423
15	120.4334	-64.1907	142.4899	73.9003	-64.1867	142.4899		8	112.8703	18.1103	-81.9423	118.4694	17.1044	-75.4518
16	73.9003	-64.1867	142.4899	42.5300	-75.6026	165.2298		9	118.4694	17.1044	-75.4518	93.6754	11.6186	-69.9820
17	42.5300	-75.6026	165.2298	-0.9957	-87.7148	189.0008		10	93.6754	11.6186	-69.9820	57.9468	5.8677	-60.1828
18	-0.9957	-87.7148	189.0008	-57.1991	-100.4443	213.7074		11	57.9468	5.8677	-60.1828	20.2708	0.8647	-52.3387
19	-57.1991	-100.4443	213.7074	-130.0239	-100.4482	213.7074		12	20.2708	0.8647	-52.3387	-17.9799	-3.4223	-46.2533
20	-130.0239	-100.4482	213.7074	-177.2700	-51.9313	115.8303		13	-17.9799	-3.4223	-46.2533	-20.4618	-3.4230	-46.2534
21	-177.2700	-51.9313	115.8303	-1.4765	0.1074	-0.1088		14	-20.4618	-3.4230	-46.2534	-60.6357	-7.0196	-41.7395
22	-1.4765	0.1074	-0.1088	-1.3745	0.1075	-0.1088		15	-60.6357	-7.0196	-41.7395	-98.5038	-9.9552	-38.6190
23	-1.3745	0.1075	-0.1088	-79.0921	6.5221	4.1026		16	-98.5038	-9.9552	-38.6190	-105.7222	-9.9555	-38.6190
24	-79.0921	6.5221	4.1026	-44.6805	3.9004	11.8388		17	-105.7222	-9.9555	-38.6190	-141.9921	-12.2689	-36.7241
25	-44.6805	3.9004	11.8388	-6.4524	0.4248	21.3960		18	-141.9921	-12.2689	-36.7241	-173.7484	-14.0020	-35.8957
26	-6.4524	0.4248	21.3960	33.6768	-3.9415	32.6976		19	-173.7484	-14.0020	-35.8957	-199.3337	-15.1170	-35.8546
27	33.6768	-3.9415	32.6976	73.5891	-9.2097	45.6580		20	-199.3337	-15.1170	-35.8546	-184.7534	46.5113	-135.8932
28	73.5891	-9.2097	45.6580	109.4162	-15.1537	59.9553		21	-184.7534	46.5113	-135.8932	-66.4549	94.8389	-208.6667
29	109.4162	-15.1537	59.9553	139.8727	-21.8054	75.5409		22	-66.4549	94.8389	-208.6667	-157.4687	105.9062	-182.5791
30	139.8727	-21.8054	75.5409	163.2313	-29.1479	92.3061		23	-157.4687	105.9062	-182.5791	-87.3445	94.8559	-162.5804
31	163.2313	-29.1479	92.3061	135.5363	-29.1449	92.3061		24	-87.3445	94.8559	-162.5804	-28.9576	83.7858	-143.7437
32	135.5363	-29.1449	92.3061	142.5797	-37.1554	110.1425		25	-28.9576	83.7858	-143.7437	17.6942	72.7512	-126.4456
33	142.5797	-37.1554	110.1425	138.8343	-45.7703	128.9418		26	17.6942	72.7512	-126.4456	54.8586	61.5837	-109.9409
34	138.8343	-45.7703	128.9418	123.0566	-54.9529	148.5956		27	54.8586	61.5837	-109.9409	81.7086	50.3812	-93.1230
35	123.0566	-54.9529	148.5956	94.2630	-64.6377	168.9956		28	81.7086	50.3812	-93.1230	98.3746	39.1854	-75.9030
36	94.2630	-64.6377	168.9956	51.7441	-74.7541	190.0334		29	98.3746	39.1854	-75.9030	105.0564	27.9903	-58.2131
37	51.7441	-74.7541	190.0334	-4.8659	-85.2200	211.6048		30	105.0564	27.9903	-58.2131	101.9657	16.8405	-40.0039
38	-4.8659	-85.2200	211.6048	-75.5516	-95.9464	233.0053		31	101.9657	16.8405	-40.0039	117.9675	16.8432	-40.0039
39	-75.5516	-95.9464	233.0053	-159.9832	-106.8790	253.6609		32	117.9675	16.8432	-40.0039	94.8335	5.7646	-21.2458
40	-159.9832	-106.8790	253.6609	-220.8111	-52.4778	129.5260		33	94.8335	5.7646	-21.2458	-22.9056	9.5877	-8.5276
41	-220.8111	-52.4778	129.5260	36.5405	-2.7474	4.7910		34	-22.9056	9.5877	-8.5276	-13.7990	9.5863	-8.5276
42	36.5405	-2.7474	4.7910	34.5488	-2.7477	4.7910		35	-13.7990	9.5863	-8.5276	-4.6930	9.5858	-8.5276
43	34.5488	-2.7477	4.7910	32.5565	-2.7471	4.7910		36	-4.6930	9.5858	-8.5276	4.4149	9.5864	-8.5276
44	32.5565	-2.7471	4.7910	30.5652	-2.7466	4.7910		37	4.4149	9.5864	-8.5276	13.5229	9.5863	-8.5276
45	30.5652	-2.7466	4.7910	-48.4291	4.1189	14.7278		38	13.5229	9.5863	-8.5276	22.6313	9.5867	-8.5276
46	-48.4291	4.1189	14.7278	-45.4427	4.1161	14.7278		39	22.6313	9.5867	-8.5276	31.7393	9.5875	-8.5276
47	-45.4427	4.1161	14.7278	-7.9716	0.0958	27.7543		40	31.7393	9.5875	-8.5276	-353.2794	17.8411	-16.6151
48	-7.9716	0.0958	27.7543	30.1418	-4.7238	42.7482		41	-353.2794	17.8411	-16.6151	-232.3541	100.4342	-151.7436
49	30.1418	-4.7238	42.7482	67.4258	-10.3689	59.5256		42	-232.3541	100.4342	-151.7436	-159.5385	100.4286	-151.7436
50	67.4258	-10.3689	59.5256	59.9081	-10.3650	59.5257		43	-159.5385	100.4286	-151.7436	-95.7062	87.1277	-124.4785
51	59.9081	-10.3650	59.5257	90.0712	-16.8679	77.8927		44	-95.7062	87.1277	-124.4785	-37.8545	73.8365	-97.2134
52	90.0712	-16.8679	77.8927	115.5119	-24.2353	97.6468		45	-37.8545	73.8365	-97.2134	14.0156	60.5396	-69.9485
53	115.5119	-24.2353	97.6468	97.9509	-24.2317	97.6469		46	14.0156	60.5396	-69.9485	57.9036	60.5400	-69.9483
54	97.9509	-24.2317	97.6469	110.9268	-32.4680	118.5757		47	57.9036	60.5400	-69.9483	94.1474	47.2488	-42.6831
55	110.9268	-32.4680	118.5757	114.9449	-41.6024	140.4571		48	94.1474	47.2488	-42.6831	-111.6321	13.3694	-17.4568
56	114.9449	-41.6024	140.4571	108.1217	-51.6486	163.0600		49	-111.6321	13.3694	-17.4568	-101.9477	13.3649	-17.4568
57	108.1217	-51.6486	163.0600	70.6839	-51.6358	163.0601		50	-101.9477	13.3649	-17.4568	-92.2617	13.3592	-17.4568
58	70.6839	-51.6358	163.0601	43.2114	-62.5749	186.1439		51	-92.2617	13.3592	-17.4568	-82.5805	13.3502	-17.4568
59	43.2114	-62.5749	186.1439	0.4638	-74.4059	209.4603		52	-82.5805	13.3502	-17.4568	-72.9016	13.3456	-17.4568
60	0.4638	-74.4059	209.4603	-53.4793	-74.4023	209.4603		53	-72.9016	13.3456	-17.4568	-63.2235	13.3395	-17.4568
								54	-63.2235	13.3395	-17.4568	-53.5544	13.3324	-17.4568
								55	-53.5544	13.3324	-17.4568	-43.8869	13.3348	-17.4568
								56	-43.8869	13.3348	-17.4568	-34.2141	13.3369	-17.4568
								57	-34.2141	13.3369	-17.4568	-24.5456	13.3342	-17.4567
ENVOL. MIN. TORSORES TREN TREN SW/0, EC-1 en via 2														
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2								

ENVOL. MIN. TORSORES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

58	-24.5456	13.3342	-17.4567	-14.8785	13.3346	-17.4567
59	-14.8785	13.3346	-17.4567	-5.2106	13.3350	-17.4567
60	-5.2106	13.3350	-17.4567	4.4575	13.3349	-17.4567

ENVOL. MAX. FLECTORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	58.6871	64.7793	-199.1049	108.2821	81.2803	-162.5462
2	108.2821	81.2803	-162.5462	160.7166	66.7891	-129.8959
3	160.7166	66.7891	-129.8959	206.5186	51.7910	-99.1459
4	206.5186	51.7910	-99.1459	244.0679	51.7845	-99.1461
5	244.0679	51.7845	-99.1461	272.2422	36.7789	-68.3961
6	272.2422	36.7789	-68.3961	293.6657	21.7917	-37.6461
7	293.6657	21.7917	-37.6461	308.3441	6.7829	-6.8962
8	308.3441	6.7829	-6.8962	313.2617	6.7643	-6.8963
9	313.2617	6.7643	-6.8963	310.3060	-8.2199	23.8536
10	310.3060	-8.2199	23.8536	300.6039	-23.2272	54.6036
11	300.6039	-23.2272	54.6036	283.7565	-23.2460	54.6035
12	283.7565	-23.2460	54.6035	256.3979	-38.2423	85.3533
13	256.3979	-38.2423	85.3533	222.3055	-53.2468	116.1033
14	222.3055	-53.2468	116.1033	181.4594	-68.2546	146.8531
15	181.4594	-68.2546	146.8531	131.9742	-68.2481	146.8531
16	131.9742	-68.2481	146.8531	73.4960	-83.2464	177.6031
17	73.4960	-83.2464	177.6031	8.2582	-98.2615	208.3532
18	8.2582	-98.2615	208.3532	-1.3046	-0.6669	1.8008
19	-1.3046	-0.6669	1.8008	-1.7880	-0.6668	1.8008
20	-1.7880	-0.6668	1.8008	-2.0259	-0.2728	0.8390
21	-2.0259	-0.2728	0.8390	-1.6653	0.1212	-0.1227
22	-1.6653	0.1212	-0.1227	-1.5501	0.1212	-0.1227
23	-1.5501	0.1212	-0.1227	28.4235	93.1802	-170.2751
24	28.4235	93.1802	-170.2751	112.4446	78.1855	-139.5250
25	112.4446	78.1855	-139.5250	182.9691	63.1849	-108.7748
26	182.9691	63.1849	-108.7748	241.0948	49.4431	-75.5033
27	241.0948	49.4431	-75.5033	285.8140	34.4366	-44.7533
28	285.8140	34.4366	-44.7533	317.6456	20.8369	-12.0985
29	317.6456	20.8369	-12.0985	336.7041	5.8582	18.6515
30	336.7041	5.8582	18.6515	342.7617	-7.7348	50.6501
31	342.7617	-7.7348	50.6501	335.4092	-7.7236	50.6501
32	335.4092	-7.7236	50.6501	314.5850	-22.7123	81.4000
33	314.5850	-22.7123	81.4000	281.3865	-36.4394	112.6964
34	281.3865	-36.4394	112.6964	234.7542	-51.4347	143.4464
35	234.7542	-51.4347	143.4464	174.6391	-66.4393	174.1964
36	174.6391	-66.4393	174.1964	101.0063	-81.4549	204.9464
37	101.0063	-81.4549	204.9464	15.6028	11.1707	-9.3956
38	15.6028	11.1707	-9.3956	26.2142	11.1695	-9.3956
39	26.2142	11.1695	-9.3956	36.8265	11.1705	-9.3956
40	36.8265	11.1705	-9.3956	45.5501	4.0290	-1.9970
41	45.5501	4.0290	-1.9970	41.4041	-3.1127	5.4017
42	41.4041	-3.1127	5.4017	39.1479	-3.1128	5.4018
43	39.1479	-3.1128	5.4018	36.8911	-3.1128	5.4018
44	36.8911	-3.1128	5.4018	34.6348	-3.1120	5.4018
45	34.6348	-3.1120	5.4018	74.2181	62.5978	-66.7048
46	74.2181	62.5978	-66.7048	119.6037	62.6079	-66.7047
47	119.6037	62.6079	-66.7047	156.3727	47.6210	-35.9545
48	156.3727	47.6210	-35.9545	186.4018	32.6477	-5.2045
49	186.4018	32.6477	-5.2045	209.7018	17.6481	25.5456

50	209.7018	17.6481	25.5456	222.4765	17.6556	25.5456
51	222.4765	17.6556	25.5456	228.1602	2.6675	56.2958
52	228.1602	2.6675	56.2958	227.0835	-12.3371	87.0461
53	227.0835	-12.3371	87.0461	218.1436	-12.3337	87.0462
54	218.1436	-12.3337	87.0462	199.4597	-27.3282	117.7964
55	199.4597	-27.3282	117.7964	174.0342	-42.3111	148.5465
56	174.0342	-42.3111	148.5465	141.8627	-57.3103	179.2964
57	141.8627	-57.3103	179.2964	102.2204	-54.4037	177.8444
58	102.2204	-54.4037	177.8444	54.5284	-69.4034	208.5945
59	54.5284	-69.4034	208.5945	0.8687	-3.1007	5.4018
60	0.8687	-3.1007	5.4018	5.2615	16.6173	-20.6064

ENVOL. MIN. FLECTORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	7.3914	-0.6665	1.8008	6.9083	-0.6664	1.8008
2	6.9083	-0.6664	1.8008	6.4253	-0.6660	1.8008
3	6.4253	-0.6660	1.8008	5.9426	-0.6661	1.8008
4	5.9426	-0.6661	1.8008	5.4595	-0.6662	1.8008
5	5.4595	-0.6662	1.8008	-2.7401	-14.2838	-71.8235
6	-2.7401	-14.2838	-71.8235	-13.0974	-14.2855	-71.8236
7	-13.0974	-14.2855	-71.8236	-24.7109	-21.1744	-55.6791
8	-24.7109	-21.1744	-55.6791	-40.0607	-21.1758	-55.6792
9	-40.0607	-21.1758	-55.6792	-55.4177	-21.1769	-55.6792
10	-55.4177	-21.1769	-55.6792	-73.8959	-28.2716	-38.0658
11	-73.8959	-28.2716	-38.0658	-94.3907	-28.2716	-38.0658
12	-94.3907	-28.2716	-38.0658	-116.0960	-35.6590	-19.1190
13	-116.0960	-35.6590	-19.1190	-141.9453	-35.6626	-19.1192
14	-141.9453	-35.6626	-19.1192	-168.6097	-43.3865	1.0287
15	-168.6097	-43.3865	1.0287	-200.0638	-43.3827	1.0287
16	-200.0638	-43.3827	1.0287	-233.7485	-51.5480	22.2485
17	-233.7485	-51.5480	22.2485	-271.1210	-51.5472	22.2485
18	-271.1210	-51.5472	22.2485	-316.6459	-124.7509	165.4834
19	-316.6459	-124.7509	165.4834	-407.0905	-124.7504	165.4834
20	-407.0905	-124.7504	165.4834	-448.7980	-0.8521	-17.2479
21	-448.7980	-0.8521	-17.2479	-263.3462	126.5750	-212.5150
22	-263.3462	126.5750	-212.5150	-184.3669	59.5017	-144.3685
23	-184.3669	59.5017	-144.3685	-132.9935	11.1753	-9.3956
24	-132.9935	11.1753	-9.3956	-122.3752	11.1742	-9.3956
25	-122.3752	11.1742	-9.3956	-111.7607	11.1765	-9.3956
26	-111.7607	11.1765	-9.3956	-101.1400	11.1779	-9.3956
27	-101.1400	11.1779	-9.3956	-90.5215	11.1733	-9.3956
28	-90.5215	11.1733	-9.3956	-79.9062	11.1712	-9.3956
29	-79.9062	11.1712	-9.3956	-69.2917	11.1749	-9.3956
30	-69.2917	11.1749	-9.3956	-58.6740	11.1735	-9.3956
31	-58.6740	11.1735	-9.3956	-48.0834	11.1257	-8.5818
32	-48.0834	11.1257	-8.5818	-37.5168	11.1231	-8.5818
33	-37.5168	11.1231	-8.5818	-26.9508	11.1214	-8.5818
34	-26.9508	11.1214	-8.5818	-16.3836	11.1213	-8.5818
35	-16.3836	11.1213	-8.5818	-5.8991	10.5965	-6.3702
36	-5.8991	10.5965	-6.3702	-29.7913	-59.6461	93.6577
37	-29.7913	-59.6461	93.6577	-109.9361	-94.5148	175.4517
38	-109.9361	-94.5148	175.4517	-210.0034	-112.7830	217.5469
39	-210.0034	-112.7830	217.5469	-325.4160	-130.2957	258.4684
40	-325.4160	-130.2957	258.4684	-396.5674	-13.0298	53.7113
41	-396.5674	-13.0298	53.7113	-253.6275	99.2834	-145.2254
42	-253.6275	99.2834	-145.2254	-215.1576	16.9166	-20.0210

43	-215.1576	16.9166	-20.0210	-202.8918	16.9114	-20.0210
44	-202.8918	16.9114	-20.0210	-190.6310	16.9074	-20.0211
45	-190.6310	16.9074	-20.0211	-178.3734	16.9175	-20.0211
46	-178.3734	16.9175	-20.0211	-166.1042	16.9105	-20.0211
47	-166.1042	16.9105	-20.0211	-153.8511	16.8934	-20.0211
48	-153.8511	16.8934	-20.0211	-141.6074	16.8830	-20.0211
49	-141.6074	16.8830	-20.0211	-129.3644	16.8741	-20.0211
50	-129.3644	16.8741	-20.0211	-117.1235	16.8740	-20.0211
51	-117.1235	16.8740	-20.0211	-104.8881	16.8639	-20.0211
52	-104.8881	16.8639	-20.0211	-92.6581	16.8595	-20.0211
53	-92.6581	16.8595	-20.0211	-80.4277	16.8672	-20.0211
54	-80.4277	16.8672	-20.0211	-68.2025	16.8636	-20.0211
55	-68.2025	16.8636	-20.0211	-55.9848	16.8546	-20.0211
56	-55.9848	16.8546	-20.0211	-43.7621	16.8498	-20.0211
57	-43.7621	16.8498	-20.0211	-31.5438	16.8474	-20.0211
58	-31.5438	16.8474	-20.0211	-19.4353	16.4668	-17.4006
59	-19.4353	16.4668	-17.4006	-11.1634	-4.5577	56.6650
60	-11.1634	-4.5577	56.6650	-69.3297	-87.2980	240.7960
ENVOL. MAX. CORTANTES TREN TREN SW/2, EC-1 en via 2						

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	48.8671	81.7891	-160.6460	108.1678	81.7883	-160.6460
2	108.1678	81.7883	-160.6460	160.7166	66.7891	-129.8959
3	160.7166	66.7891	-129.8959	206.5186	51.7910	-99.1459
4	206.5186	51.7910	-99.1459	244.0679	51.7845	-99.1461
5	244.0679	51.7845	-99.1461	271.6735	36.7790	-66.4760
6	271.6735	36.7790	-66.4760	293.6657	21.7917	-37.6461
7	293.6657	21.7917	-37.6461	307.7376	6.7896	-4.9760
8	307.7376	6.7896	-4.9760	312.6451	6.7794	-4.9760
9	312.6451	6.7794	-4.9760	3.0450	-0.6666	1.8008
10	3.0450	-0.6666	1.8008	2.5617	-0.6664	1.8008
11	2.5617	-0.6664	1.8008	2.0787	-0.6662	1.8008
12	2.0787	-0.6662	1.8008	1.5954	-0.6664	1.8008
13	1.5954	-0.6664	1.8008	1.1121	-0.6665	1.8008
14	1.1121	-0.6665	1.8008	0.6289	-0.6668	1.8008
15	0.6289	-0.6668	1.8008	0.1456	-0.6667	1.8008
16	0.1456	-0.6667	1.8008	-0.3378	-0.6666	1.8008
17	-0.3378	-0.6666	1.8008	-0.8211	-0.6667	1.8008
18	-0.8211	-0.6667	1.8008	-1.3046	-0.6669	1.8008
19	-1.3046	-0.6669	1.8008	-1.7880	-0.6668	1.8008
20	-1.7880	-0.6668	1.8008	-360.8833	38.1111	-114.5663
21	-360.8833	38.1111	-114.5663	-246.1960	130.0125	-223.6431
22	-246.1960	130.0125	-223.6431	-128.6806	115.0103	-192.8929
23	-128.6806	115.0103	-192.8929	-24.6754	100.0107	-162.1429
24	-24.6754	100.0107	-162.1429	65.8315	85.0142	-131.3929
25	65.8315	85.0142	-131.3929	18.7594	70.4783	-162.7982
26	18.7594	70.4783	-162.7982	41.7292	59.5025	-144.3683
27	41.7292	59.5025	-144.3683	54.6170	49.2331	-126.7197
28	54.6170	49.2331	-126.7197	59.3443	39.6509	-108.9810
29	59.3443	39.6509	-108.9810	56.3476	30.3540	-90.8422
30	56.3476	30.3540	-90.8422	85.1842	15.3533	-60.0920
31	85.1842	15.3533	-60.0920	99.7691	15.3552	-60.0919
32	99.7691	15.3552	-60.0919	-37.4548	11.1718	-9.3956
33	-37.4548	11.1718	-9.3956	-26.8416	11.1711	-9.3956
34	-26.8416	11.1711	-9.3956	-16.2338	11.1693	-9.3956
35	-16.2338	11.1693	-9.3956	-5.6216	11.1702	-9.3956
36	-5.6216	11.1702	-9.3956	4.9889	11.1711	-9.3956

37	4.9889	11.1711	-9.3956	15.6028	11.1707	-9.3956
38	15.6028	11.1707	-9.3956	26.2142	11.1695	-9.3956
39	26.2142	11.1695	-9.3956	36.8265	11.1705	-9.3956
40	36.8265	11.1705	-9.3956	45.5501	4.0290	-1.9970
41	45.5501	4.0290	-1.9970	-232.5793	110.9630	-159.6169
42	-232.5793	110.9630	-159.6169	-152.1273	110.9605	-159.6169
43	-152.1273	110.9605	-159.6169	-81.8105	95.9604	-128.8669
44	-81.8105	95.9604	-128.8669	-18.2322	80.9677	-98.1167
45	-18.2322	80.9677	-98.1167	38.5922	65.9636	-67.3666
46	38.5922	65.9636	-67.3666	86.4202	65.9560	-67.3665
47	86.4202	65.9560	-67.3665	125.6217	50.9627	-36.6165
48	125.6217	50.9627	-36.6165	158.0942	35.9751	-5.8664
49	158.0942	35.9751	-5.8664	183.8134	20.9876	24.8838
50	183.8134	20.9876	24.8838	199.0399	21.0011	24.8839
51	199.0399	21.0011	24.8839	-104.8881	16.8639	-20.0211
52	-104.8881	16.8639	-20.0211	-92.6581	16.8595	-20.0211
53	-92.6581	16.8595	-20.0211	-80.4277	16.8672	-20.0211
54	-80.4277	16.8672	-20.0211	-68.2025	16.8636	-20.0211
55	-68.2025	16.8636	-20.0211	-55.9848	16.8546	-20.0211
56	-55.9848	16.8546	-20.0211	-43.7621	16.8498	-20.0211
57	-43.7621	16.8498	-20.0211	-31.5438	16.8474	-20.0211
58	-31.5438	16.8474	-20.0211	-19.3252	16.8484	-20.0210
59	-19.3252	16.8484	-20.0210	-7.1072	16.8518	-20.0210
60	-7.1072	16.8518	-20.0210	5.1120	16.8525	-20.0210

ENVOL. MIN. CORTANTES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	29.9013	-7.5216	-86.3637	24.4480	-7.5217	-86.3637
2	24.4480	-7.5217	-86.3637	28.3275	-14.2839	-71.8234
3	28.3275	-14.2839	-71.8234	36.7063	-21.1773	-55.6790
4	36.7063	-21.1773	-55.6790	21.3525	-21.1768	-55.6791
5	21.3525	-21.1768	-55.6791	28.6127	-28.2790	-38.0657
6	28.6127	-28.2790	-38.0657	39.0135	-35.6618	-19.1188
7	39.0135	-35.6618	-19.1188	51.6112	-43.3954	1.0292
8	51.6112	-43.3954	1.0292	20.1488	-43.3937	1.0290
9	20.1488	-43.3937	1.0290	27.8814	-51.5548	22.2488
10	27.8814	-51.5548	22.2488	34.9958	-60.2054	44.4111
11	34.9958	-60.2054	44.4111	-8.6514	-60.2043	44.4111
12	-8.6514	-60.2043	44.4111	-10.5131	-69.4005	68.2589
13	-10.5131	-69.4005	68.2589	-16.8511	-79.1898	94.3705
14	-16.8511	-79.1898	94.3705	-29.2447	-89.6017	122.4162
15	-29.2447	-89.6017	122.4162	-94.2101	-89.6064	122.4162
16	-94.2101	-89.6064	122.4162	-129.6049	-101.0178	134.3613
17	-129.6049	-101.0178	134.3613	-207.7187	-116.0218	165.1113
18	-207.7187	-116.0218	165.1113	-292.5891	-131.0251	195.8613
19	-292.5891	-131.0251	195.8613	-387.5802	-131.0240	195.8613
20	-387.5802	-131.0240	195.8613	-199.9282	-58.5668	130.6357
21	-199.9282	-58.5668	130.6357	-1.6653	0.1212	-0.1227
22	-1.6653	0.1212	-0.1227	-1.5501	0.1212	-0.1227
23	-1.5501	0.1212	-0.1227	-1.4350	0.1212	-0.1227
24	-1.4350	0.1212	-0.1227	-1.3199	0.1212	-0.1227
25	-1.3199	0.1212	-0.1227	-1.2047	0.1212	-0.1227
26	-1.2047	0.1212	-0.1227	15.4067	-1.9344	34.3810
27	15.4067	-1.9344	34.3810	54.7478	-6.8763	48.0032
28	54.7478	-6.8763	48.0032	92.4513	-12.7285	63.2928

29	92.4513	-12.7285	63.2928	126.4892	-19.5153	80.1828
30	126.4892	-19.5153	80.1828	154.7365	-27.2523	98.6060
31	154.7365	-27.2523	98.6060	128.8486	-27.2440	98.6060
32	128.8486	-27.2440	98.6060	140.9294	-35.9168	118.4955
33	140.9294	-35.9168	118.4955	142.3484	-45.6504	139.9066
34	142.3484	-45.6504	139.9066	168.1434	-58.5566	126.2070
35	168.1434	-58.5566	126.2070	101.2614	-73.5632	156.9568
36	101.2614	-73.5632	156.9568	20.8724	-88.5674	187.7068
37	20.8724	-88.5674	187.7068	-73.0174	-103.5658	218.4570
38	-73.0174	-103.5658	218.4570	-180.4091	-118.5640	249.2070
39	-180.4091	-118.5640	249.2070	-301.2962	-133.5649	279.9570
40	-301.2962	-133.5649	279.9570	-284.1084	-62.2688	153.9628
41	-284.1084	-62.2688	153.9628	41.4041	-3.1127	5.4017
42	41.4041	-3.1127	5.4017	39.1479	-3.1128	5.4018
43	39.1479	-3.1128	5.4018	36.8911	-3.1128	5.4018
44	36.8911	-3.1128	5.4018	34.6348	-3.1120	5.4018
45	34.6348	-3.1120	5.4018	32.3788	-3.1119	5.4018
46	32.3788	-3.1119	5.4018	30.1226	-3.1115	5.4018
47	30.1226	-3.1115	5.4018	27.8674	-3.1093	5.4018
48	27.8674	-3.1093	5.4018	25.6152	-3.1070	5.4018
49	25.6152	-3.1070	5.4018	21.8827	-4.5588	56.6645
50	21.8827	-4.5588	56.6645	18.5775	-4.5583	56.6646
51	18.5775	-4.5583	56.6646	58.3308	-11.9855	77.7015
52	58.3308	-11.9855	77.7015	94.2331	-20.6844	100.7754
53	94.2331	-20.6844	100.7754	79.2359	-20.6766	100.7756
54	79.2359	-20.6766	100.7756	101.5011	-30.7168	125.7055
55	101.5011	-30.7168	125.7055	174.0342	-42.3111	148.5465
56	174.0342	-42.3111	148.5465	141.8627	-57.3103	179.2964
57	141.8627	-57.3103	179.2964	100.3051	-57.3045	179.2966
58	100.3051	-57.3045	179.2966	50.5147	-72.3005	210.0467
59	50.5147	-72.3005	210.0467	-6.0361	-87.3042	240.7963
60	-6.0361	-87.3042	240.7963	-69.3297	-87.2980	240.7960

ENVOL. MAX. TORSORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	7.3914	-0.6665	1.8008	6.9083	-0.6664	1.8008
2	6.9083	-0.6664	1.8008	25.2281	-2.5697	6.8444
3	25.2281	-2.5697	6.8444	52.3377	-5.7085	14.8897
4	52.3377	-5.7085	14.8897	48.1997	-5.7073	14.8896
5	48.1997	-5.7073	14.8896	78.3476	-10.0679	25.6919
6	78.3476	-10.0679	25.6919	111.2897	-15.6334	39.0184
7	111.2897	-15.6334	39.0184	144.5889	-22.3754	54.6503
8	144.5889	-22.3754	54.6503	128.3665	-22.3783	54.6502
9	128.3665	-22.3783	54.6502	153.9879	-30.2790	72.3826
10	153.9879	-30.2790	72.3826	174.6691	-39.2682	92.0242
11	174.6691	-39.2682	92.0242	146.1971	-39.2755	92.0242
12	146.1971	-39.2755	92.0242	152.6590	-49.3353	113.3979
13	152.6590	-49.3353	113.3979	149.7054	-60.3836	136.3406
14	149.7054	-60.3836	136.3406	135.8301	-72.3839	160.7028
15	135.8301	-72.3839	160.7028	83.3497	-72.3960	160.7028
16	83.3497	-72.3960	160.7028	47.9665	-85.2595	186.3495
17	47.9665	-85.2595	186.3495	-1.1226	-98.9271	213.1588
18	-1.1226	-98.9271	213.1588	-64.5101	-113.2893	241.0233
19	-64.5101	-113.2893	241.0233	-146.6448	-113.2873	241.0234
20	-146.6448	-113.2873	241.0234	-199.9282	-58.5668	130.6357
21	-199.9282	-58.5668	130.6357	-1.6653	0.1212	-0.1227
22	-1.6653	0.1212	-0.1227	-1.5501	0.1212	-0.1227

23	-1.5501	0.1212	-0.1227	-94.4116	7.7951	4.1899
24	-94.4116	7.7951	4.1899	-60.7696	5.3519	12.4072
25	-60.7696	5.3519	12.4072	-23.6710	2.1273	22.4933
26	-23.6710	2.1273	22.4933	15.4067	-1.9344	34.3810
27	15.4067	-1.9344	34.3810	54.7478	-6.8763	48.0032
28	54.7478	-6.8763	48.0032	92.4513	-12.7285	63.2928
29	92.4513	-12.7285	63.2928	126.4892	-19.5153	80.1828
30	126.4892	-19.5153	80.1828	154.7365	-27.2523	98.6060
31	154.7365	-27.2523	98.6060	128.8486	-27.2440	98.6060
32	128.8486	-27.2440	98.6060	140.9294	-35.9168	118.4955
33	140.9294	-35.9168	118.4955	142.3484	-45.6504	139.9066
34	142.3484	-45.6504	139.9066	130.8192	-56.4898	162.8418
35	130.8192	-56.4898	162.8418	103.8990	-68.4059	187.2352
36	103.8990	-68.4059	187.2352	59.3144	-81.3545	213.0113
37	59.3144	-81.3545	213.0113	-4.9173	-95.2285	240.0842
38	-4.9173	-95.2285	240.0842	-90.3761	-109.9709	268.3571
39	-90.3761	-109.9709	268.3571	-198.2057	-125.4610	297.7236
40	-198.2057	-125.4610	297.7236	-284.1084	-62.2688	153.9628
41	-284.1084	-62.2688	153.9628	41.2110	-3.0986	5.4034
42	41.2110	-3.0986	5.4034	38.9648	-3.0986	5.4034
43	38.9648	-3.0986	5.4034	36.7179	-3.0981	5.4034
44	36.7179	-3.0981	5.4034	34.4720	-3.0977	5.4034
45	34.4720	-3.0977	5.4034	-116.5856	10.5636	7.6747
46	-116.5856	10.5636	7.6747	-108.9223	10.5624	7.6747
47	-108.9223	10.5624	7.6747	-68.0323	6.6476	21.4929
48	-68.0323	6.6476	21.4929	-23.8424	1.6344	37.8654
49	-23.8424	1.6344	37.8654	21.8827	-4.5588	56.6645
50	21.8827	-4.5588	56.6645	18.5775	-4.5583	56.6646
51	18.5775	-4.5583	56.6646	58.3308	-11.9855	77.7015
52	58.3308	-11.9855	77.7015	94.2331	-20.6844	100.7754
53	94.2331	-20.6844	100.7754	79.2359	-20.6766	100.7756
54	79.2359	-20.6766	100.7756	101.5011	-30.7168	125.7055
55	101.5011	-30.7168	125.7055	113.7153	-42.0972	152.2819
56	113.7153	-42.0972	152.2819	113.0253	-54.8541	180.2649
57	113.0253	-54.8541	180.2649	73.2578	-54.8482	180.2650
58	73.2578	-54.8482	180.2650	50.5147	-72.3005	210.0467
59	50.5147	-72.3005	210.0467	-6.0361	-87.3042	240.7963
60	-6.0361	-87.3042	240.7963	-69.3297	-87.2980	240.7960

ENVOL. MIN. TORSORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	52.0572	63.9995	-203.8877	98.4588	63.9990	-203.8876
2	98.4588	63.9990	-203.8876	118.1467	49.6509	-180.7682
3	118.1467	49.6509	-180.7682	120.8158	36.7361	-160.2298
4	120.8158	36.7361	-160.2298	147.4495	36.7393	-160.2299
5	147.4495	36.7393	-160.2299	127.8326	25.2593	-142.0157
6	127.8326	25.2593	-142.0157	98.2773	15.2028	-125.8940
7	98.2773	15.2028	-125.8940	61.6507	6.5282	-111.6592
8	61.6507	6.5282	-111.6592	66.3845	6.5281	-111.6593
9	66.3845	6.5281	-111.6593	20.0758	-0.8023	-99.1338
10	20.0758	-0.8023	-99.1338	-24.6300	-7.5178	-86.3638
11	-24.6300	-7.5178	-86.3638	-30.0791	-7.5197	-86.3638
12	-30.0791	-7.5197	-86.3638	-75.2173	-14.2748	-71.8237
13	-75.2173	-14.2748	-71.8237	-116.8132	-21.1742	-55.6795
14	-116.8132	-21.1742	-55.6795	-155.8815	-28.2657	-38.0660

15	-155.8815	-28.2657	-38.0660	-176.3732	-28.2629	-38.0660
16	-176.3732	-28.2629	-38.0660	-219.4859	-35.6510	-19.1192
17	-219.4859	-35.6510	-19.1192	-262.9738	-43.3818	1.0287
18	-262.9738	-43.3818	1.0287	-1.3046	-0.6669	1.8008
19	-1.3046	-0.6669	1.8008	-1.7880	-0.6668	1.8008
20	-1.7880	-0.6668	1.8008	-360.8833	38.1111	-114.5663
21	-360.8833	38.1111	-114.5663	-216.4613	121.8531	-248.2545
22	-216.4613	121.8531	-248.2545	-132.2025	107.9193	-224.7325
23	-132.2025	107.9193	-224.7325	-66.1213	94.6944	-202.7816
24	-66.1213	94.6944	-202.7816	-16.4722	82.2073	-182.2031
25	-16.4722	82.2073	-182.2031	18.7594	70.4783	-162.7982
26	18.7594	70.4783	-162.7982	41.7292	59.5025	-144.3683
27	41.7292	59.5025	-144.3683	54.6170	49.2331	-126.7197
28	54.6170	49.2331	-126.7197	59.3443	39.6509	-108.9810
29	59.3443	39.6509	-108.9810	56.3476	30.3540	-90.8422
30	56.3476	30.3540	-90.8422	85.1842	15.3533	-60.0920
31	85.1842	15.3533	-60.0920	99.7691	15.3552	-60.0919
32	99.7691	15.3552	-60.0919	100.8570	0.3584	-29.3421
33	100.8570	0.3584	-29.3421	-25.8345	10.8100	-9.6176
34	-25.8345	10.8100	-9.6176	-15.5627	10.8097	-9.6176
35	-15.5627	10.8097	-9.6176	-5.2927	10.8096	-9.6176
36	-5.2927	10.8096	-9.6176	4.9788	10.8121	-9.6176
37	4.9788	10.8121	-9.6176	15.2516	10.8130	-9.6176
38	15.2516	10.8130	-9.6176	25.5241	10.8125	-9.6176
39	25.5241	10.8125	-9.6176	35.7962	10.8125	-9.6176
40	35.7962	10.8125	-9.6176	41.4743	3.6553	-2.2443
41	41.4743	3.6553	-2.2443	-202.4032	108.7325	-160.6203
42	-202.4032	108.7325	-160.6203	-123.5695	108.7326	-160.6203
43	-123.5695	108.7326	-160.6203	-54.8658	93.7354	-129.8701
44	-54.8658	93.7354	-129.8701	7.0924	78.7474	-99.1201
45	7.0924	78.7474	-99.1201	62.3090	63.7413	-68.3699
46	62.3090	63.7413	-68.3699	108.5154	63.7387	-68.3699
47	108.5154	63.7387	-68.3699	146.1115	48.7441	-37.6197
48	146.1115	48.7441	-37.6197	-139.4094	16.6551	-20.6065
49	-139.4094	16.6551	-20.6065	-127.3379	16.6536	-20.6065
50	-127.3379	16.6536	-20.6065	-115.2667	16.6467	-20.6065
51	-115.2667	16.6467	-20.6065	-103.2063	16.6420	-20.6065
52	-103.2063	16.6420	-20.6065	-91.1400	16.6390	-20.6065
53	-91.1400	16.6390	-20.6065	-79.0835	16.6329	-20.6065
54	-79.0835	16.6329	-20.6065	-67.0325	16.6338	-20.6065
55	-67.0325	16.6338	-20.6065	-54.9781	16.6245	-20.6065
56	-54.9781	16.6245	-20.6065	-42.9331	16.6199	-20.6065
57	-42.9331	16.6199	-20.6065	-30.8810	16.6182	-20.6065
58	-30.8810	16.6182	-20.6065	-18.8345	16.6124	-20.6064
59	-18.8345	16.6124	-20.6064	-6.7867	16.6159	-20.6064
60	-6.7867	16.6159	-20.6064	5.2615	16.6173	-20.6064

ENVOL. MAX. FLECTORES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	5.1520	4.9068	-17.6158	9.0236	6.7732	-13.5455
2	9.0236	6.7732	-13.5455	13.3930	5.5659	-10.8246
3	13.3930	5.5659	-10.8246	17.2099	4.3160	-8.2621
4	17.2099	4.3160	-8.2621	20.3389	4.3159	-8.2622
5	20.3389	4.3159	-8.2622	22.6868	3.0659	-5.6997
6	22.6868	3.0659	-5.6997	24.4723	1.8163	-3.1372
7	24.4723	1.8163	-3.1372	25.6951	0.5664	-0.5747
8	25.6951	0.5664	-0.5747	26.1052	0.5642	-0.5747

9	26.1052	0.5642	-0.5747	25.8588	-0.6850	1.9878
10	25.8588	-0.6850	1.9878	25.0507	-1.9362	4.5503
11	25.0507	-1.9362	4.5503	23.6463	-1.9397	4.5503
12	23.6463	-1.9397	4.5503	21.3665	-3.1892	7.1128
13	21.3665	-3.1892	7.1128	18.5250	-4.4370	9.6753
14	18.5250	-4.4370	9.6753	15.1217	-5.6864	12.2378
15	15.1217	-5.6864	12.2378	10.9982	-5.6880	12.2378
16	10.9982	-5.6880	12.2378	6.1244	-6.9382	14.8003
17	6.1244	-6.9382	14.8003	0.6881	-8.1884	17.3628
18	0.6881	-8.1884	17.3628	-0.1087	-0.0556	0.1501
19	-0.1087	-0.0556	0.1501	-0.1490	-0.0556	0.1501
20	-0.1490	-0.0556	0.1501	-0.1689	-0.0227	0.0699
21	-0.1689	-0.0227	0.0699	-0.1388	0.0101	-0.0102
22	-0.1388	0.0101	-0.0102	-0.1292	0.0101	-0.0102
23	-0.1292	0.0101	-0.0102	-0.1196	0.0101	-0.0102
24	-0.1196	0.0101	-0.0102	2.8528	6.3526	-13.5321
25	2.8528	6.3526	-13.5321	9.0234	6.1833	-9.0126
26	9.0234	6.1833	-9.0126	14.6474	4.9332	-6.4500
27	14.6474	4.9332	-6.4500	19.1457	3.6831	-3.8875
28	19.1457	3.6831	-3.8875	22.5195	2.4338	-1.3251
29	22.5195	2.4338	-1.3251	24.7698	1.1841	1.2374
30	24.7698	1.1841	1.2374	25.8937	-0.0652	3.7999
31	25.8937	-0.0652	3.7999	25.8327	-0.0644	3.7999
32	25.8327	-0.0644	3.7999	24.6454	-1.3144	6.3624
33	24.6454	-1.3144	6.3624	22.3347	-2.5647	8.9249
34	22.3347	-2.5647	8.9249	18.8980	-3.8152	11.4874
35	18.8980	-3.8152	11.4874	14.3361	-5.0647	14.0499
36	14.3361	-5.0647	14.0499	8.6499	-6.3152	16.6124
37	8.6499	-6.3152	16.6124	1.8370	-7.5655	19.1749
38	1.8370	-7.5655	19.1749	2.1845	0.9309	-0.7830
39	2.1845	0.9309	-0.7830	3.0689	0.9309	-0.7830
40	3.0689	0.9309	-0.7830	3.7959	0.3357	-0.1664
41	3.7959	0.3357	-0.1664	3.4504	-0.2594	0.4501
42	3.4504	-0.2594	0.4501	3.2623	-0.2595	0.4501
43	3.2623	-0.2595	0.4501	3.0742	-0.2595	0.4501
44	3.0742	-0.2595	0.4501	2.8862	-0.2594	0.4501
45	2.8862	-0.2594	0.4501	2.6982	-0.2593	0.4501
46	2.6982	-0.2593	0.4501	4.6698	5.8208	-6.1843
47	4.6698	5.8208	-6.1843	8.1712	4.5720	-3.6218
48	8.1712	4.5720	-3.6218	11.1111	3.3228	-1.0593
49	11.1111	3.3228	-1.0593	13.4883	2.0735	1.5032
50	13.4883	2.0735	1.5032	14.9916	2.0736	1.5032
51	14.9916	2.0736	1.5032	15.9004	0.8236	4.0657
52	15.9004	0.8236	4.0657	16.2479	-0.4261	6.6283
53	16.2479	-0.4261	6.6283	15.9390	-0.4259	6.6283
54	15.9390	-0.4259	6.6283	14.8186	-1.6748	9.1908
55	14.8186	-1.6748	9.1908	13.1361	-2.9239	11.7533
56	13.1361	-2.9239	11.7533	10.8908	-4.1732	14.3158
57	10.8908	-4.1732	14.3158	7.8649	-4.1736	14.3158
58	7.8649	-4.1736	14.3158	4.1511	-5.4243	16.8783
59	4.1511	-5.4243	16.8783	0.0724	-0.2584	0.4501
60	0.0724	-0.2584	0.4501	0.3951	1.2426	-1.5477

ENVOL. MIN. FLECTORES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						

1	0.6159	-0.0555	0.1501	0.5757	-0.0555	0.1501	60	-0.9086	-1.0821	6.6310	-5.5781	-6.7261	19.2845
2	0.5757	-0.0555	0.1501	0.5354	-0.0555	0.1501	ENVOL. MAX. CORTANTES TREN TREN SIN CARGA, EC-1 en via 2						
3	0.5354	-0.0555	0.1501	0.4952	-0.0555	0.1501	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
4	0.4952	-0.0555	0.1501	0.4550	-0.0555	0.1501	=====						
5	0.4550	-0.0555	0.1501	0.4147	-0.0555	0.1501	1	4.0723	6.8158	-13.3872	9.0140	6.8156	-13.3872
6	0.4147	-0.0555	0.1501	0.3745	-0.0555	0.1501	2	9.0140	6.8156	-13.3872	13.3930	5.5659	-10.8246
7	0.3745	-0.0555	0.1501	0.3342	-0.0555	0.1501	3	13.3930	5.5659	-10.8246	17.2099	4.3160	-8.2621
8	0.3342	-0.0555	0.1501	0.2940	-0.0555	0.1501	4	17.2099	4.3160	-8.2621	20.3389	4.3159	-8.2622
9	0.2940	-0.0555	0.1501	0.2537	-0.0555	0.1501	5	20.3389	4.3159	-8.2622	22.6868	3.0659	-5.6997
10	0.2537	-0.0555	0.1501	0.2135	-0.0555	0.1501	6	22.6868	3.0659	-5.6997	24.4723	1.8163	-3.1372
11	0.2135	-0.0555	0.1501	0.1732	-0.0556	0.1501	7	24.4723	1.8163	-3.1372	25.6951	0.5664	-0.5747
12	0.1732	-0.0556	0.1501	0.1329	-0.0556	0.1501	8	25.6951	0.5664	-0.5747	26.0532	0.5642	-0.4147
13	0.1329	-0.0556	0.1501	0.0927	-0.0555	0.1501	9	26.0532	0.5642	-0.4147	0.2537	-0.0555	0.1501
14	0.0927	-0.0555	0.1501	-3.1704	-7.5940	8.0091	10	0.2537	-0.0555	0.1501	0.2135	-0.0555	0.1501
15	-3.1704	-7.5940	8.0091	-8.6762	-7.5946	8.0091	11	0.2135	-0.0555	0.1501	0.1732	-0.0556	0.1501
16	-8.6762	-7.5946	8.0091	-14.9323	-8.8447	10.5716	12	0.1732	-0.0556	0.1501	0.1329	-0.0556	0.1501
17	-14.9323	-8.8447	10.5716	-21.7507	-10.0946	13.1341	13	0.1329	-0.0556	0.1501	0.0927	-0.0555	0.1501
18	-21.7507	-10.0946	13.1341	-29.1318	-11.3447	15.6966	14	0.0927	-0.0555	0.1501	0.0524	-0.0555	0.1501
19	-29.1318	-11.3447	15.6966	-37.3567	-11.3445	15.6966	15	0.0524	-0.0555	0.1501	0.0121	-0.0556	0.1501
20	-37.3567	-11.3445	15.6966	-41.0893	-0.0805	-1.7830	16	0.0121	-0.0556	0.1501	-0.0281	-0.0556	0.1501
21	-41.0893	-0.0805	-1.7830	-24.7229	11.1836	-19.2626	17	-0.0281	-0.0556	0.1501	-0.0684	-0.0556	0.1501
22	-24.7229	11.1836	-19.2626	-14.5984	9.9334	-16.7001	18	-0.0684	-0.0556	0.1501	-0.1087	-0.0556	0.1501
23	-14.5984	9.9334	-16.7001	-11.0828	0.9312	-0.7830	19	-0.1087	-0.0556	0.1501	-0.1490	-0.0556	0.1501
24	-11.0828	0.9312	-0.7830	-10.1979	0.9310	-0.7830	20	-0.1490	-0.0556	0.1501	-0.1689	-0.0227	0.0699
25	-10.1979	0.9310	-0.7830	-9.3134	0.9312	-0.7830	21	-0.1689	-0.0227	0.0699	-24.7229	11.1836	-19.2626
26	-9.3134	0.9312	-0.7830	-8.4284	0.9313	-0.7830	22	-24.7229	11.1836	-19.2626	-14.5984	9.9334	-16.7001
27	-8.4284	0.9313	-0.7830	-7.5437	0.9315	-0.7830	23	-14.5984	9.9334	-16.7001	-5.5996	8.6833	-14.1376
28	-7.5437	0.9315	-0.7830	-6.6586	0.9313	-0.7830	24	-5.5996	8.6833	-14.1376	2.2744	7.4335	-11.5751
29	-6.6586	0.9313	-0.7830	-5.7744	0.9310	-0.7830	25	2.2744	7.4335	-11.5751	9.0234	6.1833	-9.0126
30	-5.7744	0.9310	-0.7830	-4.8898	0.9311	-0.7830	26	9.0234	6.1833	-9.0126	14.6474	4.9332	-6.4500
31	-4.8898	0.9311	-0.7830	-4.0068	0.9272	-0.7152	27	14.6474	4.9332	-6.4500	19.1457	3.6831	-3.8875
32	-4.0068	0.9272	-0.7152	-3.1264	0.9267	-0.7152	28	19.1457	3.6831	-3.8875	22.5195	2.4338	-1.3251
33	-3.1264	0.9267	-0.7152	-2.2459	0.9267	-0.7152	29	22.5195	2.4338	-1.3251	24.7698	1.1841	1.2374
34	-2.2459	0.9267	-0.7152	-1.3653	0.9268	-0.7152	30	24.7698	1.1841	1.2374	-4.8898	0.9311	-0.7830
35	-1.3653	0.9268	-0.7152	-0.4917	0.8830	-0.5309	31	-4.8898	0.9311	-0.7830	-4.0052	0.9308	-0.7830
36	-0.4917	0.8830	-0.5309	-3.0949	-7.3960	14.6554	32	-4.0052	0.9308	-0.7830	-3.1212	0.9308	-0.7830
37	-3.0949	-7.3960	14.6554	-10.9343	-8.6465	17.2179	33	-3.1212	0.9308	-0.7830	-2.2369	0.9309	-0.7830
38	-10.9343	-8.6465	17.2179	-19.8985	-9.8966	19.7804	34	-2.2369	0.9309	-0.7830	-1.3528	0.9309	-0.7830
39	-19.8985	-9.8966	19.7804	-29.9876	-11.1466	22.3429	35	-1.3528	0.9309	-0.7830	-0.4685	0.9309	-0.7830
40	-29.9876	-11.1466	22.3429	-35.9245	-0.7884	4.2355	36	-0.4685	0.9309	-0.7830	0.4158	0.9309	-0.7830
41	-35.9245	-0.7884	4.2355	-23.0840	9.5698	-13.8719	37	0.4158	0.9309	-0.7830	1.3001	0.9309	-0.7830
42	-23.0840	9.5698	-13.8719	-16.3097	1.2827	-1.5327	38	1.3001	0.9309	-0.7830	2.1845	0.9309	-0.7830
43	-16.3097	1.2827	-1.5327	-15.3797	1.2826	-1.5327	39	2.1845	0.9309	-0.7830	3.0689	0.9309	-0.7830
44	-15.3797	1.2826	-1.5327	-14.4499	1.2820	-1.5327	40	3.0689	0.9309	-0.7830	3.7959	0.3357	-0.1664
45	-14.4499	1.2820	-1.5327	-13.5205	1.2820	-1.5327	41	3.7959	0.3357	-0.1664	-23.0840	9.5698	-13.8719
46	-13.5205	1.2820	-1.5327	-12.5907	1.2824	-1.5327	42	-23.0840	9.5698	-13.8719	-16.1459	9.5700	-13.8719
47	-12.5907	1.2824	-1.5327	-11.6614	1.2819	-1.5327	43	-16.1459	9.5700	-13.8719	-10.0514	8.3203	-11.3094
48	-11.6614	1.2819	-1.5327	-10.7331	1.2812	-1.5327	44	-10.0514	8.3203	-11.3094	-4.5194	7.0707	-8.7469
49	-10.7331	1.2812	-1.5327	-9.8046	1.2806	-1.5327	45	-4.5194	7.0707	-8.7469	0.4502	5.8207	-6.1843
50	-9.8046	1.2806	-1.5327	-8.8768	1.2803	-1.5327	46	0.4502	5.8207	-6.1843	4.6698	5.8208	-6.1843
51	-8.8768	1.2803	-1.5327	-7.9490	1.2801	-1.5327	47	4.6698	5.8208	-6.1843	8.1712	4.5720	-3.6218
52	-7.9490	1.2801	-1.5327	-7.0215	1.2797	-1.5327	48	8.1712	4.5720	-3.6218	11.1111	3.3228	-1.0593
53	-7.0215	1.2797	-1.5327	-6.0943	1.2793	-1.5327	49	11.1111	3.3228	-1.0593	13.4883	2.0735	1.5032
54	-6.0943	1.2793	-1.5327	-5.1698	1.2740	-1.4418	50	13.4883	2.0735	1.5032	14.9916	2.0736	1.5032
55	-5.1698	1.2740	-1.4418	-4.2470	1.2735	-1.4418	51	14.9916	2.0736	1.5032	-7.9490	1.2801	-1.5327
56	-4.2470	1.2735	-1.4418	-3.3236	1.2731	-1.4418	52	-7.9490	1.2801	-1.5327	-7.0215	1.2797	-1.5327
57	-3.3236	1.2731	-1.4418	-2.4008	1.2729	-1.4418	53	-7.0215	1.2797	-1.5327	-6.0943	1.2793	-1.5327
58	-2.4008	1.2729	-1.4418	-1.4778	1.2731	-1.4418							
59	-1.4778	1.2731	-1.4418	-0.9086	-1.0821	6.6310							

54	-6.0943	1.2793	-1.5327	-5.1674	1.2788	-1.5327
55	-5.1674	1.2788	-1.5327	-4.2410	1.2785	-1.5327
56	-4.2410	1.2785	-1.5327	-3.3142	1.2782	-1.5327
57	-3.3142	1.2782	-1.5327	-2.3879	1.2778	-1.5327
58	-2.3879	1.2778	-1.5327	-1.4616	1.2780	-1.5327
59	-1.4616	1.2780	-1.5327	-0.5350	1.2780	-1.5327
60	-0.5350	1.2780	-1.5327	0.3914	1.2777	-1.5327

ENVOL. MIN. CORTANTES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	0.6159	-0.0555	0.1501	0.5757	-0.0555	0.1501
2	0.5757	-0.0555	0.1501	2.1023	-0.2142	0.5704
3	2.1023	-0.2142	0.5704	4.3615	-0.4756	1.2408
4	4.3615	-0.4756	1.2408	4.0167	-0.4757	1.2408
5	4.0167	-0.4757	1.2408	6.5289	-0.8389	2.1410
6	6.5289	-0.8389	2.1410	9.2741	-1.3029	3.2515
7	9.2741	-1.3029	3.2515	12.0493	-1.8650	4.5542
8	12.0493	-1.8650	4.5542	10.6971	-1.8649	4.5542
9	10.6971	-1.8649	4.5542	14.4825	-2.5933	-2.2408
10	14.4825	-2.5933	-2.2408	12.2901	-3.8435	0.3216
11	12.2901	-3.8435	0.3216	9.5031	-3.8442	0.3216
12	9.5031	-3.8442	0.3216	5.8408	-5.0942	2.8841
13	5.8408	-5.0942	2.8841	1.6165	-6.3439	5.4466
14	1.6165	-6.3439	5.4466	-3.1704	-7.5940	8.0091
15	-3.1704	-7.5940	8.0091	-8.6762	-7.5946	8.0091
16	-8.6762	-7.5946	8.0091	-14.9323	-8.8447	10.5716
17	-14.9323	-8.8447	10.5716	-21.7507	-10.0946	13.1341
18	-21.7507	-10.0946	13.1341	-29.1318	-11.3447	15.6966
19	-29.1318	-11.3447	15.6966	-37.3567	-11.3445	15.6966
20	-37.3567	-11.3445	15.6966	-16.6607	-4.8808	10.8863
21	-16.6607	-4.8808	10.8863	-0.1388	-0.1388	0.0101
22	-0.1388	-0.0101	-0.0102	-0.1292	-0.0101	-0.0102
23	-0.1292	0.0101	-0.0102	-0.1196	0.0101	-0.0102
24	-0.1196	0.0101	-0.0102	-0.1100	0.0101	-0.0102
25	-0.1100	0.0101	-0.0102	-0.1004	0.0101	-0.0102
26	-0.1004	0.0101	-0.0102	1.2838	-0.1612	2.8651
27	1.2838	-0.1612	2.8651	4.5624	-0.5730	4.0003
28	4.5624	-0.5730	4.0003	7.7044	-1.0609	5.2744
29	7.7044	-1.0609	5.2744	10.5406	-1.6260	6.6819
30	10.5406	-1.6260	6.6819	12.8947	-2.2706	8.2172
31	12.8947	-2.2706	8.2172	10.7378	-2.2705	8.2172
32	10.7378	-2.2705	8.2172	11.7439	-2.9930	9.8746
33	11.7439	-2.9930	9.8746	11.8384	-3.7937	11.6486
34	11.8384	-3.7937	11.6486	9.2078	-4.8965	9.5304
35	9.2078	-4.8965	9.5304	3.6183	-6.1462	12.0929
36	3.6183	-6.1462	12.0929	-3.0949	-7.3960	14.6554
37	-3.0949	-7.3960	14.6554	-10.9343	-8.6465	17.2179
38	-10.9343	-8.6465	17.2179	-19.8985	-9.8966	19.7804
39	-19.8985	-9.8966	19.7804	-29.9876	-11.1466	22.3429
40	-29.9876	-11.1466	22.3429	-21.7363	-5.0188	12.7103
41	-21.7363	-5.0188	12.7103	3.4504	-0.2594	0.4501
42	3.4504	-0.2594	0.4501	3.2623	-0.2595	0.4501
43	3.2623	-0.2595	0.4501	3.0742	-0.2595	0.4501
44	3.0742	-0.2595	0.4501	2.8862	-0.2594	0.4501
45	2.8862	-0.2594	0.4501	2.6982	-0.2593	0.4501

46	2.6982	-0.2593	0.4501	2.5102	-0.2592	0.4501
47	2.5102	-0.2592	0.4501	2.3223	-0.2589	0.4501
48	2.3223	-0.2589	0.4501	2.1346	-0.2587	0.4501
49	2.1346	-0.2587	0.4501	2.7492	-0.5030	4.9409
50	2.7492	-0.5030	4.9409	2.3845	-0.5030	4.9409
51	2.3845	-0.5030	4.9409	5.3679	-1.0825	6.6309
52	5.3679	-1.0825	6.6309	8.0289	-1.7580	8.4765
53	8.0289	-1.7580	8.4765	6.7541	-1.7577	8.4765
54	6.7541	-1.7577	8.4765	8.3440	-2.5324	10.4618
55	8.3440	-2.5324	10.4618	9.1500	-3.4103	12.5696
56	9.1500	-3.4103	12.5696	8.9604	-4.3911	14.7818
57	8.9604	-4.3911	14.7818	5.7765	-4.3911	14.7818
58	5.7765	-4.3911	14.7818	3.5840	-5.4789	17.0790
59	3.5840	-5.4789	17.0790	-0.7017	-6.7264	19.2845
60	-0.7017	-6.7264	19.2845	-5.5781	-6.7261	19.2845

ENVOL. MAX. TORSORES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	0.6159	-0.0555	0.1501	0.5757	-0.0555	0.1501
2	0.5757	-0.0555	0.1501	2.1023	-0.2142	0.5704
3	2.1023	-0.2142	0.5704	4.3615	-0.4756	1.2408
4	4.3615	-0.4756	1.2408	4.0167	-0.4757	1.2408
5	4.0167	-0.4757	1.2408	6.5289	-0.8389	2.1410
6	6.5289	-0.8389	2.1410	9.2741	-1.3029	3.2515
7	9.2741	-1.3029	3.2515	12.0493	-1.8650	4.5542
8	12.0493	-1.8650	4.5542	10.6971	-1.8649	4.5542
9	10.6971	-1.8649	4.5542	12.8323	-2.5233	6.0319
10	12.8323	-2.5233	6.0319	14.5562	-3.2729	7.6687
11	14.5562	-3.2729	7.6687	12.1830	-3.2739	7.6687
12	12.1830	-3.2739	7.6687	12.7221	-4.1114	9.4498
13	12.7221	-4.1114	9.4498	12.4753	-5.0322	11.3617
14	12.4753	-5.0322	11.3617	11.3197	-6.0325	13.3919
15	11.3197	-6.0325	13.3919	6.9453	-6.0326	13.3919
16	6.9453	-6.0326	13.3919	3.9973	-7.1050	15.5291
17	3.9973	-7.1050	15.5291	-0.0933	-8.2439	17.7632
18	-0.0933	-8.2439	17.7632	-5.3758	-9.4408	20.0853
19	-5.3758	-9.4408	20.0853	-12.2204	-9.4406	20.0853
20	-12.2204	-9.4406	20.0853	-16.6607	-4.8808	10.8863
21	-16.6607	-4.8808	10.8863	-0.1388	0.0101	-0.0102
22	-0.1388	0.0101	-0.0102	-0.1292	0.0101	-0.0102
23	-0.1292	0.0101	-0.0102	-7.8677	0.6495	0.3492
24	-7.8677	0.6495	0.3492	-5.0641	0.4460	1.0339
25	-5.0641	0.4460	1.0339	-1.9726	0.1773	1.8744
26	-1.9726	0.1773	1.8744	1.2838	-0.1612	2.8651
27	1.2838	-0.1612	2.8651	4.5624	-0.5730	4.0003
28	4.5624	-0.5730	4.0003	7.7044	-1.0609	5.2744
29	7.7044	-1.0609	5.2744	10.5406	-1.6260	6.6819
30	10.5406	-1.6260	6.6819	12.8947	-2.2706	8.2172
31	12.8947	-2.2706	8.2172	10.7378	-2.2705	8.2172
32	10.7378	-2.2705	8.2172	11.7439	-2.9930	9.8746
33	11.7439	-2.9930	9.8746	11.8384	-3.7937	11.6486
34	11.8384	-3.7937	11.6486	10.8508	-4.6714	13.5337
35	10.8508	-4.6714	13.5337	8.6227	-5.6209	15.5242
36	8.6227	-5.6209	15.5242	5.0108	-6.6414	17.6145
37	5.0108	-6.6414	17.6145	-0.1073	-7.7268	19.7990
38	-0.1073	-7.7268	19.7990	-6.8306	-8.8724	22.0722
39	-6.8306	-8.8724	22.0722	-15.2307	-10.0707	24.4284

40	-15.2307	-10.0707	24.4284	-21.7363	-5.0188	12.7103	32	-3.8646	0.9011	-0.8015	-3.0085	0.9011	-0.8015
41	-21.7363	-5.0188	12.7103	3.4342	-0.2582	0.4503	33	-3.0085	0.9011	-0.8015	-2.1529	0.9010	-0.8015
42	3.4342	-0.2582	0.4503	3.2471	-0.2582	0.4503	34	-2.1529	0.9010	-0.8015	-1.2968	0.9009	-0.8015
43	3.2471	-0.2582	0.4503	3.0598	-0.2582	0.4503	35	-1.2968	0.9009	-0.8015	-0.4412	0.9008	-0.8015
44	3.0598	-0.2582	0.4503	2.8727	-0.2582	0.4503	36	-0.4412	0.9008	-0.8015	0.4150	0.9010	-0.8015
45	2.8727	-0.2582	0.4503	-7.8724	0.7033	0.9457	37	0.4150	0.9010	-0.8015	1.2709	0.9010	-0.8015
46	-7.8724	0.7033	0.9457	-7.3622	0.7031	0.9457	38	1.2709	0.9010	-0.8015	2.1270	0.9011	-0.8015
47	-7.3622	0.7031	0.9457	-4.1518	0.3849	2.0853	39	2.1270	0.9011	-0.8015	2.9830	0.9011	-0.8015
48	-4.1518	0.3849	2.0853	-0.7366	-0.0155	3.4211	40	2.9830	0.9011	-0.8015	3.4562	0.3045	-0.1870
49	-0.7366	-0.0155	3.4211	2.7492	-0.5030	4.9409	41	3.4562	0.3045	-0.1870	-22.9785	9.5175	-14.0281
50	2.7492	-0.5030	4.9409	2.3845	-0.5030	4.9409	42	-22.9785	9.5175	-14.0281	-16.0784	9.5175	-14.0281
51	2.3845	-0.5030	4.9409	5.3679	-1.0825	6.6309	43	-16.0784	9.5175	-14.0281	-10.0217	8.2679	-11.4656
52	5.3679	-1.0825	6.6309	8.0289	-1.7580	8.4765	44	-10.0217	8.2679	-11.4656	-4.5274	7.0178	-8.9030
53	8.0289	-1.7580	8.4765	6.7541	-1.7577	8.4765	45	-4.5274	7.0178	-8.9030	0.4042	5.7677	-6.3405
54	6.7541	-1.7577	8.4765	8.3440	-2.5324	10.4618	46	0.4042	5.7677	-6.3405	4.5864	5.7676	-6.3405
55	8.3440	-2.5324	10.4618	9.1500	-3.4103	12.5696	47	4.5864	5.7676	-6.3405	8.0493	4.5186	-3.7780
56	9.1500	-3.4103	12.5696	8.9604	-4.3911	14.7818	48	8.0493	4.5186	-3.7780	-10.4244	1.2450	-1.5477
57	8.9604	-4.3911	14.7818	5.7765	-4.3911	14.7818	49	-10.4244	1.2450	-1.5477	-9.5217	1.2442	-1.5477
58	5.7765	-4.3911	14.7818	3.5840	-5.4789	17.0790	50	-9.5217	1.2442	-1.5477	-8.6191	1.2436	-1.5477
59	3.5840	-5.4789	17.0790	-0.1251	-6.6740	19.4408	51	-8.6191	1.2436	-1.5477	-7.7169	1.2434	-1.5477
60	-0.1251	-6.6740	19.4408	-4.9636	-6.6738	19.4408	52	-7.7169	1.2434	-1.5477	-6.8148	1.2437	-1.5477
ENVOL. MIN. TORSORES TREN TREN SIN CARGA, EC-1 en via 2							53	-6.8148	1.2437	-1.5477	-5.9125	1.2430	-1.5477
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	-5.9125	1.2430	-1.5477	-5.0118	1.2429	-1.5477
=====	=====	=====	=====	=====	=====	=====	55	-5.0118	1.2429	-1.5477	-4.1104	1.2438	-1.5477
1	5.1520	4.9068	-17.6158	8.7096	4.9068	-17.6158	56	-4.1104	1.2438	-1.5477	-3.2088	1.2431	-1.5477
2	8.7096	4.9068	-17.6158	11.7046	3.6569	-15.0533	57	-3.2088	1.2431	-1.5477	-2.3081	1.2426	-1.5477
3	11.7046	3.6569	-15.0533	14.1374	2.4068	-12.4908	58	-2.3081	1.2426	-1.5477	-1.4069	1.2428	-1.5477
4	14.1374	2.4068	-12.4908	15.8824	2.4068	-12.4908	59	-1.4069	1.2428	-1.5477	-0.5058	1.2427	-1.5477
5	15.8824	2.4068	-12.4908	16.8461	1.1574	-9.9283	60	-0.5058	1.2427	-1.5477	0.3951	1.2426	-1.5477
6	16.8461	1.1574	-9.9283	17.2477	-0.0926	-7.3658							
7	17.2477	-0.0926	-7.3658	17.0864	-1.3433	-4.8033							
8	17.0864	-1.3433	-4.8033	16.1124	-1.3435	-4.8033							
9	16.1124	-1.3435	-4.8033	14.4825	-2.5933	-2.2408							
10	14.4825	-2.5933	-2.2408	0.2135	-0.0555	0.1501							
11	0.2135	-0.0555	0.1501	0.1732	-0.0556	0.1501							
12	0.1732	-0.0556	0.1501	0.1329	-0.0556	0.1501							
13	0.1329	-0.0556	0.1501	0.0927	-0.0555	0.1501							
14	0.0927	-0.0555	0.1501	0.0524	-0.0555	0.1501							
15	0.0524	-0.0555	0.1501	0.0121	-0.0556	0.1501							
16	0.0121	-0.0556	0.1501	-0.0281	-0.0556	0.1501							
17	-0.0281	-0.0556	0.1501	-0.0684	-0.0556	0.1501							
18	-0.0684	-0.0556	0.1501	-0.1087	-0.0556	0.1501							
19	-0.1087	-0.0556	0.1501	-0.1490	-0.0556	0.1501							
20	-0.1490	-0.0556	0.1501	-36.7136	-0.4767	-2.5285							
21	-36.7136	-0.4767	-2.5285	-21.0645	10.1029	-21.2196							
22	-21.0645	10.1029	-21.2196	-11.9666	8.8526	-18.6571							
23	-11.9666	8.8526	-18.6571	-3.9945	7.6023	-16.0946							
24	-3.9945	7.6023	-16.0946	2.8528	6.3526	-13.5321							
25	2.8528	6.3526	-13.5321	8.5751	5.1027	-10.9695							
26	8.5751	5.1027	-10.9695	13.1723	3.8527	-8.4070							
27	13.1723	3.8527	-8.4070	16.6446	2.6029	-5.8446							
28	16.6446	2.6029	-5.8446	18.9919	1.3530	-3.2821							
29	18.9919	1.3530	-3.2821	-5.5768	0.9014	-0.8015							
30	-5.5768	0.9014	-0.8015	-4.7206	0.9011	-0.8015							
31	-4.7206	0.9011	-0.8015	-3.8646	0.9011	-0.8015							

ENVOLVENTES DE ESFUERZOS CON IMPACTO

ENVOL. MAX. FLECTORES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	57.0045	49.1045	-225.3900	-99.8649	-168.9398	-88.6053
2	101.6952	115.3727	-46.1068	-196.4696	-124.5837	-149.2831
3	206.5036	146.7070	141.7671	-306.0442	-124.2271	-135.0235
4	306.0443	124.2250	135.0234	-390.5254	-108.8241	-130.4037
5	390.5578	108.9310	131.4536	-459.5279	-86.4519	-124.7099
6	459.5303	86.4595	124.7099	-514.1543	-63.9799	-117.9661
7	514.1534	63.9586	117.9663	-554.4072	-41.4816	-111.2227
8	554.4079	41.4788	111.2227	-578.9016	-26.0722	-106.6028
9	578.9139	26.0691	106.6027	-588.5178	-3.5868	-99.8591
10	588.5193	3.5818	99.8590	-583.7698	18.8926	-93.1153
11	583.7827	-18.9108	93.1155	-564.4874	34.3211	-88.4959
12	564.4756	-34.3314	88.4960	-529.0452	56.8156	-81.7523
13	529.0478	-56.7825	82.6737	-479.2955	79.2547	-75.9298
14	479.3013	-79.2517	75.9297	-415.2053	101.7303	-69.1860
15	415.2060	-101.7559	69.1861	-335.8465	117.1571	-64.5665
16	335.8471	-117.1587	64.5664	-241.0778	139.6419	-57.8226
17	242.4657	-129.1667	30.6619	-150.2468	80.5905	-80.4595
18	153.3069	-113.4499	-8.2975	-93.3410	55.3270	121.8291
19	97.2957	-62.5058	-78.9516	-63.8008	-4.7745	-8.0467
20	73.7134	-22.8414	-25.2322	-71.1870	6.3358	7.3221
21	73.2435	-7.1753	-40.5617	-61.6013	17.2811	19.8102
22	66.6678	10.8366	-29.8689	-94.6092	-124.7766	-49.6802
23	94.6092	124.7766	49.6802	-187.4731	-115.2395	-53.2083
24	187.4731	115.2395	53.2083	-275.4280	-104.7118	-55.7991
25	275.4280	104.7118	55.7991	-355.1203	-93.3569	-57.4406
26	355.1203	93.3569	57.4406	-465.9215	-106.1131	-97.7747
27	466.9649	107.2863	102.0119	-558.3608	-80.5324	-96.1984
28	558.4407	80.6191	96.8288	-624.7400	-53.3643	-88.6513
29	624.7426	53.3928	88.6513	-665.8821	-26.6058	-78.9815
30	665.8923	26.6001	78.9814	-681.8314	0.1959	-72.8176
31	681.8272	-0.1812	72.8178	-672.0691	20.3533	-66.7643
32	672.0710	-20.3374	66.7642	-637.0383	47.1740	-57.0143
33	637.0447	-47.1660	57.0145	-576.8505	73.9814	-50.4960
34	576.8451	-73.9922	50.4959	-491.2979	101.2504	-42.3185
35	491.3356	-101.1880	41.8531	-380.3315	128.0495	-32.0188
36	380.3922	-127.7013	29.1820	-283.5250	103.7665	-0.3686
37	283.5250	-103.7665	0.3686	-196.9654	114.2896	8.4372
38	196.9654	-114.2896	-8.4372	-105.5187	123.8225	18.1799
39	105.5187	-123.8225	-18.1799	-66.5867	46.5262	79.4795
40	90.6869	-4.4328	-59.3827	-75.4446	28.2710	59.7676
41	90.9780	4.6911	-10.0270	-87.5231	6.6717	-11.4481
42	92.8281	7.4222	-14.2622	-95.4186	0.2775	-1.5218
43	109.8632	32.8556	4.0226	-138.7890	-81.9575	-118.2094
44	145.9051	66.8492	28.1480	-219.7133	-111.7342	-64.4442
45	219.7133	111.7342	64.4442	-291.4106	-112.5995	-89.4484
46	297.3713	123.4143	120.5292	-381.2670	-108.0292	-115.4930
47	381.2634	108.0500	115.4930	-449.9479	-85.5788	-108.7493
48	449.9564	85.6335	108.7494	-504.3398	-63.1641	-102.0057
49	504.3367	63.1810	102.0057	-544.3832	-40.7029	-95.2620
50	544.3728	40.7138	95.2616	-568.3040	-25.3234	-90.6419
51	568.3095	25.3348	90.6419	-577.7334	-2.8610	-83.8982
52	577.7281	2.8703	83.8981	-572.8079	19.6122	-77.1544
53	572.8161	-19.5963	77.1548	-553.0307	34.9904	-72.5350
54	553.0346	-34.9656	72.5346	-517.5045	57.4364	-65.7909

55	517.5232	-57.3404	64.5350	-467.7208	79.8177	-57.7915
56	467.7332	-79.7683	57.0372	-403.6114	102.2484	-50.2935
57	403.6065	-102.2364	50.2929	-323.9031	117.6305	-45.6732
58	323.9040	-117.6180	45.6731	-229.1590	140.0934	-38.9292
59	229.1541	-140.1033	38.9293	-123.6668	166.4569	11.6986
60	123.6668	-166.4569	-11.6986	-61.7757	40.6583	148.1467

ENVOL. MAX CORTANTES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-39.6797	185.0140	153.2932	-88.8774	-169.6153	-148.6735
2	82.8635	170.1895	147.1341	-195.1976	-151.4222	-95.4654
3	195.1976	151.4222	95.4654	-266.6321	-134.2344	-99.1381
4	266.6321	134.2344	99.1381	-363.9433	-134.2417	-99.1380
5	363.9433	134.2417	99.1380	-400.2392	-117.4597	-99.8098
6	400.2392	117.4597	99.8098	-415.1886	-101.1761	-97.6774
7	415.1886	101.1761	97.6774	-410.3793	-85.5272	-92.9380
8	410.3793	85.5272	92.9380	-472.4008	-85.5216	-92.9380
9	472.4008	85.5216	92.9380	-438.9579	-70.6172	-85.7885
10	438.9579	70.6172	85.7885	-390.5291	-56.5354	-76.4262
11	390.5291	56.5354	76.4262	-431.5157	-56.5226	-76.4264
12	431.5157	56.5226	76.4264	-361.1347	-43.3921	-65.0484
13	361.1347	43.3921	65.0484	-282.0446	-31.3085	-51.8523
14	282.0446	31.3085	51.8523	-197.3124	-20.3490	-37.0512
15	197.3124	20.3490	37.0512	-212.0664	-20.3487	-37.0512
16	212.0664	20.3487	37.0512	-117.7071	-10.6080	-21.6244
17	117.7071	10.6080	21.6244	-67.0548	-5.9957	-27.2323
18	83.4358	7.2707	13.1467	-60.3391	-4.7739	-8.0467
19	72.7593	6.0018	10.6018	-63.8008	-4.7745	-8.0467
20	67.0515	5.2414	8.9212	166.5280	-92.2852	-26.5017
21	-860.8233	239.6737	100.9082	663.0703	-265.7275	-114.4660
22	-667.6338	266.0769	113.0153	427.2755	-238.8188	-104.8378
23	-440.4421	239.8569	104.3246	224.6399	-212.5980	-96.1473
24	-246.5105	214.4503	95.2639	54.4916	-187.1917	-87.0866
25	-84.7147	189.9474	85.9131	-84.3849	-162.6868	-77.7356
26	46.4693	166.4286	76.3541	-193.5746	-139.1719	-68.1768
27	148.9226	143.9595	66.6686	-259.3466	-117.5812	-60.5105
28	209.1274	123.4826	58.9571	-426.2489	-100.0405	-72.6374
29	246.4101	104.5616	48.2915	-435.5963	-86.8071	-68.5791
30	261.9084	87.0277	37.6927	-427.5606	-73.8420	-63.5712
31	427.5606	73.8420	63.5712	-497.7088	-73.8469	-63.5711
32	497.7088	73.8469	63.5711	-461.1595	-61.2701	-57.6134
33	461.1595	61.2701	57.6134	-409.9392	-49.1973	-50.7057
34	409.9392	49.1973	50.7057	-346.1579	-37.8392	-42.8485
35	104.9901	38.1843	-15.8781	-272.5197	-27.3169	-34.0428
36	91.4325	33.3002	-20.9149	-117.8317	-18.9500	-37.9280
37	80.8515	29.4726	-25.2640	-26.1374	-17.8106	25.1167
38	75.1266	26.6259	-28.8440	-43.0577	-17.8107	25.1167
39	75.7765	24.6831	-31.5735	-59.9779	-17.8108	25.1167
40	83.9185	23.5491	-33.3716	142.3046	-92.2894	-33.9764
41	-824.8375	220.0013	64.9610	730.1329	-247.1541	-67.8435
42	-733.6622	247.4366	66.4839	559.8512	-232.0380	-61.8641
43	-568.3844	232.7017	61.2638	410.0358	-210.2216	-54.5202
44	-424.1950	211.4011	53.4675	279.3414	-188.9248	-46.7238
45	-298.9598	190.6499	45.2710	167.2030	-168.1723	-38.5274
46	-191.9880	170.5020	36.7324	73.9594	-155.1021	-32.1128

47	-103.4907	158.0700	30.0398	-1.4582	-135.5940	-23.2962
48	-32.2876	139.2628	21.0146	-60.9717	-116.7877	-14.2709
49	23.6564	121.1462	11.8547	-105.7281	-98.6689	-5.1111
50	65.5986	103.7813	2.6400	-457.9482	-97.0987	-86.6695
51	457.9482	97.0987	86.6695	-427.0182	-80.4112	-78.1803
52	427.0182	80.4112	78.1803	-375.1259	-63.3233	-66.6934
53	-24.9071	69.5144	-40.2768	-421.0411	-63.3402	-66.6931
54	421.0411	63.3402	66.6931	-17.4673	-47.1110	51.2961
55	-22.5585	56.3843	-52.6494	-12.7395	-40.9838	57.2689
56	-23.9434	51.1629	-58.0821	-7.5675	-35.7645	62.7018
57	-24.5441	46.8488	-62.8574	-3.8422	-31.4507	67.4771
58	-22.4379	43.4581	-66.8512	-3.4864	-28.0595	71.4709
59	-15.6667	40.9989	-69.9346	-8.4762	-25.6006	74.5543
60	-2.2412	39.4741	-71.9750	-23.5873	-31.7742	92.3787

ENVOL. MAX. TORSORES -IPF
Barra Momento1 Cortante1 Torsor1 Momento2 Cortante2 Torsor2
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1	-80.5082	99.5403	312.1993	11.1318	-91.8414	-291.7956
2	-9.2073	91.6636	293.2243	-51.9186	-80.4166	-264.1298
3	48.7214	80.7229	265.9825	-100.7563	-69.5893	-236.9140
4	93.1160	70.3725	239.2564	-141.3446	-62.6726	-218.8527
5	129.9305	63.9324	221.7503	-176.7963	-62.8787	-200.2865
6	176.7963	62.8787	200.2865	-190.3327	-54.5456	-183.8980
7	190.3327	54.5456	183.8980	-193.7080	-46.5283	-166.2062
8	193.7080	46.5283	166.2062	-227.4435	-46.5144	-166.2063
9	227.4435	46.5144	166.2063	-216.0685	-38.8749	-147.3092
10	216.0685	38.8749	147.3092	-196.9098	-31.6377	-127.3059
11	196.9098	31.6377	127.3059	-219.8448	-31.6314	-127.3062
12	219.8448	31.6314	127.3062	-189.2806	-24.8602	-106.2951
13	189.2806	24.8602	106.2951	-154.0757	-18.6212	-84.3750
14	154.0757	18.6212	84.3750	-115.7585	-12.9426	-61.6522
15	115.7585	12.9426	61.6522	-125.1429	-12.9409	-61.6522
16	125.1429	12.9409	61.6522	-81.0553	-7.8820	-41.0562
17	81.0553	7.8820	41.0562	-36.8005	-3.4591	-23.0935
18	36.8005	3.4591	23.0935	6.7708	0.3057	-10.9210
19	-6.7708	-0.3057	10.9210	6.9932	0.3055	-10.9210
20	-6.9932	-0.3055	10.9210	82.1693	-48.1211	-126.8467
21	-331.9537	115.1338	332.1519	221.4931	-124.4541	-355.1871
22	-221.3556	124.4437	356.5730	110.1791	-110.7775	-320.8865
23	-114.6676	111.1169	323.1468	20.4405	-99.9781	-288.5470
24	-29.5391	100.7264	291.7206	-56.7451	-87.5384	-257.2625
25	43.2128	88.7398	261.3898	-117.3682	-75.5595	-226.7941
26	99.7337	77.2463	231.9159	-162.1327	-64.1021	-197.4324
27	140.8762	66.3173	203.5894	-192.0574	-53.2338	-169.2564
28	167.7588	56.0054	176.4893	-210.0206	-51.9062	-155.0171
29	210.0206	51.9062	155.0171	-217.4418	-45.2906	-140.8156
30	217.4418	45.2906	140.8156	-216.1648	-38.8038	-126.1393
31	216.1648	38.8038	126.1393	-253.0322	-38.8085	-126.1392
32	253.0322	38.8085	126.1392	-237.4988	-32.5190	-110.9880
33	237.4988	32.5190	110.9880	-214.6362	-26.4814	-95.3618
34	214.6362	26.4814	95.3618	-185.4932	-20.7990	-79.2610
35	185.4932	20.7990	79.2610	-151.4190	-15.5411	-62.6857
36	151.4190	15.5411	62.6857	-113.9548	-10.7722	-45.6419
37	113.9548	10.7722	45.6419	-74.2537	-6.5220	-30.3531
38	74.2537	6.5220	30.3531	-33.9119	-2.8309	-17.1496
39	33.9119	2.8309	17.1496	6.1286	0.3205	-8.4652
40	-6.1286	-0.3205	8.4652	74.9436	-48.2856	-124.1010
41	-206.3517	99.5042	263.8401	135.0669	-110.5567	-287.2584

42	-134.3801	110.4879	288.5136	57.0659	-102.7873	-268.1099
43	-59.4227	102.9266	269.9225	-10.0191	-91.6862	-240.1379
44	4.6363	92.0828	242.5298	-67.1923	-80.8434	-212.7450
45	58.8512	81.5025	215.7422	-105.4982	-75.3156	-193.2156
46	105.4982	75.3156	193.2156	-160.1002	-75.3337	-193.2154
47	160.1002	75.3337	193.2154	-180.4082	-68.1443	-177.5535
48	180.4082	68.1443	177.5535	-193.7726	-60.5689	-160.6884
49	193.7726	60.5689	160.6884	-198.9939	-52.7006	-142.5215
50	198.9939	52.7006	142.5215	-237.2190	-52.7127	-142.5215
51	237.2190	52.7127	142.5215	-227.3795	-44.5579	-122.9539
52	227.3795	44.5579	122.9539	-207.3523	-36.2069	-101.8876
53	207.3523	36.2069	101.8876	-233.6091	-36.2210	-101.8872
54	233.6091	36.2210	101.8872	-196.5181	-27.7104	-79.2287
55	196.5181	27.7104	79.2287	-147.8859	-19.1022	-54.9190
56	147.8859	19.1022	54.9190	-95.2150	-11.3042	-32.9234
57	95.2150	11.3042	32.9234	-103.4099	-11.3049	-32.9233
58	103.4099	11.3049	32.9233	-2.6775	2.5816	-4.1742
59	21.0937	-1.5149	10.5177	-0.8058	2.5817	-4.1742
60	8.0747	-2.6420	7.2083	1.0660	2.5817	-4.1742

ENVOL. MIN. FLECTORES -IPF
Barra Momento1 Cortante1 Torsor1 Momento2 Cortante2 Torsor2
=====

1	-81.3068	101.8765	316.3305	23.5476	11.1997	33.3854
2	-23.5476	-11.1997	-33.3854	31.7678	11.4038	34.1511
3	-31.7678	-11.4038	-34.1511	52.1208	28.5467	50.6389
4	-52.1218	-28.5461	-50.6389	72.8178	28.5461	50.6389
5	-72.8537	-28.6546	-51.6888	93.6278	28.6546	51.6888
6	-93.6278	-28.6567	-51.6888	114.4045	28.6567	51.6888
7	-114.4036	-28.6459	-51.6887	135.1835	33.1191	63.9753
8	-135.1830	-33.1180	-63.9753	159.1956	33.1174	63.9753
9	-159.2017	-33.1123	-63.9753	186.1259	37.8937	60.0695
10	-186.1285	-37.8948	-60.0695	214.1928	40.2532	60.7775
11	-214.1973	-40.2492	-60.7775	243.3786	40.2483	60.7775
12	-243.3711	-40.2356	-60.7775	274.1937	42.5966	61.4855
13	-274.1999	-42.6310	-62.4071	306.1100	44.9907	63.1151
14	-306.1129	-44.9946	-63.1151	339.0884	47.3533	63.8231
15	-339.0868	-47.3357	-63.8231	373.4058	47.3345	63.8231
16	-373.4061	-47.3286	-63.8231	409.1374	49.6890	64.5311
17	-410.5227	-60.1737	-37.3704	454.9166	62.5330	38.0784
18	-467.2047	-100.6100	-6.2424	551.0351	135.6835	1.7116
19	-568.4786	-182.5311	6.1955	700.8139	182.5305	-6.1955
20	-714.3174	-214.5635	-3.9689	881.4793	160.1516	-30.3382
21	-924.7810	213.9447	120.9145	669.0516	-265.9670	-112.7019
22	-674.1180	237.8510	122.7606	450.9890	-230.7694	-120.6366
23	-464.8645	195.9607	104.0267	298.6001	-143.0300	-68.5777
24	-323.8984	92.7227	52.7760	235.8104	-92.7232	-52.7759
25	-259.4897	42.7768	11.9268	218.8503	-42.7761	-11.9268
26	-237.1770	7.4433	-51.6207	230.1059	-7.4429	51.6207
27	-231.1484	6.2659	-55.8579	225.1926	-6.2664	55.8579
28	-225.2732	6.1738	-56.4884	219.4086	-6.1739	56.4884
29	-219.4078	6.1660	-56.4884	213.5497	-6.1648	56.4884
30	-213.5535	6.1650	-56.4884	207.6963	-6.1635	56.4884
31	-207.6932	6.1569	-56.4884	201.8473	-6.1458	56.2964
32	-201.8471	6.1375	-56.2964	196.0163	-6.1373	56.2964
33	-196.0184	6.1360	-56.2964	190.1886	-6.1367	56.2964
34	-190.1877	6.1425	-56.2964	190.0055	3.1363	49.2118

35	-190.0409	-3.1950	-48.7462	201.2149	13.9046	54.4948
36	-201.2739	-14.2616	-51.6580	216.4736	16.6215	52.3662
37	-231.4910	-52.5790	2.7506	282.9727	54.9388	-2.0426
38	-303.7183	-104.4980	12.0294	421.2047	141.4462	-14.0609
39	-440.7673	-183.8941	19.2178	619.3634	190.9750	-17.0938
40	-643.4666	-233.0751	-3.0029	872.3376	171.8060	-10.1749
41	-916.7181	193.6736	73.4189	735.0427	-247.2457	-66.1929
42	-740.3483	233.1539	91.9031	574.1005	-225.4554	-71.4993
43	-588.5439	192.3159	68.9987	467.3469	-141.8414	-34.3454
44	-485.1502	92.4576	5.6003	418.1205	-92.4536	-5.6003
45	-433.7421	49.6736	-43.8613	397.7273	-49.6772	43.8613
46	-403.6877	38.8631	-74.9424	375.5132	-38.8618	74.9424
47	-375.5085	38.8439	-74.9425	347.3495	-38.8318	74.9426
48	-347.3557	38.8148	-74.9425	319.2173	-38.8070	74.9425
49	-319.2198	38.7938	-74.9425	291.0917	-38.7921	74.9425
50	-291.0872	38.7814	-74.9426	262.9661	-38.7825	74.9426
51	-262.9702	38.7794	-74.9426	234.8528	-38.7775	74.9426
52	-234.8530	38.7719	-74.9426	206.7421	-38.7677	74.9426
53	-206.7483	38.7590	-74.9427	178.6477	-38.7560	74.9427
54	-178.6492	38.7422	-74.9427	150.5594	-38.7395	74.9427
55	-150.5677	38.6559	-73.6875	122.5413	-38.6542	73.6875
56	-122.5536	38.6065	-72.9326	94.5633	-38.6070	72.9326
57	-94.5615	38.6020	-72.9325	66.5722	-38.6029	72.9325
58	-66.5732	38.5982	-72.9326	38.6160	-38.5561	72.5963
59	-38.6144	38.5580	-72.5962	11.6049	-31.2810	48.2212
60	-14.7452	10.3121	23.6177	51.3239	64.1900	-128.4415

ENVOL. MIN. CORTANTES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	10.7557	-24.0819	-42.1278	2.3842	29.4281	49.6419
2	-6.7046	-24.0825	-42.1278	4.6837	31.3263	48.4041
3	-24.1657	-24.0833	-42.1278	-4.9066	34.7608	46.1387
4	-41.6270	-24.0832	-42.1278	-7.7797	37.9706	44.1335
5	38.6592	-26.7093	-37.1378	-27.8084	43.8563	40.7177
6	63.4709	-33.5079	-33.4748	-50.9312	51.2369	36.8847
7	319.3592	-43.4548	24.8854	-409.6045	60.9930	-31.7452
8	409.6045	-60.9930	31.7452	-72.7117	66.9250	30.0879
9	365.3882	-60.9975	31.7452	-420.3962	78.1887	-35.4180
10	420.3962	-78.1887	35.4180	-454.2404	94.9819	-36.0897
11	454.2404	-94.9819	36.0897	-59.9832	101.3353	41.0926
12	100.2025	-96.0840	-34.6588	-25.4967	117.4807	22.7221
13	63.0447	-112.9953	-16.7546	27.4618	135.4714	23.4985
14	6.6640	-131.7053	-18.0771	95.4667	154.1873	24.8208
15	-65.4179	-151.1082	-20.0201	180.5557	166.5086	24.6398
16	-155.1331	-164.0748	-20.5290	283.9171	186.5532	27.2728
17	-263.5409	-184.7332	-23.9158	405.3562	207.2134	30.6596
18	-390.3275	-205.9436	-28.1147	545.5722	228.4231	34.8585
19	-536.0652	-227.6612	-33.1778	706.7017	243.0596	37.7975
20	-702.6365	-242.7335	-36.1036	755.1271	224.7455	34.2402
21	-140.5132	-91.2324	-20.7094	-58.5368	17.4465	22.6909
22	58.5368	-17.4465	-22.6909	-58.3486	18.3252	19.2970
23	41.9630	-17.4469	-22.6909	-62.8075	20.1780	18.4133
24	25.3885	-17.4452	-22.6909	-73.8612	22.9334	17.2399
25	113.1054	-18.3134	30.5048	-89.9834	26.6711	15.8584

26	264.8195	-26.3659	10.7282	-339.8638	36.8824	-13.3189
27	339.8638	-36.8824	13.3189	-405.0299	48.2539	-14.9606
28	405.0299	-48.2539	14.9606	-457.6448	60.2968	-15.6520
29	457.6448	-60.2968	15.6520	-495.6016	72.8951	-15.3931
30	495.6016	-72.8951	15.3931	-517.3363	85.8730	-14.1845
31	517.3363	-85.8730	14.1845	-238.7712	86.4365	8.3960
32	435.7621	-85.8680	14.1845	-231.7562	102.6307	7.0372
33	427.8289	-99.0551	12.0257	-204.1045	120.4106	6.3230
34	254.7300	-114.4233	-0.6800	-152.3268	139.7252	6.4003
35	197.5217	-134.8404	-1.3633	-57.2912	161.9465	8.6292
36	95.8730	-158.1247	-4.2802	68.8941	185.3871	12.4575
37	-37.8717	-182.5461	-8.8774	225.4734	209.8048	17.0548
38	-202.6749	-207.8611	-14.3256	413.9775	235.1188	22.5030
39	-399.7500	-233.9751	-20.7050	635.5060	261.2336	28.8824
40	-629.8828	-260.8130	-28.0933	804.5073	245.1160	36.4588
41	-167.1691	-91.2590	-31.4989	-87.5231	6.6717	-11.4481
42	64.8845	-4.8709	8.1021	-91.2214	7.3378	-12.0486
43	61.3541	-4.8714	8.1021	-100.0596	8.5146	-13.1013
44	61.3364	-5.4529	22.2067	-113.5087	10.2366	-14.5541
45	104.2799	-9.8405	37.4974	-202.1983	18.9966	-15.0000
46	202.1983	-18.9966	15.0000	-188.4239	18.9895	-15.0002
47	188.4239	-18.9895	15.0002	-275.1182	29.8377	-21.9644
48	275.1182	-29.8377	21.9644	-356.3327	41.8092	-27.3249
49	356.3327	-41.8092	27.3249	-428.9679	54.8342	-30.8689
50	428.9679	-54.8342	30.8689	-389.2204	54.8214	-30.8692
51	389.2204	-54.8214	30.8692	-440.1822	68.7674	-32.4003
52	440.1822	-68.7674	32.4003	-476.3434	83.5658	-31.7218
53	476.3434	-83.5658	31.7218	-415.7663	83.5525	-31.7218
54	415.7663	-83.5525	31.7218	-423.5634	99.0590	-28.6374
55	423.5634	-99.0590	28.6374	-411.8149	115.2188	-22.9489
56	411.8149	-115.2188	22.9489	-378.8458	131.9242	-14.4601
57	378.8458	-131.9242	14.4601	-283.2083	131.9087	-14.4601
58	283.2083	-131.9087	14.4601	-215.3248	149.0163	-2.9730
59	215.3248	-149.0163	2.9730	-123.6668	166.4569	11.6986
60	123.6668	-166.4569	-11.6986	8.7467	178.4322	-26.9926

ENVOL. MIN. TORSORES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	3.4911	-10.5119	-13.6747	9.3232	12.0887	16.6689
2	-4.1304	-10.5126	-13.6747	13.6984	12.5053	19.3474
3	-11.7527	-10.5131	-13.6747	11.0568	13.7061	22.8283
4	37.0639	-3.7722	-18.2902	9.5827	14.9668	25.7259
5	34.3295	-3.7714	-18.2902	-0.0922	17.4214	30.7530
6	66.5538	-7.9153	-30.5390	-130.2175	16.9748	40.7790
7	130.2175	-16.9748	-40.7790	-181.6930	25.9421	52.6713
8	181.6930	-25.9421	-52.6713	-162.8852	25.9425	52.6713
9	162.8852	-25.9425	-52.6713	-196.3128	34.7373	66.1571
10	196.3128	-34.7373	-66.1571	-218.8659	43.3322	81.1434
11	218.8659	-43.3322	-81.1434	-187.4448	43.3336	81.1433
12	187.4448	-43.3336	-81.1433	-193.9234	51.6678	97.5316
13	193.9234	-51.6678	-97.5316	-191.6215	59.6973	115.2235
14	191.6215	-59.6973	-115.2235	-181.7091	67.3614	134.1201
15	181.7091	-67.3614	-134.1201	27.3854	71.7982	137.4331
16	132.8800	-67.3564	-134.1201	61.9728	80.8948	157.4304
17	111.4476	-74.5867	-154.1234	147.2142	93.8388	180.7428
18	-138.0041	-93.0061	-176.5519	208.4028	104.2467	206.3367

19	-201.7399	-103.6802	-203.3834	279.6994	111.3801	223.7870
20	-275.6334	-111.0532	-222.0931	312.8135	103.7036	221.6974
21	-66.4759	-43.4789	-117.4663	147.7214	-5.3907	31.7678
22	-130.6109	9.5348	-17.8319	136.1815	-4.9001	34.8304
23	-121.5530	9.5368	-17.8319	119.0018	-3.8728	39.1604
24	28.8594	-2.3476	-22.0479	96.6984	-2.2222	44.7985
25	73.5894	-6.5295	-29.8925	70.3156	0.1027	51.8015
26	117.2454	-11.2971	-40.3009	41.1414	3.1525	60.2263
27	157.5118	-16.5562	-51.1780	10.6683	6.9638	70.1287
28	192.8411	-22.2417	-62.5294	-19.4417	11.5712	81.5661
29	221.8930	-28.2662	-74.3562	-47.4190	16.9840	94.5946
30	243.6164	-34.5623	-86.6579	-71.4044	23.2261	109.2709
31	257.2332	-41.0481	-99.4346	-78.4217	28.3706	121.2149
32	107.3611	-24.0273	-107.7027	-89.0049	36.0384	138.8750
33	116.9126	-32.2840	-126.6826	-90.2575	44.5154	158.3363
34	116.3814	-41.3433	-147.5052	-80.3903	53.7897	179.6561
35	104.0566	-51.1694	-170.2265	-57.7586	63.8243	202.8904
36	78.3754	-61.7326	-194.9034	-20.8657	74.5856	228.0961
37	37.9582	-72.9869	-221.5921	31.5544	86.0085	255.3442
38	-18.3168	-84.8585	-250.3644	100.6298	98.0860	284.6163
39	-91.4226	-97.3337	-281.2005	187.2242	110.7507	315.9680
40	-182.0636	-110.3617	-314.1552	301.3698	106.8825	312.4489
41	-84.6920	-43.6471	-129.3442	283.7520	-21.6165	52.4092
42	-284.0798	29.1669	-33.8181	265.7248	-21.4673	54.2219
43	-262.8510	28.7823	-36.2102	243.4661	-20.9973	57.6685
44	-237.4405	28.0367	-40.2620	216.7221	-20.0914	62.1109
45	-207.6606	26.8418	-45.3390	185.9197	-18.7208	67.6010
46	-174.0005	25.1718	-51.4956	158.5429	-17.4714	71.8992
47	-144.0022	23.5719	-56.4945	123.2491	-15.2443	79.1949
48	-106.3887	21.0126	-64.5283	85.9180	-12.4699	87.6946
49	-67.0808	17.8678	-73.8062	47.4870	-9.0882	97.4698
50	-27.0652	14.1054	-84.4026	19.6282	-6.4057	104.8062
51	1.9360	11.0376	-92.6050	-16.7973	-2.0060	116.7988
52	39.0274	6.2249	-105.5122	-51.1312	3.0744	130.2727
53	73.5197	0.7178	-119.9516	-71.2486	6.9808	140.3552
54	93.2533	-3.6090	-131.0530	-97.2833	13.1857	156.4194
55	118.3317	-10.2503	-148.1924	-117.4083	20.1208	174.2061
56	136.9012	-17.6281	-167.1129	-130.1145	27.8014	193.8100
57	147.4390	-25.7583	-187.9135	-125.9704	33.4596	208.3172
58	140.5031	-31.8745	-203.6810	-120.4412	42.3635	231.0997
59	131.5423	-41.2413	-227.7904	-103.0941	52.0536	255.9823
60	110.1200	-51.3829	-254.0646	-70.0762	59.0817	274.4682

ENVOL. MAX. FLECTORES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	61.0640	66.3774	-239.1664	-104.5895	-96.3469	112.9074
2	113.7297	147.9937	-2.0505	-223.2076	-150.2998	-158.6737
3	230.7187	147.7039	134.6173	-340.2237	-153.4057	-140.8979
4	340.2229	153.4052	140.8980	-431.1609	-127.6569	-182.6920
5	431.1571	127.6573	182.6918	-510.5068	-103.7259	-150.6528
6	510.5063	103.7284	150.6530	-570.5182	-75.4984	-126.8560
7	570.5162	75.4890	126.8557	-617.6812	-37.5404	-123.5782
8	617.6820	37.5348	123.5782	-644.5537	-33.7356	-130.3774
9	644.5634	33.7309	130.3774	-652.4675	-2.7868	-112.7194
10	652.4713	2.7898	112.7194	-647.7759	21.1451	-80.6803
11	647.7816	-21.1533	80.6803	-624.5575	31.8093	-101.1767
12	624.5526	-31.8097	101.1765	-582.7770	69.7555	-97.8993

13	582.7810	-69.7299	98.6975	-527.2734	97.4444	-72.8501
14	527.2752	-97.4438	72.8500	-452.5732	110.9147	-17.6612
15	452.5724	-110.9298	17.6612	-365.6393	131.4640	-57.1088
16	365.6411	-131.4612	57.1089	-271.8839	151.6374	-47.0820
17	273.0851	-142.5630	23.5530	-171.2353	134.1351	-21.0005
18	181.8802	-101.1528	-6.5788	-106.5535	94.7509	59.7745
19	121.6628	-54.1650	-66.6243	-84.6142	45.1378	26.4468
20	96.3112	-17.3890	-17.6416	-83.2813	29.7100	43.1290
21	99.6524	-9.4551	-38.7932	-83.1443	23.8461	28.6879
22	87.5335	0.5121	-37.4016	-92.1628	-9.9691	71.3818
23	104.1816	40.1194	-56.9926	-159.2056	-57.0524	-31.6781
24	181.1188	100.6334	45.3673	-265.3268	-77.3927	-41.1894
25	285.8378	120.6610	76.5765	-389.6057	-86.1587	-40.9940
26	405.4787	116.7646	96.0447	-516.3860	-92.9499	-91.1158
27	517.2905	93.9703	94.7862	-606.5153	-83.3989	-116.7764
28	606.5109	83.3977	116.7765	-682.0011	-54.0011	-95.0687
29	682.0007	54.0131	95.0685	-730.7357	-26.0737	-72.2607
30	730.7377	26.0708	72.2608	-751.3362	-0.0509	-44.4656
31	751.3334	0.0578	44.4656	-744.6819	10.5396	-66.1870
32	744.6814	-10.5319	66.1870	-710.2599	39.9697	-43.7269
33	710.2603	-39.9636	43.7269	-647.9577	67.8104	-18.2575
34	647.9546	-67.8209	18.2574	-559.9567	107.8448	-19.2234
35	559.9887	-107.7939	18.8199	-444.8160	137.0684	4.1424
36	444.8630	-136.7688	-5.3989	-302.7897	165.9029	28.6124
37	311.0174	-146.3304	-73.3777	-176.8509	154.4321	41.1286
38	194.8232	-111.4947	-49.7800	-96.2523	94.3455	134.9115
39	113.1963	-57.5672	-139.3792	-80.2554	-2.0516	-5.6517
40	92.3617	0.2452	-56.6865	-96.0937	3.2259	-15.4814
41	106.4708	11.4610	-21.8870	-98.1579	7.4545	-12.6448
42	102.7538	4.7540	-9.6278	-110.6096	-20.2621	-27.5185
43	117.7953	36.6575	-54.4643	-154.6855	-83.7521	-33.6905
44	170.1082	126.5412	58.5920	-245.7949	-106.8494	-57.2393
45	259.3278	143.9081	100.0873	-350.3491	-113.1970	-117.5912
46	355.5137	122.5640	144.5162	-444.5165	-91.6486	-112.2735
47	444.5110	91.6772	112.2735	-513.1070	-99.0278	-117.2980
48	513.1116	99.0656	117.2982	-566.2345	-67.9124	-133.6759
49	566.2333	67.9213	133.6759	-609.4258	-36.5318	-100.3069
50	609.4177	36.5458	100.3066	-633.5768	-33.2514	-124.4612
51	633.5792	33.2588	124.4611	-642.3437	8.1412	-112.0409
52	642.3393	-8.1302	112.0410	-637.3253	11.6456	-86.4490
53	637.3318	-11.6293	86.4491	-612.2370	43.1405	-101.4924
54	612.2371	-43.1158	101.4927	-575.9625	74.8348	-66.7894
55	575.9727	-74.7494	65.7020	-521.2964	68.8290	-65.3900
56	521.3047	-68.7918	64.7359	-447.9774	119.7159	-75.3444
57	447.9711	-119.7035	75.3443	-364.7996	111.1348	12.5897
58	364.8015	-111.1320	-12.5896	-264.5960	149.0944	15.8674
59	264.5946	-149.0939	-15.8674	-151.4223	177.6241	42.9684
60	154.0086	-160.3917	-102.0328	-65.1760	110.7558	209.5735

ENVOL. MAX. CORTANTES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-37.7846	211.9029	147.9955	-89.6251	-200.6226	-196.1039
2	84.4155	201.1196	194.7701	-211.3537	-172.7968	-171.7603
3	202.5089	173.6933	169.3990	-323.3304	-155.3289	-139.2781
4	304.7927	157.2990	137.9739	-403.6285	-140.0973	-155.9425
5	389.1892	141.7863	151.6951	-428.6770	-116.0865	-127.3426

6	399.6903	119.6764	125.2844	-446.6857	-98.1455	-118.7345	=====							
7	414.1242	102.5048	116.4619	-483.6053	-89.1587	-112.4599								
8	448.5396	94.3120	110.0758	-467.8873	-73.1837	-102.2628								
9	431.3453	79.1030	99.8647	-437.2188	-58.4216	-90.8927		1	-102.9257	112.6333	357.4179	21.2666	-112.6376	-357.4179
10	400.1624	65.0955	88.5735	-394.4689	-44.9126	-78.5468		2	-21.2666	112.6376	357.4179	-52.6368	-95.3890	-311.7055
11	357.8299	52.3072	76.3950	-390.9127	-38.9690	-72.3930		3	52.6368	95.3890	311.7055	-121.0940	-83.7546	-268.8541
12	355.5392	47.0770	70.4920	-331.8875	-27.4434	-59.5212		4	114.4747	84.4308	270.8832	-175.4259	-78.1343	-265.9932
13	298.5876	36.2408	57.9499	-268.2797	-17.2087	-46.4488		5	175.4259	78.1343	265.9932	-190.2357	-63.3174	-221.4039
14	237.7692	26.6616	45.2810	-252.2639	-13.3186	-41.2793		6	177.6571	64.8262	224.4511	-206.3815	-53.9564	-197.4049
15	225.1717	23.3872	40.5846	-184.1547	-4.9876	-28.9801		7	191.6659	55.8546	201.0428	-229.7425	-49.1824	-183.3673
16	161.0282	15.6616	28.8234	-137.1715	0.1768	-30.2643		8	213.4393	51.4907	187.6470	-227.7140	-40.8204	-159.9693
17	118.4563	11.0558	30.7052	-54.1857	1.1674	-12.1196		9	210.3494	43.5183	164.9397	-217.5461	-33.0749	-136.6823
18	101.2585	8.6966	15.6054	-49.7345	1.7803	-13.8915		10	199.6162	36.1561	142.3899	-200.6922	-25.9564	-113.6053
19	93.7472	7.5962	13.4009	-47.6906	2.1587	-15.3174		11	182.6753	29.4121	120.0942	-201.5792	-22.7439	-102.4187
20	90.5403	6.9381	11.9451	256.0876	-84.3405	-142.0978		12	183.9118	26.5611	109.7308	-175.4343	-16.6412	-80.4741
21	-725.9919	235.2706	91.9933	621.4719	-290.6436	-176.7646		13	158.5343	20.8142	88.6487	-146.1959	-11.1961	-60.0938
22	-625.4254	290.9445	175.5077	375.8630	-261.9637	-154.5531		14	130.4338	15.7051	69.1679	-139.4026	-9.0330	-51.4926
23	-383.3791	262.5685	152.1504	159.5263	-233.4163	-130.9447		15	125.1063	13.8596	61.5009	-106.6730	-4.5609	-33.8611
24	-170.5900	234.3739	127.4301	-27.1536	-205.0812	-105.9732		16	94.1288	9.7008	44.8360	-74.1437	-0.7335	-19.1368
25	12.6938	206.4301	101.3814	-78.0352	-177.3976	-85.3737		17	63.5876	6.1591	31.1082	-43.2194	2.4731	-6.4225
26	60.4660	179.1716	79.7398	-169.7061	-154.7290	-71.2286		18	34.8356	3.2229	19.4181	-34.7539	3.4471	-1.7426
27	220.6474	157.4478	81.1889	-361.9127	-139.9658	-75.9448		19	28.6701	2.5016	15.7877	-1.7466	-0.8328	2.4603
28	318.4086	145.0771	74.5992	-405.5522	-120.6424	-67.6626		20	3.1872	0.3797	8.0530	225.9032	-60.8945	-188.5651
29	358.4093	126.7635	66.3481	-425.6011	-102.3923	-58.9094		21	-280.4608	113.7749	319.1154	324.4503	-156.0729	-423.8165
30	376.1147	109.5263	57.6971	-424.4444	-85.2655	-49.7565		22	-324.4503	156.0729	423.8165	183.0824	-138.8247	-378.1039
31	373.9853	93.4477	48.7164	-404.8940	-69.4270	-40.2739		23	-183.0824	138.8247	378.1039	57.2366	-121.5736	-332.3914
32	354.8769	78.6564	39.4771	-370.1287	-54.9070	-30.5328		24	-57.2366	121.5736	332.3914	72.4839	-107.5508	-287.4810
33	321.9577	65.1719	30.0495	-323.5850	-41.7961	-20.6035		25	-72.4839	107.5508	287.4810	19.6250	-93.8237	-247.4882
34	278.6191	53.0839	20.5045	-268.9026	-30.1539	-10.5619		26	126.3346	84.1981	249.8037	-185.9911	-71.9962	-219.6148
35	228.4177	42.4424	10.9173	-42.1093	-22.9898	37.1389		27	167.5787	73.9184	224.9486	-233.6464	-65.1780	-201.7877
36	134.5728	33.7183	9.5004	-49.8823	-21.0347	33.3336		28	212.5974	67.5784	208.0535	-251.9612	-55.3588	-177.6138
37	72.1993	29.6161	-27.1300	-59.7501	-19.5324	30.1822		29	228.8725	58.2672	184.8470	-258.1167	-46.0831	-154.1563
38	50.8102	27.1951	-45.5662	-72.4938	-18.4544	27.6492		30	233.6345	49.4950	162.3922	-253.2998	-37.3653	-131.4505
39	67.7088	26.5076	-43.6165	-88.7400	-17.7672	25.6996		31	228.1066	41.3024	140.7242	-238.9186	-29.2936	-109.5316
40	88.2213	26.1707	-42.2151	447.6330	-54.0505	-31.1290		32	213.7259	33.7540	119.8785	-216.5588	-21.8776	-88.4351
41	-703.7526	220.2211	65.7777	627.1606	-267.1773	-113.1602		33	192.0684	26.8558	99.8905	-187.9453	-15.1684	-68.1961
42	-630.2180	267.4239	111.9825	438.7506	-260.7523	-125.6558		34	164.8332	20.6571	80.7954	-154.8891	-9.1919	-48.8528
43	-444.1019	261.2029	123.5654	283.4429	-233.7306	-100.4650		35	133.7966	15.1808	62.6310	-119.0777	-3.9627	-31.3209
44	-291.0445	234.4096	97.4810	144.6523	-206.7034	-73.8436		36	100.5737	10.4336	46.3131	-82.3194	0.5131	-15.7664
45	-154.4220	207.6378	69.9885	-2.1611	-187.0340	-73.2024		37	66.8905	6.4129	32.0083	-46.1889	4.2575	-3.0016
46	-19.3095	189.0487	71.6478	-94.0021	-174.2268	-54.7342		38	34.2168	3.0956	20.5283	0.3089	0.1300	-0.1091
47	80.3710	175.7156	49.2153	-138.8477	-148.9491	-59.4273		39	4.2363	0.4741	11.1568	0.4324	0.1300	-0.1091
48	109.6125	152.1104	57.4508	-177.8297	-130.2629	-50.2111		40	-21.9645	-1.5057	4.5565	425.6439	-34.7966	-62.4160
49	145.5058	134.0423	48.1178	-237.8534	-120.7070	-44.1158		41	-172.9992	100.9243	270.1795	111.2922	-117.0294	-307.1496
50	203.0892	125.1402	41.9755	-241.7414	-103.0075	-33.2452		42	-110.6967	116.9695	308.2370	265.5756	-147.1879	-302.1082
51	205.2658	108.1120	31.1317	-227.0134	-85.7683	-20.8110		43	-265.5756	147.1879	302.1082	-34.1869	-100.4036	-267.2004
52	189.6281	91.5793	18.8030	-194.2245	-69.0687	-6.8188		44	29.5234	100.7474	269.2724	-87.6164	-90.4935	-243.8040
53	156.7974	75.6085	4.9999	-206.7809	-62.2792	-0.9977		45	80.3918	91.0611	246.4005	-143.9928	-84.3923	-228.7251
54	170.2414	69.5580	-0.5441	-162.3053	-49.0805	11.1863		46	134.3195	85.2081	231.8712	-178.3075	-74.7299	-205.8138
55	127.6299	57.1154	-12.3584	85.3760	-41.3839	80.3803		47	166.3500	75.8317	209.5371	-202.7490	-65.1794	-182.8387
56	-36.1894	49.2137	-59.2128	68.5138	-39.4060	77.9595		48	188.7341	66.5651	187.1693	-217.1126	-55.7468	-159.7779
57	-33.1645	45.4761	-63.3495	50.4714	-37.8117	75.9515		49	201.3008	57.4269	164.7477	-240.5171	-50.7563	-147.0720
58	-59.3643	43.3100	-87.9765	30.3866	-36.6300	74.3030		50	223.2165	52.7558	152.7161	-236.7338	-41.7990	-124.5794
59	-35.8110	42.5425	-86.6312	7.3842	-35.8717	72.9577		51	218.3045	44.1147	130.9345	-223.3501	-33.0434	-102.0026
60	-8.7601	42.1974	-85.5321	-21.8391	-42.2021	85.5321		52	204.1770	35.7089	109.1081	-200.6265	-24.5566	-79.3443
								53	181.1337	27.5769	87.2422	-198.7129	-20.9115	-69.5667
								54	179.3465	24.2963	78.3008	-164.0933	-13.4461	-49.2624
								55	145.3317	17.2017	58.8793	-172.3983	-0.6923	-15.3875
								56	154.7407	4.8144	25.9357	-64.3044	3.2898	-7.6852
								57	48.2718	1.2273	19.2162	-7.0958	4.0156	-6.4119
ENVOL. MAX. TORSORES -EC1														
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2								

58	32.8698	-0.5389	14.1077	-4.1847	4.0160	-6.4119
59	18.8931	-1.9110	10.0914	-1.2736	4.0156	-6.4119
60	7.1805	-2.8882	7.2244	1.6371	4.0149	-6.4119

ENVOL. MIN. FLECTORES -EC1

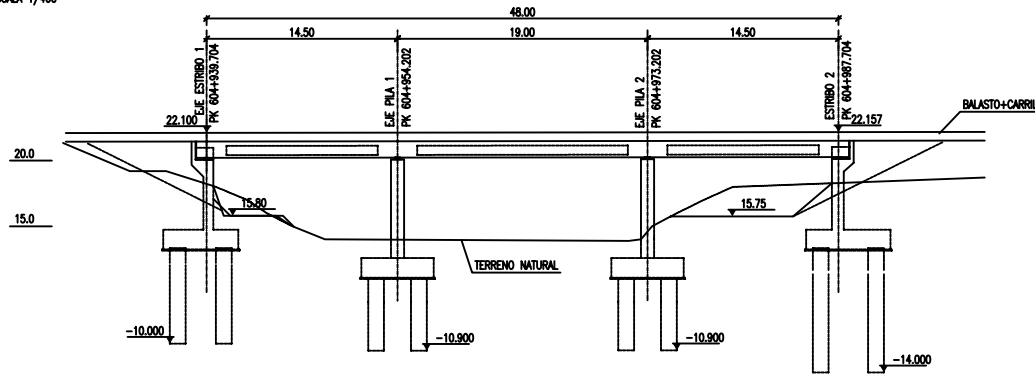
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-104.3351	116.0440	362.9391	29.1457	-1.3287	-72.2141
2	-32.1157	-14.5089	38.8728	42.6843	14.6144	-38.4760
3	-42.8401	-14.9284	37.3070	66.2202	37.1631	65.4226
4	-66.2200	-37.1634	-65.4226	93.1616	37.1626	65.4225
5	-93.1937	-37.2522	-66.3319	120.2022	37.2529	66.3319
6	-120.2025	-37.2600	-66.3320	147.2163	37.2587	66.3320
7	-147.2154	-37.2501	-66.3319	174.2194	37.2476	66.3319
8	-174.2196	-37.2453	-66.3320	201.2238	37.2441	66.3320
9	-201.2291	-37.2423	-66.3319	228.2307	37.2418	66.3319
10	-228.2319	-37.2403	-66.3319	255.2343	37.2372	66.3319
11	-255.2392	-37.2255	-66.3320	282.2257	37.2229	66.3320
12	-282.2230	-37.2147	-66.3320	309.2042	37.2118	66.3320
13	-309.2095	-37.2482	-67.1303	336.2154	37.2499	67.1303
14	-336.2180	-37.2478	-67.1304	363.2247	37.2465	67.1306
15	-363.2249	-37.2340	-67.1306	390.2178	37.2283	67.1306
16	-390.2181	-37.2271	-67.1306	425.9628	63.4494	116.6122
17	-427.1509	-72.3736	-94.3209	482.8522	81.9169	115.1000
18	-491.0354	-104.4433	-65.4412	567.6185	114.6064	86.6394
19	-574.9283	-136.1442	-43.0327	674.9392	161.1083	94.8735
20	-679.8120	-173.4570	-70.7242	924.4847	54.1502	-152.4739
21	-854.5023	114.9776	-113.3768	672.4568	-247.4146	-228.0414
22	-676.8268	231.4990	257.9580	473.9216	-165.6589	-104.8989
23	-480.3574	151.3000	130.5070	351.6920	-125.8905	-82.2008
24	-363.7567	102.8055	121.6212	276.2023	-49.0408	85.1238
25	-285.4481	29.7876	-51.2507	257.1538	-29.7880	51.2507
26	-263.1801	18.2598	-56.5742	245.8341	-18.2618	56.5742
27	-245.8609	18.2297	-55.7154	228.5446	-18.2296	55.7154
28	-228.5428	18.2293	-55.7153	218.9520	-9.4353	54.1791
29	-218.9526	9.4257	-54.1791	209.9983	-9.4230	54.1791
30	-210.0006	9.4249	-54.1791	204.0015	-0.4580	58.5656
31	-203.9982	0.4517	-58.5656	208.2074	8.5345	52.8706
32	-208.2077	-8.5404	-52.8708	216.3196	8.5406	52.8708
33	-216.3233	-8.5435	-52.8708	224.4411	8.5446	52.8708
34	-224.4381	-8.5405	-52.8708	232.5501	8.5406	52.8708
35	-232.5806	-8.5902	-52.4674	240.7425	8.5903	52.4674
36	-240.7932	-8.8977	-50.0100	249.2434	8.8964	50.0100
37	-262.2534	-40.0473	-2.2632	304.5740	93.8975	136.6682
38	-318.2678	-82.9781	6.3885	437.3735	129.8213	107.2419
39	-445.7976	-150.1393	-64.9420	592.5552	176.3562	-15.1463
40	-601.0407	-192.0732	46.4977	878.8783	91.0983	-139.0518
41	-811.3965	64.9835	-128.5289	718.6918	-223.2651	-130.4245
42	-723.2881	211.0594	152.6971	574.1591	-198.5595	-108.5329
43	-581.3450	182.1614	135.4787	494.3706	-77.5175	133.9226
44	-502.7556	56.4553	-104.2920	461.8266	-56.4446	104.2920
45	-468.3391	42.2737	-86.4409	437.6919	-42.2701	86.4410
46	-437.6928	42.2703	-86.4410	407.0428	-42.2758	86.4412
47	-407.0424	42.2734	-86.4412	376.3977	-42.2541	86.4412
48	-376.4012	42.2431	-86.4412	345.7902	-42.2189	86.4412
49	-345.7903	42.2133	-86.4412	315.1848	-42.2055	86.4412
50	-315.1806	42.1994	-86.4412	284.5915	-42.2006	86.4414

51	-284.5898	42.1999	-86.4414	253.9999	-42.1949	86.4415
52	-253.9982	42.1924	-86.4415	223.4127	-42.1657	86.4415
53	-223.4131	42.1635	-86.4415	192.8491	-42.1464	86.4415
54	-192.8496	42.1432	-86.4415	162.2925	-42.1439	86.4415
55	-162.2943	42.1371	-86.4415	131.7456	-42.1508	86.4415
56	-131.7564	42.1110	-85.7875	101.2284	-42.1123	85.7875
57	-101.2277	42.1091	-85.7875	70.7110	-42.0944	85.7875
58	-70.7113	42.0932	-85.7875	40.4661	-41.6241	82.1149
59	-40.4656	41.6253	-82.1149	10.6967	-19.2799	17.0581
60	-13.4166	1.1139	45.1752	42.0340	49.7154	-135.8658

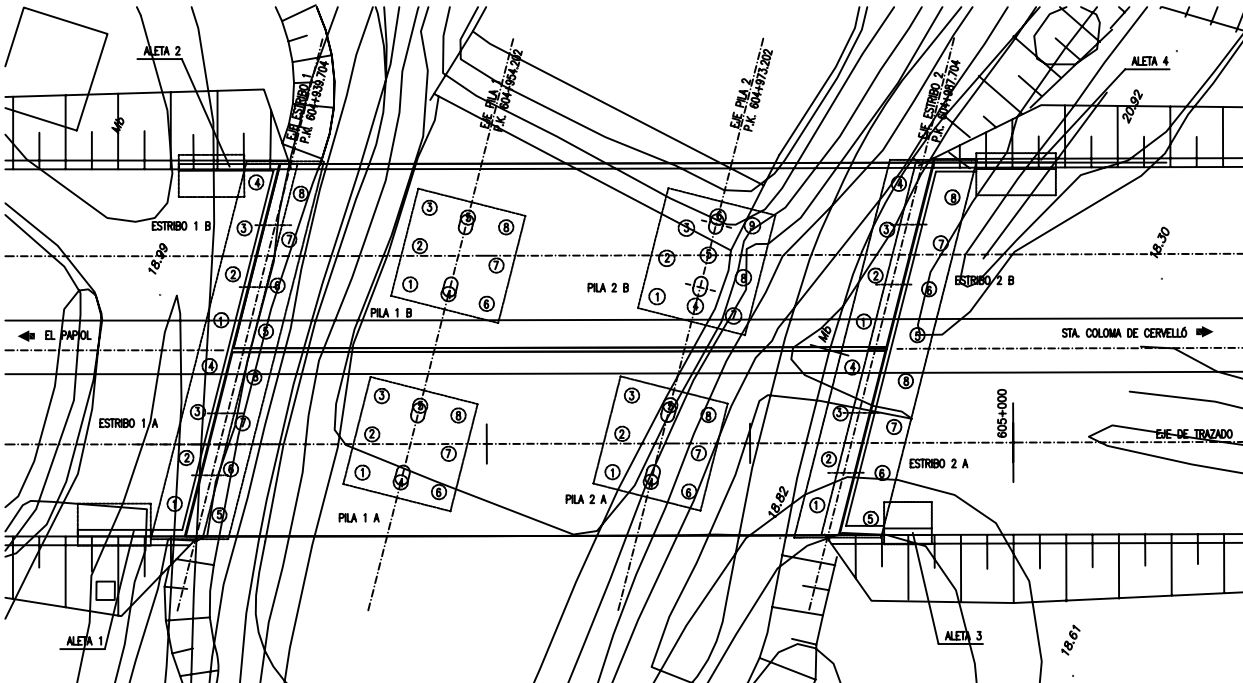
ENVOL. MIN. CORTANTES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	19.9733	-31.2548	-78.2324	5.1054	37.9256	64.5589
2	2.5541	-27.9150	-66.1297	20.9881	39.0845	63.8026
3	-9.6656	-29.2095	-62.7967	30.7899	41.0570	62.4987
4	-20.0191	-30.8967	-58.5494	36.2327	43.8371	60.7613
5	-9.4830	-34.0777	-54.7009	39.0259	47.4184	58.7029
6	-0.7779	-40.0865	-38.4354	-94.5790	58.1595	9.4168
7	112.9899	-54.3372	-16.4265	-136.5799	73.7847	16.0811
8	155.6825	-70.3381	-22.3862	-102.2724	77.0087	8.7127
9	121.5866	-73.9326	-14.3594	-128.5853	94.0809	12.7157
10	147.6553	-91.3548	-17.7484	-146.0740	111.9855	15.8249
11	164.4715	-109.5990	-20.2854	-120.7229	116.6039	3.7529
12	138.0543	-114.5546	-7.6806	-74.6865	135.3573	9.8222
13	90.6000	-133.6366	-13.2540	-53.7235	155.2908	15.4031
14	67.9047	-153.8664	-18.3739	-17.9123	176.1005	23.7178
15	30.0892	-174.9681	-26.2597	101.4177	184.1878	15.2577
16	-91.4653	-183.3235	-17.4008	169.5936	203.5630	23.5686
17	-162.0405	-202.9514	-25.3405	271.8372	227.4655	19.6559
18	-266.7997	-227.0836	-21.0817	423.1498	254.3170	48.0362
19	-420.6873	-254.1541	-49.1387	607.3676	260.8229	35.4652
20	-607.3682	-260.8213	-35.4652	672.9494	217.3708	36.9556
21	-203.1122	-79.8201	-139.3380	-83.1443	23.8461	28.6879
22	87.1049	-7.2705	-22.9993	-71.8945	24.7503	28.2433
23	84.0602	-8.8756	-22.2336	-67.3263	26.3550	27.4778
24	87.4713	-11.2617	-21.2174	-68.4701	28.7415	26.4614
25	96.0851	-14.5006	-20.0205	-133.7552	33.1050	-3.5225
26	168.0773	-19.7752	10.0731	-231.5211	42.1603	7.0202
27	271.5769	-29.7932	-0.4306	-282.9722	52.8182	4.3593
28	327.6166	-41.4494	2.1991	-327.5413	64.9062	2.2277
29	375.5052	-54.5591	4.2288	-361.7220	78.3667	0.6998
30	411.6485	-69.0668	5.5842	-382.1389	93.1560	-0.1532
31	432.6158	-84.8984	6.1942	-343.6670	102.3715	-0.9501
32	393.2867	-95.1500	6.6771	-330.1576	119.4372	-0.7444
33	324.2862	-116.1676	-4.5225	-260.2268	140.5400	6.8251
34	281.4521	-138.1059	-11.3196	-195.7368	162.3336	13.7308
35	214.3870	-160.3707	-17.5360	-148.2459	177.0385	5.4707
36	181.6673	-173.7237	-1.7028	-34.5292	197.9848	9.6433
37	61.4032	-195.5282	-6.5422	107.3911	219.5675	14.9848
38	-51.5217	-218.5014	-40.0347	261.4323	247.6255	63.2482
39	-257.0836	-247.2896	-64.6497	492.8270	276.2310	88.1137
40	-492.4261	-276.2021	-89.0003	700.2260	233.5819	38.1485
41	-327.9651	-80.8881	-194.2893	-98.1579	7.4545	-12.6448
42	101.4184	-1.2358	1.0617	-98.1057	7.9061	-14.7352
43	103.7838	-1.9180	4.0457	-99.9756	8.5888	-17.7192

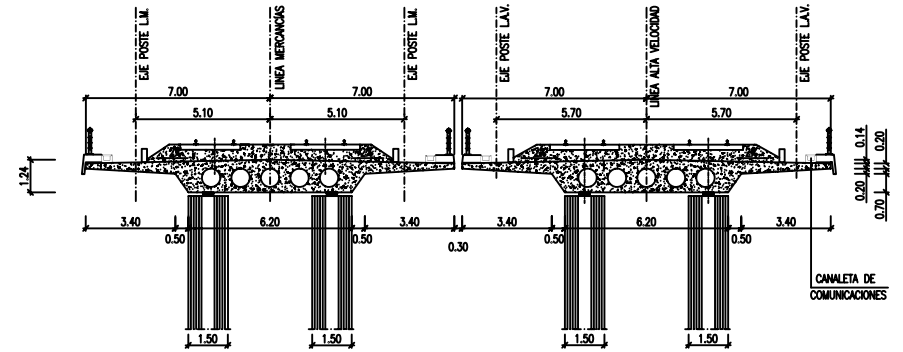
DESARROLLO POR EL EJE DE TRAZADO
ESCALA 1/400



PLANTA
ESCALA 1/400



SECCIÓN TRANSVERSAL
ESCALA 1/200



NIVELES DE CONTROL Y COEFICIENTES DE SEGURIDAD ADOPTADOS

HORMIGONES			
ELEMENTO ESTRUCTURAL	TIPO	CONTROL	γ
TABLERO	HP-40/P/20/IIa	NORMAL	1.50
ALZADOS DE PILAS	HA-30/B/20/IIa	NORMAL	1.50
CIEMENTACIONES Y ESTRIBOS	HA-25/B/20/IIa	NORMAL	1.50
NIVELACIÓN	HM-15	NORMAL	1.50

ACEROS			
ACEROS	TIPO	CONTROL	γ
ACERO PARA ARMAR CORRUGADO	B 500 S	NORMAL	1.15
ACERO PARA TESAR	Y 1860 S7	NORMAL	1.15

EJECUCIÓN DE LA OBRA

ELEMENTOS IN SITU CONTROL NORMAL.
COEFICIENTES DE MAYORACIÓN DE LAS ACCIONES SEGÚN EHE.

CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

II. PROYECTO DE PRUEBA DE CARGA

**CONTRATO DE CONSULTORÍA Y ASISTENCIA
PARA LA REALIZACIÓN DE PRUEBAS DE CARGA
PARA LA RECEPCIÓN DE PUENTES DE LA
LINEA DE ALTA VELOCIDAD
MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA.
TRAMO: VILAFRANCA DEL PENEDES- BARCELONA**



PROYECTO DE PRUEBA DE CARGA

**TRAMO: SANT VICENÇ HORTS - SANTA COLOMA CERVELLO.
VIADUCTO RIERA TORRELLES (MERCANCIAS)
62RMPI02
P.K. DE OBRA:604+940; DE LÍNEA:603+245**

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62RMPI02 RIERA TORRELLES (MERCANCÍAS)**

Página 1



UNIDAD DE CONSTRUCCIÓN

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA 62RMPI02 RIERA
TORRELLES MIXTA**

PC-LL-07-13

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62RMPI02 RIERA TORRELLES (MERCANCÍAS)**

Página 2



UNIDAD DE CONSTRUCCIÓN

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA 62RMPI02 RIERA
TORRELLES MIXTA**

PC/LL/07.13

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**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62RMPI02 RIERA TORRELLES (MERCANCÍAS)**

Página 3

ANEJOS :

- I- DOCUMENTACIÓN FACILITADA**
- II- ANÁLISIS DEL PROYECTO DE LA ESTRUCTURA**
- III- ESQUEMAS DE INSTRUMENTACIÓN PREVISTA Y TREN DE CARGAS**

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62RMPI02 RIERA TORRELLES (MERCANCÍAS)**

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1. INTRODUCCIÓN.

A instancias del ADIF, se redacta el presente documento, "Proyecto de Prueba de Carga del paso inferior sobre la Riera de Torrelles de la línea de alta velocidad Madrid-Zaragoza-Barcelona-Frontera Francesa, Tramo: Sant Vicenç del Hortons-Santa Coloma de Cervelló", de acuerdo con las especificaciones del Contrato AV 004/06 suscrito con dicho Organismo, cuyo alcance es la realización de las preceptivas pruebas de carga en los puentes y estructuras a recibir por el ADIF, previamente a su puesta en servicio.

La redacción del presente proyecto, así como el desarrollo de las actividades incluidas en el mismo, atiende a las especificaciones de la "Instrucción relativa a las acciones a considerar en el Proyecto de Puentes de Ferrocarril", y se ha realizado siguiendo las directrices recogidas en la publicación del Ministerio de Fomento "Instrucción sobre las inspecciones técnicas en los puentes de ferrocarril (ITPF-05); capítulo 4: Pruebas de carga". Así como las indicadas en el Plan de Actuación de dichas pruebas, redactado por el ADIF, e incluido en el Pliego de Bases, con objeto de desarrollar las especificaciones del Contrato.

2. DATOS SOBRE LA ESTRUCTURA.

El paso inferior permite el cruce de la línea de alta velocidad y de la línea de mercancías sobre la riera de Torrelles, con una longitud total de 48 m. El puente está constituido por dos tableros paralelos, uno para la línea de alta velocidad y otro para la línea de mercancías, de similares características de hormigón postesado con un esquema longitudinal de tres vanos de 14,5+19+14,5 m de luz. La plataforma tiene 14 m de ancho para ubicar la capa de balasto del ferrocarril, dos canaletas para el paso de cables y las barandillas con sus impostas. El desarrollo en planta de la estructura es prácticamente recto, presentando un ligero esviaje en planta de 16g. Al tratarse de una estructura de poca longitud y una altura sobre el cauce del río de unos 7 m, se ha proyectado un tablero de hormigón in situ constituido por una losa aligerada de 1,24 m de canto constante (sobre el eje del tablero) y con bombeo del 2 % (canto sobre el borde del tablero igual a 1,10 m).

Directamente sobre la losa se encuentra situado el balasto, las vías y las barandillas de protección.

Vano	Luz de cálculo (m)	Ancho del Tablero (m)	Sección Transversal
V-1	14,50	14,00	Losa Aligerada
V-2	19,00	14,00	Losa Aligerada
V-3	14,50	14,00	Losa Aligerada

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La documentación facilitada por el ADIF comprende:

- a) Planos del Paso Inferior Riera de Torrelles del Proyecto de Construcción de Plataforma. Línea de Alta Velocidad Madrid – Zaragoza – Barcelona – Frontera francesa. Tramo: Sant Vicenç dels Horts – Santa Coloma de Cervelló
- b) Anejo de Cálculo del Paso Inferior Riera de Torrelles del Proyecto de Construcción de Plataforma. Línea de Alta Velocidad Madrid – Zaragoza – Barcelona – Frontera francesa. Tramo: Sant Vicenç dels Horts – Santa Coloma de Cervelló (Documento nº1: Memoria y Anejos, Anejo 6: Estructuras, Riera de Torrelles)

A partir de dicha documentación, se ha realizado una evaluación del proyecto de la estructura, con resultados favorables en base a los siguientes conceptos:

- Las acciones a considerar son acordes con las especificaciones de la ***“Instrucción relativa a las acciones a considerar en el proyecto de puentes de ferrocarril IPF-75”*** y el ***“Eurocódigo 1: Bases de proyecto y acciones. Parte 3- Cargas de trafico en Puentes”***.
- Las hipótesis y combinaciones de cálculo y sus correspondientes coeficientes de ponderación, son acordes con lo especificado en la ***“Instrucción de hormigón estructural EHE”***.
- El proceso de dimensionamiento y comprobación de secciones respeta las prescripciones de la normativa vigente ***“Instrucción de hormigón estructural EHE”***.

Como elemento fundamental de comprobación del Proyecto de la estructura se han contrastado algunos valores de los momentos flectores debidos a la acción de la sobrecarga.

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Los resultados de dicha comparación se muestran en el siguiente cuadro:

SC	Momento Valores Proyecto (m.t)	Momento Valores Comparación (m.t)	Variación (%)
Pila 1	-924,78	-956,29	-3,41
Centro de vano	751,33	794,76	-5,75

Tal y como se observa en el cuadro anterior, las diferencias que se aprecian entre los valores de Proyecto y los de comprobación se consideran perfectamente admisibles.

3. JUSTIFICACION DE LA CARGA DE LA PRUEBA.

Para la realización de la prueba de carga se ha solicitado a través del A.D.I.F., la prestación de un total de dos (2) locomotoras y dos (2) tolvas cargadas con balasto, distribuidas en las vías de la línea mixta. Las características y dimensiones de los elementos de carga son las siguientes:

- Locomotora S/316:

- Peso total: 109.5 t
- Seis (6) ejes, transmitiendo cada eje 18.25 t, divididos en dos (2) bogies con tres (3) ejes cada uno.
- Separación entre ejes de un mismo bogie: 2.07/2.12m.
- Separación entre el tercer eje del primer bogie y el primer eje del segundo bogie es de: 5.01m
- Longitud total de la locomotora entre topes: 17.87m
- Distancia entre pivotes de bogies: 13.39
- Distancia entre bogies: 4.40

- Tolva cargada con balasto :

- Peso total de 80 T
- Dos (2) bogies de dos (2) ejes, transmitiendo cada eje 20 T
- Separación entre ejes intermedios de los dos (2) bogies: 7.4 m
- Separación entre ejes de un mismo bogie: 1.80 m

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En el Anejo nº IV se adjuntan esquemas del tren de cargas.

En la prueba de carga, según se detalla en el Anejo III, se obtienen frente a los valores de proyecto los siguientes porcentajes de esfuerzo (momento Flector):

HIPÓTESIS H 1 (VANO 2)

Sección	Momento PC (mt)	Momento de proyecto (mt)	Porcentaje alcanzado
CDV 2	307,11	751,33	40,87%

HIPÓTESIS H 2 (VANOS 1 Y 3)

Sección	Momento PC (mt)	Momento de proyecto (mt)	Porcentaje alcanzado
CDV 1	226,98	647,78	35,04%
CDV 3	293,46	633,58	46,31%

HIPÓTESIS H 3 (VANOS 1 Y 2)

Sección	Momento PC (mt)	Momento de proyecto (mt)	Porcentaje alcanzado
PILA 1	-349,86	-924,78	37,83%

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HIPÓTESIS H 4 (VANOS 2 Y 3)

Sección	Momento PC (mt)	Momento de proyecto (mt)	Porcentaje alcanzado
PILA 2	-320,38	-916,72	34,95%

4. MEDIDAS A REALIZAR

Se exponen a continuación las medidas que se realizarán durante el ensayo de Prueba de Carga.

4.1. FLECHAS.

En cada vano se medirán flechas verticales en la sección de centro de vano y en los puntos de apoyo.

Para el control de flechas verticales en secciones que no sean de apoyo del tablero se utilizarán flexímetros equipados con sensores de desplazamientos lineales potenciométricos y salida 4:20 mA, utilizando como elemento de transmisión de flechas un hilo de acero inoxidable de 2 mm de diámetro fijado a la cara inferior del tablero. El rango de medida será de 50 mm con una precisión del 0.1%

Para el control de flechas verticales en los apoyos del tablero se utilizarán los mismos sensores potenciométricos de desplazamientos lineales y salida 4:20 mA, montados sobre unos angulares metálicos y palpando directamente sobre las vigas. El rango de medida será también de 50 mm con una precisión del 0.1%.

4.2. DEFORMACIONES UNITARIAS.

En cada vano se medirán deformaciones unitarias en la sección de centro de vano. La medición de las deformaciones unitarias se realizará mediante bandas extensométricas directamente adheridas al hormigón, en la fibra interior de la losa y según la dirección longitudinal de la misma, tanto en pruebas estáticas como dinámicas.

4.3. OTRAS MEDIDAS.

Durante las pruebas dinámicas, se realizará un registro continuo de vibraciones, mediante tres (3) geófonos verticales situados en el centro de cada uno de los vanos, con objeto de determinar en dichas pruebas la frecuencia propia de oscilación de la estructura.

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Por otro lado, se realizará un control continuo de los parámetros meteorológicos más significativos: Temperatura, presión atmosférica, dirección y velocidad del viento, humedad relativa y pluviometría.

5. PLAN DE CARGA Y PROGRAMACION DEL ENSAYO.

5.1. PRUEBAS ESTÁTICAS.

Se realizará una (1) prueba estática para cada hipótesis de carga, resultando un total de cuatro (4) pruebas estáticas, cargando dos vanos alternos para obtener los máximos momentos flectores positivos en centros de vano (2 pruebas) y cargando dos vanos consecutivos para obtener los máximos momentos flectores negativos en pilas(2 pruebas). En base a los resultados obtenidos para desplazamientos y deformaciones, las 12 primeras hipótesis alternas las agruparemos en tres clases de hipótesis:

Hipótesis	Vano	Vías	Sobrecargas
H-1	V-2	1 y 2	2 Tolvas +2 Locomotoras
H-2	V-1	1 y 2	2 Tolvas
	V-3	1 y 2	2 Locomotoras
H-3	V-1	1 y 2	2 Tolvas
	V-2	1 y 2	2 Locomotoras
H-4	V-2	1 y 2	2 Tolvas
	V-3	1 y 2	2 Locomotoras

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En el Anejo nº IV se adjuntan las mencionadas posiciones de las sobrecargas para cada vano.

Para cada vano, el ensayo de prueba de carga estática se realizará atendiendo a los siguientes escalones:

- Escalón 0: Verificación de conexión y funcionamiento de todos los instrumentos de medida, equilibrado y puesta a cero.
- Escalón 1: Determinación de las lecturas origen estabilizadas de todos los sensores, sin carga en la estructura.
- Escalón 2: Situación o posicionamiento de la carga de prueba, realizándose medidas continuas en intervalos de tiempo entre 5-15 seg.
- Escalón 3: Estabilización de las medidas con la carga de prueba situada, realizándose la medida continua de todos los equipos en intervalos de tiempo entre 5-15 seg hasta su total estabilización, durante un tiempo no inferior a 10 minutos.
- Escalón 4: Descarga de la estructura retirando los vehículos que constituyen el tren de carga. Se realizarán lecturas de forma continua, cada 5-15 seg, de todos los sensores.
- Escalón 5: Estabilización final de las medidas, con la estructura totalmente descargada, realizándose la medida continua de todos los sensores, cada 5-15 seg, hasta alcanzar una recuperación no inferior al 85%, en un intervalo de tiempo no superior al de mantenimiento de la carga de prueba.

En los escalones de estabilización de carga (Escalón 3) y estabilización de descarga (Escalón 5), aparte de los tiempos indicados, y simultáneamente, se seguirán los siguientes criterios de estabilización:

- En 10 minutos no habrá variaciones superiores al 5% de la medida anterior.

- Se esperará a obtener recuperaciones finales superiores al 85 % y sirviendo los criterios anteriores. En caso de no alcanzarse dicho tanto por ciento se procederá a realizar un segundo ciclo de carga.

5.2. PRUEBAS DINÁMICAS.

En cada vano, a continuación de la correspondiente prueba estática, se realizarán cuatro (4) pruebas de carácter dinámico, realizándose cargando dos (2) vías, con el mismo tren de cargas que el utilizado en la prueba estática en dicha vía. Dichas pruebas dinámicas serán las siguientes:

- **Prueba D-1:** Prueba cuasi-estática ($V = 5 \text{ Km/h}$).
- **Prueba D-2:** Prueba a velocidad media ($V = 30 \text{ Km/h}$).
- **Prueba D-3:** Prueba a máxima velocidad.
- **Prueba D-4:** Prueba de frenado a máxima velocidad.

En el Anejo nº III se adjuntan también los cálculos correspondientes a la estimación de la frecuencia fundamental de vibración de la estructura, dando como resultado los tres primeros modos de vibración.

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6. PREVISIÓN DE RESULTADOS.

6.1. PRUEBA ESTÁTICA

H-1: VANO 2

Vano	Sección	Flecha (mm)	Deformación ($\mu\epsilon$)
V-1	1/2	0,19	-2
	P-1	-	-59
V-2	1/2	-1,97	55
	P-2	-	-66
V-3	1/2	-0,08	8

H-2: VANOS 1 Y 3

Sección	Zona	Flecha (mm)	Deformación ($\mu\epsilon$)
V-1	1/2	-1,02	40
	P-1	-	-10
V-2	1/2	0,96	-15
	P-2	-	-21
V-3	1/2	-1,35	52

H-3: VANOS 1 Y 2

Sección	Zona	Flecha (mm)	Deformación ($\mu\epsilon$)
V-1	1/2	-0,16	7
	P-1	-	-62
V-2	1/2	-1,63	33
	P-2	-	-35
V-3	1/2	-0,64	-18

H-4: VANOS 2 Y 3

Sección	Zona	Flecha (mm)	Deformación ($\mu\epsilon$)
V-1	1/2	0,41	-11
	P-1	-	-23
V-2	1/2	-1,16	30
	P-2	-	-57
V-3	1/2	-0,39	16

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6.2. FRECUENCIAS

La frecuencia natural de vibración de los tres (3) primeros modos de vibración, son los siguientes:

Modo 1: 5.0Hz

Modo 2: 8.0 Hz

Modo 3: 10.0 Hz

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7. CONCLUSIÓN.

El presente documento consta de 18 hojas correlativamente numeradas, así como de tres Anejos sin numerar titulados:

- I. DOCUMENTACION FACILITADA**
- II. ANÁLISIS DEL PROYECTO DE LA ESTRUCTURA**
- III. ESQUEMAS DE INSTRUMENTACIÓN PREVISTA Y TREN DE CARGAS.**

Madrid, Diciembre de 2006



Jesús María Sánchez Iglesias

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62PI02 RIERA TORRELLES (MERCANCÍAS)**

ANEJOS

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62PI02 RIERA TORRELLES (MERCANCÍAS)**

I. DOCUMENTACION FACILITADA

ANEJO DE CÁLCULO DEL PASO INFERIOR SOBRE LA RIERA DE TORRELLES

ÍNDICE DEL ANEJO DE CÁLCULO

1 GEOMETRÍA

- 1.1. Geometría y esquema estructural
- 1.2. Sección tipo

2 ACCIONES, MATERIALES, COEFICIENTES DE SEGURIDAD Y NORMATIVAS

- 2.1. Acciones
- 2.2. Coeficientes de seguridad, materiales, niveles de control y Normativas
- 2.3. Ambientes, recubrimientos, fisuración y cuantías mínimas
- 2.4. Hipótesis de combinación de esfuerzos

3 CÁLCULO ESTRUCTURAL

- 3.1. Cálculo estructural con modelo de viga continua
 - 3.1.1. Discretización y características mecánicas
 - 3.1.2. Cálculo de esfuerzos

4 PRETENSADO

- 4.1. Trazado
- 4.2. Cálculo de pérdidas instantáneas y diferidas

5 VERIFICACIÓN DE LOS ESTADOS LÍMITES DE SERVICIO

- 5.1. Tensiones normales (Estado Límite de fisuración)
- 5.2. Estado Límite de deformaciones
- 5.3. Estado Límite de vibraciones

6 VERIFICACIÓN DEL E.L.U DE ROTURA POR TENSIONES NORMALES

- 6.1. Flexión longitudinal
- 6.2. Flexión transversal
- 6.3. Traviesas de apoyo
- 6.4. Introducción del Pretensazo
- 6.5. Evaluación del E.L.U. de Fatiga

7 VERIFICACIÓN DEL E.L.U DE ROTURA POR TENSIONES TANGENCIALES

- 7.1. Evaluación del E.L.U. de Cortante
- 7.2. Evaluación del E.L.U. de Torsión
- 7.3. Evaluación del E.L.U. de Rasante

8 APARATOS DE APOYO Y JUNTAS

- 8.1. Reacciones verticales
- 8.2. Reacciones horizontales
- 8.3. Verificación de aparatos de apoyo y movimientos en juntas

9 CÁLCULO DEL ESTRIBO 1

- 9.1. Geometría
- 9.2. Acciones en coronación
- 9.3. Cálculo de esfuerzos y dimensionamiento
- 9.4. Cálculo y dimensionamiento de las aletas

10 CÁLCULO DEL ESTRIBO 2

- 10.1. Geometría
- 10.2. Acciones en coronación
- 10.3. Cálculo de esfuerzos y dimensionamiento
- 10.4. Cálculo y dimensionamiento de las aletas

11 CÁLCULO DE PILAS

- 11.1. Geometría

- 11.2. Acciones en coronación
- 11.3. Cálculo de esfuerzos y dimensionamiento

12 CÁLCULO DE LOS PARÁMETROS GEOTÉCNICOS DE LOS PILOTES

13 VERIFICACIÓN DE LOS CARRILES POR LA INTERACCIÓN VÍA-ESTRUCTURA

1 GEOMETRÍA

1.1 GEOMETRÍA Y ESQUEMA ESTRUCTURAL

El paso inferior permite el cruce de la línea de alta velocidad y de la línea de mercancías sobre la riera de Torrelles, con una longitud total de 48 m. El puente está constituido por dos tableros paralelos, uno para la línea de alta velocidad y otro para la línea de mercancías, de similares características de hormigón postesado con un esquema longitudinal de tres vanos de 14,5+19+14,5 m de luz. La plataforma tiene 14 m de ancho para ubicar la capa de balasto del ferrocarril, dos canaletas para el paso de cables y las barandillas con sus impostas. El desarrollo en planta de la estructura es prácticamente recto, presentando un ligero esviaje en planta de 16º.

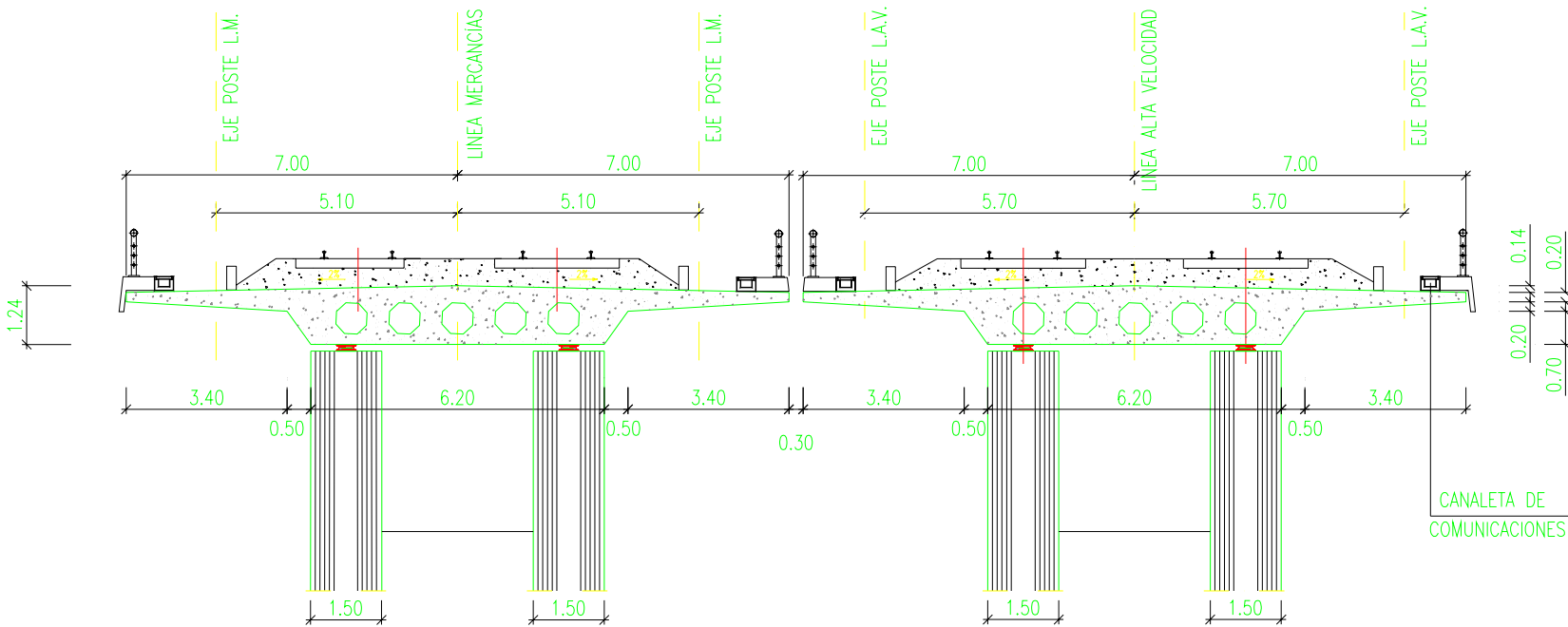
Al tratarse de un estructura de poca longitud y una altura sobre el cauce del río de unos 7 m, se ha proyectado un tablero de hormigón in situ constituido por una losa aligerada de 1,24 m de canto constante (sobre el eje del tablero). La esbeltez del tablero es $L_{max}/15.3$. La construcción del tablero podrá realizarse sobre cimbra apoyada en el terreno. La sección del dintel es un losa aligerada de inercia concentrada postesada longitudinalmente mediante 12 unidades de 24 ϕ 0,6”.

El tablero se ancla a uno de los estribos (estribo fijo) para transmitir los eventuales empujes de frenado y arranque sobre el mismo. El resto de apoyos no toman fuerzas horizontales, salvo las inducidas por el rozamiento entre el apoyo y el tablero a través de los apoyos de neopreno tipo POT. Las pilas están constituidas por un dos fustes de sección hexagonal.

Las cargas del tablero se transmiten a los estribos mediante aparatos de apoyo tipo “POT” de neopreno confinado (fijos, unidireccionales o bidireccionales, dependiendo de su posición). Las cimentaciones son profundas mediante pilotes, dimensionadas de acuerdo con las indicaciones del estudio geotécnico.

1.2 SECCIÓN TIPO

La sección transversal del tablero tiene un ancho de plataforma de 14 m y está constituida por una sección losa aligerada de hormigón postesado e inercia concentrada con un canto constante de 1,24 m sobre el eje del tablero y con bombeo del 2 % (canto sobre el borde del tablero igual a 1,10 m).



Proyecto Construido de Plataforma. Línea de Alt:

2 ACCIONES, MATERIALES, COEFICIENTES DE SEGURIDAD Y NORMATIVAS

2.1 ACCIONES

En el cálculo de los elementos estructurales se han considerado las siguientes acciones:

Acciones permanentes (G):

g1, PESO PROPIO.

El peso propio de los distintos elementos se ha calculado a partir de su geometría (secciones transversales) adoptando una densidad de valor $\gamma = 2,5 \text{ T/m}^3$ para la losa de hormigón.

El peso del tablero es: Sección aligerada $g1 = 21,66 \text{ T/m}$
 Sección maciza $g1 = 26,48 \text{ T/m}$

g2, PESO DEL BALASTO Y CARGAS MUERTAS

Las cargas permanentes distintas del propio peso del tablero son las siguientes:

- Balasto
- Vías y traviesas
- Conductos de cableado y paseos
- Soportes de catenarias
- Impostas y barandillas

El peso de balasto sobre el tablero se calcula a partir de la plataforma en la estructura de vía tomando como densidad $\gamma = 1,6 \text{ t/m}^3$.

Para la plataforma sobre el puente se obtiene $g_{2, \text{ balasto}} = 9,29 \text{ T/m}$.

De acuerdo a las Bases de Cálculo se adoptarán para esta carga los siguientes valores característicos superior e inferior:

valor inferior (0.70 x peso medio) $g_{2, \text{ bal inf}} = 6,50 \text{ T/m de tablero}$
valor superior (1.3 x peso medio) $g_{2, \text{ bal, sup}} = 12,08 \text{ T/m de tablero}$

Se consideran dos hipótesis de desbalastado.

- 50% de una vía en toda su longitud.
- 100% de una vía sobre 15 metros.

El peso de vías y traviesas para la plataforma con doble vía es:

$g_{2, \text{ vías+traviesas}} = 2 \times (0,52 + 0,12) = 2 \times 0,64 = 1,28 \text{ t/ml}$
(trav) + (carril)

El peso de los conductos para cableados y zona de paseos es:

$g_{2, \text{ conductos}} = 0,3 \text{ t/ml}$ (peso de hormigón $\gamma = 2,5 \text{ t/m}^3$) (peso de 1 canaleta)

$q_{\text{ paseos}} = 0,50 \text{ t/m}^2$ (esta carga en paseos se ha tratado como sobrecarga y no como carga permanente pudiendo actuar en las dos zonas extremas de paseo de 1,45 m de ancho).

$q_{\text{conductos + paseos}} = 2 \times (0,30 + 0,50 \times 1,45) = 2,05 \text{ t/m}$

El peso de la imposta y barandilla es:

Se toma $g_{2, \text{ imposta+barandilla}} = 1,08 \text{ T/m}$, de acuerdo a la sección tipo de plataforma.

El peso de los soportes de catenarias se tienen en cuenta sólo para efectos locales de anclaje de la catenaria y armado local de losa, pero no para el cálculo general del tablero.

	g2, medio	g2, inf	g2, sup
	(T/m)	(T/m)	(T/m)
Balasto	9,29	6,50	12,08
Vías y traviesas	1,28	1,28	1,28
Conductos cableado	0,60	0,60	0,60
Imposta y barandillas	1,08	1,08	1,08
TOTAL	12,25 T/m	9,46 T/m	15,04 T/m

Tabla 1. Carga permanente, g2

Coeficiente de envejecimiento para el hormigón a tiempo infinito $\chi = 0.80$

Las acciones indirectas derivadas de las deformaciones impuestas se estiman de acuerdo con la rigidez de los elementos de apoyo. En los aparatos de apoyo tipo POT se considera el efecto de rozamiento de acuerdo con los criterios indicados en el apartado 8 de este anejo.

Acciones permanentes de valor no constante (G*):

PRETENSADO

Las fuerzas del pretensado se calculan para cada fase de construcción de acuerdo con las especificaciones de la normativa vigente para el proyecto con hormigón estructural (EHE).

Para la determinación de las pérdidas de pretensado se han utilizado los siguientes valores de los parámetros de cálculo:

El efecto de la relajación del acero de pretensado a 1000 horas es: $\rho_{1000horas} = 2 \%$ y la relajación a tiempo infinito ($\rho_f = \rho_{1000000horas}$).

Tensión inicial	0.60 fmax	0.70 fmax	0.80 fmax
$\rho_{1000horas} (\%)$	1.0	2.0	5.5
$\rho_f (1000000horas) (\%)$	2.9	5.8	16

ACCIONES REOLÓGICAS.

Las acciones reolológicas se han determinado de acuerdo con las especificaciones de la normativa vigente para hormigón (EHE) diferenciando la retracción y la fluencia del hormigón.

RETRACCIÓN

$\epsilon_{cs}(t,ts)= \epsilon_{cso} \beta_s (t-ts)$
 $\epsilon_{cso} = \beta_{HR} (570-5 fck) 10^{-6}$ (fck en MPa)
 $\beta_{HR} = -1.55 (1-(HR/100)^3)$

$\beta_s = \sqrt{\frac{t - ts}{0.035 e^2 + (t - ts)}}$ $e = \frac{2 Ac}{u}$

- t = edad del hormigón en el instante de evaluación (en días)
- ts = edad del hormigón al comienzo de la retracción (en días)
- εcso = coeficiente básico de retracción
- HR = humedad relativa
- βs = coeficiente que define la evolución de la retracción en el tiempo
- e = espesor medio en mm
- Ac = área de la sección transversal
- u = perímetro en contacto con la atmósfera

Los valores de la sección transversal tipo del tablero son los siguientes:

En la zona de construcción de las estructuras HR= 70 %

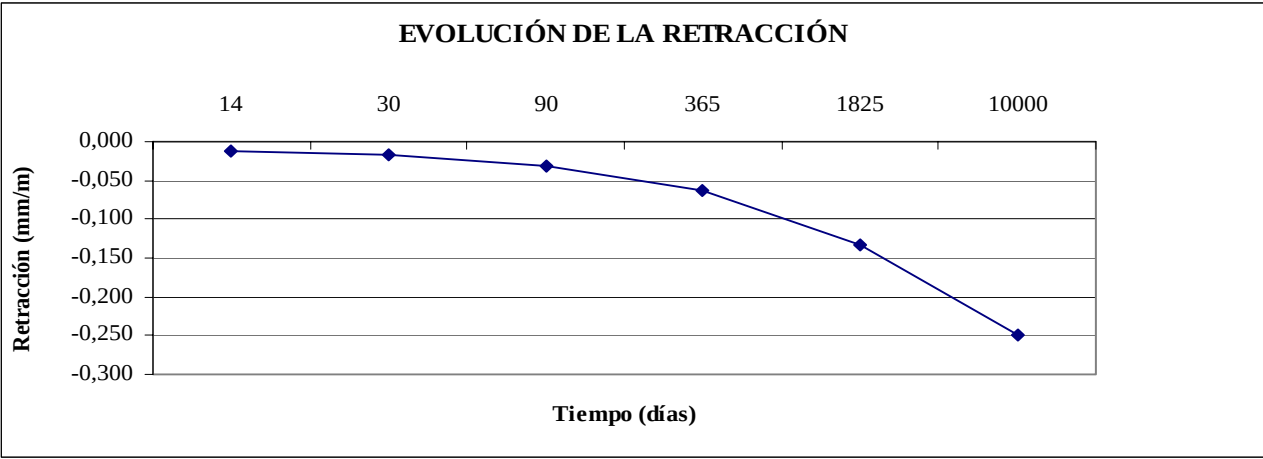
Sección transversal tipo : Ac= 8.66 m² u=28.73m e=603 mm

Cálculo del valor de la retracción en el tablero:

$\beta_{HR}=-1.018$ $\epsilon_{cso}=3.77 \cdot 10^{-4}$ $\beta_s(10.000 \text{ días}) = 0.66$ $\epsilon_{cs}(t,ts)= 2.5 \cdot 10^{-4}$

$\epsilon_c(t, to) = \sigma (to) \left[\frac{1}{Eo , to} + \frac{\varphi (t, to)}{Eo ,28} \right]$

$\varphi(t,to) = \varphi_o \beta_c(t - to)$
 $\varphi_o = \varphi_{HR} \beta(fcm) \beta(to)$
 $\varphi_{HR} = 1 + \frac{100 - HR}{9.9e^{1/3}}$
 $\beta(fcm) = \frac{16.8}{\sqrt{fck + 8}}$
 $\beta_{to} = \frac{1}{0.1 + to^{0.2}}$
 $\beta_c(t - to) = \left[\frac{t - to}{\beta_H + (t - to)} \right]^{0.3}$
 $\beta_H = 1.5e \left[1 + (0.012HR)^{18} \right] + 250 > / 1500$



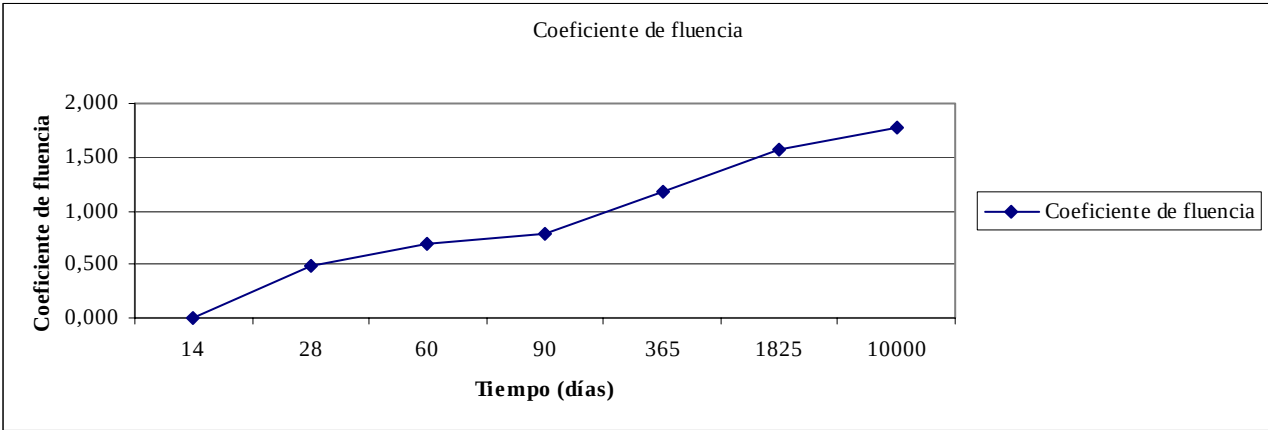
FLUENCIA

σ_c = tensión media en el hormigón aplicada en el tiempo t_0
 E_{o,t_0} = módulo de deformación en el tiempo t_0
 $\varphi(t,t_0)$ = coeficiente de fluencia
 φ_0 = coeficiente básico de fluencia

En el caso del tablero, adoptando un valor de aplicación de la fuerza de postesado $t_0= 14$ días tenemos

un coeficiente de fluencia a tiempo infinito (10000 días) $\varphi_f=1.77$

$\varphi_{HR}=1.36$
 $\beta_H = 1194$ $\beta_{ct}(10000-14)=1.217$ $\beta_{t_0}=0.56$ $\beta(f_{cm})=2.425$
 $\varphi_0=1.835$



ACCIONES DEBIDAS AL TERRENO

Carga sobre zapatas y empuje de las tierras en alzados de estribos y aletas, con una densidad 2,0 T/m³ y un ángulo de rozamiento interno de 30 ° (con presiones horizontales correspondientes a un empuje con coeficiente Ka= 0,33).

ASIENTOS DIFERENCIALES

Al estar cimentada la estructura sobre un terreno granular y mediante cimentación profunda no se prevé la existencia de asientos diferenciales significativos, por lo cual no se han tenido en cuenta en los cálculos.

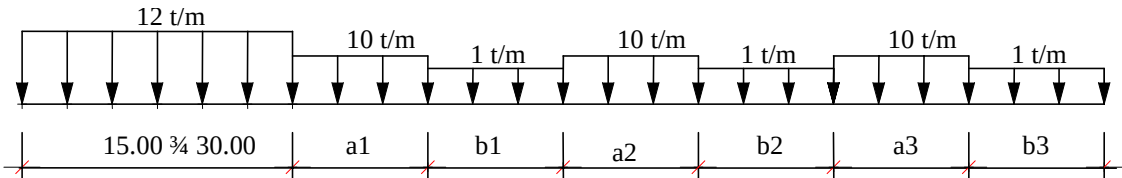
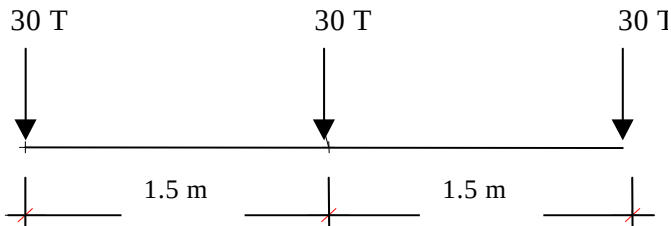
SOBRECARGAS DE USO. COMPONENTES VERTICALES.

En el cálculo de esfuerzos se ha empleado la envolvente de esfuerzos debidos a los trenes de carga de IPF-75 y del Eurocódigo 1 (parte 3, acciones en puentes) EC1-3 tomando como coeficiente de impacto correspondiente en cada caso.

Los coeficientes de impacto no afectan al cálculo de apoyos, pilas y estribos, salvo aquellos casos en que la unión tablero-estructura fuera rígido. Esto conduciría a que el coeficiente de impacto afectaría a la subestructura para las fuerzas de frenado, transmitida al estribo a través del tope rígido longitudinal, y fuerza centrífuga, transmitida a través de apoyos tipo POT guiados. No obstante, la presencia del balasto supone una liberación en la rigidez de la transmisión de las fuerzas horizontales a los apoyos y topes, por lo que no se considera el coeficiente de impacto para estas acciones.

De acuerdo con la normativa IPF-75 Existen dos trenes de carga

Tipo A Por cada vía: Q_A = 3 ejes de 30 T separados 1.50 m



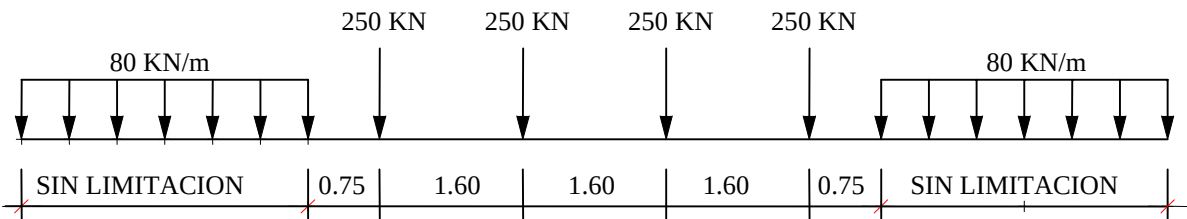
Tipo B Por cada vía: Sobrecarga uniforme de 12 T/m sobre 15 ó 30 metros, más un conjunto de cuchillos de carga de 10 T/m y 1 T/m de longitud arbitraria.

El tren tipo A suele condicionar el trabajo local de reparto de la losa y el tren tipo B condiciona el dimensionamiento general de la mayor parte de los Estados Límites Últimos o de Servicio.

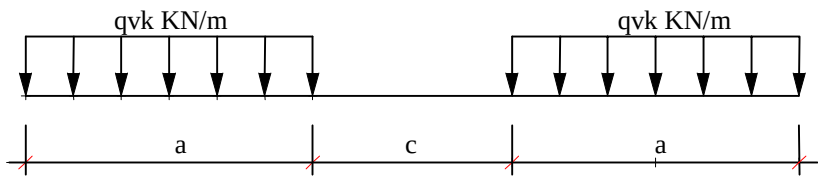
De acuerdo con las especificaciones de la IPF, no se admite reducción de cargas por simultaneidad entre ambas vías. En cualquier caso se debe contemplar la posibilidad de un ripado de la vía respecto al eje teórico de 0.30 m.

El tren de cargas de Eurocódigo 1 (parte 3, acciones en puentes) EC1-3 se define de acuerdo con las configuraciones indicadas en las 2 figuras siguientes. En ambos casos, a efectos de cálculo se contemplará un eventual ripado de la vía de 0.30 m.

Tren tipo 71



Modelo de carga SW



Se considera adicionalmente un tren pesado equivalente al siguiente esquema de cargas (SW/0) ó (SW2) en una de las vías y el tren tipo 71 en la otra vía.

	SW0	SW2
Q _{vk} (kN)	133	150
a (m)	15	25
c (m)	5,3	7

De acuerdo con la IPF-75, para algunas comprobaciones específicas asociadas a combinaciones de carga con viento transversal se considerará un tren sin carga de 12.5 KN/m.

Coefficientes de mayoración por impacto

De acuerdo con la normativa IPF75, se aplica la formulación siguiente:

$$I = 65 \frac{\mu}{1 - \mu + \mu^2}$$

Para una luz de cálculo de valor L= 19,0 m se obtiene: I = 18 %

De acuerdo con el Eurocódigo EC-1, para vías de mantenimiento cuidadoso.

$$\phi_2 = \frac{1,44}{\sqrt{L\phi} - 0,20} + 0,82 = 1,15 \leq 1,17$$

$$L\phi = K * L_m = 20,8 \text{ m}$$

Este valor se debe emplear en el cálculo longitudinal del tablero. Los coeficientes a aplicar en el cálculo local se estudiarán en el apartado correspondiente.

En las zonas del tablero destinadas a mantenimiento (zonas de paseo) se considera una sobrecarga de 0.5 T/m², considerándose concomitante con las sobrecargas ferroviario un 50 % de dicha carga.

SOBRECARGAS DE USO. COMPONENTES HORIZONTALES.

EFFECTO LAZO

En la estructura se considerará una única fuerza transversal concomitante con la sobrecarga vertical para contemplar el efecto lazo. El valor de dicha carga (que no debe ser mayorada con el coeficiente de impacto) es el siguiente:

Según IPF-75 H_T = 5 T para el conjunto de ambas vías, aplicada a cota superior del carril.

Según EC1 H_T = 10,2 T para el conjunto de ambas vías, aplicada a cota superior del carril.

FUERZA CENTRÍFUGA

En puentes de trazado curvo en planta se debe considerar la fuerza centrífuga, cuyo valor se puede obtener mediante la expresión siguiente:

$$\text{IPF 75: } F_c = Q \times \frac{V^2}{127R}$$

El Eurocódigo 1 permite una reducción de la fuerza centrífuga en función de la longitud cargada. Se constata que la IPF-75 da un valor mayor de fuerza centrífuga que el EC1 y por tanto, si el puente es curvo se tomará dicho valor, combinado con el efecto del peralte. Se supondrá la carga actuando 1,80 m por encima del carril.

El puente está ubicado en una clotoide con un radio de curvatura muy alto $R=13\ 000$ a $80\ 000$ m. Para un valor medio del radio de curvatura de $20\ 000$ m obtenemos una fuerza centrífuga de valor $0,22$ T/m.

EFFECTOS DE FRENADO Y ARRANQUE

En el presente proyecto se adoptan las acciones especificadas en el Eurocódigo EC-1 más desfavorables que las propuestas por la IPF-75 (1/8 de la carga frente a 1/4). Esta fuerza se considerará actuando sobre la cota superior del carril y no se multiplica por el coeficiente de impacto.

Fuerzas de arranque (por vía) LM71 y SW

$F_a = 33 \text{ (KN/m)} \times L(\text{m}) \leq 1.000 \text{ KN}$ Se tomará $F_a = 639.90 \text{ KN/vía}$

Fuerzas de frenado (por vía)

$F_f = 20 \text{ (KN/m)} \times L(\text{m}) \leq 6.000 \text{ (KN)}$ LM71 y SW0
 $F_f = 35 \text{ (KN/m)} \times L(\text{m})$ SW2
 $H_f = 0,082 L^{0,9} K^{0,4} = 279 \text{ KN}$

La parte de estas acciones que se transmite al apoyo fijo del tablero puede reducirse debido a la continuidad del carril entre las zonas sobre la estructura y en los accesos. El valor de la fuerza de frenado por vía resulta ser:

Donde:

L es la longitud del puente en metros.
K es la rigidez del estribo por metro de ancho y por vía.

Estos valores se reducirán al 50% si se consideran concomitantes con la fuerza centrífuga.

$H_{Tf} = (0,34 + 0,013k) L_T^{0,9} K^{0,25} = 516 \text{ kN}$
ACCIONES TÉRMICAS VÍA-ESTRUCTURA

La parte de estas acciones que se transmite al apoyo fijo del tablero se calcula como:

Donde:

L_T es la longitud de cálculo a efectos térmicos en metros.
k es la resistencia plástica a rasante en el contacto entre vía y estructura.
K es la rigidez del estribo por metro de ancho y por vía.

EMPUJE SOBRE BARANDILLAS.

En el elemento superior de la barandilla se considera una fuerza horizontal de valor 1.5 kN/m actuando de modo simultáneo con la sobrecarga uniforme.

DESCARRILAMIENTO

El efecto de descarrilamiento se estudiará como una situación accidental, mayorándose las acciones por un coeficiente de seguridad γ_f =1,0 y minorándose los parámetros mecánicos de los materiales por los coeficientes indicados en el apartado 2.2.

Para el estudio del Estado Límite Último de estabilidad se empleará, según el Eurocódigo, una carga vertical de 80 KN/m en una longitud total de 20,00 m a una distancia máxima del eje de la vía de 1,5 veces el ancho.

Para el análisis local de elementos estructurales se tomarán 2 cargas verticales a cada lado del eje de vía de 5 T/m en 6.4 m y separadas entre sí 1.4 m

Acciones climáticas

VIENTO

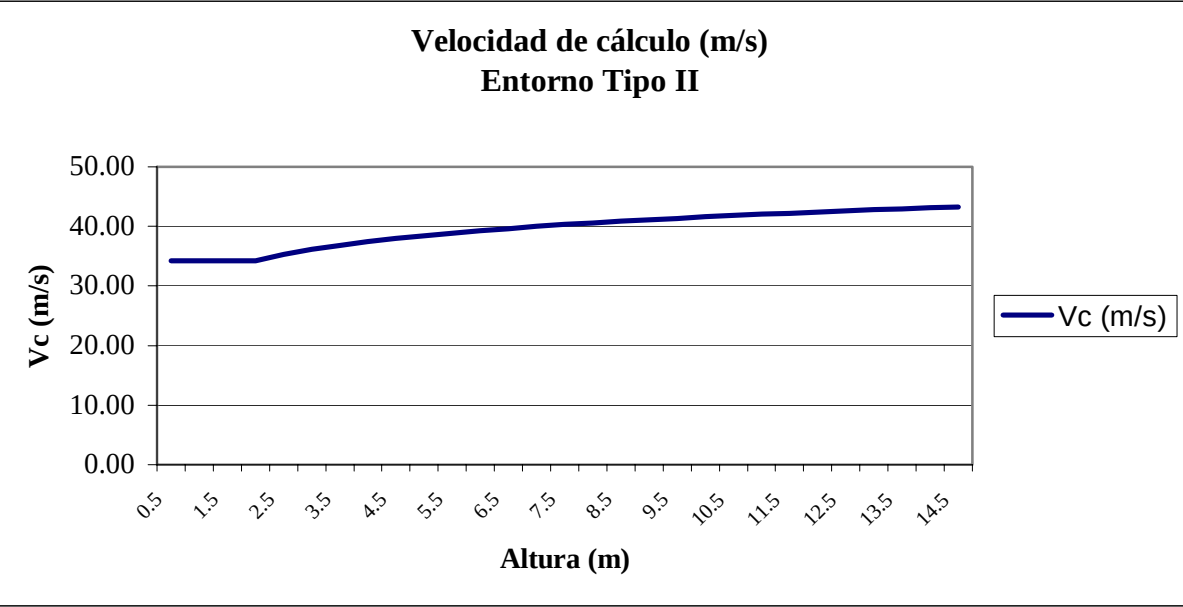
Al estar la estructura ubicada junto a la población de Sant Vicenç dels Horts la velocidad de cálculo se puede determinar a partir de una velocidad de referencia de vref=28 m/s corregida con los siguientes parámetros multiplicadores:

- Ct = factor de topografía
- Cr = factor de riesgo (se toma un periodo de retorno de 100 años)
- Cz = factor de altura (se adopta un entorno Tipo II, zona plana con algunos obstáculos)
- Cg = factor de ráfaga

$$C_z = K_z \ln\left(\frac{z}{z_0}\right) \quad \text{si } z \geq z_{min}$$
$$C_z = K_z \ln\left(\frac{z_{min}}{z_0}\right) \quad \text{si } z \leq z_{min}$$

$$C_g = \sqrt{1 + \frac{7K_z}{C_z C_t}}$$

Vref=28 m/s, Ct=1.0 y Cr=1.04



Para un entorno Tipo II

$K_z = 0.19$ $z_0 = 0.05\text{m}$ $z_{min} = 4\text{ m}$

Para determinar el empuje de viento sobre el tablero, la velocidad de cálculo es:

$V_c = C_t \cdot C_r \cdot C_z \cdot C_g \cdot V_{ref} = 42.5\text{ m/s}$

Esta velocidad de viento da lugar a una presión de 0.147 T/m².

Las situaciones consideradas han sido:

- Puente sin sobrecarga
- Puente con tren en una vía
- Puente con trenes en ambas vías

Se tiene en cuenta en el cálculo del empuje total del viento sobre el tablero los coeficientes de ocultamiento entre zonas expuestas, obteniéndose los siguientes valores:

- Puente sin sobrecarga F = 0.596 T/m
- Puente con tren en una vía F = 0.722 T/m
- Puente con trenes en ambas vías F = 0.743 T/m

Cuando se combina con la sobrecarga se reduce en un 50% esta acción.

NIEVE

Según al IAP se debe aplicar una carga de nieve sobre la superficie de tablero en la que no se considere sobrecarga de uso. Para el cálculo del tablero se considera la posibilidad de tener sobrecarga en toda su superficie, por lo tanto no es necesario aplicar la sobrecarga de nieve.

Acciones Térmicas

VARIACIÓN UNIFORME DE TEMPERATURA

El puente está emplazado en la región climática V (Figura 7 de la IAP)

Por ser una losa aligerada de hormigón, la variación uniforme de temperatura viene dada por:

$$\Delta T = K \cdot z^a \cdot h^b \cdot s^c = 29,13 \cdot 4^{0,301} \cdot 1.2^{-0,148} \cdot 1^0 = 38.07^{\circ} = \pm 19^{\circ} C$$

GRADIENTE TÉRMICO

$$\nabla T_{si,ref} = 12^{\circ} C$$

$$K_1 = 0.80$$

$$K_3 = 1.06$$

$$K_4 = 1.19$$

Vertical positivo $\nabla T_{SI} = (K_1 \cdot K_3 \cdot K_4) \cdot \nabla T_{SI,ref} = 7,30^{\circ} C$

Vertical negativo $\nabla T_{SI} = 0^{\circ} C$ (tablero de hormigón con pavimento bituminoso)

Transversal $\nabla T_T = 2.5^{\circ} C$ si la estructura tiene dirección Este-Oeste (+/- 25 g)

ACCIÓN SÍSMICA

La aceleración sísmica básica de la zona, según la normativa vigente, es $a_b = 0,04 \text{ g}$.

La categoría de la estructura puede considerarse de especial importancia, lo que es equivalente a un factor de nivel de daño $\gamma_1 = 1.3$.

La aceleración de cálculo es: $a_c = \gamma_1 \cdot a_b = 0.052 \text{ g}$

Las acciones sísmicas en puentes sólo se consideran, de acuerdo con la IAP, para aceleraciones de cálculo superiores a 0.06g, por lo tanto no es preciso realizar el análisis sísmico del puente.

2.2 COEFICIENTES DE SEGURIDAD, MATERIALES, NIVELES DE CONTROL Y NORMATIVAS

HORMIGONES

- Hormigón de Limpieza..... HM-15
- Cimentaciones y estribos..... HA-25 / B / 20 / IIa
- Alzados de pilas HA-25 / B / 20 / IIa
- Tablero HP-40 / B / 20 / IIa

Control del hormigón ESTADÍSTICO

γc= 1.50 (Situación persistente o transitoria)
γc= 1.30 (Situación accidental)

El módulo de elasticidad se ha evaluado en todos los casos de acuerdo a la expresión de EHE:

$E_c = 8500 \sqrt[3]{f_{ck} + 8} \text{ (Nw/mm}^2\text{)}$

Los límites establecidos para la consistencia en la puesta en obra podrán superarse con el empleo de aditivos superfluidificantes, siempre que el valor de la relación agua-cemento cumpla los requisitos prefijados en EHE.

ACEROS

- Acero corrugado para la armadura pasiva B500S, con f_{yk} > 500 MPa (5100 Kp/cm²)
- Acero de pretensado tipo 170/190 con tendones de 0,6 " (Y 1860 S7 15.2).

Control de los aceros NORMAL

γs= 1.15 (Situación persistente o transitoria)
γs= 1.0 (Situación accidental)

CONTROL DE EJECUCIÓN

El control de ejecución será INTENSO (γ_g= 1.35 y γ_{tq}= 1.5) en tablero y estribos de acuerdo con las especificaciones de la normativa EHE.

NORMAS UTILIZADAS

Para el establecimiento de acciones y las combinaciones necesarias para la obtención de las solicitaciones de cálculo que se emplearán en la comprobación de los diferentes Estados Límite se realizarán los cálculos empleando la normativa IPF-75 y los criterios especificados en los Eurocódigos, adoptándose el más desfavorable de ambos.

Cálculo según IPF-75

Para el cálculo de las acciones se utilizarán las siguientes instrucciones.

- Instrucción relativa a las acciones a considerar en el Proyecto de Puentes de Ferrocarril", correspondiente a la O.M. 25 de Junio de 1.975 (IPF-75).
- Norma de construcción Sismorresistente: Parte general y edificación (NCSE-94)” R.D. 29 de Diciembre de 1.994.

Para el cálculo de las acciones ambientales se utilizará la siguiente instrucción.

- Instrucción relativa a las acciones a considerar en el proyecto de Puentes de Carreteras I.A.P. 12 de Febrero de 1998.

Para establecer las hipótesis y combinaciones de cálculo y sus correspondientes coeficientes de ponderación se utilizarán las siguientes Instrucciones:

- Instrucción de Hormigón Estructural (EHE) R.D. 2661/1998 de 11 de Diciembre.

Cálculo según Eurocódigos y EHE

- Eurocódigo 1: *Bases de proyecto y acciones. Parte 3. Cargas de tráfico en puentes.* UNE-ENV 1991-3. Octubre 1997. (EC1.1.3.)

Para establecer las hipótesis y combinaciones de cálculo y sus correspondientes coeficientes de ponderación se utilizarán las siguientes Instrucciones:

- Eurocódigo 1: *Bases de proyecto y acciones en estructuras. Parte 1; Bases de proyecto.* UNE-ENV 1991-1, Octubre 1997 (EC1.1)

Para dimensionamiento y comprobación de secciones se actuará, en todo momento, de acuerdo con la normativa española;

- Instrucción de Hormigón Estructural EHE. R.D. 2661/1998 de 11 de Diciembre

El estudio de la fatiga de los materiales se hará de acuerdo con la siguiente norma:

- Eurocódigo 2: *Proyecto de estructuras de hormigón. Parte 2: Puentes de hormigón.* ENV 1992.2: Septiembre 1996. (EC2.2).

La comprobación de flechas, deformaciones y vibraciones se hará de acuerdo con la norma:

- Eurocódigo 1: *Bases de proyecto y acciones en estructuras. Parte 3: Cargas de tráfico en puentes* UNE-ENV 1991-3. Octubre 1997. (EC1.1.3).

Para el análisis de la interacción vía-estructura se empleará la siguiente norma:

- Norma U.I.C. Ficha 774.3 R. 1ª edición. Febrero 1999 (U.I.C. 774.3).

Subsidiariamente, y en lo no contemplado en las normas anteriores se emplearán las siguientes:

- Norma UIC. Ficha 776.1. 3ª edición. 1 de Julio de 1.979. (U.I.C. 776.1)
- Norma UIC. Ficha 774-2. 1ª Edición. 1 de Julio de 1.974. (U.I.C. 774.2)
- Norma UIC. Ficha 702.0. 2ª Edición. 1 de Enero de 1.974. (U.I.C. 702.0)

2.3 AMBIENTES, RECUBRIMIENTOS, FISURACIÓN Y CUANTÍAS MÍNIMAS

De acuerdo con la normativa EHE se consideran los ambientes indicados en la tabla siguiente.

Elemento	Ambiente	Recubrimiento de Armadura pasiva (mm)	Límite de abertura de fisura Wmax (mm)	
			Hormigón armado	Hormigón postesado
Tablero	Iia	35	-	Descompresion bajo comb. cuasipermanente
Alzados de pilas y estribos	Iia	30	0.2	-

Cimentaciones	Iia	30	0.1	-
Pilotes/Pantallas	Iia	75	0.1	-

Para las armaduras postesas el recubrimiento es el máximo de los siguientes valores: 4 cm o el diámetro de la vaina.

Las cuantías mínimas de armadura pasiva B500S serán las expuestas en la siguiente tabla (EHE, art. 4.3.5)

Elemento	Posición	Tipo	Cuantía geométrica o/oo
Zapatas	cara superior o inferior	transversal o longitudinal	0.90
Pilotes	vertical	-	4.0
Pilas	vertical	-	4.0
Alzados de estribos y aletas (1)	horizontal	lado tierras	1.07
		lado visto	2.13
	vertical	lado tierras	0.90
		lado visto	0.30
Tablero	cara superior o inferior	transversal o longitudinal	0.90

(1) las cuantías geométricas horizontales se pueden reducir un 50 % si se colocan juntas de contracción distanciadas menos de 7,5 m.

2.4 HIPÓTESIS DE COMBINACIÓN DE ESFUERZOS

Se han considerado las combinaciones de hipótesis de las acciones recogidas en la Normativas IAP y EHE, basados en la teoría de Estados Límites, para las distintas situaciones de cálculo de la estructura.

2.4.1 ESTADOS LÍMITES ÚLTIMOS

Las hipótesis de cálculo consideradas son:

- Situaciones persistentes o transitorias

$$\sum_{j \geq 1} \gamma_{Gj} G_{kj} + \sum \gamma_{Gj} G^*_{kj} + \gamma_{Q1} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{0i} Q_{ki}$$

- Situaciones accidentales

$$\sum_{j \geq 1} \gamma_{Gaj} G_{kj} + \sum \gamma_{Gj} G^*_{kj} + \gamma_A A_k + \Psi_{11} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

- Situaciones accidentales de sismo

$$\sum_{j \geq 1} G_{kj} + \sum \gamma_{Gj} G^*_{kj} + \gamma_i A_{Ed} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

donde:

- G = Valor característico de las cargas permanentes.
- G* = Valor característico de las cargas permanentes de valor no constante.
- Q_{k1} = Valor característico de la carga variable dominante.
- A_k = Valor característico de la acción accidental
- A_{eq} = Valor característico de la acción sísmica, calculado según la Norma Sismorresistente.

Los coeficientes de seguridad y de combinación de acciones empleados se definen en la EHE para control de ejecución intenso.

2.4.2 ESTADOS LÍMITES DE SERVICIO

Las hipótesis de cálculo consideradas son:

- Combinación característica

$$\sum_{j \geq 1} \gamma_{Gj} G_{kj} + \sum \gamma_{Gj} G^*_{kj} + \gamma_{Q1} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{0i} Q_{ki}$$

- Combinación frecuente

$$\sum_{j \geq 1} \gamma_{Gaj} G_{kj} + \sum \gamma_{Gj} G^*_{kj} + \Psi_{11} Q_{k1} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

- Combinación casi permanente

$$\sum_{j \geq 1} G_{kj} + \sum \gamma_{Gj} G^*_{kj} + \sum_{i > 1} \gamma_{Qi} \Psi_{2i} Q_{ki}$$

3 CÁLCULO ESTRUCTURAL DEL TABLERO

3.1 CÁLCULO ESTRUCTURAL CON MODELO DE VIGA CONTINUA

3.1.1 DISCRETIZACIÓN Y CARACTERÍSTICAS MECÁNICAS

Se modela el tablero mediante un emparrillado plano constituido por dos nervios longitudinales, coincidente con los ejes de viga en planta, con 3 grados de libertad por nudo (desplazamiento vertical, giro de flexión longitudinal de la barra y giro a torsión). Los nervios longitudinales se han dividido para cada uno de los vanos del tablero en 20 barras de igual longitud asignando las características mecánicas en cada uno de los extremos de la barra. Las propiedades mecánicas de la barra se obtienen como media de las características de sus secciones extremas. En la zona de estribos se ha simulado la riostra de apoyo mediante 2 barras transversales, una a cada lado del nervio longitudinal, con su extremo final coincidente con la posición real de los apoyos de neopreno. En las barras transversales de las riostras de apoyo se ha despreciado su rigidez a torsión. En los apoyos se han prescrito únicamente los movimientos verticales del nudo.

La numeración de nudos y barras es correlativa, tomando como origen el extremo izquierdo del nervio longitudinal, en último lugar se numeran las barras y nudos que permiten simular las riostras de apoyo en los dos estribos. La discretización adoptada aparece en las hojas y esquemas adjuntos.

En los listados aparece la siguiente información:

1. Datos generales.
2. Discretización: numeración de barras y nudos, coordenadas de los nudos condiciones de vinculación.
3. Cargas en los nudos para cada hipótesis de carga.
4. Reacciones para cada hipótesis de carga.
5. Esfuerzos en extremo de barra para cada hipótesis de carga.

3.1.2 CÁLCULO DE ESFUERZOS LONGITUDINALES

El cálculo de esfuerzos longitudinales con el modelo de análisis estructural expuesto se detalla a continuación.

La notación adoptada para cada una de las hipótesis de carga es la siguiente:

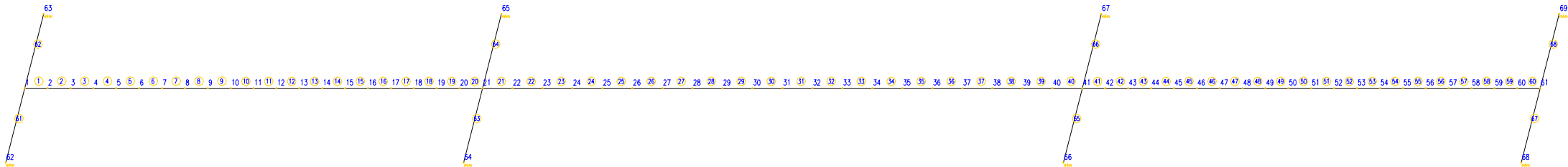
- **g₁** Peso propio de la estructura.
- **g₂** Carga permanente.
- **q** Sobrecarga uniforme de ferrocarril.
- **ΔT** Gradiente de temperatura.
- **P_{ii}** Pretensado inicial de descimbrado (pretensado parcial con pérdidas iniciales).
- **P_i** Pretensado inicial (con pérdidas iniciales).
- **P_∞** Pretensado final (con pérdidas iniciales y diferidas).

**CÁLCULO ESTRUCTURAL DEL TABLERO CON MODELO DE
EMPARRILLADO**

MODELO DE CALCULO

② Numeración de barras

J Numeración de nudos



PEDELTA, S.L.- INGENIERIA DE ESTRUCTURAS, BARCELONA

Vinf (m) = 0.69200

Referencia del Proyecto:

Paso Inferior Riera de Torrelles

DATOS GENERALES DEL EMPARRILLADO

No. de Barras = 68
No. de Nudos = 69
No. de Nudos con condiciones impuestas = 8
No. de Materiales = 3
No. de Hipotesis de carga = 1

Propiedades de barras =1, de secciones =0

TIPO DE PROPIEDADES = 0

PROPIEDADES DE LOS MATERIALES

MATERIAL/SECCION	3		
Inercia a Flexion	(m4)	=	1.0000000
Modulo de Torsion	(m4)	=	0.0000100
Area a Cortante	(m2)	=	0.0000000
Modulo de elasticidad (T/m2)		=	2850000.00
Coeficiente de Poisson		=	0.16
Canto (m)		=	1.10000
Vsup (m)		=	0.55000
Vinf (m)		=	0.55000

PROPIEDADES DE LOS MATERIALES

MATERIAL/SECCION 1

Inercia a Flexion (m4) = 1.1212699
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Coeficiente de Poisson = 0.16
Canto (m) = 1.24000
Vsup (m) = 0.51700
Vinf (m) = 0.72300

MATERIAL/SECCION 2

Inercia a Flexion (m4) = 1.2274500
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Coeficiente de Poisson = 0.16
Canto (m) = 1.24000
Vsup (m) = 0.54800

DISCRETIZACION. DATOS DE LAS BARRAS
=====

Barra	Nudo 1	Nudo 2	No.de Secc Nud.1 Nud.2	No. MAT	
=====					
1	1	2	2	2	1
2	2	3	2	2	1
3	3	4	1	1	2
4	4	5	1	1	2
5	5	6	1	1	2
6	6	7	1	1	2
7	7	8	1	1	2
8	8	9	1	1	2
9	9	10	1	1	2
10	10	11	1	1	2
11	11	12	1	1	2
12	12	13	1	1	2
13	13	14	1	1	2
14	14	15	1	1	2
15	15	16	1	1	2
16	16	17	1	1	2
17	17	18	1	1	2
18	18	19	1	1	2
19	19	20	2	2	1
20	20	21	2	2	1
21	21	22	2	2	1
22	22	23	2	1	3
23	23	24	1	1	2
24	24	25	1	1	2
25	25	26	1	1	2
26	26	27	1	1	2
27	27	28	1	1	2
28	28	29	1	1	2
29	29	30	1	1	2
30	30	31	1	1	2
31	31	32	1	1	2
32	32	33	1	1	2
33	33	34	1	1	2
34	34	35	1	1	2
35	35	36	1	1	2
36	36	37	1	1	2
37	37	38	1	1	2
38	38	39	1	1	2
39	39	40	1	2	3
40	40	41	2	2	1
41	41	42	2	2	1
42	42	43	2	2	1
43	43	44	1	1	2
44	44	45	1	1	2
45	45	46	1	1	2
46	46	47	1	1	2
47	47	48	1	1	2

DISCRETIZACION. DATOS DE LAS BARRAS
=====

Barra	Nudo 1	Nudo 2	No.de Secc Nud.1 Nud.2	No. MAT	
=====					
48	48	49	1	1	2
49	49	50	1	1	2
50	50	51	1	1	2
51	51	52	1	1	2
52	52	53	1	1	2
53	53	54	1	1	2
54	54	55	1	1	2
55	55	56	1	1	2
56	56	57	1	1	2
57	57	58	1	1	2
58	58	59	1	1	2
59	59	60	2	2	1
60	60	61	2	2	1
61	1	62	3	3	4
62	1	63	3	3	4
63	21	64	3	3	4
64	21	65	3	3	4
65	41	66	3	3	4
66	41	67	3	3	4
67	61	68	3	3	4
68	61	69	3	3	4

PROPIEDADES DE LAS BARRAS
=====

MATERIAL 1

Inercia a Flexion (m4) = 1.2274500
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.24000
Vsup (m) = 0.54800
Vinf (m) = 0.69200

MATERIAL 2

Inercia a Flexion (m4) = 1.1212699
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.24000
Vsup (m) = 0.51700
Vinf (m) = 0.72300

MATERIAL 3

Inercia a Flexion (m4) = 1.1743600
Modulo de Torsion (m4) = 2.2570000
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.24000
Vsup (m) = 0.53250
Vinf (m) = 0.70750

MATERIAL 4

Inercia a Flexion (m4) = 1.0000000
Modulo de Torsion (m4) = 0.0000100
Area a Cortante (m2) = 0.0000000
Modulo de elasticidad (T/m2) = 2850000.00
Modulo de deformacion G (T/m2) = 1653000.00
Canto (m) = 1.10000
Vsup (m) = 0.55000
Vinf (m) = 0.55000

COORDENADAS DE LOS NUDOS

Nudo	X	Y
1	0.000	0.000
2	0.725	0.000
3	1.450	0.000
4	2.175	0.000
5	2.900	0.000
6	3.625	0.000
7	4.350	0.000
8	5.075	0.000
9	5.800	0.000
10	6.525	0.000
11	7.250	0.000
12	7.975	0.000
13	8.700	0.000
14	9.425	0.000
15	10.150	0.000
16	10.875	0.000
17	11.600	0.000
18	12.325	0.000
19	13.050	0.000
20	13.775	0.000
21	14.500	0.000
22	15.225	0.000
23	16.000	0.000
24	16.750	0.000
25	17.500	0.000
26	18.250	0.000
27	19.000	0.000
28	19.750	0.000
29	20.500	0.000
30	21.250	0.000
31	22.000	0.000
32	22.750	0.000
33	23.500	0.000
34	24.250	0.000
35	25.000	0.000
36	25.750	0.000
37	26.500	0.000
38	27.250	0.000
39	28.000	0.000
40	28.750	0.000
41	29.500	0.000
42	30.250	0.000
43	31.000	0.000
44	31.750	0.000

45	36.400	0.000
46	37.125	0.000
47	37.850	0.000
48	38.575	0.000

COORDENADAS DE LOS NUDOS		
=====		
Nudo	X	Y
=====		
49	39.300	0.000
50	40.025	0.000
51	40.750	0.000
52	41.475	0.000
53	42.200	0.000
54	42.925	0.000
55	43.650	0.000
56	44.375	0.000
57	45.100	0.000
58	45.825	0.000
59	46.550	0.000
60	47.275	0.000
61	48.000	0.000
62	-0.600	-2.350
63	0.600	2.350º
64	13.900	-2.350
65	15.100	2.350
66	32.900	-2.350
67	34.100	2.350
68	47.400	-2.350
69	48.600	2.350

CONDICIONES DE VINCULACION				
=====				
Nudo	Codigo	RX	RZ	RY
=====				
62	0 1 0	0.000	0.000	0.000
63	0 1 0	0.000	0.000	0.000
64	0 1 0	0.000	0.000	0.000
65	0 1 0	0.000	0.000	0.000
66	0 1 0	0.000	0.000	0.000
67	0 1 0	0.000	0.000	0.000
68	0 1 0	0.000	0.000	0.000
69	0 1 0	0.000	0.000	0.000

Ancho de banda = 189

HIPOTESIS 1 PESO PROPIO

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	62.26733	0.00000
63	0.00000	70.32077	0.00000
64	0.00000	213.22035	0.00000
65	0.00000	209.39070	0.00000
66	0.00000	209.34145	0.00000
67	0.00000	213.15686	0.00000
68	0.00000	70.28559	0.00000
69	0.00000	62.24726	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 1110.230
Suma Momentos Torsores = 0.000

HIPOTESIS 1 PESO PROPIO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-4.83	120.46	18.93	-75.55	-101.27	-18.93
2	75.55	101.26	18.93	-142.01	-82.07	-18.93
3	142.01	82.07	18.93	-195.82	-66.36	-18.93
4	195.82	66.37	18.93	-238.25	-50.66	-18.93
5	238.25	50.66	18.93	-269.28	-34.96	-18.93
6	269.28	34.98	18.93	-288.94	-19.27	-18.93
7	288.93	19.24	18.93	-297.19	-3.54	-18.93
8	297.20	3.52	18.93	-294.05	12.19	-18.93
9	294.06	-12.17	18.93	-279.55	27.87	-18.93
10	279.55	-27.89	18.93	-253.64	43.60	-18.93
11	253.65	-43.60	18.93	-216.35	59.31	-18.93
12	216.35	-59.33	18.93	-167.64	75.04	-18.93
13	167.64	-75.00	18.93	-107.57	90.70	-18.93
14	107.57	-90.72	18.93	-36.11	106.43	-18.93
15	36.11	-106.44	18.93	46.75	122.14	-18.93
16	-46.75	-122.14	18.93	141.00	137.85	-18.93
17	-140.99	-137.85	18.93	246.63	153.56	-18.93
18	-246.63	-153.56	18.93	363.66	169.27	-18.93
19	-363.66	-169.27	18.93	493.33	188.47	-18.93
20	-493.34	-188.46	18.93	636.93	207.66	-18.93
21	-634.63	214.95	9.92	442.37	-189.80	-9.92

22	-442.37	189.80	9.92	274.01	-164.65	-9.92
23	-274.00	164.64	9.92	127.37	-144.06	-9.92
24	-127.37	144.06	9.92	0.29	-123.48	-9.92

HIPOTESIS 1 PESO PROPIO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	-0.29	123.48	9.92	-107.25	-102.90	-9.92
26	107.25	102.92	9.92	-195.23	-82.34	-9.92
27	195.23	82.33	9.92	-263.65	-61.75	-9.92
28	263.65	61.74	9.92	-312.52	-41.16	-9.92
29	312.52	41.18	9.92	-341.87	-20.60	-9.92
30	341.87	20.58	9.92	-351.65	0.00	-9.92
31	351.65	0.01	9.92	-341.88	20.57	-9.92
32	341.88	-20.54	9.92	-312.59	41.12	-9.92
33	312.59	-41.12	9.92	-263.74	61.70	-9.92
34	263.74	-61.72	9.92	-195.33	82.30	-9.92
35	195.33	-82.31	9.92	-107.36	102.89	-9.92
36	107.37	-102.88	9.92	0.15	123.46	-9.92
37	-0.15	-123.48	9.92	127.22	144.06	-9.92
38	-127.22	-144.05	9.92	273.85	164.63	-9.92
39	-273.85	-164.63	9.92	442.19	189.78	-9.92
40	-442.19	-189.78	9.92	634.43	214.93	-9.92
41	-636.72	207.57	18.89	493.19	-188.38	-18.89
42	-493.20	188.38	18.89	363.58	-169.18	-18.89
43	-363.58	169.17	18.89	246.62	-153.47	-18.89
44	-246.62	153.48	18.89	141.04	-137.77	-18.89
45	-141.04	137.78	18.89	46.85	-122.07	-18.89
46	-46.85	122.07	18.89	-35.95	-106.37	-18.89
47	35.95	106.38	18.89	-107.37	-90.67	-18.89
48	107.37	90.69	18.89	-167.43	-74.99	-18.89
49	167.42	74.99	18.89	-216.10	-59.28	-18.89
50	216.08	59.31	18.89	-253.39	-43.61	-18.89
51	253.37	43.62	18.89	-279.30	-27.91	-18.89
52	279.27	27.90	18.89	-293.81	-12.19	-18.89
53	293.80	12.21	18.89	-296.95	3.50	-18.89
54	296.95	-3.52	18.89	-288.70	19.23	-18.89
55	288.72	-19.21	18.89	-269.10	34.92	-18.89
56	269.10	-34.92	18.89	-238.10	50.62	-18.89
57	238.09	-50.61	18.89	-195.71	66.32	-18.89
58	195.71	-66.32	18.89	-141.93	82.03	-18.89
59	141.94	-82.02	18.89	-75.52	101.21	-18.89
60	75.51	-101.21	18.89	4.82	120.40	-18.89
61	143.67	-56.20	0.00	0.00	62.27	0.00
62	163.20	-64.26	0.00	0.00	70.32	0.00
63	517.14	-213.22	0.00	0.00	213.22	0.00
64	507.85	-209.39	0.00	0.00	209.39	0.00
65	507.73	-209.34	0.00	0.00	209.34	0.00

66	516.99	-213.16	0.00	0.00	213.16	0.00
67	163.12	-64.22	0.00	0.00	70.29	0.00
68	143.62	-56.18	0.00	0.00	62.25	0.00

HIPOTESIS 1 CARGA PERMANENTE

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	36.81569	0.00000
63	0.00000	42.33951	0.00000
64	0.00000	142.22897	0.00000
65	0.00000	139.60217	0.00000
66	0.00000	139.56870	0.00000
67	0.00000	142.18568	0.00000
68	0.00000	42.31549	0.00000
69	0.00000	36.80199	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 721.858
Suma Momentos Torsores = 0.000

HIPOTESIS 1 CARGA PERMANENTE

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-3.31	79.15	12.98	-50.12	-68.25	-12.98
2	50.12	68.25	12.98	-95.65	-57.35	-12.98
3	95.65	57.35	12.98	-133.28	-46.44	-12.98
4	133.28	46.45	12.98	-163.00	-35.54	-12.98
5	163.00	35.53	12.98	-184.81	-24.63	-12.98
6	184.82	24.64	12.98	-198.73	-13.73	-12.98
7	198.72	13.74	12.98	-204.73	-2.84	-12.98
8	204.72	2.83	12.98	-202.83	8.07	-12.98
9	202.83	-8.07	12.98	-193.02	18.98	-12.98
10	193.02	-18.99	12.98	-175.30	29.89	-12.98
11	175.31	-29.89	12.98	-149.68	40.80	-12.98
12	149.68	-40.81	12.98	-116.14	51.71	-12.98
13	116.14	-51.71	12.98	-74.70	62.61	-12.98
14	74.70	-62.62	12.98	-25.35	73.52	-12.98
15	25.36	-73.53	12.98	31.90	84.43	-12.98
16	-31.90	-84.43	12.98	97.06	95.33	-12.98
17	-97.06	-95.33	12.98	170.13	106.24	-12.98
18	-170.13	-106.24	12.98	251.10	117.14	-12.98
19	-251.10	-117.14	12.98	339.98	128.04	-12.98
20	-339.99	-128.04	12.98	436.77	138.95	-12.98
21	-435.19	142.88	6.81	306.24	-128.59	-6.81

22	-306.24	128.59	6.81	190.86	-114.31	-6.81
23	-190.87	114.30	6.81	89.06	-100.02	-6.81
24	-89.06	100.01	6.81	0.84	-85.72	-6.81

HIPOTESIS 1 CARGA PERMANENTE

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	-0.84	85.73	6.81	-73.82	-71.44	-6.81
26	73.82	71.43	6.81	-134.89	-57.15	-6.81
27	134.90	57.14	6.81	-182.40	-42.86	-6.81
28	182.39	42.88	6.81	-216.33	-28.59	-6.81
29	216.33	28.59	6.81	-236.70	-14.30	-6.81
30	236.70	14.28	6.81	-243.49	0.01	-6.81
31	243.49	0.00	6.81	-236.71	14.29	-6.81
32	236.71	-14.27	6.81	-216.36	28.56	-6.81
33	216.37	-28.55	6.81	-182.46	42.84	-6.81
34	182.46	-42.86	6.81	-134.96	57.14	-6.81
35	134.96	-57.13	6.81	-73.90	71.42	-6.81
36	73.90	-71.43	6.81	0.75	85.72	-6.81
37	-0.75	-85.72	6.81	88.96	100.01	-6.81
38	-88.96	-100.01	6.81	190.76	114.29	-6.81
39	-190.76	-114.29	6.81	306.12	128.58	-6.81
40	-306.12	-128.58	6.81	435.06	142.87	-6.81
41	-436.63	138.89	12.96	339.89	-127.98	-12.96
42	-339.89	127.99	12.96	251.05	-117.08	-12.96
43	-251.05	117.08	12.96	170.12	-106.18	-12.96
44	-170.12	106.18	12.96	97.09	-95.27	-12.96
45	-97.09	95.27	12.96	31.97	-84.37	-12.96
46	-31.97	84.37	12.96	-25.25	-73.47	-12.96
47	25.25	73.46	12.96	-74.56	-62.56	-12.96
48	74.57	62.58	12.96	-115.98	-51.68	-12.96
49	115.99	51.67	12.96	-149.50	-40.77	-12.96
50	149.51	40.78	12.96	-175.12	-29.87	-12.96
51	175.11	29.90	12.96	-192.84	-19.00	-12.96
52	192.84	18.97	12.96	-202.64	-8.07	-12.96
53	202.65	8.09	12.96	-204.56	2.82	-12.96
54	204.56	-2.80	12.96	-198.58	13.70	-12.96
55	198.58	-13.71	12.96	-184.69	24.61	-12.96
56	184.69	-24.60	12.96	-162.90	35.51	-12.96
57	162.90	-35.51	12.96	-133.20	46.42	-12.96
58	133.20	-46.40	12.96	-95.61	57.31	-12.96
59	95.60	-57.31	12.96	-50.10	68.21	-12.96
60	50.10	-68.21	12.96	3.31	79.12	-12.96
61	89.29	-36.82	0.00	0.00	36.82	0.00
62	102.69	-42.34	0.00	0.00	42.34	0.00
63	344.96	-142.23	0.00	0.00	142.23	0.00
64	338.59	-139.60	0.00	0.00	139.60	0.00
65	338.51	-139.57	0.00	0.00	139.57	0.00

66	344.86	-142.19	0.00	0.00	142.19	0.00
67	102.63	-42.32	0.00	0.00	42.32	0.00
68	89.26	-36.80	0.00	0.00	36.80	0.00

HIPOTESIS 1 GRADIENTE TERMICO, AT= 8 C

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	13.09889	0.00000
63	0.00000	3.65886	0.00000
64	0.00000	-14.74649	0.00000
65	0.00000	-2.03953	0.00000
66	0.00000	-2.00702	0.00000
67	0.00000	-14.70539	0.00000
68	0.00000	3.67987	0.00000
69	0.00000	13.11114	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 0.050
Suma Momentos Torsores = 0.000

HIPOTESIS 1 GRADIENTE TERMICO, AT= 8 C

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	5.66	16.76	-22.18	-17.81	-16.76	22.18
2	17.81	16.76	-22.18	-29.96	-16.76	22.18
3	29.95	16.76	-22.18	-42.10	-16.76	22.18
4	42.10	16.75	-22.18	-54.25	-16.75	22.18
5	54.25	16.75	-22.18	-66.39	-16.75	22.18
6	66.40	16.74	-22.18	-78.53	-16.74	22.18
7	78.54	16.75	-22.18	-90.69	-16.75	22.18
8	90.69	16.76	-22.18	-102.84	-16.76	22.18
9	102.83	16.77	-22.18	-114.99	-16.77	22.18
10	114.98	16.77	-22.18	-127.13	-16.77	22.18
11	127.13	16.76	-22.18	-139.28	-16.76	22.18
12	139.28	16.77	-22.18	-151.45	-16.77	22.18
13	151.44	16.76	-22.18	-163.60	-16.76	22.18
14	163.60	16.77	-22.18	-175.75	-16.77	22.18
15	175.75	16.78	-22.18	-187.91	-16.78	22.18
16	187.91	16.77	-22.18	-200.07	-16.77	22.18
17	200.07	16.78	-22.18	-212.24	-16.78	22.18
18	212.24	16.78	-22.18	-224.40	-16.78	22.18
19	224.40	16.78	-22.18	-236.57	-16.78	22.18
20	236.57	16.77	-22.18	-248.73	-16.77	22.18
21	241.11	-0.01	7.68	-241.10	0.01	-7.68

22	241.10	-0.01	7.68	-241.09	0.01	-7.68
23	241.09	-0.01	7.68	-241.09	0.01	-7.68
24	241.09	-0.01	7.68	-241.08	0.01	-7.68

HIPOTESIS 1 GRADIENTE TERMICO, AT= 8 C

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	241.08	-0.01	7.68	-241.07	0.01	-7.68
26	241.07	-0.01	7.68	-241.06	0.01	-7.68
27	241.06	-0.01	7.68	-241.06	0.01	-7.68
28	241.06	-0.01	7.68	-241.05	0.01	-7.68
29	241.05	-0.01	7.68	-241.04	0.01	-7.68
30	241.04	-0.01	7.68	-241.04	0.01	-7.68
31	241.04	-0.01	7.68	-241.03	0.01	-7.68
32	241.03	0.00	7.68	-241.03	0.00	-7.68
33	241.03	-0.01	7.68	-241.02	0.01	-7.68
34	241.02	0.00	7.68	-241.02	0.00	-7.68
35	241.02	-0.01	7.68	-241.01	0.01	-7.68
36	241.01	-0.01	7.68	-241.01	0.01	-7.68
37	241.01	-0.01	7.68	-241.00	0.01	-7.68
38	241.00	-0.01	7.68	-240.99	0.01	-7.68
39	240.99	-0.01	7.68	-240.99	0.01	-7.68
40	240.99	-0.01	7.68	-240.98	0.01	-7.68
41	248.60	-16.72	-22.16	-236.48	16.72	22.16
42	236.48	-16.72	-22.16	-224.36	16.72	22.16
43	224.35	-16.72	-22.16	-212.23	16.72	22.16
44	212.23	-16.73	-22.16	-200.10	16.73	22.16
45	200.10	-16.72	-22.16	-187.98	16.72	22.16
46	187.97	-16.72	-22.16	-175.85	16.72	22.16
47	175.85	-16.73	-22.16	-163.72	16.73	22.16
48	163.71	-16.74	-22.16	-151.58	16.74	22.16
49	151.58	-16.74	-22.16	-139.44	16.74	22.16
50	139.44	-16.76	-22.16	-127.29	16.76	22.16
51	127.29	-16.75	-22.16	-115.15	16.75	22.16
52	115.14	-16.76	-22.16	-102.99	16.76	22.16
53	103.00	-16.78	-22.16	-90.83	16.78	22.16
54	90.83	-16.77	-22.16	-78.67	16.77	22.16
55	78.67	-16.78	-22.16	-66.50	16.78	22.16
56	66.50	-16.76	-22.16	-54.34	16.76	22.16
57	54.34	-16.79	-22.16	-42.17	16.79	22.16
58	42.17	-16.78	-22.16	-30.00	16.78	22.16
59	30.00	-16.79	-22.16	-17.83	16.79	22.16
60	17.83	-16.79	-22.16	-5.66	16.79	22.16
61	31.77	-13.10	0.00	0.00	13.10	0.00
62	8.87	-3.66	0.00	0.00	3.66	0.00
63	-35.77	14.75	0.00	0.00	-14.75	0.00
64	-4.95	2.04	0.00	0.00	-2.04	0.00
65	-4.87	2.01	0.00	0.00	-2.01	0.00
66	-35.67	14.71	0.00	0.00	-14.71	0.00

67	8.92	-3.68	0.00	0.00	3.68	0.00
68	31.80	-13.11	0.00	0.00	13.11	0.00

HIPOTESIS 1 PRETENSADO: PRIMER TESADO

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	43.78411	0.00000
63	0.00000	21.82740	0.00000
64	0.00000	-41.02703	0.00000
65	0.00000	-24.27980	0.00000
66	0.00000	-24.98618	0.00000
67	0.00000	-41.36550	0.00000
68	0.00000	22.30260	0.00000
69	0.00000	43.88968	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores	=	0.000
Suma Reacciones Vertic.	=	0.145
Suma Momentos Torsores	=	0.000

HIPOTESIS 1 PRETENSADO: PRIMER TESADO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-215.69	65.61	-51.60	306.57	-65.61	51.60
2	-306.57	65.62	-51.60	487.31	-65.62	51.60
3	-487.32	65.61	-51.60	560.76	-65.61	51.60
4	-560.76	65.61	-51.60	612.72	-65.61	51.60
5	-612.71	65.59	-51.60	643.28	-65.59	51.60
6	-643.28	65.60	-51.60	652.47	-65.60	51.60
7	-652.47	65.64	-51.60	640.28	-65.64	51.60
8	-640.28	65.63	-51.60	606.67	-65.63	51.60
9	-606.68	65.64	-51.60	553.73	-65.64	51.60
10	-553.73	65.64	-51.60	484.75	-65.64	51.60
11	-484.76	65.65	-51.60	399.50	-65.65	51.60
12	-399.48	65.65	-51.60	297.73	-65.65	51.60
13	-297.73	65.67	-51.60	179.17	-65.67	51.60
14	-179.19	65.64	-51.60	43.55	-65.64	51.60
15	-43.56	65.68	-51.60	-109.48	-65.68	51.60
16	109.48	65.67	-51.60	-280.17	-65.67	51.60
17	280.17	65.67	-51.60	-466.87	-65.67	51.60
18	466.87	65.67	-51.60	-751.03	-65.67	51.60
19	751.04	65.67	-51.60	-883.50	-65.67	51.60
20	883.50	65.67	-51.60	-959.20	-65.67	51.60
21	949.15	0.36	-12.24	-873.90	-0.36	12.24

22	873.90	0.37	-12.24	-559.23	-0.37	12.24
23	559.23	0.37	-12.24	-268.50	-0.37	12.24
24	268.50	0.37	-12.24	-21.22	-0.37	12.24

HIPOTESIS 1 PRETENSADO: PRIMER TESADO

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	21.21	0.38	-12.24	182.30	-0.38	12.24
26	-182.31	0.38	-12.24	343.73	-0.38	12.24
27	-343.75	0.40	-12.24	464.95	-0.40	12.24
28	-464.96	0.38	-12.24	547.86	-0.38	12.24
29	-547.87	0.34	-12.24	594.06	-0.34	12.24
30	-594.06	0.37	-12.24	604.76	-0.37	12.24
31	-604.74	0.32	-12.24	593.38	-0.32	12.24
32	-593.37	0.31	-12.24	546.53	-0.31	12.24
33	-546.53	0.33	-12.24	462.97	-0.33	12.24
34	-462.95	0.32	-12.24	341.06	-0.32	12.24
35	-341.05	0.32	-12.24	178.99	-0.32	12.24
36	-178.98	0.33	-12.24	-25.22	-0.33	12.24
37	25.22	0.35	-12.24	-273.18	-0.35	12.24
38	273.18	0.34	-12.24	-564.01	-0.34	12.24
39	564.01	0.34	-12.24	-879.82	-0.34	12.24
40	879.82	0.34	-12.24	-955.83	-0.34	12.24
41	965.66	-66.01	-50.73	-889.75	66.01	50.73
42	889.75	-66.01	-50.73	-661.08	66.01	50.73
43	661.08	-66.00	-50.73	-473.09	66.00	50.73
44	473.09	-66.01	-50.73	-285.65	66.01	50.73
45	285.64	-66.01	-50.73	-114.69	66.01	50.73
46	114.69	-66.02	-50.73	38.59	66.02	50.73
47	-38.59	-66.04	-50.73	174.50	66.04	50.73
48	-174.51	-66.06	-50.73	293.35	66.06	50.73
49	-293.34	-66.08	-50.73	395.41	66.08	50.73
50	-395.39	-66.11	-50.73	480.99	66.11	50.73
51	-480.98	-66.13	-50.73	550.32	66.13	50.73
52	-550.31	-66.11	-50.73	603.60	66.11	50.73
53	-603.63	-66.05	-50.73	637.56	66.05	50.73
54	-637.59	-66.15	-50.73	650.16	66.15	50.73
55	-650.16	-66.20	-50.73	641.40	66.20	50.73
56	-641.39	-66.19	-50.73	611.27	66.19	50.73
57	-611.24	-66.19	-50.73	560.85	66.19	50.73
58	-560.85	-66.21	-50.73	396.61	66.21	50.73
59	-396.60	-66.18	-50.73	306.79	66.18	50.73
60	-306.78	-66.20	-50.73	215.91	66.20	50.73
61	106.19	-43.78	0.00	0.00	43.78	0.00
62	52.94	-21.83	0.00	0.00	21.83	0.00
63	-99.51	41.03	0.00	0.00	-41.03	0.00
64	-58.89	24.28	0.00	0.00	-24.28	0.00
65	-60.60	24.99	0.00	0.00	-24.99	0.00

66	-100.33	41.37	0.00	0.00	-41.37	0.00
67	54.09	-22.30	0.00	0.00	22.30	0.00
68	106.45	-43.89	0.00	0.00	43.89	0.00

HIPOTESIS 1 PRETENSADO INICIAL

REACCIONES

=====

Nudo	Flector	Reac_vert	Torsor
=====			
62	0.00000	74.25537	0.00000
63	0.00000	35.73052	0.00000
64	0.00000	-70.12151	0.00000
65	0.00000	-39.36417	0.00000
66	0.00000	-40.54156	0.00000
67	0.00000	-70.66792	0.00000
68	0.00000	36.53395	0.00000
69	0.00000	74.42496	0.00000

SUMA DE REACCIONES

=====

Suma Momentos Flectores = 0.000
Suma Reacciones Vertic. = 0.250
Suma Momentos Torsores = 0.000

HIPOTESIS 1 PRETENSADO INICIAL

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-366.80	109.98	-90.53	522.91	-109.98	90.53
2	-522.92	110.00	-90.53	832.11	-110.00	90.53
3	-832.12	109.98	-90.53	958.42	-109.98	90.53
4	-958.43	109.96	-90.53	1048.15	-109.96	90.53
5	-1048.15	109.99	-90.53	1101.36	-109.99	90.53
6	-1101.37	109.96	-90.53	1118.19	-109.96	90.53
7	-1118.17	109.96	-90.53	1098.60	-109.96	90.53
8	-1098.58	109.97	-90.53	1042.50	-109.97	90.53
9	-1042.50	109.97	-90.53	953.55	-109.97	90.53
10	-953.54	110.03	-90.53	837.24	-110.03	90.53
11	-837.26	110.05	-90.53	693.24	-110.05	90.53
12	-693.21	110.01	-90.53	521.15	-110.01	90.53
13	-521.12	110.03	-90.53	324.25	-110.03	90.53
14	-324.26	110.06	-90.53	88.00	-110.06	90.53
15	-88.01	110.08	-90.53	-176.09	-110.08	90.53
16	176.09	110.09	-90.53	-468.10	-110.09	90.53
17	468.09	110.08	-90.53	-787.12	-110.08	90.53
18	787.12	110.08	-90.53	-1261.18	-110.08	90.53
19	1261.19	110.09	-90.53	-1482.42	-110.09	90.53
20	1482.43	110.09	-90.53	-1609.05	-110.09	90.53
21	1590.60	0.61	-18.25	-1465.17	-0.61	18.25

22	1465.17	0.61	-18.25	-940.72	-0.61	18.25
23	940.71	0.61	-18.25	-456.17	-0.61	18.25
24	456.18	0.61	-18.25	-44.03	-0.61	18.25

HIPOTESIS 1 PRETENSADO INICIAL

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
25	44.04	0.59	-18.25	295.19	-0.59	18.25
26	-295.18	0.62	-18.25	564.23	-0.62	18.25
27	-564.23	0.62	-18.25	766.28	-0.62	18.25
28	-766.26	0.62	-18.25	904.45	-0.62	18.25
29	-904.44	0.56	-18.25	981.45	-0.56	18.25
30	-981.42	0.56	-18.25	999.29	-0.56	18.25
31	-999.27	0.58	-18.25	980.29	-0.58	18.25
32	-980.30	0.57	-18.25	902.21	-0.57	18.25
33	-902.23	0.51	-18.25	762.97	-0.51	18.25
34	-762.93	0.52	-18.25	559.81	-0.52	18.25
35	-559.79	0.55	-18.25	289.67	-0.55	18.25
36	-289.67	0.57	-18.25	-50.68	-0.57	18.25
37	50.68	0.55	-18.25	-463.93	-0.55	18.25
38	463.94	0.57	-18.25	-948.64	-0.57	18.25
39	948.65	0.56	-18.25	-1475.00	-0.56	18.25
40	1475.00	0.57	-18.25	-1601.68	-0.57	18.25
41	1619.76	-110.64	-89.05	-1492.80	110.64	89.05
42	1492.80	-110.64	-89.05	-1111.22	110.64	89.05
43	1111.22	-110.64	-89.05	-797.45	110.64	89.05
44	797.45	-110.64	-89.05	-477.20	110.64	89.05
45	477.20	-110.68	-89.05	-184.77	110.68	89.05
46	184.79	-110.67	-89.05	79.76	110.67	89.05
47	-79.74	-110.71	-89.05	316.45	110.71	89.05
48	-316.46	-110.70	-89.05	513.83	110.70	89.05
49	-513.81	-110.82	-89.05	686.45	110.82	89.05
50	-686.42	-110.74	-89.05	830.92	110.74	89.05
51	-830.95	-110.76	-89.05	947.81	110.76	89.05
52	-947.79	-110.86	-89.05	1037.39	110.86	89.05
53	-1037.40	-110.81	-89.05	1094.08	110.81	89.05
54	-1094.08	-110.92	-89.05	1114.34	110.92	89.05
55	-1114.34	-110.95	-89.04	1098.24	110.95	89.04
56	-1098.24	-110.91	-89.05	1045.69	110.91	89.05
57	-1045.68	-110.95	-89.05	958.64	110.95	89.05
58	-958.65	-110.93	-89.04	677.57	110.93	89.04
59	-677.57	-110.97	-89.04	523.31	110.97	89.04
60	-523.30	-110.96	-89.04	367.17	110.96	89.04
61	180.10	-74.26	0.00	0.00	74.26	0.00
62	86.66	-35.73	0.00	0.00	35.73	0.00
63	-170.07	70.12	0.00	0.00	-70.12	0.00
64	-95.47	39.36	0.00	0.00	-39.36	0.00
65	-98.33	40.54	0.00	0.00	-40.54	0.00

66	-171.40	70.67	0.00	0.00	-70.67	0.00
67	88.61	-36.53	0.00	0.00	36.53	0.00
68	180.51	-74.42	0.00	0.00	74.42	0.00

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.9586	-8.9084	-11.5887	2.7506	75.6119	203.9413
2	2.7506	75.6119	203.9413	49.1379	68.0235	193.8632
3	49.1379	68.0235	193.8632	93.2054	38.0249	114.3632
4	93.2054	38.0249	114.3632	129.0643	60.5728	182.4345
5	129.0643	60.5728	182.4345	154.2266	30.5671	102.9346
6	154.2266	30.5671	102.9346	177.9605	23.2840	90.2343
7	177.9605	23.2840	90.2343	194.8382	23.2855	90.2343
8	194.8382	23.2855	90.2343	204.3229	16.2264	76.3459
9	204.3229	16.2264	76.3459	215.3350	-13.7701	-3.1540
10	215.3350	-13.7701	-3.1540	212.4171	9.4193	61.3529
11	212.4171	9.4193	61.3529	204.9955	-20.5929	-18.1471
12	204.9955	-20.5929	-18.1471	197.7380	-27.0681	-34.1614
13	197.7380	-27.0681	-34.1614	182.4125	-3.1930	28.3867
14	182.4125	-3.1930	28.3867	160.5983	-33.1954	-51.1132
15	160.5983	-33.1954	-51.1132	138.7329	-38.9361	-68.9191
16	138.7329	-38.9361	-68.9191	113.8878	-44.2249	-87.4957
17	113.8878	-44.2249	-87.4957	82.2076	-19.0380	-27.2524
18	82.2076	-19.0380	-27.2524	51.9047	-49.0368	-106.7524
19	51.9047	-49.0368	-106.7524	25.3120	1.8965	3.3118
20	25.3120	1.8965	3.3118	27.8228	-2.4499	-1.1356
21	27.8228	-2.4499	-1.1356	22.5014	-6.7966	-5.5829
22	22.5014	-6.7966	-5.5829	21.8753	54.4686	133.6675
23	21.8753	54.4686	133.6675	63.5526	50.4267	124.8469
24	63.5526	50.4267	124.8469	103.1492	45.9644	115.6290
25	103.1492	45.9644	115.6290	139.2440	41.1558	106.0089
26	139.2440	41.1558	106.0089	170.5718	36.0408	95.9863
27	170.5718	36.0408	95.9863	196.1167	30.6996	85.5611
28	196.1167	30.6996	85.5611	215.0977	25.2080	74.7334
29	215.0977	25.2080	74.7334	227.0070	19.6137	63.5032
30	227.0070	19.6137	63.5032	231.5452	13.9856	51.8705
31	231.5452	13.9856	51.8705	231.3327	-16.0104	-27.6296
32	231.3327	-16.0104	-27.6296	224.6761	-21.6139	-39.6648
33	224.6761	-21.6139	-39.6648	210.9341	-27.1120	-52.1022
34	210.9341	-27.1120	-52.1022	190.6234	-32.4489	-64.9423
35	190.6234	-32.4489	-64.9423	164.5400	-37.5525	-78.1847
36	164.5400	-37.5525	-78.1847	133.6894	-42.3731	-91.8297
37	133.6894	-42.3731	-91.8297	99.3378	-46.8337	-105.8766
38	99.3378	-46.8337	-105.8766	62.9148	-50.8720	-120.3204
39	62.9148	-50.8720	-120.3204	27.7896	8.1628	-14.7481
40	27.7896	8.1628	-14.7481	33.2100	2.9833	-5.6054
41	33.2100	2.9833	-5.6054	29.2832	-2.1961	3.5374
42	29.2832	-2.1961	3.5374	27.6914	-2.1959	3.5374
43	27.6914	-2.1959	3.5374	40.4238	49.8586	118.7759
44	40.4238	49.8586	118.7759	76.5721	49.8610	118.7758
45	76.5721	49.8610	118.7758	109.9759	39.5780	96.5784
46	109.9759	39.5780	96.5784	138.6648	39.5825	96.5784
47	138.6648	39.5825	96.5784	165.1264	9.5980	17.0783
48	165.1264	9.5980	17.0783	189.2587	33.8605	84.2419
49	189.2587	33.8605	84.2419	205.8719	27.7611	70.9687
50	205.8719	27.7611	70.9687	218.4978	-2.2355	-8.5312
51	218.4978	-2.2355	-8.5312	231.6277	21.3470	56.6763
52	231.6277	21.3470	56.6763	229.7965	14.6796	41.2803
53	229.7965	14.6796	41.2803	227.6925	-15.3091	-38.2199
54	227.6925	-15.3091	-38.2199	220.8636	-22.1926	-54.8023

55	220.8636	-22.1926	-54.8023	204.7718	-22.1946	-54.8022
56	204.7718	-22.1946	-54.8022	185.6718	-52.2053	-134.3022
57	185.6718	-52.2053	-134.3022	162.5390	-29.2825	-72.6551
58	162.5390	-29.2825	-72.6551	126.6788	-36.5016	-91.8573
59	126.6788	-36.5016	-91.8573	91.9637	-66.5016	-171.3573
60	91.9637	-66.5016	-171.3573	49.0098	-43.8084	-112.4571

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-54.2861	53.2928	133.1195	-17.8825	1.6323	-4.8257
2	-17.8825	1.6323	-4.8257	-16.6991	1.6322	-4.8257
3	-16.6991	1.6322	-4.8257	-16.8640	-9.1112	-11.5856
4	-16.8640	-9.1112	-11.5856	-23.4704	-9.1105	-11.5856
5	-23.4704	-9.1105	-11.5856	-30.0769	-9.1117	-11.5856
6	-30.0769	-9.1117	-11.5856	-36.6840	-9.1163	-11.5856
7	-36.6840	-9.1163	-11.5856	-43.2921	-9.1174	-11.5856
8	-43.2921	-9.1174	-11.5856	-49.8981	-9.1132	-11.5856
9	-49.8981	-9.1132	-11.5856	-56.5042	-9.1122	-11.5856
10	-56.5042	-9.1122	-11.5856	-63.1099	-9.1107	-11.5856
11	-63.1099	-9.1107	-11.5856	-69.7139	-9.1035	-11.5856
12	-69.7139	-9.1035	-11.5856	-76.3117	-9.1025	-11.5856
13	-76.3117	-9.1025	-11.5856	-82.9133	-9.1069	-11.5856
14	-82.9133	-9.1069	-11.5856	-89.5188	-9.1034	-11.5856
15	-89.5188	-9.1034	-11.5856	-96.1160	-9.0994	-11.5856
16	-96.1160	-9.0994	-11.5856	-102.7135	-9.1015	-11.5856
17	-102.7135	-9.1015	-11.5856	-109.3128	-9.1011	-11.5856
18	-109.3128	-9.1011	-11.5856	-115.9072	-9.0977	-11.5856
19	-115.9072	-9.0977	-11.5856	-122.5019	-9.0978	-11.5856
20	-122.5019	-9.0978	-11.5856	-150.5714	25.8437	76.9930
21	-150.5714	25.8437	76.9930	-118.9899	55.2040	154.2335
22	-118.9899	55.2040	154.2335	-104.0603	8.1650	-14.7481
23	-104.0603	8.1650	-14.7481	-96.3020	8.1656	-14.7481
24	-96.3020	8.1656	-14.7481	-88.5437	8.1665	-14.7481
25	-88.5437	8.1665	-14.7481	-80.7851	8.1668	-14.7481
26	-80.7851	8.1668	-14.7481	-73.0265	8.1651	-14.7481
27	-73.0265	8.1651	-14.7481	-65.2690	8.1661	-14.7481
28	-65.2690	8.1661	-14.7481	-57.5081	8.1669	-14.7481
29	-57.5081	8.1669	-14.7481	-49.7533	8.1656	-14.7481
30	-49.7533	8.1656	-14.7481	-41.9959	8.1653	-14.7481
31	-41.9959	8.1653	-14.7481	-42.0656	-6.7972	-5.5829
32	-42.0656	-6.7972	-5.5829	-48.5266	-6.8025	-5.5829
33	-48.5266	-6.8025	-5.5829	-54.9894	-6.8025	-5.5829
34	-54.9894	-6.8025	-5.5829	-61.4474	-6.8003	-5.5829
35	-61.4474	-6.8003	-5.5829	-67.9086	-6.7999	-5.5829
36	-67.9086	-6.7999	-5.5829	-74.3671	-6.7980	-5.5829
37	-74.3671	-6.7980	-5.5829	-80.8244	-6.7972	-5.5829
38	-80.8244	-6.7972	-5.5829	-87.2832	-6.7976	-5.5829
39	-87.2832	-6.7976	-5.5829	-93.7408	-6.7979	-5.5829
40	-93.7408	-6.7979	-5.5829	-147.8820	-22.7529	-78.6842
41	-147.8820	-22.7529	-78.6842	-152.9770	11.6076	-25.7661
42	-152.9770	11.6076	-25.7661	-144.5623	11.6076	-25.7661
43	-144.5623	11.6076	-25.7661	-136.1466	11.6067	-25.7661
44	-136.1466	11.6067	-25.7661	-127.7340	11.6082	-25.7661
45	-127.7340	11.6082	-25.7661	-119.3176	11.6037	-25.7662
46	-119.3176	11.6037	-25.7662	-110.9072	11.5981	-25.7663
47	-110.9072	11.5981	-25.7663	-102.4980	11.5948	-25.7663

48	-102.4980	11.5948	-25.7663	-94.0958	11.5869	-25.7663
49	-94.0958	11.5869	-25.7663	-85.6949	11.5816	-25.7663
50	-85.6949	11.5816	-25.7663	-77.2972	11.5783	-25.7663
51	-77.2972	11.5783	-25.7663	-68.9015	11.5778	-25.7663
52	-68.9015	11.5778	-25.7663	-60.5061	11.5756	-25.7664
53	-60.5061	11.5756	-25.7664	-52.1155	11.5714	-25.7664
54	-52.1155	11.5714	-25.7664	-43.7280	11.5624	-25.7664
55	-43.7280	11.5624	-25.7664	-35.3449	11.5594	-25.7664
56	-35.3449	11.5594	-25.7664	-26.9588	11.5634	-25.7664
57	-26.9588	11.5634	-25.7664	-18.5738	11.5642	-25.7664
58	-18.5738	11.5642	-25.7664	-10.1891	11.5646	-25.7664
59	-10.1891	11.5646	-25.7664	-1.8596	11.3597	-24.9697
60	-1.8596	11.3597	-24.9697	-0.9034	-2.1879	3.5375

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-52.0697	75.6125	203.9413	2.7506	75.6119	203.9413
2	2.7506	75.6119	203.9413	49.1379	68.0235	193.8632
3	49.1379	68.0235	193.8632	85.1542	60.5697	182.4344
4	85.1542	60.5697	182.4344	129.0643	60.5728	182.4345
5	129.0643	60.5728	182.4345	149.8274	53.2870	169.7343
6	149.8274	53.2870	169.7343	161.2989	46.2251	155.8458
7	161.2989	46.2251	155.8458	164.1593	39.4308	140.8527
8	164.1593	39.4308	140.8527	192.7487	39.4190	140.8528
9	192.7487	39.4190	140.8528	183.1089	32.9448	124.8383
10	183.1089	32.9448	124.8383	166.8727	26.8116	107.8864
11	166.8727	26.8116	107.8864	186.3092	26.8063	107.8866
12	186.3092	26.8063	107.8866	160.4073	21.0680	90.0806
13	160.4073	21.0680	90.0806	130.5726	15.7807	71.5042
14	130.5726	15.7807	71.5042	98.1004	10.9683	52.2476
15	98.1004	10.9683	52.2476	106.0533	10.9669	52.2476
16	106.0533	10.9669	52.2476	68.6909	6.6797	34.7934
17	68.6909	6.6797	34.7934	31.1869	2.9314	19.5708
18	31.1869	2.9314	19.5708	23.9370	1.8962	3.3118
19	23.9370	1.8962	3.3118	25.3120	1.8965	3.3118
20	25.3120	1.8965	3.3118	-69.6350	40.7806	107.4972
21	-69.6350	40.7806	107.4972	-48.7584	80.4269	204.3469
22	-48.7584	80.4269	204.3469	-2.1869	75.9682	195.1291
23	-2.1869	75.9682	195.1291	41.5601	71.1523	185.5090
24	41.5601	71.1523	185.5090	81.0968	66.0399	175.4864
25	81.0968	66.0399	175.4864	115.2853	60.7039	165.0611
26	115.2853	60.7039	165.0611	143.2213	55.1998	154.2334
27	143.2213	55.1998	154.2334	164.2510	49.6067	143.0031
28	164.2510	49.6067	143.0031	177.9836	43.9883	131.3704
29	177.9836	43.9883	131.3704	184.2727	38.3819	119.3353
30	184.2727	38.3819	119.3353	183.1905	32.8846	106.8977
31	183.1905	32.8846	106.8977	214.4341	32.8886	106.8976
32	214.4341	32.8886	106.8976	201.2702	27.5585	94.0576
33	201.2702	27.5585	94.0576	181.8951	22.4419	80.8151
34	181.8951	22.4419	80.8151	157.1976	17.6263	67.1703
35	157.1976	17.6263	67.1703	128.3212	13.1704	53.1235
36	128.3212	13.1704	53.1235	96.5719	9.1290	38.6796
37	96.5719	9.1290	38.6796	12.2800	8.1628	-14.7481
38	12.2800	8.1628	-14.7481	20.0349	8.1627	-14.7481
39	20.0349	8.1627	-14.7481	27.7896	8.1628	-14.7481
40	27.7896	8.1628	-14.7481	-63.5115	40.9200	105.1703

41	-63.5115	40.9200	105.1703	-55.1216	79.8584	198.2761
42	-55.1216	79.8584	198.2761	2.7765	79.8589	198.2760
43	2.7765	79.8589	198.2760	33.9222	74.9424	187.5621
44	33.9222	74.9424	187.5621	63.2714	69.5849	176.0786
45	63.2714	69.5849	176.0786	89.4053	63.8268	163.7420
46	89.4053	63.8268	163.7420	135.6781	63.8421	163.7419
47	135.6781	63.8421	163.7419	152.8883	57.7494	150.4691
48	152.8883	57.7494	150.4691	164.2141	51.3296	136.1766
49	164.2141	51.3296	136.1766	168.6389	44.6615	120.7809
50	168.6389	44.6615	120.7809	201.0331	44.6718	120.7809
51	201.0331	44.6718	120.7809	192.6945	37.7609	104.1982
52	192.6945	37.7609	104.1982	175.7223	30.6838	86.3454
53	175.7223	30.6838	86.3454	197.9738	30.6958	86.3451
54	197.9738	30.6958	86.3451	166.5408	23.4834	67.1430
55	166.5408	23.4834	67.1430	125.3270	16.1883	46.5415
56	125.3270	16.1883	46.5415	-26.9588	11.5634	-25.7664
57	-26.9588	11.5634	-25.7664	-18.5738	11.5642	-25.7664
58	-18.5738	11.5642	-25.7664	-10.1891	11.5646	-25.7664
59	-10.1891	11.5646	-25.7664	-1.8048	11.5634	-25.7664
60	-1.8048	11.5634	-25.7664	6.5786	11.5621	-25.7664

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.9579	-9.1125	-11.5856	-3.6490	-9.1130	-11.5856
2	-3.6490	-9.1130	-11.5856	-10.2566	-9.1132	-11.5856
3	-10.2566	-9.1132	-11.5856	-16.8640	-9.1112	-11.5856
4	-16.8640	-9.1112	-11.5856	-23.4704	-9.1105	-11.5856
5	-23.4704	-9.1105	-11.5856	-30.0769	-9.1117	-11.5856
6	-30.0769	-9.1117	-11.5856	110.3538	-14.3854	-34.5585
7	110.3538	-14.3854	-34.5585	153.9771	-21.9848	-44.6367
8	153.9771	-21.9848	-44.6367	138.0383	-21.9852	-44.6367
9	138.0383	-21.9852	-44.6367	166.3668	-29.4384	-56.0653
10	166.3668	-29.4384	-56.0653	185.4796	-36.7222	-68.7656
11	185.4796	-36.7222	-68.7656	158.8515	-36.7234	-68.7655
12	158.8515	-36.7234	-68.7655	164.3419	-43.7863	-82.6539
13	164.3419	-43.7863	-82.6539	162.3911	-50.5909	-97.6470
14	162.3911	-50.5909	-97.6470	153.9908	-57.0859	-113.6611
15	153.9908	-57.0859	-113.6611	112.6102	-57.0817	-113.6611
16	112.6102	-57.0817	-113.6611	94.4471	-63.2091	-130.6131
17	94.4471	-63.2091	-130.6131	72.5229	-68.9432	-148.4193
18	72.5229	-68.9432	-148.4193	48.2570	-74.2328	-166.9958
19	48.2570	-74.2328	-166.9958	-5.5616	-74.2310	-166.9958
20	-5.5616	-74.2310	-166.9958	-56.3355	-36.8465	-99.5477
21	-56.3355	-36.8465	-99.5477	22.5014	-6.7966	-5.5829
22	22.5014	-6.7966	-5.5829	16.0447	-6.7969	-5.5829
23	16.0447	-6.7969	-5.5829	9.5877	-6.7965	-5.5829
24	9.5877	-6.7965	-5.5829	3.1316	-6.7957	-5.5829
25	3.1316	-6.7957	-5.5829	99.3605	-9.5738	-34.1533
26	99.3605	-9.5738	-34.1533	133.4846	-14.0307	-43.3712
27	133.4846	-14.0307	-43.3712	163.4247	-18.8489	-52.9910
28	163.4247	-18.8489	-52.9910	188.0449	-23.9544	-63.0137
29	188.0449	-23.9544	-63.0137	206.4546	-29.2901	-73.4389
30	206.4546	-29.2901	-73.4389	217.9943	-34.7865	-84.2666
31	217.9943	-34.7865	-84.2666	184.9472	-34.7877	-84.2666
32	184.9472	-34.7877	-84.2666	183.9074	-40.3711	-95.4969
33	183.9074	-40.3711	-95.4969	175.4132	-46.0022	-107.1295

34	175.4132	-46.0022	-107.1295	159.6177	-51.6021	-119.1646
35	159.6177	-51.6021	-119.1646	136.9223	-57.1113	-131.6021
36	136.9223	-57.1113	-131.6021	107.9750	-62.4472	-144.4423
37	107.9750	-62.4472	-144.4423	73.6778	-67.5596	-157.6848
38	73.6778	-67.5596	-157.6848	35.1741	-72.3740	-171.3298
39	35.1741	-72.3740	-171.3298	-6.1446	-76.8322	-185.3766
40	-6.1446	-76.8322	-185.3766	-71.7729	-36.9891	-109.6137
41	-71.7729	-36.9891	-109.6137	29.2832	-2.1961	3.5374
42	29.2832	-2.1961	3.5374	27.6914	-2.1959	3.5374
43	27.6914	-2.1959	3.5374	26.0989	-2.1960	3.5374
44	26.0989	-2.1960	3.5374	24.5070	-2.1960	3.5374
45	24.5070	-2.1960	3.5374	69.4897	-5.7021	-30.1897
46	69.4897	-5.7021	-30.1897	65.3560	-5.7009	-30.1898
47	65.3560	-5.7009	-30.1898	105.5234	-10.1250	-40.2243
48	105.5234	-10.1250	-40.2243	143.6117	-15.0310	-50.9382
49	143.6117	-15.0310	-50.9382	178.3038	-20.3797	-62.4221
50	178.3038	-20.3797	-62.4221	163.5348	-20.3748	-62.4221
51	163.5348	-20.3748	-62.4221	189.4100	-26.1135	-74.7587
52	189.4100	-26.1135	-74.7587	209.2548	-32.2208	-88.0318
53	209.2548	-32.2208	-88.0318	185.9035	-32.2155	-88.0318
54	185.9035	-32.2155	-88.0318	194.0963	-38.6199	-102.3242
55	194.0963	-38.6199	-102.3242	194.2602	-45.2993	-117.7200
56	194.2602	-45.2993	-117.7200	185.6718	-52.2053	-134.3022
57	185.6718	-52.2053	-134.3022	147.8231	-52.2012	-134.3023
58	147.8231	-52.2012	-134.3023	124.8076	-59.2817	-152.1552
59	124.8076	-59.2817	-152.1552	91.9637	-66.5016	-171.3573
60	91.9637	-66.5016	-171.3573	43.7504	-66.5014	-171.3573

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-52.0697	75.6125	203.9413	2.7506	75.6119	203.9413
2	2.7506	75.6119	203.9413	49.1379	68.0235	193.8632
3	49.1379	68.0235	193.8632	85.1542	60.5697	182.4344
4	85.1542	60.5697	182.4344	129.0643	60.5728	182.4345
5	129.0643	60.5728	182.4345	149.8274	53.2870	169.7343
6	149.8274	53.2870	169.7343	161.2989	46.2251	155.8458
7	161.2989	46.2251	155.8458	164.1593	39.4308	140.8527
8	164.1593	39.4308	140.8527	192.7487	39.4190	140.8528
9	192.7487	39.4190	140.8528	183.1089	32.9448	124.8383
10	183.1089	32.9448	124.8383	166.8727	26.8116	107.8864
11	166.8727	26.8116	107.8864	186.3092	26.8063	107.8866
12	186.3092	26.8063	107.8866	160.4073	21.0680	90.0806
13	160.4073	21.0680	90.0806	130.5726	15.7807	71.5042
14	130.5726	15.7807	71.5042	98.1004	10.9683	52.2476
15	98.1004	10.9683	52.2476	106.0533	10.9669	52.2476
16	106.0533	10.9669	52.2476	68.6909	6.6797	34.7934
17	68.6909	6.6797	34.7934	31.1869	2.9314	19.5708
18	31.1869	2.9314	19.5708	-5.7380	-0.2591	9.2551
19	-5.7380	-0.2591	9.2551	-5.9264	-0.2589	9.2551
20	-5.9264	-0.2589	9.2551	-69.6350	40.7806	107.4972
21	-69.6350	40.7806	107.4972	-48.7584	80.4269	204.3469
22	-48.7584	80.4269	204.3469	-2.1869	75.9682	195.1291
23	-2.1869	75.9682	195.1291	41.5601	71.1523	185.5090
24	41.5601	71.1523	185.5090	81.0968	66.0399	175.4864
25	81.0968	66.0399	175.4864	115.2853	60.7039	165.0611
26	115.2853	60.7039	165.0611	143.2213	55.1998	154.2334
27	143.2213	55.1998	154.2334	164.2510	49.6067	143.0031
28	164.2510	49.6067	143.0031	177.9836	43.9883	131.3704
29	177.9836	43.9883	131.3704	184.2727	38.3819	119.3353
30	184.2727	38.3819	119.3353	183.1905	32.8846	106.8977
31	183.1905	32.8846	106.8977	214.4341	32.8886	106.8976
32	214.4341	32.8886	106.8976	201.2702	27.5585	94.0576
33	201.2702	27.5585	94.0576	181.8951	22.4419	80.8151
34	181.8951	22.4419	80.8151	157.1976	17.6263	67.1703
35	157.1976	17.6263	67.1703	128.3212	13.1704	53.1235
36	128.3212	13.1704	53.1235	96.5719	9.1290	38.6796
37	96.5719	9.1290	38.6796	62.9269	5.5271	25.7230
38	62.9269	5.5271	25.7230	28.7389	2.3991	14.5336
39	28.7389	2.3991	14.5336	-5.1937	-0.2716	7.1739
40	-5.1937	-0.2716	7.1739	-63.5115	40.9200	105.1703
41	-63.5115	40.9200	105.1703	-55.1216	79.8584	198.2761
42	-55.1216	79.8584	198.2761	2.7765	79.8589	198.2760
43	2.7765	79.8589	198.2760	33.9222	74.9424	187.5621
44	33.9222	74.9424	187.5621	63.2714	69.5849	176.0786
45	63.2714	69.5849	176.0786	89.4053	63.8268	163.7420
46	89.4053	63.8268	163.7420	135.6781	63.8421	163.7419
47	135.6781	63.8421	163.7419	152.8883	57.7494	150.4691
48	152.8883	57.7494	150.4691	164.2141	51.3296	136.1766
49	164.2141	51.3296	136.1766	168.6389	44.6615	120.7809
50	168.6389	44.6615	120.7809	201.0331	44.6718	120.7809
51	201.0331	44.6718	120.7809	192.6945	37.7609	104.1982
52	192.6945	37.7609	104.1982	175.7223	30.6838	86.3454
53	175.7223	30.6838	86.3454	166.5408	23.4834	67.1430
54	166.5408	23.4834	67.1430			

55	166.5408	23.4834	67.1430	125.3270	16.1883	46.5415
56	125.3270	16.1883	46.5415	80.6907	9.5798	27.9012
57	80.6907	9.5798	27.9012	87.6355	9.5804	27.9011
58	87.6355	9.5804	27.9011	2.2691	-2.1878	3.5375
59	2.2691	-2.1878	3.5375	0.6829	-2.1879	3.5375
60	0.6829	-2.1879	3.5375	-0.9034	-2.1879	3.5375

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO A en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.9586	-8.9084	-11.5887	-3.5003	-8.9090	-11.5887
2	-3.5003	-8.9090	-11.5887	-9.9599	-8.9094	-11.5887
3	-9.9599	-8.9094	-11.5887	31.4101	-3.1968	-15.5002
4	31.4101	-3.1968	-15.5002	29.0928	-3.1961	-15.5002
5	29.0928	-3.1961	-15.5002	56.4015	-6.7079	-25.8805
6	56.4015	-6.7079	-25.8805	110.3538	-14.3854	-34.5585
7	110.3538	-14.3854	-34.5585	153.9771	-21.9848	-44.6367
8	153.9771	-21.9848	-44.6367	138.0383	-21.9852	-44.6367
9	138.0383	-21.9852	-44.6367	166.3668	-29.4384	-56.0653
10	166.3668	-29.4384	-56.0653	185.4796	-36.7222	-68.7656
11	185.4796	-36.7222	-68.7656	158.8515	-36.7234	-68.7655
12	158.8515	-36.7234	-68.7655	164.3419	-43.7863	-82.6539
13	164.3419	-43.7863	-82.6539	162.3911	-50.5909	-97.6470
14	162.3911	-50.5909	-97.6470	153.9908	-57.0859	-113.6611
15	153.9908	-57.0859	-113.6611	112.6102	-57.0817	-113.6611
16	112.6102	-57.0817	-113.6611	94.4471	-63.2091	-130.6131
17	94.4471	-63.2091	-130.6131	72.5229	-68.9432	-148.4193
18	72.5229	-68.9432	-148.4193	48.2570	-74.2328	-166.9958
19	48.2570	-74.2328	-166.9958	-5.5616	-74.2310	-166.9958
20	-5.5616	-74.2310	-166.9958	-56.3355	-36.8465	-99.5477
21	-56.3355	-36.8465	-99.5477	-110.6872	8.0803	-15.1118
22	-110.6872	8.0803	-15.1118	-103.0110	8.0820	-15.1118
23	-103.0110	8.0820	-15.1118	24.4571	-1.9895	-18.6847
24	24.4571	-1.9895	-18.6847	62.3639	-5.5335	-25.3326
25	62.3639	-5.5335	-25.3326	99.3605	-9.5738	-34.1533
26	99.3605	-9.5738	-34.1533	133.4846	-14.0307	-43.3712
27	133.4846	-14.0307	-43.3712	163.4247	-18.8489	-52.9910
28	163.4247	-18.8489	-52.9910	188.0449	-23.9544	-63.0137
29	188.0449	-23.9544	-63.0137	206.4546	-29.2901	-73.4389
30	206.4546	-29.2901	-73.4389	217.9943	-34.7865	-84.2666
31	217.9943	-34.7865	-84.2666	184.9472	-34.7877	-84.2666
32	184.9472	-34.7877	-84.2666	183.9074	-40.3711	-95.4969
33	183.9074	-40.3711	-95.4969	175.4132	-46.0022	-107.1295
34	175.4132	-46.0022	-107.1295	159.6177	-51.6021	-119.1646
35	159.6177	-51.6021	-119.1646	136.9223	-57.1113	-131.6021
36	136.9223	-57.1113	-131.6021	107.9750	-62.4472	-144.4423
37	107.9750	-62.4472	-144.4423	73.6778	-67.5596	-157.6848
38	73.6778	-67.5596	-157.6848	35.1741	-72.3740	-171.3298
39	35.1741	-72.3740	-171.3298	-6.1446	-76.8322	-185.3766
40	-6.1446	-76.8322	-185.3766	-71.7729	-36.9891	-109.6137
41	-71.7729	-36.9891	-109.6137	-151.2616	11.4879	-25.9770
42	-151.2616	11.4879	-25.9770	-142.9344	11.4879	-25.9771
43	-142.9344	11.4879	-25.9771	-134.6060	11.4873	-25.9771
44	-134.6060	11.4873	-25.9771	-126.2811	11.4878	-25.9771
45	-126.2811	11.4878	-25.9771	69.4897	-5.7021	-30.1897
46	69.4897	-5.7021	-30.1897	65.3560	-5.7009	-30.1898

47	65.3560	-5.7009	-30.1898	105.5234	-10.1250	-40.2243
48	105.5234	-10.1250	-40.2243	143.6117	-15.0310	-50.9382
49	143.6117	-15.0310	-50.9382	178.3038	-20.3797	-62.4221
50	178.3038	-20.3797	-62.4221	163.5348	-20.3748	-62.4221
51	163.5348	-20.3748	-62.4221	189.4100	-26.1135	-74.7587
52	189.4100	-26.1135	-74.7587	209.2548	-32.2208	-88.0318
53	209.2548	-32.2208	-88.0318	185.9035	-32.2155	-88.0318
54	185.9035	-32.2155	-88.0318	194.0963	-38.6199	-102.3242
55	194.0963	-38.6199	-102.3242	194.2602	-45.2993	-117.7200
56	194.2602	-45.2993	-117.7200	185.6718	-52.2053	-134.3022
57	185.6718	-52.2053	-134.3022	147.8231	-52.2012	-134.3023
58	147.8231	-52.2012	-134.3023	124.8076	-59.2817	-152.1552
59	124.8076	-59.2817	-152.1552	91.9637	-66.5016	-171.3573
60	91.9637	-66.5016	-171.3573	43.7504	-66.5014	-171.3573

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-1.9066	0.1633	-0.4826	-1.3682	8.1050	20.4235
2	-1.3682	8.1050	20.4235	9.3212	16.6296	53.7854
3	9.3212	16.6296	53.7854	20.8528	13.6306	45.8354
4	20.8528	13.6306	45.8354	30.7375	13.6571	46.1413
5	30.7375	13.6571	46.1413	38.7641	10.6591	38.1913
6	38.7641	10.6591	38.1913	45.4431	7.6572	30.2413
7	45.4431	7.6572	30.2413	50.7672	4.6576	22.2913
8	50.7672	4.6576	22.2913	54.1455	4.6606	22.2913
9	54.1455	4.6606	22.2913	55.9468	1.6579	14.3414
10	55.9468	1.6579	14.3414	56.3973	-1.3463	6.3913
11	56.3973	-1.3463	6.3913	55.4202	-1.3503	6.3913
12	55.4202	-1.3503	6.3913	52.3411	-4.3478	-1.5586
13	52.3411	-4.3478	-1.5586	47.9139	-7.3423	-9.5086
14	47.9139	-7.3423	-9.5086	42.1394	-10.3465	-17.4585
15	42.1394	-10.3465	-17.4585	34.6340	-10.3519	-17.4585
16	34.6340	-10.3519	-17.4585	25.3297	-13.3520	-25.4086
17	25.3297	-13.3520	-25.4086	14.6754	-16.3536	-33.3586
18	14.6754	-16.3536	-33.3586	2.6681	-19.3542	-41.3086
19	2.6681	-19.3542	-41.3086	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	0.3970	0.0704	-0.2318
21	0.3970	0.0704	-0.2318	0.3115	-0.0226	0.0190
22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
24	0.2685	-0.0226	0.0190	9.6187	16.5478	48.9699
25	9.6187	16.5478	48.9699	24.6461	13.6901	40.8700
26	24.6461	13.6901	40.8700	37.0515	10.6898	32.9200
27	37.0515	10.6898	32.9200	46.7540	7.6873	24.9700
28	46.7540	7.6873	24.9700	53.8883	4.9226	16.9541
29	53.8883	4.9226	16.9541	58.6622	2.5956	8.7875
30	58.6622	2.5956	8.7875	62.1538	1.5646	-0.0538
31	62.1538	1.5646	-0.0538	63.7719	1.8512	-0.3284
32	63.7719	1.8512	-0.3284	62.8493	-0.9520	-8.6139
33	62.8493	-0.9520	-8.6139	59.3960	-3.9520	-16.5639
34	59.3960	-3.9520	-16.5639	53.2401	-6.9545	-24.5139
35	53.2401	-6.9545	-24.5139	44.3834	-9.9540	-32.4639
36	44.3834	-9.9540	-32.4639	32.8280	-12.9534	-40.4139
37	32.8280	-12.9534	-40.4139	18.5705	-15.9541	-48.3639
38	18.5705	-15.9541	-48.3639	6.4554	2.6333	-5.5397
39	6.4554	2.6333	-5.5397	8.9574	2.6335	-5.5397
40	8.9574	2.6335	-5.5397	10.6546	0.9657	-2.0031

41	10.6546	0.9657	-2.0031	9.3502	-0.7010	1.1151
42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
45	7.8256	-0.7007	1.1151	7.3177	-0.7004	1.1151
46	7.3177	-0.7004	1.1151	6.8097	-0.7007	1.1151
47	6.8097	-0.7007	1.1151	7.0174	15.2519	17.4713
48	7.0174	15.2519	17.4713	17.1766	12.2533	9.5214
49	17.1766	12.2533	9.5214	25.9860	9.2544	1.5713
50	25.9860	9.2544	1.5713	32.6964	9.2544	1.5713
51	32.6964	9.2544	1.5713	37.9819	6.2554	-6.3787
52	37.9819	6.2554	-6.3787	41.9178	3.2592	-14.3289
53	41.9178	3.2592	-14.3289	44.2808	3.2622	-14.3290
54	44.2808	3.2622	-14.3290	44.6949	0.2648	-22.2790
55	44.6949	0.2648	-22.2790	43.7606	-2.7350	-30.2290
56	43.7606	-2.7350	-30.2290	41.4756	-5.7377	-38.1791
57	41.4756	-5.7377	-38.1791	37.3148	-5.7374	-38.1791
58	37.3148	-5.7374	-38.1791	31.5060	-8.7371	-46.1291
59	31.5060	-8.7371	-46.1291	24.3463	-11.7374	-54.0790
60	24.3463	-11.7374	-54.0790	15.8989	-11.6245	-54.3223

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-17.9003	19.5890	62.1597	-5.0615	16.3779	58.3804
2	-5.0615	16.3779	58.3804	-1.6699	0.1632	-0.4826
3	-1.6699	0.1632	-0.4826	-1.5516	0.1632	-0.4826
4	-1.5516	0.1632	-0.4826	-1.4332	0.1632	-0.4826
5	-1.4332	0.1632	-0.4826	-1.3149	0.1632	-0.4826
6	-1.3149	0.1632	-0.4826	-1.1965	0.1632	-0.4826
7	-1.1965	0.1632	-0.4826	-1.0782	0.1633	-0.4826
8	-1.0782	0.1633	-0.4826	-0.9599	0.1633	-0.4826
9	-0.9599	0.1633	-0.4826	-0.8415	0.1632	-0.4826
10	-0.8415	0.1632	-0.4826	-2.5356	-3.4927	-0.7878
11	-2.5356	-3.4927	-0.7878	-5.0676	-3.4924	-0.7878
12	-5.0676	-3.4924	-0.7878	-8.2993	-4.4925	-3.4378
13	-8.2993	-4.4925	-3.4378	-11.9815	-5.4926	-6.0878
14	-11.9815	-5.4926	-6.0878	-16.1137	-6.4922	-8.7378
15	-16.1137	-6.4922	-8.7378	-20.8202	-6.4919	-8.7378
16	-20.8202	-6.4919	-8.7378	-26.1271	-7.4917	-11.3878
17	-26.1271	-7.4917	-11.3878	-31.8835	-8.4916	-14.0378
18	-31.8835	-8.4916	-14.0378	-42.3662	-22.7014	-43.8706
19	-42.3662	-22.7014	-43.8706	-58.8248	-22.7011	-43.8706
20	-58.8248	-22.7011	-43.8706	-93.3215	3.1978	12.9540
21	-93.3215	3.1978	12.9540	-80.7182	29.0966	69.7786
22	-80.7182	29.0966	69.7786	-54.2761	26.0958	61.8286
23	-54.2761	26.0958	61.8286	-31.0781	2.6348	-5.5397
24	-31.0781	2.6348	-5.5397	-28.5751	2.6348	-5.5397
25	-28.5751	2.6348	-5.5397	-26.0718	2.6349	-5.5397
26	-26.0718	2.6349	-5.5397	-23.5688	2.6346	-5.5397
27	-23.5688	2.6346	-5.5397	-21.0657	2.6344	-5.5397
28	-21.0657	2.6344	-5.5397	-18.5627	2.6346	-5.5397
29	-18.5627	2.6346	-5.5397	-16.0595	2.6340	-5.5397
30	-16.0595	2.6340	-5.5397	-13.5580	2.6335	-5.5397
31	-13.5580	2.6335	-5.5397	-11.0556	2.6331	-5.5397
32	-11.0556	2.6331	-5.5397	-8.5546	2.6328	-5.5397

33	-8.5546	2.6328	-5.5397	-6.0533	2.6314	-5.1213
34	-6.0533	2.6314	-5.1213	-3.5530	2.6321	-5.1213
35	-3.5530	2.6321	-5.1213	-1.0526	2.6326	-5.1213
36	-1.0526	2.6326	-5.1213	-0.0108	-0.0226	0.0190
37	-0.0108	-0.0226	0.0190	-9.2871	-19.1660	-44.6521
38	-9.2871	-19.1660	-44.6521	-29.4181	-22.3903	-53.4256
39	-29.4181	-22.3903	-53.4256	-52.3405	-25.3911	-61.3756
40	-52.3405	-25.3911	-61.3756	-94.0036	0.9421	-6.4986
41	-94.0036	0.9421	-6.4986	-88.7697	27.2757	48.3783
42	-88.7697	27.2757	48.3783	-68.9945	27.2758	48.3782
43	-68.9945	27.2758	48.3782	-51.4653	23.9147	39.0783
44	-51.4653	23.9147	39.0783	-44.7953	4.1013	-10.4860
45	-44.7953	4.1013	-10.4860	-41.8215	4.0990	-10.4860
46	-41.8215	4.0990	-10.4860	-38.8489	4.0992	-10.4860
47	-38.8489	4.0992	-10.4860	-35.8760	4.0989	-10.4861
48	-35.8760	4.0989	-10.4861	-32.9066	4.0968	-10.4861
49	-32.9066	4.0968	-10.4861	-29.9375	4.0958	-10.4861
50	-29.9375	4.0958	-10.4861	-26.9690	4.0929	-10.4861
51	-26.9690	4.0929	-10.4861	-24.0019	4.0917	-10.4861
52	-24.0019	4.0917	-10.4861	-21.0344	4.0901	-10.4861
53	-21.0344	4.0901	-10.4861	-18.0693	4.0890	-10.4861
54	-18.0693	4.0890	-10.4861	-15.1047	4.0889	-10.4861
55	-15.1047	4.0889	-10.4861	-12.1413	4.0900	-10.4861
56	-12.1413	4.0900	-10.4861	-9.1976	4.0445	-9.9073
57	-9.1976	4.0445	-9.9073	-6.2656	4.0447	-9.9073
58	-6.2656	4.0447	-9.9073	-3.3336	4.0443	-9.9073
59	-3.3336	4.0443	-9.9073	-0.4319	3.6845	-8.7696
60	-0.4319	3.6845	-8.7696	-0.2847	-0.6982	1.1151

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-17.8700	19.6567	62.0413	-3.6182	19.6565	62.0413
2	-3.6182	19.6565	62.0413	9.2836	16.6572	54.0913
3	9.2836	16.6572	54.0913	20.8362	13.6572	46.1413
4	20.8362	13.6572	46.1413	30.7375	13.6571	46.1413
5	30.7375	13.6571	46.1413	38.7641	10.6591	38.1913
6	38.7641	10.6591	38.1913	45.4431	7.6572	30.2413
7	45.4431	7.6572	30.2413	50.7672	4.6576	22.2913
8	50.7672	4.6576	22.2913	54.1455	4.6606	22.2913
9	54.1455	4.6606	22.2913	55.9468	1.6579	14.3414
10	55.9468	1.6579	14.3414	-0.7232	0.1632	-0.4826
11	-0.7232	0.1632	-0.4826	-0.6048	0.1633	-0.4826
12	-0.6048	0.1633	-0.4826	-0.4863	0.1633	-0.4826
13	-0.4863	0.1633	-0.4826	-0.3679	0.1633	-0.4826
14	-0.3679	0.1633	-0.4826	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-65.1129	9.0987	30.6412
21	-65.1129	9.0987	30.6412	-80.0576	29.1325	70.4714
22	-80.0576	29.1325	70.4714	-53.5817	26.1324	62.5214
23	-53.5817	26.1324	62.5214	-29.8064	23.1324	54.5714
24	-29.8064	23.1324	54.5714	-8.7310	20.1320	46.6214
25	-8.7310	20.1320	46.6214	9.6442	17.1300	38.6713
26	9.6442	17.1300	38.6713	25.3179	14.1294	30.7213

27	25.3179	14.1294	30.7213	38.2929	11.1300	22.7713
28	38.2929	11.1300	22.7713	48.5666	8.1328	14.8213
29	48.5666	8.1328	14.8213	56.1460	5.1336	6.8713
30	56.1460	5.1336	6.8713	-13.5580	2.6335	-5.5397
31	-13.5580	2.6335	-5.5397	-11.0556	2.6331	-5.5397
32	-11.0556	2.6331	-5.5397	-8.5546	2.6328	-5.5397
33	-8.5546	2.6328	-5.5397	-6.0533	2.6336	-5.5397
34	-6.0533	2.6336	-5.5397	-3.5514	2.6335	-5.5397
35	-3.5514	2.6335	-5.5397	-1.0500	2.6330	-5.5397
36	-1.0500	2.6330	-5.5397	1.4517	2.6332	-5.5397
37	1.4517	2.6332	-5.5397	3.9536	2.6332	-5.5397
38	3.9536	2.6332	-5.5397	6.4554	2.6333	-5.5397
39	6.4554	2.6333	-5.5397	8.9574	2.6335	-5.5397
40	8.9574	2.6335	-5.5397	-91.9648	1.2211	-5.1088
41	-91.9648	1.2211	-5.1088	-88.1130	27.3635	49.0283
42	-88.1130	27.3635	49.0283	-68.2746	27.3635	49.0282
43	-68.2746	27.3635	49.0282	-50.4613	24.3633	41.0782
44	-50.4613	24.3633	41.0782	-33.9981	21.3642	33.1282
45	-33.9981	21.3642	33.1282	-18.8840	18.3647	25.1781
46	-18.8840	18.3647	25.1781	-5.5707	18.3647	25.1781
47	-5.5707	18.3647	25.1781	6.0189	15.3647	17.2281
48	6.0189	15.3647	17.2281	16.2591	12.3652	9.2780
49	16.2591	12.3652	9.2780	25.1506	9.3657	1.3280
50	25.1506	9.3657	1.3280	31.9423	9.3661	1.3280
51	31.9423	9.3661	1.3280	37.3094	6.3677	-6.6221
52	37.3094	6.3677	-6.6221	-21.0344	4.0901	-10.4861
53	-21.0344	4.0901	-10.4861	-18.0693	4.0890	-10.4861
54	-18.0693	4.0890	-10.4861	-15.1047	4.0889	-10.4861
55	-15.1047	4.0889	-10.4861	-12.1413	4.0900	-10.4861
56	-12.1413	4.0900	-10.4861	-9.1763	4.0900	-10.4861
57	-9.1763	4.0900	-10.4861	-6.2128	4.0885	-10.4861
58	-6.2128	4.0885	-10.4861	-3.2497	4.0877	-10.4861
59	-3.2497	4.0877	-10.4861	-0.2861	4.0873	-10.4861
60	-0.2861	4.0873	-10.4861	2.6774	4.0872	-10.4861

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265
6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754
12	24.7634	-5.7960	-12.5754	23.1167	-7.8779	-4.6945
13	23.1167	-7.8779	-4.6945	16.1316	-10.8766	-12.6445
14	16.1316	-10.8766	-12.6445	7.7952	-13.8796	-20.5945
15	7.7952	-13.8796	-20.5945	-2.2677	-13.8804	-20.5945
16	-2.2677	-13.8804	-20.5945	-14.1300	-16.8796	-28.5444
17	-14.1300	-16.8796	-28.5444	-27.3424	-19.8804	-36.4944
18	-27.3424	-19.8804	-36.4944	-41.9059	-22.8806	-44.4445

19	-41.9059	-22.8806	-44.4445	-58.4943	-22.8801	-44.4445
20	-58.4943	-22.8801	-44.4445	-32.8969	-9.8739	-27.3428
21	-32.8969	-9.8739	-27.3428	0.3115	-0.0226	0.0190
22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
24	0.2685	-0.0226	0.0190	0.2470	-0.0226	0.0190
25	0.2470	-0.0226	0.0190	0.2255	-0.0226	0.0190
26	0.2255	-0.0226	0.0190	0.2040	-0.0226	0.0190
27	0.2040	-0.0226	0.0190	3.5727	-0.2226	-14.2709
28	3.5727	-0.2226	-14.2709	11.8983	-1.2869	-16.8876
29	11.8983	-1.2869	-16.8876	19.7457	-2.5372	-19.8719
30	19.7457	-2.5372	-19.8719	26.6926	-3.9778	-23.2373
31	26.6926	-3.9778	-23.2373	22.9133	-3.9773	-23.2374
32	22.9133	-3.9773	-23.2374	26.9831	-5.6063	-26.9971
33	26.9831	-5.6063	-26.9971	45.6636	-7.4813	-14.2654
34	45.6636	-7.4813	-14.2654	36.1553	-10.4796	-22.2154
35	36.1553	-10.4796	-22.2154	23.9501	-13.4790	-30.1654
36	23.9501	-13.4790	-30.1654	9.0419	-16.4810	-38.1154
37	9.0419	-16.4810	-38.1154	-8.5662	-19.4818	-46.0654
38	-8.5662	-19.4818	-46.0654	-28.8746	-22.4818	-54.0154
39	-28.8746	-22.4818	-54.0154	-51.8827	-25.4825	-61.9654
40	-51.8827	-25.4825	-61.9654	-48.1974	-10.4033	-41.2680
41	-48.1974	-10.4033	-41.2680	9.3502	-0.7010	1.1151
42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
45	7.8256	-0.7007	1.1151	7.3177	-0.7004	1.1151
46	7.3177	-0.7004	1.1151	6.8097	-0.7007	1.1151
47	6.8097	-0.7007	1.1151	6.3017	-0.7003	1.1151
48	6.3017	-0.7003	1.1151	5.7944	-0.6998	1.1151
49	5.7944	-0.6998	1.1151	5.2870	-0.6996	1.1151
50	5.2870	-0.6996	1.1151	4.7801	-0.6995	1.1151
51	4.7801	-0.6995	1.1151	4.2729	-0.6993	1.1151
52	4.2729	-0.6993	1.1151	14.0367	-1.1830	-28.1339
53	14.0367	-1.1830	-28.1339	13.1796	-1.1823	-28.1339
54	13.1796	-1.1823	-28.1339	20.3209	-2.7731	-32.3395
55	20.3209	-2.7731	-32.3395	26.1926	-4.6129	-37.0938
56	26.1926	-4.6129	-37.0938	30.2928	-6.7094	-42.4273
57	30.2928	-6.7094	-42.4273	25.4278	-6.7109	-42.4273
58	25.4278	-6.7109	-42.4273	25.5099	-9.0749	-48.3723
59	25.5099	-9.0749	-48.3723	24.3463	-11.7374	-54.0790
60	24.3463	-11.7374	-54.0790	15.8370	-11.7370	-54.0789

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-17.9003	19.5890	62.1597	-3.6979	19.5886	62.1597
2	-3.6979	19.5886	62.1597	9.1544	16.5886	54.2097
3	9.1544	16.5886	54.2097	20.6565	13.5894	46.2597
4	20.6565	13.5894	46.2597	30.5086	13.5893	46.2597
5	30.5086	13.5893	46.2597	38.4866	10.5886	38.3097
6	38.4866	10.5886	38.3097	45.1133	7.5880	30.3597
7	45.1133	7.5880	30.3597	20.3023	3.0038	23.0326
8	20.3023	3.0038	23.0326	22.4794	3.0020	23.0326
9	22.4794	3.0020	23.0326	18.0889	0.9373	16.8073
10	18.0889	0.9373	16.8073	12.8349	-0.9611	10.9268
11	12.8349	-0.9611	10.9268	12.1379	-0.9612	10.9268
12	12.1379	-0.9612	10.9268	5.0363	-2.7010	5.4078

13	5.0363	-2.7010	5.4078	-2.3027	-4.2940	0.2655
14	-2.3027	-4.2940	0.2655	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-65.1129	9.0987	30.6412
21	-65.1129	9.0987	30.6412	-51.4893	25.5473	72.8200
22	-51.4893	25.5473	72.8200	-29.1289	22.5157	65.2347
23	-29.1289	22.5157	65.2347	-10.6279	19.6061	57.8745
24	-10.6279	19.6061	57.8745	4.2353	16.8296	50.7480
25	4.2353	16.8296	50.7480	15.7221	14.1889	43.8609
26	15.7221	14.1889	43.8609	28.6012	11.1880	35.9109
27	28.6012	11.1880	35.9109	38.7807	8.1877	27.9608
28	38.7807	8.1877	27.9608	46.2593	5.1888	20.0108
29	46.2593	5.1888	20.0108	51.0412	2.1904	12.0608
30	51.0412	2.1904	12.0608	53.1220	-0.8080	4.1108
31	53.1220	-0.8080	4.1108	52.3534	-0.8054	4.1108
32	52.3534	-0.8054	4.1108	0.0751	0.0751	0.0190
33	0.0751	-0.0226	0.0190	0.0537	-0.0226	0.0190
34	0.0537	-0.0226	0.0190	0.0322	-0.0226	0.0190
35	0.0322	-0.0226	0.0190	0.0107	-0.0226	0.0190
36	0.0107	-0.0226	0.0190	-0.0108	-0.0226	0.0190
37	-0.0108	-0.0226	0.0190	-0.0322	-0.0226	0.0190
38	-0.0322	-0.0226	0.0190	-0.0537	-0.0226	0.0190
39	-0.0537	-0.0226	0.0190	-0.0752	-0.0226	0.0190
40	-0.0752	-0.0226	0.0190	-0.0928	-0.0082	0.0040
41	-0.0928	-0.0082	0.0040	-86.6228	27.2502	49.2716
42	-86.6228	27.2502	49.2716	-66.8663	27.2502	49.2715
43	-66.8663	27.2502	49.2715	-49.1350	24.2504	41.3215
44	-49.1350	24.2504	41.3215	-32.7534	21.2507	33.3715
45	-32.7534	21.2507	33.3715	-17.7215	18.2508	25.4214
46	-17.7215	18.2508	25.4214	-4.4898	18.2509	25.4214
47	-4.4898	18.2509	25.4214	7.0174	15.2519	17.4713
48	7.0174	15.2519	17.4713	17.1766	12.2533	9.5214
49	17.1766	12.2533	9.5214	25.9860	9.2544	1.5713
50	25.9860	9.2544	1.5713	32.6964	9.2544	1.5713
51	32.6964	9.2544	1.5713	4.2729	-0.6993	1.1151
52	4.2729	-0.6993	1.1151	3.7661	-0.6988	1.1151
53	3.7661	-0.6988	1.1151	3.2595	-0.6987	1.1151
54	3.2595	-0.6987	1.1151	2.7529	-0.6982	1.1151
55	2.7529	-0.6982	1.1151	2.2469	-0.6983	1.1151
56	2.2469	-0.6983	1.1151	1.7403	-0.6987	1.1151
57	1.7403	-0.6987	1.1151	1.2341	-0.6984	1.1151
58	1.2341	-0.6984	1.1151	0.7278	-0.6984	1.1151
59	0.7278	-0.6984	1.1151	0.2215	-0.6982	1.1151
60	0.2215	-0.6982	1.1151	-0.2847	-0.6982	1.1151

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265

6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665	=====							
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112		1	-1.9066	0.1633	-0.4826	-1.3682	8.1050	20.4235
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112		2	-1.3682	8.1050	20.4235	10.3969	16.5503	54.4130
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014		3	10.3969	16.5503	54.4130	21.8713	13.5494	46.4630
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754		4	21.8713	13.5494	46.4630	31.6931	13.5481	46.4630
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754		5	31.6931	13.5481	46.4630	39.6412	10.5495	38.5130
12	24.7634	-5.7960	-12.5754	27.7316	-7.6011	-16.0686		6	39.6412	10.5495	38.5130	46.2401	7.5482	30.5630
13	27.7316	-7.6011	-16.0686	29.2324	-9.6173	-20.1137		7	46.2401	7.5482	30.5630	51.4864	4.5472	22.6130
14	29.2324	-9.6173	-20.1137	28.9407	-11.8316	-24.7406		8	51.4864	4.5472	22.6130	54.7843	4.5477	22.6130
15	28.9407	-11.8316	-24.7406	20.3623	-11.8344	-24.7406		9	54.7843	4.5477	22.6130	56.5075	1.5484	14.6630
16	20.3623	-11.8344	-24.7406	16.2604	-14.2321	-29.9762		10	56.5075	1.5484	14.6630	56.8793	-1.4546	6.7131
17	16.2604	-14.2321	-29.9762	-24.7955	-19.6261	-37.0194		11	56.8793	-1.4546	6.7131	55.8240	-1.4597	6.7131
18	-24.7955	-19.6261	-37.0194	-39.1758	-22.6271	-44.9694		12	55.8240	-1.4597	6.7131	52.6666	-4.4590	-1.2369
19	-39.1758	-22.6271	-44.9694	-55.5807	-22.6274	-44.9694		13	52.6666	-4.4590	-1.2369	48.1594	-7.4578	-9.1869
20	-55.5807	-22.6274	-44.9694	-32.8969	-9.8739	-27.3428		14	48.1594	-7.4578	-9.1869	42.3039	-10.4581	-17.1369
21	-32.8969	-9.8739	-27.3428	-36.0834	2.6343	-5.5397		15	42.3039	-10.4581	-17.1369	34.7216	-10.4591	-17.1368
22	-36.0834	2.6343	-5.5397	-32.1380	2.5241	-6.2323		16	34.7216	-10.4591	-17.1368	25.3386	-13.4602	-25.0868
23	-32.1380	2.5241	-6.2323	-26.8353	2.2857	-7.2122		17	25.3386	-13.4602	-25.0868	14.6047	-16.4609	-33.0368
24	-26.8353	2.2857	-7.2122	-20.3477	1.9038	-8.4925		18	14.6047	-16.4609	-33.0368	2.5191	-19.4617	-40.9869
25	-20.3477	1.9038	-8.4925	-12.9118	1.3652	-10.0868		19	2.5191	-19.4617	-40.9869	0.3426	0.1634	-0.4826
26	-12.9118	1.3652	-10.0868	-4.8241	0.6594	-12.0085		20	0.3426	0.1634	-0.4826	0.3970	0.0704	-0.2318
27	-4.8241	0.6594	-12.0085	3.5727	-0.2226	-14.2709		21	0.3970	0.0704	-0.2318	0.3115	-0.0226	0.0190
28	3.5727	-0.2226	-14.2709	11.8983	-1.2869	-16.8876		22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
29	11.8983	-1.2869	-16.8876	19.7457	-2.5372	-19.8719		23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
30	19.7457	-2.5372	-19.8719	26.6926	-3.9778	-23.2373		24	0.2685	-0.0226	0.0190	9.8360	17.3045	44.6148
31	26.6926	-3.9778	-23.2373	22.9133	-3.9773	-23.2374		25	9.8360	17.3045	44.6148	25.6518	14.8075	38.9604
32	22.9133	-3.9773	-23.2374	26.9831	-5.6063	-26.9971		26	25.6518	14.8075	38.9604	39.1179	11.8061	31.0104
33	26.9831	-5.6063	-26.9971	29.1199	-7.4219	-31.1648		27	39.1179	11.8061	31.0104	49.9902	9.2350	25.0638
34	29.1199	-7.4219	-31.1648	28.9146	-9.4197	-35.7538		28	49.9902	9.2350	25.0638	58.4650	6.2373	17.1138
35	28.9146	-9.4197	-35.7538	25.9893	-11.5942	-40.7775		29	58.4650	6.2373	17.1138	64.2433	3.2380	9.1639
36	25.9893	-11.5942	-40.7775	20.0008	-13.9365	-46.2494		30	64.2433	3.2380	9.1639	67.5351	0.6285	2.9204
37	20.0008	-13.9365	-46.2494	10.6731	-16.4218	-52.1954		31	67.5351	0.6285	2.9204	68.1308	0.6305	2.9203
38	10.6731	-16.4218	-52.1954	-2.3047	-19.0815	-58.5650		32	68.1308	0.6305	2.9203	66.0324	-2.3668	-5.0297
39	-2.3047	-19.0815	-58.5650	-19.1959	-21.9018	-65.3715		33	66.0324	-2.3668	-5.0297	61.4172	-4.9932	-11.5739
40	-19.1959	-21.9018	-65.3715	-48.1974	-10.4033	-41.2680		34	61.4172	-4.9932	-11.5739	54.2701	-7.9929	-19.5238
41	-48.1974	-10.4033	-41.2680	-53.7172	4.1026	-10.4859		35	54.2701	-7.9929	-19.5238	44.4267	-10.9928	-27.4739
42	-53.7172	4.1026	-10.4859	-50.7430	4.1026	-10.4860		36	44.4267	-10.9928	-27.4739	32.0716	-13.6150	-34.1348
43	-50.7430	4.1026	-10.4860	-46.6591	4.0301	-11.3798		37	32.0716	-13.6150	-34.1348	17.1858	-16.6165	-42.0848
44	-46.6591	4.0301	-11.3798	-41.0402	3.8218	-12.6046		38	17.1858	-16.6165	-42.0848	6.4913	2.6487	-5.5524
45	-41.0402	3.8218	-12.6046	-33.9725	3.4646	-14.1795		39	6.4913	2.6487	-5.5524	9.0076	2.6487	-5.5524
46	-33.9725	3.4646	-14.1795	-31.4610	3.4639	-14.1795		40	9.0076	2.6487	-5.5524	10.6750	0.9751	-2.2283
47	-31.4610	3.4639	-14.1795	-23.4800	2.9316	-16.1258		41	10.6750	0.9751	-2.2283	9.3502	-0.7010	1.1151
48	-23.4800	2.9316	-16.1258	-14.5515	2.2170	-18.4671		42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
49	-14.5515	2.2170	-18.4671	-4.9516	1.3017	-21.2297		43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
50	-4.9516	1.3017	-21.2297	-4.0072	1.3016	-21.2297		44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
51	-4.0072	1.3016	-21.2297	5.1145	0.1727	-24.4417		45	7.8256	-0.7007	1.1151	11.6422	15.3771	32.4481
52	5.1145	0.1727	-24.4417	14.0367	-1.1830	-28.1339		46	11.6422	15.3771	32.4481	22.7906	15.3884	32.0951
53	14.0367	-1.1830	-28.1339	13.1796	-1.1823	-28.1339		47	22.7906	15.3884	32.0951	32.2224	12.3923	24.1451
54	13.1796	-1.1823	-28.1339	20.3209	-2.7731	-32.3395		48	32.2224	12.3923	24.1451	40.3103	9.3964	16.1950
55	20.3209	-2.7731	-32.3395	26.1926	-4.6129	-37.0938		49	40.3103	9.3964	16.1950	47.0464	6.3965	8.2449
56	26.1926	-4.6129	-37.0938	30.2928	-6.7094	-42.4273		50	47.0464	6.3965	8.2449	51.6837	6.4023	8.2449
57	30.2928	-6.7094	-42.4273	25.4278	-6.7109	-42.4273		51	51.6837	6.4023	8.2449	54.8997	3.4044	0.2949
58	25.4278	-6.7109	-42.4273	25.5099	-9.0749	-48.3723		52	54.8997	3.4044	0.2949	56.7661	0.3988	-7.6551
59	25.5099	-9.0749	-48.3723	22.5270	-11.7128	-54.9725		53	56.7661	0.3988	-7.6551	57.0560	0.4020	-7.6553
60	22.5270	-11.7128	-54.9725	14.0352	-11.7122	-54.9725		54	57.0560	0.4020	-7.6553	55.4029	-2.5914	-15.6053
ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 1								55	55.4029	-2.5914	-15.6053	52.3993	-5.5919	-23.5553
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2		56	52.3993	-5.5919	-23.5553	48.0452	-8.5911	-31.5053
								57	48.0452	-8.5911	-31.5053	41.8160	-8.5894	-31.5053

58	41.8160	-8.5894	-31.5053	33.9388	-11.5901	-39.4554
59	33.9388	-11.5901	-39.4554	24.7112	-14.5914	-47.4054
60	24.7112	-14.5914	-47.4054	14.1319	-14.5919	-47.4053

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-17.7921	19.6296	61.7354	-3.5605	19.6294	61.7354
2	-3.5605	19.6294	61.7354	-1.6699	0.1632	-0.4826
3	-1.6699	0.1632	-0.4826	-1.5516	0.1632	-0.4826
4	-1.5516	0.1632	-0.4826	-1.4332	0.1632	-0.4826
5	-1.4332	0.1632	-0.4826	-1.3149	0.1632	-0.4826
6	-1.3149	0.1632	-0.4826	-1.1965	0.1632	-0.4826
7	-1.1965	0.1632	-0.4826	-1.0782	0.1633	-0.4826
8	-1.0782	0.1633	-0.4826	-0.9599	0.1633	-0.4826
9	-0.9599	0.1633	-0.4826	-2.7883	-2.8888	0.7775
10	-2.7883	-2.8888	0.7775	-5.1326	-3.8885	-1.8725
11	-5.1326	-3.8885	-1.8725	-7.9523	-3.8882	-1.8725
12	-7.9523	-3.8882	-1.8725	-11.4709	-4.8883	-4.5225
13	-11.4709	-4.8883	-4.5225	-15.4403	-5.8885	-7.1725
14	-15.4403	-5.8885	-7.1725	-19.8597	-6.8881	-9.8225
15	-19.8597	-6.8881	-9.8225	-24.8535	-6.8877	-9.8225
16	-24.8535	-6.8877	-9.8225	-30.4471	-7.8877	-12.4725
17	-30.4471	-7.8877	-12.4725	-36.4908	-8.8878	-15.1225
18	-36.4908	-8.8878	-15.1225	-42.9839	-9.8874	-17.7725
19	-42.9839	-9.8874	-17.7725	-50.1521	-9.8871	-17.7725
20	-50.1521	-9.8871	-17.7725	-69.3782	7.6755	24.8457
21	-69.3782	7.6755	24.8457	-56.4747	23.6276	63.8705
22	-56.4747	23.6276	63.8705	-34.9473	20.9997	57.3261
23	-34.9473	20.9997	57.3261	-31.2571	2.6495	-5.5523
24	-31.2571	2.6495	-5.5523	-28.7400	2.6502	-5.5524
25	-28.7400	2.6502	-5.5524	-26.2221	2.6501	-5.5524
26	-26.2221	2.6501	-5.5524	-23.7050	2.6496	-5.5524
27	-23.7050	2.6496	-5.5524	-21.1873	2.6502	-5.5524
28	-21.1873	2.6502	-5.5524	-18.6697	2.6501	-5.5524
29	-18.6697	2.6501	-5.5524	-16.1532	2.6493	-5.5524
30	-16.1532	2.6493	-5.5524	-13.6365	2.6486	-5.5524
31	-13.6365	2.6486	-5.5524	-11.1203	2.6484	-5.5524
32	-11.1203	2.6484	-5.5524	-8.6044	2.6485	-5.5524
33	-8.6044	2.6485	-5.5524	-6.0890	2.6487	-5.5524
34	-6.0890	2.6487	-5.5524	-3.5728	2.6484	-5.5524
35	-3.5728	2.6484	-5.5524	-7.2035	-5.4277	-12.4741
36	-7.2035	-5.4277	-12.4741	-13.0599	-6.4277	-15.1242
37	-13.0599	-6.4277	-15.1242	-19.8162	-7.4277	-17.7742
38	-19.8162	-7.4277	-17.7742	-27.4725	-8.4277	-20.4242
39	-27.4725	-8.4277	-20.4242	-36.0289	-9.4277	-23.0742
40	-36.0289	-9.4277	-23.0742	-57.2867	3.1491	2.8223
41	-57.2867	3.1491	2.8223	-56.7388	4.3167	-10.1996
42	-56.7388	4.3167	-10.1996	-53.6094	4.3181	-10.1996
43	-53.6094	4.3181	-10.1996	-50.4787	4.3181	-10.1996
44	-50.4787	4.3181	-10.1996	-47.3498	4.3156	-10.1996
45	-47.3498	4.3156	-10.1996	-44.2213	4.3168	-10.1996
46	-44.2213	4.3168	-10.1996	-41.0917	4.3176	-10.1996
47	-41.0917	4.3176	-10.1996	-37.9631	4.3105	-10.1997
48	-37.9631	4.3105	-10.1997	-34.8397	4.3057	-10.1997
49	-34.8397	4.3057	-10.1997	-31.7160	4.3067	-10.1997

50	-31.7160	4.3067	-10.1997	-28.5915	4.3064	-10.1997
51	-28.5915	4.3064	-10.1997	-25.4683	4.3040	-10.1997
52	-25.4683	4.3040	-10.1997	-22.3480	4.3032	-10.1997
53	-22.3480	4.3032	-10.1997	-19.2262	4.3036	-10.1997
54	-19.2262	4.3036	-10.1997	-16.1069	4.3019	-10.1997
55	-16.1069	4.3019	-10.1997	-12.9881	4.3009	-10.1997
56	-12.9881	4.3009	-10.1997	-9.8696	4.3013	-10.1997
57	-9.8696	4.3013	-10.1997	-6.7504	4.3013	-10.1997
58	-6.7504	4.3013	-10.1997	-3.6546	4.2655	-9.9147
59	-3.6546	4.2655	-9.9147	-0.5771	4.1158	-9.4270
60	-0.5771	4.1158	-9.4270	-0.2847	-0.6982	1.1151

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-17.7921	19.6296	61.7354	-3.5605	19.6294	61.7354
2	-3.5605	19.6294	61.7354	9.3212	16.6296	53.7854
3	9.3212	16.6296	53.7854	18.4536	13.6325	47.6547
4	18.4536	13.6325	47.6547	28.3374	13.6322	47.6547
5	28.3374	13.6322	47.6547	32.2365	10.8310	40.3974
6	32.2365	10.8310	40.3974	33.5665	8.1503	33.2859
7	33.5665	8.1503	33.2859	32.6340	5.5984	26.3751
8	32.6340	5.5984	26.3751	36.6949	5.5989	26.3751
9	36.6949	5.5989	26.3751	32.0831	3.1963	19.7161
10	32.0831	3.1963	19.7161	25.9819	0.9365	13.3552
11	25.9819	0.9365	13.3552	26.6597	0.9355	13.3552
12	26.6597	0.9355	13.3552	-0.4863	0.1633	-0.4826
13	-0.4863	0.1633	-0.4826	-0.3679	0.1633	-0.4826
14	-0.3679	0.1633	-0.4826	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-67.6293	9.2994	28.2692
21	-67.6293	9.2994	28.2692	-55.2080	26.8064	70.7605
22	-55.2080	26.8064	70.7605	-32.8838	24.2379	64.8139
23	-32.8838	24.2379	64.8139	-13.2835	21.6260	58.5704
24	-13.2835	21.6260	58.5704	3.3517	18.9997	52.0261
25	3.3517	18.9997	52.0261	16.8624	16.3800	45.3652
26	16.8624	16.3800	45.3652	27.1745	13.7908	38.7994
27	27.1745	13.7908	38.7994	34.3211	11.2531	32.3611
28	34.3211	11.2531	32.3611	38.4264	8.7946	26.0821
29	38.4264	8.7946	26.0821	39.6857	6.4180	19.9914
30	39.6857	6.4180	19.9914	38.3552	4.1553	14.1166
31	38.3552	4.1553	14.1166	42.3032	4.1540	14.1165
32	42.3032	4.1540	14.1165	-8.6044	2.6485	-5.5524
33	-8.6044	2.6485	-5.5524	-6.0890	2.6487	-5.5524
34	-6.0890	2.6487	-5.5524	-3.5728	2.6484	-5.5524
35	-3.5728	2.6484	-5.5524	-1.0574	2.6480	-5.5524
36	-1.0574	2.6480	-5.5524	1.4589	2.6486	-5.5524
37	1.4589	2.6486	-5.5524	3.9751	2.6487	-5.5524
38	3.9751	2.6487	-5.5524	6.4913	2.6487	-5.5524
39	6.4913	2.6487	-5.5524	9.0076	2.6487	-5.5524
40	9.0076	2.6487	-5.5524	-56.7223	8.4865	19.1609
41	-56.7223	8.4865	19.1609	-48.9640	24.3866	55.9452
42	-48.9640	24.3866	55.9452	-31.2835	24.3870	55.9452
43	-31.2835	24.3870	55.9452	-15.6277	21.3870	47.9951

44	-15.6277	21.3870	47.9951	-1.3216	18.3860	40.0452
45	-1.3216	18.3860	40.0452	11.6339	15.3875	32.0951
46	11.6339	15.3875	32.0951	22.7906	15.3884	32.0951
47	22.7906	15.3884	32.0951	32.2224	12.3923	24.1451
48	32.2224	12.3923	24.1451	40.3103	9.3964	16.1950
49	40.3103	9.3964	16.1950	47.0464	6.3965	8.2449
50	47.0464	6.3965	8.2449	51.6837	6.4023	8.2449
51	51.6837	6.4023	8.2449	-25.4683	4.3040	-10.1997
52	-25.4683	4.3040	-10.1997	-22.3480	4.3032	-10.1997
53	-22.3480	4.3032	-10.1997	-19.2262	4.3036	-10.1997
54	-19.2262	4.3036	-10.1997	-16.1069	4.3019	-10.1997
55	-16.1069	4.3019	-10.1997	-12.9881	4.3009	-10.1997
56	-12.9881	4.3009	-10.1997	-9.8696	4.3013	-10.1997
57	-9.8696	4.3013	-10.1997	-6.7504	4.3013	-10.1997
58	-6.7504	4.3013	-10.1997	-3.6326	4.3013	-10.1997
59	-3.6326	4.3013	-10.1997	-0.5140	4.3018	-10.1997
60	-0.5140	4.3018	-10.1997	2.6046	4.3017	-10.1997

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265
6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754
12	24.7634	-5.7960	-12.5754	27.7316	-7.6011	-16.0686
13	27.7316	-7.6011	-16.0686	29.2324	-9.6173	-20.1137
14	29.2324	-9.6173	-20.1137	28.9407	-11.8316	-24.7406
15	28.9407	-11.8316	-24.7406	20.3623	-11.8344	-24.7406
16	20.3623	-11.8344	-24.7406	16.2604	-14.2321	-29.9762
17	16.2604	-14.2321	-29.9762	9.7519	-16.8022	-35.8450
18	9.7519	-16.8022	-35.8450	0.6941	-19.5245	-42.3684
19	0.6941	-19.5245	-42.3684	-13.4627	-19.5261	-42.3684
20	-13.4627	-19.5261	-42.3684	-32.8969	-9.8739	-27.3428
21	-32.8969	-9.8739	-27.3428	0.3115	-0.0226	0.0190
22	0.3115	-0.0226	0.0190	0.2900	-0.0226	0.0190
23	0.2900	-0.0226	0.0190	0.2685	-0.0226	0.0190
24	0.2685	-0.0226	0.0190	0.2470	-0.0226	0.0190
25	0.2470	-0.0226	0.0190	0.2255	-0.0226	0.0190
26	0.2255	-0.0226	0.0190	0.2040	-0.0226	0.0190
27	0.2040	-0.0226	0.0190	7.9212	-0.7676	-13.3219
28	7.9212	-0.7676	-13.3219	16.9597	-2.0071	-15.6356
29	16.9597	-2.0071	-15.6356	25.2504	-3.4431	-18.2930
30	25.2504	-3.4431	-18.2930	32.3025	-5.0695	-21.3172
31	32.3025	-5.0695	-21.3172	27.4861	-5.0694	-21.3171
32	27.4861	-5.0694	-21.3171	31.1100	-6.8793	-24.7322
33	31.1100	-6.8793	-24.7322	32.4241	-8.8618	-28.5638
34	32.4241	-8.8618	-28.5638	31.0441	-11.0059	-32.8391
35	31.0441	-11.0059	-32.8391	26.6604	-13.2887	-37.5864

36	26.6604	-13.2887	-37.5864	19.0351	-15.6910	-42.8352
37	19.0351	-15.6910	-42.8352	8.0159	-18.1924	-48.4897
38	8.0159	-18.1924	-48.4897	-6.4430	-20.7589	-54.4362
39	-6.4430	-20.7589	-54.4362	-24.2723	-23.3687	-60.6796
40	-24.2723	-23.3687	-60.6796	-52.5888	-10.8399	-38.7118
41	-52.5888	-10.8399	-38.7118	9.3502	-0.7010	1.1151
42	9.3502	-0.7010	1.1151	8.8421	-0.7011	1.1151
43	8.8421	-0.7011	1.1151	8.3339	-0.7013	1.1151
44	8.3339	-0.7013	1.1151	7.8256	-0.7007	1.1151
45	7.8256	-0.7007	1.1151	7.3177	-0.7004	1.1151
46	7.3177	-0.7004	1.1151	6.8097	-0.7007	1.1151
47	6.8097	-0.7007	1.1151	6.3017	-0.7003	1.1151
48	6.3017	-0.7003	1.1151	5.7944	-0.6998	1.1151
49	5.7944	-0.6998	1.1151	5.2870	-0.6996	1.1151
50	5.2870	-0.6996	1.1151	4.7801	-0.6995	1.1151
51	4.7801	-0.6995	1.1151	15.1390	-1.5112	-20.7282
52	15.1390	-1.5112	-20.7282	24.4151	-3.1659	-23.7752
53	24.4151	-3.1659	-23.7752	22.1203	-3.1665	-23.7752
54	22.1203	-3.1665	-23.7752	28.8996	-5.0378	-27.3539
55	28.8996	-5.0378	-27.3539	33.9059	-7.1330	-31.5208
56	33.9059	-7.1330	-31.5208	36.6648	-9.4447	-36.3371
57	36.6648	-9.4447	-36.3371	29.8180	-9.4436	-36.3371
58	29.8180	-9.4436	-36.3371	28.0377	-11.9636	-41.8685
59	28.0377	-11.9636	-41.8685	22.9471	-14.6831	-48.1846
60	22.9471	-14.6831	-48.1846	12.3018	-14.6831	-48.1846

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-16.5990	19.5485	62.3630	-2.4264	19.5490	62.3630
2	-2.4264	19.5490	62.3630	9.5940	16.5427	54.9978
3	9.5940	16.5427	54.9978	18.4536	13.6325	47.6547
4	18.4536	13.6325	47.6547	28.3374	13.6322	47.6547
5	28.3374	13.6322	47.6547	32.2365	10.8310	40.3974
6	32.2365	10.8310	40.3974	33.5665	8.1503	33.2859
7	33.5665	8.1503	33.2859	32.6340	5.5984	26.3751
8	32.6340	5.5984	26.3751	36.6949	5.5989	26.3751
9	36.6949	5.5989	26.3751	32.0831	3.1963	19.7161
10	32.0831	3.1963	19.7161	25.9819	0.9365	13.3552
11	25.9819	0.9365	13.3552	26.6597	0.9355	13.3552
12	26.6597	0.9355	13.3552	17.8790	-1.1699	7.3342
13	17.8790	-1.1699	7.3342	8.3938	-3.1215	1.6904
14	8.3938	-3.1215	1.6904	-0.2496	0.1633	-0.4826
15	-0.2496	0.1633	-0.4826	-0.1311	0.1633	-0.4826
16	-0.1311	0.1633	-0.4826	-0.0127	0.1633	-0.4826
17	-0.0127	0.1633	-0.4826	0.1057	0.1633	-0.4826
18	0.1057	0.1633	-0.4826	0.2241	0.1634	-0.4826
19	0.2241	0.1634	-0.4826	0.3426	0.1634	-0.4826
20	0.3426	0.1634	-0.4826	-67.6293	9.2994	28.2692
21	-67.6293	9.2994	28.2692	-55.2080	26.8064	70.7605
22	-55.2080	26.8064	70.7605	-32.8838	24.2379	64.8139
23	-32.8838	24.2379	64.8139	-13.2835	21.6260	58.5704
24	-13.2835	21.6260	58.5704	3.3517	18.9997	52.0261
25	3.3517	18.9997	52.0261	16.8624	16.3800	45.3652
26	16.8624	16.3800	45.3652	27.1745	13.7908	38.7994
27	27.1745	13.7908	38.7994	34.3211	11.2531	32.3611
28	34.3211	11.2531	32.3611	38.4264	8.7946	26.0821
29	38.4264	8.7946	26.0821	39.6857	6.4180	19.9914

30	39.6857	6.4180	19.9914	38.3552	4.1553	14.1166	22	-36.2911	2.6493	-5.5524	-32.0991	2.5208	-6.2063
31	38.3552	4.1553	14.1166	42.3032	4.1540	14.1165	23	-32.0991	2.5208	-6.2063	-26.1970	2.2311	-7.0959
32	42.3032	4.1540	14.1165	36.6445	2.0080	8.4827	24	-26.1970	2.2311	-7.0959	-18.8654	1.7663	-8.2356
33	36.6445	2.0080	8.4827	29.1579	-0.0134	3.1129	25	-18.8654	1.7663	-8.2356	-10.4563	1.1168	-9.6414
34	29.1579	-0.0134	3.1129	0.0322	-0.0226	0.0190	26	-10.4563	1.1168	-9.6414	-1.3770	0.2731	-11.3306
35	0.0322	-0.0226	0.0190	0.0107	-0.0226	0.0190	27	-1.3770	0.2731	-11.3306	7.9212	-0.7676	-13.3219
36	0.0107	-0.0226	0.0190	-0.0108	-0.0226	0.0190	28	7.9212	-0.7676	-13.3219	16.9597	-2.0071	-15.6356
37	-0.0108	-0.0226	0.0190	-0.0322	-0.0226	0.0190	29	16.9597	-2.0071	-15.6356	25.2504	-3.4431	-18.2930
38	-0.0322	-0.0226	0.0190	-0.0537	-0.0226	0.0190	30	25.2504	-3.4431	-18.2930	32.3025	-5.0695	-21.3172
39	-0.0537	-0.0226	0.0190	-0.0752	-0.0226	0.0190	31	32.3025	-5.0695	-21.3172	27.4861	-5.0694	-21.3171
40	-0.0752	-0.0226	0.0190	-56.7223	8.4865	19.1609	32	27.4861	-5.0694	-21.3171	31.1100	-6.8793	-24.7322
41	-56.7223	8.4865	19.1609	-48.9301	24.3779	56.2981	33	31.1100	-6.8793	-24.7322	32.4241	-8.8618	-28.5638
42	-48.9301	24.3779	56.2981	-31.2554	24.3771	56.2981	34	32.4241	-8.8618	-28.5638	31.0441	-11.0059	-32.8391
43	-31.2554	24.3771	56.2981	-15.6071	21.3764	48.3481	35	31.0441	-11.0059	-32.8391	26.6604	-13.2887	-37.5864
44	-15.6071	21.3764	48.3481	-1.3075	18.3765	40.3981	36	26.6604	-13.2887	-37.5864	19.0351	-15.6910	-42.8352
45	-1.3075	18.3765	40.3981	11.6422	15.3771	32.4481	37	19.0351	-15.6910	-42.8352	8.0159	-18.1924	-48.4897
46	11.6422	15.3771	32.4481	22.7906	15.3808	32.4481	38	8.0159	-18.1924	-48.4897	-6.4430	-20.7589	-54.4362
47	22.7906	15.3808	32.4481	32.2179	12.3857	24.4979	39	-6.4430	-20.7589	-54.4362	-24.2723	-23.3687	-60.6796
48	32.2179	12.3857	24.4979	40.2983	9.3883	16.5479	40	-24.2723	-23.3687	-60.6796	-52.5888	-10.8399	-38.7118
49	40.2983	9.3883	16.5479	47.0285	6.3873	8.5979	41	-52.5888	-10.8399	-38.7118	-55.2990	4.2174	-10.4856
50	47.0285	6.3873	8.5979	51.6599	6.3867	8.5979	42	-55.2990	4.2174	-10.4856	-52.2417	4.2178	-10.4856
51	51.6599	6.3867	8.5979	4.2729	-0.6993	1.1151	43	-52.2417	4.2178	-10.4856	-45.9621	3.9668	-11.0145
52	4.2729	-0.6993	1.1151	3.7661	-0.6988	1.1151	44	-45.9621	3.9668	-11.0145	-38.0322	3.5455	-11.8057
53	3.7661	-0.6988	1.1151	3.2595	-0.6987	1.1151	45	-38.0322	3.5455	-11.8057	-28.6499	2.9432	-12.8843
54	3.2595	-0.6987	1.1151	2.7529	-0.6982	1.1151	46	-28.6499	2.9432	-12.8843	-26.5161	2.9430	-12.8843
55	2.7529	-0.6982	1.1151	2.2469	-0.6983	1.1151	47	-26.5161	2.9430	-12.8843	-16.5228	2.1447	-14.2797
56	2.2469	-0.6983	1.1151	1.7403	-0.6987	1.1151	48	-16.5228	2.1447	-14.2797	-5.8109	1.1395	-16.0257
57	1.7403	-0.6987	1.1151	1.2341	-0.6984	1.1151	49	-5.8109	1.1395	-16.0257	5.2462	-0.0768	-18.1609
58	1.2341	-0.6984	1.1151	0.7278	-0.6984	1.1151	50	5.2462	-0.0768	-18.1609	5.1904	-0.0766	-18.1609
59	0.7278	-0.6984	1.1151	0.2215	-0.6982	1.1151	51	5.1904	-0.0766	-18.1609	15.1390	-1.5112	-20.7282
60	0.2215	-0.6982	1.1151	-0.2847	-0.6982	1.1151	52	15.1390	-1.5112	-20.7282	24.4151	-3.1659	-23.7752
ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 1							53	24.4151	-3.1659	-23.7752	22.1203	-3.1665	-23.7752
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	22.1203	-3.1665	-23.7752	28.8996	-5.0378	-27.3539
=====	=====	=====	=====	=====	=====	=====	55	28.8996	-5.0378	-27.3539	33.9059	-7.1330	-31.5208
1	-1.9066	0.1633	-0.4826	-1.7882	0.1632	-0.4826	56	33.9059	-7.1330	-31.5208	36.6648	-9.4447	-36.3371
2	-1.7882	0.1632	-0.4826	-0.6595	0.0677	-1.1822	57	36.6648	-9.4447	-36.3371	29.8180	-9.4436	-36.3371
3	-0.6595	0.0677	-1.1822	2.8374	-0.2857	-2.1472	58	29.8180	-9.4436	-36.3371	28.0377	-11.9636	-41.8685
4	2.8374	-0.2857	-2.1472	2.6302	-0.2857	-2.1472	59	28.0377	-11.9636	-41.8685	22.9471	-14.6831	-48.1846
5	2.6302	-0.2857	-2.1472	7.5113	-0.8951	-3.4265	60	22.9471	-14.6831	-48.1846	12.3018	-14.6831	-48.1846
6	7.5113	-0.8951	-3.4265	13.5049	-1.7562	-5.0665	ENVOL. MAX. FLECTORES TREN TREN LM 71, EC-1 en via 1						
7	13.5049	-1.7562	-5.0665	20.0993	-2.8636	-7.1112	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
8	20.0993	-2.8636	-7.1112	18.0222	-2.8653	-7.1112	=====	=====	=====	=====	=====	=====	=====
9	18.0222	-2.8653	-7.1112	23.7517	-4.2134	-9.6014	1	1.5514	-4.7033	-6.0765	1.2648	31.0639	83.2554
10	23.7517	-4.2134	-9.6014	28.9653	-5.7970	-12.5754	2	1.2648	31.0639	83.2554	23.4023	24.3381	71.5794
11	28.9653	-5.7970	-12.5754	24.7634	-5.7960	-12.5754	3	23.4023	24.3381	71.5794	45.8026	32.5257	97.6794
12	24.7634	-5.7960	-12.5754	27.7316	-7.6011	-16.0686	4	45.8026	32.5257	97.6794	60.8426	20.3242	65.3495
13	27.7316	-7.6011	-16.0686	29.2324	-9.6173	-20.1137	5	60.8426	20.3242	65.3495	75.5767	20.3252	65.3495
14	29.2324	-9.6173	-20.1137	28.9407	-11.8316	-24.7406	6	75.5767	20.3252	65.3495	87.2430	16.4146	58.4352
15	28.9407	-11.8316	-24.7406	20.3623	-11.8344	-24.7406	7	87.2430	16.4146	58.4352	95.7840	4.2079	26.1052
16	20.3623	-11.8344	-24.7406	16.2604	-14.2321	-29.9762	8	95.7840	4.2079	26.1052	103.1572	6.5142	34.7161
17	16.2604	-14.2321	-29.9762	9.7519	-16.8022	-35.8450	9	103.1572	6.5142	34.7161	103.4557	0.4123	18.5511
18	9.7519	-16.8022	-35.8450	0.6941	-19.5245	-42.3684	10	103.4557	0.4123	18.5511	103.7880	-3.2344	10.4025
19	0.6941	-19.5245	-42.3684	-13.4627	-19.5261	-42.3684	11	103.7880	-3.2344	10.4025	101.4384	-3.2399	10.4025
20	-13.4627	-19.5261	-42.3684	-32.8969	-9.8739	-27.3428	12	101.4384	-3.2399	10.4025	95.4492	-6.7213	1.7050
21	-32.8969	-9.8739	-27.3428	-36.2911	2.6493	-5.5524	13	95.4492	-6.7213	1.7050	90.2748	-18.9182	-30.6250
							14	90.2748	-18.9182	-30.6250	79.1333	-10.0064	-7.4965
							15	79.1333	-10.0064	-7.4965	66.0829	-22.2076	-39.8265

16	66.0829	-22.2076	-39.8265	53.4998	-25.2709	-49.4867	8	-22.8549	-4.8061	-6.0636	-26.3415	-4.8064	-6.0636
17	53.4998	-25.2709	-49.4867	38.6104	-15.9004	-27.2272	9	-26.3415	-4.8064	-6.0636	-29.8270	-4.8054	-6.0636
18	38.6104	-15.9004	-27.2272	20.4499	-18.4601	-36.6877	10	-29.8270	-4.8054	-6.0636	-33.3122	-4.8039	-6.0636
19	20.4499	-18.4601	-36.6877	13.2031	0.9894	1.7292	11	-33.3122	-4.8039	-6.0636	-36.7952	-4.8040	-6.0636
20	13.2031	0.9894	1.7292	14.5066	-1.2778	-0.5665	12	-36.7952	-4.8040	-6.0636	-40.2787	-4.8038	-6.0636
21	14.5066	-1.2778	-0.5665	11.7251	-3.5450	-2.8622	13	-40.2787	-4.8038	-6.0636	-43.7614	-4.8048	-6.0636
22	11.7251	-3.5450	-2.8622	8.3573	-3.5450	-2.8622	14	-43.7614	-4.8048	-6.0636	-47.2456	-4.8040	-6.0636
23	8.3573	-3.5450	-2.8622	24.8275	28.5768	72.7760	15	-47.2456	-4.8040	-6.0636	-50.7275	-4.8003	-6.0636
24	24.8275	28.5768	72.7760	46.3884	25.9786	67.5379	16	-50.7275	-4.8003	-6.0636	-54.2087	-4.7998	-6.0636
25	46.3884	25.9786	67.5379	65.5753	13.7762	35.2079	17	-54.2087	-4.7998	-6.0636	-57.6901	-4.7994	-6.0636
26	65.5753	13.7762	35.2079	82.7043	11.0238	29.7516	18	-57.6901	-4.7994	-6.0636	-61.1701	-4.7991	-6.0636
27	82.7043	11.0238	29.7516	96.7113	8.1476	24.0770	19	-61.1701	-4.7991	-6.0636	-64.6495	-4.7998	-6.0636
28	96.7113	8.1476	24.0770	107.1997	5.1922	18.1842	20	-64.6495	-4.7998	-6.0636	-79.6008	13.8975	41.4785
29	107.1997	5.1922	18.1842	113.8833	2.1834	12.0731	21	-79.6008	13.8975	41.4785	-62.7200	29.5894	82.8442
30	113.8833	2.1834	12.0731	116.6322	-0.8354	5.7437	22	-62.7200	29.5894	82.8442	-54.4400	4.2713	-7.8144
31	116.6322	-0.8354	5.7437	115.8382	-0.8391	5.7437	23	-54.4400	4.2713	-7.8144	-50.3816	4.2723	-7.8144
32	115.8382	-0.8391	5.7437	111.7865	-3.8354	-0.8038	24	-50.3816	4.2723	-7.8144	-46.3229	4.2719	-7.8144
33	111.7865	-3.8354	-0.8038	103.9755	-6.7794	-7.5694	25	-46.3229	4.2719	-7.8144	-42.2643	4.2715	-7.8144
34	103.9755	-6.7794	-7.5694	92.6851	-9.6306	-14.5534	26	-42.2643	4.2715	-7.8144	-38.2063	4.2722	-7.8144
35	92.6851	-9.6306	-14.5534	79.2624	-21.8307	-46.8835	27	-38.2063	4.2722	-7.8144	-34.1467	4.2720	-7.8144
36	79.2624	-21.8307	-46.8835	62.9526	-24.5639	-54.0857	28	-34.1467	4.2720	-7.8144	-30.0882	4.2707	-7.8144
37	62.9526	-24.5639	-54.0857	44.3151	-27.1271	-61.5059	29	-30.0882	4.2707	-7.8144	-26.0312	4.2703	-7.8144
38	44.3151	-27.1271	-61.5059	24.0466	-29.4931	-69.1421	30	-26.0312	4.2703	-7.8144	-21.9735	4.2690	-7.8144
39	24.0466	-29.4931	-69.1421	14.5321	4.2701	-7.8144	31	-21.9735	4.2690	-7.8144	-21.9520	-3.5459	-2.8622
40	14.5321	4.2701	-7.8144	17.3558	1.5617	-2.9856	32	-21.9520	-3.5459	-2.8622	-25.3214	-3.5468	-2.8622
41	17.3558	1.5617	-2.9856	15.2914	-1.1467	1.8433	33	-25.3214	-3.5468	-2.8622	-28.6916	-3.5473	-2.8622
42	15.2914	-1.1467	1.8433	14.4602	-1.1468	1.8433	34	-28.6916	-3.5473	-2.8622	-32.0604	-3.5464	-2.8622
43	14.4602	-1.1468	1.8433	16.1053	30.6238	74.2977	35	-32.0604	-3.5464	-2.8622	-35.4296	-3.5468	-2.8622
44	16.1053	30.6238	74.2977	34.1694	27.9516	68.4086	36	-35.4296	-3.5468	-2.8622	-38.7992	-3.5469	-2.8622
45	34.1694	27.9516	68.4086	51.0294	25.0485	62.0993	37	-38.7992	-3.5469	-2.8622	-42.1673	-3.5466	-2.8622
46	51.0294	25.0485	62.0993	68.5770	12.8517	29.7694	38	-42.1673	-3.5466	-2.8622	-45.5358	-3.5464	-2.8622
47	68.5770	12.8517	29.7694	81.8606	21.9371	55.3230	39	-45.5358	-3.5464	-2.8622	-48.9042	-3.5459	-2.8622
48	81.8606	21.9371	55.3230	91.8045	18.6375	48.0345	40	-48.9042	-3.5459	-2.8622	-77.9270	-12.5204	-42.9767
49	91.8045	18.6375	48.0345	102.5686	6.4354	15.7045	41	-77.9270	-12.5204	-42.9767	-80.9421	6.1432	-13.7238
50	102.5686	6.4354	15.7045	109.4051	15.1698	40.1884	42	-80.9421	6.1432	-13.7238	-76.4887	6.1438	-13.7239
51	109.4051	15.1698	40.1884	112.1745	2.9689	7.8583	43	-76.4887	6.1438	-13.7239	-72.0343	6.1441	-13.7239
52	112.1745	2.9689	7.8583	114.3195	2.9628	7.8583	44	-72.0343	6.1441	-13.7239	-67.5805	6.1412	-13.7239
53	114.3195	2.9628	7.8583	112.5856	-0.6422	-0.5906	45	-67.5805	6.1412	-13.7239	-63.1293	6.1404	-13.7239
54	112.5856	-0.6422	-0.5906	109.0739	-12.8383	-32.9207	46	-63.1293	6.1404	-13.7239	-58.6762	6.1411	-13.7239
55	109.0739	-12.8383	-32.9207	103.1279	-4.3685	-9.6872	47	-58.6762	6.1411	-13.7239	-54.2245	6.1375	-13.7239
56	103.1279	-4.3685	-9.6872	91.4185	-16.5713	-42.0172	48	-54.2245	6.1375	-13.7239	-49.7794	6.1336	-13.7239
57	91.4185	-16.5713	-42.0172	79.4090	-16.5681	-42.0173	49	-49.7794	6.1336	-13.7239	-45.3315	6.1283	-13.7240
58	79.4090	-16.5681	-42.0173	63.2519	-20.3951	-51.8056	50	-45.3315	6.1283	-13.7240	-40.8892	6.1272	-13.7240
59	63.2519	-20.3951	-51.8056	45.1109	-32.5938	-84.1357	51	-40.8892	6.1272	-13.7240	-36.4441	6.1297	-13.7240
60	45.1109	-32.5938	-84.1357	24.1643	-24.2929	-62.3163	52	-36.4441	6.1297	-13.7240	-32.0010	6.1263	-13.7240
ENVOL. MIN. FLECTORES TREN TREN LM 71, EC-1 en vía 1							53	-32.0010	6.1263	-13.7240	-27.5614	6.1245	-13.7240
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	-27.5614	6.1245	-13.7240	-23.1220	6.1247	-13.7240
=====	=====	=====	=====	=====	=====	=====	55	-23.1220	6.1247	-13.7240	-18.6842	6.1241	-13.7240
1	-27.9375	40.6278	109.4224	-7.2723	0.6637	-1.9624	56	-18.6842	6.1241	-13.7240	-14.2450	6.1213	-13.7240
2	-7.2723	0.6637	-1.9624	-6.7910	0.6638	-1.9625	57	-14.2450	6.1213	-13.7240	-9.8083	6.1198	-13.7240
3	-6.7910	0.6638	-1.9625	-8.9105	-4.8087	-6.0637	58	-9.8083	6.1198	-13.7240	-5.3706	6.1210	-13.7240
4	-8.9105	-4.8087	-6.0637	-12.3966	-4.8089	-6.0636	59	-5.3706	6.1210	-13.7240	-0.9726	6.0455	-13.3582
5	-12.3966	-4.8089	-6.0636	-15.8829	-4.8088	-6.0636	60	-0.9726	6.0455	-13.3582	-0.4707	-1.1423	1.8433
6	-15.8829	-4.8088	-6.0636	-19.3695	-4.8070	-6.0636	ENVOL. MAX. CORTANTES TREN TREN LM 71, EC-1 en vía 1						
7	-19.3695	-4.8070	-6.0636	-22.8549	-4.8061	-6.0636	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
							=====	=====	=====	=====	=====	=====	=====
							1	-27.9375	40.6278	109.4224	-0.0387	36.5382	103.9095

2	-0.0387	36.5382	103.9095	22.2209	32.5238	97.6794
3	22.2209	32.5238	97.6794	45.8026	32.5257	97.6794
4	45.8026	32.5257	97.6794	59.7908	28.6070	90.7651
5	59.7908	28.6070	90.7651	68.7064	24.8171	83.2110
6	68.7064	24.8171	83.2110	72.9106	21.1651	75.0625
7	72.9106	21.1651	75.0625	88.2541	21.1632	75.0625
8	88.2541	21.1632	75.0625	85.6515	17.6847	66.3649
9	85.6515	17.6847	66.3649	79.3976	14.4035	57.1633
10	79.3976	14.4035	57.1633	70.0847	11.3342	47.5032
11	70.0847	11.3342	47.5032	78.3004	11.3358	47.5032
12	78.3004	11.3358	47.5032	64.5049	8.5098	37.4326
13	64.5049	8.5098	37.4326	48.9257	5.9462	27.9723
14	48.9257	5.9462	27.9723	53.2367	5.9444	27.9724
15	53.2367	5.9444	27.9724	34.8819	3.6586	19.3078
16	34.8819	3.6586	19.3078	16.1428	1.6609	12.3307
17	16.1428	1.6609	12.3307	11.7687	0.9897	1.7292
18	11.7687	0.9897	1.7292	12.4860	0.9895	1.7292
19	12.4860	0.9895	1.7292	13.2031	0.9894	1.7292
20	13.2031	0.9894	1.7292	-51.6976	20.2923	54.5198
21	-51.6976	20.2923	54.5198	-38.6187	40.7770	105.1060
22	-38.6187	40.7770	105.1060	-12.7279	38.1779	99.8680
23	-12.7279	38.1779	99.8680	11.0323	35.4215	94.4117
24	11.0323	35.4215	94.4117	32.0152	32.5463	88.7370
25	32.0152	32.5463	88.7370	49.7147	29.5891	82.8441
26	49.7147	29.5891	82.8441	63.7547	26.5788	76.7330
27	63.7547	26.5788	76.7330	89.0027	26.5784	76.7330
28	89.0027	26.5784	76.7330	96.2663	23.5527	70.4037
29	96.2663	23.5527	70.4037	99.5484	20.5579	63.8562
30	99.5484	20.5579	63.8562	98.9014	17.6104	57.0904
31	98.9014	17.6104	57.0904	94.5242	14.7680	50.1064
32	94.5242	14.7680	50.1064	86.7437	12.0407	42.9043
33	86.7437	12.0407	42.9043	76.0216	9.4777	35.4841
34	76.0216	9.4777	35.4841	62.9238	7.1080	27.8479
35	62.9238	7.1080	27.8479	47.9466	4.9531	20.7618
36	47.9466	4.9531	20.7618	2.3622	4.2709	-7.8144
37	2.3622	4.2709	-7.8144	6.4193	4.2705	-7.8144
38	6.4193	4.2705	-7.8144	10.4755	4.2698	-7.8144
39	10.4755	4.2698	-7.8144	14.5321	4.2701	-7.8144
40	14.5321	4.2701	-7.8144	-45.4100	20.3476	53.2209
41	-45.4100	20.3476	53.2209	-38.5238	40.1520	100.7387
42	-38.5238	40.1520	100.7387	-9.4135	40.1524	100.7387
43	-9.4135	40.1524	100.7387	8.3073	37.2415	94.4294
44	8.3073	37.2415	94.4294	24.4104	34.1251	87.6531
45	24.4104	34.1251	87.6531	49.1509	34.1261	87.6531
46	49.1509	34.1261	87.6531	60.5266	30.8146	80.3645
47	60.5266	30.8146	80.3645	68.8144	27.3517	72.5186
48	68.8144	27.3517	72.5186	73.4594	23.7444	64.0699
49	73.4594	23.7444	64.0699	90.6749	23.7439	64.0697
50	90.6749	23.7439	64.0697	88.4865	20.0163	54.9730
51	88.4865	20.0163	54.9730	81.6761	16.1891	45.1848
52	81.6761	16.1891	45.1848	69.9157	12.2915	34.6733
53	69.9157	12.2915	34.6733	78.8307	12.2955	34.6732
54	78.8307	12.2955	34.6732	61.2668	8.6606	24.7924
55	61.2668	8.6606	24.7924	-18.6842	6.1241	-13.7240
56	-18.6842	6.1241	-13.7240	-14.2450	6.1213	-13.7240
57	-14.2450	6.1213	-13.7240	-9.8083	6.1198	-13.7240
58	-9.8083	6.1198	-13.7240	-5.3706	6.1210	-13.7240
59	-5.3706	6.1210	-13.7240	-0.9329	6.1197	-13.7240
60	-0.9329	6.1197	-13.7240	3.5038	6.1187	-13.7240

ENVOL. MIN. CORTANTES TREN TREN LM 71, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	1.5480	-4.8080	-6.0636	-1.9379	-4.8082	-6.0636
2	-1.9379	-4.8082	-6.0636	-5.4243	-4.8085	-6.0637
3	-5.4243	-4.8085	-6.0637	-8.9105	-4.8087	-6.0637
4	-8.9105	-4.8087	-6.0637	-12.3966	-4.8089	-6.0636
5	-12.3966	-4.8089	-6.0636	-15.8829	-4.8088	-6.0636
6	-15.8829	-4.8088	-6.0636	42.5033	-5.5348	-13.7346
7	42.5033	-5.5348	-13.7346	57.4726	-8.1730	-19.8975
8	57.4726	-8.1730	-19.8975	51.5472	-8.1749	-19.8975
9	51.5472	-8.1749	-19.8975	69.1482	-12.2629	-25.4105
10	69.1482	-12.2629	-25.4105	81.5419	-16.2831	-31.6404
11	81.5419	-16.2831	-31.6404	69.7374	-16.2895	-31.6404
12	69.7374	-16.2895	-31.6404	74.4191	-20.2008	-38.5547
13	74.4191	-20.2008	-38.5547	74.7430	-23.9910	-46.1087
14	74.7430	-23.9910	-46.1087	71.2035	-27.6450	-54.2572
15	71.2035	-27.6450	-54.2572	51.1597	-27.6490	-54.2572
16	51.1597	-27.6490	-54.2572	41.7971	-31.1319	-62.9550
17	41.7971	-31.1319	-62.9550	29.9174	-34.4104	-72.1566
18	29.9174	-34.4104	-72.1566	16.2421	-37.4747	-81.8167
19	16.2421	-37.4747	-81.8167	-10.9277	-37.4747	-81.8167
20	-10.9277	-37.4747	-81.8167	-38.4802	-18.4693	-49.6205
21	-38.4802	-18.4693	-49.6205	11.7251	-3.5450	-2.8622
22	11.7251	-3.5450	-2.8622	8.3573	-3.5450	-2.8622
23	8.3573	-3.5450	-2.8622	4.9896	-3.5448	-2.8622
24	4.9896	-3.5448	-2.8622	1.6224	-3.5446	-2.8622
25	1.6224	-3.5446	-2.8622	-1.7448	-3.5449	-2.8622
26	-1.7448	-3.5449	-2.8622	53.3863	-5.6150	-19.1926
27	53.3863	-5.6150	-19.1926	69.3629	-8.0223	-24.2141
28	69.3629	-8.0223	-24.2141	82.8770	-10.6243	-29.4522
29	82.8770	-10.6243	-29.4522	93.3759	-13.3716	-34.9084
30	93.3759	-13.3716	-34.9084	100.4178	-16.2447	-40.5830
31	100.4178	-16.2447	-40.5830	84.9864	-16.2440	-40.5831
32	84.9864	-16.2440	-40.5831	85.4538	-19.2081	-46.4758
33	85.4538	-19.2081	-46.4758	81.9348	-22.2126	-52.5869
34	81.9348	-22.2126	-52.5869	74.4168	-25.2334	-58.9163
35	74.4168	-25.2334	-58.9163	63.0344	-28.2356	-65.4637
36	63.0344	-28.2356	-65.4637	48.0443	-31.1818	-72.2294
37	48.0443	-31.1818	-72.2294	29.8411	-34.0350	-79.2135
38	29.8411	-34.0350	-79.2135	8.9605	-36.7633	-86.4157
39	8.9605	-36.7633	-86.4157	-13.9354	-39.3259	-93.8359
40	-13.9354	-39.3259	-93.8359	-49.5721	-18.6350	-56.5106
41	-49.5721	-18.6350	-56.5106	15.2914	-1.1467	1.8433
42	15.2914	-1.1467	1.8433	14.4602	-1.1468	1.8433
43	14.4602	-1.1468	1.8433	13.6285	-1.1467	1.8433
44	13.6285	-1.1467	1.8433	12.7971	-1.1453	1.8433
45	12.7971	-1.1453	1.8433	18.7898	-1.3975	-14.2866
46	18.7898	-1.3975	-14.2866	17.7763	-1.3956	-14.2866
47	17.7763	-1.3956	-14.2866	37.8958	-3.5469	-17.7345
48	37.8958	-3.5469	-17.7345	57.5973	-5.9645	-22.6924
49	57.5973	-5.9645	-22.6924	76.0488	-8.6308	-28.5816
50	76.0488	-8.6308	-28.5816	69.7901	-8.6315	-28.5816
51	69.7901	-8.6315	-28.5816	84.0872	-11.5279	-34.8909
52	84.0872	-11.5279	-34.8909	95.5337	-14.6546	-41.6674

53	95.5337	-14.6546	-41.6674	84.9131	-14.6483	-41.6674
54	84.9131	-14.6483	-41.6674	90.5457	-17.9464	-48.9560
55	90.5457	-17.9464	-48.9560	92.1319	-21.4145	-56.8019
56	92.1319	-21.4145	-56.8019	89.2468	-25.0303	-65.2505
57	89.2468	-25.0303	-65.2505	71.1011	-25.0333	-65.2506
58	71.1011	-25.0333	-65.2506	60.6905	-28.7673	-74.3474
59	60.6905	-28.7673	-74.3474	45.1109	-32.5938	-84.1357
60	45.1109	-32.5938	-84.1357	21.4815	-32.5926	-84.1357

ENVOL. MAX. TORSORES TREN TREN LM 71, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-27.9375	40.6278	109.4224	-0.0387	36.5382	103.9095
2	-0.0387	36.5382	103.9095	22.2209	32.5238	97.6794
3	22.2209	32.5238	97.6794	45.8026	32.5257	97.6794
4	45.8026	32.5257	97.6794	59.7908	28.6070	90.7651
5	59.7908	28.6070	90.7651	68.7064	24.8171	83.2110
6	68.7064	24.8171	83.2110	72.9106	21.1651	75.0625
7	72.9106	21.1651	75.0625	88.2541	21.1632	75.0625
8	88.2541	21.1632	75.0625	85.6515	17.6847	66.3649
9	85.6515	17.6847	66.3649	79.3976	14.4035	57.1633
10	79.3976	14.4035	57.1633	70.0847	11.3342	47.5032
11	70.0847	11.3342	47.5032	78.3004	11.3358	47.5032
12	78.3004	11.3358	47.5032	64.5049	8.5098	37.4326
13	64.5049	8.5098	37.4326	48.9257	5.9462	27.9723
14	48.9257	5.9462	27.9723	53.2367	5.9444	27.9724
15	53.2367	5.9444	27.9724	34.8819	3.6586	19.3078
16	34.8819	3.6586	19.3078	16.1428	1.6609	12.3307
17	16.1428	1.6609	12.3307	-2.1449	-0.0453	6.2349
18	-2.1449	-0.0453	6.2349	-2.1779	-0.0453	6.2349
19	-2.1779	-0.0453	6.2349	-20.6175	-1.4631	1.7338
20	-20.6175	-1.4631	1.7338	-51.6976	20.2923	54.5198
21	-51.6976	20.2923	54.5198	-38.6187	40.7770	105.1060
22	-38.6187	40.7770	105.1060	-12.7279	38.1779	99.8680
23	-12.7279	38.1779	99.8680	11.0323	35.4215	94.4117
24	11.0323	35.4215	94.4117	32.0152	32.5463	88.7370
25	32.0152	32.5463	88.7370	49.7147	29.5891	82.8441
26	49.7147	29.5891	82.8441	63.7547	26.5788	76.7330
27	63.7547	26.5788	76.7330	89.0027	26.5784	76.7330
28	89.0027	26.5784	76.7330	96.2663	23.5527	70.4037
29	96.2663	23.5527	70.4037	99.5484	20.5579	63.8562
30	99.5484	20.5579	63.8562	98.9014	17.6104	57.0904
31	98.9014	17.6104	57.0904	94.5242	14.7680	50.1064
32	94.5242	14.7680	50.1064	86.7437	12.0407	42.9043
33	86.7437	12.0407	42.9043	76.0216	9.4777	35.4841
34	76.0216	9.4777	35.4841	62.9238	7.1080	27.8479
35	62.9238	7.1080	27.8479	47.9466	4.9531	20.7618
36	47.9466	4.9531	20.7618	31.7695	3.0342	14.3394
37	31.7695	3.0342	14.3394	14.9631	1.3556	9.2562
38	14.9631	1.3556	9.2562	-1.5820	-0.0575	4.8586
39	-1.5820	-0.0575	4.8586	-17.3414	-1.2167	1.6923
40	-17.3414	-1.2167	1.6923	-45.4100	20.3476	53.2209
41	-45.4100	20.3476	53.2209	-38.5238	40.1520	100.7387
42	-38.5238	40.1520	100.7387	-9.4135	40.1524	100.7387
43	-9.4135	40.1524	100.7387	8.3073	37.2415	94.4294
44	8.3073	37.2415	94.4294	24.4104	34.1251	87.6531
45	24.4104	34.1251	87.6531	49.1509	34.1261	87.6531
46	49.1509	34.1261	87.6531	60.5266	30.8146	80.3645

47	60.5266	30.8146	80.3645	68.8144	27.3517	72.5186
48	68.8144	27.3517	72.5186	73.4594	23.7444	64.0699
49	73.4594	23.7444	64.0699	90.6749	23.7439	64.0697
50	90.6749	23.7439	64.0697	88.4865	20.0163	54.9730
51	88.4865	20.0163	54.9730	81.6761	16.1891	45.1848
52	81.6761	16.1891	45.1848	69.9157	12.2915	34.6733
53	69.9157	12.2915	34.6733	78.8307	12.2955	34.6732
54	78.8307	12.2955	34.6732	61.2668	8.6606	24.7924
55	61.2668	8.6606	24.7924	82.3396	0.1046	2.3433
56	82.3396	0.1046	2.3433	2.8422	-1.1425	1.8433
57	2.8422	-1.1425	1.8433	2.0138	-1.1423	1.8433
58	2.0138	-1.1423	1.8433	1.1858	-1.1421	1.8433
59	1.1858	-1.1421	1.8433	0.3575	-1.1423	1.8433
60	0.3575	-1.1423	1.8433	-0.4707	-1.1423	1.8433

ENVOL. MIN. TORSORES TREN TREN LM 71, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	1.5514	-4.7033	-6.0765	-1.8588	-4.7033	-6.0765
2	-1.8588	-4.7033	-6.0765	-5.2689	-4.7035	-6.0765
3	-5.2689	-4.7035	-6.0765	11.7600	-1.1947	-6.2161
4	11.7600	-1.1947	-6.2161	10.8940	-1.1942	-6.2161
5	10.8940	-1.1942	-6.2161	27.4172	-3.2869	-8.4555
6	27.4172	-3.2869	-8.4555	42.5033	-5.5348	-13.7346
7	42.5033	-5.5348	-13.7346	57.4726	-8.1730	-19.8975
8	57.4726	-8.1730	-19.8975	51.5472	-8.1749	-19.8975
9	51.5472	-8.1749	-19.8975	69.1482	-12.2629	-25.4105
10	69.1482	-12.2629	-25.4105	81.5419	-16.2831	-31.6404
11	81.5419	-16.2831	-31.6404	69.7374	-16.2895	-31.6404
12	69.7374	-16.2895	-31.6404	74.4191	-20.2008	-38.5547
13	74.4191	-20.2008	-38.5547	74.7430	-23.9910	-46.1087
14	74.7430	-23.9910	-46.1087	71.2035	-27.6450	-54.2572
15	71.2035	-27.6450	-54.2572	51.1597	-27.6490	-54.2572
16	51.1597	-27.6490	-54.2572	41.7971	-31.1319	-62.9550
17	41.7971	-31.1319	-62.9550	29.9174	-34.4104	-72.1566
18	29.9174	-34.4104	-72.1566	16.2421	-37.4747	-81.8167
19	16.2421	-37.4747	-81.8167	-10.9277	-37.4747	-81.8167
20	-10.9277	-37.4747	-81.8167	-38.4802	-18.4693	-49.6205
21	-38.4802	-18.4693	-49.6205	-57.3437	4.1858	-7.9562
22	-57.3437	4.1858	-7.9562	-53.3674	4.1856	-7.9562
23	-53.3674	4.1856	-7.9562	-1.2333	0.1363	-9.4353
24	-1.2333	0.1363	-9.4353	17.2425	-1.5078	-11.5967
25	17.2425	-1.5078	-11.5967	35.7182	-3.4307	-14.8247
26	35.7182	-3.4307	-14.8247	53.3863	-5.6150	-19.1926
27	53.3863	-5.6150	-19.1926	69.3629	-8.0223	-24.2141
28	69.3629	-8.0223	-24.2141	82.8770	-10.6243	-29.4522
29	82.8770	-10.6243	-29.4522	93.3759	-13.3716	-34.9084
30	93.3759	-13.3716	-34.9084	100.4178	-16.2447	-40.5830
31	100.4178	-16.2447	-40.5830	84.9864	-16.2440	-40.5831
32	84.9864	-16.2440	-40.5831	85.4538	-19.2081	-46.4758
33	85.4538	-19.2081	-46.4758	81.9348	-22.2126	-52.5869
34	81.9348	-22.2126	-52.5869	74.4168	-25.2334	-58.9163
35	74.4168	-25.2334	-58.9163	63.0344	-28.2356	-65.4637
36	63.0344	-28.2356	-65.4637	48.0443	-31.1818	-72.2294
37	48.0443	-31.1818	-72.2294	29.8411	-34.0350	-79.2135
38	29.8411	-34.0350	-79.2135	8.9605	-36.7633	-86.4157

39	8.9605	-36.7633	-86.4157	-13.9354	-39.3259	-93.8359
40	-13.9354	-39.3259	-93.8359	-49.5721	-18.6350	-56.5106
41	-49.5721	-18.6350	-56.5106	-79.4976	6.0391	-13.7679
42	-79.4976	6.0391	-13.7679	-75.1194	6.0396	-13.7679
43	-75.1194	6.0396	-13.7679	-70.7406	6.0364	-13.7679
44	-70.7406	6.0364	-13.7679	-66.3642	6.0344	-13.7679
45	-66.3642	6.0344	-13.7679	18.7898	-1.3975	-14.2866
46	18.7898	-1.3975	-14.2866	17.7763	-1.3956	-14.2866
47	17.7763	-1.3956	-14.2866	37.8958	-3.5469	-17.7345
48	37.8958	-3.5469	-17.7345	57.5973	-5.9645	-22.6924
49	57.5973	-5.9645	-22.6924	76.0488	-8.6308	-28.5816
50	76.0488	-8.6308	-28.5816	69.7901	-8.6315	-28.5816
51	69.7901	-8.6315	-28.5816	84.0872	-11.5279	-34.8909
52	84.0872	-11.5279	-34.8909	95.5337	-14.6546	-41.6674
53	95.5337	-14.6546	-41.6674	84.9131	-14.6483	-41.6674
54	84.9131	-14.6483	-41.6674	90.5457	-17.9464	-48.9560
55	90.5457	-17.9464	-48.9560	92.1319	-21.4145	-56.8019
56	92.1319	-21.4145	-56.8019	89.2468	-25.0303	-65.2505
57	89.2468	-25.0303	-65.2505	71.1011	-25.0333	-65.2506
58	71.1011	-25.0333	-65.2506	60.6905	-28.7673	-74.3474
59	60.6905	-28.7673	-74.3474	45.1109	-32.5938	-84.1357
60	45.1109	-32.5938	-84.1357	21.4815	-32.5926	-84.1357
ENVOL. MAX. FLECTORES TREN TREN SW/0, EC-1 en via 1						

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.1212	-10.6662	-8.3088	-5.6121	-10.6665	-8.3088
2	-5.6121	-10.6665	-8.3088	47.9859	72.8210	242.4688
3	47.9859	72.8210	242.4688	98.4541	59.5249	207.2238
4	98.4541	59.5249	207.2238	141.6090	59.5261	207.2240
5	141.6090	59.5261	207.2240	176.4478	46.2311	171.9790
6	176.4478	46.2311	171.9790	205.3124	32.9181	136.7340
7	205.3124	32.9181	136.7340	228.1687	19.6164	101.4890
8	228.1687	19.6164	101.4890	242.4028	19.6226	101.4892
9	242.4028	19.6226	101.4892	249.6419	6.3118	66.2442
10	249.6419	6.3118	66.2442	250.8950	-6.9948	30.9991
11	250.8950	-6.9948	30.9991	245.8188	-7.0086	30.9992
12	245.8188	-7.0086	30.9992	232.0466	-19.2720	-6.9098
13	232.0466	-19.2720	-6.9098	212.4250	-32.5727	-42.1547
14	212.4250	-32.5727	-42.1547	186.8154	-45.8899	-77.3996
15	186.8154	-45.8899	-77.3996	153.5445	-45.8941	-77.3996
16	153.5445	-45.8941	-77.3996	112.2960	-59.1909	-112.6446
17	112.2960	-59.1909	-112.6446	65.0585	-72.4982	-147.8896
18	65.0585	-72.4982	-147.8896	11.8308	-85.8003	-183.1347
19	11.8308	-85.8003	-183.1347	1.5188	0.7242	-2.1394
20	1.5188	0.7242	-2.1394	1.7600	0.3119	-1.0276
21	1.7600	0.3119	-1.0276	1.3809	-0.1003	0.0841
22	1.3809	-0.1003	0.0841	1.2857	-0.1003	0.0841
23	1.2857	-0.1003	0.0841	25.9100	76.6497	230.5130
24	25.9100	76.6497	230.5130	90.7406	63.3498	195.2679
25	90.7406	63.3498	195.2679	143.6072	50.0481	160.0228
26	143.6072	50.0481	160.0228	184.4987	36.7459	124.7778
27	184.4987	36.7459	124.7778	213.4234	23.4383	89.5328
28	213.4234	23.4383	89.5328	235.1519	28.8368	61.1441
29	235.1519	28.8368	61.1441	261.8947	15.5430	25.8991
30	261.8947	15.5430	25.8991	278.0798	5.0459	-2.9506
31	278.0798	5.0459	-2.9506	282.8907	5.0501	-2.9506
32	282.8907	5.0501	-2.9506	277.0187	-5.5786	-32.7164

33	277.0187	-5.5786	-32.7164	260.4164	-18.8776	-67.9612
34	260.4164	-18.8776	-67.9612	233.0641	-29.5796	-98.5551
35	233.0641	-29.5796	-98.5551	194.9924	-42.8788	-133.8001
36	194.9924	-42.8788	-133.8001	146.3854	-53.5970	-164.2888
37	146.3854	-53.5970	-164.2888	86.8139	-66.9026	-199.5339
38	86.8139	-66.9026	-199.5339	28.6199	11.6763	-24.5594
39	28.6199	11.6763	-24.5594	39.7111	11.6754	-24.5594
40	39.7111	11.6754	-24.5594	47.2354	4.2807	-8.8804
41	47.2354	4.2807	-8.8804	41.4525	-3.1079	4.9437
42	41.4525	-3.1079	4.9437	39.1998	-3.1080	4.9437
43	39.1998	-3.1080	4.9437	36.9464	-3.1070	4.9437
44	36.9464	-3.1070	4.9437	34.6936	-3.1052	4.9437
45	34.6936	-3.1052	4.9437	32.4423	-3.1066	4.9437
46	32.4423	-3.1066	4.9437	46.2493	67.7684	113.6581
47	46.2493	67.7684	113.6581	88.7699	57.9255	86.4815
48	88.7699	57.9255	86.4815	126.7905	44.6544	51.2365
49	126.7905	44.6544	51.2365	159.1039	33.9562	20.4387
50	159.1039	33.9562	20.4387	183.7188	33.9525	20.4385
51	183.7188	33.9525	20.4385	202.0255	20.6746	-14.8067
52	202.0255	20.6746	-14.8067	214.3607	7.3804	-50.0521
53	214.3607	7.3804	-50.0521	219.7104	7.3819	-50.0523
54	219.7104	7.3819	-50.0523	217.4446	-4.0997	-84.7132
55	217.4446	-4.0997	-84.7132	209.4931	-17.3950	-119.9583
56	209.4931	-17.3950	-119.9583	195.5425	-30.7015	-155.2034
57	195.5425	-30.7015	-155.2034	173.2830	-30.7011	-155.2035
58	173.2830	-30.7011	-155.2035	143.7157	-43.9957	-190.4486
59	143.7157	-43.9957	-190.4486	108.1603	-57.2939	-225.6934
60	108.1603	-57.2939	-225.6934	67.1329	-55.9738	-227.7006

ENVOL. MIN. FLECTORES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-79.2232	87.1475	275.0496	-16.0406	87.1468	275.0497
2	-16.0406	87.1468	275.0497	-13.3458	-10.6665	-8.3088
3	-13.3458	-10.6665	-8.3088	-21.0794	-10.6665	-8.3088
4	-21.0794	-10.6665	-8.3088	-28.8125	-10.6670	-8.3088
5	-28.8125	-10.6670	-8.3088	-36.5473	-10.6655	-8.3088
6	-36.5473	-10.6655	-8.3088	-44.2801	-10.6652	-8.3088
7	-44.2801	-10.6652	-8.3088	-52.0133	-10.6625	-8.3088
8	-52.0133	-10.6625	-8.3088	-59.7457	-10.6628	-8.3088
9	-59.7457	-10.6628	-8.3088	-67.4794	-10.6637	-8.3088
10	-67.4794	-10.6637	-8.3088	-75.2104	-10.6632	-8.3088
11	-75.2104	-10.6632	-8.3088	-82.9389	-10.6607	-8.3088
12	-82.9389	-10.6607	-8.3088	-90.6632	-10.6593	-8.3088
13	-90.6632	-10.6593	-8.3088	-98.3923	-10.6602	-8.3088
14	-98.3923	-10.6602	-8.3088	-106.1196	-10.6561	-8.3088
15	-106.1196	-10.6561	-8.3088	-113.8447	-10.6511	-8.3088
16	-113.8447	-10.6511	-8.3088	-136.3087	-55.4218	-97.6763
17	-136.3087	-55.4218	-97.6763	-176.4901	-55.4223	-97.6763
18	-176.4901	-55.4223	-97.6763	-222.5677	-65.4949	-119.2413
19	-222.5677	-65.4949	-119.2413	-273.3278	-75.8443	-142.4640
20	-273.3278	-75.8443	-142.4640	-383.5457	8.4519	43.1302
21	-383.5457	8.4519	43.1302	-340.6607	92.6945	223.4062
22	-340.6607	92.6945	223.4062	-255.8328	82.0232	194.0851
23	-255.8328	82.0232	194.0851	-182.0421	71.3814	166.0284
24	-182.0421	71.3814	166.0284	-126.6826	11.6794	-24.5594

25	-126.6826	11.6794	-24.5594	-115.5851	11.6781	-24.5594
26	-115.5851	11.6781	-24.5594	-104.4915	11.6798	-24.5594
27	-104.4915	11.6798	-24.5594	-93.3913	11.6861	-24.5595
28	-93.3913	11.6861	-24.5595	-82.2919	11.6824	-24.5595
29	-82.2919	11.6824	-24.5595	-71.1991	11.6752	-24.5594
30	-71.1991	11.6752	-24.5594	-60.1077	11.6763	-24.5594
31	-60.1077	11.6763	-24.5594	-49.0147	11.6782	-24.5594
32	-49.0147	11.6782	-24.5594	-37.9235	11.6755	-24.5594
33	-37.9235	11.6755	-24.5594	-26.8365	11.6754	-24.5594
34	-26.8365	11.6754	-24.5594	-15.7512	11.6670	-22.7046
35	-15.7512	11.6670	-22.7046	-15.8238	-48.6232	-111.9899
36	-15.8238	-48.6232	-111.9899	-62.1099	-59.1906	-134.6477
37	-62.1099	-59.1906	-134.6477	-118.3437	-59.1918	-134.6478
38	-118.3437	-59.1918	-134.6478	-183.8191	-69.6384	-157.1822
39	-183.8191	-69.6384	-157.1822	-249.9765	-69.6394	-157.1821
40	-249.9765	-69.6394	-157.1821	-370.1251	30.2579	54.2748
41	-370.1251	30.2579	54.2748	-332.7446	116.8590	230.4865
42	-332.7446	116.8590	230.4865	-248.0217	116.8580	230.4864
43	-248.0217	116.8580	230.4864	-206.5403	17.6698	-41.8862
44	-206.5403	17.6698	-41.8862	-193.7343	17.6677	-41.8863
45	-193.7343	17.6677	-41.8863	-180.9315	17.6701	-41.8864
46	-180.9315	17.6701	-41.8864	-168.1217	17.6627	-41.8865
47	-168.1217	17.6627	-41.8865	-155.3263	17.6395	-41.8865
48	-155.3263	17.6395	-41.8865	-142.5394	17.6296	-41.8866
49	-142.5394	17.6296	-41.8866	-129.7538	17.6378	-41.8866
50	-129.7538	17.6378	-41.8866	-116.9707	17.6448	-41.8866
51	-116.9707	17.6448	-41.8866	-104.1852	17.6259	-41.8866
52	-104.1852	17.6259	-41.8866	-91.4160	17.6063	-41.8867
53	-91.4160	17.6063	-41.8867	-78.6444	17.6041	-41.8867
54	-78.6444	17.6041	-41.8867	-65.8763	17.5968	-41.8867
55	-65.8763	17.5968	-41.8867	-53.1173	17.5966	-41.8867
56	-53.1173	17.5966	-41.8867	-40.3514	17.6018	-41.8867
57	-40.3514	17.6018	-41.8867	-27.5897	17.6021	-41.8867
58	-27.5897	17.6021	-41.8867	-14.8273	17.6026	-41.8867
59	-14.8273	17.6026	-41.8867	-2.2464	16.3256	-37.5573
60	-2.2464	16.3256	-37.5573	-1.2624	-3.0957	4.9437

ENVOL. MAX. CORTANTES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-79.2232	87.1475	275.0496	-16.0406	87.1468	275.0497
2	-16.0406	87.1468	275.0497	41.1580	73.8521	239.8046
3	41.1580	73.8521	239.8046	92.3732	60.5548	204.5595
4	92.3732	60.5548	204.5595	136.2708	60.5562	204.5596
5	136.2708	60.5562	204.5596	128.0105	48.2063	183.0284
6	128.0105	48.2063	183.0284	123.7019	37.4588	153.6188
7	123.7019	37.4588	153.6188	109.5667	28.1733	130.9995
8	109.5667	28.1733	130.9995	128.6377	27.7158	125.8020
9	128.6377	27.7158	125.8020	108.5584	20.8156	106.9590
10	108.5584	20.8156	106.9590	81.9308	14.2743	84.6110
11	81.9308	14.2743	84.6110	76.3950	10.0455	69.3263
12	76.3950	10.0455	69.3263	19.3878	3.5721	45.8065
13	19.3878	3.5721	45.8065	21.9780	3.5731	45.8065
14	21.9780	3.5731	45.8065	-1.1064	0.7240	-2.1394
15	-1.1064	0.7240	-2.1394	-0.5813	0.7240	-2.1394
16	-0.5813	0.7240	-2.1394	-0.0564	0.7240	-2.1394
17	-0.0564	0.7240	-2.1394	0.4686	0.7242	-2.1394
18	0.4686	0.7242	-2.1394	0.9937	0.7243	-2.1394

19	0.9937	0.7243	-2.1394	1.5188	0.7242	-2.1394
20	1.5188	0.7242	-2.1394	-196.4376	52.9517	163.9697
21	-196.4376	52.9517	163.9697	-309.7048	124.7477	314.2548
22	-309.7048	124.7477	314.2548	-220.5160	114.1102	284.4890
23	-220.5160	114.1102	284.4890	-142.6569	103.3994	253.8948
24	-142.6569	103.3994	253.8948	-76.4909	92.6910	223.4060
25	-76.4909	92.6910	223.4060	-22.0729	82.0240	194.0849
26	-22.0729	82.0240	194.0849	21.3905	71.3797	166.0282
27	21.3905	71.3797	166.0282	55.8161	60.6180	138.2847
28	55.8161	60.6180	138.2847	81.0654	49.7504	110.9435
29	81.0654	49.7504	110.9435	97.0657	38.8114	84.0724
30	97.0657	38.8114	84.0724	103.7716	27.8222	57.7202
31	103.7716	27.8222	57.7202	130.2057	27.8247	57.7201
32	130.2057	27.8247	57.7201	117.1255	16.8067	31.9174
33	117.1255	16.8067	31.9174	-26.8365	11.6754	-24.5594
34	-26.8365	11.6754	-24.5594	-15.7441	11.6758	-24.5594
35	-15.7441	11.6758	-24.5594	-4.6552	11.6753	-24.5594
36	-4.6552	11.6753	-24.5594	6.4358	11.6763	-24.5594
37	6.4358	11.6763	-24.5594	17.5270	11.6764	-24.5594
38	17.5270	11.6764	-24.5594	28.6199	11.6763	-24.5594
39	28.6199	11.6763	-24.5594	39.7111	11.6754	-24.5594
40	39.7111	11.6754	-24.5594	-370.1251	30.2579	54.2748
41	-370.1251	30.2579	54.2748	-332.7446	116.8590	230.4865
42	-332.7446	116.8590	230.4865	-248.0217	116.8580	230.4864
43	-248.0217	116.8580	230.4864	-172.2800	103.5542	195.2413
44	-172.2800	103.5542	195.2413	-102.5203	90.2549	159.9962
45	-102.5203	90.2549	159.9962	-38.7466	76.9558	124.7511
46	-38.7466	76.9558	124.7511	17.0466	76.9607	124.7509
47	17.0466	76.9607	124.7509	65.2023	63.6699	89.5057
48	65.2023	63.6699	89.5057	107.3782	50.3729	54.2607
49	107.3782	50.3729	54.2607	143.5693	37.0732	19.0154
50	143.5693	37.0732	19.0154	170.4565	37.0741	19.0154
51	170.4565	37.0741	19.0154	191.0297	23.7791	-16.2299
52	191.0297	23.7791	-16.2299	-91.4160	17.6063	-41.8867
53	-91.4160	17.6063	-41.8867	-78.6444	17.6041	-41.8867
54	-78.6444	17.6041	-41.8867	-65.8763	17.5968	-41.8867
55	-65.8763	17.5968	-41.8867	-53.1173	17.5966	-41.8867
56	-53.1173	17.5966	-41.8867	-40.3514	17.6018	-41.8867
57	-40.3514	17.6018	-41.8867	-27.5897	17.6021	-41.8867
58	-27.5897	17.6021	-41.8867	-14.8273	17.6026	-41.8867
59	-14.8273	17.6026	-41.8867	-2.0658	17.6019	-41.8866
60	-2.0658	17.6019	-41.8866	10.6946	17.6011	-41.8866

ENVOL. MIN. CORTANTES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.1212	-10.6662	-8.3088	-5.6121	-10.6665	-8.3088
2	-5.6121	-10.6665	-8.3088	-13.3458	-10.6665	-8.3088
3	-13.3458	-10.6665	-8.3088	-21.0794	-10.6665	-8.3088
4	-21.0794	-10.6665	-8.3088	-28.8125	-10.6670	-8.3088
5	-28.8125	-10.6670	-8.3088	-36.5473	-10.6655	-8.3088
6	-36.5473	-10.6655	-8.3088	-44.2801	-10.6652	-8.3088
7	-44.2801	-10.6652	-8.3088	49.3040	-17.1919	-7.8363
8	49.3040	-17.1919	-7.8363	55.7182	-26.5044	-31.6077
9	55.7182	-26.5044	-31.6077	36.5031	-26.5047	-31.6077
10	36.5031	-26.5047	-31.6077	34.6860	-35.9602	-54.4660

11	34.6860	-35.9602	-54.4660	30.8647	-45.5884	-76.4659
12	30.8647	-45.5884	-76.4659	24.4137	-48.7719	-80.0539
13	24.4137	-48.7719	-80.0539	-15.7664	-55.4216	-97.6763
14	-15.7664	-55.4216	-97.6763	-32.6339	-65.4953	-119.2413
15	-32.6339	-65.4953	-119.2413	-53.3838	-75.8422	-142.4641
16	-53.3838	-75.8422	-142.4641	-108.3676	-75.8408	-142.4641
17	-108.3676	-75.8408	-142.4641	-141.5973	-86.4980	-167.6345
18	-141.5973	-86.4980	-167.6345	-180.5633	-97.4702	-194.9792
19	-180.5633	-97.4702	-194.9792	-225.9044	-108.7592	-224.6953
20	-225.9044	-108.7592	-224.6953	-145.8433	-43.7762	-121.2200
21	-145.8433	-43.7762	-121.2200	1.3809	-0.1003	0.0841
22	1.3809	-0.1003	0.0841	1.2857	-0.1003	0.0841
23	1.2857	-0.1003	0.0841	1.1904	-0.1003	0.0841
24	1.1904	-0.1003	0.0841	1.0951	-0.1002	0.0841
25	1.0951	-0.1002	0.0841	0.9999	-0.1002	0.0841
26	0.9999	-0.1002	0.0841	0.9046	-0.1003	0.0841
27	0.9046	-0.1003	0.0841	36.3223	-3.5553	-58.7599
28	36.3223	-3.5553	-58.7599	77.8410	-9.2738	-68.7121
29	77.8410	-9.2738	-68.7121	114.5541	-16.2016	-42.1688
30	114.5541	-16.2016	-42.1688	126.7489	-27.1078	-65.8400
31	126.7489	-27.1078	-65.8400	129.4727	-37.9174	-89.0869
32	129.4727	-37.9174	-89.0869	122.7421	-48.6106	-111.9899
33	122.7421	-48.6106	-111.9899	106.5882	-59.1926	-134.6478
34	106.5882	-59.1926	-134.6478	80.8084	-69.6403	-157.1818
35	80.8084	-69.6403	-157.1818	14.6522	-69.6360	-157.1820
36	14.6522	-69.6360	-157.1820	-51.5000	-69.6349	-157.1821
37	-51.5000	-69.6349	-157.1821	40.2677	-77.5545	-220.8156
38	40.2677	-77.5545	-220.8156	-18.5956	-88.0406	-249.6654
39	-18.5956	-88.0406	-249.6654	-90.5696	-98.6802	-279.4311
40	-90.5696	-98.6802	-279.4311	-209.0909	-45.9133	-176.3741
41	-209.0909	-45.9133	-176.3741	41.4525	-3.1079	4.9437
42	41.4525	-3.1079	4.9437	39.1998	-3.1080	4.9437
43	39.1998	-3.1080	4.9437	36.9464	-3.1070	4.9437
44	36.9464	-3.1070	4.9437	34.6936	-3.1052	4.9437
45	34.6936	-3.1052	4.9437	32.4423	-3.1066	4.9437
46	32.4423	-3.1066	4.9437	30.1887	-3.1068	4.9437
47	30.1887	-3.1068	4.9437	27.9375	-3.1047	4.9437
48	27.9375	-3.1047	4.9437	25.6881	-3.1023	4.9437
49	25.6881	-3.1023	4.9437	23.4402	-3.1020	4.9437
50	23.4402	-3.1020	4.9437	21.1912	-3.1028	4.9437
51	21.1912	-3.1028	4.9437	72.2113	-7.5167	-90.9659
52	72.2113	-7.5167	-90.9659	108.4500	-14.0343	-106.0576
53	108.4500	-14.0343	-106.0576	98.2733	-21.3731	-123.8284
54	98.2733	-21.3731	-123.8284	144.0187	-29.5625	-144.4998
55	144.0187	-29.5625	-144.4998	154.8088	-38.5720	-168.3033
56	154.8088	-38.5720	-168.3033	126.8473	-38.5681	-168.3036
57	126.8473	-38.5681	-168.3036	120.1144	-48.4095	-195.4803
58	120.1144	-48.4095	-195.4803	100.6163	-59.0896	-226.2780
59	100.6163	-59.0896	-226.2780	57.7727	-59.0928	-226.2780

ENVOL. MAX. TORSORES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-70.9045	86.1192	277.7139	-8.4672	86.1197	277.7139
2	-8.4672	86.1197	277.7139	42.6001	72.5889	245.4091
3	42.6001	72.5889	245.4091	75.7829	59.9350	213.7325

4	75.7829	59.9350	213.7325	119.2363	59.9323	213.7326
5	119.2363	59.9323	213.7326	117.7325	45.3893	183.2860
6	117.7325	45.3893	183.2860	118.2337	36.3673	156.5168
7	118.2337	36.3673	156.5168	109.5667	28.1733	130.9995
8	109.5667	28.1733	130.9995	128.6377	27.7158	125.8020
9	128.6377	27.7158	125.8020	108.5584	20.8156	106.9590
10	108.5584	20.8156	106.9590	81.9308	14.2743	84.6110
11	81.9308	14.2743	84.6110	76.3950	10.0455	69.3263
12	76.3950	10.0455	69.3263	57.8922	1.8824	46.5389
13	57.8922	1.8824	46.5389	21.9780	3.5731	45.8065
14	21.9780	3.5731	45.8065	-14.0897	-0.6394	29.7339
15	-14.0897	-0.6394	29.7339	-49.0595	-4.1284	16.1211
16	-49.0595	-4.1284	16.1211	-52.0527	-4.1282	16.1211
17	-52.0527	-4.1282	16.1211	-86.8524	-6.9323	5.1364
18	-86.8524	-6.9323	5.1364	0.9937	0.7243	-2.1394
19	0.9937	0.7243	-2.1394	1.5188	0.7242	-2.1394
20	1.5188	0.7242	-2.1394	-196.4376	52.9517	163.9697
21	-196.4376	52.9517	163.9697	-309.7048	124.7477	314.2548
22	-309.7048	124.7477	314.2548	-220.5160	114.1102	284.4890
23	-220.5160	114.1102	284.4890	-142.6569	103.3994	253.8948
24	-142.6569	103.3994	253.8948	-76.4909	92.6910	223.4060
25	-76.4909	92.6910	223.4060	-22.0729	82.0240	194.0849
26	-22.0729	82.0240	194.0849	21.3905	71.3797	166.0282
27	21.3905	71.3797	166.0282	55.8161	60.6180	138.2847
28	55.8161	60.6180	138.2847	81.0654	49.7504	110.9435
29	81.0654	49.7504	110.9435	97.0657	38.8114	84.0724
30	97.0657	38.8114	84.0724	103.7716	27.8222	57.7202
31	103.7716	27.8222	57.7202	130.2057	27.8247	57.7201
32	130.2057	27.8247	57.7201	117.1255	117.1255	16.8067
33	117.1255	16.8067	31.9174	94.7366	5.7787	6.6757
34	94.7366	5.7787	6.6757	0.1427	-0.1002	0.0841
35	0.1427	-0.1002	0.0841	0.0475	-0.1002	0.0841
36	0.0475	-0.1002	0.0841	-0.0477	-0.1002	0.0841
37	-0.0477	-0.1002	0.0841	-0.1429	-0.1002	0.0841
38	-0.1429	-0.1002	0.0841	-0.2382	-0.1002	0.0841
39	-0.2382	-0.1002	0.0841	-0.3334	-0.1002	0.0841
40	-0.3334	-0.1002	0.0841	-370.1251	30.2579	54.2748
41	-370.1251	30.2579	54.2748	-315.0299	115.5293	232.4942
42	-315.0299	115.5293	232.4942	-231.2697	115.5296	232.4940
43	-231.2697	115.5296	232.4940	-156.4892	102.2294	197.2489
44	-156.4892	102.2294	197.2489	-87.6904	88.9293	162.0038
45	-87.6904	88.9293	162.0038	-24.8759	75.6238	126.7586
46	-24.8759	75.6238	126.7586	29.9540	75.6262	126.7584
47	29.9540	75.6262	126.7584	77.1459	62.3449	91.5132
48	77.1459	62.3449	91.5132	118.3631	49.0607	56.2681
49	118.3631	49.0607	56.2681	153.5984	35.7677	21.0229
50	153.5984	35.7677	21.0229	179.5258	35.7661	21.0226
51	179.5258	35.7661	21.0226	18.9429	-3.1010	4.9437
52	18.9429	-3.1010	4.9437	16.6967	-3.0995	4.9437
53	16.6967	-3.0995	4.9437	14.4497	-3.0981	4.9437
54	14.4497	-3.0981	4.9437	12.2047	-3.0956	4.9437
55	12.2047	-3.0956	4.9437	9.9607	-3.0957	4.9437
56	9.9607	-3.0957	4.9437	7.7157	-3.0978	4.9437
57	7.7157	-3.0978	4.9437	5.4704	-3.0972	4.9437
58	5.4704	-3.0972	4.9437	3.2264	-3.0957	4.9437
59	3.2264	-3.0957	4.9437	0.9821	-3.0954	4.9437
60	0.9821	-3.0954	4.9437	-1.2624	-3.0957	4.9437

ENVOL. MIN. TORSORES TREN TREN SW/0, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	2.1212	-10.6662	-8.3088	-5.6121	-10.6665	-8.3088
2	-5.6121	-10.6665	-8.3088	-13.3458	-10.6665	-8.3088
3	-13.3458	-10.6665	-8.3088	12.5790	-1.2668	-9.5194
4	12.5790	-1.2668	-9.5194	11.6608	-1.2673	-9.5194
5	11.6608	-1.2673	-9.5194	33.3006	-3.9678	-15.1908
6	33.3006	-3.9678	-15.1908	59.8713	-7.7871	-22.4617
7	59.8713	-7.7871	-22.4617	89.1044	-12.7024	-31.5262
8	89.1044	-12.7024	-31.5262	55.7182	-26.5044	-31.6077
9	55.7182	-26.5044	-31.6077	105.3006	-18.6801	-42.5662
10	105.3006	-18.6801	-42.5662	128.4165	-25.6985	-55.7510
11	128.4165	-25.6985	-55.7510	30.8647	-45.5884	-76.4659
12	30.8647	-45.5884	-76.4659	24.4137	-48.7719	-80.0539
13	24.4137	-48.7719	-80.0539	-15.7664	-55.4216	-97.6763
14	-15.7664	-55.4216	-97.6763	-32.6339	-65.4953	-119.2413
15	-32.6339	-65.4953	-119.2413	-53.3838	-75.8422	-142.4641
16	-53.3838	-75.8422	-142.4641	-108.3676	-75.8408	-142.4641
17	-108.3676	-75.8408	-142.4641	-141.5973	-86.4980	-167.6345
18	-141.5973	-86.4980	-167.6345	-180.5633	-97.4702	-194.9792
19	-180.5633	-97.4702	-194.9792	-225.9044	-108.7592	-224.6953
20	-225.9044	-108.7592	-224.6953	-145.8433	-43.7762	-121.2200
21	-145.8433	-43.7762	-121.2200	-159.9703	11.6778	-24.5592
22	-159.9703	11.6778	-24.5592	-143.7633	11.2893	-27.7141
23	-143.7633	11.2893	-27.7141	-118.7337	10.1112	-31.8007
24	-118.7337	10.1112	-31.8007	-86.3063	8.0779	-36.8769
25	-86.3063	8.0779	-36.8769	-48.2543	5.1411	-43.0097
26	-48.2543	5.1411	-43.0097	-6.6277	1.2682	-50.2756
27	-6.6277	1.2682	-50.2756	36.3223	-3.5553	-58.7599
28	36.3223	-3.5553	-58.7599	77.8410	-9.2738	-68.7121
29	77.8410	-9.2738	-68.7121	114.6539	-15.7057	-80.4249
30	114.6539	-15.7057	-80.4249	145.0329	-22.8288	-94.0068
31	145.0329	-22.8288	-94.0068	123.3431	-22.8231	-94.0068
32	123.3431	-22.8231	-94.0068	122.7421	-48.6106	-111.9899
33	122.7421	-48.6106	-111.9899	106.5882	-59.1926	-134.6478
34	106.5882	-59.1926	-134.6478	80.8084	-69.6403	-157.1818
35	80.8084	-69.6403	-157.1818	117.6324	-57.4296	-169.1936
36	117.6324	-57.4296	-169.1936	85.6671	-67.3129	-193.7471
37	85.6671	-67.3129	-193.7471	40.2677	-77.5545	-220.8156
38	40.2677	-77.5545	-220.8156	-18.5956	-88.0406	-249.6654
39	-18.5956	-88.0406	-249.6654	-90.5696	-98.6802	-279.4311
40	-90.5696	-98.6802	-279.4311	-209.0909	-45.9133	-176.3741
41	-209.0909	-45.9133	-176.3741	-220.6436	16.8585	-43.5461
42	-220.6436	16.8585	-43.5461	-208.4212	16.8582	-43.5461
43	-208.4212	16.8582	-43.5461	-179.0340	15.5049	-45.4506
44	-179.0340	15.5049	-45.4506	-143.2878	13.4501	-48.5937
45	-143.2878	13.4501	-48.5937	-102.8503	10.7365	-53.2855
46	-102.8503	10.7365	-53.2855	-95.0676	10.7307	-53.2857
47	-95.0676	10.7307	-53.2857	-53.4471	7.2985	-59.6898
48	-53.4471	7.2985	-59.6898	-9.8769	3.1323	-67.9802
49	-9.8769	3.1323	-67.9802	34.3098	-1.7973	-78.3410
50	34.3098	-1.7973	-78.3410	33.0062	-1.7972	-78.3410
51	33.0062	-1.7972	-78.3410	72.2113	-7.5167	-90.9659
52	72.2113	-7.5167	-90.9659	108.4500	-14.0343	-106.0576
53	108.4500	-14.0343	-106.0576	98.2733	-14.0322	-106.0576
54	98.2733	-14.0322	-106.0576	124.5893	-21.3731	-123.8284
55	124.5893	-21.3731	-123.8284	144.0187	-29.5625	-144.4998

56	144.0187	-29.5625	-144.4998	154.8088	-38.5720	-168.3033
57	154.8088	-38.5720	-168.3033	126.8473	-38.5681	-168.3036
58	126.8473	-38.5681	-168.3036	120.1144	-48.4095	-195.4803
59	120.1144	-48.4095	-195.4803	107.7167	-55.9750	-227.7009
60	107.7167	-55.9750	-227.7009	67.1329	-55.9738	-227.7006
ENVOL. MAX. FLECTORES TREN TREN SW/2, EC-1 en via 1						

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-9.5330	0.8161	-2.4128	-6.8407	40.5245	102.1175
2	-6.8407	40.5245	102.1175	46.6050	83.1515	268.9271
3	46.6050	83.1515	268.9271	104.2662	68.1509	229.1771
4	104.2662	68.1509	229.1771	153.6900	68.2856	230.7064
5	153.6900	68.2856	230.7064	193.8216	53.2798	190.9564
6	193.8216	53.2798	190.9564	227.2133	38.2691	151.2065
7	227.2133	38.2691	151.2065	253.8365	23.2699	111.4565
8	253.8365	23.2699	111.4565	270.7242	23.2792	111.4566
9	270.7242	23.2792	111.4566	279.7344	8.2703	71.7067
10	279.7344	8.2703	71.7067	281.9860	-6.7420	31.9566
11	281.9860	-6.7420	31.9566	277.0977	-6.7452	31.9567
12	277.0977	-6.7452	31.9567	261.7098	-21.7344	-7.7930
13	261.7098	-21.7344	-7.7930	239.5774	-36.7420	-47.5428
14	239.5774	-36.7420	-47.5428	210.6873	-51.7505	-87.2928
15	210.6873	-51.7505	-87.2928	173.1718	-51.7511	-87.2928
16	173.1718	-51.7511	-87.2928	126.6485	-66.7533	-127.0428
17	126.6485	-66.7533	-127.0428	73.3797	-81.7648	-166.7927
18	73.3797	-81.7648	-166.7927	13.3392	-96.7697	-206.5427
19	13.3392	-96.7697	-206.5427	1.7129	0.8168	-2.4128
20	1.7129	0.8168	-2.4128	1.9850	0.3519	-1.1590
21	1.9850	0.3519	-1.1590	1.5574	-0.1131	0.0949
22	1.5574	-0.1131	0.0949	1.4500	-0.1131	0.0949
23	1.4500	-0.1131	0.0949	1.3425	-0.1131	0.0949
24	1.3425	-0.1131	0.0949	47.0977	89.6416	249.2441
25	47.0977	89.6416	249.2441	128.5780	75.7056	209.5358
26	128.5780	75.7056	209.5358	197.4924	60.7077	169.7859
27	197.4924	60.7077	169.7859	252.9218	45.7118	130.0359
28	252.9218	45.7118	130.0359	294.8414	30.7053	90.2856
29	294.8414	30.7053	90.2856	324.4999	17.0165	49.7971
30	324.4999	17.0165	49.7971	340.6550	1.9905	10.0473
31	340.6550	1.9905	10.0473	343.3990	3.3903	8.4982
32	343.3990	3.3903	8.4982	333.1401	-11.5984	-31.2514
33	333.1401	-11.5984	-31.2514	309.6154	-25.2695	-73.3996
34	309.6154	-25.2695	-73.3996	273.6036	-40.2720	-113.1496
35	273.6036	-40.2720	-113.1496	224.0849	-55.2739	-152.8994
36	224.0849	-55.2739	-152.8994	161.0679	-70.2864	-192.6495
37	161.0679	-70.2864	-192.6495	85.3427	-84.1541	-235.6928
38	85.3427	-84.1541	-235.6928	32.2775	13.1676	-27.6985
39	32.2775	13.1676	-27.6985	44.7871	13.1670	-27.6985
40	44.7871	13.1670	-27.6985	53.2730	4.8280	-10.0156
41	53.2730	4.8280	-10.0156	46.7509	-3.5046	5.5756
42	46.7509	-3.5046	5.5756	44.2104	-3.5049	5.5756
43	44.2104	-3.5049	5.5756	41.6694	-3.5055	5.5756
44	41.6694	-3.5055	5.5756	39.1284	-3.5050	5.5756
45	39.1284	-3.5050	5.5756	36.5891	-3.5058	5.5756
46	36.5891	-3.5058	5.5756	56.9961	83.0150	143.4522
47	56.9961	83.0150	143.4522	108.5455	68.0112	103.7018
48	108.5455	68.0112	103.7018	153.3625	53.0172	63.9516
49	153.3625	53.0172	63.9516	191.4231	38.0312	24.2013

50	191.4231	38.0312	24.2013	219.0020	38.0480	24.2010
51	219.0020	38.0480	24.2010	239.4551	23.0478	-15.5489
52	239.4551	23.0478	-15.5489	253.1657	8.0411	-55.2991
53	253.1657	8.0411	-55.2991	258.9984	8.0661	-55.2994
54	258.9984	8.0661	-55.2994	255.1133	-6.9173	-95.0497
55	255.1133	-6.9173	-95.0497	244.4666	-21.9354	-134.8000
56	244.4666	-21.9354	-134.8000	227.0642	-36.9197	-174.5500
57	227.0642	-36.9197	-174.5500	200.3060	-36.9064	-174.5501
58	200.3060	-36.9064	-174.5501	165.2896	-51.9144	-214.3003
59	165.2896	-51.9144	-214.3003	123.5251	-66.9129	-254.0500
60	123.5251	-66.9129	-254.0500	75.7800	-65.4937	-257.0667

ENVOL. MIN. FLECTORES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-89.5006	97.9420	310.7982	-24.8311	5.1983	72.2654
2	-24.8311	5.1983	72.2654	-21.0624	5.1983	72.2654
3	-21.0624	5.1983	72.2654	-19.9721	-1.2916	46.4676
4	-19.9721	-1.2916	46.4676	-20.9086	-1.2917	46.4676
5	-20.9086	-1.2917	46.4676	-21.8456	-1.2914	46.4677
6	-21.8456	-1.2914	46.4677	-25.5044	-7.9002	22.2917
7	-25.5044	-7.9002	22.2917	-31.2320	-7.8992	22.2917
8	-31.2320	-7.8992	22.2917	-36.9597	-7.8959	22.2919
9	-36.9597	-7.8959	22.2919	-46.4238	-14.6985	-0.3972
10	-46.4238	-14.6985	-0.3972	-57.0825	-14.6977	-0.3973
11	-57.0825	-14.6977	-0.3973	-68.8205	-21.7640	-21.7350
12	-68.8205	-21.7640	-21.7350	-84.5985	-21.7653	-21.7350
13	-84.5985	-21.7653	-21.7350	-100.3802	-21.7668	-21.7349
14	-100.3802	-21.7668	-21.7349	-121.3921	-29.1740	-41.8538
15	-121.3921	-29.1740	-41.8538	-142.8950	-36.9954	-60.8830
16	-142.8950	-36.9954	-60.8830	-169.7185	-36.9964	-60.8830
17	-169.7185	-36.9964	-60.8830	-199.3504	-45.2972	-78.9518
18	-199.3504	-45.2972	-78.9518	-232.9420	-54.1371	-97.3850
19	-232.9420	-54.1371	-97.3850	-272.1915	-54.1367	-97.3851
20	-272.1915	-54.1367	-97.3851	-434.7231	15.3097	59.7326
21	-434.7231	15.3097	59.7326	-373.3458	139.2762	327.1800
22	-373.3458	139.2762	327.1800	-252.0539	70.3985	182.5081
23	-252.0539	70.3985	182.5081	-191.0154	59.9272	152.0797
24	-191.0154	59.9272	152.0797	-142.8754	13.1763	-27.6986
25	-142.8754	13.1763	-27.6986	-130.3614	13.1765	-27.6986
26	-130.3614	13.1765	-27.6986	-117.8446	13.1772	-27.6986
27	-117.8446	13.1772	-27.6986	-105.3273	13.1770	-27.6986
28	-105.3273	13.1770	-27.6986	-92.8112	13.1718	-27.6985
29	-92.8112	13.1718	-27.6985	-80.3011	13.1669	-27.6986
30	-80.3011	13.1669	-27.6986	-67.7917	13.1693	-27.6986
31	-67.7917	13.1693	-27.6986	-55.2762	13.1683	-27.6986
32	-55.2762	13.1683	-27.6986	-42.7735	13.1655	-27.6986
33	-42.7735	13.1655	-27.6986	-30.2661	13.1585	-25.6067
34	-30.2661	13.1585	-25.6067	-17.7651	13.1606	-25.6067
35	-17.7651	13.1606	-25.6067	-5.2625	13.1612	-25.6067
36	-5.2625	13.1612	-25.6067	-0.0538	-0.1130	0.0949
37	-0.0538	-0.1130	0.0949	-21.6772	-75.0687	-205.6703
38	-21.6772	-75.0687	-205.6703	-107.3789	-98.4057	-261.7929
39	-107.3789	-98.4057	-261.7929	-210.7306	-116.4681	-306.5163
40	-210.7306	-116.4681	-306.5163	-405.9595	3.6996	-44.3546
41	-405.9595	3.6996	-44.3546	-385.7388	123.8696	217.8071

42	-385.7388	123.8696	217.8071	-299.3152	112.9999	179.4034
43	-299.3152	112.9999	179.4034	-256.6015	22.0057	-54.8586
44	-256.6015	22.0057	-54.8586	-240.6491	21.9975	-54.8586
45	-240.6491	21.9975	-54.8586	-224.7018	21.9946	-54.8587
46	-224.7018	21.9946	-54.8587	-208.7522	21.9981	-54.8589
47	-208.7522	21.9981	-54.8589	-192.8048	21.9833	-54.8589
48	-192.8048	21.9833	-54.8589	-176.8766	21.9679	-54.8589
49	-176.8766	21.9679	-54.8589	-160.9472	21.9639	-54.8589
50	-160.9472	21.9639	-54.8589	-145.0266	21.9625	-54.8590
51	-145.0266	21.9625	-54.8590	-129.1075	21.9577	-54.8591
52	-129.1075	21.9577	-54.8591	-113.1882	21.9382	-54.8591
53	-113.1882	21.9382	-54.8591	-97.2847	21.9267	-54.8591
54	-97.2847	21.9267	-54.8591	-81.3839	21.9303	-54.8591
55	-81.3839	21.9303	-54.8591	-65.4855	21.9431	-54.8591
56	-65.4855	21.9431	-54.8591	-49.5790	21.9429	-54.8591
57	-49.5790	21.9429	-54.8591	-33.6824	21.9298	-54.8591
58	-33.6824	21.9298	-54.8591	-18.0186	21.5230	-51.6656
59	-18.0186	21.5230	-51.6656	-2.4610	20.5456	-48.6976
60	-2.4610	20.5456	-48.6976	-1.4236	-3.4912	5.5756

ENVOL. MAX. CORTANTES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-89.3500	98.2860	310.2063	-18.0903	98.2875	310.2063
2	-18.0903	98.2875	310.2063	46.4187	83.2923	270.4563
3	46.4187	83.2923	270.4563	104.1799	68.2955	230.7064
4	104.1799	68.2955	230.7064	153.6900	68.2856	230.7064
5	153.6900	68.2856	230.7064	193.8216	53.2798	190.9564
6	193.8216	53.2798	190.9564	227.2133	38.2691	151.2065
7	227.2133	38.2691	151.2065	253.8365	23.2699	111.4565
8	253.8365	23.2699	111.4565	270.7242	23.2792	111.4566
9	270.7242	23.2792	111.4566	50.4247	11.6278	99.7461
10	50.4247	11.6278	99.7461	9.0877	5.1988	72.2655
11	9.0877	5.1988	72.2655	12.8568	5.1988	72.2656
12	12.8568	5.1988	72.2656	-2.4317	0.8167	-2.4128
13	-2.4317	0.8167	-2.4128	-1.8397	0.8167	-2.4128
14	-1.8397	0.8167	-2.4128	-1.2478	0.8166	-2.4128
15	-1.2478	0.8166	-2.4128	-0.6557	0.8167	-2.4128
16	-0.6557	0.8167	-2.4128	-0.0636	0.8167	-2.4128
17	-0.0636	0.8167	-2.4128	0.5285	0.8167	-2.4128
18	0.5285	0.8167	-2.4128	1.1207	0.8168	-2.4128
19	1.1207	0.8168	-2.4128	1.7129	0.8168	-2.4128
20	1.7129	0.8168	-2.4128	-359.7660	51.6337	163.4691
21	-359.7660	51.6337	163.4691	-363.3062	141.7054	348.1289
22	-363.3062	141.7054	348.1289	-234.6855	126.7052	308.3788
23	-234.6855	126.7052	308.3788	-119.5666	111.7074	268.6287
24	-119.5666	111.7074	268.6287	-17.9483	96.7104	228.8785
25	-17.9483	96.7104	228.8785	70.1701	81.7074	189.1284
26	70.1701	81.7074	189.1284	15.4569	70.4001	182.5078
27	15.4569	70.4001	182.5078	36.7073	59.9270	152.0796
28	36.7073	59.9270	152.0796	48.9246	50.1055	123.1711
29	48.9246	50.1055	123.1711	53.9743	40.8101	94.8793
30	53.9743	40.8101	94.8793	92.7444	25.8098	55.1294
31	92.7444	25.8098	55.1294	117.2661	25.8112	55.1293
32	117.2661	25.8112	55.1293	-42.7735	13.1655	-27.6986
33	-42.7735	13.1655	-27.6986	-30.2649	13.1667	-27.6986
34	-30.2649	13.1667	-27.6986	-17.7579	13.1659	-27.6985
35	-17.7579	13.1659	-27.6985	-5.2496	13.1651	-27.6985

36	-5.2496	13.1651	-27.6985	7.2579	13.1668	-27.6985
37	7.2579	13.1668	-27.6985	19.7680	13.1682	-27.6985
38	19.7680	13.1682	-27.6985	32.2775	13.1676	-27.6985
39	32.2775	13.1676	-27.6985	44.7871	13.1670	-27.6985
40	44.7871	13.1670	-27.6985	-346.7766	16.9004	-0.0838
41	-346.7766	16.9004	-0.0838	-359.4114	130.0056	254.3340
42	-359.4114	130.0056	254.3340	-265.1555	130.0057	254.3338
43	-265.1555	130.0057	254.3338	-181.0273	115.0033	214.5838
44	-181.0273	115.0033	214.5838	-103.6492	100.0105	174.8337
45	-103.6492	100.0105	174.8337	-33.0114	85.0072	135.0836
46	-33.0114	85.0072	135.0836	28.6103	85.0133	135.0833
47	28.6103	85.0133	135.0833	81.6295	70.0359	95.3331
48	81.6295	70.0359	95.3331	127.9002	55.0432	55.5830
49	127.9002	55.0432	55.5830	167.4344	40.0342	15.8329
50	167.4344	40.0342	15.8329	196.4534	40.0331	15.8323
51	196.4534	40.0331	15.8323	218.3611	25.0583	-23.9180
52	218.3611	25.0583	-23.9180	-113.1882	21.9382	-54.8591
53	-113.1882	21.9382	-54.8591	-97.2847	21.9267	-54.8591
54	-97.2847	21.9267	-54.8591	-81.3839	21.9303	-54.8591
55	-81.3839	21.9303	-54.8591	-65.4855	21.9431	-54.8591
56	-65.4855	21.9431	-54.8591	-49.5790	21.9429	-54.8591
57	-49.5790	21.9429	-54.8591	-33.6824	21.9298	-54.8591
58	-33.6824	21.9298	-54.8591	-17.7855	21.9221	-54.8591
59	-17.7855	21.9221	-54.8591	-1.8911	21.9216	-54.8591
60	-1.8911	21.9216	-54.8591	14.0073	21.9262	-54.8591

ENVOL. MIN. CORTANTES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-9.5330	0.8161	-2.4128	-8.9412	0.8162	-2.4128
2	-8.9412	0.8162	-2.4128	-19.0354	-1.2917	46.4676
3	-19.0354	-1.2917	46.4676	-8.3214	-7.9014	22.2915
4	-8.3214	-7.9014	22.2915	-14.0497	-7.9003	22.2916
5	-14.0497	-7.9003	22.2916	-3.7894	-14.7019	-0.3974
6	-3.7894	-14.7019	-0.3974	10.0967	-21.7703	-21.7351
7	10.0967	-21.7703	-21.7351	26.6944	-29.1819	-41.8540
8	26.6944	-29.1819	-41.8540	5.5378	-29.1799	-41.8540
9	5.5378	-29.1799	-41.8540	18.0592	-37.0015	-60.8832
10	18.0592	-37.0015	-60.8832	30.5466	-45.2994	-78.9521
11	30.5466	-45.2994	-78.9521	-2.2962	-45.3004	-78.9520
12	-2.2962	-45.3004	-78.9520	2.5565	-54.1390	-97.3851
13	2.5565	-54.1390	-97.3851	4.4967	-63.5662	-117.6712
14	4.4967	-63.5662	-117.6712	1.9381	-73.6281	-140.1410
15	1.9381	-73.6281	-140.1410	-51.4423	-73.6292	-140.1410
16	-51.4423	-73.6292	-140.1410	-67.8316	-84.3455	-165.1011
17	-67.8316	-84.3455	-165.1011	-103.7438	-96.7578	-176.9279
18	-103.7438	-96.7578	-176.9279	-174.6451	-111.7579	-216.6779
19	-174.6451	-111.7579	-216.6779	-255.6709	-111.7570	-216.6779
20	-255.6709	-111.7570	-216.6779	-164.4841	-49.3698	-136.7142
21	-164.4841	-49.3698	-136.7142	1.5574	-0.1131	0.0949
22	1.5574	-0.1131	0.0949	1.4500	-0.1131	0.0949
23	1.4500	-0.1131	0.0949	1.3425	-0.1131	0.0949
24	1.3425	-0.1131	0.0949	1.2351	-0.1131	0.0949
25	1.2351	-0.1131	0.0949	1.1276	-0.1131	0.0949
26	1.1276	-0.1131	0.0949	1.0202	-0.1131	0.0949
27	1.0202	-0.1131	0.0949	17.8634	-1.1131	-71.3544

28	17.8634	-1.1131	-71.3544	59.4911	-6.4368	-84.4380
29	59.4911	-6.4368	-84.4380	98.7297	-12.6880	-99.3595
30	98.7297	-12.6880	-99.3595	133.4606	-19.8885	-116.1864
31	133.4606	-19.8885	-116.1864	114.5692	-19.8878	-116.1866
32	114.5692	-19.8878	-116.1866	134.9145	-28.0280	-134.9856
33	134.9145	-28.0280	-134.9856	145.3296	-36.9929	-155.9189
34	145.3296	-36.9929	-155.9189	144.5856	-47.1244	-178.5738
35	144.5856	-47.1244	-178.5738	172.9462	-61.4105	-150.6102
36	172.9462	-61.4105	-150.6102	104.1050	-76.4190	-190.3602
37	104.1050	-76.4190	-190.3602	21.7430	-91.4254	-230.1104
38	21.7430	-91.4254	-230.1104	-74.1058	-106.4232	-269.8604
39	-74.1058	-106.4232	-269.8604	-183.4597	-121.4263	-309.6103
40	-183.4597	-121.4263	-309.6103	-260.7074	-53.7733	-203.3040
41	-260.7074	-53.7733	-203.3040	46.7509	-3.5046	5.5756
42	46.7509	-3.5046	5.5756	44.2104	-3.5049	5.5756
43	44.2104	-3.5049	5.5756	41.6694	-3.5055	5.5756
44	41.6694	-3.5055	5.5756	39.1284	-3.5050	5.5756
45	39.1284	-3.5050	5.5756	36.5891	-3.5058	5.5756
46	36.5891	-3.5058	5.5756	34.0476	-3.5054	5.5756
47	34.0476	-3.5054	5.5756	31.5082	-3.5015	5.5756
48	31.5082	-3.5015	5.5756	28.9716	-3.4981	5.5756
49	28.9716	-3.4981	5.5756	26.4359	-3.4985	5.5756
50	26.4359	-3.4985	5.5756	23.8995	-3.4969	5.5756
51	23.8995	-3.4969	5.5756	21.3643	-3.4928	5.5756
52	21.3643	-3.4928	5.5756	75.9377	-6.9962	-138.5981
53	75.9377	-6.9962	-138.5981	70.8649	-6.9941	-138.5984
54	70.8649	-6.9941	-138.5984	109.3188	-15.8587	-157.9116
55	109.3188	-15.8587	-157.9116	140.4454	-26.0950	-179.6956
56	140.4454	-26.0950	-179.6956	161.3922	-37.6725	-204.1901
57	161.3922	-37.6725	-204.1901	134.0785	-37.6762	-204.1903
58	134.0785	-37.6762	-204.1903	165.2896	-51.9144	-214.3003
59	165.2896	-51.9144	-214.3003	123.5251	-66.9129	-254.0500
60	123.5251	-66.9129	-254.0500	75.0116	-66.9126	-254.0497

ENVOL. MAX. TORSORES TREN TREN SW/2, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-89.5006	97.9420	310.7982	-18.4927	97.9457	310.7982
2	-18.4927	97.9457	310.7982	45.7711	82.9470	271.0483
3	45.7711	82.9470	271.0483	103.2822	67.9485	231.2983
4	103.2822	67.9485	231.2983	152.5443	67.9429	231.2984
5	152.5443	67.9429	231.2984	192.4312	52.9315	191.5483
6	192.4312	52.9315	191.5483	90.5989	30.0678	157.4644
7	90.5989	30.0678	157.4644	69.8546	20.1692	127.3924
8	69.8546	20.1692	127.3924	84.4772	20.1702	127.3924
9	84.4772	20.1702	127.3924	50.4247	11.6278	99.7461
10	50.4247	11.6278	99.7461	9.0877	5.1988	72.2655
11	9.0877	5.1988	72.2655	12.8568	5.1988	72.2656
12	12.8568	5.1988	72.2656	-28.3947	-1.2880	46.4678
13	-28.3947	-1.2880	46.4678	-65.5833	-7.8954	22.2920
14	-65.5833	-7.8954	22.2920	-99.7023	-14.6912	-0.3970
15	-99.7023	-14.6912	-0.3970	-110.3531	-14.6924	-0.3970
16	-110.3531	-14.6924	-0.3970	-0.0636	0.8167	-2.4128
17	-0.0636	0.8167	-2.4128	0.5285	0.8167	-2.4128
18	0.5285	0.8167	-2.4128	1.1207	0.8168	-2.4128
19	1.1207	0.8168	-2.4128	1.7129	0.8168	-2.4128
20	1.7129	0.8168	-2.4128	-359.7660	51.6337	163.4691
21	-359.7660	51.6337	163.4691	-282.1307	135.7156	368.5361

22	-282.1307	135.7156	368.5361	-159.2021	120.7171	328.7860	14	4.4967	-63.5662	-117.6712	1.9381	-73.6281	-140.1410
23	-159.2021	120.7171	328.7860	-49.7710	105.7162	289.0360	15	1.9381	-73.6281	-140.1410	-51.4423	-73.6292	-140.1410
24	-49.7710	105.7162	289.0360	-63.0295	93.5224	249.9835	16	-51.4423	-73.6292	-140.1410	-67.8316	-84.3455	-165.1011
25	-63.0295	93.5224	249.9835	-17.0652	81.5858	215.2071	17	-67.8316	-84.3455	-165.1011	-92.2184	-95.7197	-192.8289
26	-17.0652	81.5858	215.2071	15.4569	70.4001	182.5078	18	-92.2184	-95.7197	-192.8289	-125.8884	-107.7531	-223.5710
27	15.4569	70.4001	182.5078	36.7073	59.9270	152.0796	19	-125.8884	-107.7531	-223.5710	-204.0110	-107.7514	-223.5710
28	36.7073	59.9270	152.0796	48.9246	50.1055	123.1711	20	-204.0110	-107.7514	-223.5710	-164.4841	-49.3698	-136.7142
29	48.9246	50.1055	123.1711	53.9743	40.8101	94.8793	21	-164.4841	-49.3698	-136.7142	-180.4180	13.1715	-27.6985
30	53.9743	40.8101	94.8793	92.7444	25.8098	55.1294	22	-180.4180	13.1715	-27.6985	-160.6898	12.6212	-31.1616
31	92.7444	25.8098	55.1294	117.2661	25.8112	55.1293	23	-160.6898	12.6212	-31.1616	-134.1786	11.4307	-36.0607
32	117.2661	25.8112	55.1293	128.2891	10.8156	15.3794	24	-134.1786	11.4307	-36.0607	-101.7377	9.5191	-42.4624
33	128.2891	10.8156	15.3794	0.2684	-0.1131	0.0949	25	-101.7377	9.5191	-42.4624	-64.5595	6.8244	-50.4339
34	0.2684	-0.1131	0.0949	0.1610	-0.1130	0.0949	26	-64.5595	6.8244	-50.4339	-24.1201	3.2980	-60.0424
35	0.1610	-0.1130	0.0949	0.0536	-0.1130	0.0949	27	-24.1201	3.2980	-60.0424	17.8634	-1.1131	-71.3544
36	0.0536	-0.1130	0.0949	-0.0538	-0.1130	0.0949	28	17.8634	-1.1131	-71.3544	59.4911	-6.4368	-84.4380
37	-0.0538	-0.1130	0.0949	-0.1612	-0.1130	0.0949	29	59.4911	-6.4368	-84.4380	98.7297	-12.6880	-99.3595
38	-0.1612	-0.1130	0.0949	-0.2686	-0.1130	0.0949	30	98.7297	-12.6880	-99.3595	133.4606	-19.8885	-116.1864
39	-0.2686	-0.1130	0.0949	-0.3760	-0.1130	0.0949	31	133.4606	-19.8885	-116.1864	114.5692	-19.8878	-116.1866
40	-0.3760	-0.1130	0.0949	-0.4642	-0.0406	0.0199	32	114.5692	-19.8878	-116.1866	134.9145	-28.0280	-134.9856
41	-0.4642	-0.0406	0.0199	-323.7292	127.9906	262.7029	33	134.9145	-28.0280	-134.9856	145.3296	-36.9929	-155.9189
42	-323.7292	127.9906	262.7029	-230.9353	127.9895	262.7028	34	145.3296	-36.9929	-155.9189	144.5856	-47.1244	-178.5738
43	-230.9353	127.9895	262.7028	-148.2695	112.9890	222.9527	35	144.5856	-47.1244	-178.5738	130.0867	-58.3701	-203.0157
44	-148.2695	112.9890	222.9527	-72.3478	97.9908	183.2023	36	130.0867	-58.3701	-203.0157	99.4040	-70.7137	-229.3201
45	-72.3478	97.9908	183.2023	-3.1830	83.0070	143.4523	37	99.4040	-70.7137	-229.3201	50.4101	-84.0545	-257.5732
46	-3.1830	83.0070	143.4523	56.9961	83.0150	143.4522	38	50.4101	-84.0545	-257.5732	-18.6273	-98.2850	-287.8715
47	56.9961	83.0150	143.4522	108.5455	68.0112	103.7018	39	-18.6273	-98.2850	-287.8715	-109.0009	-113.3178	-320.3215
48	108.5455	68.0112	103.7018	153.3625	53.0172	63.9516	40	-109.0009	-113.3178	-320.3215	-260.7074	-53.7733	-203.3040
49	153.3625	53.0172	63.9516	191.4231	38.0312	24.2013	41	-260.7074	-53.7733	-203.3040	-288.5121	22.0052	-54.8584
50	191.4231	38.0312	24.2013	219.0020	38.0480	24.2010	42	-288.5121	22.0052	-54.8584	-272.5584	22.0056	-54.8585
51	219.0020	38.0480	24.2010	21.3643	-3.4928	5.5756	43	-272.5584	22.0056	-54.8585	-252.0947	21.7327	-59.4639
52	21.3643	-3.4928	5.5756	18.8312	-3.4938	5.5756	44	-252.0947	21.7327	-59.4639	-222.6463	20.6732	-65.5482
53	18.8312	-3.4938	5.5756	16.2969	-3.4944	5.5756	45	-222.6463	20.6732	-65.5482	-184.8203	18.7444	-73.1962
54	16.2969	-3.4944	5.5756	13.7650	-3.4922	5.5756	46	-184.8203	18.7444	-73.1962	-171.2229	18.7553	-73.1962
55	13.7650	-3.4922	5.5756	11.2337	-3.4915	5.5756	47	-171.2229	18.7553	-73.1962	-128.0512	15.8439	-82.5059
56	11.2337	-3.4915	5.5756	8.7015	-3.4917	5.5756	48	-128.0512	15.8439	-82.5059	-79.5028	11.9005	-93.5895
57	8.7015	-3.4917	5.5756	6.1703	-3.4918	5.5756	49	-79.5028	11.9005	-93.5895	-27.2108	6.8331	-106.5754
58	6.1703	-3.4918	5.5756	3.6389	-3.4922	5.5756	50	-27.2108	6.8331	-106.5754	-22.2558	6.8297	-106.5755
59	3.6389	-3.4922	5.5756	1.1075	-3.4918	5.5756	51	-22.2558	6.8297	-106.5755	27.4049	0.5563	-121.5466
60	1.1075	-3.4918	5.5756	-1.4236	-3.4912	5.5756	52	27.4049	0.5563	-121.5466	75.9377	-6.9962	-138.5981
							53	75.9377	-6.9962	-138.5981	70.8649	-6.9941	-138.5984
							54	70.8649	-6.9941	-138.5984	109.3188	-15.8587	-157.9116
							55	109.3188	-15.8587	-157.9116	140.4454	-26.0950	-179.6956
							56	140.4454	-26.0950	-179.6956	161.3922	-37.6725	-204.1901
							57	161.3922	-37.6725	-204.1901	134.0785	-37.6762	-204.1903
							58	134.0785	-37.6762	-204.1903	132.5540	-50.6233	-231.6661
							59	132.5540	-50.6233	-231.6661	114.0603	-64.9165	-262.4191
							60	114.0603	-64.9165	-262.4191	66.9994	-64.9123	-262.4191
ENVOL. MAX. FLECTORES TREN TREN SIN CARGA, EC-1 en via 1													
							Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
							=====						
1	-9.5330	0.8161	-2.4128	-8.9412	0.8162	-2.4128							
2	-8.9412	0.8162	-2.4128	-3.2977	0.3386	-5.9111							
3	-3.2977	0.3386	-5.9111	14.1870	-1.4282	-10.7362							
4	14.1870	-1.4282	-10.7362	13.1509	-1.4286	-10.7362							
5	13.1509	-1.4286	-10.7362	37.5563	-4.4753	-17.1325							
6	37.5563	-4.4753	-17.1325	67.5245	-8.7805	-25.3328							
7	67.5245	-8.7805	-25.3328	26.6944	-29.1819	-41.8540							
8	26.6944	-29.1819	-41.8540	5.5378	-29.1799	-41.8540							
9	5.5378	-29.1799	-41.8540	18.0592	-37.0015	-60.8832							
10	18.0592	-37.0015	-60.8832	30.5466	-45.2994	-78.9521							
11	30.5466	-45.2994	-78.9521	-2.2962	-45.3004	-78.9520							
12	-2.2962	-45.3004	-78.9520	2.5565	-54.1390	-97.3851							
13	2.5565	-54.1390	-97.3851	4.4967	-63.5662	-117.6712							

8	21.1535	1.9405	9.2881	22.5606	1.9402	9.2881								
9	22.5606	1.9402	9.2881	23.3111	0.6891	5.9756		1	-7.4584	8.1618	25.8998	-2.1603	6.6987	24.1696
10	23.3111	0.6891	5.9756	23.4985	-0.5610	2.6631		2	-2.1603	6.6987	24.1696	-0.6958	0.0680	-0.2011
11	23.4985	-0.5610	2.6631	23.0919	-0.5616	2.6631		3	-0.6958	0.0680	-0.2011	-0.6465	0.0680	-0.2011
12	23.0919	-0.5616	2.6631	21.8088	-1.8119	-0.6494		4	-0.6465	0.0680	-0.2011	-0.5972	0.0680	-0.2011
13	21.8088	-1.8119	-0.6494	19.9650	-3.0615	-3.9619		5	-0.5972	0.0680	-0.2011	-0.5479	0.0680	-0.2011
14	19.9650	-3.0615	-3.9619	17.5578	-4.3125	-7.2744		6	-0.5479	0.0680	-0.2011	-0.4986	0.0680	-0.2011
15	17.5578	-4.3125	-7.2744	14.4307	-4.3140	-7.2744		7	-0.4986	0.0680	-0.2011	-0.4493	0.0680	-0.2011
16	14.4307	-4.3140	-7.2744	10.5541	-5.5643	-10.5869		8	-0.4493	0.0680	-0.2011	-0.3999	0.0680	-0.2011
17	10.5541	-5.5643	-10.5869	6.1144	-6.8140	-13.8994		9	-0.3999	0.0680	-0.2011	-0.3506	0.0680	-0.2011
18	6.1144	-6.8140	-13.8994	1.1120	-8.0642	-17.2119		10	-0.3506	0.0680	-0.2011	-0.3013	0.0680	-0.2011
19	1.1120	-8.0642	-17.2119	0.1427	0.0681	-0.2011		11	-0.3013	0.0680	-0.2011	-0.2520	0.0680	-0.2011
20	0.1427	0.0681	-0.2011	0.1654	0.0293	-0.0966		12	-0.2520	0.0680	-0.2011	-0.2026	0.0680	-0.2011
21	0.1654	0.0293	-0.0966	0.1298	-0.0094	0.0079		13	-0.2026	0.0680	-0.2011	-0.1533	0.0680	-0.2011
22	0.1298	-0.0094	0.0079	0.1208	-0.0094	0.0079		14	-0.1533	0.0680	-0.2011	-0.1040	0.0680	-0.2011
23	0.1208	-0.0094	0.0079	0.1119	-0.0094	0.0079		15	-0.1040	0.0680	-0.2011	-1.3616	-5.8029	-8.9553
24	0.1119	-0.0094	0.0079	0.1029	-0.0094	0.0079		16	-1.3616	-5.8029	-8.9553	-6.3191	-7.0532	-12.2678
25	0.1029	-0.0094	0.0079	3.4637	7.0503	15.3370		17	-6.3191	-7.0532	-12.2678	-11.8388	-8.3032	-15.5803
26	3.4637	7.0503	15.3370	10.0401	5.9455	12.6935		18	-11.8388	-8.3032	-15.5803	-17.9214	-9.5534	-18.8928
27	10.0401	5.9455	12.6935	15.5023	4.7053	9.4753		19	-17.9214	-9.5534	-18.8928	-24.8477	-9.5534	-18.8928
28	15.5023	4.7053	9.4753	19.8466	3.4547	6.1628		20	-24.8477	-9.5534	-18.8928	-39.4034	1.3256	5.2288
29	19.8466	3.4547	6.1628	23.0665	2.2042	2.8503		21	-39.4034	1.3256	5.2288	-34.1883	12.2049	29.3503
30	23.0665	2.2042	2.8503	25.1615	0.9553	-0.4622		22	-34.1883	12.2049	29.3503	-23.0936	10.9548	26.0378
31	25.1615	0.9553	-0.4622	26.0695	0.9562	-0.4622		23	-23.0936	10.9548	26.0378	-13.1244	9.7048	22.7253
32	26.0695	0.9562	-0.4622	25.8538	-0.2941	-3.7747		24	-13.1244	9.7048	22.7253	-11.9062	1.0975	-2.3082
33	25.8538	-0.2941	-3.7747	24.5123	-1.5445	-7.0872		25	-11.9062	1.0975	-2.3082	-10.8635	1.0977	-2.3082
34	24.5123	-1.5445	-7.0872	22.0461	-2.7939	-10.3997		26	-10.8635	1.0977	-2.3082	-9.8204	1.0979	-2.3082
35	22.0461	-2.7939	-10.3997	18.4547	-4.0435	-13.7122		27	-9.8204	1.0979	-2.3082	-8.7774	1.0979	-2.3082
36	18.4547	-4.0435	-13.7122	13.7381	-5.2938	-17.0247		28	-8.7774	1.0979	-2.3082	-7.7343	1.0977	-2.3082
37	13.7381	-5.2938	-17.0247	7.8959	-6.5440	-20.3372		29	-7.7343	1.0977	-2.3082	-6.6918	1.0975	-2.3082
38	7.8959	-6.5440	-20.3372	2.6898	1.0973	-2.3082		30	-6.6918	1.0975	-2.3082	-5.6490	1.0974	-2.3082
39	2.6898	1.0973	-2.3082	3.7322	1.0973	-2.3082		31	-5.6490	1.0974	-2.3082	-4.6066	1.0970	-2.3082
40	3.7322	1.0973	-2.3082	4.4395	0.4023	-0.8346		32	-4.6066	1.0970	-2.3082	-3.5645	1.0971	-2.3082
41	4.4395	0.4023	-0.8346	3.8959	-0.2921	0.4646		33	-3.5645	1.0971	-2.3082	-2.5221	1.0965	-2.1339
42	3.8959	-0.2921	0.4646	3.6842	-0.2921	0.4646		34	-2.5221	1.0965	-2.1339	-1.4803	1.0965	-2.1339
43	3.6842	-0.2921	0.4646	3.4724	-0.2921	0.4646		35	-1.4803	1.0965	-2.1339	-0.4386	1.0966	-2.1339
44	3.4724	-0.2921	0.4646	3.2607	-0.2920	0.4646		36	-0.4386	1.0966	-2.1339	-0.0045	-0.0094	0.0079
45	3.2607	-0.2920	0.4646	3.0490	-0.2919	0.4646		37	-0.0045	-0.0094	0.0079	-2.9927	-7.4581	-20.9640
46	3.0490	-0.2919	0.4646	2.8373	-0.2919	0.4646		38	-2.9927	-7.4581	-20.9640	-10.8279	-8.7078	-24.2765
47	2.8373	-0.2919	0.4646	3.6266	6.2789	7.3249		39	-10.8279	-8.7078	-24.2765	-19.7874	-9.9577	-27.5890
48	3.6266	6.2789	7.3249	7.8048	5.0297	4.0124		40	-19.7874	-9.9577	-27.5890	-36.8669	0.6602	-3.5070
49	7.8048	5.0297	4.0124	11.4204	3.7795	0.6998		41	-36.8669	0.6602	-3.5070	-35.0596	11.2782	20.5750
50	11.4204	3.7795	0.6998	14.1609	3.7801	0.6998		42	-35.0596	11.2782	20.5750	-26.8827	11.2780	20.5750
51	14.1609	3.7801	0.6998	16.3086	2.5306	-2.6127		43	-26.8827	11.2780	20.5750	-19.5703	1.6811	-4.3239
52	16.3086	2.5306	-2.6127	17.8937	1.2807	-5.9252		44	-19.5703	1.6811	-4.3239	-18.3515	1.6812	-4.3239
53	17.8937	1.2807	-5.9252	18.8232	1.2815	-5.9253		45	-18.3515	1.6812	-4.3239	-17.1332	1.6813	-4.3239
54	18.8232	1.2815	-5.9253	18.9407	0.0328	-9.2378		46	-17.1332	1.6813	-4.3239	-15.9143	1.6808	-4.3239
55	18.9407	0.0328	-9.2378	18.4967	-1.2169	-12.5502		47	-15.9143	1.6808	-4.3239	-14.6990	1.6737	-4.1033
56	18.4967	-1.2169	-12.5502	17.4892	-2.4662	-15.8628		48	-14.6990	1.6737	-4.1033	-13.4871	1.6731	-4.1033
57	17.4892	-2.4662	-15.8628	15.7013	-2.4657	-15.8628		49	-13.4871	1.6731	-4.1033	-12.2739	1.6737	-4.1033
58	15.7013	-2.4657	-15.8628	13.2258	-3.7164	-19.1753		50	-12.2739	1.6737	-4.1033	-11.0609	1.6722	-4.1033
59	13.2258	-3.7164	-19.1753	10.1875	-4.9665	-22.4878		51	-11.0609	1.6722	-4.1033	-9.8494	1.6710	-4.1033
60	10.1875	-4.9665	-22.4878	6.5873	-4.9660	-22.4878		52	-9.8494	1.6710	-4.1033	-8.6376	1.6712	-4.1033
								53	-8.6376	1.6712	-4.1033	-7.4261	1.6707	-4.1033
								54	-7.4261	1.6707	-4.1033	-6.2153	1.6698	-4.1033
ENVOL. MIN. FLECTORES TREN TREN SIN CARGA, EC-1 en via 1								55	-6.2153	1.6698	-4.1033	-5.0051	1.6702	-4.1033
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2		56	-5.0051	1.6702	-4.1033	-3.7938	1.6701	-4.1033
=====								57	-3.7938	1.6701	-4.1033	-2.5837	1.6695	-4.1033
								58	-2.5837	1.6695	-4.1033	-1.3730	1.6695	-4.1033

ENVOL. MIN. FLECTORES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						

59 -1.3730 1.6695 -4.1033 -0.1798 1.5347 -3.6539
 60 -0.1798 1.5347 -3.6539 -0.1186 -0.2909 0.4646
 ENVOL. MAX. CORTANTES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====
1	-7.4459	8.1906	25.8505	-1.5076	8.1906	25.8505
2	-1.5076	8.1906	25.8505	3.8682	6.9409	22.5380
3	3.8682	6.9409	22.5380	8.6818	5.6908	19.2255
4	8.6818	5.6908	19.2255	12.8075	5.6902	19.2255
5	12.8075	5.6902	19.2255	16.1518	4.4406	15.9130
6	16.1518	4.4406	15.9130	18.9345	3.1909	12.6005
7	18.9345	3.1909	12.6005	21.1535	1.9405	9.2881
8	21.1535	1.9405	9.2881	22.5606	1.9402	9.2881
9	22.5606	1.9402	9.2881	23.3111	0.6891	5.9756
10	23.3111	0.6891	5.9756	-0.3013	0.0680	-0.2011
11	-0.3013	0.0680	-0.2011	-0.2520	0.0680	-0.2011
12	-0.2520	0.0680	-0.2011	-0.2026	0.0680	-0.2011
13	-0.2026	0.0680	-0.2011	-0.1533	0.0680	-0.2011
14	-0.1533	0.0680	-0.2011	-0.1040	0.0680	-0.2011
15	-0.1040	0.0680	-0.2011	-0.0547	0.0680	-0.2011
16	-0.0547	0.0680	-0.2011	-0.0053	0.0681	-0.2011
17	-0.0053	0.0681	-0.2011	0.0440	0.0681	-0.2011
18	0.0440	0.0681	-0.2011	0.0934	0.0681	-0.2011
19	0.0934	0.0681	-0.2011	0.1427	0.0681	-0.2011
20	0.1427	0.0681	-0.2011	-39.4034	1.3256	5.2288
21	-39.4034	1.3256	5.2288	-34.1883	12.2049	29.3503
22	-34.1883	12.2049	29.3503	-23.0936	10.9548	26.0378
23	-23.0936	10.9548	26.0378	-13.1244	9.7048	22.7253
24	-13.1244	9.7048	22.7253	-4.2801	8.4549	19.4128
25	-4.2801	8.4549	19.4128	3.4390	7.2046	16.1003
26	3.4390	7.2046	16.1003	10.0330	5.9549	12.7878
27	10.0330	5.9549	12.7878	15.5023	4.7053	9.4753
28	15.5023	4.7053	9.4753	19.8466	3.4547	6.1628
29	19.8466	3.4547	6.1628	23.0665	2.2042	2.8503
30	23.0665	2.2042	2.8503	-5.6490	1.0974	-2.3082
31	-5.6490	1.0974	-2.3082	-4.6066	1.0970	-2.3082
32	-4.6066	1.0970	-2.3082	-3.5645	1.0971	-2.3082
33	-3.5645	1.0971	-2.3082	-2.5221	1.0974	-2.3082
34	-2.5221	1.0974	-2.3082	-1.4797	1.0974	-2.3082
35	-1.4797	1.0974	-2.3082	-0.4374	1.0971	-2.3082
36	-0.4374	1.0971	-2.3082	0.6048	1.0970	-2.3082
37	0.6048	1.0970	-2.3082	1.6472	1.0972	-2.3082
38	1.6472	1.0972	-2.3082	2.6898	1.0973	-2.3082
39	2.6898	1.0973	-2.3082	3.7322	1.0973	-2.3082
40	3.7322	1.0973	-2.3082	-36.8669	0.6602	-3.5070
41	-36.8669	0.6602	-3.5070	-35.0596	11.2782	20.5750
42	-35.0596	11.2782	20.5750	-26.8827	11.2780	20.5750
43	-26.8827	11.2780	20.5750	-19.5498	10.0280	17.2624
44	-19.5498	10.0280	17.2624	-12.7792	8.7785	13.9499
45	-12.7792	8.7785	13.9499	-6.5710	7.5283	10.6374
46	-6.5710	7.5283	10.6374	-1.1130	7.5280	10.6374
47	-1.1130	7.5280	10.6374	3.6266	6.2789	7.3249
48	3.6266	6.2789	7.3249	7.8048	5.0297	4.0124
49	7.8048	5.0297	4.0124	11.4204	3.7795	0.6998
50	11.4204	3.7795	0.6998	14.1609	3.7801	0.6998
51	14.1609	3.7801	0.6998	16.3086	2.5306	-2.6127
52	16.3086	2.5306	-2.6127	-8.6143	1.6764	-4.3239

53 -8.6143 1.6764 -4.3239 -7.3986 1.6772 -4.3239
 54 -7.3986 1.6772 -4.3239 -6.1833 1.6764 -4.3239
 55 -6.1833 1.6764 -4.3239 -4.9690 1.6758 -4.3239
 56 -4.9690 1.6758 -4.3239 -3.7542 1.6758 -4.3239
 57 -3.7542 1.6758 -4.3239 -2.5394 1.6755 -4.3239
 58 -2.5394 1.6755 -4.3239 -1.3249 1.6751 -4.3239
 59 -1.3249 1.6751 -4.3239 -0.1106 1.6750 -4.3239
 60 -0.1106 1.6750 -4.3239 1.1040 1.6752 -4.3239

ENVOL. MIN. CORTANTES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====
1	-0.7944	0.0680	-0.2011	-0.7451	0.0680	-0.2011
2	-0.7451	0.0680	-0.2011	-0.2748	0.0282	-0.4926
3	-0.2748	0.0282	-0.4926	1.1823	-0.1190	-0.8947
4	1.1823	-0.1190	-0.8947	1.0959	-0.1190	-0.8947
5	1.0959	-0.1190	-0.8947	3.1297	-0.3731	-1.4277
6	3.1297	-0.3731	-1.4277	5.6270	-0.7317	-2.1111
7	5.6270	-0.7317	-2.1111	8.3745	-1.1939	-2.9630
8	8.3745	-1.1939	-2.9630	7.5093	-1.1941	-2.9630
9	7.5093	-1.1941	-2.9630	9.8967	-1.7557	-4.0006
10	9.8967	-1.7557	-4.0006	12.0690	-2.4150	-5.2397
11	12.0690	-2.4150	-5.2397	10.3182	-2.4155	-5.2397
12	10.3182	-2.4155	-5.2397	9.2589	-3.3028	-2.3303
13	9.2589	-3.3028	-2.3303	6.3336	-4.5532	-5.6428
14	6.3336	-4.5532	-5.6428	2.8452	-5.8032	-8.9553
15	2.8452	-5.8032	-8.9553	-1.3616	-5.8029	-8.9553
16	-1.3616	-5.8029	-8.9553	-6.3191	-7.0532	-12.2678
17	-6.3191	-7.0532	-12.2678	-11.8388	-8.3032	-15.5803
18	-11.8388	-8.3032	-15.5803	-17.9214	-9.5534	-18.8928
19	-17.9214	-9.5534	-18.8928	-24.8477	-9.5534	-18.8928
20	-24.8477	-9.5534	-18.8928	-13.7071	-4.1142	-11.3928
21	-13.7071	-4.1142	-11.3928	0.1298	-0.0094	0.0079
22	0.1298	-0.0094	0.0079	0.1208	-0.0094	0.0079
23	0.1208	-0.0094	0.0079	0.1119	-0.0094	0.0079
24	0.1119	-0.0094	0.0079	0.1029	-0.0094	0.0079
25	0.1029	-0.0094	0.0079	0.0940	-0.0094	0.0079
26	0.0940	-0.0094	0.0079	0.0850	-0.0094	0.0079
27	0.0850	-0.0094	0.0079	1.4886	-0.0928	-5.9462
28	1.4886	-0.0928	-5.9462	4.9575	-0.5362	-7.0365
29	4.9575	-0.5362	-7.0365	8.2274	-1.0573	-8.2800
30	8.2274	-1.0573	-8.2800	11.1218	-1.6575	-9.6822
31	11.1218	-1.6575	-9.6822	9.5473	-1.6574	-9.6822
32	9.5473	-1.6574	-9.6822	11.2430	-2.3353	-11.2488
33	11.2430	-2.3353	-11.2488	12.1332	-3.0925	-12.9853
34	12.1332	-3.0925	-12.9853	12.0475	-3.9255	-14.8974
35	12.0475	-3.9255	-14.8974	9.3021	-4.9576	-17.6515
36	9.3021	-4.9576	-17.6515	3.7168	-6.2084	-20.9640
37	3.7168	-6.2084	-20.9640	-2.9927	-7.4581	-24.2765
38	-2.9927	-7.4581	-24.2765	-8.7078	-9.9577	-27.5890
39	-8.7078	-9.9577	-27.5890	-19.7874	-4.3137	-17.2361
40	-19.7874	-4.3137	-17.2361	3.8959	-0.2921	0.4646
41	3.8959	-0.2921	0.4646	3.6842	-0.2921	0.4646
42	3.6842	-0.2921	0.4646	3.4724	-0.2921	0.4646
43	3.4724	-0.2921	0.4646	3.2607	-0.2920	0.4646
44	3.2607	-0.2920	0.4646			

45	3.2607	-0.2920	0.4646	3.0490	-0.2919	0.4646
46	3.0490	-0.2919	0.4646	2.8373	-0.2919	0.4646
47	2.8373	-0.2919	0.4646	2.6258	-0.2916	0.4646
48	2.6258	-0.2916	0.4646	2.4144	-0.2914	0.4646
49	2.4144	-0.2914	0.4646	2.2029	-0.2914	0.4646
50	2.2029	-0.2914	0.4646	1.9917	-0.2912	0.4646
51	1.9917	-0.2912	0.4646	1.7805	-0.2912	0.4646
52	1.7805	-0.2912	0.4646	6.8011	-0.6696	-11.4374
53	6.8011	-0.6696	-11.4374	6.3158	-0.6691	-11.4374
54	6.3158	-0.6691	-11.4374	9.2084	-1.3438	-13.1726
55	9.2084	-1.3438	-13.1726	11.5375	-2.1161	-15.1460
56	11.5375	-2.1161	-15.1460	13.1017	-2.9880	-17.3757
57	13.1017	-2.9880	-17.3757	10.9352	-2.9876	-17.3757
58	10.9352	-2.9876	-17.3757	10.8205	-3.9610	-19.8811
59	10.8205	-3.9610	-19.8811	9.4435	-5.0373	-22.6826
60	9.4435	-5.0373	-22.6826	5.7912	-5.0373	-22.6826

ENVOL. MAX. TORSORES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-7.4584	8.1618	25.8998	-1.5410	8.1620	25.8998
2	-1.5410	8.1620	25.8998	3.8143	6.9123	22.5873
3	3.8143	6.9123	22.5873	8.6068	5.6624	19.2748
4	8.6068	5.6624	19.2748	12.7120	5.6622	19.2748
5	12.7120	5.6622	19.2748	16.0355	4.4127	15.9624
6	16.0355	4.4127	15.9624	18.7976	3.1624	12.6499
7	18.7976	3.1624	12.6499	20.9957	1.9122	9.3374
8	20.9957	1.9122	9.3374	22.3823	1.9121	9.3374
9	22.3823	1.9121	9.3374	23.1118	0.6614	6.0249
10	23.1118	0.6614	6.0249	23.2789	-0.5890	2.7124
11	23.2789	-0.5890	2.7124	22.8516	-0.5904	2.7124
12	22.8516	-0.5904	2.7124	-0.2026	0.0680	-0.2011
13	-0.2026	0.0680	-0.2011	-0.1533	0.0680	-0.2011
14	-0.1533	0.0680	-0.2011	-0.1040	0.0680	-0.2011
15	-0.1040	0.0680	-0.2011	-0.0547	0.0680	-0.2011
16	-0.0547	0.0680	-0.2011	-0.0053	0.0681	-0.2011
17	-0.0053	0.0681	-0.2011	0.0440	0.0681	-0.2011
18	0.0440	0.0681	-0.2011	0.0934	0.0681	-0.2011
19	0.0934	0.0681	-0.2011	0.1427	0.0681	-0.2011
20	0.1427	0.0681	-0.2011	-38.8086	1.2719	5.2744
21	-38.8086	1.2719	5.2744	-33.9590	12.1278	29.3947
22	-33.9590	12.1278	29.3947	-22.9376	10.8778	26.0822
23	-22.9376	10.8778	26.0822	-13.0414	9.6279	22.7697
24	-13.0414	9.6279	22.7697	-4.2703	8.3780	19.4572
25	-4.2703	8.3780	19.4572	3.3760	7.1277	16.1447
26	3.3760	7.1277	16.1447	9.8968	5.8778	12.8322
27	9.8968	5.8778	12.8322	15.2932	4.6273	9.5197
28	15.2932	4.6273	9.5197	19.5641	3.3769	6.2072
29	19.5641	3.3769	6.2072	22.7101	2.1284	2.8947
30	22.7101	2.1284	2.8947	0.0492	-0.0094	0.0079
31	0.0492	-0.0094	0.0079	0.0403	-0.0094	0.0079
32	0.0403	-0.0094	0.0079	0.0313	-0.0094	0.0079
33	0.0313	-0.0094	0.0079	0.0224	-0.0094	0.0079
34	0.0224	-0.0094	0.0079	0.0134	-0.0094	0.0079
35	0.0134	-0.0094	0.0079	0.0045	-0.0094	0.0079
36	0.0045	-0.0094	0.0079	-0.0045	-0.0094	0.0079
37	-0.0045	-0.0094	0.0079	-0.0134	-0.0094	0.0079
38	-0.0134	-0.0094	0.0079	-0.0224	-0.0094	0.0079

39	-0.0224	-0.0094	0.0079	-0.0313	-0.0094	0.0079
40	-0.0313	-0.0094	0.0079	-0.0387	-0.0034	0.0016
41	-0.0387	-0.0034	0.0016	-35.0596	11.2782	20.5750
42	-35.0596	11.2782	20.5750	-26.8827	11.2780	20.5750
43	-26.8827	11.2780	20.5750	-19.5498	10.0280	17.2624
44	-19.5498	10.0280	17.2624	-12.7792	8.7785	13.9499
45	-12.7792	8.7785	13.9499	-6.5710	7.5283	10.6374
46	-6.5710	7.5283	10.6374	-1.1130	7.5280	10.6374
47	-1.1130	7.5280	10.6374	3.6266	6.2789	7.3249
48	3.6266	6.2789	7.3249	7.8048	5.0297	4.0124
49	7.8048	5.0297	4.0124	11.4204	3.7795	0.6998
50	11.4204	3.7795	0.6998	14.1609	3.7801	0.6998
51	14.1609	3.7801	0.6998	1.7805	-0.2912	0.4646
52	1.7805	-0.2912	0.4646	1.5693	-0.2914	0.4646
53	1.5693	-0.2914	0.4646	1.3581	-0.2914	0.4646
54	1.3581	-0.2914	0.4646	1.1470	-0.2910	0.4646
55	1.1470	-0.2910	0.4646	0.9362	-0.2909	0.4646
56	0.9362	-0.2909	0.4646	0.7251	-0.2911	0.4646
57	0.7251	-0.2911	0.4646	0.5142	-0.2909	0.4646
58	0.5142	-0.2909	0.4646	0.3033	-0.2909	0.4646
59	0.3033	-0.2909	0.4646	0.0923	-0.2910	0.4646
60	0.0923	-0.2910	0.4646	-0.1186	-0.2909	0.4646

ENVOL. MIN. TORSORES TREN TREN SIN CARGA, EC-1 en via 1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====

1	-0.7944	0.0680	-0.2011	-0.7451	0.0680	-0.2011
2	-0.7451	0.0680	-0.2011	-0.2748	0.0282	-0.4926
3	-0.2748	0.0282	-0.4926	1.1823	-0.1190	-0.8947
4	1.1823	-0.1190	-0.8947	1.0959	-0.1190	-0.8947
5	1.0959	-0.1190	-0.8947	3.1297	-0.3731	-1.4277
6	3.1297	-0.3731	-1.4277	5.6270	-0.7317	-2.1111
7	5.6270	-0.7317	-2.1111	8.3745	-1.1939	-2.9630
8	8.3745	-1.1939	-2.9630	7.5093	-1.1941	-2.9630
9	7.5093	-1.1941	-2.9630	9.8967	-1.7557	-4.0006
10	9.8967	-1.7557	-4.0006	12.0690	-2.4150	-5.2397
11	12.0690	-2.4150	-5.2397	10.3182	-2.4155	-5.2397
12	10.3182	-2.4155	-5.2397	11.5552	-3.1670	-6.6953
13	11.5552	-3.1670	-6.6953	12.1804	-4.0062	-8.3807
14	12.1804	-4.0062	-8.3807	12.0588	-4.9304	-10.3085
15	12.0588	-4.9304	-10.3085	8.4837	-4.9302	-10.3085
16	8.4837	-4.9302	-10.3085	6.7755	-5.9307	-12.4901
17	6.7755	-5.9307	-12.4901	-11.8388	-8.3032	-15.5803
18	-11.8388	-8.3032	-15.5803	-17.9214	-9.5534	-18.8928
19	-17.9214	-9.5534	-18.8928	-24.8477	-9.5534	-18.8928
20	-24.8477	-9.5534	-18.8928	-13.7071	-4.1142	-11.3928
21	-13.7071	-4.1142	-11.3928	-15.0348	1.0975	-2.3082
22	-15.0348	1.0975	-2.3082	-13.3908	1.0517	-2.5968
23	-13.3908	1.0517	-2.5968	-11.1815	0.9525	-3.0051
24	-11.1815	0.9525	-3.0051	-8.4781	0.7932	-3.5385
25	-8.4781	0.7932	-3.5385	-5.3800	0.5688	-4.2028
26	-5.3800	0.5688	-4.2028	-2.0100	0.2747	-5.0035
27	-2.0100	0.2747	-5.0035	1.4886	-0.0928	-5.9462
28	1.4886	-0.0928	-5.9462	4.9575	-0.5362	-7.0365
29	4.9575	-0.5362	-7.0365	8.2274	-1.0573	-8.2800
30	8.2274	-1.0573	-8.2800	11.1218	-1.6575	-9.6822

31	11.1218	-1.6575	-9.6822	9.5473	-1.6574	-9.6822
32	9.5473	-1.6574	-9.6822	11.2430	-2.3353	-11.2488
33	11.2430	-2.3353	-11.2488	12.1332	-3.0925	-12.9853
34	12.1332	-3.0925	-12.9853	12.0475	-3.9255	-14.8974
35	12.0475	-3.9255	-14.8974	10.8290	-4.8312	-16.9906
36	10.8290	-4.8312	-16.9906	8.3335	-5.8066	-19.2705
37	8.3335	-5.8066	-19.2705	4.4383	-6.8486	-21.7428
38	4.4383	-6.8486	-21.7428	-0.9559	-7.9486	-24.4129
39	-0.9559	-7.9486	-24.4129	-19.7874	-9.9577	-27.5890
40	-19.7874	-9.9577	-27.5890	-19.8485	-4.3137	-17.2361
41	-19.8485	-4.3137	-17.2361	-22.0079	1.6811	-4.3239
42	-22.0079	1.6811	-4.3239	-20.7892	1.6810	-4.3239
43	-20.7892	1.6810	-4.3239	-18.9232	1.6358	-4.6710
44	-18.9232	1.6358	-4.6710	-16.4136	1.5318	-5.1522
45	-16.4136	1.5318	-5.1522	-13.3076	1.3619	-5.7764
46	-13.3076	1.3619	-5.7764	-12.3200	1.3619	-5.7764
47	-12.3200	1.3619	-5.7764	-8.8670	1.1201	-6.5538
48	-8.8670	1.1201	-6.5538	-5.0468	0.8010	-7.4956
49	-5.0468	0.8010	-7.4956	-0.9829	0.3994	-8.6142
50	-0.9829	0.3994	-8.6142	-0.6934	0.3993	-8.6142
51	-0.6934	0.3993	-8.6142	3.1168	-0.0895	-9.9232
52	3.1168	-0.0895	-9.9232	6.8011	-0.6696	-11.4374
53	6.8011	-0.6696	-11.4374	6.3158	-0.6691	-11.4374
54	6.3158	-0.6691	-11.4374	9.2084	-1.3438	-13.1726
55	9.2084	-1.3438	-13.1726	11.5375	-2.1161	-15.1460
56	11.5375	-2.1161	-15.1460	13.1017	-2.9880	-17.3757
57	13.1017	-2.9880	-17.3757	10.9352	-2.9876	-17.3757
58	10.9352	-2.9876	-17.3757	10.8205	-3.9610	-19.8811
59	10.8205	-3.9610	-19.8811	9.4435	-5.0373	-22.6826
60	9.4435	-5.0373	-22.6826	5.7912	-5.0373	-22.6826

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	37.3138	44.9014	-84.6439	81.8807	67.5574	-128.8521
2	81.8807	67.5574	-128.8521	117.3618	37.5559	-67.3521
3	117.3618	37.5559	-67.3521	154.7574	30.3052	-51.4604
4	154.7574	30.3052	-51.4604	179.3622	53.1914	-98.4192
5	179.3622	53.1914	-98.4192	199.1717	23.1924	-36.9193
6	199.1717	23.1924	-36.9193	215.9836	23.1870	-36.9193
7	215.9836	23.1870	-36.9193	224.1566	16.2262	-23.6497
8	224.1566	16.2262	-23.6497	226.9298	-13.7730	37.8502
9	226.9298	-13.7730	37.8502	229.9920	-20.4862	49.9315
10	229.9920	-20.4862	49.9315	218.0204	3.0526	-0.5917
11	218.0204	3.0526	-0.5917	205.9761	-26.9592	60.9082
12	205.9761	-26.9592	60.9082	190.3934	-33.1087	70.8636
13	190.3934	-33.1087	70.8636	167.2220	-8.8904	18.3814
14	167.2220	-8.8904	18.3814	141.2718	-38.8997	79.8813
15	141.2718	-38.8997	79.8813	113.0602	-38.9057	79.8813
16	113.0602	-38.9057	79.8813	80.8291	-49.2571	95.4384
17	80.8291	-49.2571	95.4384	45.1202	-49.2590	95.4384
18	45.1202	-49.2590	95.4384	27.1978	2.1495	3.5074
19	27.1978	2.1495	3.5074	28.7565	2.1497	3.5074
20	28.7565	2.1497	3.5074	32.5052	-2.9194	-5.0696
21	32.5052	-2.9194	-5.0696	27.1061	-7.9886	-13.6467
22	27.1061	-7.9886	-13.6467	58.3020	51.2743	-91.5656
23	58.3020	51.2743	-91.5656	95.3229	47.2339	-79.7551

24	95.3229	47.2339	-79.7551	130.2644	42.7744	-68.3416
25	130.2644	42.7744	-68.3416	161.7054	37.9602	-57.3304
26	161.7054	37.9602	-57.3304	188.3820	32.8455	-46.7219
27	188.3820	32.8455	-46.7219	209.2678	27.5110	-36.5159
28	209.2678	27.5110	-36.5159	223.5969	22.0074	-26.7127
29	223.5969	22.0074	-26.7127	230.8473	16.4137	-17.3118
30	230.8473	16.4137	-17.3118	231.4483	-13.5791	44.1882
31	231.4483	-13.5791	44.1882	227.4923	-19.1994	53.1867
32	227.4923	-19.1994	53.1867	216.1793	-24.7961	61.7827
33	216.1793	-24.7961	61.7827	197.7864	-30.3085	69.9762
34	197.7864	-30.3085	69.9762	172.8286	-40.7459	85.1559
35	172.8286	-40.7459	85.1559	106.5860	-45.5646	92.1421
36	142.0882	-45.5646	92.1421	67.5820	-50.0219	98.7264
37	106.5860	-50.0219	98.7264	26.5078	-54.0623	104.9137
38	67.5820	-54.0623	104.9137	23.0391	6.9311	-6.5372
39	26.5078	6.9311	-6.5372	28.3640	2.4995	-1.6042
40	23.0391	2.4995	-1.6042	25.7037	-1.9318	3.3288
41	28.3640	-1.9318	3.3288	46.4852	-80.0985	-80.0985
42	25.7037	-80.0985	77.1940	19.5969	-18.5984	-18.5984
43	46.4852	77.1940	109.6256	44.8290	-64.1621	-64.1621
44	77.1940	109.6256	44.8290	135.2751	-48.9053	-48.9053
45	109.6256	44.8290	-48.9053	157.9927	-34.4180	-34.4180
46	135.2751	-48.9053	157.9927	180.3098	27.0820	27.0820
47	157.9927	180.3098	27.0820	196.6154	-20.7837	-20.7837
48	180.3098	196.6154	-20.7837	204.9024	-8.0856	-8.0856
49	196.6154	204.9024	-8.0856	212.9005	53.4145	53.4145
50	204.9024	212.9005	53.4145	216.9863	3.5928	3.5928
51	212.9005	216.9863	3.5928	14.6470	-15.3560	-15.3560
52	216.9863	14.6470	-15.3560	65.0930	-22.3627	-22.3627
53	206.6015	65.0930	-22.3627	198.3934	75.6682	75.6682
54	206.6015	198.3934	75.6682	182.1871	-22.3549	-22.3549
55	198.3934	182.1871	-22.3549	159.8438	-29.5911	-29.5911
56	182.1871	159.8438	-29.5911	135.3840	-59.5949	-59.5949
57	159.8438	135.3840	-59.5949	101.0015	-37.0049	-37.0049
58	135.3840	101.0015	-37.0049	93.1747	57.6710	57.6710
59	101.0015	93.1747	57.6710	12.8387	-74.5636	-74.5636
60	93.1747	12.8387	-74.5636	161.4432	9.3522	9.3522

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-0.8955	2.1537	3.5074	-2.0731	-11.1236	-23.4670
2	-2.0731	-11.1236	-23.4670	-10.2228	-11.2964	-24.1159
3	-10.2228	-11.2964	-24.1159	-18.4131	-11.2983	-24.1159
4	-18.4131	-11.2983	-24.1159	-26.6038	-11.2969	-24.1159
5	-26.6038	-11.2969	-24.1159	-34.7909	-11.3014	-24.1159
6	-34.7909	-11.3014	-24.1159	-42.9866	-11.2998	-24.1159
7	-42.9866	-11.2998	-24.1159	-51.1736	-11.2931	-24.1159
8	-51.1736	-11.2931	-24.1159	-59.3628	-11.2928	-24.1159
9	-59.3628	-11.2928	-24.1159	-67.5521	-11.2894	-24.1159
10	-67.5521	-11.2894	-24.1159	-75.7412	-11.2850	-24.1159
11	-75.7412	-11.2850	-24.1159	-83.9238	-11.2872	-24.1159
12	-83.9238	-11.2872	-24.1159	-92.1087	-11.2891	-24.1159
13	-92.1087	-11.2891	-24.1159	-100.2899	-11.2842	-24.1159
14	-100.2899	-11.2842	-24.1159	-108.4758	-11.2829	-24.1160
15	-108.4758	-11.2829	-24.1160	-116.6541	-11.2856	-24.1159
16	-116.6541	-11.2856	-24.1159	-124.8357	-11.2860	-24.1159

17	-124.8357	-11.2860	-24.1159	-133.0149	-11.2778	-24.1160
18	-133.0149	-11.2778	-24.1160	-141.1882	-11.2766	-24.1160
19	-141.1882	-11.2766	-24.1160	-149.3654	-11.2791	-24.1160
20	-149.3654	-11.2791	-24.1160	-148.1067	23.1175	-61.0661
21	-148.1067	23.1175	-61.0661	-95.4983	6.9326	-6.5372
22	-95.4983	6.9326	-6.5372	-88.9124	6.9335	-6.5372
23	-88.9124	6.9335	-6.5372	-82.3249	6.9349	-6.5372
24	-82.3249	6.9349	-6.5372	-75.7370	6.9359	-6.5372
25	-75.7370	6.9359	-6.5372	-69.1495	6.9344	-6.5372
26	-69.1495	6.9344	-6.5372	-62.5622	6.9334	-6.5372
27	-62.5622	6.9334	-6.5372	-55.9734	6.9323	-6.5372
28	-55.9734	6.9323	-6.5372	-49.3884	6.9338	-6.5372
29	-49.3884	6.9338	-6.5372	-42.8006	6.9355	-6.5372
30	-42.8006	6.9355	-6.5372	-41.1933	-7.9913	-13.6467
31	-41.1933	-7.9913	-13.6467	-48.7831	-7.9924	-13.6467
32	-48.7831	-7.9924	-13.6467	-56.3773	-7.9946	-13.6467
33	-56.3773	-7.9946	-13.6467	-63.9707	-7.9953	-13.6467
34	-63.9707	-7.9953	-13.6467	-71.5636	-7.9956	-13.6467
35	-71.5636	-7.9956	-13.6467	-79.1577	-7.9932	-13.6467
36	-79.1577	-7.9932	-13.6467	-86.7479	-7.9908	-13.6467
37	-86.7479	-7.9908	-13.6467	-94.3387	-7.9901	-13.6467
38	-94.3387	-7.9901	-13.6467	-101.9292	-7.9893	-13.6467
39	-101.9292	-7.9893	-13.6467	-115.2642	-54.8061	123.2826
40	-115.2642	-54.8061	123.2826	-150.3343	-25.4817	59.3738
41	-150.3343	-25.4817	59.3738	-125.7042	9.3884	-13.0910
42	-125.7042	9.3884	-13.0910	-118.8986	9.3891	-13.0910
43	-118.8986	9.3891	-13.0910	-112.0912	9.3893	-13.0910
44	-112.0912	9.3893	-13.0910	-105.2863	9.3894	-13.0910
45	-105.2863	9.3894	-13.0910	-98.4812	9.3877	-13.0910
46	-98.4812	9.3877	-13.0910	-91.6774	9.3857	-13.0911
47	-91.6774	9.3857	-13.0911	-84.8725	9.3773	-13.0911
48	-84.8725	9.3773	-13.0911	-78.0800	9.3673	-13.0911
49	-78.0800	9.3673	-13.0911	-71.2882	9.3699	-13.0911
50	-71.2882	9.3699	-13.0911	-64.4921	9.3705	-13.0911
51	-64.4921	9.3705	-13.0911	-57.6999	9.3602	-13.0911
52	-57.6999	9.3602	-13.0911	-50.9136	9.3542	-13.0911
53	-50.9136	9.3542	-13.0911	-44.1280	9.3543	-13.0911
54	-44.1280	9.3543	-13.0911	-37.3453	9.3540	-13.0911
55	-37.3453	9.3540	-13.0911	-30.5629	9.3550	-13.0911
56	-30.5629	9.3550	-13.0911	-23.7808	9.3538	-13.0911
57	-23.7808	9.3538	-13.0911	-16.9990	9.3517	-13.0911
58	-16.9990	9.3517	-13.0911	-10.2450	9.3051	-12.7286
59	-10.2450	9.3051	-12.7286	-4.7390	-52.2110	105.3118
60	-4.7390	-52.2110	105.3118	-42.5914	-52.2104	105.3112

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	32.8988	67.5597	-128.8521	81.8807	67.5574	-128.8521
2	81.8807	67.5574	-128.8521	116.2838	60.3004	-112.9603
3	116.2838	60.3004	-112.9603	140.8052	53.1883	-98.4191
4	140.8052	53.1883	-98.4191	179.3622	53.1914	-98.4192
5	179.3622	53.1914	-98.4192	189.3584	46.2551	-85.1497
6	189.3584	46.2551	-85.1497	190.5559	39.5174	-73.0683
7	190.5559	39.5174	-73.0683	183.6198	33.0499	-62.0917
8	183.6198	33.0499	-62.0917	207.5910	33.0569	-62.0918
9	207.5910	33.0569	-62.0918	188.8893	26.9003	-52.1362
10	188.8893	26.9003	-52.1362	164.0842	21.0998	-43.1184

11	164.0842	21.0998	-43.1184	179.3821	21.0942	-43.1185
12	179.3821	21.0942	-43.1185	145.6391	15.7050	-34.9548
13	145.6391	15.7050	-34.9548	108.4483	10.7519	-27.5616
14	108.4483	10.7519	-27.5616	69.1135	6.2766	-20.8483
15	69.1135	6.2766	-20.8483	73.6640	6.2778	-20.8483
16	73.6640	6.2778	-20.8483	31.0609	2.3101	-16.4676
17	31.0609	2.3101	-16.4676	25.6392	2.1497	3.5074
18	25.6392	2.1497	3.5074	27.1978	2.1495	3.5074
19	27.1978	2.1495	3.5074	28.7565	2.1497	3.5074
20	28.7565	2.1497	3.5074	-71.4904	37.4272	-85.0381
21	-71.4904	37.4272	-85.0381	-10.9208	77.2350	-141.2552
22	-10.9208	77.2350	-141.2552	30.9963	72.7751	-129.8418
23	30.9963	72.7751	-129.8418	70.0891	67.9604	-118.8306
24	70.0891	67.9604	-118.8306	104.9723	62.8470	-108.2220
25	104.9723	62.8470	-108.2220	134.5031	57.5113	-98.0160
26	134.5031	57.5113	-98.0160	157.7841	52.0058	-88.2126
27	157.7841	52.0058	-88.2126	174.1630	46.4090	-78.8117
28	174.1630	46.4090	-78.8117	183.2443	40.7918	-69.8133
29	183.2443	40.7918	-69.8133	184.8767	35.1834	-61.2174
30	184.8767	35.1834	-61.2174	179.1490	29.6934	-53.0238
31	179.1490	29.6934	-53.0238	207.3530	29.6935	-53.0238
32	207.3530	29.6935	-53.0238	189.5430	24.3653	-45.2327
33	189.5430	24.3653	-45.2327	165.5110	19.2507	-37.8442
34	165.5110	19.2507	-37.8442	136.1566	14.4408	-30.8580
35	136.1566	14.4408	-30.8580	102.6277	9.9795	-24.2737
36	102.6277	9.9795	-24.2737	3.2855	6.9303	-6.5372
37	3.2855	6.9303	-6.5372	9.8703	6.9309	-6.5372
38	9.8703	6.9309	-6.5372	16.4547	6.9311	-6.5372
39	16.4547	6.9311	-6.5372	23.0391	6.9311	-6.5372
40	23.0391	6.9311	-6.5372	-57.0856	37.2914	-76.3767
41	-57.0856	37.2914	-76.3767	-11.1192	74.8242	-125.6623
42	-11.1192	74.8242	-125.6623	43.1302	74.8227	-125.6622
43	43.1302	74.8227	-125.6622	68.1397	69.5721	-110.4054
44	68.1397	69.5721	-110.4054	90.8660	63.8812	-95.9182
45	90.8660	63.8812	-95.9182	109.8951	57.7931	-82.2840
46	109.8951	57.7931	-82.2840	151.7877	57.7938	-82.2840
47	151.7877	57.7938	-82.2840	161.1478	51.3620	-69.5858
48	161.1478	51.3620	-69.5858	164.1606	44.6250	-57.9075
49	164.1606	44.6250	-57.9075	159.7865	37.6208	-47.3322
50	159.7865	37.6208	-47.3322	187.0586	37.6152	-47.3322
51	187.0586	37.6152	-47.3322	169.1854	30.3842	-37.9437
52	169.1854	30.3842	-37.9437	142.1810	22.9800	-29.8256
53	142.1810	22.9800	-29.8256	158.8407	22.9823	-29.8255
54	158.8407	22.9823	-29.8255	116.6397	15.4356	-23.0569
55	116.6397	15.4356	-23.0569	-30.5629	9.3550	-13.0911
56	-30.5629	9.3550	-13.0911	-23.7808	9.3538	-13.0911
57	-23.7808	9.3538	-13.0911	-16.9990	9.3517	-13.0911
58	-16.9990	9.3517	-13.0911	-10.2191	9.3518	-13.0910
59	-10.2191	9.3518	-13.0910	-3.4381	9.3529	-13.0910
60	-3.4381	9.3529	-13.0910	3.3425	9.3522	-13.0910

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	6.1571	-11.2959	-24.1159	-2.0329	-11.2959	-24.1159
2	-2.0329	-11.2959	-24.1159	-10.2228	-11.2964	-24.1159

3	-10.2228	-11.2964	-24.1159	-18.4131	-11.2983	-24.1159
4	-18.4131	-11.2983	-24.1159	-26.6038	-11.2969	-24.1159
5	-26.6038	-11.2969	-24.1159	117.5894	-15.0972	38.3561
6	117.5894	-15.0972	38.3561	160.2896	-22.4407	55.6478
7	160.2896	-22.4407	55.6478	193.1454	-29.7042	71.5394
8	193.1454	-29.7042	71.5394	171.6127	-29.7076	71.5394
9	171.6127	-29.7076	71.5394	189.9012	-36.8232	86.0806
10	189.9012	-36.8232	86.0806	199.4699	-43.7709	99.3501
11	199.4699	-43.7709	99.3501	167.7347	-43.7749	99.3501
12	167.7347	-43.7749	99.3501	164.4068	-50.5032	111.4314
13	164.4068	-50.5032	111.4314	154.1283	-56.9641	122.4080
14	154.1283	-56.9641	122.4080	137.8871	-63.1129	132.3634
15	137.8871	-63.1129	132.3634	92.1245	-63.1221	132.3634
16	92.1245	-63.1221	132.3634	66.8529	-68.9051	141.3813
17	66.8529	-68.9051	141.3813	38.3066	-74.3096	149.5452
18	38.3066	-74.3096	149.5452	7.9079	-79.2587	156.9385
19	7.9079	-79.2587	156.9385	-49.5547	-79.2590	156.9384
20	-49.5547	-79.2590	156.9384	-62.7435	-40.4691	81.9974
21	-62.7435	-40.4691	81.9974	27.1061	-7.9886	-13.6467
22	27.1061	-7.9886	-13.6467	19.5172	-7.9886	-13.6467
23	19.5172	-7.9886	-13.6467	11.9280	-7.9876	-13.6467
24	11.9280	-7.9876	-13.6467	92.7204	-8.7241	31.4344
25	92.7204	-8.7241	31.4344	125.0628	-12.7702	43.2450
26	125.0628	-12.7702	43.2450	154.5356	-17.2256	54.6584
27	154.5356	-17.2256	54.6584	179.8210	-22.0442	65.6695
28	179.8210	-22.0442	65.6695	199.7897	-27.1446	76.2781
29	199.7897	-27.1446	76.2781	213.5468	-32.4854	86.4839
30	213.5468	-32.4854	86.4839	220.4263	-37.9872	96.2874
31	220.4263	-37.9872	96.2874	184.3427	-37.9818	96.2874
32	184.3427	-37.9818	96.2874	178.6595	-43.5739	105.6882
33	178.6595	-43.5739	105.6882	165.5061	-49.2018	114.6866
34	165.5061	-49.2018	114.6866	145.0603	-54.7946	123.2825
35	145.0603	-54.7946	123.2825	117.7131	-60.3044	131.4761
36	117.7131	-60.3044	131.4761	84.1117	-65.6423	139.2672
37	84.1117	-65.6423	139.2672	45.1597	-70.7496	146.6559
38	45.1597	-70.7496	146.6559	2.0058	-75.5670	153.6422
39	2.0058	-75.5670	153.6422	-43.9635	-80.0235	160.2264
40	-43.9635	-80.0235	160.2264	-69.8958	-40.3490	82.9197
41	-69.8958	-40.3490	82.9197	25.7037	-1.9318	3.3288
42	25.7037	-1.9318	3.3288	24.3036	-1.9324	3.3288
43	24.3036	-1.9324	3.3288	25.8811	-2.4251	15.2818
44	25.8811	-2.4251	15.2818	63.8658	-6.1434	28.2401
45	63.8658	-6.1434	28.2401	101.8648	-10.3967	42.9016
46	101.8648	-10.3967	42.9016	94.3253	-10.3919	42.9018
47	94.3253	-10.3919	42.9018	127.6276	-15.1612	58.8382
48	127.6276	-15.1612	58.8382	158.3652	-20.4005	74.0949
49	158.3652	-20.4005	74.0949	185.2283	-26.0900	88.5822
50	185.2283	-26.0900	88.5822	166.3130	-26.0840	88.5824
51	166.3130	-26.0840	88.5824	183.6258	-32.1640	102.2166
52	183.6258	-32.1640	102.2166	194.4261	-38.5977	114.9147
53	194.4261	-38.5977	114.9147	166.4408	-38.5917	114.9147
54	166.4408	-38.5917	114.9147	164.8558	-45.3284	126.5932
55	164.8558	-45.3284	126.5932	154.7355	-52.3438	137.1682
56	154.7355	-52.3438	137.1682	135.3840	-59.5949	146.5565
57	135.3840	-59.5949	146.5565	92.1839	-59.5858	146.5566
58	92.1839	-59.5858	146.5566	57.6710	-67.0033	154.6747
59	57.6710	-67.0033	154.6747	12.8387	-74.5636	161.4432
60	12.8387	-74.5636	161.4432	-41.2195	-74.5622	161.4432

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO A en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====	=====	=====	=====	=====	=====	=====
1	14.7828	-1.3329	3.6015	13.8167	-1.3328	3.6015
2	13.8167	-1.3328	3.6015	37.6057	-3.8073	10.0873
3	37.6057	-3.8073	10.0873	81.2953	-8.8453	22.9960
4	81.2953	-8.8453	22.9960	74.8828	-8.8467	22.9959
5	74.8828	-8.8467	22.9959	117.5894	-15.0972	38.3561
6	117.5894	-15.0972	38.3561	160.2896	-22.4407	55.6478
7	160.2896	-22.4407	55.6478	193.1454	-29.7042	71.5394
8	193.1454	-29.7042	71.5394	171.6127	-29.7076	71.5394
9	171.6127	-29.7076	71.5394	189.9012	-36.8232	86.0806
10	189.9012	-36.8232	86.0806	199.4699	-43.7709	99.3501
11	199.4699	-43.7709	99.3501	167.7347	-43.7749	99.3501
12	167.7347	-43.7749	99.3501	164.4068	-50.5032	111.4314
13	164.4068	-50.5032	111.4314	154.1283	-56.9641	122.4080
14	154.1283	-56.9641	122.4080	137.8871	-63.1129	132.3634
15	137.8871	-63.1129	132.3634	92.1245	-63.1221	132.3634
16	92.1245	-63.1221	132.3634	66.8529	-68.9051	141.3813
17	66.8529	-68.9051	141.3813	38.3066	-74.3096	149.5452
18	38.3066	-74.3096	149.5452	7.9079	-79.2587	156.9385
19	7.9079	-79.2587	156.9385	-49.5547	-79.2590	156.9384
20	-49.5547	-79.2590	156.9384	-62.7435	-40.4691	81.9974
21	-62.7435	-40.4691	81.9974	-9.9938	0.6339	4.9263
22	-9.9938	0.6339	4.9263	24.0350	-2.0114	11.3110
23	24.0350	-2.0114	11.3110	58.5877	-5.1299	20.6964
24	58.5877	-5.1299	20.6964	92.7204	-8.7241	31.4344
25	92.7204	-8.7241	31.4344	125.0628	-12.7702	43.2450
26	125.0628	-12.7702	43.2450	154.5356	-17.2256	54.6584
27	154.5356	-17.2256	54.6584	179.8210	-22.0442	65.6695
28	179.8210	-22.0442	65.6695	199.7897	-27.1446	76.2781
29	199.7897	-27.1446	76.2781	213.5468	-32.4854	86.4839
30	213.5468	-32.4854	86.4839	220.4263	-37.9872	96.2874
31	220.4263	-37.9872	96.2874	184.3427	-37.9818	96.2874
32	184.3427	-37.9818	96.2874	178.6595	-43.5739	105.6882
33	178.6595	-43.5739	105.6882	165.5061	-49.2018	114.6866
34	165.5061	-49.2018	114.6866	145.0603	-54.7946	123.2825
35	145.0603	-54.7946	123.2825	117.7131	-60.3044	131.4761
36	117.7131	-60.3044	131.4761	84.1117	-65.6423	139.2672
37	84.1117	-65.6423	139.2672	45.1597	-70.7496	146.6559
38	45.1597	-70.7496	146.6559	2.0058	-75.5670	153.6422
39	2.0058	-75.5670	153.6422	-43.9635	-80.0235	160.2264
40	-43.9635	-80.0235	160.2264	-69.8958	-40.3490	82.9197
41	-69.8958	-40.3490	82.9197	-11.7983	0.7404	6.1742
42	-11.7983	0.7404	6.1742	-11.2593	0.7421	6.1742
43	-11.2593	0.7421	6.1742	25.8811	-2.4251	15.2818
44	25.8811	-2.4251	15.2818	63.8658	-6.1434	28.2401
45	63.8658	-6.1434	28.2401	101.8648	-10.3967	42.9016
46	101.8648	-10.3967	42.9016	94.3253	-10.3919	42.9018
47	94.3253	-10.3919	42.9018	127.6276	-15.1612	58.8382
48	127.6276	-15.1612	58.8382	158.3652	-20.4005	74.0949
49	158.3652	-20.4005	74.0949	185.2283	-26.0900	88.5822
50	185.2283	-26.0900	88.5822	166.3130	-26.0840	88.5824
51	166.3130	-26.0840	88.5824	183.6258	-32.1640	102.2166
52	183.6258	-32.1640	102.2166	194.4261	-38.5977	114.9147
53	194.4261	-38.5977	114.9147	166.4408	-38.5917	114.9147
54	166.4408	-38.5917	114.9147	164.8558	-45.3284	126.5932
55	164.8558	-45.3284	126.5932	154.7355	-52.3438	137.1682

56	154.7355	-52.3438	137.1682	135.3840	-59.5949	146.5565
57	135.3840	-59.5949	146.5565	92.1839	-59.5858	146.5566
58	92.1839	-59.5858	146.5566	57.6710	-67.0033	154.6747
59	57.6710	-67.0033	154.6747	12.8387	-74.5636	161.4432
60	12.8387	-74.5636	161.4432	-41.2195	-74.5622	161.4432

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO A en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	32.8988	67.5597	-128.8521	81.8807	67.5574	-128.8521
2	81.8807	67.5574	-128.8521	116.2838	60.3004	-112.9603
3	116.2838	60.3004	-112.9603	140.8052	53.1883	-98.4191
4	140.8052	53.1883	-98.4191	179.3622	53.1914	-98.4192
5	179.3622	53.1914	-98.4192	189.3584	46.2551	-85.1497
6	189.3584	46.2551	-85.1497	190.5559	39.5174	-73.0683
7	190.5559	39.5174	-73.0683	183.6198	33.0499	-62.0917
8	183.6198	33.0499	-62.0917	207.5910	33.0569	-62.0918
9	207.5910	33.0569	-62.0918	188.8893	26.9003	-52.1362
10	188.8893	26.9003	-52.1362	164.0842	21.0998	-43.1184
11	164.0842	21.0998	-43.1184	179.3821	21.0942	-43.1185
12	179.3821	21.0942	-43.1185	145.6391	15.7050	-34.9548
13	145.6391	15.7050	-34.9548	108.4483	10.7519	-27.5616
14	108.4483	10.7519	-27.5616	-106.9095	-11.1314	-24.1789
15	-106.9095	-11.1314	-24.1789	-114.9792	-11.1300	-24.1789
16	-114.9792	-11.1300	-24.1789	-123.0495	-11.1288	-24.1789
17	-123.0495	-11.1288	-24.1789	-131.1156	-11.1257	-24.1789
18	-131.1156	-11.1257	-24.1789	-139.1815	-11.1257	-24.1789
19	-139.1815	-11.1257	-24.1789	-147.2467	-11.1255	-24.1789
20	-147.2467	-11.1255	-24.1789	-71.4904	37.4272	-85.0381
21	-71.4904	37.4272	-85.0381	-10.9208	77.2350	-141.2552
22	-10.9208	77.2350	-141.2552	30.9963	72.7751	-129.8418
23	30.9963	72.7751	-129.8418	70.0891	67.9604	-118.8306
24	70.0891	67.9604	-118.8306	104.9723	62.8470	-108.2220
25	104.9723	62.8470	-108.2220	134.5031	57.5113	-98.0160
26	134.5031	57.5113	-98.0160	157.7841	52.0058	-88.2126
27	157.7841	52.0058	-88.2126	174.1630	46.4090	-78.8117
28	174.1630	46.4090	-78.8117	183.2443	40.7918	-69.8133
29	183.2443	40.7918	-69.8133	184.8767	35.1834	-61.2174
30	184.8767	35.1834	-61.2174	179.1490	29.6934	-53.0238
31	179.1490	29.6934	-53.0238	207.3530	29.6935	-53.0238
32	207.3530	29.6935	-53.0238	189.5430	24.3653	-45.2327
33	189.5430	24.3653	-45.2327	165.5110	19.2507	-37.8442
34	165.5110	19.2507	-37.8442	136.1566	14.4408	-30.8580
35	136.1566	14.4408	-30.8580	102.6277	9.9795	-24.2737
36	102.6277	9.9795	-24.2737	66.2289	5.9395	-18.0863
37	66.2289	5.9395	-18.0863	-92.9087	-7.8644	-13.8633
38	-92.9087	-7.8644	-13.8633	-100.3806	-7.8646	-13.8633
39	-100.3806	-7.8646	-13.8633	-107.8532	-7.8652	-13.8633
40	-107.8532	-7.8652	-13.8633	-57.0856	37.2914	-76.3767
41	-57.0856	37.2914	-76.3767	-11.1192	74.8242	-125.6623
42	-11.1192	74.8242	-125.6623	43.1302	74.8227	-125.6622
43	43.1302	74.8227	-125.6622	68.1397	69.5721	-110.4054
44	68.1397	69.5721	-110.4054	90.8660	63.8812	-95.9182
45	90.8660	63.8812	-95.9182	109.8951	57.7931	-82.2840
46	109.8951	57.7931	-82.2840	151.7877	57.7938	-82.2840
47	151.7877	57.7938	-82.2840	161.1478	51.3620	-69.5858

48	161.1478	51.3620	-69.5858	164.1606	44.6250	-57.9075
49	164.1606	44.6250	-57.9075	159.7865	37.6208	-47.3322
50	159.7865	37.6208	-47.3322	187.0586	37.6152	-47.3322
51	187.0586	37.6152	-47.3322	169.1854	30.3842	-37.9437
52	169.1854	30.3842	-37.9437	142.1810	22.9800	-29.8256
53	142.1810	22.9800	-29.8256	158.8407	22.9823	-29.8255
54	158.8407	22.9823	-29.8255	116.6397	15.4356	-23.0569
55	116.6397	15.4356	-23.0569	64.1714	7.7913	-17.6876
56	64.1714	7.7913	-17.6876	-23.7808	9.3538	-13.0911
57	-23.7808	9.3538	-13.0911	-16.9990	9.3517	-13.0911
58	-16.9990	9.3517	-13.0911	-10.2191	9.3518	-13.0910
59	-10.2191	9.3518	-13.0910	-3.4381	9.3529	-13.0910
60	-3.4381	9.3529	-13.0910	3.3425	9.3522	-13.0910

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	12.2209	12.0383	-41.7148	21.6562	16.2575	-32.5092
2	21.6562	16.2575	-32.5092	32.1435	13.3586	-25.9792
3	32.1435	13.3586	-25.9792	41.3028	10.3587	-19.8292
4	41.3028	10.3587	-19.8292	48.8136	10.3584	-19.8292
5	48.8136	10.3584	-19.8292	54.4492	7.3569	-13.6792
6	54.4492	7.3569	-13.6792	58.7329	4.3577	-7.5293
7	58.7329	4.3577	-7.5293	61.6667	1.3604	-1.3793
8	61.6667	1.3604	-1.3793	62.6548	1.3535	-1.3793
9	62.6548	1.3535	-1.3793	62.0601	-1.6500	4.7708
10	62.0601	-1.6500	4.7708	60.1188	-4.6431	10.9207
11	60.1188	-4.6431	10.9207	56.7527	-4.6476	10.9207
12	56.7527	-4.6476	10.9207	51.2796	-7.6527	17.0707
13	51.2796	-7.6527	17.0707	44.4599	-10.6481	23.2206
14	44.4599	-10.6481	23.2206	36.2922	-13.6474	29.3706
15	36.2922	-13.6474	29.3706	26.3946	-13.6483	29.3706
16	26.3946	-13.6483	29.3706	14.6997	-16.6508	35.5206
17	14.6997	-16.6508	35.5206	1.6513	-19.6533	41.6706
18	1.6513	-19.6533	41.6706	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-0.4052	-0.0546	0.1678
21	-0.4052	-0.0546	0.1678	-0.3331	0.0242	-0.0245
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
23	-0.3100	0.0242	-0.0245	7.7436	16.9991	-37.0918
24	7.7436	16.9991	-37.0918	22.9918	13.9995	-30.9417
25	22.9918	13.9995	-30.9417	35.6395	11.1615	-24.4149
26	35.6395	11.1615	-24.4149	45.6437	8.1608	-18.2649
27	45.6437	8.1608	-18.2649	53.0110	5.4130	-11.7561
28	53.0110	5.4130	-11.7561	57.9631	2.7421	-5.2574
29	57.9631	2.7421	-5.2574	61.3807	1.7903	2.5371
30	61.3807	1.7903	2.5371	63.4659	-0.5696	9.1815
31	63.4659	-0.5696	9.1815	62.9313	-0.3760	9.3382
32	62.9313	-0.3760	9.3382	59.8741	-3.3754	15.4882
33	59.8741	-3.3754	15.4882	54.1189	-6.3730	21.6381
34	54.1189	-6.3730	21.6381	45.6639	-9.3747	27.7881
35	45.6639	-9.3747	27.7881	34.5056	-12.3748	33.9381
36	34.5056	-12.3748	33.9381	20.6493	-15.3741	40.0881
37	20.6493	-15.3741	40.0881	4.0912	-18.3770	46.2381
38	4.0912	-18.3770	46.2381	5.2428	2.2340	-1.8791
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791
40	7.3653	2.2342	-1.8791	9.1101	0.8059	-0.3994
41	9.1101	0.8059	-0.3994	8.2809	-0.6225	1.0803

42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803
43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803
44	7.3781	-0.6224	1.0803	6.9269	-0.6221	1.0803
45	6.9269	-0.6221	1.0803	6.4759	-0.6221	1.0804
46	6.4759	-0.6221	1.0804	9.9325	13.9587	-15.5280
47	9.9325	13.9587	-15.5280	18.3263	10.9613	-9.3779
48	18.3263	10.9613	-9.3779	25.3745	7.9627	-3.2279
49	25.3745	7.9627	-3.2279	31.0714	4.9624	2.9221
50	31.0714	4.9624	2.9221	34.6700	4.9634	2.9221
51	34.6700	4.9634	2.9221	36.8428	1.9650	9.0722
52	36.8428	1.9650	9.0722	37.6683	-1.0322	15.2222
53	37.6683	-1.0322	15.2222	36.9199	-1.0316	15.2222
54	36.9199	-1.0316	15.2222	34.4122	-3.7203	21.4888
55	34.4122	-3.7203	21.4888	30.5902	-6.7176	27.6388
56	30.5902	-6.7176	27.6388	25.4186	-9.7171	33.7887
57	25.4186	-9.7171	33.7887	18.3717	-9.7183	33.7887
58	18.3717	-9.7183	33.7887	9.6756	-12.7192	39.9388
59	9.6756	-12.7192	39.9388	0.1738	-0.6202	1.0804
60	0.1738	-0.6202	1.0804	0.9555	2.9985	-3.7426

ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=30 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
2	1.3817	-0.1332	0.3602	1.2851	-0.1332	0.3602
3	1.2851	-0.1332	0.3602	1.1885	-0.1332	0.3602
4	1.1885	-0.1332	0.3602	1.0919	-0.1332	0.3602
5	1.0919	-0.1332	0.3602	0.9954	-0.1332	0.3602
6	0.9954	-0.1332	0.3602	0.8988	-0.1332	0.3602
7	0.8988	-0.1332	0.3602	0.8022	-0.1332	0.3602
8	0.8022	-0.1332	0.3602	0.1256	-3.5432	-9.9270
9	0.1256	-3.5432	-9.9270	-2.9679	-4.5431	-7.8770
10	-2.9679	-4.5431	-7.8770	-6.5114	-5.5428	-5.8271
11	-6.5114	-5.5428	-5.8271	-10.5299	-6.5422	-3.7771
12	-10.5299	-5.5416	-5.8271	-15.2470	-7.5434	-1.7271
13	-15.2470	-6.5422	-3.7771	-20.4151	-8.5429	0.3229
14	-20.4151	-7.5434	-1.7271	-26.0333	-8.5418	0.3229
15	-26.0333	-8.5429	0.3229	-32.2261	-9.5411	2.3729
16	-32.2261	-8.5418	0.3229	-39.0180	-23.4558	29.5644
17	-39.0180	-9.5411	2.3729	-51.3437	-26.8302	36.8855
18	-51.3437	-23.4558	29.5644	-68.6342	-26.8300	36.8855
19	-68.6342	-26.8302	36.8855	-88.0862	-0.0921	-4.2416
20	-88.0862	-26.8300	36.8855	-96.9673	26.6458	-45.3685
21	-96.9673	-0.0921	-4.2416	-58.0834	23.6452	-39.2185
22	-58.0834	26.6458	-45.3685	-33.9694	-26.5986	-1.8791
23	-33.9694	23.6452	-39.2185	-26.5986	2.2347	-1.8791
24	-26.5986	2.2350	-1.8791	-24.4750	2.2342	-1.8791
25	-24.4750	2.2347	-1.8791	-22.3516	2.2343	-1.8791
26	-22.3516	2.2342	-1.8791	-20.2282	2.2341	-1.8791
27	-20.2282	2.2343	-1.8791	-18.1044	2.2335	-1.8791
28	-18.1044	2.2341	-1.8791	-15.9813	2.2243	-1.7164
29	-15.9813	2.2343	-1.8791	-13.8580	2.2240	-1.7164
30	-13.8580	2.2341	-1.8791	-11.7352	2.2244	-1.7164
31	-11.7352	2.2335	-1.8791	-9.6165		
32	-9.6165	2.2243	-1.7164	-7.5037		
33	-7.5037	2.2240	-1.7164	-5.3901		

34	-5.3901	2.2244	-1.7164	-3.2767	2.2242	-1.7164
35	-3.2767	2.2242	-1.7164	-1.1801	2.1193	-1.2740
36	-1.1801	2.1193	-1.2740	-7.6715	-18.7903	34.6143
37	-7.6715	-18.7903	34.6143	-27.4948	-21.9883	41.6604
38	-27.4948	-21.9883	41.6604	-50.1837	-24.9878	47.8105
39	-50.1837	-24.9878	47.8105	-75.5723	-27.9877	53.9605
40	-75.5723	-27.9877	53.9605	-90.9314	-2.3979	10.2511
41	-90.9314	-2.3979	10.2511	-59.8868	23.1935	-33.4583
42	-59.8868	23.1935	-33.4583	-43.0709	23.1943	-33.4583
43	-43.0709	23.1943	-33.4583	-37.5533	3.1291	-3.5658
44	-37.5533	3.1291	-3.5658	-35.2854	3.1287	-3.5658
45	-35.2854	3.1287	-3.5658	-33.0187	3.1273	-3.5658
46	-33.0187	3.1273	-3.5658	-30.7512	3.1270	-3.5658
47	-30.7512	3.1270	-3.5658	-28.4845	3.1255	-3.5658
48	-28.4845	3.1255	-3.5658	-26.2206	3.1242	-3.5658
49	-26.2206	3.1242	-3.5658	-23.9559	3.1221	-3.5658
50	-23.9559	3.1221	-3.5658	-21.6938	3.1209	-3.5658
51	-21.6938	3.1209	-3.5658	-19.4307	3.1220	-3.5658
52	-19.4307	3.1220	-3.5658	-17.1681	3.1196	-3.5658
53	-17.1681	3.1196	-3.5658	-14.9075	3.1179	-3.5658
54	-14.9075	3.1179	-3.5658	-12.6469	3.1182	-3.5658
55	-12.6469	3.1182	-3.5658	-10.3876	3.1185	-3.5658
56	-10.3876	3.1185	-3.5658	-8.1273	3.1185	-3.5658
57	-8.1273	3.1185	-3.5658	-5.8674	3.1175	-3.5658
58	-5.8674	3.1175	-3.5658	-3.6134	3.0219	-3.0123
59	-3.6134	3.0219	-3.0123	-2.2868	-2.2211	15.2640
60	-2.2868	-2.2211	15.2640	-13.3076	-16.0279	45.9722

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	9.7734	16.3580	-32.1292	21.6333	16.3585	-32.1292
2	21.6333	16.3585	-32.1292	32.1435	13.3586	-25.9792
3	32.1435	13.3586	-25.9792	41.3028	10.3587	-19.8292
4	41.3028	10.3587	-19.8292	48.8136	10.3584	-19.8292
5	48.8136	10.3584	-19.8292	54.4492	7.3569	-13.6792
6	54.4492	7.3569	-13.6792	58.7329	4.3577	-7.5293
7	58.7329	4.3577	-7.5293	61.6667	1.3604	-1.3793
8	61.6667	1.3604	-1.3793	62.6548	1.3535	-1.3793
9	62.6548	1.3535	-1.3793	0.6090	-0.1333	0.3602
10	0.6090	-0.1333	0.3602	0.5124	-0.1333	0.3602
11	0.5124	-0.1333	0.3602	0.4157	-0.1333	0.3602
12	0.4157	-0.1333	0.3602	0.3191	-0.1332	0.3602
13	0.3191	-0.1332	0.3602	0.2224	-0.1332	0.3602
14	0.2224	-0.1332	0.3602	0.1258	-0.1333	0.3602
15	0.1258	-0.1333	0.3602	0.0291	-0.1334	0.3602
16	0.0291	-0.1334	0.3602	-0.0676	-0.1333	0.3602
17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-62.4284	6.7517	-23.3439
21	-62.4284	6.7517	-23.3439	-57.5425	26.7013	-45.7957
22	-57.5425	26.7013	-45.7957	-33.3763	23.7013	-39.6458
23	-33.3763	23.7013	-39.6458	-11.9108	20.7005	-33.4958
24	-11.9108	20.7005	-33.4958	6.8534	17.7003	-27.3457
25	6.8534	17.7003	-27.3457	22.9195	14.7001	-21.1957
26	22.9195	14.7001	-21.1957	36.2820	11.7018	-15.0457
27	36.2820	11.7018	-15.0457	46.9495	8.7025	-8.8957

28	46.9495	8.7025	-8.8957	54.9132	5.7007	-2.7457	20	-87.6087	-27.0013	37.7346	-39.9857	-11.7134	26.1271
29	54.9132	5.7007	-2.7457	60.1798	2.7024	3.4043	21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245
30	60.1798	2.7024	3.4043	-11.7352	2.2335	-1.8791	22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
31	-11.7352	2.2335	-1.8791	-9.6128	2.2335	-1.8791	23	-0.3100	0.0242	-0.0245	-0.2870	0.0242	-0.0245
32	-9.6128	2.2335	-1.8791	-7.4907	2.2336	-1.8791	24	-0.2870	0.0242	-0.0245	-0.2640	0.0242	-0.0245
33	-7.4907	2.2336	-1.8791	-5.3688	2.2338	-1.8791	25	-0.2640	0.0242	-0.0245	-0.2409	0.0242	-0.0245
34	-5.3688	2.2338	-1.8791	-3.2464	2.2337	-1.8791	26	-0.2409	0.0242	-0.0245	3.0813	-0.3868	6.8762
35	-3.2464	2.2337	-1.8791	-1.1246	2.2338	-1.8791	27	3.0813	-0.3868	6.8762	10.9495	-1.3755	9.6006
36	-1.1246	2.2338	-1.8791	0.9978	2.2343	-1.8791	28	10.9495	-1.3755	9.6006	18.4904	-2.5466	12.6586
37	0.9978	2.2343	-1.8791	3.1206	2.2341	-1.8791	29	18.4904	-2.5466	12.6586	25.2978	-3.9039	16.0365
38	3.1206	2.2341	-1.8791	5.2428	2.2340	-1.8791	30	25.2978	-3.9039	16.0365	30.9475	-5.4492	19.7212
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791	31	30.9475	-5.4492	19.7212	25.7703	-5.4499	19.7212
40	7.3653	2.2342	-1.8791	9.1101	0.8059	-0.3994	32	25.7703	-5.4499	19.7212	28.1863	-7.1827	23.6991
41	9.1101	0.8059	-0.3994	-59.3733	23.2672	-33.8616	33	28.1863	-7.1827	23.6991	37.1766	-10.0501	17.7619
42	-59.3733	23.2672	-33.8616	-42.5041	23.2677	-33.8616	34	37.1766	-10.0501	17.7619	25.2269	-13.0501	23.9119
43	-42.5041	23.2677	-33.8616	-27.6604	20.2670	-27.7115	35	25.2269	-13.0501	23.9119	10.5792	-16.0514	30.0619
44	-27.6604	20.2670	-27.7115	-14.1669	17.2684	-21.5615	36	10.5792	-16.0514	30.0619	-6.7719	-19.0531	36.2119
45	-14.1669	17.2684	-21.5615	-2.0216	14.2691	-15.4115	37	-6.7719	-19.0531	36.2119	-26.8216	-22.0529	42.3619
46	-2.0216	14.2691	-15.4115	8.3221	14.2684	-15.4115	38	-26.8216	-22.0529	42.3619	-49.5722	-25.0526	48.5119
47	8.3221	14.2684	-15.4115	16.9421	11.2710	-9.2615	39	-49.5722	-25.0526	48.5119	-75.0219	-28.0523	54.6619
48	16.9421	11.2710	-9.2615	24.2141	8.2738	-3.1115	40	-75.0219	-28.0523	54.6619	-53.0699	-12.1240	30.5612
49	24.2141	8.2738	-3.1115	30.1372	5.2747	3.0385	41	-53.0699	-12.1240	30.5612	8.2809	-0.6225	1.0803
50	30.1372	5.2747	3.0385	33.9597	5.2767	3.0386	42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803
51	33.9597	5.2767	3.0386	-19.4307	3.1220	-3.5658	43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803
52	-19.4307	3.1220	-3.5658	-17.1681	3.1196	-3.5658	44	7.3781	-0.6224	1.0803	6.9269	-0.6221	1.0803
53	-17.1681	3.1196	-3.5658	-14.9075	3.1179	-3.5658	45	6.9269	-0.6221	1.0803	6.4759	-0.6221	1.0804
54	-14.9075	3.1179	-3.5658	-12.6469	3.1182	-3.5658	46	6.4759	-0.6221	1.0804	6.0245	-0.6222	1.0804
55	-12.6469	3.1182	-3.5658	-10.3876	3.1185	-3.5658	47	6.0245	-0.6222	1.0804	5.5735	-0.6215	1.0804
56	-10.3876	3.1185	-3.5658	-8.1273	3.1185	-3.5658	48	5.5735	-0.6215	1.0804	5.1230	-0.6213	1.0804
57	-8.1273	3.1185	-3.5658	-5.8674	3.1175	-3.5658	49	5.1230	-0.6213	1.0804	4.0219	-0.8651	11.2671
58	-5.8674	3.1175	-3.5658	-3.6084	3.1164	-3.5658	50	4.0219	-0.8651	11.2671	3.3947	-0.8651	11.2671
59	-3.6084	3.1164	-3.5658	-1.3489	3.1164	-3.5658	51	3.3947	-0.8651	11.2671	10.5984	-2.2224	15.2639
60	-1.3489	3.1164	-3.5658	0.9105	3.1164	-3.5658	52	10.5984	-2.2224	15.2639	17.1245	-3.8201	19.6486
ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=30 m en via 2							53	17.1245	-3.8201	19.6486	14.3556	-3.8194	19.6486
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	14.3556	-3.8194	19.6486	18.4111	-5.6649	24.3881
=====							55	18.4111	-5.6649	24.3881	20.6520	-7.7724	29.4466
1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602	56	20.6520	-7.7724	29.4466	20.5422	-10.1449	34.7801
2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689	57	20.5422	-10.1449	34.7801	13.1869	-10.1444	34.7801
3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779	58	13.1869	-10.1444	34.7801	8.5842	-13.0284	39.8223
4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779	59	8.5842	-13.0284	39.8223	-1.6867	-16.0276	45.9723
5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384	60	-1.6867	-16.0276	45.9723	-13.3076	-16.0279	45.9722
6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037	ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 2						
7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301	=====						
9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765	1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
10	30.7973	-6.0536	14.4765	30.0706	-8.9977	0.8347	2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689
11	30.0706	-8.9977	0.8347	23.5457	-9.0009	0.8347	3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779
12	23.5457	-9.0009	0.8347	14.9198	-12.0018	6.9847	4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779
13	14.9198	-12.0018	6.9847	4.9447	-15.0007	13.1346	5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384
14	4.9447	-15.0007	13.1346	-6.3799	-18.0002	19.2846	6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037
15	-6.3799	-18.0002	19.2846	-19.4302	-18.0006	19.2846	7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301
16	-19.4302	-18.0006	19.2846	-34.2809	-21.0009	25.4346	8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301
17	-34.2809	-21.0009	25.4346	-50.4816	-24.0011	31.5846	9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765
18	-50.4816	-24.0011	31.5846	-68.0325	-27.0013	37.7346	10	30.7973	-6.0536	14.4765	34.9349	-7.8547	18.4049
19	-68.0325	-27.0013	37.7346	-87.6087	-27.0013	37.7346	11	34.9349	-7.8547	18.4049	29.2394	-7.8575	18.4048
							12	29.2394	-7.8575	18.4048	30.5310	-9.8671	22.6796
							13	30.5310	-9.8671	22.6796	29.9425	-12.0772	27.2681

14	29.9425	-12.0772	27.2681	27.1665	-14.4799	32.1406
15	27.1665	-14.4799	32.1406	16.6691	-14.4806	32.1406
16	16.6691	-14.4806	32.1406	9.5929	-17.0539	37.2699
17	9.5929	-17.0539	37.2699	-0.2242	-19.7833	42.6317
18	-0.2242	-19.7833	42.6317	-12.9020	-22.6566	48.2047
19	-12.9020	-22.6566	48.2047	-29.3289	-22.6574	48.2047
20	-29.3289	-22.6574	48.2047	-39.9857	-11.7134	26.1271
21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
23	-0.3100	0.0242	-0.0245	-18.8823	1.5587	0.8380
24	-18.8823	1.5587	0.8380	-12.1539	1.0702	2.4814
25	-12.1539	1.0702	2.4814	-4.7343	0.4255	4.4987
26	-4.7343	0.4255	4.4987	3.0813	-0.3868	6.8762
27	3.0813	-0.3868	6.8762	10.9495	-1.3755	9.6006
28	10.9495	-1.3755	9.6006	18.4904	-2.5466	12.6586
29	18.4904	-2.5466	12.6586	25.2978	-3.9039	16.0365
30	25.2978	-3.9039	16.0365	30.9475	-5.4492	19.7212
31	30.9475	-5.4492	19.7212	25.7703	-5.4499	19.7212
32	25.7703	-5.4499	19.7212	28.1863	-7.1827	23.6991
33	28.1863	-7.1827	23.6991	28.4123	-9.1063	27.9568
34	28.4123	-9.1063	27.9568	26.0419	-11.2103	32.4809
35	26.0419	-11.2103	32.4809	20.6947	-13.4904	37.2581
36	20.6947	-13.4904	37.2581	12.0266	-15.9411	42.2747
37	12.0266	-15.9411	42.2747	-0.2813	-18.5618	47.5340
38	-0.2813	-18.5618	47.5340	-16.5353	-21.3534	53.0315
39	-16.5353	-21.3534	53.0315	-36.9792	-24.2956	58.7542
40	-36.9792	-24.2956	58.7542	-53.0699	-12.1240	30.5612
41	-53.0699	-12.1240	30.5612	8.2422	-0.6197	1.0807
42	8.2422	-0.6197	1.0807	7.7929	-0.6197	1.0807
43	7.7929	-0.6197	1.0807	7.3436	-0.6197	1.0807
44	7.3436	-0.6197	1.0807	6.8945	-0.6198	1.0807
45	6.8945	-0.6198	1.0807	-21.1370	1.9040	1.8994
46	-21.1370	1.9040	1.8994	-19.7565	1.9039	1.8994
47	-19.7565	1.9039	1.8994	-12.2936	1.1837	4.5577
48	-12.2936	1.1837	4.5577	-4.2653	0.2654	7.6889
49	-4.2653	0.2654	7.6889	4.0219	-0.8651	11.2671
50	4.0219	-0.8651	11.2671	3.3947	-0.8651	11.2671
51	3.3947	-0.8651	11.2671	10.5984	-2.2224	15.2639
52	10.5984	-2.2224	15.2639	17.1245	-3.8201	19.6486
53	17.1245	-3.8201	19.6486	14.3556	-3.8194	19.6486
54	14.3556	-3.8194	19.6486	18.4111	-5.6649	24.3881
55	18.4111	-5.6649	24.3881	20.6520	-7.7724	29.4466
56	20.6520	-7.7724	29.4466	20.5422	-10.1449	34.7801
57	20.5422	-10.1449	34.7801	13.1869	-10.1444	34.7801
58	13.1869	-10.1444	34.7801	8.2501	-12.7945	40.3420
59	8.2501	-12.7945	40.3420	-0.3714	-15.7191	46.0888
60	-0.3714	-15.7191	46.0888	-11.7674	-15.7184	46.0888

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=30 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	11.3017	12.0024	-42.2151	20.0037	12.0026	-42.2151
2	20.0037	12.0026	-42.2151	24.7733	9.1731	-36.9143
3	24.7733	9.1731	-36.9143	26.9645	6.5471	-31.9354
4	26.9645	6.5471	-31.9354	31.7113	6.5474	-31.9354
5	31.7113	6.5474	-31.9354	29.9849	4.1198	-27.2536

6	29.9849	4.1198	-27.2536	26.6283	1.8805	-22.8564
7	26.6283	1.8805	-22.8564	21.9927	-0.1829	-18.7323
8	21.9927	-0.1829	-18.7323	21.8602	-0.1831	-18.7323
9	21.8602	-0.1831	-18.7323	14.9005	-2.0781	-14.8619
10	14.9005	-2.0781	-14.8619	7.4011	-3.8141	-11.2274
11	7.4011	-3.8141	-11.2274	4.6357	-3.8145	-11.2274
12	4.6357	-3.8145	-11.2274	-4.2997	-5.4028	-7.8122
13	-4.2997	-5.4028	-7.8122	-13.2000	-6.8547	-4.6008
14	-13.2000	-6.8547	-4.6008	-21.8916	-8.1825	-1.5791
15	-21.8916	-8.1825	-1.5791	-27.8230	-8.1818	-1.5791
16	-27.8230	-8.1818	-1.5791	-0.0676	-0.1333	0.3602
17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-62.4284	6.7517	-23.3439
21	-62.4284	6.7517	-23.3439	-31.3504	22.9450	-49.8882
22	-31.3504	22.9450	-49.8882	-12.3456	20.0096	-44.4395
23	-12.3456	20.0096	-44.4395	3.0013	17.2081	-39.1856
24	3.0013	17.2081	-39.1856	14.9417	14.5495	-34.1179
25	14.9417	14.5495	-34.1179	23.7453	11.9793	-29.3126
26	23.7453	11.9793	-29.3126	34.5243	8.9782	-23.1626
27	34.5243	8.9782	-23.1626	42.6030	5.9802	-17.0126
28	42.6030	5.9802	-17.0126	47.9829	2.9825	-10.8626
29	47.9829	2.9825	-10.8626	50.6648	-0.0171	-4.7127
30	50.6648	-0.0171	-4.7127	-11.3291	2.1627	-1.9235
31	-11.3291	2.1627	-1.9235	-9.2750	2.1624	-1.9235
32	-9.2750	2.1624	-1.9235	-7.2208	2.1623	-1.9235
33	-7.2208	2.1623	-1.9235	-5.1668	2.1623	-1.9235
34	-5.1668	2.1623	-1.9235	-3.1126	2.1623	-1.9235
35	-3.1126	2.1623	-1.9235	-1.0586	2.1622	-1.9235
36	-1.0586	2.1622	-1.9235	0.9959	2.1622	-1.9235
37	0.9959	2.1622	-1.9235	3.0503	2.1621	-1.9235
38	3.0503	2.1621	-1.9235	5.1047	2.1625	-1.9235
39	5.1047	2.1625	-1.9235	7.1593	2.1628	-1.9235
40	7.1593	2.1628	-1.9235	8.2948	0.7311	-0.4489
41	8.2948	0.7311	-0.4489	-58.0365	23.0606	-34.1248
42	-58.0365	23.0606	-34.1248	-41.3172	23.0606	-34.1248
43	-41.3172	23.0606	-34.1248	-26.6231	20.0609	-27.9748
44	-26.6231	20.0609	-27.9748	-13.2782	17.0608	-21.8248
45	-13.2782	17.0608	-21.8248	-1.2837	14.0610	-15.6748
46	-1.2837	14.0610	-15.6748	8.9109	14.0624	-15.6747
47	8.9109	14.0624	-15.6747	17.3821	11.0642	-9.5247
48	17.3821	11.0642	-9.5247	-25.1535	3.0045	-3.7426
49	-25.1535	3.0045	-3.7426	-22.9753	3.0022	-3.7426
50	-22.9753	3.0022	-3.7426	-20.7976	3.0027	-3.7426
51	-20.7976	3.0027	-3.7426	-18.6196	3.0026	-3.7426
52	-18.6196	3.0026	-3.7426	-16.4427	3.0022	-3.7426
53	-16.4427	3.0022	-3.7426	-14.2663	3.0013	-3.7426
54	-14.2663	3.0013	-3.7426	-12.0914	2.9991	-3.7426
55	-12.0914	2.9991	-3.7426	-9.9173	2.9994	-3.7426
56	-9.9173	2.9994	-3.7426	-7.7420	3.0001	-3.7426
57	-7.7420	3.0001	-3.7426	-5.5673	2.9992	-3.7426
58	-5.5673	2.9992	-3.7426	-3.3931	2.9990	-3.7426
59	-3.3931	2.9990	-3.7426	-1.2187	2.9987	-3.7426
60	-1.2187	2.9987	-3.7426	0.9555	2.9985	-3.7426

ENVOL. MAX. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						

1	9.7734	16.3580	-32.1292	21.6333	16.3585	-32.1292	59	12.3011	-15.0616	42.9602	0.5559	-18.0616	49.1102
2	21.6333	16.3585	-32.1292	32.1435	13.3586	-25.9792	60	0.5559	-18.0616	49.1102	1.1139	3.3392	-4.3619
3	32.1435	13.3586	-25.9792	41.3028	10.3587	-19.8292	ENVOL. MIN. FLECTORES TREN TREN IPF-75 TIPO B Li=15 m en via 2						
4	41.3028	10.3587	-19.8292	48.8136	10.3584	-19.8292	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
5	48.8136	10.3584	-19.8292	54.4492	7.3569	-13.6792	=====	=====	=====	=====	=====	=====	=====
6	54.4492	7.3569	-13.6792	58.7329	4.3577	-7.5293	1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
7	58.7329	4.3577	-7.5293	61.6667	1.3604	-1.3793	2	1.3817	-0.1332	0.3602	1.2851	-0.1332	0.3602
8	61.6667	1.3604	-1.3793	62.6548	1.3535	-1.3793	3	1.2851	-0.1332	0.3602	1.1885	-0.1332	0.3602
9	62.6548	1.3535	-1.3793	62.0601	-1.6500	4.7708	4	1.1885	-0.1332	0.3602	1.0919	-0.1332	0.3602
10	62.0601	-1.6500	4.7708	60.1188	-4.6431	10.9207	5	1.0919	-0.1332	0.3602	0.9954	-0.1332	0.3602
11	60.1188	-4.6431	10.9207	56.7527	-4.6476	10.9207	6	0.9954	-0.1332	0.3602	0.8988	-0.1332	0.3602
12	56.7527	-4.6476	10.9207	51.2796	-7.6527	17.0707	7	0.8988	-0.1332	0.3602	0.7931	-3.9241	-10.0522
13	51.2796	-7.6527	17.0707	44.4599	-10.6481	23.2206	8	0.7931	-3.9241	-10.0522	-2.0519	-3.9236	-10.0522
14	44.4599	-10.6481	23.2206	36.2922	-13.6474	29.3706	9	-2.0519	-3.9236	-10.0522	-5.4212	-4.9235	-8.0023
15	36.2922	-13.6474	29.3706	26.3946	-13.6483	29.3706	10	-5.4212	-4.9235	-8.0023	-9.2411	-5.9225	-5.9523
16	26.3946	-13.6483	29.3706	14.6997	-16.6508	35.5206	11	-9.2411	-5.9225	-5.9523	-13.5349	-5.9220	-5.9523
17	14.6997	-16.6508	35.5206	1.6513	-19.6533	41.6706	12	-13.5349	-5.9220	-5.9523	-18.5285	-6.9227	-3.9023
18	1.6513	-19.6533	41.6706	-0.2609	-0.1334	0.3602	13	-18.5285	-6.9227	-3.9023	-23.9726	-7.9222	-1.8523
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602	14	-23.9726	-7.9222	-1.8523	-29.8666	-8.9215	0.1977
20	-0.3576	-0.1334	0.3602	-0.4052	-0.0546	0.1678	15	-29.8666	-8.9215	0.1977	-36.3349	-8.9209	0.1977
21	-0.4052	-0.0546	0.1678	-0.3331	0.0242	-0.0245	16	-36.3349	-8.9209	0.1977	-43.4025	-9.9212	2.2477
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245	17	-43.4025	-9.9212	2.2477	-50.9208	-10.9205	4.2977
23	-0.3100	0.0242	-0.0245	5.8612	17.3431	-27.7367	18	-50.9208	-10.9205	4.2977	-58.8875	-11.9199	6.3477
24	5.8612	17.3431	-27.7367	22.0178	15.0154	-22.9892	19	-58.8875	-11.9199	6.3477	-67.5297	-11.9204	6.3476
25	22.0178	15.0154	-22.9892	35.9819	12.5715	-18.0809	20	-67.5297	-11.9204	6.3476	-69.7362	6.5593	-18.7677
26	35.9819	12.5715	-18.0809	47.4156	10.0392	-13.1329	21	-69.7362	6.5593	-18.7677	-40.5256	21.7887	-38.2804
27	47.4156	10.0392	-13.1329	56.5002	7.0375	-6.9830	22	-40.5256	21.7887	-38.2804	-28.7220	2.2348	-1.8791
28	56.5002	7.0375	-6.9830	62.8847	4.0379	-0.8330	23	-28.7220	2.2348	-1.8791	-26.5986	2.2350	-1.8791
29	62.8847	4.0379	-0.8330	66.8714	1.4364	4.0522	24	-26.5986	2.2350	-1.8791	-24.4750	2.2347	-1.8791
30	66.8714	1.4364	4.0522	68.2346	-1.5626	10.2022	25	-24.4750	2.2347	-1.8791	-22.3516	2.2342	-1.8791
31	68.2346	-1.5626	10.2022	66.7513	-1.5596	10.2022	26	-22.3516	2.2342	-1.8791	-20.2282	2.2343	-1.8791
32	66.7513	-1.5596	10.2022	62.7711	-4.2053	15.0196	27	-20.2282	2.2343	-1.8791	-18.1044	2.2341	-1.8791
33	62.7711	-4.2053	15.0196	56.2257	-7.2038	21.1696	28	-18.1044	2.2341	-1.8791	-15.9813	2.2343	-1.8791
34	56.2257	-7.2038	21.1696	46.9802	-10.2042	27.3196	29	-15.9813	2.2343	-1.8791	-13.8580	2.2341	-1.8791
35	46.9802	-10.2042	27.3196	35.0554	-12.8683	32.0655	30	-13.8580	2.2341	-1.8791	-11.7352	2.2335	-1.8791
36	35.0554	-12.8683	32.0655	20.7287	-15.8706	38.2155	31	-11.7352	2.2335	-1.8791	-9.6165	2.2243	-1.7164
37	20.7287	-15.8706	38.2155	3.7011	-18.8704	44.3655	32	-9.6165	2.2243	-1.7164	-7.5037	2.2240	-1.7164
38	3.7011	-18.8704	44.3655	5.2428	2.2340	-1.8791	33	-7.5037	2.2240	-1.7164	-5.3901	2.2244	-1.7164
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791	34	-5.3901	2.2244	-1.7164	-8.0682	-5.6387	4.2875
40	7.3653	2.2342	-1.8791	9.1101	0.8059	-0.3994	35	-8.0682	-5.6387	4.2875	-14.1751	-6.6386	6.3375
41	9.1101	0.8059	-0.3994	8.2809	-0.6225	1.0803	36	-14.1751	-6.6386	6.3375	-21.1816	-7.6385	8.3875
42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803	37	-21.1816	-7.6385	8.3875	-29.0882	-8.6383	10.4375
43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803	38	-29.0882	-8.6383	10.4375	-37.8947	-9.6384	12.4875
44	7.3781	-0.6224	1.0803	12.2730	14.9151	-18.5401	39	-37.8947	-9.6384	12.4875	-47.6013	-10.6385	14.5375
45	12.2730	14.9151	-18.5401	22.7129	11.9168	-12.3900	40	-47.6013	-10.6385	14.5375	-55.7506	-10.9150	26.9110
46	22.7129	11.9168	-12.3900	31.3536	11.9173	-12.3900	41	-55.7506	-10.9150	26.9110	-45.3462	3.3780	-4.2476
47	31.3536	11.9173	-12.3900	38.2691	8.9200	-6.2400	42	-45.3462	3.3780	-4.2476	-42.8974	3.3780	-4.2477
48	38.2691	8.9200	-6.2400	43.8385	5.9240	-0.0900	43	-42.8974	3.3780	-4.2477	-40.4479	3.3770	-4.2477
49	43.8385	5.9240	-0.0900	48.0612	2.9247	6.0601	44	-40.4479	3.3770	-4.2477	-38.0002	3.3761	-4.2477
50	48.0612	2.9247	6.0601	50.1812	2.9262	6.0601	45	-38.0002	3.3761	-4.2477	-35.5522	3.3779	-4.2477
51	50.1812	2.9262	6.0601	50.8800	-0.0715	12.2101	46	-35.5522	3.3779	-4.2477	-33.1029	3.3760	-4.2477
52	50.8800	-0.0715	12.2101	50.2280	-3.0689	18.3601	47	-33.1029	3.3760	-4.2477	-30.6562	3.3728	-4.2477
53	50.2280	-3.0689	18.3601	48.0058	-3.0682	18.3602	48	-30.6562	3.3728	-4.2477	-28.2109	3.3710	-4.2477
54	48.0058	-3.0682	18.3602	43.8316	-6.0678	24.5102	49	-28.2109	3.3710	-4.2477	-25.7664	3.3686	-4.2477
55	43.8316	-6.0678	24.5102	38.3132	-9.0659	30.6602	50	-25.7664	3.3686	-4.2477	-23.3233	3.3698	-4.2477
56	38.3132	-9.0659	30.6602	31.4419	-12.0677	36.8102							
57	31.4419	-12.0677	36.8102	22.6945	-12.0653	36.8102							
58	22.6945	-12.0653	36.8102	12.3011	-15.0616	42.9602							

51	-23.3233	3.3698	-4.2477	-20.8792	3.3706	-4.2477
52	-20.8792	3.3706	-4.2477	-18.4365	3.3679	-4.2477
53	-18.4365	3.3679	-4.2477	-15.9954	3.3650	-4.2477
54	-15.9954	3.3650	-4.2477	-13.5549	3.3644	-4.2477
55	-13.5549	3.3644	-4.2477	-11.1142	3.3640	-4.2477
56	-11.1142	3.3640	-4.2477	-8.6749	3.3640	-4.2477
57	-8.6749	3.3640	-4.2477	-6.2344	3.3647	-4.2477
58	-6.2344	3.3647	-4.2477	-3.7950	3.3649	-4.2477
59	-3.7950	3.3649	-4.2477	-1.7792	-2.1416	13.0489
60	-1.7792	-2.1416	13.0489	-13.9764	-18.1795	48.5897

ENVOL. MAX. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	9.7734	16.3580	-32.1292	21.6333	16.3585	-32.1292
2	21.6333	16.3585	-32.1292	28.5884	13.4087	-27.8006
3	28.5884	13.4087	-27.8006	33.5206	10.5676	-23.3684
4	33.5206	10.5676	-23.3684	41.1811	10.5672	-23.3684
5	41.1811	10.5672	-23.3684	41.4441	7.8333	-19.3888
6	41.4441	7.8333	-19.3888	39.3831	5.2262	-15.8020
7	39.3831	5.2262	-15.8020	35.3038	2.7496	-12.5527
8	35.3038	2.7496	-12.5527	37.2981	2.7490	-12.5527
9	37.2981	2.7490	-12.5527	29.8405	0.4175	-9.5902
10	29.8405	0.4175	-9.5902	0.5124	-0.1333	0.3602
11	0.5124	-0.1333	0.3602	0.4157	-0.1333	0.3602
12	0.4157	-0.1333	0.3602	0.3191	-0.1332	0.3602
13	0.3191	-0.1332	0.3602	0.2224	-0.1332	0.3602
14	0.2224	-0.1332	0.3602	0.1258	-0.1333	0.3602
15	0.1258	-0.1333	0.3602	0.0291	-0.1334	0.3602
16	0.0291	-0.1334	0.3602	-0.0676	-0.1333	0.3602
17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-68.5439	7.3549	-20.2132
21	-68.5439	7.3549	-20.2132	-38.5136	25.0390	-43.8830
22	-38.5136	25.0390	-43.8830	-18.2654	22.4349	-38.9978
23	-18.2654	22.4349	-38.9978	-0.8274	19.7895	-34.1804
24	-0.8274	19.7895	-34.1804	13.5606	17.1282	-29.4345
25	13.5606	17.1282	-29.4345	24.7686	14.4769	-24.9004
26	24.7686	14.4769	-24.9004	32.7655	11.8678	-20.6912
27	32.7655	11.8678	-20.6912	37.6224	9.3236	-16.7742
28	37.6224	9.3236	-16.7742	39.4860	6.8614	-13.1180
29	39.4860	6.8614	-13.1180	38.5854	4.5019	-9.6931
30	38.5854	4.5019	-9.6931	35.2054	2.2575	-6.4723
31	35.2054	2.2575	-6.4723	37.3511	2.2583	-6.4723
32	37.3511	2.2583	-6.4723	-7.4907	2.2336	-1.8791
33	-7.4907	2.2336	-1.8791	-5.3688	2.2338	-1.8791
34	-5.3688	2.2338	-1.8791	-3.2464	2.2337	-1.8791
35	-3.2464	2.2337	-1.8791	-1.1246	2.2338	-1.8791
36	-1.1246	2.2338	-1.8791	0.9978	2.2343	-1.8791
37	0.9978	2.2343	-1.8791	3.1206	2.2341	-1.8791
38	3.1206	2.2341	-1.8791	5.2428	2.2340	-1.8791
39	5.2428	2.2340	-1.8791	7.3653	2.2342	-1.8791
40	7.3653	2.2342	-1.8791	-51.1465	6.0835	-10.3520
41	-51.1465	6.0835	-10.3520	-27.8185	20.9162	-30.8401
42	-27.8185	20.9162	-30.8401	-12.6538	20.9155	-30.8401
43	-12.6538	20.9155	-30.8401	0.4844	17.9138	-24.6901
44	0.4844	17.9138	-24.6901	12.2730	14.9151	-18.5401

45	12.2730	14.9151	-18.5401	22.7129	11.9168	-12.3900
46	22.7129	11.9168	-12.3900	31.3536	11.9173	-12.3900
47	31.3536	11.9173	-12.3900	38.2691	8.9200	-6.2400
48	38.2691	8.9200	-6.2400	43.8385	5.9240	-0.0900
49	43.8385	5.9240	-0.0900	-25.7664	3.3686	-4.2477
50	-25.7664	3.3686	-4.2477	-23.3233	3.3698	-4.2477
51	-23.3233	3.3698	-4.2477	-20.8792	3.3706	-4.2477
52	-20.8792	3.3706	-4.2477	-18.4365	3.3679	-4.2477
53	-18.4365	3.3679	-4.2477	-15.9954	3.3650	-4.2477
54	-15.9954	3.3650	-4.2477	-13.5549	3.3644	-4.2477
55	-13.5549	3.3644	-4.2477	-11.1142	3.3640	-4.2477
56	-11.1142	3.3640	-4.2477	-8.6749	3.3640	-4.2477
57	-8.6749	3.3640	-4.2477	-6.2344	3.3647	-4.2477
58	-6.2344	3.3647	-4.2477	-3.7950	3.3649	-4.2477
59	-3.7950	3.3649	-4.2477	-1.3551	3.3651	-4.2477
60	-1.3551	3.3651	-4.2477	1.0846	3.3649	-4.2477

ENVOL. MIN. CORTANTES TREN TREN IPF-75 TIPO B Li=15 m en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689
3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779
4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779
5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384
6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037
7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301
8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301
9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765
10	30.7973	-6.0536	14.4765	34.9349	-7.8547	18.4049
11	34.9349	-7.8547	18.4049	29.2394	-7.8575	18.4048
12	29.2394	-7.8575	18.4048	30.5310	-9.8671	22.6796
13	30.5310	-9.8671	22.6796	29.9425	-12.0772	27.2681
14	29.9425	-12.0772	27.2681	27.1665	-14.4799	32.1406
15	27.1665	-14.4799	32.1406	16.6691	-14.4806	32.1406
16	16.6691	-14.4806	32.1406	9.5929	-17.0539	37.2699
17	9.5929	-17.0539	37.2699	-0.2242	-19.7833	42.6317
18	-0.2242	-19.7833	42.6317	-13.8045	-22.6666	47.2005
19	-13.8045	-22.6666	47.2005	-30.2374	-22.6660	47.2005
20	-30.2374	-22.6660	47.2005	-39.9857	-11.7134	26.1271
21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
23	-0.3100	0.0242	-0.0245	-0.2870	0.0242	-0.0245
24	-0.2870	0.0242	-0.0245	-0.2640	0.0242	-0.0245
25	-0.2640	0.0242	-0.0245	-0.2409	0.0242	-0.0245
26	-0.2409	0.0242	-0.0245	7.2922	-0.8548	7.3416
27	7.2922	-0.8548	7.3416	15.9067	-1.9911	10.2116
28	15.9067	-1.9911	10.2116	23.9784	-3.3199	13.4212
29	23.9784	-3.3199	13.4212	31.0384	-4.8348	16.9491
30	31.0384	-4.8348	16.9491	36.6165	-6.5347	20.7722
31	36.6165	-6.5347	20.7722	30.4074	-6.5344	20.7722
32	30.4074	-6.5344	20.7722	32.2706	-8.4123	24.8662
33	32.2706	-8.4123	24.8662	31.6280	-10.4550	29.2056
34	31.6280	-10.4550	29.2056	28.1174	-12.6532	33.7633
35	28.1174	-12.6532	33.7633	21.4440	-14.9794	38.5108
36	21.4440	-14.9794	38.5108	11.3939	-17.4237	43.4190

37	11.3939	-17.4237	43.4190	-2.1558	-19.9582	48.3670
38	-2.1558	-19.9582	48.3670	-19.2286	-22.5615	53.2521
39	-19.2286	-22.5615	53.2521	-39.7579	-25.2078	58.0696
40	-39.7579	-25.2078	58.0696	-55.0606	-12.2923	29.4489
41	-55.0606	-12.2923	29.4489	8.2809	-0.6225	1.0803
42	8.2809	-0.6225	1.0803	7.8295	-0.6226	1.0803
43	7.8295	-0.6226	1.0803	7.3781	-0.6224	1.0803
44	7.3781	-0.6224	1.0803	6.9269	-0.6221	1.0803
45	6.9269	-0.6221	1.0803	6.4759	-0.6221	1.0804
46	6.4759	-0.6221	1.0804	6.0245	-0.6222	1.0804
47	6.0245	-0.6222	1.0804	5.5735	-0.6215	1.0804
48	5.5735	-0.6215	1.0804	4.3093	-0.7630	9.1031
49	4.3093	-0.7630	9.1031	13.7514	-2.1441	13.0488
50	13.7514	-2.1441	13.0488	12.1971	-2.1439	13.0488
51	12.1971	-2.1439	13.0488	19.9945	-3.7502	17.4024
52	19.9945	-3.7502	17.4024	26.6885	-5.5781	22.1164
53	26.6885	-5.5781	22.1164	22.6463	-5.5762	22.1164
54	22.6463	-5.5762	22.1164	26.2712	-7.6342	27.1385
55	26.2712	-7.6342	27.1385	27.6677	-9.9181	32.4123
56	27.6677	-9.9181	32.4123	26.3464	-12.4198	37.8766
57	26.3464	-12.4198	37.8766	17.3416	-12.4205	37.8766
58	17.3416	-12.4205	37.8766	11.0344	-15.1792	42.4398
59	11.0344	-15.1792	42.4398	-0.7961	-18.1796	48.5898
60	-0.7961	-18.1796	48.5898	-13.9764	-18.1795	48.5897

ENVOL. MAX. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	1.4783	-0.1332	0.3602	1.3817	-0.1332	0.3602
2	1.3817	-0.1332	0.3602	5.0457	-0.5138	1.3689
3	5.0457	-0.5138	1.3689	10.4677	-1.1414	2.9779
4	10.4677	-1.1414	2.9779	9.6400	-1.1418	2.9779
5	9.6400	-1.1418	2.9779	15.6697	-2.0138	5.1384
6	15.6697	-2.0138	5.1384	22.2584	-3.1273	7.8037
7	22.2584	-3.1273	7.8037	28.9180	-4.4761	10.9301
8	28.9180	-4.4761	10.9301	25.6734	-4.4762	10.9301
9	25.6734	-4.4762	10.9301	30.7973	-6.0536	14.4765
10	30.7973	-6.0536	14.4765	34.9349	-7.8547	18.4049
11	34.9349	-7.8547	18.4049	29.2394	-7.8575	18.4048
12	29.2394	-7.8575	18.4048	30.5310	-9.8671	22.6796
13	30.5310	-9.8671	22.6796	29.9425	-12.0772	27.2681
14	29.9425	-12.0772	27.2681	27.1665	-14.4799	32.1406
15	27.1665	-14.4799	32.1406	16.6691	-14.4806	32.1406
16	16.6691	-14.4806	32.1406	9.5929	-17.0539	37.2699
17	9.5929	-17.0539	37.2699	-0.2242	-19.7833	42.6317
18	-0.2242	-19.7833	42.6317	-12.9020	-22.6566	48.2047
19	-12.9020	-22.6566	48.2047	-29.3289	-22.6574	48.2047
20	-29.3289	-22.6574	48.2047	-39.9857	-11.7134	26.1271
21	-39.9857	-11.7134	26.1271	-0.3331	0.0242	-0.0245
22	-0.3331	0.0242	-0.0245	-0.3100	0.0242	-0.0245
23	-0.3100	0.0242	-0.0245	-17.3779	1.4318	0.9640
24	-17.3779	1.4318	0.9640	-9.7593	0.8507	2.6998
25	-9.7593	0.8507	2.6998	-1.4065	0.0910	4.8314
26	-1.4065	0.0910	4.8314	7.2922	-0.8548	7.3416
27	7.2922	-0.8548	7.3416	15.9067	-1.9911	10.2116
28	15.9067	-1.9911	10.2116	23.9784	-3.3199	13.4212
29	23.9784	-3.3199	13.4212	31.0384	-4.8348	16.9491
30	31.0384	-4.8348	16.9491	36.6165	-6.5347	20.7722

31	36.6165	-6.5347	20.7722	30.4074	-6.5344	20.7722
32	30.4074	-6.5344	20.7722	32.2706	-8.4123	24.8662
33	32.2706	-8.4123	24.8662	31.6280	-10.4550	29.2056
34	31.6280	-10.4550	29.2056	28.1174	-12.6532	33.7633
35	28.1174	-12.6532	33.7633	21.4440	-14.9794	38.5108
36	21.4440	-14.9794	38.5108	11.3939	-17.4237	43.4190
37	11.3939	-17.4237	43.4190	-2.1558	-19.9582	48.3670
38	-2.1558	-19.9582	48.3670	-19.2286	-22.5615	53.2521
39	-19.2286	-22.5615	53.2521	-39.7579	-25.2078	58.0696
40	-39.7579	-25.2078	58.0696	-55.0606	-12.2923	29.4489
41	-55.0606	-12.2923	29.4489	8.2422	-0.6197	1.0807
42	8.2422	-0.6197	1.0807	7.7929	-0.6197	1.0807
43	7.7929	-0.6197	1.0807	7.3436	-0.6197	1.0807
44	7.3436	-0.6197	1.0807	6.8945	-0.6198	1.0807
45	6.8945	-0.6198	1.0807	-15.3344	1.3526	2.6023
46	-15.3344	1.3526	2.6023	-14.3540	1.3521	2.6023
47	-14.3540	1.3521	2.6023	-5.1881	0.3999	5.6081
48	-5.1881	0.3999	5.6081	4.3093	-0.7630	9.1031
49	4.3093	-0.7630	9.1031	13.7514	-2.1441	13.0488
50	13.7514	-2.1441	13.0488	12.1971	-2.1439	13.0488
51	12.1971	-2.1439	13.0488	19.9945	-3.7502	17.4024
52	19.9945	-3.7502	17.4024	26.6885	-5.5781	22.1164
53	26.6885	-5.5781	22.1164	22.6463	-5.5762	22.1164
54	22.6463	-5.5762	22.1164	26.2712	-7.6342	27.1385
55	26.2712	-7.6342	27.1385	27.6677	-9.9181	32.4123
56	27.6677	-9.9181	32.4123	26.3464	-12.4198	37.8766
57	26.3464	-12.4198	37.8766	17.3416	-12.4205	37.8766
58	17.3416	-12.4205	37.8766	10.8531	-15.1381	43.4658
59	10.8531	-15.1381	43.4658	0.5559	-18.0616	49.1102
60	0.5559	-18.0616	49.1102	-12.5391	-18.0618	49.1102

ENVOL. MIN. TORSORES TREN TREN IPF-75 TIPO B Li=15 m en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	8.8850	16.3447	-32.7494	20.7354	16.3448	-32.7494
2	20.7354	16.3448	-32.7494	28.5884	13.4087	-27.8006
3	28.5884	13.4087	-27.8006	33.5206	10.5676	-23.3684
4	33.5206	10.5676	-23.3684	41.1811	10.5672	-23.3684
5	41.1811	10.5672	-23.3684	41.4441	7.8333	-19.3888
6	41.4441	7.8333	-19.3888	39.3831	5.2262	-15.8020
7	39.3831	5.2262	-15.8020	35.3038	2.7496	-12.5527
8	35.3038	2.7496	-12.5527	37.2981	2.7490	-12.5527
9	37.2981	2.7490	-12.5527	29.8405	0.4175	-9.5902
10	29.8405	0.4175	-9.5902	21.1427	-1.7661	-6.8681
11	21.1427	-1.7661	-6.8681	19.8620	-1.7667	-6.8681
12	19.8620	-1.7667	-6.8681	8.7939	-3.7970	-4.3446
13	8.7939	-3.7970	-4.3446	-2.7246	-5.6730	-1.9822
14	-2.7246	-5.6730	-1.9822	-29.8666	-8.9215	0.1977
15	-29.8666	-8.9215	0.1977	-36.3349	-8.9209	0.1977
16	-36.3349	-8.9209	0.1977	-0.0676	-0.1333	0.3602
17	-0.0676	-0.1333	0.3602	-0.1642	-0.1333	0.3602
18	-0.1642	-0.1333	0.3602	-0.2609	-0.1334	0.3602
19	-0.2609	-0.1334	0.3602	-0.3576	-0.1334	0.3602
20	-0.3576	-0.1334	0.3602	-68.5439	7.3549	-20.2132
21	-68.5439	7.3549	-20.2132	-38.5136	25.0390	-43.8830
22	-38.5136	25.0390	-43.8830	-18.2654	22.4349	-38.9978

23	-18.2654	22.4349	-38.9978	-0.8274	19.7895	-34.1804
24	-0.8274	19.7895	-34.1804	13.5606	17.1282	-29.4345
25	13.5606	17.1282	-29.4345	24.7686	14.4769	-24.9004
26	24.7686	14.4769	-24.9004	32.7655	11.8678	-20.6912
27	32.7655	11.8678	-20.6912	37.6224	9.3236	-16.7742
28	37.6224	9.3236	-16.7742	39.4860	6.8614	-13.1180
29	39.4860	6.8614	-13.1180	38.5854	4.5019	-9.6931
30	38.5854	4.5019	-9.6931	35.2054	2.2575	-6.4723
31	35.2054	2.2575	-6.4723	37.3511	2.2583	-6.4723
32	37.3511	2.2583	-6.4723	29.8169	0.1438	-3.4303
33	29.8169	0.1438	-3.4303	-5.1668	2.1623	-1.9235
34	-5.1668	2.1623	-1.9235	-3.1126	2.1623	-1.9235
35	-3.1126	2.1623	-1.9235	-1.0586	2.1622	-1.9235
36	-1.0586	2.1622	-1.9235	0.9959	2.1622	-1.9235
37	0.9959	2.1622	-1.9235	3.0503	2.1621	-1.9235
38	3.0503	2.1621	-1.9235	5.1047	2.1625	-1.9235
39	5.1047	2.1625	-1.9235	7.1593	2.1628	-1.9235
40	7.1593	2.1628	-1.9235	-51.1465	6.0835	-10.3520
41	-51.1465	6.0835	-10.3520	-28.6896	20.8824	-31.7661
42	-28.6896	20.8824	-31.7661	-13.5494	20.8825	-31.7661
43	-13.5494	20.8825	-31.7661	-0.4348	17.8816	-25.6161
44	-0.4348	17.8816	-25.6161	11.3306	14.8818	-19.4661
45	11.3306	14.8818	-19.4661	21.7456	11.8826	-13.3161
46	21.7456	11.8826	-13.3161	30.3604	11.8864	-13.3160
47	30.3604	11.8864	-13.3160	37.2544	8.8897	-7.1660
48	37.2544	8.8897	-7.1660	-27.9538	3.3468	-4.3620
49	-27.9538	3.3468	-4.3620	-25.5288	3.3442	-4.3620
50	-25.5288	3.3442	-4.3620	-23.1033	3.3426	-4.3620
51	-23.1033	3.3426	-4.3620	-20.6805	3.3429	-4.3620
52	-20.6805	3.3429	-4.3620	-18.2556	3.3432	-4.3620
53	-18.2556	3.3432	-4.3620	-15.8336	3.3414	-4.3620
54	-15.8336	3.3414	-4.3620	-13.4110	3.3401	-4.3620
55	-13.4110	3.3401	-4.3620	-10.9909	3.3382	-4.3620
56	-10.9909	3.3382	-4.3620	-8.5695	3.3381	-4.3620
57	-8.5695	3.3381	-4.3620	-6.1486	3.3382	-4.3619
58	-6.1486	3.3382	-4.3619	-3.7279	3.3386	-4.3619
59	-3.7279	3.3386	-4.3619	-1.3070	3.3391	-4.3619
60	-1.3070	3.3391	-4.3619	1.1139	3.3392	-4.3619

ENVOL. MAX. FLECTORES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	17.7749	36.2787	-69.6175	39.0573	32.3719	-61.0490
2	39.0573	32.3719	-61.0490	59.4777	20.1716	-36.0389
3	59.4777	20.1716	-36.0389	75.6564	28.5421	-53.1975
4	75.6564	28.5421	-53.1975	87.8104	16.3420	-28.1875
5	87.8104	16.3420	-28.1875	99.6565	16.3378	-28.1875
6	99.6565	16.3378	-28.1875	105.6301	12.6007	-21.0206
7	105.6301	12.6007	-21.0206	111.4118	0.4011	3.9894
8	111.4118	0.4011	3.9894	113.4913	2.8881	-1.9883
9	113.4913	2.8881	-1.9883	111.1637	-3.2109	10.5168
10	111.1637	-3.2109	10.5168	108.8396	-3.2115	10.5168
11	108.8396	-3.2115	10.5168	101.7561	-6.6744	16.4496
12	101.7561	-6.6744	16.4496	93.2458	-18.8816	41.4595
13	93.2458	-18.8816	41.4595	83.7276	-22.1736	46.8433
14	83.7276	-22.1736	46.8433	68.4789	-13.0790	26.7131
15	68.4789	-13.0790	26.7131	53.1992	-25.2819	51.7231
16	53.1992	-25.2819	51.7231	36.9074	-28.1631	56.1443

17	36.9074	-28.1631	56.1443	18.5737	-18.6050	35.1452
18	18.5737	-18.6050	35.1452	14.1914	1.1216	1.8286
19	14.1914	1.1216	1.8286	15.0047	1.1218	1.8286
20	15.0047	1.1218	1.8286	16.9663	-1.5249	-2.6687
21	16.9663	-1.5249	-2.6687	14.1515	-4.1716	-7.1658
22	14.1515	-4.1716	-7.1658	21.0111	19.2519	-32.1538
23	21.0111	19.2519	-32.1538	41.3867	17.0545	-26.1269
24	41.3867	17.0545	-26.1269	60.4881	14.6434	-19.9617
25	60.4881	14.6434	-19.9617	77.6675	12.0438	-14.0130
26	77.6675	12.0438	-14.0130	92.2713	9.2878	-8.2826
27	92.2713	9.2878	-8.2826	103.7568	6.4161	-2.7706
28	103.7568	6.4161	-2.7706	111.7187	3.4604	2.5232
29	111.7187	3.4604	2.5232	115.8850	0.4541	7.5988
30	115.8850	0.4541	7.5988	116.3127	0.4541	7.5988
31	116.3127	0.4541	7.5988	113.6689	-2.5609	12.4561
32	113.6689	-2.5609	12.4561	107.0946	-5.5703	17.0952
33	107.0946	-5.5703	17.0952	96.7574	-8.5138	21.5161
34	96.7574	-8.5138	21.5161	83.7909	-20.7147	46.5261
35	83.7909	-20.7147	46.5261	67.8795	-23.5689	50.7287
36	67.8795	-23.5689	50.7287	49.0461	-26.2904	54.7132
37	49.0461	-26.2904	54.7132	27.8859	-28.8563	58.4797
38	27.8859	-28.8563	58.4797	8.5809	3.6220	-3.3515
39	8.5809	3.6220	-3.3515	12.0220	3.6222	-3.3515
40	12.0220	3.6222	-3.3515	14.8130	1.3063	-0.8049
41	14.8130	1.3063	-0.8049	13.4307	-1.0094	1.7416
42	13.4307	-1.0094	1.7416	18.6348	18.2762	-25.7055
43	18.6348	18.2762	-25.7055	35.8711	27.8769	-42.6005
44	35.8711	27.8769	-42.6005	50.4633	25.0258	-34.4077
45	50.4633	25.0258	-34.4077	64.6416	12.8236	-9.3977
46	64.6416	12.8236	-9.3977	78.8810	9.7374	-1.6250
47	78.8810	9.7374	-1.6250	88.0322	18.6438	-19.3293
48	88.0322	18.6438	-19.3293	95.4552	6.4536	5.6807
49	95.4552	6.4536	5.6807	101.8269	2.9606	12.4741
50	101.8269	2.9606	5.6807	103.9753	2.9615	12.4742
51	103.9753	2.9615	5.6807	105.2085	-9.2376	37.4842
52	105.2085	-9.2376	37.4842	103.4892	-0.6884	18.7103
53	103.4892	-0.6884	18.7103	96.5863	-12.8845	43.7204
54	96.5863	-12.8845	43.7204	90.1356	-16.6701	49.3536
55	90.1356	-16.6701	49.3536	78.4729	-8.3918	29.3288
56	78.4729	-8.3918	49.3536	64.7424	-28.8708	74.3636
57	64.7424	-28.8708	74.3636	48.9212	-20.5858	54.3389
58	48.9212	-20.5858	74.3636	27.2845	-32.7887	79.3489
59	27.2845	-32.7887	79.3489	5.3249	-36.7990	83.6425
60	5.3249	-36.7990	83.6425	1.7501	4.9434	-6.8544

ENVOL. MIN. FLECTORES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-0.4668	1.1237	1.8285	-1.0897	-5.8850	-12.4431
2	-1.0897	-5.8850	-12.4431	-5.3991	-5.9768	-12.7881
3	-5.3991	-5.9768	-12.7881	-9.7325	-5.9762	-12.7881
4	-9.7325	-5.9762	-12.7881	-14.0637	-5.9753	-12.7881
5	-14.0637	-5.9753	-12.7881	-18.3960	-5.9760	-12.7881
6	-18.3960	-5.9760	-12.7881	-22.7286	-5.9767	-12.7881
7	-22.7286	-5.9767	-12.7881	-27.0602	-5.9754	-12.7881
8	-27.0602	-5.9754	-12.7881	-31.3921	-5.9741	-12.7881

9	-31.3921	-5.9741	-12.7881	-35.7235	-5.9747	-12.7881	3	54.9656	28.5386	-53.1975	75.6564	28.5421	-53.1975
10	-35.7235	-5.9747	-12.7881	-40.0561	-5.9735	-12.7881	4	75.6564	28.5421	-53.1975	83.6899	24.8062	-46.0304
11	-40.0561	-5.9735	-12.7881	-44.3843	-5.9711	-12.7881	5	83.6899	24.8062	-46.0304	86.9135	21.1960	-39.5032
12	-44.3843	-5.9711	-12.7881	-48.7126	-5.9688	-12.7881	6	86.9135	21.1960	-39.5032	85.6908	17.7255	-33.5703
13	-48.7126	-5.9688	-12.7881	-53.0406	-5.9693	-12.7881	7	85.6908	17.7255	-33.5703	98.5420	17.7221	-33.5703
14	-53.0406	-5.9693	-12.7881	-57.3704	-5.9690	-12.7882	8	98.5420	17.7221	-33.5703	90.9080	14.4282	-28.1866
15	-57.3704	-5.9690	-12.7882	-61.6973	-5.9677	-12.7882	9	90.9080	14.4282	-28.1866	79.8868	11.3256	-23.3068
16	-61.6973	-5.9677	-12.7882	-66.0241	-5.9684	-12.7882	10	79.8868	11.3256	-23.3068	66.0690	8.4445	-18.8855
17	-66.0241	-5.9684	-12.7882	-70.3510	-5.9661	-12.7882	11	66.0690	8.4445	-18.8855	72.1902	8.4445	-18.8855
18	-70.3510	-5.9661	-12.7882	-74.6750	-5.9636	-12.7882	12	72.1902	8.4445	-18.8855	54.2864	5.7978	-14.8747
19	-74.6750	-5.9636	-12.7882	-78.9991	-5.9643	-12.7882	13	54.2864	5.7978	-14.8747	35.2413	3.4118	-11.9353
20	-78.9991	-5.9643	-12.7882	-78.2177	12.4268	-32.7895	14	35.2413	3.4118	-11.9353	37.7158	3.4110	-11.9353
21	-78.2177	12.4268	-32.7895	-49.9264	3.6229	-3.3515	15	37.7158	3.4110	-11.9353	16.6465	1.2971	-9.8816
22	-49.9264	3.6229	-3.3515	-46.4850	3.6236	-3.3515	16	16.6465	1.2971	-9.8816	12.5646	1.1223	1.8285
23	-46.4850	3.6236	-3.3515	-43.0420	3.6244	-3.3515	17	12.5646	1.1223	1.8285	13.3783	1.1219	1.8285
24	-43.0420	3.6244	-3.3515	-39.5993	3.6234	-3.3515	18	13.3783	1.1219	1.8285	14.1914	1.1216	1.8286
25	-39.5993	3.6234	-3.3515	-36.1572	3.6235	-3.3515	19	14.1914	1.1216	1.8286	15.0047	1.1218	1.8286
26	-36.1572	3.6235	-3.3515	-32.7141	3.6245	-3.3515	20	15.0047	1.1218	1.8286	-52.1881	18.5487	-43.3788
27	-32.7141	3.6245	-3.3515	-29.2711	3.6246	-3.3515	21	-52.1881	18.5487	-43.3788	-19.0691	39.0459	-69.9818
28	-29.2711	3.6246	-3.3515	-25.8277	3.6237	-3.3515	22	-19.0691	39.0459	-69.9818	4.2983	36.4454	-64.0331
29	-25.8277	3.6237	-3.3515	-22.3858	3.6217	-3.3515	23	4.2983	36.4454	-64.0331	25.5326	33.6935	-58.3027
30	-22.3858	3.6217	-3.3515	-21.5146	-4.1743	-7.1658	24	25.5326	33.6935	-58.3027	43.9937	30.8186	-52.7907
31	-21.5146	-4.1743	-7.1658	-25.4797	-4.1735	-7.1658	25	43.9937	30.8186	-52.7907	59.1698	27.8594	-47.4968
32	-25.4797	-4.1735	-7.1658	-29.4439	-4.1728	-7.1658	26	59.1698	27.8594	-47.4968	70.6855	24.8493	-42.4212
33	-29.4439	-4.1728	-7.1658	-33.4092	-4.1733	-7.1658	27	70.6855	24.8493	-42.4212	94.2890	24.8480	-42.4212
34	-33.4092	-4.1733	-7.1658	-37.3741	-4.1743	-7.1658	28	94.2890	24.8480	-42.4212	99.0313	21.8261	-37.5639
35	-37.3741	-4.1743	-7.1658	-41.3403	-4.1740	-7.1658	29	99.0313	21.8261	-37.5639	99.7883	18.8286	-32.9248
36	-41.3403	-4.1740	-7.1658	-45.3035	-4.1728	-7.1658	30	99.7883	18.8286	-32.9248	96.6207	15.8797	-28.5039
37	-45.3035	-4.1728	-7.1658	-49.2674	-4.1726	-7.1658	31	96.6207	15.8797	-28.5039	89.7160	13.0345	-24.3012
38	-49.2674	-4.1726	-7.1658	-53.2313	-4.1728	-7.1658	32	89.7160	13.0345	-24.3012	79.4151	10.3101	-20.3167
39	-53.2313	-4.1728	-7.1658	-60.7828	-26.9691	62.4761	33	79.4151	10.3101	-20.3167	66.1686	7.7463	-16.5503
40	-60.7828	-26.9691	62.4761	-79.5067	-12.5038	30.1304	34	66.1686	7.7463	-16.5503	50.5489	5.3769	-12.9998
41	-79.5067	-12.5038	30.1304	-66.4653	4.9624	-6.8544	35	50.5489	5.3769	-12.9998	-1.7418	3.6210	-3.3515
42	-66.4653	4.9624	-6.8544	-62.8679	4.9626	-6.8544	36	-1.7418	3.6210	-3.3515	1.6984	3.6213	-3.3515
43	-62.8679	4.9626	-6.8544	-59.2696	4.9621	-6.8544	37	1.6984	3.6213	-3.3515	5.1399	3.6220	-3.3515
44	-59.2696	4.9621	-6.8544	-55.6717	4.9610	-6.8544	38	5.1399	3.6220	-3.3515	8.5809	3.6220	-3.3515
45	-55.6717	4.9610	-6.8544	-52.0753	4.9608	-6.8544	39	8.5809	3.6220	-3.3515	12.0220	3.6222	-3.3515
46	-52.0753	4.9608	-6.8544	-48.4790	4.9621	-6.8544	40	12.0220	3.6222	-3.3515	-41.0858	18.3746	-37.1273
47	-48.4790	4.9621	-6.8544	-44.8829	4.9601	-6.8544	41	-41.0858	18.3746	-37.1273	-15.8587	37.2235	-59.4178
48	-44.8829	4.9601	-6.8544	-41.2900	4.9545	-6.8544	42	-15.8587	37.2235	-59.4178	11.1287	37.2220	-59.4178
49	-41.2900	4.9545	-6.8544	-37.6998	4.9517	-6.8544	43	11.1287	37.2220	-59.4178	25.3754	34.1353	-51.6451
50	-37.6998	4.9517	-6.8544	-34.1099	4.9542	-6.8544	44	25.3754	34.1353	-51.6451	37.7425	30.8358	-44.3394
51	-34.1099	4.9542	-6.8544	-30.5184	4.9546	-6.8544	45	37.7425	30.8358	-44.3394	60.0990	30.8353	-44.3394
52	-30.5184	4.9546	-6.8544	-26.9301	4.9509	-6.8544	46	60.0990	30.8353	-44.3394	67.3412	27.3397	-37.5460
53	-26.9301	4.9509	-6.8544	-23.3427	4.9475	-6.8544	47	67.3412	27.3397	-37.5460	71.2313	23.6928	-31.3099
54	-23.3427	4.9475	-6.8544	-19.7573	4.9445	-6.8544	48	71.2313	23.6928	-31.3099	71.2234	19.9022	-25.6766
55	-19.7573	4.9445	-6.8544	-16.1723	4.9436	-6.8544	49	71.2234	19.9022	-25.6766	85.6548	19.9069	-25.6765
56	-16.1723	4.9436	-6.8544	-12.5884	4.9449	-6.8544	50	85.6548	19.9069	-25.6765	78.4141	15.9886	-20.6913
57	-12.5884	4.9449	-6.8544	-9.0022	4.9452	-6.8544	51	78.4141	15.9886	-20.6913	66.2868	11.9865	-16.3976
58	-9.0022	4.9452	-6.8544	-5.4187	4.9441	-6.8544	52	66.2868	11.9865	-16.3976	48.9398	7.9096	-12.8270
59	-5.4187	4.9441	-6.8544	-2.0034	-11.5435	40.6227	53	48.9398	7.9096	-12.8270	54.6743	7.9149	-12.8270
60	-2.0034	-11.5435	40.6227	-22.2679	-28.6824	62.2026	54	54.6743	7.9149	-12.8270	40.3437	5.3433	-8.7204
ENVOL. MAX. CORTANTES TREN TREN LM 71, EC-1 en via 2							55	40.3437	5.3433	-8.7204	-16.1723	4.9436	-6.8544
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	56	-16.1723	4.9436	-6.8544	-12.5884	4.9449	-6.8544
=====	=====	=====	=====	=====	=====	=====	57	-12.5884	4.9449	-6.8544	-9.0022	4.9452	-6.8544
1	17.7749	36.2787	-69.6175	39.0573	32.3719	-61.0490	58	-9.0022	4.9452	-6.8544	-5.4187	4.9441	-6.8544
2	39.0573	32.3719	-61.0490	54.9656	28.5386	-53.1975	59	-5.4187	4.9441	-6.8544	-1.8340	4.9439	-6.8544
							60	-1.8340	4.9439	-6.8544	1.7501	4.9434	-6.8544

ENVOL. MIN. CORTANTES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	3.2649	-5.9750	-12.7881	-1.0671	-5.9755	-12.7881
2	-1.0671	-5.9755	-12.7881	-5.3991	-5.9768	-12.7881
3	-5.3991	-5.9768	-12.7881	-9.7325	-5.9762	-12.7881
4	-9.7325	-5.9762	-12.7881	-14.0637	-5.9753	-12.7881
5	-14.0637	-5.9753	-12.7881	-18.3960	-5.9760	-12.7881
6	-18.3960	-5.9760	-12.7881	63.0205	-8.8233	21.8932
7	63.0205	-8.8233	21.8932	81.1142	-12.5226	30.4224
8	81.1142	-12.5226	30.4224	72.0372	-12.5251	30.4224
9	72.0372	-12.5251	30.4224	84.0774	-16.4238	38.9909
10	84.0774	-16.4238	38.9909	91.1763	-20.2656	46.8424
11	91.1763	-20.2656	46.8424	76.4798	-20.2678	46.8423
12	76.4798	-20.2678	46.8423	76.2626	-24.0065	54.0093
13	76.2626	-24.0065	54.0093	71.9523	-27.6091	60.5366
14	71.9523	-27.6091	60.5366	64.0399	-31.0812	66.4695
15	64.0399	-31.0812	66.4695	41.5029	-31.0842	66.4695
16	41.5029	-31.0842	66.4695	28.1666	-34.3805	71.8532
17	28.1666	-34.3805	71.8532	12.5765	-37.4848	76.7331
18	12.5765	-37.4848	76.7331	-4.5413	-40.3659	81.1544
19	-4.5413	-40.3659	81.1544	-33.8067	-40.3657	81.1544
20	-33.8067	-40.3657	81.1544	-42.6442	-20.4394	42.1977
21	-42.6442	-20.4394	42.1977	14.1515	-4.1716	-7.1658
22	14.1515	-4.1716	-7.1658	10.1883	-4.1714	-7.1658
23	10.1883	-4.1714	-7.1658	6.2255	-4.1711	-7.1658
24	6.2255	-4.1711	-7.1658	2.2629	-4.1711	-7.1658
25	2.2629	-4.1711	-7.1658	50.2556	-5.1486	17.8663
26	50.2556	-5.1486	17.8663	65.5912	-7.3438	23.8931
27	65.5912	-7.3438	23.8931	79.0433	-9.7583	30.0583
28	79.0433	-9.7583	30.0583	90.0336	-12.3535	36.0069
29	90.0336	-12.3535	36.0069	98.0106	-15.1085	41.7374
30	98.0106	-15.1085	41.7374	102.5282	-17.9825	47.2494
31	102.5282	-17.9825	47.2494	85.4487	-17.9772	47.2494
32	85.4487	-17.9772	47.2494	83.3964	-20.9324	52.5432
33	83.3964	-20.9324	52.5432	77.3553	-23.9438	57.6188
34	77.3553	-23.9438	57.6188	67.3172	-26.9637	62.4761
35	67.3172	-26.9637	62.4761	53.4097	-29.9650	67.1152
36	53.4097	-29.9650	67.1152	35.8947	-32.9154	71.5361
37	35.8947	-32.9154	71.5361	15.1698	-35.7660	75.7388
38	15.1698	-35.7660	75.7388	-8.2330	-38.4935	79.7232
39	-8.2330	-38.4935	79.7232	-33.6524	-41.0569	83.4897
40	-33.6524	-41.0569	83.4897	-48.9769	-20.3960	42.5685
41	-48.9769	-20.3960	42.5685	13.4307	-1.0094	1.7416
42	13.4307	-1.0094	1.7416	12.6991	-1.0094	1.7416
43	12.6991	-1.0094	1.7416	11.9671	-1.0096	1.7416
44	11.9671	-1.0096	1.7416	17.5994	-1.7576	10.7443
45	17.5994	-1.7576	10.7443	36.8424	-3.7965	17.0439
46	36.8424	-3.7965	17.0439	34.0891	-3.7975	17.0440
47	34.0891	-3.7975	17.0440	51.3445	-6.1179	24.3147
48	51.3445	-6.1179	24.3147	67.4035	-8.7115	32.4296
49	67.4035	-8.7115	32.4296	81.7236	-11.5602	40.6225
50	81.7236	-11.5602	40.6225	73.3446	-11.5581	40.6225
51	73.3446	-11.5581	40.6225	83.1120	-14.6424	48.3951
52	83.1120	-14.6424	48.3951	89.7714	-17.9381	55.7010
53	89.7714	-17.9381	55.7010	76.7657	-17.9351	55.7010

54	76.7657	-17.9351	55.7010	77.2094	-21.4209	62.4944
55	77.2094	-21.4209	62.4944	73.3407	-25.0695	68.7303
56	73.3407	-25.0695	68.7303	64.7424	-28.8708	74.3636
57	64.7424	-28.8708	74.3636	43.8078	-28.8727	74.3636
58	43.8078	-28.8727	74.3636	27.2845	-32.7887	79.3489
59	27.2845	-32.7887	79.3489	5.3249	-36.7990	83.6425
60	5.3249	-36.7990	83.6425	-21.3560	-36.8000	83.6425

ENVOL. MAX. TORSORES TREN TREN LM 71, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-0.4668	1.1237	1.8285	0.3479	1.1237	1.8285
2	0.3479	1.1237	1.8285	15.2931	-1.5483	4.1022
3	15.2931	-1.5483	4.1022	32.1266	-3.4962	9.0870
4	32.1266	-3.4962	9.0870	29.5915	-3.4964	9.0870
5	29.5915	-3.4964	9.0870	42.9786	-5.4973	13.8883
6	42.9786	-5.4973	13.8883	63.0205	-8.8233	21.8932
7	63.0205	-8.8233	21.8932	81.1142	-12.5226	30.4224
8	81.1142	-12.5226	30.4224	72.0372	-12.5251	30.4224
9	72.0372	-12.5251	30.4224	84.0774	-16.4238	38.9909
10	84.0774	-16.4238	38.9909	91.1763	-20.2656	46.8424
11	91.1763	-20.2656	46.8424	76.4798	-20.2678	46.8423
12	76.4798	-20.2678	46.8423	76.2626	-24.0065	54.0093
13	76.2626	-24.0065	54.0093	71.9523	-27.6091	60.5366
14	71.9523	-27.6091	60.5366	64.0399	-31.0812	66.4695
15	64.0399	-31.0812	66.4695	41.5029	-31.0842	66.4695
16	41.5029	-31.0842	66.4695	28.1666	-34.3805	71.8532
17	28.1666	-34.3805	71.8532	12.5765	-37.4848	76.7331
18	12.5765	-37.4848	76.7331	-4.5413	-40.3659	81.1544
19	-4.5413	-40.3659	81.1544	-33.8067	-40.3657	81.1544
20	-33.8067	-40.3657	81.1544	-42.6442	-20.4394	42.1977
21	-42.6442	-20.4394	42.1977	-16.8591	1.1845	1.2171
22	-16.8591	1.1845	1.2171	-0.6052	-0.0131	4.0110
23	-0.6052	-0.0131	4.0110	16.3888	-1.4665	8.0089
24	16.3888	-1.4665	8.0089	33.6139	-3.1838	12.5471
25	33.6139	-3.1838	12.5471	50.2556	-5.1486	17.8663
26	50.2556	-5.1486	17.8663	65.5912	-7.3438	23.8931
27	65.5912	-7.3438	23.8931	79.0433	-9.7583	30.0583
28	79.0433	-9.7583	30.0583	90.0336	-12.3535	36.0069
29	90.0336	-12.3535	36.0069	98.0106	-15.1085	41.7374
30	98.0106	-15.1085	41.7374	102.5282	-17.9825	47.2494
31	102.5282	-17.9825	47.2494	85.4487	-17.9772	47.2494
32	85.4487	-17.9772	47.2494	83.3964	-20.9324	52.5432
33	83.3964	-20.9324	52.5432	77.3553	-23.9438	57.6188
34	77.3553	-23.9438	57.6188	67.3172	-26.9637	62.4761
35	67.3172	-26.9637	62.4761	53.4097	-29.9650	67.1152
36	53.4097	-29.9650	67.1152	35.8947	-32.9154	71.5361
37	35.8947	-32.9154	71.5361	15.1698	-35.7660	75.7388
38	15.1698	-35.7660	75.7388	-8.2330	-38.4935	79.7232
39	-8.2330	-38.4935	79.7232	-33.6524	-41.0569	83.4897
40	-33.6524	-41.0569	83.4897	-48.9769	-20.3960	42.5685
41	-48.9769	-20.3960	42.5685	13.4307	-1.0094	1.7416
42	13.4307	-1.0094	1.7416	12.6991	-1.0094	1.7416
43	12.6991	-1.0094	1.7416	12.6991	-1.0094	1.7416
44	-1.2175	-0.0082	5.1361	17.5994	-1.7576	10.7443
45	17.5994	-1.7576	10.7443	36.8424	-3.7965	17.0439
46	36.8424	-3.7965	17.0439	34.0891	-3.7975	17.0440
47	34.0891	-3.7975	17.0440	51.3445	-6.1179	24.3147

48	51.3445	-6.1179	24.3147	67.4035	-8.7115	32.4296
49	67.4035	-8.7115	32.4296	81.7236	-11.5602	40.6225
50	81.7236	-11.5602	40.6225	73.3446	-11.5581	40.6225
51	73.3446	-11.5581	40.6225	83.1120	-14.6424	48.3951
52	83.1120	-14.6424	48.3951	89.7714	-17.9381	55.7010
53	89.7714	-17.9381	55.7010	76.7657	-17.9351	55.7010
54	76.7657	-17.9351	55.7010	77.2094	-21.4209	62.4944
55	77.2094	-21.4209	62.4944	73.3407	-25.0695	68.7303
56	73.3407	-25.0695	68.7303	64.7424	-28.8708	74.3636
57	64.7424	-28.8708	74.3636	43.8078	-28.8727	74.3636
58	43.8078	-28.8727	74.3636	27.2845	-32.7887	79.3489
59	27.2845	-32.7887	79.3489	5.3249	-36.7990	83.6425
60	5.3249	-36.7990	83.6425	-21.3560	-36.8000	83.6425

ENVOL. MIN. TORSORES TREN TREN LM 71, EC-1 en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	17.7749	36.2787	-69.6175	39.0573	32.3719	-61.0490
2	39.0573	32.3719	-61.0490	54.9656	28.5386	-53.1975
3	54.9656	28.5386	-53.1975	75.6564	28.5421	-53.1975
4	75.6564	28.5421	-53.1975	83.6899	24.8062	-46.0304
5	83.6899	24.8062	-46.0304	86.9135	21.1960	-39.5032
6	86.9135	21.1960	-39.5032	85.6908	17.7255	-33.5703
7	85.6908	17.7255	-33.5703	98.5420	17.7221	-33.5703
8	98.5420	17.7221	-33.5703	90.9080	14.4282	-28.1866
9	90.9080	14.4282	-28.1866	79.8868	11.3256	-23.3068
10	79.8868	11.3256	-23.3068	66.0690	8.4445	-18.8855
11	66.0690	8.4445	-18.8855	72.1902	8.4445	-18.8855
12	72.1902	8.4445	-18.8855	54.2864	5.7978	-14.8747
13	54.2864	5.7978	-14.8747	-52.2436	-5.8899	-12.8196
14	-52.2436	-5.8899	-12.8196	-56.5122	-5.8868	-12.8196
15	-56.5122	-5.8868	-12.8196	-60.7774	-5.8850	-12.8196
16	-60.7774	-5.8850	-12.8196	-65.0450	-5.8837	-12.8196
17	-65.0450	-5.8837	-12.8196	-69.3090	-5.8814	-12.8196
18	-69.3090	-5.8814	-12.8196	-73.5740	-5.8814	-12.8196
19	-73.5740	-5.8814	-12.8196	-77.8371	-5.8814	-12.8196
20	-77.8371	-5.8814	-12.8196	-52.1881	18.5487	-43.3788
21	-52.1881	18.5487	-43.3788	-19.0691	39.0459	-69.9818
22	-19.0691	39.0459	-69.9818	4.2983	36.4454	-64.0331
23	4.2983	36.4454	-64.0331	25.5326	33.6935	-58.3027
24	25.5326	33.6935	-58.3027	43.9937	30.8186	-52.7907
25	43.9937	30.8186	-52.7907	59.1698	27.8594	-47.4968
26	59.1698	27.8594	-47.4968	70.6855	24.8493	-42.4212
27	70.6855	24.8493	-42.4212	94.2890	24.8480	-42.4212
28	94.2890	24.8480	-42.4212	99.0313	21.8261	-37.5639
29	99.0313	21.8261	-37.5639	99.7883	18.8286	-32.9248
30	99.7883	18.8286	-32.9248	96.6207	15.8797	-28.5039
31	96.6207	15.8797	-28.5039	89.7160	13.0345	-24.3012
32	89.7160	13.0345	-24.3012	79.4151	10.3101	-20.3167
33	79.4151	10.3101	-20.3167	66.1686	7.7463	-16.5503
34	66.1686	7.7463	-16.5503	50.5489	5.3769	-12.9998
35	50.5489	5.3769	-12.9998	33.3682	3.2443	-10.2190
36	33.3682	3.2443	-10.2190	15.3652	1.3663	-8.0943
37	15.3652	1.3663	-8.0943	-48.4913	-4.1049	-7.2808
38	-48.4913	-4.1049	-7.2808	-52.3912	-4.1049	-7.2808
39	-52.3912	-4.1049	-7.2808	-56.2908	-4.1052	-7.2808

40	-56.2908	-4.1052	-7.2808	-41.0858	18.3746	-37.1273
41	-41.0858	18.3746	-37.1273	-15.8587	37.2235	-59.4178
42	-15.8587	37.2235	-59.4178	11.1287	37.2220	-59.4178
43	11.1287	37.2220	-59.4178	25.3754	34.1353	-51.6451
44	25.3754	34.1353	-51.6451	37.7425	30.8358	-44.3394
45	37.7425	30.8358	-44.3394	60.0990	30.8353	-44.3394
46	60.0990	30.8353	-44.3394	67.3412	27.3397	-37.5460
47	67.3412	27.3397	-37.5460	71.2313	23.6928	-31.3099
48	71.2313	23.6928	-31.3099	71.2234	19.9022	-25.6766
49	71.2234	19.9022	-25.6766	85.6548	19.9069	-25.6765
50	85.6548	19.9069	-25.6765	78.4141	15.9886	-20.6913
51	78.4141	15.9886	-20.6913	66.2868	11.9865	-16.3976
52	66.2868	11.9865	-16.3976	48.9398	7.9096	-12.8270
53	48.9398	7.9096	-12.8270	54.6743	7.9149	-12.8270
54	54.6743	7.9149	-12.8270	40.3437	5.3433	-8.7204
55	40.3437	5.3433	-8.7204	-16.1723	4.9436	-6.8544
56	-16.1723	4.9436	-6.8544	-12.5884	4.9449	-6.8544
57	-12.5884	4.9449	-6.8544	-9.0022	4.9452	-6.8544
58	-9.0022	4.9452	-6.8544	-5.4187	4.9441	-6.8544
59	-5.4187	4.9441	-6.8544	-1.8340	4.9439	-6.8544
60	-1.8340	4.9439	-6.8544	1.7501	4.9434	-6.8544

ENVOL. MAX. FLECTORES TREN TREN SW/0, EC-1 en vía 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	47.0613	58.0712	-184.3218	96.0108	72.0670	-144.1243
2	96.0108	72.0670	-144.1243	142.5015	59.2219	-115.1743
3	142.5015	59.2219	-115.1743	183.1111	45.9263	-87.9093
4	183.1111	45.9263	-87.9093	216.4065	45.9266	-87.9095
5	216.4065	45.9266	-87.9095	241.3889	32.6234	-60.6446
6	241.3889	32.6234	-60.6446	260.3844	19.3195	-33.3797
7	260.3844	19.3195	-33.3797	273.3939	6.0220	-6.1146
8	273.3939	6.0220	-6.1146	277.7628	6.0086	-6.1147
9	277.7628	6.0086	-6.1147	275.1407	-7.3006	21.1502
10	275.1407	-7.3006	21.1502	266.5321	-20.5997	48.4152
11	266.5321	-20.5997	48.4152	251.5941	-20.6003	48.4151
12	251.5941	-20.6003	48.4151	227.3383	-33.8860	75.6801
13	227.3383	-33.8860	75.6801	197.1129	-47.1892	102.9449
14	197.1129	-47.1892	102.9449	160.8983	-60.5250	130.2098
15	160.8983	-60.5250	130.2098	117.0112	-60.5302	130.2097
16	117.0112	-60.5302	130.2097	65.1667	-73.8161	157.4748
17	65.1667	-73.8161	157.4748	7.3214	-87.1256	184.7398
18	7.3214	-87.1256	184.7398	-1.1567	-0.5913	1.5967
19	-1.1567	-0.5913	1.5967	-1.5854	-0.5913	1.5967
20	-1.5854	-0.5913	1.5967	-1.7963	-0.2419	0.7439
21	-1.7963	-0.2419	0.7439	-1.4765	0.1074	-0.1088
22	-1.4765	0.1074	-0.1088	19.7178	74.9265	-170.4373
23	19.7178	74.9265	-170.4373	84.9019	64.9520	-148.5342
24	84.9019	64.9520	-148.5342	139.9900	54.9379	-126.8716
25	139.9900	54.9379	-126.8716	184.8605	41.6432	-99.6064
26	184.8605	41.6432	-99.6064	217.7700	28.3421	-72.3412
27	217.7700	28.3421	-72.3412	238.6974	15.0338	-45.0764
28	238.6974	15.0338	-45.0764	256.7650	18.3387	-0.8217
29	256.7650	18.3387	-0.8217	274.9889	7.8680	20.7499
30	274.9889	7.8680	20.7499	282.4656	-5.4265	48.0149
31	282.4656	-5.4265	48.0149	278.5159	-2.8393	42.1503
32	278.5159	-2.8393	42.1503	263.8561	-16.1376	69.4153

33	263.8561	-16.1376	69.4153	237.7525	-27.0606	90.0710
34	237.7525	-27.0606	90.0710	201.3999	-40.3736	117.3358
35	201.3999	-40.3736	117.3358	153.0576	-53.6771	144.6008
36	153.0576	-53.6771	144.6008	94.7597	-64.7249	164.5996
37	94.7597	-64.7249	164.5996	24.6217	-78.0322	191.8647
38	24.6217	-78.0322	191.8647	23.2432	9.9044	-8.3308
39	23.2432	9.9044	-8.3308	32.6530	9.9050	-8.3308
40	32.6530	9.9050	-8.3308	40.3879	3.5725	-1.7706
41	40.3879	3.5725	-1.7706	36.7117	-2.7599	4.7895
42	36.7117	-2.7599	4.7895	34.7110	-2.7596	4.7895
43	34.7110	-2.7596	4.7895	32.7101	-2.7592	4.7895
44	32.7101	-2.7592	4.7895	30.7094	-2.7583	4.7896
45	30.7094	-2.7583	4.7896	56.0321	51.4300	-50.3990
46	56.0321	51.4300	-50.3990	94.3730	54.6828	-55.0608
47	94.3730	54.6828	-55.0608	126.3750	41.4011	-27.7957
48	126.3750	41.4011	-27.7957	152.5639	30.4753	-4.7120
49	152.5639	30.4753	-4.7120	174.3257	17.1805	22.5532
50	174.3257	17.1805	22.5532	186.7888	17.1791	22.5534
51	186.7888	17.1791	22.5534	192.9296	3.8802	49.8184
52	192.9296	3.8802	49.8184	193.0857	-9.4030	77.0836
53	193.0857	-9.4030	77.0836	186.2778	-9.3837	77.0838
54	186.2778	-9.3837	77.0838	171.7744	-21.2125	100.4001
55	171.7744	-21.2125	100.4001	151.4138	-34.5124	127.6651
56	151.4138	-34.5124	127.6651	125.0565	-47.8156	154.9301
57	125.0565	-47.8156	154.9301	90.3984	-47.8096	154.9303
58	90.3984	-47.8096	154.9303	48.4245	-61.1094	182.1953
59	48.4245	-61.1094	182.1953	0.7701	-2.7498	4.7896
60	0.7701	-2.7498	4.7896	4.4575	13.3349	-17.4567

ENVOL. MIN. FLECTORES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	6.5537	-0.5909	1.5967	-1.8249	-15.1430	-35.8545
2	-1.8249	-15.1430	-35.8545	-12.8045	-15.1431	-35.8545
3	-12.8045	-15.1431	-35.8545	-23.7843	-15.1423	-35.8545
4	-23.7843	-15.1423	-35.8545	-34.7634	-15.1418	-35.8545
5	-34.7634	-15.1418	-35.8545	-45.7424	-15.1401	-35.8545
6	-45.7424	-15.1401	-35.8545	-56.7230	-15.1379	-35.8545
7	-56.7230	-15.1379	-35.8545	-67.7003	-15.1357	-35.8545
8	-67.7003	-15.1357	-35.8545	-78.6783	-15.1375	-35.8545
9	-78.6783	-15.1375	-35.8545	-89.6544	-15.1453	-35.8545
10	-89.6544	-15.1453	-35.8545	-100.6356	-15.1418	-35.8545
11	-100.6356	-15.1418	-35.8545	-111.6063	-15.1327	-35.8546
12	-111.6063	-15.1327	-35.8546	-122.5714	-15.1351	-35.8546
13	-122.5714	-15.1351	-35.8546	-133.5453	-15.1374	-35.8546
14	-133.5453	-15.1374	-35.8546	-144.5154	-15.1326	-35.8547
15	-144.5154	-15.1326	-35.8547	-160.3203	-59.7895	49.7038
16	-160.3203	-59.7895	49.7038	-203.6682	-59.7887	49.7038
17	-203.6682	-59.7887	49.7038	-254.2104	-69.9026	70.1921
18	-254.2104	-69.9026	70.1921	-309.0926	-80.2140	92.3305
19	-309.0926	-80.2140	92.3305	-369.2991	-90.7508	116.6488
20	-369.2991	-90.7508	116.6488	-396.8947	7.5794	-32.9651
21	-396.8947	7.5794	-32.9651	-267.7444	83.7867	-143.7440
22	-267.7444	83.7867	-143.7440	-189.6462	72.7547	-126.4457
23	-189.6462	72.7547	-126.4457	-120.6476	61.5819	-109.9410
24	-120.6476	61.5819	-109.9410	-108.5058	9.9073	-8.3308
25	-108.5058	9.9073	-8.3308	-99.0938	9.9083	-8.3308

26	-99.0938	9.9083	-8.3308	-89.6781	9.9109	-8.3308
27	-89.6781	9.9109	-8.3308	-80.2623	9.9100	-8.3308
28	-80.2623	9.9100	-8.3308	-70.8490	9.9079	-8.3308
29	-70.8490	9.9079	-8.3308	-61.4368	9.9050	-8.3308
30	-61.4368	9.9050	-8.3308	-52.0271	9.9028	-8.3308
31	-52.0271	9.9028	-8.3308	-42.6339	9.8636	-7.6092
32	-42.6339	9.8636	-7.6092	-33.2656	9.8614	-7.6092
33	-33.2656	9.8614	-7.6092	-23.8972	9.8627	-7.6092
34	-23.8972	9.8627	-7.6092	-15.2202	-47.8576	80.5550
35	-15.2202	-47.8576	80.5550	-60.6824	-47.8568	80.5549
36	-60.6824	-47.8568	80.5549	-114.1943	-58.0633	102.2128
37	-114.1943	-58.0633	102.2128	-175.0459	-68.0414	124.1157
38	-175.0459	-68.0414	124.1157	-246.4416	-78.0502	145.7784
39	-246.4416	-78.0502	145.7784	-320.5914	-78.0522	145.7784
40	-320.5914	-78.0522	145.7784	-353.2794	17.8411	-16.6151
41	-353.2794	17.8411	-16.6151	-232.3541	100.4342	-151.7436
42	-232.3541	100.4342	-151.7436	-174.0620	13.7062	-17.3270
43	-174.0620	13.7062	-17.3270	-164.1244	13.7104	-17.3270
44	-164.1244	13.7104	-17.3270	-154.1859	13.7109	-17.3271
45	-154.1859	13.7109	-17.3271	-144.2500	13.7010	-17.3270
46	-144.2500	13.7010	-17.3270	-134.3181	13.7002	-17.3270
47	-134.3181	13.7002	-17.3270	-124.3821	13.6927	-17.3271
48	-124.3821	13.6927	-17.3271	-114.4638	13.6835	-17.3271
49	-114.4638	13.6835	-17.3271	-104.5404	13.6751	-17.3271
50	-104.5404	13.6751	-17.3271	-94.6247	13.6627	-17.3271
51	-94.6247	13.6627	-17.3271	-84.7101	13.6613	-17.3271
52	-84.7101	13.6613	-17.3271	-74.8004	13.6690	-17.3271
53	-74.8004	13.6690	-17.3271	-64.8869	13.6697	-17.3271
54	-64.8869	13.6697	-17.3271	-54.9826	13.6582	-17.3271
55	-54.9826	13.6582	-17.3271	-45.0828	13.6561	-17.3271
56	-45.0828	13.6561	-17.3271	-35.1796	13.6579	-17.3271
57	-35.1796	13.6579	-17.3271	-25.2770	13.6570	-17.3271
58	-25.2770	13.6570	-17.3271	-15.4472	13.5468	-16.4267
59	-15.4472	13.5468	-16.4267	-7.6898	-10.3562	59.5259
60	-7.6898	-10.3562	59.5259	-59.4301	-73.8126	205.5016

ENVOL. MAX. CORTANTES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	43.3293	72.5201	-142.4394	95.9088	72.5189	-142.4394
2	95.9088	72.5189	-142.4394	142.5015	59.2219	-115.1743
3	142.5015	59.2219	-115.1743	130.9366	47.1508	-111.2372
4	130.9366	47.1508	-111.2372	165.1173	47.1460	-111.2373
5	165.1173	47.1460	-111.2373	155.8294	36.1549	-97.0362
6	155.8294	36.1549	-97.0362	135.4172	26.1254	-85.2072
7	135.4172	26.1254	-85.2072	112.8703	18.1103	-81.9423
8	112.8703	18.1103	-81.9423	118.4694	17.1044	-75.4518
9	118.4694	17.1044	-75.4518	93.6754	11.6186	-69.9820
10	93.6754	11.6186	-69.9820	57.9468	5.8677	-60.1828
11	57.9468	5.8677	-60.1828	20.2708	0.8647	-52.3387
12	20.2708	0.8647	-52.3387	1.4146	-0.5909	1.5967
13	1.4146	-0.5909	1.5967	0.9862	-0.5910	1.5967
14	0.9862	-0.5910	1.5967	0.5576	-0.5911	1.5967
15	0.5576	-0.5911	1.5967	0.1291	-0.5910	1.5967
16	0.1291	-0.5910	1.5967	-0.2994	-0.5911	1.5967
17	-0.2994	-0.5911	1.5967	-0.7280	-0.5912	1.5967
18	-0.7280	-0.5912	1.5967	-1.1567	-0.5913	1.5967
19	-1.1567	-0.5913	1.5967	-1.5854	-0.5913	1.5967

20	-1.5854	-0.5913	1.5967	-184.7534	46.5113	-135.8932
21	-184.7534	46.5113	-135.8932	-238.9406	116.8394	-203.2347
22	-238.9406	116.8394	-203.2347	-157.4687	105.9062	-182.5791
23	-157.4687	105.9062	-182.5791	-87.3445	94.8559	-162.5804
24	-87.3445	94.8559	-162.5804	-28.9576	83.7858	-143.7437
25	-28.9576	83.7858	-143.7437	17.6942	72.7512	-126.4456
26	17.6942	72.7512	-126.4456	54.8586	61.5837	-109.9409
27	54.8586	61.5837	-109.9409	81.7086	50.3812	-93.1230
28	81.7086	50.3812	-93.1230	98.3746	39.1854	-75.9030
29	98.3746	39.1854	-75.9030	105.0564	27.9903	-58.2131
30	105.0564	27.9903	-58.2131	101.9657	16.8405	-40.0039
31	101.9657	16.8405	-40.0039	117.9675	16.8432	-40.0039
32	117.9675	16.8432	-40.0039	-33.2094	9.9015	-8.3308
33	-33.2094	9.9015	-8.3308	-23.8008	9.9014	-8.3308
34	-23.8008	9.9014	-8.3308	-14.3939	9.9032	-8.3308
35	-14.3939	9.9032	-8.3308	-4.9846	9.9042	-8.3308
36	-4.9846	9.9042	-8.3308	4.4236	9.9050	-8.3308
37	4.4236	9.9050	-8.3308	13.8342	9.9053	-8.3308
38	13.8342	9.9053	-8.3308	23.2432	9.9044	-8.3308
39	23.2432	9.9044	-8.3308	32.6530	9.9050	-8.3308
40	32.6530	9.9050	-8.3308	-353.2794	17.8411	-16.6151
41	-353.2794	17.8411	-16.6151	-232.3541	100.4342	-151.7436
42	-232.3541	100.4342	-151.7436	-159.5385	100.4286	-151.7436
43	-159.5385	100.4286	-151.7436	-95.7062	87.1277	-124.4785
44	-95.7062	87.1277	-124.4785	-37.8545	73.8365	-97.2134
45	-37.8545	73.8365	-97.2134	14.0156	60.5396	-69.9485
46	14.0156	60.5396	-69.9485	57.9036	60.5400	-69.9483
47	57.9036	60.5400	-69.9483	94.1474	47.2488	-42.6831
48	94.1474	47.2488	-42.6831	124.4215	33.9542	-15.4180
49	124.4215	33.9542	-15.4180	148.7075	20.6524	11.8471
50	148.7075	20.6524	11.8471	163.6869	20.6591	11.8472
51	163.6869	20.6591	11.8472	-84.7101	13.6613	-17.3271
52	-84.7101	13.6613	-17.3271	-74.8004	13.6690	-17.3271
53	-74.8004	13.6690	-17.3271	-64.8869	13.6697	-17.3271
54	-64.8869	13.6697	-17.3271	-54.9826	13.6582	-17.3271
55	-54.9826	13.6582	-17.3271	-45.0828	13.6561	-17.3271
56	-45.0828	13.6561	-17.3271	-35.1796	13.6579	-17.3271
57	-35.1796	13.6579	-17.3271	-25.2770	13.6570	-17.3271
58	-25.2770	13.6570	-17.3271	-15.3771	13.6560	-17.3270
59	-15.3771	13.6560	-17.3270	-5.4764	13.6563	-17.3270
60	-5.4764	13.6563	-17.3270	4.4243	13.6557	-17.3270

ENVOL. MIN. CORTANTES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	9.1542	-15.1426	-35.8546	-1.8249	-15.1430	-35.8545
2	-1.8249	-15.1430	-35.8545	-12.8045	-15.1431	-35.8545
3	-12.8045	-15.1431	-35.8545	-23.7843	-15.1423	-35.8545
4	-23.7843	-15.1423	-35.8545	-34.7634	-15.1418	-35.8545
5	-34.7634	-15.1418	-35.8545	-45.7424	-15.1401	-35.8545
6	-45.7424	-15.1401	-35.8545	60.4206	-20.7094	-22.0214
7	60.4206	-20.7094	-22.0214	61.9101	-30.3265	-5.7351
8	61.9101	-30.3265	-5.7351	61.9671	-40.0317	11.6785
9	61.9671	-40.0317	11.6785	32.9444	-40.0313	11.6784
10	32.9444	-40.0313	11.6784	24.1415	-49.8425	30.1763
11	24.1415	-49.8425	30.1763	13.0712	-59.7911	49.7041
12	13.0712	-59.7911	49.7041	-0.8090	-63.2537	56.5598

13	-0.8090	-63.2537	56.5598	-51.4895	-69.9034	70.1922
14	-51.4895	-69.9034	70.1922	-76.4720	-80.2125	92.3306
15	-76.4720	-80.2125	92.3306	-106.1207	-90.7509	116.6489
16	-106.1207	-90.7509	116.6489	-171.9146	-90.7520	116.6489
17	-171.9146	-90.7520	116.6489	-214.8221	-101.5448	142.8574
18	-214.8221	-101.5448	142.8574	-264.2933	-112.6327	170.6360
19	-264.2933	-112.6327	170.6360	-321.2235	-124.0322	199.6937
20	-321.2235	-124.0322	199.6937	-177.2700	-51.9313	115.8303
21	-177.2700	-51.9313	115.8303	-1.4765	0.1074	-0.1088
22	-1.4765	0.1074	-0.1088	-1.3745	0.1075	-0.1088
23	-1.3745	0.1075	-0.1088	-1.2724	0.1075	-0.1088
24	-1.2724	0.1075	-0.1088	-1.1703	0.1074	-0.1088
25	-1.1703	0.1074	-0.1088	-1.0682	0.1075	-0.1088
26	-1.0682	0.1075	-0.1088	33.6768	-3.9415	32.6976
27	33.6768	-3.9415	32.6976	73.5891	-9.2097	45.6580
28	73.5891	-9.2097	45.6580	113.2426	-16.1175	17.9477
29	113.2426	-16.1175	17.9477	124.8448	-26.8617	38.3512
30	124.8448	-26.8617	38.3512	127.4017	-37.4530	59.2410
31	127.4017	-37.4530	59.2410	121.1707	-47.8554	80.5551
32	121.1707	-47.8554	80.5551	106.4368	-58.0608	102.2130
33	106.4368	-58.0608	102.2130	83.5018	-68.0365	124.1158
34	83.5018	-68.0365	124.1158	50.1480	-78.0394	145.7784
35	50.1480	-78.0394	145.7784	-23.9975	-78.0432	145.7784
36	-23.9975	-78.0432	145.7784	-98.1436	-78.0486	145.7784
37	-98.1436	-78.0486	145.7784	-4.8659	-85.2200	211.6048
38	-4.8659	-85.2200	211.6048	-75.5516	-95.9464	233.0053
39	-75.5516	-95.9464	233.0053	-159.9832	-106.8790	253.6609
40	-159.9832	-106.8790	253.6609	-220.8111	-52.4778	129.5260
41	-220.8111	-52.4778	129.5260	36.7117	-2.7599	4.7895
42	36.7117	-2.7599	4.7895	34.7110	-2.7596	4.7895
43	34.7110	-2.7596	4.7895	32.7101	-2.7592	4.7895
44	32.7101	-2.7592	4.7895	30.7094	-2.7583	4.7896
45	30.7094	-2.7583	4.7896	28.7096	-2.7582	4.7896
46	28.7096	-2.7582	4.7896	26.7085	-2.7580	4.7896
47	26.7085	-2.7580	4.7896	24.7094	-2.7566	4.7896
48	24.7094	-2.7566	4.7896	30.1418	-4.7238	42.7482
49	30.1418	-4.7238	42.7482	67.4258	-10.3689	59.5256
50	67.4258	-10.3689	59.5256	59.9081	-10.3650	59.5257
51	59.9081	-10.3650	59.5257	90.0712	-16.8679	77.8927
52	90.0712	-16.8679	77.8927	115.5119	-24.2353	97.6468
53	115.5119	-24.2353	97.6468	97.9509	-24.2317	97.6469
54	97.9509	-24.2317	97.6469	110.9268	-32.4680	118.5757
55	110.9268	-32.4680	118.5757	114.9449	-41.6024	140.4571
56	114.9449	-41.6024	140.4571	108.1217	-51.6486	163.0600
57	108.1217	-51.6486	163.0600	70.6839	-51.6358	163.0601
58	70.6839	-51.6358	163.0601	43.2114	-62.5749	186.1439
59	43.2114	-62.5749	186.1439	0.4638	-74.4059	209.4603
60	0.4638	-74.4059	209.4603	-53.4793	-74.4023	209.4603

ENVOL. MAX. TORSORES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	6.5537	-0.5909	1.5967	6.1253	-0.5908	1.5967
2	6.1253	-0.5908	1.5967	22.3692	-2.2785	6.0687
3	22.3692	-2.2785	6.0687	46.4066	-5.0610	13.2022
4	46.4066	-5.0610	13.2022	42.7372	-5.0619	13.2021
5	42.7372	-5.0619	13.2021	69.4687	-8.9262	22.7801

6	69.4687	-8.9262	22.7801	98.6768	-13.8594	34.5963	=====							
7	98.6768	-13.8594	34.5963	128.2025	-19.8401	48.4566								
8	128.2025	-19.8401	48.4566	113.8186	-19.8412	48.4566		1	47.0613	58.0712	-184.3218	88.8315	44.7691	-157.0567
9	113.8186	-19.8412	48.4566	136.5358	-26.8430	64.1792		2	88.8315	44.7691	-157.0567	121.2908	44.7690	-157.0565
10	136.5358	-26.8430	64.1792	154.8762	-34.8232	81.5948		3	121.2908	44.7690	-157.0565	125.8278	42.2445	-132.9927
11	154.8762	-34.8232	81.5948	129.6266	-34.8246	81.5948		4	125.8278	42.2445	-132.9927	125.8364	33.4265	-113.2180
12	129.6266	-34.8246	81.5948	135.3557	-43.7377	100.5462		5	125.8364	33.4265	-113.2180	150.0663	33.4334	-113.2180
13	135.3557	-43.7377	100.5462	132.7379	-53.5418	120.8887		6	150.0663	33.4334	-113.2180	135.0067	25.3873	-96.2793
14	132.7379	-53.5418	120.8887	120.4334	-64.1907	142.4899		7	135.0067	25.3873	-96.2793	112.8703	18.1103	-81.9423
15	120.4334	-64.1907	142.4899	73.9003	-64.1867	142.4899		8	112.8703	18.1103	-81.9423	118.4694	17.1044	-75.4518
16	73.9003	-64.1867	142.4899	42.5300	-75.6026	165.2298		9	118.4694	17.1044	-75.4518	93.6754	11.6186	-69.9820
17	42.5300	-75.6026	165.2298	-0.9957	-87.7148	189.0008		10	93.6754	11.6186	-69.9820	57.9468	5.8677	-60.1828
18	-0.9957	-87.7148	189.0008	-57.1991	-100.4443	213.7074		11	57.9468	5.8677	-60.1828	20.2708	0.8647	-52.3387
19	-57.1991	-100.4443	213.7074	-130.0239	-100.4482	213.7074		12	20.2708	0.8647	-52.3387	-17.9799	-3.4223	-46.2533
20	-130.0239	-100.4482	213.7074	-177.2700	-51.9313	115.8303		13	-17.9799	-3.4223	-46.2533	-20.4618	-3.4230	-46.2534
21	-177.2700	-51.9313	115.8303	-1.4765	0.1074	-0.1088		14	-20.4618	-3.4230	-46.2534	-60.6357	-7.0196	-41.7395
22	-1.4765	0.1074	-0.1088	-1.3745	0.1075	-0.1088		15	-60.6357	-7.0196	-41.7395	-98.5038	-9.9552	-38.6190
23	-1.3745	0.1075	-0.1088	-79.0921	6.5221	4.1026		16	-98.5038	-9.9552	-38.6190	-105.7222	-9.9555	-38.6190
24	-79.0921	6.5221	4.1026	-44.6805	3.9004	11.8388		17	-105.7222	-9.9555	-38.6190	-141.9921	-12.2689	-36.7241
25	-44.6805	3.9004	11.8388	-6.4524	0.4248	21.3960		18	-141.9921	-12.2689	-36.7241	-173.7484	-14.0020	-35.8957
26	-6.4524	0.4248	21.3960	33.6768	-3.9415	32.6976		19	-173.7484	-14.0020	-35.8957	-199.3337	-15.1170	-35.8546
27	33.6768	-3.9415	32.6976	73.5891	-9.2097	45.6580		20	-199.3337	-15.1170	-35.8546	-184.7534	46.5113	-135.8932
28	73.5891	-9.2097	45.6580	109.4162	-15.1537	59.9553		21	-184.7534	46.5113	-135.8932	-66.4549	94.8389	-208.6667
29	109.4162	-15.1537	59.9553	139.8727	-21.8054	75.5409		22	-66.4549	94.8389	-208.6667	-157.4687	105.9062	-182.5791
30	139.8727	-21.8054	75.5409	163.2313	-29.1479	92.3061		23	-157.4687	105.9062	-182.5791	-87.3445	94.8559	-162.5804
31	163.2313	-29.1479	92.3061	135.5363	-29.1449	92.3061		24	-87.3445	94.8559	-162.5804	-28.9576	83.7858	-143.7437
32	135.5363	-29.1449	92.3061	142.5797	-37.1554	110.1425		25	-28.9576	83.7858	-143.7437	17.6942	72.7512	-126.4456
33	142.5797	-37.1554	110.1425	138.8343	-45.7703	128.9418		26	17.6942	72.7512	-126.4456	54.8586	61.5837	-109.9409
34	138.8343	-45.7703	128.9418	123.0566	-54.9529	148.5956		27	54.8586	61.5837	-109.9409	81.7086	50.3812	-93.1230
35	123.0566	-54.9529	148.5956	94.2630	-64.6377	168.9956		28	81.7086	50.3812	-93.1230	98.3746	39.1854	-75.9030
36	94.2630	-64.6377	168.9956	51.7441	-74.7541	190.0334		29	98.3746	39.1854	-75.9030	105.0564	27.9903	-58.2131
37	51.7441	-74.7541	190.0334	-4.8659	-85.2200	211.6048		30	105.0564	27.9903	-58.2131	101.9657	16.8405	-40.0039
38	-4.8659	-85.2200	211.6048	-75.5516	-95.9464	233.0053		31	101.9657	16.8405	-40.0039	117.9675	16.8432	-40.0039
39	-75.5516	-95.9464	233.0053	-159.9832	-106.8790	253.6609		32	117.9675	16.8432	-40.0039	94.8335	5.7646	-21.2458
40	-159.9832	-106.8790	253.6609	-220.8111	-52.4778	129.5260		33	94.8335	5.7646	-21.2458	-22.9056	9.5877	-8.5276
41	-220.8111	-52.4778	129.5260	36.5405	-2.7474	4.7910		34	-22.9056	9.5877	-8.5276	-13.7990	9.5863	-8.5276
42	36.5405	-2.7474	4.7910	34.5488	-2.7477	4.7910		35	-13.7990	9.5863	-8.5276	-4.6930	9.5858	-8.5276
43	34.5488	-2.7477	4.7910	32.5565	-2.7471	4.7910		36	-4.6930	9.5858	-8.5276	4.4149	9.5864	-8.5276
44	32.5565	-2.7471	4.7910	30.5652	-2.7466	4.7910		37	4.4149	9.5864	-8.5276	13.5229	9.5863	-8.5276
45	30.5652	-2.7466	4.7910	-48.4291	4.1189	14.7278		38	13.5229	9.5863	-8.5276	22.6313	9.5867	-8.5276
46	-48.4291	4.1189	14.7278	-45.4427	4.1161	14.7278		39	22.6313	9.5867	-8.5276	31.7393	9.5875	-8.5276
47	-45.4427	4.1161	14.7278	-7.9716	0.0958	27.7543		40	31.7393	9.5875	-8.5276	-353.2794	17.8411	-16.6151
48	-7.9716	0.0958	27.7543	30.1418	-4.7238	42.7482		41	-353.2794	17.8411	-16.6151	-232.3541	100.4342	-151.7436
49	30.1418	-4.7238	42.7482	67.4258	-10.3689	59.5256		42	-232.3541	100.4342	-151.7436	-159.5385	100.4286	-151.7436
50	67.4258	-10.3689	59.5256	59.9081	-10.3650	59.5257		43	-159.5385	100.4286	-151.7436	-95.7062	87.1277	-124.4785
51	59.9081	-10.3650	59.5257	90.0712	-16.8679	77.8927		44	-95.7062	87.1277	-124.4785	-37.8545	73.8365	-97.2134
52	90.0712	-16.8679	77.8927	115.5119	-24.2353	97.6468		45	-37.8545	73.8365	-97.2134	14.0156	60.5396	-69.9485
53	115.5119	-24.2353	97.6468	97.9509	-24.2317	97.6469		46	14.0156	60.5396	-69.9485	57.9036	60.5400	-69.9483
54	97.9509	-24.2317	97.6469	110.9268	-32.4680	118.5757		47	57.9036	60.5400	-69.9483	94.1474	47.2488	-42.6831
55	110.9268	-32.4680	118.5757	114.9449	-41.6024	140.4571		48	94.1474	47.2488	-42.6831	-111.6321	13.3694	-17.4568
56	114.9449	-41.6024	140.4571	108.1217	-51.6486	163.0600		49	-111.6321	13.3694	-17.4568	-101.9477	13.3649	-17.4568
57	108.1217	-51.6486	163.0600	70.6839	-51.6358	163.0601		50	-101.9477	13.3649	-17.4568	-92.2617	13.3592	-17.4568
58	70.6839	-51.6358	163.0601	43.2114	-62.5749	186.1439		51	-92.2617	13.3592	-17.4568	-82.5805	13.3502	-17.4568
59	43.2114	-62.5749	186.1439	0.4638	-74.4059	209.4603		52	-82.5805	13.3502	-17.4568	-72.9016	13.3456	-17.4568
60	0.4638	-74.4059	209.4603	-53.4793	-74.4023	209.4603		53	-72.9016	13.3456	-17.4568	-63.2235	13.3395	-17.4568
								54	-63.2235	13.3395	-17.4568	-53.5544	13.3324	-17.4568
								55	-53.5544	13.3324	-17.4568	-43.8869	13.3348	-17.4568
								56	-43.8869	13.3348	-17.4568	-34.2141	13.3369	-17.4568
								57	-34.2141	13.3369	-17.4568	-24.5456	13.3342	-17.4567
ENVOL. MIN. TORSORES TREN TREN SW/0, EC-1 en via 2														
	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2							

ENVOL. MIN. TORSORES TREN TREN SW/0, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

58	-24.5456	13.3342	-17.4567	-14.8785	13.3346	-17.4567
59	-14.8785	13.3346	-17.4567	-5.2106	13.3350	-17.4567
60	-5.2106	13.3350	-17.4567	4.4575	13.3349	-17.4567

ENVOL. MAX. FLECTORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	58.6871	64.7793	-199.1049	108.2821	81.2803	-162.5462
2	108.2821	81.2803	-162.5462	160.7166	66.7891	-129.8959
3	160.7166	66.7891	-129.8959	206.5186	51.7910	-99.1459
4	206.5186	51.7910	-99.1459	244.0679	51.7845	-99.1461
5	244.0679	51.7845	-99.1461	272.2422	36.7789	-68.3961
6	272.2422	36.7789	-68.3961	293.6657	21.7917	-37.6461
7	293.6657	21.7917	-37.6461	308.3441	6.7829	-6.8962
8	308.3441	6.7829	-6.8962	313.2617	6.7643	-6.8963
9	313.2617	6.7643	-6.8963	310.3060	-8.2199	23.8536
10	310.3060	-8.2199	23.8536	300.6039	-23.2272	54.6036
11	300.6039	-23.2272	54.6036	283.7565	-23.2460	54.6035
12	283.7565	-23.2460	54.6035	256.3979	-38.2423	85.3533
13	256.3979	-38.2423	85.3533	222.3055	-53.2468	116.1033
14	222.3055	-53.2468	116.1033	181.4594	-68.2546	146.8531
15	181.4594	-68.2546	146.8531	131.9742	-68.2481	146.8531
16	131.9742	-68.2481	146.8531	73.4960	-83.2464	177.6031
17	73.4960	-83.2464	177.6031	8.2582	-98.2615	208.3532
18	8.2582	-98.2615	208.3532	-1.3046	-0.6669	1.8008
19	-1.3046	-0.6669	1.8008	-1.7880	-0.6668	1.8008
20	-1.7880	-0.6668	1.8008	-2.0259	-0.2728	0.8390
21	-2.0259	-0.2728	0.8390	-1.6653	0.1212	-0.1227
22	-1.6653	0.1212	-0.1227	-1.5501	0.1212	-0.1227
23	-1.5501	0.1212	-0.1227	28.4235	93.1802	-170.2751
24	28.4235	93.1802	-170.2751	112.4446	78.1855	-139.5250
25	112.4446	78.1855	-139.5250	182.9691	63.1849	-108.7748
26	182.9691	63.1849	-108.7748	241.0948	49.4431	-75.5033
27	241.0948	49.4431	-75.5033	285.8140	34.4366	-44.7533
28	285.8140	34.4366	-44.7533	317.6456	20.8369	-12.0985
29	317.6456	20.8369	-12.0985	336.7041	5.8582	18.6515
30	336.7041	5.8582	18.6515	342.7617	-7.7348	50.6501
31	342.7617	-7.7348	50.6501	335.4092	-7.7236	50.6501
32	335.4092	-7.7236	50.6501	314.5850	-22.7123	81.4000
33	314.5850	-22.7123	81.4000	281.3865	-36.4394	112.6964
34	281.3865	-36.4394	112.6964	234.7542	-51.4347	143.4464
35	234.7542	-51.4347	143.4464	174.6391	-66.4393	174.1964
36	174.6391	-66.4393	174.1964	101.0063	-81.4549	204.9464
37	101.0063	-81.4549	204.9464	15.6028	11.1707	-9.3956
38	15.6028	11.1707	-9.3956	26.2142	11.1695	-9.3956
39	26.2142	11.1695	-9.3956	36.8265	11.1705	-9.3956
40	36.8265	11.1705	-9.3956	45.5501	4.0290	-1.9970
41	45.5501	4.0290	-1.9970	41.4041	-3.1127	5.4017
42	41.4041	-3.1127	5.4017	39.1479	-3.1128	5.4018
43	39.1479	-3.1128	5.4018	36.8911	-3.1128	5.4018
44	36.8911	-3.1128	5.4018	34.6348	-3.1120	5.4018
45	34.6348	-3.1120	5.4018	74.2181	62.5978	-66.7048
46	74.2181	62.5978	-66.7048	119.6037	62.6079	-66.7047
47	119.6037	62.6079	-66.7047	156.3727	47.6210	-35.9545
48	156.3727	47.6210	-35.9545	186.4018	32.6477	-5.2045
49	186.4018	32.6477	-5.2045	209.7018	17.6481	25.5456

50	209.7018	17.6481	25.5456	222.4765	17.6556	25.5456
51	222.4765	17.6556	25.5456	228.1602	2.6675	56.2958
52	228.1602	2.6675	56.2958	227.0835	-12.3371	87.0461
53	227.0835	-12.3371	87.0461	218.1436	-12.3337	87.0462
54	218.1436	-12.3337	87.0462	199.4597	-27.3282	117.7964
55	199.4597	-27.3282	117.7964	174.0342	-42.3111	148.5465
56	174.0342	-42.3111	148.5465	141.8627	-57.3103	179.2964
57	141.8627	-57.3103	179.2964	102.2204	-54.4037	177.8444
58	102.2204	-54.4037	177.8444	54.5284	-69.4034	208.5945
59	54.5284	-69.4034	208.5945	0.8687	-3.1007	5.4018
60	0.8687	-3.1007	5.4018	5.2615	16.6173	-20.6064

ENVOL. MIN. FLECTORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	7.3914	-0.6665	1.8008	6.9083	-0.6664	1.8008
2	6.9083	-0.6664	1.8008	6.4253	-0.6660	1.8008
3	6.4253	-0.6660	1.8008	5.9426	-0.6661	1.8008
4	5.9426	-0.6661	1.8008	5.4595	-0.6662	1.8008
5	5.4595	-0.6662	1.8008	-2.7401	-14.2838	-71.8235
6	-2.7401	-14.2838	-71.8235	-13.0974	-14.2855	-71.8236
7	-13.0974	-14.2855	-71.8236	-24.7109	-21.1744	-55.6791
8	-24.7109	-21.1744	-55.6791	-40.0607	-21.1758	-55.6792
9	-40.0607	-21.1758	-55.6792	-55.4177	-21.1769	-55.6792
10	-55.4177	-21.1769	-55.6792	-73.8959	-28.2716	-38.0658
11	-73.8959	-28.2716	-38.0658	-94.3907	-28.2716	-38.0658
12	-94.3907	-28.2716	-38.0658	-116.0960	-35.6590	-19.1190
13	-116.0960	-35.6590	-19.1190	-141.9453	-35.6626	-19.1192
14	-141.9453	-35.6626	-19.1192	-168.6097	-43.3865	1.0287
15	-168.6097	-43.3865	1.0287	-200.0638	-43.3827	1.0287
16	-200.0638	-43.3827	1.0287	-233.7485	-51.5480	22.2485
17	-233.7485	-51.5480	22.2485	-271.1210	-51.5472	22.2485
18	-271.1210	-51.5472	22.2485	-316.6459	-124.7509	165.4834
19	-316.6459	-124.7509	165.4834	-407.0905	-124.7504	165.4834
20	-407.0905	-124.7504	165.4834	-448.7980	-0.8521	-17.2479
21	-448.7980	-0.8521	-17.2479	-263.3462	126.5750	-212.5150
22	-263.3462	126.5750	-212.5150	-184.3669	59.5017	-144.3685
23	-184.3669	59.5017	-144.3685	-132.9935	11.1753	-9.3956
24	-132.9935	11.1753	-9.3956	-122.3752	11.1742	-9.3956
25	-122.3752	11.1742	-9.3956	-111.7607	11.1765	-9.3956
26	-111.7607	11.1765	-9.3956	-101.1400	11.1779	-9.3956
27	-101.1400	11.1779	-9.3956	-90.5215	11.1733	-9.3956
28	-90.5215	11.1733	-9.3956	-79.9062	11.1712	-9.3956
29	-79.9062	11.1712	-9.3956	-69.2917	11.1749	-9.3956
30	-69.2917	11.1749	-9.3956	-58.6740	11.1735	-9.3956
31	-58.6740	11.1735	-9.3956	-48.0834	11.1257	-8.5818
32	-48.0834	11.1257	-8.5818	-37.5168	11.1231	-8.5818
33	-37.5168	11.1231	-8.5818	-26.9508	11.1214	-8.5818
34	-26.9508	11.1214	-8.5818	-16.3836	11.1213	-8.5818
35	-16.3836	11.1213	-8.5818	-5.8991	10.5965	-6.3702
36	-5.8991	10.5965	-6.3702	-29.7913	-59.6461	93.6577
37	-29.7913	-59.6461	93.6577	-109.9361	-94.5148	175.4517
38	-109.9361	-94.5148	175.4517	-210.0034	-112.7830	217.5469
39	-210.0034	-112.7830	217.5469	-325.4160	-130.2957	258.4684
40	-325.4160	-130.2957	258.4684	-396.5674	-13.0298	53.7113
41	-396.5674	-13.0298	53.7113	-253.6275	99.2834	-145.2254
42	-253.6275	99.2834	-145.2254	-215.1576	16.9166	-20.0210

43	-215.1576	16.9166	-20.0210	-202.8918	16.9114	-20.0210
44	-202.8918	16.9114	-20.0210	-190.6310	16.9074	-20.0211
45	-190.6310	16.9074	-20.0211	-178.3734	16.9175	-20.0211
46	-178.3734	16.9175	-20.0211	-166.1042	16.9105	-20.0211
47	-166.1042	16.9105	-20.0211	-153.8511	16.8934	-20.0211
48	-153.8511	16.8934	-20.0211	-141.6074	16.8830	-20.0211
49	-141.6074	16.8830	-20.0211	-129.3644	16.8741	-20.0211
50	-129.3644	16.8741	-20.0211	-117.1235	16.8740	-20.0211
51	-117.1235	16.8740	-20.0211	-104.8881	16.8639	-20.0211
52	-104.8881	16.8639	-20.0211	-92.6581	16.8595	-20.0211
53	-92.6581	16.8595	-20.0211	-80.4277	16.8672	-20.0211
54	-80.4277	16.8672	-20.0211	-68.2025	16.8636	-20.0211
55	-68.2025	16.8636	-20.0211	-55.9848	16.8546	-20.0211
56	-55.9848	16.8546	-20.0211	-43.7621	16.8498	-20.0211
57	-43.7621	16.8498	-20.0211	-31.5438	16.8474	-20.0211
58	-31.5438	16.8474	-20.0211	-19.4353	16.4668	-17.4006
59	-19.4353	16.4668	-17.4006	-11.1634	-4.5577	56.6650
60	-11.1634	-4.5577	56.6650	-69.3297	-87.2980	240.7960
ENVOL. MAX. CORTANTES TREN TREN SW/2, EC-1 en via 2						

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	48.8671	81.7891	-160.6460	108.1678	81.7883	-160.6460
2	108.1678	81.7883	-160.6460	160.7166	66.7891	-129.8959
3	160.7166	66.7891	-129.8959	206.5186	51.7910	-99.1459
4	206.5186	51.7910	-99.1459	244.0679	51.7845	-99.1461
5	244.0679	51.7845	-99.1461	271.6735	36.7790	-66.4760
6	271.6735	36.7790	-66.4760	293.6657	21.7917	-37.6461
7	293.6657	21.7917	-37.6461	307.7376	6.7896	-4.9760
8	307.7376	6.7896	-4.9760	312.6451	6.7794	-4.9760
9	312.6451	6.7794	-4.9760	3.0450	-0.6666	1.8008
10	3.0450	-0.6666	1.8008	2.5617	-0.6664	1.8008
11	2.5617	-0.6664	1.8008	2.0787	-0.6662	1.8008
12	2.0787	-0.6662	1.8008	1.5954	-0.6664	1.8008
13	1.5954	-0.6664	1.8008	1.1121	-0.6665	1.8008
14	1.1121	-0.6665	1.8008	0.6289	-0.6668	1.8008
15	0.6289	-0.6668	1.8008	0.1456	-0.6667	1.8008
16	0.1456	-0.6667	1.8008	-0.3378	-0.6666	1.8008
17	-0.3378	-0.6666	1.8008	-0.8211	-0.6667	1.8008
18	-0.8211	-0.6667	1.8008	-1.3046	-0.6669	1.8008
19	-1.3046	-0.6669	1.8008	-1.7880	-0.6668	1.8008
20	-1.7880	-0.6668	1.8008	-360.8833	38.1111	-114.5663
21	-360.8833	38.1111	-114.5663	-246.1960	130.0125	-223.6431
22	-246.1960	130.0125	-223.6431	-128.6806	115.0103	-192.8929
23	-128.6806	115.0103	-192.8929	-24.6754	100.0107	-162.1429
24	-24.6754	100.0107	-162.1429	65.8315	85.0142	-131.3929
25	65.8315	85.0142	-131.3929	18.7594	70.4783	-162.7982
26	18.7594	70.4783	-162.7982	41.7292	59.5025	-144.3683
27	41.7292	59.5025	-144.3683	54.6170	49.2331	-126.7197
28	54.6170	49.2331	-126.7197	59.3443	39.6509	-108.9810
29	59.3443	39.6509	-108.9810	56.3476	30.3540	-90.8422
30	56.3476	30.3540	-90.8422	85.1842	15.3533	-60.0920
31	85.1842	15.3533	-60.0920	99.7691	15.3552	-60.0919
32	99.7691	15.3552	-60.0919	-37.4548	11.1718	-9.3956
33	-37.4548	11.1718	-9.3956	-26.8416	11.1711	-9.3956
34	-26.8416	11.1711	-9.3956	-16.2338	11.1693	-9.3956
35	-16.2338	11.1693	-9.3956	-5.6216	11.1702	-9.3956
36	-5.6216	11.1702	-9.3956	4.9889	11.1711	-9.3956

37	4.9889	11.1711	-9.3956	15.6028	11.1707	-9.3956
38	15.6028	11.1707	-9.3956	26.2142	11.1695	-9.3956
39	26.2142	11.1695	-9.3956	36.8265	11.1705	-9.3956
40	36.8265	11.1705	-9.3956	45.5501	4.0290	-1.9970
41	45.5501	4.0290	-1.9970	-232.5793	110.9630	-159.6169
42	-232.5793	110.9630	-159.6169	-152.1273	110.9605	-159.6169
43	-152.1273	110.9605	-159.6169	-81.8105	95.9604	-128.8669
44	-81.8105	95.9604	-128.8669	-18.2322	80.9677	-98.1167
45	-18.2322	80.9677	-98.1167	38.5922	65.9636	-67.3666
46	38.5922	65.9636	-67.3666	86.4202	65.9560	-67.3665
47	86.4202	65.9560	-67.3665	125.6217	50.9627	-36.6165
48	125.6217	50.9627	-36.6165	158.0942	35.9751	-5.8664
49	158.0942	35.9751	-5.8664	183.8134	20.9876	24.8838
50	183.8134	20.9876	24.8838	199.0399	21.0011	24.8839
51	199.0399	21.0011	24.8839	-104.8881	16.8639	-20.0211
52	-104.8881	16.8639	-20.0211	-92.6581	16.8595	-20.0211
53	-92.6581	16.8595	-20.0211	-80.4277	16.8672	-20.0211
54	-80.4277	16.8672	-20.0211	-68.2025	16.8636	-20.0211
55	-68.2025	16.8636	-20.0211	-55.9848	16.8546	-20.0211
56	-55.9848	16.8546	-20.0211	-43.7621	16.8498	-20.0211
57	-43.7621	16.8498	-20.0211	-31.5438	16.8474	-20.0211
58	-31.5438	16.8474	-20.0211	-19.3252	16.8484	-20.0210
59	-19.3252	16.8484	-20.0210	-7.1072	16.8518	-20.0210
60	-7.1072	16.8518	-20.0210	5.1120	16.8525	-20.0210

ENVOL. MIN. CORTANTES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	29.9013	-7.5216	-86.3637	24.4480	-7.5217	-86.3637
2	24.4480	-7.5217	-86.3637	28.3275	-14.2839	-71.8234
3	28.3275	-14.2839	-71.8234	36.7063	-21.1773	-55.6790
4	36.7063	-21.1773	-55.6790	21.3525	-21.1768	-55.6791
5	21.3525	-21.1768	-55.6791	28.6127	-28.2790	-38.0657
6	28.6127	-28.2790	-38.0657	39.0135	-35.6618	-19.1188
7	39.0135	-35.6618	-19.1188	51.6112	-43.3954	1.0292
8	51.6112	-43.3954	1.0292	20.1488	-43.3937	1.0290
9	20.1488	-43.3937	1.0290	27.8814	-51.5548	22.2488
10	27.8814	-51.5548	22.2488	34.9958	-60.2054	44.4111
11	34.9958	-60.2054	44.4111	-8.6514	-60.2043	44.4111
12	-8.6514	-60.2043	44.4111	-10.5131	-69.4005	68.2589
13	-10.5131	-69.4005	68.2589	-16.8511	-79.1898	94.3705
14	-16.8511	-79.1898	94.3705	-29.2447	-89.6017	122.4162
15	-29.2447	-89.6017	122.4162	-94.2101	-89.6064	122.4162
16	-94.2101	-89.6064	122.4162	-129.6049	-101.0178	134.3613
17	-129.6049	-101.0178	134.3613	-207.7187	-116.0218	165.1113
18	-207.7187	-116.0218	165.1113	-292.5891	-131.0251	195.8613
19	-292.5891	-131.0251	195.8613	-387.5802	-131.0240	195.8613
20	-387.5802	-131.0240	195.8613	-199.9282	-58.5668	130.6357
21	-199.9282	-58.5668	130.6357	-1.6653	0.1212	-0.1227
22	-1.6653	0.1212	-0.1227	-1.5501	0.1212	-0.1227
23	-1.5501	0.1212	-0.1227	-1.4350	0.1212	-0.1227
24	-1.4350	0.1212	-0.1227	-1.3199	0.1212	-0.1227
25	-1.3199	0.1212	-0.1227	-1.2047	0.1212	-0.1227
26	-1.2047	0.1212	-0.1227	15.4067	-1.9344	34.3810
27	15.4067	-1.9344	34.3810	54.7478	-6.8763	48.0032
28	54.7478	-6.8763	48.0032	92.4513	-12.7285	63.2928

29	92.4513	-12.7285	63.2928	126.4892	-19.5153	80.1828
30	126.4892	-19.5153	80.1828	154.7365	-27.2523	98.6060
31	154.7365	-27.2523	98.6060	128.8486	-27.2440	98.6060
32	128.8486	-27.2440	98.6060	140.9294	-35.9168	118.4955
33	140.9294	-35.9168	118.4955	142.3484	-45.6504	139.9066
34	142.3484	-45.6504	139.9066	168.1434	-58.5566	126.2070
35	168.1434	-58.5566	126.2070	101.2614	-73.5632	156.9568
36	101.2614	-73.5632	156.9568	20.8724	-88.5674	187.7068
37	20.8724	-88.5674	187.7068	-73.0174	-103.5658	218.4570
38	-73.0174	-103.5658	218.4570	-180.4091	-118.5640	249.2070
39	-180.4091	-118.5640	249.2070	-301.2962	-133.5649	279.9570
40	-301.2962	-133.5649	279.9570	-284.1084	-62.2688	153.9628
41	-284.1084	-62.2688	153.9628	41.4041	-3.1127	5.4017
42	41.4041	-3.1127	5.4017	39.1479	-3.1128	5.4018
43	39.1479	-3.1128	5.4018	36.8911	-3.1128	5.4018
44	36.8911	-3.1128	5.4018	34.6348	-3.1120	5.4018
45	34.6348	-3.1120	5.4018	32.3788	-3.1119	5.4018
46	32.3788	-3.1119	5.4018	30.1226	-3.1115	5.4018
47	30.1226	-3.1115	5.4018	27.8674	-3.1093	5.4018
48	27.8674	-3.1093	5.4018	25.6152	-3.1070	5.4018
49	25.6152	-3.1070	5.4018	21.8827	-4.5588	56.6645
50	21.8827	-4.5588	56.6645	18.5775	-4.5583	56.6646
51	18.5775	-4.5583	56.6646	58.3308	-11.9855	77.7015
52	58.3308	-11.9855	77.7015	94.2331	-20.6844	100.7754
53	94.2331	-20.6844	100.7754	79.2359	-20.6766	100.7756
54	79.2359	-20.6766	100.7756	101.5011	-30.7168	125.7055
55	101.5011	-30.7168	125.7055	174.0342	-42.3111	148.5465
56	174.0342	-42.3111	148.5465	141.8627	-57.3103	179.2964
57	141.8627	-57.3103	179.2964	100.3051	-57.3045	179.2966
58	100.3051	-57.3045	179.2966	50.5147	-72.3005	210.0467
59	50.5147	-72.3005	210.0467	-6.0361	-87.3042	240.7963
60	-6.0361	-87.3042	240.7963	-69.3297	-87.2980	240.7960

ENVOL. MAX. TORSORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	7.3914	-0.6665	1.8008	6.9083	-0.6664	1.8008
2	6.9083	-0.6664	1.8008	25.2281	-2.5697	6.8444
3	25.2281	-2.5697	6.8444	52.3377	-5.7085	14.8897
4	52.3377	-5.7085	14.8897	48.1997	-5.7073	14.8896
5	48.1997	-5.7073	14.8896	78.3476	-10.0679	25.6919
6	78.3476	-10.0679	25.6919	111.2897	-15.6334	39.0184
7	111.2897	-15.6334	39.0184	144.5889	-22.3754	54.6503
8	144.5889	-22.3754	54.6503	128.3665	-22.3783	54.6502
9	128.3665	-22.3783	54.6502	153.9879	-30.2790	72.3826
10	153.9879	-30.2790	72.3826	174.6691	-39.2682	92.0242
11	174.6691	-39.2682	92.0242	146.1971	-39.2755	92.0242
12	146.1971	-39.2755	92.0242	152.6590	-49.3353	113.3979
13	152.6590	-49.3353	113.3979	149.7054	-60.3836	136.3406
14	149.7054	-60.3836	136.3406	135.8301	-72.3839	160.7028
15	135.8301	-72.3839	160.7028	83.3497	-72.3960	160.7028
16	83.3497	-72.3960	160.7028	47.9665	-85.2595	186.3495
17	47.9665	-85.2595	186.3495	-1.1226	-98.9271	213.1588
18	-1.1226	-98.9271	213.1588	-64.5101	-113.2893	241.0233
19	-64.5101	-113.2893	241.0233	-146.6448	-113.2873	241.0234
20	-146.6448	-113.2873	241.0234	-199.9282	-58.5668	130.6357
21	-199.9282	-58.5668	130.6357	-1.6653	0.1212	-0.1227
22	-1.6653	0.1212	-0.1227	-1.5501	0.1212	-0.1227

23	-1.5501	0.1212	-0.1227	-94.4116	7.7951	4.1899
24	-94.4116	7.7951	4.1899	-60.7696	5.3519	12.4072
25	-60.7696	5.3519	12.4072	-23.6710	2.1273	22.4933
26	-23.6710	2.1273	22.4933	15.4067	-1.9344	34.3810
27	15.4067	-1.9344	34.3810	54.7478	-6.8763	48.0032
28	54.7478	-6.8763	48.0032	92.4513	-12.7285	63.2928
29	92.4513	-12.7285	63.2928	126.4892	-19.5153	80.1828
30	126.4892	-19.5153	80.1828	154.7365	-27.2523	98.6060
31	154.7365	-27.2523	98.6060	128.8486	-27.2440	98.6060
32	128.8486	-27.2440	98.6060	140.9294	-35.9168	118.4955
33	140.9294	-35.9168	118.4955	142.3484	-45.6504	139.9066
34	142.3484	-45.6504	139.9066	130.8192	-56.4898	162.8418
35	130.8192	-56.4898	162.8418	103.8990	-68.4059	187.2352
36	103.8990	-68.4059	187.2352	59.3144	-81.3545	213.0113
37	59.3144	-81.3545	213.0113	-4.9173	-95.2285	240.0842
38	-4.9173	-95.2285	240.0842	-90.3761	-109.9709	268.3571
39	-90.3761	-109.9709	268.3571	-198.2057	-125.4610	297.7236
40	-198.2057	-125.4610	297.7236	-284.1084	-62.2688	153.9628
41	-284.1084	-62.2688	153.9628	41.2110	-3.0986	5.4034
42	41.2110	-3.0986	5.4034	38.9648	-3.0986	5.4034
43	38.9648	-3.0986	5.4034	36.7179	-3.0981	5.4034
44	36.7179	-3.0981	5.4034	34.4720	-3.0977	5.4034
45	34.4720	-3.0977	5.4034	-116.5856	10.5636	7.6747
46	-116.5856	10.5636	7.6747	-108.9223	10.5624	7.6747
47	-108.9223	10.5624	7.6747	-68.0323	6.6476	21.4929
48	-68.0323	6.6476	21.4929	-23.8424	1.6344	37.8654
49	-23.8424	1.6344	37.8654	21.8827	-4.5588	56.6645
50	21.8827	-4.5588	56.6645	18.5775	-4.5583	56.6646
51	18.5775	-4.5583	56.6646	58.3308	-11.9855	77.7015
52	58.3308	-11.9855	77.7015	94.2331	-20.6844	100.7754
53	94.2331	-20.6844	100.7754	79.2359	-20.6766	100.7756
54	79.2359	-20.6766	100.7756	101.5011	-30.7168	125.7055
55	101.5011	-30.7168	125.7055	113.7153	-42.0972	152.2819
56	113.7153	-42.0972	152.2819	113.0253	-54.8541	180.2649
57	113.0253	-54.8541	180.2649	73.2578	-54.8482	180.2650
58	73.2578	-54.8482	180.2650	50.5147	-72.3005	210.0467
59	50.5147	-72.3005	210.0467	-6.0361	-87.3042	240.7963
60	-6.0361	-87.3042	240.7963	-69.3297	-87.2980	240.7960

ENVOL. MIN. TORSORES TREN TREN SW/2, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	52.0572	63.9995	-203.8877	98.4588	63.9990	-203.8876
2	98.4588	63.9990	-203.8876	118.1467	49.6509	-180.7682
3	118.1467	49.6509	-180.7682	120.8158	36.7361	-160.2298
4	120.8158	36.7361	-160.2298	147.4495	36.7393	-160.2299
5	147.4495	36.7393	-160.2299	127.8326	25.2593	-142.0157
6	127.8326	25.2593	-142.0157	98.2773	15.2028	-125.8940
7	98.2773	15.2028	-125.8940	61.6507	6.5282	-111.6592
8	61.6507	6.5282	-111.6592	66.3845	6.5281	-111.6593
9	66.3845	6.5281	-111.6593	20.0758	-0.8023	-99.1338
10	20.0758	-0.8023	-99.1338	-24.6300	-7.5178	-86.3638
11	-24.6300	-7.5178	-86.3638	-30.0791	-7.5197	-86.3638
12	-30.0791	-7.5197	-86.3638	-75.2173	-14.2748	-71.8237
13	-75.2173	-14.2748	-71.8237	-116.8132	-21.1742	-55.6795
14	-116.8132	-21.1742	-55.6795	-155.8815	-28.2657	-38.0660

15	-155.8815	-28.2657	-38.0660	-176.3732	-28.2629	-38.0660
16	-176.3732	-28.2629	-38.0660	-219.4859	-35.6510	-19.1192
17	-219.4859	-35.6510	-19.1192	-262.9738	-43.3818	1.0287
18	-262.9738	-43.3818	1.0287	-1.3046	-0.6669	1.8008
19	-1.3046	-0.6669	1.8008	-1.7880	-0.6668	1.8008
20	-1.7880	-0.6668	1.8008	-360.8833	38.1111	-114.5663
21	-360.8833	38.1111	-114.5663	-216.4613	121.8531	-248.2545
22	-216.4613	121.8531	-248.2545	-132.2025	107.9193	-224.7325
23	-132.2025	107.9193	-224.7325	-66.1213	94.6944	-202.7816
24	-66.1213	94.6944	-202.7816	-16.4722	82.2073	-182.2031
25	-16.4722	82.2073	-182.2031	18.7594	70.4783	-162.7982
26	18.7594	70.4783	-162.7982	41.7292	59.5025	-144.3683
27	41.7292	59.5025	-144.3683	54.6170	49.2331	-126.7197
28	54.6170	49.2331	-126.7197	59.3443	39.6509	-108.9810
29	59.3443	39.6509	-108.9810	56.3476	30.3540	-90.8422
30	56.3476	30.3540	-90.8422	85.1842	15.3533	-60.0920
31	85.1842	15.3533	-60.0920	99.7691	15.3552	-60.0919
32	99.7691	15.3552	-60.0919	100.8570	0.3584	-29.3421
33	100.8570	0.3584	-29.3421	-25.8345	10.8100	-9.6176
34	-25.8345	10.8100	-9.6176	-15.5627	10.8097	-9.6176
35	-15.5627	10.8097	-9.6176	-5.2927	10.8096	-9.6176
36	-5.2927	10.8096	-9.6176	4.9788	10.8121	-9.6176
37	4.9788	10.8121	-9.6176	15.2516	10.8130	-9.6176
38	15.2516	10.8130	-9.6176	25.5241	10.8125	-9.6176
39	25.5241	10.8125	-9.6176	35.7962	10.8125	-9.6176
40	35.7962	10.8125	-9.6176	41.4743	3.6553	-2.2443
41	41.4743	3.6553	-2.2443	-202.4032	108.7325	-160.6203
42	-202.4032	108.7325	-160.6203	-123.5695	108.7326	-160.6203
43	-123.5695	108.7326	-160.6203	-54.8658	93.7354	-129.8701
44	-54.8658	93.7354	-129.8701	7.0924	78.7474	-99.1201
45	7.0924	78.7474	-99.1201	62.3090	63.7413	-68.3699
46	62.3090	63.7413	-68.3699	108.5154	63.7387	-68.3699
47	108.5154	63.7387	-68.3699	146.1115	48.7441	-37.6197
48	146.1115	48.7441	-37.6197	-139.4094	16.6551	-20.6065
49	-139.4094	16.6551	-20.6065	-127.3379	16.6536	-20.6065
50	-127.3379	16.6536	-20.6065	-115.2667	16.6467	-20.6065
51	-115.2667	16.6467	-20.6065	-103.2063	16.6420	-20.6065
52	-103.2063	16.6420	-20.6065	-91.1400	16.6390	-20.6065
53	-91.1400	16.6390	-20.6065	-79.0835	16.6329	-20.6065
54	-79.0835	16.6329	-20.6065	-67.0325	16.6338	-20.6065
55	-67.0325	16.6338	-20.6065	-54.9781	16.6245	-20.6065
56	-54.9781	16.6245	-20.6065	-42.9331	16.6199	-20.6065
57	-42.9331	16.6199	-20.6065	-30.8810	16.6182	-20.6065
58	-30.8810	16.6182	-20.6065	-18.8345	16.6124	-20.6064
59	-18.8345	16.6124	-20.6064	-6.7867	16.6159	-20.6064
60	-6.7867	16.6159	-20.6064	5.2615	16.6173	-20.6064

ENVOL. MAX. FLECTORES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	5.1520	4.9068	-17.6158	9.0236	6.7732	-13.5455
2	9.0236	6.7732	-13.5455	13.3930	5.5659	-10.8246
3	13.3930	5.5659	-10.8246	17.2099	4.3160	-8.2621
4	17.2099	4.3160	-8.2621	20.3389	4.3159	-8.2622
5	20.3389	4.3159	-8.2622	22.6868	3.0659	-5.6997
6	22.6868	3.0659	-5.6997	24.4723	1.8163	-3.1372
7	24.4723	1.8163	-3.1372	25.6951	0.5664	-0.5747
8	25.6951	0.5664	-0.5747	26.1052	0.5642	-0.5747

9	26.1052	0.5642	-0.5747	25.8588	-0.6850	1.9878
10	25.8588	-0.6850	1.9878	25.0507	-1.9362	4.5503
11	25.0507	-1.9362	4.5503	23.6463	-1.9397	4.5503
12	23.6463	-1.9397	4.5503	21.3665	-3.1892	7.1128
13	21.3665	-3.1892	7.1128	18.5250	-4.4370	9.6753
14	18.5250	-4.4370	9.6753	15.1217	-5.6864	12.2378
15	15.1217	-5.6864	12.2378	10.9982	-5.6880	12.2378
16	10.9982	-5.6880	12.2378	6.1244	-6.9382	14.8003
17	6.1244	-6.9382	14.8003	0.6881	-8.1884	17.3628
18	0.6881	-8.1884	17.3628	-0.1087	-0.0556	0.1501
19	-0.1087	-0.0556	0.1501	-0.1490	-0.0556	0.1501
20	-0.1490	-0.0556	0.1501	-0.1689	-0.0227	0.0699
21	-0.1689	-0.0227	0.0699	-0.1388	0.0101	-0.0102
22	-0.1388	0.0101	-0.0102	-0.1292	0.0101	-0.0102
23	-0.1292	0.0101	-0.0102	-0.1196	0.0101	-0.0102
24	-0.1196	0.0101	-0.0102	2.8528	6.3526	-13.5321
25	2.8528	6.3526	-13.5321	9.0234	6.1833	-9.0126
26	9.0234	6.1833	-9.0126	14.6474	4.9332	-6.4500
27	14.6474	4.9332	-6.4500	19.1457	3.6831	-3.8875
28	19.1457	3.6831	-3.8875	22.5195	2.4338	-1.3251
29	22.5195	2.4338	-1.3251	24.7698	1.1841	1.2374
30	24.7698	1.1841	1.2374	25.8937	-0.0652	3.7999
31	25.8937	-0.0652	3.7999	25.8327	-0.0644	3.7999
32	25.8327	-0.0644	3.7999	24.6454	-1.3144	6.3624
33	24.6454	-1.3144	6.3624	22.3347	-2.5647	8.9249
34	22.3347	-2.5647	8.9249	18.8980	-3.8152	11.4874
35	18.8980	-3.8152	11.4874	14.3361	-5.0647	14.0499
36	14.3361	-5.0647	14.0499	8.6499	-6.3152	16.6124
37	8.6499	-6.3152	16.6124	1.8370	-7.5655	19.1749
38	1.8370	-7.5655	19.1749	2.1845	0.9309	-0.7830
39	2.1845	0.9309	-0.7830	3.0689	0.9309	-0.7830
40	3.0689	0.9309	-0.7830	3.7959	0.3357	-0.1664
41	3.7959	0.3357	-0.1664	3.4504	-0.2594	0.4501
42	3.4504	-0.2594	0.4501	3.2623	-0.2595	0.4501
43	3.2623	-0.2595	0.4501	3.0742	-0.2595	0.4501
44	3.0742	-0.2595	0.4501	2.8862	-0.2594	0.4501
45	2.8862	-0.2594	0.4501	2.6982	-0.2593	0.4501
46	2.6982	-0.2593	0.4501	4.6698	5.8208	-6.1843
47	4.6698	5.8208	-6.1843	8.1712	4.5720	-3.6218
48	8.1712	4.5720	-3.6218	11.1111	3.3228	-1.0593
49	11.1111	3.3228	-1.0593	13.4883	2.0735	1.5032
50	13.4883	2.0735	1.5032	14.9916	2.0736	1.5032
51	14.9916	2.0736	1.5032	15.9004	0.8236	4.0657
52	15.9004	0.8236	4.0657	16.2479	-0.4261	6.6283
53	16.2479	-0.4261	6.6283	15.9390	-0.4259	6.6283
54	15.9390	-0.4259	6.6283	14.8186	-1.6748	9.1908
55	14.8186	-1.6748	9.1908	13.1361	-2.9239	11.7533
56	13.1361	-2.9239	11.7533	10.8908	-4.1732	14.3158
57	10.8908	-4.1732	14.3158	7.8649	-4.1736	14.3158
58	7.8649	-4.1736	14.3158	4.1511	-5.4243	16.8783
59	4.1511	-5.4243	16.8783	0.0724	-0.2584	0.4501
60	0.0724	-0.2584	0.4501	0.3951	1.2426	-1.5477

ENVOL. MIN. FLECTORES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						

1	0.6159	-0.0555	0.1501	0.5757	-0.0555	0.1501	60	-0.9086	-1.0821	6.6310	-5.5781	-6.7261	19.2845
2	0.5757	-0.0555	0.1501	0.5354	-0.0555	0.1501	ENVOL. MAX. CORTANTES TREN TREN SIN CARGA, EC-1 en via 2						
3	0.5354	-0.0555	0.1501	0.4952	-0.0555	0.1501	Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
4	0.4952	-0.0555	0.1501	0.4550	-0.0555	0.1501	=====						
5	0.4550	-0.0555	0.1501	0.4147	-0.0555	0.1501	1	4.0723	6.8158	-13.3872	9.0140	6.8156	-13.3872
6	0.4147	-0.0555	0.1501	0.3745	-0.0555	0.1501	2	9.0140	6.8156	-13.3872	13.3930	5.5659	-10.8246
7	0.3745	-0.0555	0.1501	0.3342	-0.0555	0.1501	3	13.3930	5.5659	-10.8246	17.2099	4.3160	-8.2621
8	0.3342	-0.0555	0.1501	0.2940	-0.0555	0.1501	4	17.2099	4.3160	-8.2621	20.3389	4.3159	-8.2622
9	0.2940	-0.0555	0.1501	0.2537	-0.0555	0.1501	5	20.3389	4.3159	-8.2622	22.6868	3.0659	-5.6997
10	0.2537	-0.0555	0.1501	0.2135	-0.0555	0.1501	6	22.6868	3.0659	-5.6997	24.4723	1.8163	-3.1372
11	0.2135	-0.0555	0.1501	0.1732	-0.0556	0.1501	7	24.4723	1.8163	-3.1372	25.6951	0.5664	-0.5747
12	0.1732	-0.0556	0.1501	0.1329	-0.0556	0.1501	8	25.6951	0.5664	-0.5747	26.0532	0.5642	-0.4147
13	0.1329	-0.0556	0.1501	0.0927	-0.0555	0.1501	9	26.0532	0.5642	-0.4147	0.2537	-0.0555	0.1501
14	0.0927	-0.0555	0.1501	-3.1704	-7.5940	8.0091	10	0.2537	-0.0555	0.1501	0.2135	-0.0555	0.1501
15	-3.1704	-7.5940	8.0091	-8.6762	-7.5946	8.0091	11	0.2135	-0.0555	0.1501	0.1732	-0.0556	0.1501
16	-8.6762	-7.5946	8.0091	-14.9323	-8.8447	10.5716	12	0.1732	-0.0556	0.1501	0.1329	-0.0556	0.1501
17	-14.9323	-8.8447	10.5716	-21.7507	-10.0946	13.1341	13	0.1329	-0.0556	0.1501	0.0927	-0.0555	0.1501
18	-21.7507	-10.0946	13.1341	-29.1318	-11.3447	15.6966	14	0.0927	-0.0555	0.1501	0.0524	-0.0555	0.1501
19	-29.1318	-11.3447	15.6966	-37.3567	-11.3445	15.6966	15	0.0524	-0.0555	0.1501	0.0121	-0.0556	0.1501
20	-37.3567	-11.3445	15.6966	-41.0893	-0.0805	-1.7830	16	0.0121	-0.0556	0.1501	-0.0281	-0.0556	0.1501
21	-41.0893	-0.0805	-1.7830	-24.7229	11.1836	-19.2626	17	-0.0281	-0.0556	0.1501	-0.0684	-0.0556	0.1501
22	-24.7229	11.1836	-19.2626	-14.5984	9.9334	-16.7001	18	-0.0684	-0.0556	0.1501	-0.1087	-0.0556	0.1501
23	-14.5984	9.9334	-16.7001	-11.0828	0.9312	-0.7830	19	-0.1087	-0.0556	0.1501	-0.1490	-0.0556	0.1501
24	-11.0828	0.9312	-0.7830	-10.1979	0.9310	-0.7830	20	-0.1490	-0.0556	0.1501	-0.1689	-0.0227	0.0699
25	-10.1979	0.9310	-0.7830	-9.3134	0.9312	-0.7830	21	-0.1689	-0.0227	0.0699	-24.7229	11.1836	-19.2626
26	-9.3134	0.9312	-0.7830	-8.4284	0.9313	-0.7830	22	-24.7229	11.1836	-19.2626	-14.5984	9.9334	-16.7001
27	-8.4284	0.9313	-0.7830	-7.5437	0.9315	-0.7830	23	-14.5984	9.9334	-16.7001	-5.5996	8.6833	-14.1376
28	-7.5437	0.9315	-0.7830	-6.6586	0.9313	-0.7830	24	-5.5996	8.6833	-14.1376	2.2744	7.4335	-11.5751
29	-6.6586	0.9313	-0.7830	-5.7744	0.9310	-0.7830	25	2.2744	7.4335	-11.5751	9.0234	6.1833	-9.0126
30	-5.7744	0.9310	-0.7830	-4.8898	0.9311	-0.7830	26	9.0234	6.1833	-9.0126	14.6474	4.9332	-6.4500
31	-4.8898	0.9311	-0.7830	-4.0068	0.9272	-0.7152	27	14.6474	4.9332	-6.4500	19.1457	3.6831	-3.8875
32	-4.0068	0.9272	-0.7152	-3.1264	0.9267	-0.7152	28	19.1457	3.6831	-3.8875	22.5195	2.4338	-1.3251
33	-3.1264	0.9267	-0.7152	-2.2459	0.9267	-0.7152	29	22.5195	2.4338	-1.3251	24.7698	1.1841	1.2374
34	-2.2459	0.9267	-0.7152	-1.3653	0.9268	-0.7152	30	24.7698	1.1841	1.2374	-4.8898	0.9311	-0.7830
35	-1.3653	0.9268	-0.7152	-0.4917	0.8830	-0.5309	31	-4.8898	0.9311	-0.7830	-4.0052	0.9308	-0.7830
36	-0.4917	0.8830	-0.5309	-3.0949	-7.3960	14.6554	32	-4.0052	0.9308	-0.7830	-3.1212	0.9308	-0.7830
37	-3.0949	-7.3960	14.6554	-10.9343	-8.6465	17.2179	33	-3.1212	0.9308	-0.7830	-2.2369	0.9309	-0.7830
38	-10.9343	-8.6465	17.2179	-19.8985	-9.8966	19.7804	34	-2.2369	0.9309	-0.7830	-1.3528	0.9309	-0.7830
39	-19.8985	-9.8966	19.7804	-29.9876	-11.1466	22.3429	35	-1.3528	0.9309	-0.7830	-0.4685	0.9309	-0.7830
40	-29.9876	-11.1466	22.3429	-35.9245	-0.7884	4.2355	36	-0.4685	0.9309	-0.7830	0.4158	0.9309	-0.7830
41	-35.9245	-0.7884	4.2355	-23.0840	9.5698	-13.8719	37	0.4158	0.9309	-0.7830	1.3001	0.9309	-0.7830
42	-23.0840	9.5698	-13.8719	-16.3097	1.2827	-1.5327	38	1.3001	0.9309	-0.7830	2.1845	0.9309	-0.7830
43	-16.3097	1.2827	-1.5327	-15.3797	1.2826	-1.5327	39	2.1845	0.9309	-0.7830	3.0689	0.9309	-0.7830
44	-15.3797	1.2826	-1.5327	-14.4499	1.2820	-1.5327	40	3.0689	0.9309	-0.7830	3.7959	0.3357	-0.1664
45	-14.4499	1.2820	-1.5327	-13.5205	1.2820	-1.5327	41	3.7959	0.3357	-0.1664	-23.0840	9.5698	-13.8719
46	-13.5205	1.2820	-1.5327	-12.5907	1.2824	-1.5327	42	-23.0840	9.5698	-13.8719	-16.1459	9.5700	-13.8719
47	-12.5907	1.2824	-1.5327	-11.6614	1.2819	-1.5327	43	-16.1459	9.5700	-13.8719	-10.0514	8.3203	-11.3094
48	-11.6614	1.2819	-1.5327	-10.7331	1.2812	-1.5327	44	-10.0514	8.3203	-11.3094	-4.5194	7.0707	-8.7469
49	-10.7331	1.2812	-1.5327	-9.8046	1.2806	-1.5327	45	-4.5194	7.0707	-8.7469	0.4502	5.8207	-6.1843
50	-9.8046	1.2806	-1.5327	-8.8768	1.2803	-1.5327	46	0.4502	5.8207	-6.1843	4.6698	5.8208	-6.1843
51	-8.8768	1.2803	-1.5327	-7.9490	1.2801	-1.5327	47	4.6698	5.8208	-6.1843	8.1712	4.5720	-3.6218
52	-7.9490	1.2801	-1.5327	-7.0215	1.2797	-1.5327	48	8.1712	4.5720	-3.6218	11.1111	3.3228	-1.0593
53	-7.0215	1.2797	-1.5327	-6.0943	1.2793	-1.5327	49	11.1111	3.3228	-1.0593	13.4883	2.0735	1.5032
54	-6.0943	1.2793	-1.5327	-5.1698	1.2740	-1.4418	50	13.4883	2.0735	1.5032	14.9916	2.0736	1.5032
55	-5.1698	1.2740	-1.4418	-4.2470	1.2735	-1.4418	51	14.9916	2.0736	1.5032	-7.9490	1.2801	-1.5327
56	-4.2470	1.2735	-1.4418	-3.3236	1.2731	-1.4418	52	-7.9490	1.2801	-1.5327	-7.0215	1.2797	-1.5327
57	-3.3236	1.2731	-1.4418	-2.4008	1.2729	-1.4418	53	-7.0215	1.2797	-1.5327	-6.0943	1.2793	-1.5327
58	-2.4008	1.2729	-1.4418	-1.4778	1.2731	-1.4418							
59	-1.4778	1.2731	-1.4418	-0.9086	-1.0821	6.6310							

54	-6.0943	1.2793	-1.5327	-5.1674	1.2788	-1.5327
55	-5.1674	1.2788	-1.5327	-4.2410	1.2785	-1.5327
56	-4.2410	1.2785	-1.5327	-3.3142	1.2782	-1.5327
57	-3.3142	1.2782	-1.5327	-2.3879	1.2778	-1.5327
58	-2.3879	1.2778	-1.5327	-1.4616	1.2780	-1.5327
59	-1.4616	1.2780	-1.5327	-0.5350	1.2780	-1.5327
60	-0.5350	1.2780	-1.5327	0.3914	1.2777	-1.5327

ENVOL. MIN. CORTANTES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	0.6159	-0.0555	0.1501	0.5757	-0.0555	0.1501
2	0.5757	-0.0555	0.1501	2.1023	-0.2142	0.5704
3	2.1023	-0.2142	0.5704	4.3615	-0.4756	1.2408
4	4.3615	-0.4756	1.2408	4.0167	-0.4757	1.2408
5	4.0167	-0.4757	1.2408	6.5289	-0.8389	2.1410
6	6.5289	-0.8389	2.1410	9.2741	-1.3029	3.2515
7	9.2741	-1.3029	3.2515	12.0493	-1.8650	4.5542
8	12.0493	-1.8650	4.5542	10.6971	-1.8649	4.5542
9	10.6971	-1.8649	4.5542	14.4825	-2.5933	-2.2408
10	14.4825	-2.5933	-2.2408	12.2901	-3.8435	0.3216
11	12.2901	-3.8435	0.3216	9.5031	-3.8442	0.3216
12	9.5031	-3.8442	0.3216	5.8408	-5.0942	2.8841
13	5.8408	-5.0942	2.8841	1.6165	-6.3439	5.4466
14	1.6165	-6.3439	5.4466	-3.1704	-7.5940	8.0091
15	-3.1704	-7.5940	8.0091	-8.6762	-7.5946	8.0091
16	-8.6762	-7.5946	8.0091	-14.9323	-8.8447	10.5716
17	-14.9323	-8.8447	10.5716	-21.7507	-10.0946	13.1341
18	-21.7507	-10.0946	13.1341	-29.1318	-11.3447	15.6966
19	-29.1318	-11.3447	15.6966	-37.3567	-11.3445	15.6966
20	-37.3567	-11.3445	15.6966	-16.6607	-4.8808	10.8863
21	-16.6607	-4.8808	10.8863	-0.1388	-0.1388	0.0101
22	-0.1388	-0.0101	-0.0102	-0.1292	-0.0101	-0.0102
23	-0.1292	0.0101	-0.0102	-0.1196	0.0101	-0.0102
24	-0.1196	0.0101	-0.0102	-0.1100	0.0101	-0.0102
25	-0.1100	0.0101	-0.0102	-0.1004	0.0101	-0.0102
26	-0.1004	0.0101	-0.0102	1.2838	-0.1612	2.8651
27	1.2838	-0.1612	2.8651	4.5624	-0.5730	4.0003
28	4.5624	-0.5730	4.0003	7.7044	-1.0609	5.2744
29	7.7044	-1.0609	5.2744	10.5406	-1.6260	6.6819
30	10.5406	-1.6260	6.6819	12.8947	-2.2706	8.2172
31	12.8947	-2.2706	8.2172	10.7378	-2.2705	8.2172
32	10.7378	-2.2705	8.2172	11.7439	-2.9930	9.8746
33	11.7439	-2.9930	9.8746	11.8384	-3.7937	11.6486
34	11.8384	-3.7937	11.6486	9.2078	-4.8965	9.5304
35	9.2078	-4.8965	9.5304	3.6183	-6.1462	12.0929
36	3.6183	-6.1462	12.0929	-3.0949	-7.3960	14.6554
37	-3.0949	-7.3960	14.6554	-10.9343	-8.6465	17.2179
38	-10.9343	-8.6465	17.2179	-19.8985	-9.8966	19.7804
39	-19.8985	-9.8966	19.7804	-29.9876	-11.1466	22.3429
40	-29.9876	-11.1466	22.3429	-21.7363	-5.0188	12.7103
41	-21.7363	-5.0188	12.7103	3.4504	-0.2594	0.4501
42	3.4504	-0.2594	0.4501	3.2623	-0.2595	0.4501
43	3.2623	-0.2595	0.4501	3.0742	-0.2595	0.4501
44	3.0742	-0.2595	0.4501	2.8862	-0.2594	0.4501
45	2.8862	-0.2594	0.4501	2.6982	-0.2593	0.4501

46	2.6982	-0.2593	0.4501	2.5102	-0.2592	0.4501
47	2.5102	-0.2592	0.4501	2.3223	-0.2589	0.4501
48	2.3223	-0.2589	0.4501	2.1346	-0.2587	0.4501
49	2.1346	-0.2587	0.4501	2.7492	-0.5030	4.9409
50	2.7492	-0.5030	4.9409	2.3845	-0.5030	4.9409
51	2.3845	-0.5030	4.9409	5.3679	-1.0825	6.6309
52	5.3679	-1.0825	6.6309	8.0289	-1.7580	8.4765
53	8.0289	-1.7580	8.4765	6.7541	-1.7577	8.4765
54	6.7541	-1.7577	8.4765	8.3440	-2.5324	10.4618
55	8.3440	-2.5324	10.4618	9.1500	-3.4103	12.5696
56	9.1500	-3.4103	12.5696	8.9604	-4.3911	14.7818
57	8.9604	-4.3911	14.7818	5.7765	-4.3911	14.7818
58	5.7765	-4.3911	14.7818	3.5840	-5.4789	17.0790
59	3.5840	-5.4789	17.0790	-0.7017	-6.7264	19.2845
60	-0.7017	-6.7264	19.2845	-5.5781	-6.7261	19.2845

ENVOL. MAX. TORSORES TREN TREN SIN CARGA, EC-1 en via 2

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	0.6159	-0.0555	0.1501	0.5757	-0.0555	0.1501
2	0.5757	-0.0555	0.1501	2.1023	-0.2142	0.5704
3	2.1023	-0.2142	0.5704	4.3615	-0.4756	1.2408
4	4.3615	-0.4756	1.2408	4.0167	-0.4757	1.2408
5	4.0167	-0.4757	1.2408	6.5289	-0.8389	2.1410
6	6.5289	-0.8389	2.1410	9.2741	-1.3029	3.2515
7	9.2741	-1.3029	3.2515	12.0493	-1.8650	4.5542
8	12.0493	-1.8650	4.5542	10.6971	-1.8649	4.5542
9	10.6971	-1.8649	4.5542	12.8323	-2.5233	6.0319
10	12.8323	-2.5233	6.0319	14.5562	-3.2729	7.6687
11	14.5562	-3.2729	7.6687	12.1830	-3.2739	7.6687
12	12.1830	-3.2739	7.6687	12.7221	-4.1114	9.4498
13	12.7221	-4.1114	9.4498	12.4753	-5.0322	11.3617
14	12.4753	-5.0322	11.3617	11.3197	-6.0325	13.3919
15	11.3197	-6.0325	13.3919	6.9453	-6.0326	13.3919
16	6.9453	-6.0326	13.3919	3.9973	-7.1050	15.5291
17	3.9973	-7.1050	15.5291	-0.0933	-8.2439	17.7632
18	-0.0933	-8.2439	17.7632	-5.3758	-9.4408	20.0853
19	-5.3758	-9.4408	20.0853	-12.2204	-9.4406	20.0853
20	-12.2204	-9.4406	20.0853	-16.6607	-4.8808	10.8863
21	-16.6607	-4.8808	10.8863	-0.1388	0.0101	-0.0102
22	-0.1388	0.0101	-0.0102	-0.1292	0.0101	-0.0102
23	-0.1292	0.0101	-0.0102	-7.8677	0.6495	0.3492
24	-7.8677	0.6495	0.3492	-5.0641	0.4460	1.0339
25	-5.0641	0.4460	1.0339	-1.9726	0.1773	1.8744
26	-1.9726	0.1773	1.8744	1.2838	-0.1612	2.8651
27	1.2838	-0.1612	2.8651	4.5624	-0.5730	4.0003
28	4.5624	-0.5730	4.0003	7.7044	-1.0609	5.2744
29	7.7044	-1.0609	5.2744	10.5406	-1.6260	6.6819
30	10.5406	-1.6260	6.6819	12.8947	-2.2706	8.2172
31	12.8947	-2.2706	8.2172	10.7378	-2.2705	8.2172
32	10.7378	-2.2705	8.2172	11.7439	-2.9930	9.8746
33	11.7439	-2.9930	9.8746	11.8384	-3.7937	11.6486
34	11.8384	-3.7937	11.6486	10.8508	-4.6714	13.5337
35	10.8508	-4.6714	13.5337	8.6227	-5.6209	15.5242
36	8.6227	-5.6209	15.5242	5.0108	-6.6414	17.6145
37	5.0108	-6.6414	17.6145	-0.1073	-7.7268	19.7990
38	-0.1073	-7.7268	19.7990	-6.8306	-8.8724	22.0722
39	-6.8306	-8.8724	22.0722	-15.2307	-10.0707	24.4284

40	-15.2307	-10.0707	24.4284	-21.7363	-5.0188	12.7103	32	-3.8646	0.9011	-0.8015	-3.0085	0.9011	-0.8015
41	-21.7363	-5.0188	12.7103	3.4342	-0.2582	0.4503	33	-3.0085	0.9011	-0.8015	-2.1529	0.9010	-0.8015
42	3.4342	-0.2582	0.4503	3.2471	-0.2582	0.4503	34	-2.1529	0.9010	-0.8015	-1.2968	0.9009	-0.8015
43	3.2471	-0.2582	0.4503	3.0598	-0.2582	0.4503	35	-1.2968	0.9009	-0.8015	-0.4412	0.9008	-0.8015
44	3.0598	-0.2582	0.4503	2.8727	-0.2582	0.4503	36	-0.4412	0.9008	-0.8015	0.4150	0.9010	-0.8015
45	2.8727	-0.2582	0.4503	-7.8724	0.7033	0.9457	37	0.4150	0.9010	-0.8015	1.2709	0.9010	-0.8015
46	-7.8724	0.7033	0.9457	-7.3622	0.7031	0.9457	38	1.2709	0.9010	-0.8015	2.1270	0.9011	-0.8015
47	-7.3622	0.7031	0.9457	-4.1518	0.3849	2.0853	39	2.1270	0.9011	-0.8015	2.9830	0.9011	-0.8015
48	-4.1518	0.3849	2.0853	-0.7366	-0.0155	3.4211	40	2.9830	0.9011	-0.8015	3.4562	0.3045	-0.1870
49	-0.7366	-0.0155	3.4211	2.7492	-0.5030	4.9409	41	3.4562	0.3045	-0.1870	-22.9785	9.5175	-14.0281
50	2.7492	-0.5030	4.9409	2.3845	-0.5030	4.9409	42	-22.9785	9.5175	-14.0281	-16.0784	9.5175	-14.0281
51	2.3845	-0.5030	4.9409	5.3679	-1.0825	6.6309	43	-16.0784	9.5175	-14.0281	-10.0217	8.2679	-11.4656
52	5.3679	-1.0825	6.6309	8.0289	-1.7580	8.4765	44	-10.0217	8.2679	-11.4656	-4.5274	7.0178	-8.9030
53	8.0289	-1.7580	8.4765	6.7541	-1.7577	8.4765	45	-4.5274	7.0178	-8.9030	0.4042	5.7677	-6.3405
54	6.7541	-1.7577	8.4765	8.3440	-2.5324	10.4618	46	0.4042	5.7677	-6.3405	4.5864	5.7676	-6.3405
55	8.3440	-2.5324	10.4618	9.1500	-3.4103	12.5696	47	4.5864	5.7676	-6.3405	8.0493	4.5186	-3.7780
56	9.1500	-3.4103	12.5696	8.9604	-4.3911	14.7818	48	8.0493	4.5186	-3.7780	-10.4244	1.2450	-1.5477
57	8.9604	-4.3911	14.7818	5.7765	-4.3911	14.7818	49	-10.4244	1.2450	-1.5477	-9.5217	1.2442	-1.5477
58	5.7765	-4.3911	14.7818	3.5840	-5.4789	17.0790	50	-9.5217	1.2442	-1.5477	-8.6191	1.2436	-1.5477
59	3.5840	-5.4789	17.0790	-0.1251	-6.6740	19.4408	51	-8.6191	1.2436	-1.5477	-7.7169	1.2434	-1.5477
60	-0.1251	-6.6740	19.4408	-4.9636	-6.6738	19.4408	52	-7.7169	1.2434	-1.5477	-6.8148	1.2437	-1.5477
ENVOL. MIN. TORSORES TREN TREN SIN CARGA, EC-1 en via 2							53	-6.8148	1.2437	-1.5477	-5.9125	1.2430	-1.5477
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2	54	-5.9125	1.2430	-1.5477	-5.0118	1.2429	-1.5477
=====	=====	=====	=====	=====	=====	=====	55	-5.0118	1.2429	-1.5477	-4.1104	1.2438	-1.5477
1	5.1520	4.9068	-17.6158	8.7096	4.9068	-17.6158	56	-4.1104	1.2438	-1.5477	-3.2088	1.2431	-1.5477
2	8.7096	4.9068	-17.6158	11.7046	3.6569	-15.0533	57	-3.2088	1.2431	-1.5477	-2.3081	1.2426	-1.5477
3	11.7046	3.6569	-15.0533	14.1374	2.4068	-12.4908	58	-2.3081	1.2426	-1.5477	-1.4069	1.2428	-1.5477
4	14.1374	2.4068	-12.4908	15.8824	2.4068	-12.4908	59	-1.4069	1.2428	-1.5477	-0.5058	1.2427	-1.5477
5	15.8824	2.4068	-12.4908	16.8461	1.1574	-9.9283	60	-0.5058	1.2427	-1.5477	0.3951	1.2426	-1.5477
6	16.8461	1.1574	-9.9283	17.2477	-0.0926	-7.3658							
7	17.2477	-0.0926	-7.3658	17.0864	-1.3433	-4.8033							
8	17.0864	-1.3433	-4.8033	16.1124	-1.3435	-4.8033							
9	16.1124	-1.3435	-4.8033	14.4825	-2.5933	-2.2408							
10	14.4825	-2.5933	-2.2408	0.2135	-0.0555	0.1501							
11	0.2135	-0.0555	0.1501	0.1732	-0.0556	0.1501							
12	0.1732	-0.0556	0.1501	0.1329	-0.0556	0.1501							
13	0.1329	-0.0556	0.1501	0.0927	-0.0555	0.1501							
14	0.0927	-0.0555	0.1501	0.0524	-0.0555	0.1501							
15	0.0524	-0.0555	0.1501	0.0121	-0.0556	0.1501							
16	0.0121	-0.0556	0.1501	-0.0281	-0.0556	0.1501							
17	-0.0281	-0.0556	0.1501	-0.0684	-0.0556	0.1501							
18	-0.0684	-0.0556	0.1501	-0.1087	-0.0556	0.1501							
19	-0.1087	-0.0556	0.1501	-0.1490	-0.0556	0.1501							
20	-0.1490	-0.0556	0.1501	-36.7136	-0.4767	-2.5285							
21	-36.7136	-0.4767	-2.5285	-21.0645	10.1029	-21.2196							
22	-21.0645	10.1029	-21.2196	-11.9666	8.8526	-18.6571							
23	-11.9666	8.8526	-18.6571	-3.9945	7.6023	-16.0946							
24	-3.9945	7.6023	-16.0946	2.8528	6.3526	-13.5321							
25	2.8528	6.3526	-13.5321	8.5751	5.1027	-10.9695							
26	8.5751	5.1027	-10.9695	13.1723	3.8527	-8.4070							
27	13.1723	3.8527	-8.4070	16.6446	2.6029	-5.8446							
28	16.6446	2.6029	-5.8446	18.9919	1.3530	-3.2821							
29	18.9919	1.3530	-3.2821	-5.5768	0.9014	-0.8015							
30	-5.5768	0.9014	-0.8015	-4.7206	0.9011	-0.8015							
31	-4.7206	0.9011	-0.8015	-3.8646	0.9011	-0.8015							

ENVOLVENTES DE ESFUERZOS CON IMPACTO

ENVOL. MAX. FLECTORES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	57.0045	49.1045	-225.3900	-99.8649	-168.9398	-88.6053
2	101.6952	115.3727	-46.1068	-196.4696	-124.5837	-149.2831
3	206.5036	146.7070	141.7671	-306.0442	-124.2271	-135.0235
4	306.0443	124.2250	135.0234	-390.5254	-108.8241	-130.4037
5	390.5578	108.9310	131.4536	-459.5279	-86.4519	-124.7099
6	459.5303	86.4595	124.7099	-514.1543	-63.9799	-117.9661
7	514.1534	63.9586	117.9663	-554.4072	-41.4816	-111.2227
8	554.4079	41.4788	111.2227	-578.9016	-26.0722	-106.6028
9	578.9139	26.0691	106.6027	-588.5178	-3.5868	-99.8591
10	588.5193	3.5818	99.8590	-583.7698	18.8926	-93.1153
11	583.7827	-18.9108	93.1155	-564.4874	34.3211	-88.4959
12	564.4756	-34.3314	88.4960	-529.0452	56.8156	-81.7523
13	529.0478	-56.7825	82.6737	-479.2955	79.2547	-75.9298
14	479.3013	-79.2517	75.9297	-415.2053	101.7303	-69.1860
15	415.2060	-101.7559	69.1861	-335.8465	117.1571	-64.5665
16	335.8471	-117.1587	64.5664	-241.0778	139.6419	-57.8226
17	242.4657	-129.1667	30.6619	-150.2468	80.5905	-80.4595
18	153.3069	-113.4499	-8.2975	-93.3410	55.3270	121.8291
19	97.2957	-62.5058	-78.9516	-63.8008	-4.7745	-8.0467
20	73.7134	-22.8414	-25.2322	-71.1870	6.3358	7.3221
21	73.2435	-7.1753	-40.5617	-61.6013	17.2811	19.8102
22	66.6678	10.8366	-29.8689	-94.6092	-124.7766	-49.6802
23	94.6092	124.7766	49.6802	-187.4731	-115.2395	-53.2083
24	187.4731	115.2395	53.2083	-275.4280	-104.7118	-55.7991
25	275.4280	104.7118	55.7991	-355.1203	-93.3569	-57.4406
26	355.1203	93.3569	57.4406	-465.9215	-106.1131	-97.7747
27	466.9649	107.2863	102.0119	-558.3608	-80.5324	-96.1984
28	558.4407	80.6191	96.8288	-624.7400	-53.3643	-88.6513
29	624.7426	53.3928	88.6513	-665.8821	-26.6058	-78.9815
30	665.8923	26.6001	78.9814	-681.8314	0.1959	-72.8176
31	681.8272	-0.1812	72.8178	-672.0691	20.3533	-66.7643
32	672.0710	-20.3374	66.7642	-637.0383	47.1740	-57.0143
33	637.0447	-47.1660	57.0145	-576.8505	73.9814	-50.4960
34	576.8451	-73.9922	50.4959	-491.2979	101.2504	-42.3185
35	491.3356	-101.1880	41.8531	-380.3315	128.0495	-32.0188
36	380.3922	-127.7013	29.1820	-283.5250	103.7665	-0.3686
37	283.5250	-103.7665	0.3686	-196.9654	114.2896	8.4372
38	196.9654	-114.2896	-8.4372	-105.5187	123.8225	18.1799
39	105.5187	-123.8225	-18.1799	-66.5867	46.5262	79.4795
40	90.6869	-4.4328	-59.3827	-75.4446	28.2710	59.7676
41	90.9780	4.6911	-10.0270	-87.5231	6.6717	-11.4481
42	92.8281	7.4222	-14.2622	-95.4186	0.2775	-1.5218
43	109.8632	32.8556	4.0226	-138.7890	-81.9575	-118.2094
44	145.9051	66.8492	28.1480	-219.7133	-111.7342	-64.4442
45	219.7133	111.7342	64.4442	-291.4106	-112.5995	-89.4484
46	297.3713	123.4143	120.5292	-381.2670	-108.0292	-115.4930
47	381.2634	108.0500	115.4930	-449.9479	-85.5788	-108.7493
48	449.9564	85.6335	108.7494	-504.3398	-63.1641	-102.0057
49	504.3367	63.1810	102.0057	-544.3832	-40.7029	-95.2620
50	544.3728	40.7138	95.2616	-568.3040	-25.3234	-90.6419
51	568.3095	25.3348	90.6419	-577.7334	-2.8610	-83.8982
52	577.7281	2.8703	83.8981	-572.8079	19.6122	-77.1544
53	572.8161	-19.5963	77.1548	-553.0307	34.9904	-72.5350
54	553.0346	-34.9656	72.5346	-517.5045	57.4364	-65.7909

55	517.5232	-57.3404	64.5350	-467.7208	79.8177	-57.7915
56	467.7332	-79.7683	57.0372	-403.6114	102.2484	-50.2935
57	403.6065	-102.2364	50.2929	-323.9031	117.6305	-45.6732
58	323.9040	-117.6180	45.6731	-229.1590	140.0934	-38.9292
59	229.1541	-140.1033	38.9293	-123.6668	166.4569	11.6986
60	123.6668	-166.4569	-11.6986	-61.7757	40.6583	148.1467

ENVOL. MAX CORTANTES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-39.6797	185.0140	153.2932	-88.8774	-169.6153	-148.6735
2	82.8635	170.1895	147.1341	-195.1976	-151.4222	-95.4654
3	195.1976	151.4222	95.4654	-266.6321	-134.2344	-99.1381
4	266.6321	134.2344	99.1381	-363.9433	-134.2417	-99.1380
5	363.9433	134.2417	99.1380	-400.2392	-117.4597	-99.8098
6	400.2392	117.4597	99.8098	-415.1886	-101.1761	-97.6774
7	415.1886	101.1761	97.6774	-410.3793	-85.5272	-92.9380
8	410.3793	85.5272	92.9380	-472.4008	-85.5216	-92.9380
9	472.4008	85.5216	92.9380	-438.9579	-70.6172	-85.7885
10	438.9579	70.6172	85.7885	-390.5291	-56.5354	-76.4262
11	390.5291	56.5354	76.4262	-431.5157	-56.5226	-76.4264
12	431.5157	56.5226	76.4264	-361.1347	-43.3921	-65.0484
13	361.1347	43.3921	65.0484	-282.0446	-31.3085	-51.8523
14	282.0446	31.3085	51.8523	-197.3124	-20.3490	-37.0512
15	197.3124	20.3490	37.0512	-212.0664	-20.3487	-37.0512
16	212.0664	20.3487	37.0512	-117.7071	-10.6080	-21.6244
17	117.7071	10.6080	21.6244	-67.0548	-5.9957	-27.2323
18	83.4358	7.2707	13.1467	-60.3391	-4.7739	-8.0467
19	72.7593	6.0018	10.6018	-63.8008	-4.7745	-8.0467
20	67.0515	5.2414	8.9212	166.5280	-92.2852	-26.5017
21	-860.8233	239.6737	100.9082	663.0703	-265.7275	-114.4660
22	-667.6338	266.0769	113.0153	427.2755	-238.8188	-104.8378
23	-440.4421	239.8569	104.3246	224.6399	-212.5980	-96.1473
24	-246.5105	214.4503	95.2639	54.4916	-187.1917	-87.0866
25	-84.7147	189.9474	85.9131	-84.3849	-162.6868	-77.7356
26	46.4693	166.4286	76.3541	-193.5746	-139.1719	-68.1768
27	148.9226	143.9595	66.6686	-259.3466	-117.5812	-60.5105
28	209.1274	123.4826	58.9571	-426.2489	-100.0405	-72.6374
29	246.4101	104.5616	48.2915	-435.5963	-86.8071	-68.5791
30	261.9084	87.0277	37.6927	-427.5606	-73.8420	-63.5712
31	427.5606	73.8420	63.5712	-497.7088	-73.8469	-63.5711
32	497.7088	73.8469	63.5711	-461.1595	-61.2701	-57.6134
33	461.1595	61.2701	57.6134	-409.9392	-49.1973	-50.7057
34	409.9392	49.1973	50.7057	-346.1579	-37.8392	-42.8485
35	104.9901	38.1843	-15.8781	-272.5197	-27.3169	-34.0428
36	91.4325	33.3002	-20.9149	-117.8317	-18.9500	-37.9280
37	80.8515	29.4726	-25.2640	-26.1374	-17.8106	25.1167
38	75.1266	26.6259	-28.8440	-43.0577	-17.8107	25.1167
39	75.7765	24.6831	-31.5735	-59.9779	-17.8108	25.1167
40	83.9185	23.5491	-33.3716	142.3046	-92.2894	-33.9764
41	-824.8375	220.0013	64.9610	730.1329	-247.1541	-67.8435
42	-733.6622	247.4366	66.4839	559.8512	-232.0380	-61.8641
43	-568.3844	232.7017	61.2638	410.0358	-210.2216	-54.5202
44	-424.1950	211.4011	53.4675	279.3414	-188.9248	-46.7238
45	-298.9598	190.6499	45.2710	167.2030	-168.1723	-38.5274
46	-191.9880	170.5020	36.7324	73.9594	-155.1021	-32.1128

47	-103.4907	158.0700	30.0398	-1.4582	-135.5940	-23.2962
48	-32.2876	139.2628	21.0146	-60.9717	-116.7877	-14.2709
49	23.6564	121.1462	11.8547	-105.7281	-98.6689	-5.1111
50	65.5986	103.7813	2.6400	-457.9482	-97.0987	-86.6695
51	457.9482	97.0987	86.6695	-427.0182	-80.4112	-78.1803
52	427.0182	80.4112	78.1803	-375.1259	-63.3233	-66.6934
53	-24.9071	69.5144	-40.2768	-421.0411	-63.3402	-66.6931
54	421.0411	63.3402	66.6931	-17.4673	-47.1110	51.2961
55	-22.5585	56.3843	-52.6494	-12.7395	-40.9838	57.2689
56	-23.9434	51.1629	-58.0821	-7.5675	-35.7645	62.7018
57	-24.5441	46.8488	-62.8574	-3.8422	-31.4507	67.4771
58	-22.4379	43.4581	-66.8512	-3.4864	-28.0595	71.4709
59	-15.6667	40.9989	-69.9346	-8.4762	-25.6006	74.5543
60	-2.2412	39.4741	-71.9750	-23.5873	-31.7742	92.3787

ENVOL. MAX. TORSORES -IPF						
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	-80.5082	99.5403	312.1993	11.1318	-91.8414	-291.7956
2	-9.2073	91.6636	293.2243	-51.9186	-80.4166	-264.1298
3	48.7214	80.7229	265.9825	-100.7563	-69.5893	-236.9140
4	93.1160	70.3725	239.2564	-141.3446	-62.6726	-218.8527
5	129.9305	63.9324	221.7503	-176.7963	-62.8787	-200.2865
6	176.7963	62.8787	200.2865	-190.3327	-54.5456	-183.8980
7	190.3327	54.5456	183.8980	-193.7080	-46.5283	-166.2062
8	193.7080	46.5283	166.2062	-227.4435	-46.5144	-166.2063
9	227.4435	46.5144	166.2063	-216.0685	-38.8749	-147.3092
10	216.0685	38.8749	147.3092	-196.9098	-31.6377	-127.3059
11	196.9098	31.6377	127.3059	-219.8448	-31.6314	-127.3062
12	219.8448	31.6314	127.3062	-189.2806	-24.8602	-106.2951
13	189.2806	24.8602	106.2951	-154.0757	-18.6212	-84.3750
14	154.0757	18.6212	84.3750	-115.7585	-12.9426	-61.6522
15	115.7585	12.9426	61.6522	-125.1429	-12.9409	-61.6522
16	125.1429	12.9409	61.6522	-81.0553	-7.8820	-41.0562
17	81.0553	7.8820	41.0562	-36.8005	-3.4591	-23.0935
18	36.8005	3.4591	23.0935	6.7708	0.3057	-10.9210
19	-6.7708	-0.3057	10.9210	6.9932	0.3055	-10.9210
20	-6.9932	-0.3055	10.9210	82.1693	-48.1211	-126.8467
21	-331.9537	115.1338	332.1519	221.4931	-124.4541	-355.1871
22	-221.3556	124.4437	356.5730	110.1791	-110.7775	-320.8865
23	-114.6676	111.1169	323.1468	20.4405	-99.9781	-288.5470
24	-29.5391	100.7264	291.7206	-56.7451	-87.5384	-257.2625
25	43.2128	88.7398	261.3898	-117.3682	-75.5595	-226.7941
26	99.7337	77.2463	231.9159	-162.1327	-64.1021	-197.4324
27	140.8762	66.3173	203.5894	-192.0574	-53.2338	-169.2564
28	167.7588	56.0054	176.4893	-210.0206	-51.9062	-155.0171
29	210.0206	51.9062	155.0171	-217.4418	-45.2906	-140.8156
30	217.4418	45.2906	140.8156	-216.1648	-38.8038	-126.1393
31	216.1648	38.8038	126.1393	-253.0322	-38.8085	-126.1392
32	253.0322	38.8085	126.1392	-237.4988	-32.5190	-110.9880
33	237.4988	32.5190	110.9880	-214.6362	-26.4814	-95.3618
34	214.6362	26.4814	95.3618	-185.4932	-20.7990	-79.2610
35	185.4932	20.7990	79.2610	-151.4190	-15.5411	-62.6857
36	151.4190	15.5411	62.6857	-113.9548	-10.7722	-45.6419
37	113.9548	10.7722	45.6419	-74.2537	-6.5220	-30.3531
38	74.2537	6.5220	30.3531	-33.9119	-2.8309	-17.1496
39	33.9119	2.8309	17.1496	6.1286	0.3205	-8.4652
40	-6.1286	-0.3205	8.4652	74.9436	-48.2856	-124.1010
41	-206.3517	99.5042	263.8401	135.0669	-110.5567	-287.2584

42	-134.3801	110.4879	288.5136	57.0659	-102.7873	-268.1099
43	-59.4227	102.9266	269.9225	-10.0191	-91.6862	-240.1379
44	4.6363	92.0828	242.5298	-67.1923	-80.8434	-212.7450
45	58.8512	81.5025	215.7422	-105.4982	-75.3156	-193.2156
46	105.4982	75.3156	193.2156	-160.1002	-75.3337	-193.2154
47	160.1002	75.3337	193.2154	-180.4082	-68.1443	-177.5535
48	180.4082	68.1443	177.5535	-193.7726	-60.5689	-160.6884
49	193.7726	60.5689	160.6884	-198.9939	-52.7006	-142.5215
50	198.9939	52.7006	142.5215	-237.2190	-52.7127	-142.5215
51	237.2190	52.7127	142.5215	-227.3795	-44.5579	-122.9539
52	227.3795	44.5579	122.9539	-207.3523	-36.2069	-101.8876
53	207.3523	36.2069	101.8876	-233.6091	-36.2210	-101.8872
54	233.6091	36.2210	101.8872	-196.5181	-27.7104	-79.2287
55	196.5181	27.7104	79.2287	-147.8859	-19.1022	-54.9190
56	147.8859	19.1022	54.9190	-95.2150	-11.3042	-32.9234
57	95.2150	11.3042	32.9234	-103.4099	-11.3049	-32.9233
58	103.4099	11.3049	32.9233	-2.6775	2.5816	-4.1742
59	21.0937	-1.5149	10.5177	-0.8058	2.5817	-4.1742
60	8.0747	-2.6420	7.2083	1.0660	2.5817	-4.1742

ENVOL. MIN. FLECTORES -IPF						
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	-81.3068	101.8765	316.3305	23.5476	11.1997	33.3854
2	-23.5476	-11.1997	-33.3854	31.7678	11.4038	34.1511
3	-31.7678	-11.4038	-34.1511	52.1208	28.5467	50.6389
4	-52.1218	-28.5461	-50.6389	72.8178	28.5461	50.6389
5	-72.8537	-28.6546	-51.6888	93.6278	28.6546	51.6888
6	-93.6278	-28.6567	-51.6888	114.4045	28.6567	51.6888
7	-114.4036	-28.6459	-51.6887	135.1835	33.1191	63.9753
8	-135.1830	-33.1180	-63.9753	159.1956	33.1174	63.9753
9	-159.2017	-33.1123	-63.9753	186.1259	37.8937	60.0695
10	-186.1285	-37.8948	-60.0695	214.1928	40.2532	60.7775
11	-214.1973	-40.2492	-60.7775	243.3786	40.2483	60.7775
12	-243.3711	-40.2356	-60.7775	274.1937	42.5966	61.4855
13	-274.1999	-42.6310	-62.4071	306.1100	44.9907	63.1151
14	-306.1129	-44.9946	-63.1151	339.0884	47.3533	63.8231
15	-339.0868	-47.3357	-63.8231	373.4058	47.3345	63.8231
16	-373.4061	-47.3286	-63.8231	409.1374	49.6890	64.5311
17	-410.5227	-60.1737	-37.3704	454.9166	62.5330	38.0784
18	-467.2047	-100.6100	-6.2424	551.0351	135.6835	1.7116
19	-568.4786	-182.5311	6.1955	700.8139	182.5305	-6.1955
20	-714.3174	-214.5635	-3.9689	881.4793	160.1516	-30.3382
21	-924.7810	213.9447	120.9145	669.0516	-265.9670	-112.7019
22	-674.1180	237.8510	122.7606	450.9890	-230.7694	-120.6366
23	-464.8645	195.9607	104.0267	298.6001	-143.0300	-68.5777
24	-323.8984	92.7227	52.7760	235.8104	-92.7232	-52.7759
25	-259.4897	42.7768	11.9268	218.8503	-42.7761	-11.9268
26	-237.1770	7.4433	-51.6207	230.1059	-7.4429	51.6207
27	-231.1484	6.2659	-55.8579	225.1926	-6.2664	55.8579
28	-225.2732	6.1738	-56.4884	219.4086	-6.1739	56.4884
29	-219.4078	6.1660	-56.4884	213.5497	-6.1648	56.4884
30	-213.5535	6.1650	-56.4884	207.6963	-6.1635	56.4884
31	-207.6932	6.1569	-56.4884	201.8473	-6.1458	56.2964
32	-201.8471	6.1375	-56.2964	196.0163	-6.1373	56.2964
33	-196.0184	6.1360	-56.2964	190.1886	-6.1367	56.2964
34	-190.1877	6.1425	-56.2964	190.0055	3.1363	49.2118

35	-190.0409	-3.1950	-48.7462	201.2149	13.9046	54.4948
36	-201.2739	-14.2616	-51.6580	216.4736	16.6215	52.3662
37	-231.4910	-52.5790	2.7506	282.9727	54.9388	-2.0426
38	-303.7183	-104.4980	12.0294	421.2047	141.4462	-14.0609
39	-440.7673	-183.8941	19.2178	619.3634	190.9750	-17.0938
40	-643.4666	-233.0751	-3.0029	872.3376	171.8060	-10.1749
41	-916.7181	193.6736	73.4189	735.0427	-247.2457	-66.1929
42	-740.3483	233.1539	91.9031	574.1005	-225.4554	-71.4993
43	-588.5439	192.3159	68.9987	467.3469	-141.8414	-34.3454
44	-485.1502	92.4576	5.6003	418.1205	-92.4536	-5.6003
45	-433.7421	49.6736	-43.8613	397.7273	-49.6772	43.8613
46	-403.6877	38.8631	-74.9424	375.5132	-38.8618	74.9424
47	-375.5085	38.8439	-74.9425	347.3495	-38.8318	74.9426
48	-347.3557	38.8148	-74.9425	319.2173	-38.8070	74.9425
49	-319.2198	38.7938	-74.9425	291.0917	-38.7921	74.9425
50	-291.0872	38.7814	-74.9426	262.9661	-38.7825	74.9426
51	-262.9702	38.7794	-74.9426	234.8528	-38.7775	74.9426
52	-234.8530	38.7719	-74.9426	206.7421	-38.7677	74.9426
53	-206.7483	38.7590	-74.9427	178.6477	-38.7560	74.9427
54	-178.6492	38.7422	-74.9427	150.5594	-38.7395	74.9427
55	-150.5677	38.6559	-73.6875	122.5413	-38.6542	73.6875
56	-122.5536	38.6065	-72.9326	94.5633	-38.6070	72.9326
57	-94.5615	38.6020	-72.9325	66.5722	-38.6029	72.9325
58	-66.5732	38.5982	-72.9326	38.6160	-38.5561	72.5963
59	-38.6144	38.5580	-72.5962	11.6049	-31.2810	48.2212
60	-14.7452	10.3121	23.6177	51.3239	64.1900	-128.4415

ENVOL. MIN. CORTANTES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	10.7557	-24.0819	-42.1278	2.3842	29.4281	49.6419
2	-6.7046	-24.0825	-42.1278	4.6837	31.3263	48.4041
3	-24.1657	-24.0833	-42.1278	-4.9066	34.7608	46.1387
4	-41.6270	-24.0832	-42.1278	-7.7797	37.9706	44.1335
5	38.6592	-26.7093	-37.1378	-27.8084	43.8563	40.7177
6	63.4709	-33.5079	-33.4748	-50.9312	51.2369	36.8847
7	319.3592	-43.4548	24.8854	-409.6045	60.9930	-31.7452
8	409.6045	-60.9930	31.7452	-72.7117	66.9250	30.0879
9	365.3882	-60.9975	31.7452	-420.3962	78.1887	-35.4180
10	420.3962	-78.1887	35.4180	-454.2404	94.9819	-36.0897
11	454.2404	-94.9819	36.0897	-59.9832	101.3353	41.0926
12	100.2025	-96.0840	-34.6588	-25.4967	117.4807	22.7221
13	63.0447	-112.9953	-16.7546	27.4618	135.4714	23.4985
14	6.6640	-131.7053	-18.0771	95.4667	154.1873	24.8208
15	-65.4179	-151.1082	-20.0201	180.5557	166.5086	24.6398
16	-155.1331	-164.0748	-20.5290	283.9171	186.5532	27.2728
17	-263.5409	-184.7332	-23.9158	405.3562	207.2134	30.6596
18	-390.3275	-205.9436	-28.1147	545.5722	228.4231	34.8585
19	-536.0652	-227.6612	-33.1778	706.7017	243.0596	37.7975
20	-702.6365	-242.7335	-36.1036	755.1271	224.7455	34.2402
21	-140.5132	-91.2324	-20.7094	-58.5368	17.4465	22.6909
22	58.5368	-17.4465	-22.6909	-58.3486	18.3252	19.2970
23	41.9630	-17.4469	-22.6909	-62.8075	20.1780	18.4133
24	25.3885	-17.4452	-22.6909	-73.8612	22.9334	17.2399
25	113.1054	-18.3134	30.5048	-89.9834	26.6711	15.8584

26	264.8195	-26.3659	10.7282	-339.8638	36.8824	-13.3189
27	339.8638	-36.8824	13.3189	-405.0299	48.2539	-14.9606
28	405.0299	-48.2539	14.9606	-457.6448	60.2968	-15.6520
29	457.6448	-60.2968	15.6520	-495.6016	72.8951	-15.3931
30	495.6016	-72.8951	15.3931	-517.3363	85.8730	-14.1845
31	517.3363	-85.8730	14.1845	-238.7712	86.4365	8.3960
32	435.7621	-85.8680	14.1845	-231.7562	102.6307	7.0372
33	427.8289	-99.0551	12.0257	-204.1045	120.4106	6.3230
34	254.7300	-114.4233	-0.6800	-152.3268	139.7252	6.4003
35	197.5217	-134.8404	-1.3633	-57.2912	161.9465	8.6292
36	95.8730	-158.1247	-4.2802	68.8941	185.3871	12.4575
37	-37.8717	-182.5461	-8.8774	225.4734	209.8048	17.0548
38	-202.6749	-207.8611	-14.3256	413.9775	235.1188	22.5030
39	-399.7500	-233.9751	-20.7050	635.5060	261.2336	28.8824
40	-629.8828	-260.8130	-28.0933	804.5073	245.1160	36.4588
41	-167.1691	-91.2590	-31.4989	-87.5231	6.6717	-11.4481
42	64.8845	-4.8709	8.1021	-91.2214	7.3378	-12.0486
43	61.3541	-4.8714	8.1021	-100.0596	8.5146	-13.1013
44	61.3364	-5.4529	22.2067	-113.5087	10.2366	-14.5541
45	104.2799	-9.8405	37.4974	-202.1983	18.9966	-15.0000
46	202.1983	-18.9966	15.0000	-188.4239	18.9895	-15.0002
47	188.4239	-18.9895	15.0002	-275.1182	29.8377	-21.9644
48	275.1182	-29.8377	21.9644	-356.3327	41.8092	-27.3249
49	356.3327	-41.8092	27.3249	-428.9679	54.8342	-30.8689
50	428.9679	-54.8342	30.8689	-389.2204	54.8214	-30.8692
51	389.2204	-54.8214	30.8692	-440.1822	68.7674	-32.4003
52	440.1822	-68.7674	32.4003	-476.3434	83.5658	-31.7218
53	476.3434	-83.5658	31.7218	-415.7663	83.5525	-31.7218
54	415.7663	-83.5525	31.7218	-423.5634	99.0590	-28.6374
55	423.5634	-99.0590	28.6374	-411.8149	115.2188	-22.9489
56	411.8149	-115.2188	22.9489	-378.8458	131.9242	-14.4601
57	378.8458	-131.9242	14.4601	-283.2083	131.9087	-14.4601
58	283.2083	-131.9087	14.4601	-215.3248	149.0163	-2.9730
59	215.3248	-149.0163	2.9730	-123.6668	166.4569	11.6986
60	123.6668	-166.4569	-11.6986	8.7467	178.4322	-26.9926

ENVOL. MIN. TORSORES -IPF

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	3.4911	-10.5119	-13.6747	9.3232	12.0887	16.6689
2	-4.1304	-10.5126	-13.6747	13.6984	12.5053	19.3474
3	-11.7527	-10.5131	-13.6747	11.0568	13.7061	22.8283
4	37.0639	-3.7722	-18.2902	9.5827	14.9668	25.7259
5	34.3295	-3.7714	-18.2902	-0.0922	17.4214	30.7530
6	66.5538	-7.9153	-30.5390	-130.2175	16.9748	40.7790
7	130.2175	-16.9748	-40.7790	-181.6930	25.9421	52.6713
8	181.6930	-25.9421	-52.6713	-162.8852	25.9425	52.6713
9	162.8852	-25.9425	-52.6713	-196.3128	34.7373	66.1571
10	196.3128	-34.7373	-66.1571	-218.8659	43.3322	81.1434
11	218.8659	-43.3322	-81.1434	-187.4448	43.3336	81.1433
12	187.4448	-43.3336	-81.1433	-193.9234	51.6678	97.5316
13	193.9234	-51.6678	-97.5316	-191.6215	59.6973	115.2235
14	191.6215	-59.6973	-115.2235	-181.7091	67.3614	134.1201
15	181.7091	-67.3614	-134.1201	27.3854	71.7982	137.4331
16	132.8800	-67.3564	-134.1201	61.9728	80.8948	157.4304
17	111.4476	-74.5867	-154.1234	147.2142	93.8388	180.7428
18	-138.0041	-93.0061	-176.5519	208.4028	104.2467	206.3367

19	-201.7399	-103.6802	-203.3834	279.6994	111.3801	223.7870
20	-275.6334	-111.0532	-222.0931	312.8135	103.7036	221.6974
21	-66.4759	-43.4789	-117.4663	147.7214	-5.3907	31.7678
22	-130.6109	9.5348	-17.8319	136.1815	-4.9001	34.8304
23	-121.5530	9.5368	-17.8319	119.0018	-3.8728	39.1604
24	28.8594	-2.3476	-22.0479	96.6984	-2.2222	44.7985
25	73.5894	-6.5295	-29.8925	70.3156	0.1027	51.8015
26	117.2454	-11.2971	-40.3009	41.1414	3.1525	60.2263
27	157.5118	-16.5562	-51.1780	10.6683	6.9638	70.1287
28	192.8411	-22.2417	-62.5294	-19.4417	11.5712	81.5661
29	221.8930	-28.2662	-74.3562	-47.4190	16.9840	94.5946
30	243.6164	-34.5623	-86.6579	-71.4044	23.2261	109.2709
31	257.2332	-41.0481	-99.4346	-78.4217	28.3706	121.2149
32	107.3611	-24.0273	-107.7027	-89.0049	36.0384	138.8750
33	116.9126	-32.2840	-126.6826	-90.2575	44.5154	158.3363
34	116.3814	-41.3433	-147.5052	-80.3903	53.7897	179.6561
35	104.0566	-51.1694	-170.2265	-57.7586	63.8243	202.8904
36	78.3754	-61.7326	-194.9034	-20.8657	74.5856	228.0961
37	37.9582	-72.9869	-221.5921	31.5544	86.0085	255.3442
38	-18.3168	-84.8585	-250.3644	100.6298	98.0860	284.6163
39	-91.4226	-97.3337	-281.2005	187.2242	110.7507	315.9680
40	-182.0636	-110.3617	-314.1552	301.3698	106.8825	312.4489
41	-84.6920	-43.6471	-129.3442	283.7520	-21.6165	52.4092
42	-284.0798	29.1669	-33.8181	265.7248	-21.4673	54.2219
43	-262.8510	28.7823	-36.2102	243.4661	-20.9973	57.6685
44	-237.4405	28.0367	-40.2620	216.7221	-20.0914	62.1109
45	-207.6606	26.8418	-45.3390	185.9197	-18.7208	67.6010
46	-174.0005	25.1718	-51.4956	158.5429	-17.4714	71.8992
47	-144.0022	23.5719	-56.4945	123.2491	-15.2443	79.1949
48	-106.3887	21.0126	-64.5283	85.9180	-12.4699	87.6946
49	-67.0808	17.8678	-73.8062	47.4870	-9.0882	97.4698
50	-27.0652	14.1054	-84.4026	19.6282	-6.4057	104.8062
51	1.9360	11.0376	-92.6050	-16.7973	-2.0060	116.7988
52	39.0274	6.2249	-105.5122	-51.1312	3.0744	130.2727
53	73.5197	0.7178	-119.9516	-71.2486	6.9808	140.3552
54	93.2533	-3.6090	-131.0530	-97.2833	13.1857	156.4194
55	118.3317	-10.2503	-148.1924	-117.4083	20.1208	174.2061
56	136.9012	-17.6281	-167.1129	-130.1145	27.8014	193.8100
57	147.4390	-25.7583	-187.9135	-125.9704	33.4596	208.3172
58	140.5031	-31.8745	-203.6810	-120.4412	42.3635	231.0997
59	131.5423	-41.2413	-227.7904	-103.0941	52.0536	255.9823
60	110.1200	-51.3829	-254.0646	-70.0762	59.0817	274.4682

ENVOL. MAX. FLECTORES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	61.0640	66.3774	-239.1664	-104.5895	-96.3469	112.9074
2	113.7297	147.9937	-2.0505	-223.2076	-150.2998	-158.6737
3	230.7187	147.7039	134.6173	-340.2237	-153.4057	-140.8979
4	340.2229	153.4052	140.8980	-431.1609	-127.6569	-182.6920
5	431.1571	127.6573	182.6918	-510.5068	-103.7259	-150.6528
6	510.5063	103.7284	150.6530	-570.5182	-75.4984	-126.8560
7	570.5162	75.4890	126.8557	-617.6812	-37.5404	-123.5782
8	617.6820	37.5348	123.5782	-644.5537	-33.7356	-130.3774
9	644.5634	33.7309	130.3774	-652.4675	-2.7868	-112.7194
10	652.4713	2.7898	112.7194	-647.7759	21.1451	-80.6803
11	647.7816	-21.1533	80.6803	-624.5575	31.8093	-101.1767
12	624.5526	-31.8097	101.1765	-582.7770	69.7555	-97.8993

13	582.7810	-69.7299	98.6975	-527.2734	97.4444	-72.8501
14	527.2752	-97.4438	72.8500	-452.5732	110.9147	-17.6612
15	452.5724	-110.9298	17.6612	-365.6393	131.4640	-57.1088
16	365.6411	-131.4612	57.1089	-271.8839	151.6374	-47.0820
17	273.0851	-142.5630	23.5530	-171.2353	134.1351	-21.0005
18	181.8802	-101.1528	-6.5788	-106.5535	94.7509	59.7745
19	121.6628	-54.1650	-66.6243	-84.6142	45.1378	26.4468
20	96.3112	-17.3890	-17.6416	-83.2813	29.7100	43.1290
21	99.6524	-9.4551	-38.7932	-83.1443	23.8461	28.6879
22	87.5335	0.5121	-37.4016	-92.1628	-9.9691	71.3818
23	104.1816	40.1194	-56.9926	-159.2056	-57.0524	-31.6781
24	181.1188	100.6334	45.3673	-265.3268	-77.3927	-41.1894
25	285.8378	120.6610	76.5765	-389.6057	-86.1587	-40.9940
26	405.4787	116.7646	96.0447	-516.3860	-92.9499	-91.1158
27	517.2905	93.9703	94.7862	-606.5153	-83.3989	-116.7764
28	606.5109	83.3977	116.7765	-682.0011	-54.0011	-95.0687
29	682.0007	54.0131	95.0685	-730.7357	-26.0737	-72.2607
30	730.7377	26.0708	72.2608	-751.3362	-0.0509	-44.4656
31	751.3334	0.0578	44.4656	-744.6819	10.5396	-66.1870
32	744.6814	-10.5319	66.1870	-710.2599	39.9697	-43.7269
33	710.2603	-39.9636	43.7269	-647.9577	67.8104	-18.2575
34	647.9546	-67.8209	18.2574	-559.9567	107.8448	-19.2234
35	559.9887	-107.7939	18.8199	-444.8160	137.0684	4.1424
36	444.8630	-136.7688	-5.3989	-302.7897	165.9029	28.6124
37	311.0174	-146.3304	-73.3777	-176.8509	154.4321	41.1286
38	194.8232	-111.4947	-49.7800	-96.2523	94.3455	134.9115
39	113.1963	-57.5672	-139.3792	-80.2554	-2.0516	-5.6517
40	92.3617	0.2452	-56.6865	-96.0937	3.2259	-15.4814
41	106.4708	11.4610	-21.8870	-98.1579	7.4545	-12.6448
42	102.7538	4.7540	-9.6278	-110.6096	-20.2621	-27.5185
43	117.7953	36.6575	-54.4643	-154.6855	-83.7521	-33.6905
44	170.1082	126.5412	58.5920	-245.7949	-106.8494	-57.2393
45	259.3278	143.9081	100.0873	-350.3491	-113.1970	-117.5912
46	355.5137	122.5640	144.5162	-444.5165	-91.6486	-112.2735
47	444.5110	91.6772	112.2735	-513.1070	-99.0278	-117.2980
48	513.1116	99.0656	117.2982	-566.2345	-67.9124	-133.6759
49	566.2333	67.9213	133.6759	-609.4258	-36.5318	-100.3069
50	609.4177	36.5458	100.3066	-633.5768	-33.2514	-124.4612
51	633.5792	33.2588	124.4611	-642.3437	8.1412	-112.0409
52	642.3393	-8.1302	112.0410	-637.3253	11.6456	-86.4490
53	637.3318	-11.6293	86.4491	-612.2370	43.1405	-101.4924
54	612.2371	-43.1158	101.4927	-575.9625	74.8348	-66.7894
55	575.9727	-74.7494	65.7020	-521.2964	68.8290	-65.3900
56	521.3047	-68.7918	64.7359	-447.9774	119.7159	-75.3444
57	447.9711	-119.7035	75.3443	-364.7996	111.1348	12.5897
58	364.8015	-111.1320	-12.5896	-264.5960	149.0944	15.8674
59	264.5946	-149.0939	-15.8674	-151.4223	177.6241	42.9684
60	154.0086	-160.3917	-102.0328	-65.1760	110.7558	209.5735

ENVOL. MAX. CORTANTES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-37.7846	211.9029	147.9955	-89.6251	-200.6226	-196.1039
2	84.4155	201.1196	194.7701	-211.3537	-172.7968	-171.7603
3	202.5089	173.6933	169.3990	-323.3304	-155.3289	-139.2781
4	304.7927	157.2990	137.9739	-403.6285	-140.0973	-155.9425
5	389.1892	141.7863	151.6951	-428.6770	-116.0865	-127.3426

6	399.6903	119.6764	125.2844	-446.6857	-98.1455	-118.7345	=====							
7	414.1242	102.5048	116.4619	-483.6053	-89.1587	-112.4599								
8	448.5396	94.3120	110.0758	-467.8873	-73.1837	-102.2628								
9	431.3453	79.1030	99.8647	-437.2188	-58.4216	-90.8927		1	-102.9257	112.6333	357.4179	21.2666	-112.6376	-357.4179
10	400.1624	65.0955	88.5735	-394.4689	-44.9126	-78.5468		2	-21.2666	112.6376	357.4179	-52.6368	-95.3890	-311.7055
11	357.8299	52.3072	76.3950	-390.9127	-38.9690	-72.3930		3	52.6368	95.3890	311.7055	-121.0940	-83.7546	-268.8541
12	355.5392	47.0770	70.4920	-331.8875	-27.4434	-59.5212		4	114.4747	84.4308	270.8832	-175.4259	-78.1343	-265.9932
13	298.5876	36.2408	57.9499	-268.2797	-17.2087	-46.4488		5	175.4259	78.1343	265.9932	-190.2357	-63.3174	-221.4039
14	237.7692	26.6616	45.2810	-252.2639	-13.3186	-41.2793		6	177.6571	64.8262	224.4511	-206.3815	-53.9564	-197.4049
15	225.1717	23.3872	40.5846	-184.1547	-4.9876	-28.9801		7	191.6659	55.8546	201.0428	-229.7425	-49.1824	-183.3673
16	161.0282	15.6616	28.8234	-137.1715	0.1768	-30.2643		8	213.4393	51.4907	187.6470	-227.7140	-40.8204	-159.9693
17	118.4563	11.0558	30.7052	-54.1857	1.1674	-12.1196		9	210.3494	43.5183	164.9397	-217.5461	-33.0749	-136.6823
18	101.2585	8.6966	15.6054	-49.7345	1.7803	-13.8915		10	199.6162	36.1561	142.3899	-200.6922	-25.9564	-113.6053
19	93.7472	7.5962	13.4009	-47.6906	2.1587	-15.3174		11	182.6753	29.4121	120.0942	-201.5792	-22.7439	-102.4187
20	90.5403	6.9381	11.9451	256.0876	-84.3405	-142.0978		12	183.9118	26.5611	109.7308	-175.4343	-16.6412	-80.4741
21	-725.9919	235.2706	91.9933	621.4719	-290.6436	-176.7646		13	158.5343	20.8142	88.6487	-146.1959	-11.1961	-60.0938
22	-625.4254	290.9445	175.5077	375.8630	-261.9637	-154.5531		14	130.4338	15.7051	69.1679	-139.4026	-9.0330	-51.4926
23	-383.3791	262.5685	152.1504	159.5263	-233.4163	-130.9447		15	125.1063	13.8596	61.5009	-106.6730	-4.5609	-33.8611
24	-170.5900	234.3739	127.4301	-27.1536	-205.0812	-105.9732		16	94.1288	9.7008	44.8360	-74.1437	-0.7335	-19.1368
25	12.6938	206.4301	101.3814	-78.0352	-177.3976	-85.3737		17	63.5876	6.1591	31.1082	-43.2194	2.4731	-6.4225
26	60.4660	179.1716	79.7398	-169.7061	-154.7290	-71.2286		18	34.8356	3.2229	19.4181	-34.7539	3.4471	-1.7426
27	220.6474	157.4478	81.1889	-361.9127	-139.9658	-75.9448		19	28.6701	2.5016	15.7877	-1.7466	-0.8328	2.4603
28	318.4086	145.0771	74.5992	-405.5522	-120.6424	-67.6626		20	3.1872	0.3797	8.0530	225.9032	-60.8945	-188.5651
29	358.4093	126.7635	66.3481	-425.6011	-102.3923	-58.9094		21	-280.4608	113.7749	319.1154	324.4503	-156.0729	-423.8165
30	376.1147	109.5263	57.6971	-424.4444	-85.2655	-49.7565		22	-324.4503	156.0729	423.8165	183.0824	-138.8247	-378.1039
31	373.9853	93.4477	48.7164	-404.8940	-69.4270	-40.2739		23	-183.0824	138.8247	378.1039	57.2366	-121.5736	-332.3914
32	354.8769	78.6564	39.4771	-370.1287	-54.9070	-30.5328		24	-57.2366	121.5736	332.3914	72.4839	-107.5508	-287.4810
33	321.9577	65.1719	30.0495	-323.5850	-41.7961	-20.6035		25	-72.4839	107.5508	287.4810	19.6250	-93.8237	-247.4882
34	278.6191	53.0839	20.5045	-268.9026	-30.1539	-10.5619		26	126.3346	84.1981	249.8037	-185.9911	-71.9962	-219.6148
35	228.4177	42.4424	10.9173	-42.1093	-22.9898	37.1389		27	167.5787	73.9184	224.9486	-233.6464	-65.1780	-201.7877
36	134.5728	33.7183	9.5004	-49.8823	-21.0347	33.3336		28	212.5974	67.5784	208.0535	-251.9612	-55.3588	-177.6138
37	72.1993	29.6161	-27.1300	-59.7501	-19.5324	30.1822		29	228.8725	58.2672	184.8470	-258.1167	-46.0831	-154.1563
38	50.8102	27.1951	-45.5662	-72.4938	-18.4544	27.6492		30	233.6345	49.4950	162.3922	-253.2998	-37.3653	-131.4505
39	67.7088	26.5076	-43.6165	-88.7400	-17.7672	25.6996		31	228.1066	41.3024	140.7242	-238.9186	-29.2936	-109.5316
40	88.2213	26.1707	-42.2151	447.6330	-54.0505	-31.1290		32	213.7259	33.7540	119.8785	-216.5588	-21.8776	-88.4351
41	-703.7526	220.2211	65.7777	627.1606	-267.1773	-113.1602		33	192.0684	26.8558	99.8905	-187.9453	-15.1684	-68.1961
42	-630.2180	267.4239	111.9825	438.7506	-260.7523	-125.6558		34	164.8332	20.6571	80.7954	-154.8891	-9.1919	-48.8528
43	-444.1019	261.2029	123.5654	283.4429	-233.7306	-100.4650		35	133.7966	15.1808	62.6310	-119.0777	-3.9627	-31.3209
44	-291.0445	234.4096	97.4810	144.6523	-206.7034	-73.8436		36	100.5737	10.4336	46.3131	-82.3194	0.5131	-15.7664
45	-154.4220	207.6378	69.9885	-2.1611	-187.0340	-73.2024		37	66.8905	6.4129	32.0083	-46.1889	4.2575	-3.0016
46	-19.3095	189.0487	71.6478	-94.0021	-174.2268	-54.7342		38	34.2168	3.0956	20.5283	0.3089	0.1300	-0.1091
47	80.3710	175.7156	49.2153	-138.8477	-148.9491	-59.4273		39	4.2363	0.4741	11.1568	0.4324	0.1300	-0.1091
48	109.6125	152.1104	57.4508	-177.8297	-130.2629	-50.2111		40	-21.9645	-1.5057	4.5565	425.6439	-34.7966	-62.4160
49	145.5058	134.0423	48.1178	-237.8534	-120.7070	-44.1158		41	-172.9992	100.9243	270.1795	111.2922	-117.0294	-307.1496
50	203.0892	125.1402	41.9755	-241.7414	-103.0075	-33.2452		42	-110.6967	116.9695	308.2370	265.5756	-147.1879	-302.1082
51	205.2658	108.1120	31.1317	-227.0134	-85.7683	-20.8110		43	-265.5756	147.1879	302.1082	-34.1869	-100.4036	-267.2004
52	189.6281	91.5793	18.8030	-194.2245	-69.0687	-6.8188		44	29.5234	100.7474	269.2724	-87.6164	-90.4935	-243.8040
53	156.7974	75.6085	4.9999	-206.7809	-62.2792	-0.9977		45	80.3918	91.0611	246.4005	-143.9928	-84.3923	-228.7251
54	170.2414	69.5580	-0.5441	-162.3053	-49.0805	11.1863		46	134.3195	85.2081	231.8712	-178.3075	-74.7299	-205.8138
55	127.6299	57.1154	-12.3584	85.3760	-41.3839	80.3803		47	166.3500	75.8317	209.5371	-202.7490	-65.1794	-182.8387
56	-36.1894	49.2137	-59.2128	68.5138	-39.4060	77.9595		48	188.7341	66.5651	187.1693	-217.1126	-55.7468	-159.7779
57	-33.1645	45.4761	-63.3495	50.4714	-37.8117	75.9515		49	201.3008	57.4269	164.7477	-240.5171	-50.7563	-147.0720
58	-59.3643	43.3100	-87.9765	30.3866	-36.6300	74.3030		50	223.2165	52.7558	152.7161	-236.7338	-41.7990	-124.5794
59	-35.8110	42.5425	-86.6312	7.3842	-35.8717	72.9577		51	218.3045	44.1147	130.9345	-223.3501	-33.0434	-102.0026
60	-8.7601	42.1974	-85.5321	-21.8391	-42.2021	85.5321		52	204.1770	35.7089	109.1081	-200.6265	-24.5566	-79.3443
								53	181.1337	27.5769	87.2422	-198.7129	-20.9115	-69.5667
								54	179.3465	24.2963	78.3008	-164.0933	-13.4461	-49.2624
								55	145.3317	17.2017	58.8793	-172.3983	-0.6923	-15.3875
								56	154.7407	4.8144	25.9357	-64.3044	3.2898	-7.6852
								57	48.2718	1.2273	19.2162	-7.0958	4.0156	-6.4119
ENVOL. MAX. TORSORES -EC1														
Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2								

58	32.8698	-0.5389	14.1077	-4.1847	4.0160	-6.4119
59	18.8931	-1.9110	10.0914	-1.2736	4.0156	-6.4119
60	7.1805	-2.8882	7.2244	1.6371	4.0149	-6.4119

ENVOL. MIN. FLECTORES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	-104.3351	116.0440	362.9391	29.1457	-1.3287	-72.2141
2	-32.1157	-14.5089	38.8728	42.6843	14.6144	-38.4760
3	-42.8401	-14.9284	37.3070	66.2202	37.1631	65.4226
4	-66.2200	-37.1634	-65.4226	93.1616	37.1626	65.4225
5	-93.1937	-37.2522	-66.3319	120.2022	37.2529	66.3319
6	-120.2025	-37.2600	-66.3320	147.2163	37.2587	66.3320
7	-147.2154	-37.2501	-66.3319	174.2194	37.2476	66.3319
8	-174.2196	-37.2453	-66.3320	201.2238	37.2441	66.3320
9	-201.2291	-37.2423	-66.3319	228.2307	37.2418	66.3319
10	-228.2319	-37.2403	-66.3319	255.2343	37.2372	66.3319
11	-255.2392	-37.2255	-66.3320	282.2257	37.2229	66.3320
12	-282.2230	-37.2147	-66.3320	309.2042	37.2118	66.3320
13	-309.2095	-37.2482	-67.1303	336.2154	37.2499	67.1303
14	-336.2180	-37.2478	-67.1304	363.2247	37.2465	67.1306
15	-363.2249	-37.2340	-67.1306	390.2178	37.2283	67.1306
16	-390.2181	-37.2271	-67.1306	425.9628	63.4494	116.6122
17	-427.1509	-72.3736	-94.3209	482.8522	81.9169	115.1000
18	-491.0354	-104.4433	-65.4412	567.6185	114.6064	86.6394
19	-574.9283	-136.1442	-43.0327	674.9392	161.1083	94.8735
20	-679.8120	-173.4570	-70.7242	924.4847	54.1502	-152.4739
21	-854.5023	114.9776	-113.3768	672.4568	-247.4146	-228.0414
22	-676.8268	231.4990	257.9580	473.9216	-165.6589	-104.8989
23	-480.3574	151.3000	130.5070	351.6920	-125.8905	-82.2008
24	-363.7567	102.8055	121.6212	276.2023	-49.0408	85.1238
25	-285.4481	29.7876	-51.2507	257.1538	-29.7880	51.2507
26	-263.1801	18.2598	-56.5742	245.8341	-18.2618	56.5742
27	-245.8609	18.2297	-55.7154	228.5446	-18.2296	55.7154
28	-228.5428	18.2293	-55.7153	218.9520	-9.4353	54.1791
29	-218.9526	9.4257	-54.1791	209.9983	-9.4230	54.1791
30	-210.0006	9.4249	-54.1791	204.0015	-0.4580	58.5656
31	-203.9982	0.4517	-58.5656	208.2074	8.5345	52.8706
32	-208.2077	-8.5404	-52.8708	216.3196	8.5406	52.8708
33	-216.3233	-8.5435	-52.8708	224.4411	8.5446	52.8708
34	-224.4381	-8.5405	-52.8708	232.5501	8.5406	52.8708
35	-232.5806	-8.5902	-52.4674	240.7425	8.5903	52.4674
36	-240.7932	-8.8977	-50.0100	249.2434	8.8964	50.0100
37	-262.2534	-40.0473	-2.2632	304.5740	93.8975	136.6682
38	-318.2678	-82.9781	6.3885	437.3735	129.8213	107.2419
39	-445.7976	-150.1393	-64.9420	592.5552	176.3562	-15.1463
40	-601.0407	-192.0732	46.4977	878.8783	91.0983	-139.0518
41	-811.3965	64.9835	-128.5289	718.6918	-223.2651	-130.4245
42	-723.2881	211.0594	152.6971	574.1591	-198.5595	-108.5329
43	-581.3450	182.1614	135.4787	494.3706	-77.5175	133.9226
44	-502.7556	56.4553	-104.2920	461.8266	-56.4446	104.2920
45	-468.3391	42.2737	-86.4409	437.6919	-42.2701	86.4410
46	-437.6928	42.2703	-86.4410	407.0428	-42.2758	86.4412
47	-407.0424	42.2734	-86.4412	376.3977	-42.2541	86.4412
48	-376.4012	42.2431	-86.4412	345.7902	-42.2189	86.4412
49	-345.7903	42.2133	-86.4412	315.1848	-42.2055	86.4412
50	-315.1806	42.1994	-86.4412	284.5915	-42.2006	86.4414

51	-284.5898	42.1999	-86.4414	253.9999	-42.1949	86.4415
52	-253.9982	42.1924	-86.4415	223.4127	-42.1657	86.4415
53	-223.4131	42.1635	-86.4415	192.8491	-42.1464	86.4415
54	-192.8496	42.1432	-86.4415	162.2925	-42.1439	86.4415
55	-162.2943	42.1371	-86.4415	131.7456	-42.1508	86.4415
56	-131.7564	42.1110	-85.7875	101.2284	-42.1123	85.7875
57	-101.2277	42.1091	-85.7875	70.7110	-42.0944	85.7875
58	-70.7113	42.0932	-85.7875	40.4661	-41.6241	82.1149
59	-40.4656	41.6253	-82.1149	10.6967	-19.2799	17.0581
60	-13.4166	1.1139	45.1752	42.0340	49.7154	-135.8658

ENVOL. MIN. CORTANTES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
1	19.9733	-31.2548	-78.2324	5.1054	37.9256	64.5589
2	2.5541	-27.9150	-66.1297	20.9881	39.0845	63.8026
3	-9.6656	-29.2095	-62.7967	30.7899	41.0570	62.4987
4	-20.0191	-30.8967	-58.5494	36.2327	43.8371	60.7613
5	-9.4830	-34.0777	-54.7009	39.0259	47.4184	58.7029
6	-0.7779	-40.0865	-38.4354	-94.5790	58.1595	9.4168
7	112.9899	-54.3372	-16.4265	-136.5799	73.7847	16.0811
8	155.6825	-70.3381	-22.3862	-102.2724	77.0087	8.7127
9	121.5866	-73.9326	-14.3594	-128.5853	94.0809	12.7157
10	147.6553	-91.3548	-17.7484	-146.0740	111.9855	15.8249
11	164.4715	-109.5990	-20.2854	-120.7229	116.6039	3.7529
12	138.0543	-114.5546	-7.6806	-74.6865	135.3573	9.8222
13	90.6000	-133.6366	-13.2540	-53.7235	155.2908	15.4031
14	67.9047	-153.8664	-18.3739	-17.9123	176.1005	23.7178
15	30.0892	-174.9681	-26.2597	101.4177	184.1878	15.2577
16	-91.4653	-183.3235	-17.4008	169.5936	203.5630	23.5686
17	-162.0405	-202.9514	-25.3405	271.8372	227.4655	19.6559
18	-266.7997	-227.0836	-21.0817	423.1498	254.3170	48.0362
19	-420.6873	-254.1541	-49.1387	607.3676	260.8229	35.4652
20	-607.3682	-260.8213	-35.4652	672.9494	217.3708	36.9556
21	-203.1122	-79.8201	-139.3380	-83.1443	23.8461	28.6879
22	87.1049	-7.2705	-22.9993	-71.8945	24.7503	28.2433
23	84.0602	-8.8756	-22.2336	-67.3263	26.3550	27.4778
24	87.4713	-11.2617	-21.2174	-68.4701	28.7415	26.4614
25	96.0851	-14.5006	-20.0205	-133.7552	33.1050	-3.5225
26	168.0773	-19.7752	10.0731	-231.5211	42.1603	7.0202
27	271.5769	-29.7932	-0.4306	-282.9722	52.8182	4.3593
28	327.6166	-41.4494	2.1991	-327.5413	64.9062	2.2277
29	375.5052	-54.5591	4.2288	-361.7220	78.3667	0.6998
30	411.6485	-69.0668	5.5842	-382.1389	93.1560	-0.1532
31	432.6158	-84.8984	6.1942	-343.6670	102.3715	-0.9501
32	393.2867	-95.1500	6.6771	-330.1576	119.4372	-0.7444
33	324.2862	-116.1676	-4.5225	-260.2268	140.5400	6.8251
34	281.4521	-138.1059	-11.3196	-195.7368	162.3336	13.7308
35	214.3870	-160.3707	-17.5360	-148.2459	177.0385	5.4707
36	181.6673	-173.7237	-1.7028	-34.5292	197.9848	9.6433
37	61.4032	-195.5282	-6.5422	107.3911	219.5675	14.9848
38	-51.5217	-218.5014	-40.0347	261.4323	247.6255	63.2482
39	-257.0836	-247.2896	-64.6497	492.8270	276.2310	88.1137
40	-492.4261	-276.2021	-89.0003	700.2260	233.5819	38.1485
41	-327.9651	-80.8881	-194.2893	-98.1579	7.4545	-12.6448
42	101.4184	-1.2358	1.0617	-98.1057	7.9061	-14.7352
43	103.7838	-1.9180	4.0457	-99.9756	8.5888	-17.7192

44	108.0003	-2.8459	7.9007	-118.2070	10.8546	-24.8399
45	121.0856	-4.9027	22.9546	-163.2507	15.5038	-15.0896
46	150.9981	-8.7353	35.7182	-177.5923	18.0780	-16.8854
47	156.3408	-10.5188	42.0255	-241.0339	26.3723	-23.2583
48	271.2630	-16.7992	29.3534	-303.4297	35.9020	-28.9820
49	336.5714	-26.9946	35.1243	-362.0881	46.6770	-33.7717
50	397.4310	-38.4404	39.8868	-364.7261	51.7788	-35.8848
51	401.4923	-44.2453	41.8947	-409.0874	64.4631	-39.5755
52	446.4153	-57.6528	45.3967	-442.4217	78.3786	-42.0034
53	479.4083	-72.3109	47.5474	-422.1519	85.6402	-43.5454
54	457.8174	-80.3227	48.7195	-428.9013	101.4642	-44.1481
55	462.2422	-96.9250	48.8548	-417.3341	118.4491	-43.0013
56	447.2799	-114.7164	47.1378	-384.8245	136.5861	-39.8982
57	410.2910	-133.6402	43.3579	-308.5617	146.9860	-39.3558
58	328.4459	-144.8497	42.0267	-232.5640	166.9871	-33.2965
59	245.7234	-165.6722	35.0643	-128.9275	188.0245	-24.7434
60	135.0122	-187.4431	26.4046	5.7214	200.7827	-22.4027

ENVOL. MIN. TORSORES -EC1

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	2.4394	-12.2661	-9.5551	8.3861	16.0485	20.9348
2	-6.4539	-12.2665	-9.5551	17.2518	16.3108	22.5400
3	-15.3477	-12.2665	-9.5551	-1.0450	12.9554	24.7297
4	16.3151	-1.6424	-12.3466	-1.5379	14.0479	27.2397
5	12.7900	-8.8792	-12.6115	-23.9313	17.9558	32.8623
6	43.1897	-5.1466	-19.7024	-45.7154	22.4500	42.5712
7	61.2734	-18.0869	-29.1753	-67.5730	27.7908	53.9381
8	30.6986	-33.5592	-48.1321	-64.7930	30.4917	58.9086
9	6.3685	-33.5569	-48.1321	-87.6750	38.2761	70.9560
10	20.7681	-42.5517	-70.0157	-35.1286	52.0943	90.7949
11	35.1286	-52.0943	-90.7949	-86.4790	50.1839	91.9213
12	-2.6406	-52.0955	-90.7948	-2.9400	62.2598	111.9929
13	2.9400	-62.2598	-111.9929	-5.1712	73.1011	135.3219
14	5.1712	-73.1011	-135.3219	-2.2288	84.6723	161.1622
15	2.2288	-84.6723	-161.1622	61.3914	87.2185	163.8337
16	-61.3914	-87.2185	-163.8337	78.0063	96.9973	189.8663
17	-78.0063	-96.9973	-189.8663	106.0512	110.0777	221.7532
18	-106.0512	-110.0777	-221.7532	144.7717	123.9161	257.1067
19	-144.7717	-123.9161	-257.1067	259.7901	125.0731	258.3996
20	-259.7901	-125.0731	-258.3996	281.6110	100.9825	221.1671
21	-189.1567	-56.7753	-157.2213	207.4807	-15.1472	31.8533
22	-207.4807	15.1472	-31.8533	184.7933	-14.5144	35.8358
23	-184.7933	14.5144	-35.8358	154.3054	-13.1453	41.4698
24	-154.3054	13.1453	-41.4698	116.9984	-10.9470	48.8318
25	-116.9984	10.9470	-48.8318	74.2434	-7.8481	57.9990
26	-74.2434	7.8481	-57.9990	27.7381	-3.7927	69.0488
27	-27.7381	3.7927	-69.0488	-20.5429	1.2801	82.0576
28	20.5429	-1.2801	-82.0576	-68.4148	7.4023	97.1037
29	68.4148	-7.4023	-97.1037	-113.5392	14.5912	114.2634
30	113.5392	-14.5912	-114.2634	-153.4797	22.8718	133.6144
31	153.4797	-22.8718	-133.6144	-131.7546	22.8710	133.6146
32	131.7546	-22.8710	-133.6146	-155.1517	32.2322	155.2334
33	155.1517	-32.2322	-155.2334	-167.1290	42.5418	179.3067
34	167.1290	-42.5418	-179.3067	-166.2734	54.1931	205.3599
35	166.2734	-54.1931	-205.3599	-149.5997	67.1256	233.4680
36	149.5997	-67.1256	-233.4680	-114.3146	81.3208	263.7181

37	114.3146	-81.3208	-263.7181	-57.9716	96.6627	296.2092
38	57.9716	-96.6627	-296.2092	21.4214	113.0277	331.0522
39	-21.4214	-113.0277	-331.0522	125.3510	130.3155	368.3697
40	-125.3510	-130.3155	-368.3697	268.8126	103.3874	293.4731
41	-299.8135	-61.8393	-233.7996	331.7889	-25.3060	63.0872
42	-331.7889	25.3060	-63.0872	313.4422	-25.3064	63.0873
43	-313.4422	25.3064	-63.0873	289.9089	-24.9926	68.3835
44	-289.9089	24.9926	-68.3835	256.0432	-23.7742	75.3804
45	-256.0432	23.7742	-75.3804	212.5433	-21.5561	84.1756
46	-212.5433	21.5561	-84.1756	196.9063	-21.5686	84.1756
47	-196.9063	21.5686	-84.1756	147.2589	-18.2205	94.8818
48	-147.2589	18.2205	-94.8818	91.4282	-13.6856	107.6279
49	-91.4282	13.6856	-107.6279	31.2924	-7.8581	122.5617
50	-31.2924	7.8581	-122.5617	25.5942	-7.8542	122.5618
51	-25.5942	7.8542	-122.5618	-31.5156	-0.6397	139.7786
52	31.5156	0.6397	-139.7786	-87.3284	8.0456	159.3878
53	87.3284	-8.0456	-159.3878	-81.4946	8.0432	159.3882
54	81.4946	-8.0432	-159.3882	-125.7166	18.2375	181.5983
55	125.7166	-18.2375	-181.5983	-161.5122	30.0092	206.6499
56	161.5122	-30.0092	-206.6499	-185.6010	43.3234	234.8186
57	185.6010	-43.3234	-234.8186	-154.1903	43.3276	234.8188
58	154.1903	-43.3276	-234.8188	-152.4371	58.2168	266.4160
59	152.4371	-58.2168	-266.4160	-131.1693	74.6540	301.7820
60	131.1693	-74.6540	-301.7820	-77.0493	74.6491	301.7820

4 **PRETENSADO**

4.1 **TRAZADO**

El trazado del pretensado en alzado se define en los planos del proyecto mediante una sucesión de tramos formados por recta y parábolas con continuidad en la pendiente. En planta el trazado puede ser recto o curvo, permitiéndose variaciones del radio de curvatura.

Los 2 extremos del trazado son anclajes de tipo activo.

4.2 **CÁLCULO DEL PRETENSADO**

El cálculo de la fuerza de pretensado se realiza con un programa de cálculo automático que considera las pérdidas de tensión instantáneas y diferidas, de acuerdo con la normativa vigente (EHE). El programa calcula, además, un sistema de fuerzas equivalentes a la introducción del pretensado en la estructura, para su consideración en el modelo de análisis estructural del tablero.

El programa permite la determinación de las pérdidas de la fuerza de pretensado asociadas a los siguientes aspectos:

Pérdidas instantáneas

- a.- Pérdidas por rozamiento.
- b.- Pérdidas de penetración de cuña en anclajes.
- c.- Pérdidas por acortamiento elástico del hormigón.

Pérdidas diferidas

- d.- Pérdidas por retracción del hormigón.
- e.- Pérdidas por fluencia del hormigón.
- f.- Pérdidas por relajación del acero de pretensado.

CÁLCULO ESTRUCTURAL

La acción del pretensado sobre la estructura se realiza considerándolo como un sistema de fuerzas equivalentes, constituido por las fuerzas de anclaje y las de interacción (de desviación o repartidas).

Los resultados del programa de cálculo del pretensado son los siguientes:

- a. Definición del trazado del pretensado, mediante su excentricidad y cotas respecto a la fibra superior e inferior del elemento.
- b. Listados de tensiones en los cables y de las pérdidas instantáneas y diferidas en cada punto.

- c. Longitud afectada por la penetración de las cuñas en anclajes.
- d. Alargamiento de los cables al tesar.

- e. Fuerzas equivalentes del pretensado en los nudos de los elementos por los que pasan los cables del pretensado.
- f. Esfuerzos isostáticos de pretensado en los nudos de los elementos atravesados por el trazado.

Al igual que con cualquier estado de cargas introducido en el programa general de análisis estructural, posteriormente se obtienen las reacciones, desplazamientos, esfuerzos y tensiones en todo punto de la estructura.

PEDELTA, S.L.- INGENIERIA DE ESTRUCTURAS, BARCELONA

ENERO 2002

Pag. 1

Referencia del Proyecto:

PASO INFERIOR RIERA DE TORRELLES

PROGRAMA DE CALCULO DE PRETENSADO EN NERVIOS DE UN EMPARRILLADO

DATOS GENERALES DE PRETENSADO

NUMERO DE NERVIOS = 1
NUMERO DE VANOS = 3
NUMERO DE SECCIONES POR VANO = 21
NUMERO DE MATERIALES = 3
LUZ DEL VANO = 1 L (m) = 14.50
LUZ DEL VANO = 2 L (m) = 19.00
LUZ DEL VANO = 3 L (m) = 14.50

COEFICIENTE DE ROZAMIENTO EN CURVA = 0.21
COEFICIENTE DE DESV. PARASITAS = 0.0060
RELAJACION = 0.04
RETRACCION mm/m = 0.250
COEF. FLUENCIA = 1.900

ACERO DE PRETENSADO (Kp/mm2)

LIMITE DE PROPORCIONALIDAD AL 0,2% = 170.00
TENSION DE ROTURA = 190.00
MODULO DE DEFORMACION = 19000.00

HORMIGON

MODULO DE DEFORMACION DURANTE TESADO (Kp/cm2) = 297000.00
MODULO DE DEFORMACION A 28 DIAS (Kp/cm2) = 320000.00

CARACTERISTICAS MECANICAS DE LA SECCION 1

AREA DE LA SECCION (m2) = 8.666
INERCIA DE LA SECCION (m2) = 1.1213
V_SUP. DE LA SECCION (m2) = 0.52
V_INF. DE LA SECCION (m2) = 0.72
CANTO DE LA SECCION (m2) = 1.24

CARACTERISTICAS MECANICAS DE LA SECCION 2

AREA DE LA SECCION (m2) = 10.590
INERCIA DE LA SECCION (m2) = 1.2275
V_SUP. DE LA SECCION (m2) = 0.55
V_INF. DE LA SECCION (m2) = 0.69
CANTO DE LA SECCION (m2) = 1.24

CARACTERISTICAS MECANICAS DE LA SECCION 3

AREA DE LA SECCION (m2) = 1.000
INERCIA DE LA SECCION (m2) = 1.0000
V_SUP. DE LA SECCION (m2) = 0.55
V_INF. DE LA SECCION (m2) = 0.55
CANTO DE LA SECCION (m2) = 1.10

DEFINICION DEL TRAZADO DEL NERVIO = 1 VANO = 1

Parametros de la parabola = 1
 A = 0.00000 B = -0.06429 C = -0.62500
 Origen = 0.00 Final = 1.20

Parametros de la parabola = 2
 A = 0.00699 B = -0.08106 C = -0.61494
 Origen = 1.20 Final = 5.80

Parametros de la parabola = 4
 A = 0.00515 B = -0.05970 C = -0.67687
 Origen = 5.80 Final = 12.50

Parametros de la parabola = 5
 A = -0.01724 B = 0.50000 C = -4.17500
 Origen = 12.50 Final = 14.50

(origen en inicio vano)

DEFINICION DEL TRAZADO DEL NERVIO = 1 VANO = 2

Parametros de la parabola = 2
 A = -0.02763 B = 0.00000 C = -0.55000
 Origen = 0.00 Final = 2.00

Parametros de la parabola = 3
 A = 0.00737 B = -0.14000 C = -0.41000
 Origen = 2.00 Final = 9.50

Parametros de la parabola = 5
 A = 0.00737 B = -0.14000 C = -0.41000
 Origen = 9.50 Final = 17.00

Parametros de la parabola = 6
 A = -0.02763 B = 1.05000 C = -10.52500
 Origen = 17.00 Final = 19.00

(origen en inicio vano)

DEFINICION DEL TRAZADO DEL NERVIO = 1 VANO = 3

Parametros de la parabola = 2
 A = -0.01724 B = 0.00000 C = -0.55000
 Origen = 0.00 Final = 2.00

Parametros de la parabola = 3
 A = 0.00515 B = -0.08955 C = -0.46045
 Origen = 2.00 Final = 8.70

Parametros de la parabola = 5
 A = 0.00699 B = -0.12158 C = -0.32111
 Origen = 8.70 Final = 13.30

Parametros de la parabola = 6
 A = 0.00000 B = 0.06429 C = -1.55714
 Origen = 13.30 Final = 14.50

(origen en inicio vano)

DEFINICION DEL TRAZADO DEL NERVIO= 1

I	S	Ysup	Yinf	EXC	ALPHA_IZ	ALPHA_DE	CURV
1	0.000	-0.625	0.615	-0.077	0.0000	0.8468	0.0000
2	0.725	-0.672	0.568	-0.124	0.0000	0.8468	0.0000
3	1.450	-0.718	0.522	-0.201	0.0035	0.8433	0.0140
4	2.175	-0.758	0.482	-0.241	0.0136	0.8332	0.0140
5	2.900	-0.791	0.449	-0.274	0.0238	0.8230	0.0140

6	3.625	-0.817	0.423	-0.300	0.0339	0.8129	0.0140
7	4.350	-0.835	0.405	-0.318	0.0440	0.8028	0.0140
8	5.075	-0.846	0.394	-0.329	0.0542	0.7926	0.0140
9	5.800	-0.850	0.390	-0.333	0.0643	0.7825	0.0140
10	6.525	-0.847	0.393	-0.330	0.0718	0.7750	0.0103
11	7.250	-0.839	0.401	-0.322	0.0792	0.7676	0.0103
12	7.975	-0.826	0.414	-0.309	0.0867	0.7601	0.0103
13	8.700	-0.807	0.433	-0.290	0.0941	0.7527	0.0103
14	9.425	-0.782	0.458	-0.265	0.1016	0.7452	0.0103
15	10.150	-0.753	0.487	-0.236	0.1091	0.7377	0.0103
16	10.875	-0.717	0.523	-0.200	0.1165	0.7303	0.0103
17	11.600	-0.677	0.563	-0.160	0.1240	0.7228	0.0103
18	12.325	-0.631	0.609	-0.114	0.1315	0.7153	0.0103
19	13.050	-0.586	0.654	-0.038	0.1522	0.6945	-0.0345
20	13.775	-0.559	0.681	-0.011	0.1773	0.6695	-0.0345
21	14.500	-0.550	0.690	-0.002	0.2023	0.6445	-0.0553
22	15.450	-0.575	0.665	-0.027	0.2548	0.5920	-0.0553
23	16.400	-0.650	0.590	-0.133	0.3073	0.5395	-0.0553
24	17.350	-0.749	0.491	-0.232	0.3253	0.5215	0.0147
25	18.300	-0.836	0.404	-0.319	0.3393	0.5075	0.0147
26	19.250	-0.909	0.331	-0.392	0.3533	0.4935	0.0147
27	20.200	-0.969	0.271	-0.452	0.3673	0.4795	0.0147
28	21.150	-1.015	0.225	-0.498	0.3813	0.4654	0.0147
29	22.100	-1.048	0.192	-0.531	0.3953	0.4515	0.0147
30	23.050	-1.068	0.172	-0.551	0.4094	0.4374	0.0147
31	24.000	-1.075	0.165	-0.558	0.4233	0.4234	0.0147
32	24.950	-1.068	0.172	-0.551	0.4373	0.4095	0.0147
33	25.900	-1.048	0.192	-0.531	0.4514	0.3954	0.0147
34	26.850	-1.015	0.225	-0.498	0.4654	0.3814	0.0147
35	27.800	-0.969	0.271	-0.452	0.4793	0.3675	0.0147
36	28.750	-0.909	0.331	-0.392	0.4934	0.3534	0.0147
37	29.700	-0.836	0.404	-0.319	0.5074	0.3394	0.0147
38	30.650	-0.749	0.491	-0.232	0.5214	0.3254	0.0147
39	31.600	-0.650	0.590	-0.133	0.5395	0.3073	-0.0553
40	32.550	-0.575	0.665	-0.027	0.5920	0.2548	-0.0553
41	33.500	-0.550	0.690	-0.002	0.6445	0.2023	-0.0345
42	34.225	-0.559	0.681	-0.011	0.6695	0.1773	-0.0345
43	34.950	-0.586	0.654	-0.069	0.6945	0.1523	-0.0345
44	35.675	-0.631	0.609	-0.114	0.7153	0.1315	0.0103
45	36.400	-0.677	0.563	-0.160	0.7228	0.1240	0.0103
46	37.125	-0.717	0.523	-0.200	0.7302	0.1166	0.0103
47	37.850	-0.753	0.487	-0.236	0.7377	0.1091	0.0103
48	38.575	-0.782	0.458	-0.265	0.7452	0.1016	0.0103
49	39.300	-0.807	0.433	-0.290	0.7526	0.0942	0.0103
50	40.025	-0.826	0.414	-0.309	0.7601	0.0867	0.0103
51	40.750	-0.839	0.401	-0.322	0.7676	0.0792	0.0103
52	41.475	-0.847	0.393	-0.330	0.7750	0.0718	0.0103
53	42.200	-0.850	0.390	-0.333	0.7825	0.0643	0.0140
54	42.925	-0.846	0.394	-0.329	0.7926	0.0542	0.0140
55	43.650	-0.835	0.405	-0.318	0.8028	0.0440	0.0140
56	44.375	-0.817	0.423	-0.300	0.8129	0.0339	0.0140
57	45.100	-0.791	0.449	-0.274	0.8230	0.0238	0.0140
58	45.825	-0.758	0.482	-0.241	0.8331	0.0136	0.0140
59	46.550	-0.718	0.522	-0.170	0.8433	0.0035	0.0140
60	47.275	-0.672	0.568	-0.124	0.8468	0.0000	0.0000
61	48.000	-0.625	0.615	-0.077	0.8468	0.0000	0.0000

SECCIONES INICIAL Y FINAL DEL TRAZADO = 1 61

NUMERO DE VANOS INICIAL Y FINAL DEL TRAZADO = 1 3
PENDIENTE INICIAL DEL TRAZADO = -0.06429
PENDIENTE FINAL DEL TRAZADO = 0.06429

ETAPA DE TESADO INICIAL

PRETENSADO EN EL NERVIO = 1

NUMERO DE CABLES = 12

TENSION EN ANCLAJE IZQUIERDO (Kp/mm2) = 142.50

TESAMOS POR LA IZQUIERDA (SI=1) = 1

TENSION EN ANCLAJE DERECHO (Kp/mm2) = 142.50

TESAMOS POR LA DERECHA (SI=1) = 1

PROPORCION DE TESADO EN LA PRIMERA FASE 0.60

AREA DE PRETENSADO (cm2) = 386.40

PENETRACION DE CUNA EN EXTREMO 1 (mm) = 5.000

PENETRACION DE CUNA EN EXTREMO 2 (mm) = 5.000

LONGITUD AFECT. POR PENETRAC. DE CUNA EXTR-1 (m) = 12.60

LONGITUD AFECT. POR PENETRAC. DE CUNA EXTR-2 (m) = 12.60

TENSION EN LOS CABLES. PERDIDAS INSTANT. (Kp/mm2)

I	X	To	P_ROZ	P_CUNA	P_ELAS	Ti
1	0.00	85.50	0.00	7.54	0.88	77.08
2	0.73	85.50	0.08	7.39	1.03	77.00
3	1.45	85.50	0.22	7.11	1.34	76.84
4	2.18	85.50	0.48	6.59	1.49	76.95
5	2.90	85.50	0.74	6.07	1.63	77.07
6	3.62	85.50	0.99	5.56	1.75	77.20
7	4.35	85.50	1.25	5.04	1.85	77.36
8	5.07	85.50	1.51	4.53	1.91	77.55
9	5.80	85.50	1.76	4.02	1.94	77.78
10	6.52	85.50	1.97	3.61	1.93	78.00
11	7.25	85.50	2.18	3.19	1.89	78.24
12	7.97	85.50	2.38	2.78	1.82	78.51
13	8.70	85.50	2.59	2.37	1.74	78.81
14	9.43	85.50	2.79	1.96	1.63	79.12
15	10.15	85.50	3.00	1.55	1.51	79.44
16	10.88	85.50	3.20	1.14	1.39	79.77
17	11.60	85.50	3.41	0.73	1.27	80.09
18	12.33	85.50	3.61	0.00	1.07	80.82
19	13.05	85.50	4.04	0.00	0.88	80.58
20	13.78	85.50	4.54	0.00	0.87	80.09
21	14.50	85.50	5.04	0.00	0.86	79.60
22	15.45	85.50	6.02	0.00	0.94	78.54
23	16.40	85.50	6.98	0.00	1.17	77.35
24	17.35	85.50	7.37	0.00	1.45	76.68
25	18.30	85.50	7.70	0.00	1.82	75.99
26	19.25	85.50	8.02	0.00	2.21	75.27
27	20.20	85.50	8.34	0.00	2.60	74.56

28	21.15	85.50	8.66	0.00	2.93	73.91
29	22.10	85.50	8.97	0.00	3.18	73.34
30	23.05	85.50	9.29	0.00	3.34	72.87
31	24.00	85.50	9.60	0.00	3.38	72.52
32	24.95	85.50	9.29	0.00	3.34	72.87
33	25.90	85.50	8.97	0.00	3.18	73.34
34	26.85	85.50	8.66	0.00	2.93	73.91
35	27.80	85.50	8.34	0.00	2.60	74.56
36	28.75	85.50	8.02	0.00	2.21	75.27
37	29.70	85.50	7.70	0.00	1.82	75.99
38	30.65	85.50	7.37	0.00	1.45	76.68
39	31.60	85.50	6.98	0.00	1.06	77.46
40	32.55	85.50	6.02	0.00	0.86	78.63
41	33.50	85.50	5.04	0.00	0.86	79.60
42	34.23	85.50	4.54	0.00	0.95	80.00
43	34.95	85.50	4.04	0.00	1.10	80.35
44	35.68	85.50	3.61	0.00	1.18	80.71
45	36.40	85.50	3.41	0.73	1.27	80.09
46	37.13	85.50	3.20	1.14	1.39	79.77
47	37.85	85.50	3.00	1.55	1.51	79.44
48	38.58	85.50	2.79	1.96	1.63	79.12
49	39.30	85.50	2.59	2.37	1.74	78.81
50	40.03	85.50	2.38	2.78	1.82	78.51
51	40.75	85.50	2.18	3.19	1.89	78.24
52	41.47	85.50	1.97	3.61	1.93	78.00
53	42.20	85.50	1.76	4.02	1.94	77.78
54	42.92	85.50	1.51	4.53	1.91	77.55
55	43.65	85.50	1.25	5.04	1.85	77.36
56	44.37	85.50	0.99	5.56	1.75	77.20
57	45.10	85.50	0.74	6.07	1.63	77.07
58	45.82	85.50	0.48	6.59	1.36	77.07
59	46.55	85.50	0.22	7.11	1.04	77.13
60	47.27	85.50	0.08	7.39	0.94	77.09
61	48.00	85.50	0.00	7.54	0.88	77.08

ALARGAMIENTO DE LOS CABLES (sobre embolo)= 204.8 mm

ETAPA DE TESADO INICIAL

TENSION EN LOS CABLES. PERDIDAS DIFERIDAS (Kp/mm2)

I	S	Ti	P_RETRA	P_FLUE	P_RELAJ.
1	0.00	77.08	0.00	0.00	0.00
2	0.73	77.00	0.00	0.00	0.00
3	1.45	76.84	0.00	0.00	0.00
4	2.18	76.95	0.00	0.00	0.00
5	2.90	77.07	0.00	0.00	0.00
6	3.62	77.20	0.00	0.00	0.00
7	4.35	77.36	0.00	0.00	0.00
8	5.07	77.55	0.00	0.00	0.00
9	5.80	77.78	0.00	0.00	0.00
10	6.52	78.00	0.00	0.00	0.00
11	7.25	78.24	0.00	0.00	0.00
12	7.97	78.51	0.00	0.00	0.00
13	8.70	78.81	0.00	0.00	0.00
14	9.43	79.12	0.00	0.00	0.00
15	10.15	79.44	0.00	0.00	0.00
16	10.88	79.77	0.00	0.00	0.00
17	11.60	80.09	0.00	0.00	0.00
18	12.33	80.82	0.00	0.00	0.00
19	13.05	80.58	0.00	0.00	0.00
20	13.78	80.09	0.00	0.00	0.00
21	14.50	79.60	0.00	0.00	0.00
22	15.45	78.54	0.00	0.00	0.00
23	16.40	77.35	0.00	0.00	0.00
24	17.35	76.68	0.00	0.00	0.00
25	18.30	75.99	0.00	0.00	0.00
26	19.25	75.27	0.00	0.00	0.00
27	20.20	74.56	0.00	0.00	0.00
28	21.15	73.91	0.00	0.00	0.00
29	22.10	73.34	0.00	0.00	0.00
30	23.05	72.87	0.00	0.00	0.00
31	24.00	72.52	0.00	0.00	0.00
32	24.95	72.87	0.00	0.00	0.00
33	25.90	73.34	0.00	0.00	0.00
34	26.85	73.91	0.00	0.00	0.00
35	27.80	74.56	0.00	0.00	0.00
36	28.75	75.27	0.00	0.00	0.00
37	29.70	75.99	0.00	0.00	0.00
38	30.65	76.68	0.00	0.00	0.00
39	31.60	77.46	0.00	0.00	0.00
40	32.55	78.63	0.00	0.00	0.00
41	33.50	79.60	0.00	0.00	0.00
42	34.23	80.00	0.00	0.00	0.00
43	34.95	80.35	0.00	0.00	0.00
44	35.68	80.71	0.00	0.00	0.00
45	36.40	80.09	0.00	0.00	0.00
46	37.13	79.77	0.00	0.00	0.00
47	37.85	79.44	0.00	0.00	0.00
48	38.58	79.12	0.00	0.00	0.00
49	39.30	78.81	0.00	0.00	0.00
50	40.03	78.51	0.00	0.00	0.00
51	40.75	78.24	0.00	0.00	0.00
52	41.47	78.00	0.00	0.00	0.00
53	42.20	77.78	0.00	0.00	0.00
54	42.92	77.55	0.00	0.00	0.00

55	43.65	77.36	0.00	0.00	0.00
56	44.37	77.20	0.00	0.00	0.00
57	45.10	77.07	0.00	0.00	0.00
58	45.82	77.07	0.00	0.00	0.00
59	46.55	77.13	0.00	0.00	0.00
60	47.27	77.09	0.00	0.00	0.00
61	48.00	77.08	0.00	0.00	0.00

ETAPA DE TESADO INICIAL

TENSION EN LOS CABLES (Kp/mm2)

I	S	To	APi	Ti	APf	Tf
1	0.00	85.50	8.42	77.08	0.00	77.08
2	0.73	85.50	8.50	77.00	0.00	77.00
3	1.45	85.50	8.66	76.84	0.00	76.84
4	2.18	85.50	8.55	76.95	0.00	76.95
5	2.90	85.50	8.43	77.07	0.00	77.07
6	3.62	85.50	8.30	77.20	0.00	77.20
7	4.35	85.50	8.14	77.36	0.00	77.36
8	5.07	85.50	7.95	77.55	0.00	77.55
9	5.80	85.50	7.72	77.78	0.00	77.78
10	6.52	85.50	7.50	78.00	0.00	78.00
11	7.25	85.50	7.26	78.24	0.00	78.24
12	7.97	85.50	6.99	78.51	0.00	78.51
13	8.70	85.50	6.69	78.81	0.00	78.81
14	9.43	85.50	6.38	79.12	0.00	79.12
15	10.15	85.50	6.06	79.44	0.00	79.44
16	10.88	85.50	5.73	79.77	0.00	79.77
17	11.60	85.50	5.41	80.09	0.00	80.09
18	12.33	85.50	4.68	80.82	0.00	80.82
19	13.05	85.50	4.92	80.58	0.00	80.58
20	13.78	85.50	5.41	80.09	0.00	80.09
21	14.50	85.50	5.90	79.60	0.00	79.60
22	15.45	85.50	6.96	78.54	0.00	78.54
23	16.40	85.50	8.15	77.35	0.00	77.35
24	17.35	85.50	8.82	76.68	0.00	76.68
25	18.30	85.50	9.51	75.99	0.00	75.99
26	19.25	85.50	10.23	75.27	0.00	75.27
27	20.20	85.50	10.94	74.56	0.00	74.56
28	21.15	85.50	11.59	73.91	0.00	73.91
29	22.10	85.50	12.16	73.34	0.00	73.34
30	23.05	85.50	12.63	72.87	0.00	72.87
31	24.00	85.50	12.98	72.52	0.00	72.52
32	24.95	85.50	12.63	72.87	0.00	72.87
33	25.90	85.50	12.16	73.34	0.00	73.34
34	26.85	85.50	11.59	73.91	0.00	73.91
35	27.80	85.50	10.94	74.56	0.00	74.56
36	28.75	85.50	10.23	75.27	0.00	75.27
37	29.70	85.50	9.51	75.99	0.00	75.99
38	30.65	85.50	8.82	76.68	0.00	76.68
39	31.60	85.50	8.04	77.46	0.00	77.46
40	32.55	85.50	6.87	78.63	0.00	78.63
41	33.50	85.50	5.90	79.60	0.00	79.60
42	34.23	85.50	5.50	80.00	0.00	80.00
43	34.95	85.50	5.15	80.35	0.00	80.35
44	35.68	85.50	4.79	80.71	0.00	80.71
45	36.40	85.50	5.41	80.09	0.00	80.09
46	37.13	85.50	5.73	79.77	0.00	79.77
47	37.85	85.50	6.06	79.44	0.00	79.44
48	38.58	85.50	6.38	79.12	0.00	79.12

49	39.30	85.50	6.69	78.81	0.00	78.81
50	40.03	85.50	6.99	78.51	0.00	78.51
51	40.75	85.50	7.26	78.24	0.00	78.24
52	41.47	85.50	7.50	78.00	0.00	78.00
53	42.20	85.50	7.72	77.78	0.00	77.78
54	42.92	85.50	7.95	77.55	0.00	77.55
55	43.65	85.50	8.14	77.36	0.00	77.36
56	44.37	85.50	8.30	77.20	0.00	77.20
57	45.10	85.50	8.43	77.07	0.00	77.07
58	45.82	85.50	8.43	77.07	0.00	77.07
59	46.55	85.50	8.37	77.13	0.00	77.13
60	47.27	85.50	8.41	77.09	0.00	77.09
61	48.00	85.50	8.42	77.08	0.00	77.08

ETAPA DE TESADO INICIAL

FUERZAS EN LOS CABLES (T, m)

I	S(m)	Pi (T)	Mpi (mT)	Upi (T/m)	Pf (T)	Mpf (mT)	Upf (T/m)
1	0.00	2978.4	229.34	0.00	2978.4	229.34	0.00
2	0.73	2975.4	367.78	0.00	2975.4	367.78	0.00
3	1.45	2968.9	596.09	41.49	2968.9	596.09	41.49
4	2.18	2973.3	717.09	41.55	2973.3	717.09	41.55
5	2.90	2977.8	816.63	41.62	2977.8	816.63	41.62
6	3.62	2983.0	894.74	41.69	2983.0	894.74	41.69
7	4.35	2989.2	951.49	41.77	2989.2	951.49	41.77
8	5.07	2996.7	986.88	41.88	2996.7	986.88	41.88
9	5.80	3005.5	1000.84	42.00	3005.5	1000.84	42.00
10	6.52	3013.9	995.48	31.02	3013.9	995.48	31.02
11	7.25	3023.4	974.06	31.12	3023.4	974.06	31.12
12	7.97	3033.8	936.40	31.23	3033.8	936.40	31.23
13	8.70	3045.2	882.23	31.34	3045.2	882.23	31.34
14	9.43	3057.2	811.29	31.47	3057.2	811.29	31.47
15	10.15	3069.7	723.25	31.60	3069.7	723.25	31.60
16	10.88	3082.3	617.82	31.73	3082.3	617.82	31.73
17	11.60	3094.7	494.73	31.85	3094.7	494.73	31.85
18	12.33	3123.1	355.64	32.15	3123.1	355.64	32.15
19	13.05	3113.5	119.09	-107.36	3113.5	119.09	-107.36
20	13.78	3094.7	34.24	-106.71	3094.7	34.24	-106.71
21	14.50	3075.7	6.15	-169.98	3075.7	6.15	-169.98
22	15.45	3034.9	81.75	-167.72	3034.9	81.75	-167.72
23	16.40	2988.9	396.77	-165.17	2988.9	396.77	-165.17
24	17.35	2962.9	687.84	43.66	2962.9	687.84	43.66
25	18.30	2936.2	935.48	43.27	2936.2	935.48	43.27
26	19.25	2908.4	1139.36	42.86	2908.4	1139.36	42.86
27	20.20	2881.2	1301.14	42.46	2881.2	1301.14	42.46
28	21.15	2856.0	1422.72	42.09	2856.0	1422.72	42.09
29	22.10	2834.0	1505.98	41.76	2834.0	1505.98	41.76
30	23.05	2815.8	1552.51	41.50	2815.8	1552.51	41.50
31	24.00	2802.0	1563.54	41.29	2802.0	1563.54	41.29
32	24.95	2815.8	1552.48	41.50	2815.8	1552.48	41.50
33	25.90	2833.9	1505.95	41.76	2833.9	1505.95	41.76
34	26.85	2856.0	1422.69	42.09	2856.0	1422.69	42.09
35	27.80	2881.1	1301.10	42.46	2881.1	1301.10	42.46
36	28.75	2908.3	1139.35	42.86	2908.3	1139.35	42.86
37	29.70	2936.2	935.46	43.27	2936.2	935.46	43.27
38	30.65	2962.9	687.83	43.66	2962.9	687.83	43.66
39	31.60	2993.0	397.33	-165.41	2993.0	397.33	-165.41
40	32.55	3038.2	81.84	-167.90	3038.2	81.84	-167.90

41	33.50	3075.7	6.15	-106.06	3075.7	6.15	-106.06
42	34.23	3091.4	34.20	-106.60	3091.4	34.20	-106.60
43	34.95	3104.9	215.01	-107.07	3104.9	215.01	-107.07
44	35.68	3118.7	355.15	32.10	3118.7	355.15	32.10
45	36.40	3094.6	494.73	31.85	3094.6	494.73	31.85
46	37.13	3082.3	617.82	31.73	3082.3	617.82	31.73
47	37.85	3069.6	723.24	31.60	3069.6	723.24	31.60
48	38.58	3057.2	811.28	31.47	3057.2	811.28	31.47
49	39.30	3045.2	882.23	31.34	3045.2	882.23	31.34
50	40.03	3033.8	936.39	31.23	3033.8	936.39	31.23
51	40.75	3023.3	974.06	31.12	3023.3	974.06	31.12
52	41.47	3013.9	995.47	31.02	3013.9	995.47	31.02
53	42.20	3005.5	1000.83	42.00	3005.5	1000.83	42.00
54	42.92	2996.6	986.87	41.88	2996.6	986.87	41.88
55	43.65	2989.2	951.48	41.77	2989.2	951.48	41.77
56	44.37	2983.0	894.74	41.69	2983.0	894.74	41.69
57	45.10	2977.8	816.62	41.62	2977.8	816.62	41.62
58	45.82	2978.0	718.24	41.62	2978.0	718.24	41.62
59	46.55	2980.3	505.99	41.65	2980.3	505.99	41.65
60	47.27	2978.8	368.20	0.00	2978.8	368.20	0.00
61	48.00	2978.4	229.33	0.00	2978.4	229.33	0.00

ETAPA DE TESADO INICIAL

FUERZAS HORIZONTALES DE DESVIACION

I	S(m)	R(m)	Ti (T)	Uh(T/m)	Tf(T)	Uh(T/m)
1	0.00	0.0	2978.39	0.00	2978.39	0.00
2	0.73	0.0	2975.36	0.00	2975.36	0.00
3	1.45	0.0	2968.92	0.00	2968.92	0.00
4	2.18	0.0	2973.29	0.00	2973.29	0.00
5	2.90	0.0	2977.84	0.00	2977.84	0.00
6	3.62	0.0	2983.03	0.00	2983.03	0.00
7	4.35	0.0	2989.21	0.00	2989.21	0.00
8	5.07	0.0	2996.65	0.00	2996.65	0.00
9	5.80	0.0	3005.52	0.00	3005.52	0.00
10	6.52	0.0	3013.90	0.00	3013.90	0.00
11	7.25	0.0	3023.36	0.00	3023.36	0.00
12	7.97	0.0	3033.82	0.00	3033.82	0.00
13	8.70	0.0	3045.15	0.00	3045.15	0.00
14	9.43	0.0	3057.20	0.00	3057.20	0.00
15	10.15	0.0	3069.66	0.00	3069.66	0.00
16	10.88	0.0	3082.26	0.00	3082.26	0.00
17	11.60	0.0	3094.66	0.00	3094.66	0.00
18	12.33	0.0	3123.05	0.00	3123.05	0.00
19	13.05	0.0	3113.48	0.00	3113.48	0.00
20	13.78	0.0	3094.73	0.00	3094.73	0.00
21	14.50	0.0	3075.75	0.00	3075.75	0.00
22	15.45	0.0	3034.88	0.00	3034.88	0.00
23	16.40	0.0	2988.86	0.00	2988.86	0.00
24	17.35	0.0	2962.93	0.00	2962.93	0.00
25	18.30	0.0	2936.22	0.00	2936.22	0.00
26	19.25	0.0	2908.38	0.00	2908.38	0.00
27	20.20	0.0	2881.18	0.00	2881.18	0.00
28	21.15	0.0	2856.00	0.00	2856.00	0.00
29	22.10	0.0	2833.99	0.00	2833.99	0.00
30	23.05	0.0	2815.83	0.00	2815.83	0.00
31	24.00	0.0	2802.04	0.00	2802.04	0.00
32	24.95	0.0	2815.78	0.00	2815.78	0.00
33	25.90	0.0	2833.93	0.00	2833.93	0.00

34	26.85	0.0	2855.95	0.00	2855.95	0.00
35	27.80	0.0	2881.10	0.00	2881.10	0.00
36	28.75	0.0	2908.35	0.00	2908.35	0.00
37	29.70	0.0	2936.17	0.00	2936.17	0.00
38	30.65	0.0	2962.86	0.00	2962.86	0.00
39	31.60	0.0	2993.05	0.00	2993.05	0.00
40	32.55	0.0	3038.16	0.00	3038.16	0.00
41	33.50	0.0	3075.75	0.00	3075.75	0.00
42	34.23	0.0	3091.39	0.00	3091.39	0.00
43	34.95	0.0	3104.90	0.00	3104.90	0.00
44	35.68	0.0	3118.71	0.00	3118.71	0.00
45	36.40	0.0	3094.65	0.00	3094.65	0.00
46	37.13	0.0	3082.27	0.00	3082.27	0.00
47	37.85	0.0	3069.64	0.00	3069.64	0.00
48	38.58	0.0	3057.18	0.00	3057.18	0.00
49	39.30	0.0	3045.16	0.00	3045.16	0.00
50	40.03	0.0	3033.79	0.00	3033.79	0.00
51	40.75	0.0	3023.34	0.00	3023.34	0.00
52	41.47	0.0	3013.88	0.00	3013.88	0.00
53	42.20	0.0	3005.51	0.00	3005.51	0.00
54	42.92	0.0	2996.63	0.00	2996.63	0.00
55	43.65	0.0	2989.18	0.00	2989.18	0.00
56	44.37	0.0	2983.01	0.00	2983.01	0.00
57	45.10	0.0	2977.81	0.00	2977.81	0.00
58	45.82	0.0	2978.03	0.00	2978.03	0.00
59	46.55	0.0	2980.33	0.00	2980.33	0.00
60	47.27	0.0	2978.76	0.00	2978.76	0.00
61	48.00	0.0	2978.36	0.00	2978.36	0.00

TESADO DEFINITIVO

PRETENSADO EN EL NERVIO = 1

NUMERO DE CABLES = 12

TENSION EN ANCLAJE IZQUIERDO (Kp/mm2) = 142.50
TESAMOS POR LA IZQUIERDA (SI=1) = 1
TENSION EN ANCLAJE DERECHO (Kp/mm2) = 142.50
TESAMOS POR LA DERECHA (SI=1) = 1

PROPORCION DE TESADO EN LA PRIMERA FASE 0.60
AREA DE PRETENSADO (cm2) = 386.40
PENETRACION DE CUNA EN EXTREMO 1 (mm) = 5.000
PENETRACION DE CUNA EN EXTREMO 2 (mm) = 5.000

LONGITUD AFECT. POR PENETRAC. DE CUNA EXTR-1 (m) = 9.82
LONGITUD AFECT. POR PENETRAC. DE CUNA EXTR-2 (m) = 9.82

TENSION EN LOS CABLES. PERDIDAS INSTANT. (Kp/mm2)

I	X	To	P_ROZ	P_CUNA	P_ELAS	Ti
1	0.00	142.50	0.00	9.69	1.49	131.32

2	0.73	142.50	0.13	9.42	1.76	131.18
3	1.45	142.50	0.36	8.96	2.28	130.90
4	2.18	142.50	0.80	8.09	2.53	131.08
5	2.90	142.50	1.23	7.23	2.77	131.27
6	3.62	142.50	1.66	6.37	2.98	131.49
7	4.35	142.50	2.08	5.52	3.14	131.75
8	5.07	142.50	2.51	4.67	3.25	132.07
9	5.80	142.50	2.93	3.82	3.30	132.45
10	6.52	142.50	3.28	3.12	3.28	132.82
11	7.25	142.50	3.63	2.43	3.21	133.23
12	7.97	142.50	3.97	1.75	3.10	133.68
13	8.70	142.50	4.31	1.06	2.96	134.17
14	9.43	142.50	4.66	0.00	2.78	135.06
15	10.15	142.50	5.00	0.00	2.57	134.93
16	10.88	142.50	5.34	0.00	2.35	134.81
17	11.60	142.50	5.68	0.00	2.14	134.68
18	12.33	142.50	6.02	0.00	1.78	134.71
19	13.05	142.50	6.73	0.00	1.47	134.29
20	13.78	142.50	7.57	0.00	1.45	133.49
21	14.50	142.50	8.40	0.00	1.43	132.67
22	15.45	142.50	10.03	0.00	1.57	130.90
23	16.40	142.50	11.64	0.00	1.94	128.92
24	17.35	142.50	12.29	0.00	2.41	127.80
25	18.30	142.50	12.83	0.00	3.03	126.65
26	19.25	142.50	13.36	0.00	3.69	125.45
27	20.20	142.50	13.89	0.00	4.33	124.27
28	21.15	142.50	14.43	0.00	4.89	123.19
29	22.10	142.50	14.95	0.00	5.31	122.24
30	23.05	142.50	15.48	0.00	5.56	121.46
31	24.00	142.50	16.01	0.00	5.63	120.86
32	24.95	142.50	15.48	0.00	5.56	121.45
33	25.90	142.50	14.96	0.00	5.31	122.24
34	26.85	142.50	14.43	0.00	4.89	123.19
35	27.80	142.50	13.90	0.00	4.33	124.27
36	28.75	142.50	13.36	0.00	3.69	125.45
37	29.70	142.50	12.83	0.00	3.03	126.65
38	30.65	142.50	12.29	0.00	2.41	127.80
39	31.60	142.50	11.64	0.00	1.76	129.10
40	32.55	142.50	10.03	0.00	1.43	131.05
41	33.50	142.50	8.40	0.00	1.43	132.67
42	34.23	142.50	7.57	0.00	1.59	133.34
43	34.95	142.50	6.74	0.00	1.84	133.92
44	35.68	142.50	6.02	0.00	1.96	134.52
45	36.40	142.50	5.68	0.00	2.14	134.68
46	37.13	142.50	5.34	0.00	2.35	134.81
47	37.85	142.50	5.00	0.00	2.57	134.93
48	38.58	142.50	4.66	0.00	2.78	135.06
49	39.30	142.50	4.31	1.06	2.96	134.17
50	40.03	142.50	3.97	1.75	3.10	133.68
51	40.75	142.50	3.63	2.43	3.21	133.22
52	41.47	142.50	3.28	3.12	3.28	132.82
53	42.20	142.50	2.94	3.81	3.30	132.45
54	42.92	142.50	2.51	4.67	3.25	132.07
55	43.65	142.50	2.08	5.52	3.14	131.75
56	44.37	142.50	1.66	6.37	2.98	131.49
57	45.10	142.50	1.23	7.23	2.77	131.27
58	45.82	142.50	0.80	8.09	2.53	131.08
59	46.55	142.50	0.36	8.96	2.28	130.90
60	47.27	142.50	0.13	9.42	1.76	131.18

61 48.00 142.50 0.00 9.69 1.49 131.32

ALARGAMIENTO DE LOS CABLES (sobre embolo)= 336.2 mm

PRETENSADO EN EL NERVIO = 1

TENSION EN LOS CABLES. PERDIDAS DIFERIDAS (Kp/mm2)

I	S	Ti	P_RETRA	P_FLUE	P_RELAJ.
1	0.00	131.32	4.75	5.93	5.35
2	0.73	131.18	4.75	6.41	5.38
3	1.45	130.90	4.75	7.79	5.48
4	2.18	131.08	4.75	8.12	5.51
5	2.90	131.27	4.75	8.39	5.54
6	3.62	131.49	4.75	8.57	5.56
7	4.35	131.75	4.75	8.65	5.58
8	5.07	132.07	4.75	8.62	5.59
9	5.80	132.45	4.75	8.49	5.60
10	6.52	132.82	4.75	8.28	5.59
11	7.25	133.23	4.75	8.03	5.59
12	7.97	133.68	4.75	7.74	5.59
13	8.70	134.17	4.75	7.44	5.58
14	9.43	135.06	4.75	7.17	5.60
15	10.15	134.93	4.75	6.85	5.57
16	10.88	134.81	4.75	6.58	5.54
17	11.60	134.68	4.75	6.40	5.52
18	12.33	134.71	4.75	5.69	5.46
19	13.05	134.29	4.75	5.30	5.42
20	13.78	133.49	4.75	5.43	5.39
21	14.50	132.67	4.75	5.45	5.36
22	15.45	130.90	4.75	5.74	5.32
23	16.40	128.92	4.75	5.85	5.24
24	17.35	127.80	4.75	5.87	5.20
25	18.30	126.65	4.75	6.23	5.18
26	19.25	125.45	4.75	6.76	5.18
27	20.20	124.27	4.75	7.31	5.18
28	21.15	123.19	4.75	7.80	5.17
29	22.10	122.24	4.75	8.16	5.16
30	23.05	121.46	4.75	8.34	5.15
31	24.00	120.86	4.75	8.35	5.12
32	24.95	121.45	4.75	8.34	5.15
33	25.90	122.24	4.75	8.14	5.16
34	26.85	123.19	4.75	7.78	5.17
35	27.80	124.27	4.75	7.29	5.17
36	28.75	125.45	4.75	6.74	5.18
37	29.70	126.65	4.75	6.21	5.18
38	30.65	127.80	4.75	5.85	5.20
39	31.60	129.10	4.75	5.23	5.20
40	32.55	131.05	4.75	5.21	5.28
41	33.50	132.67	4.75	5.45	5.36
42	34.23	133.34	4.75	5.97	5.43
43	34.95	133.92	4.75	6.39	5.49
44	35.68	134.52	4.75	6.33	5.51
45	36.40	134.68	4.75	6.39	5.52
46	37.13	134.81	4.75	6.57	5.54
47	37.85	134.93	4.75	6.83	5.56
48	38.58	135.06	4.75	7.15	5.59
49	39.30	134.17	4.75	7.42	5.58
50	40.03	133.68	4.75	7.72	5.58
51	40.75	133.22	4.75	8.01	5.59
52	41.47	132.82	4.75	8.26	5.59
53	42.20	132.45	4.75	8.48	5.60
54	42.92	132.07	4.75	8.61	5.59

55	43.65	131.75	4.75	8.64	5.58
56	44.37	131.49	4.75	8.56	5.56
57	45.10	131.27	4.75	8.38	5.54
58	45.82	131.29	4.75	7.40	5.46
59	46.55	131.40	4.75	6.10	5.36
60	47.27	131.34	4.75	5.86	5.34
61	48.00	131.32	4.75	5.69	5.33

TENSION EN LOS CABLES (Kp/mm2)

I	S	To	APi	Ti	APf	Tf
1	0.00	142.50	11.18	131.32	16.03	115.29
2	0.73	142.50	11.32	131.18	16.54	114.64
3	1.45	142.50	11.60	130.90	18.01	112.88
4	2.18	142.50	11.42	131.08	18.38	112.70
5	2.90	142.50	11.23	131.27	18.68	112.59
6	3.62	142.50	11.01	131.49	18.88	112.61
7	4.35	142.50	10.75	131.75	18.98	112.77
8	5.07	142.50	10.43	132.07	18.96	113.11
9	5.80	142.50	10.05	132.45	18.84	113.62
10	6.52	142.50	9.68	132.82	18.62	114.19
11	7.25	142.50	9.27	133.23	18.37	114.86
12	7.97	142.50	8.82	133.68	18.08	115.60
13	8.70	142.50	8.33	134.17	17.77	116.40
14	9.43	142.50	7.44	135.06	17.52	117.54
15	10.15	142.50	7.57	134.93	17.17	117.77
16	10.88	142.50	7.69	134.81	16.87	117.94
17	11.60	142.50	7.82	134.68	16.67	118.01
18	12.33	142.50	7.79	134.71	15.91	118.80
19	13.05	142.50	8.21	134.29	15.47	118.83
20	13.78	142.50	9.01	133.49	15.57	117.91
21	14.50	142.50	9.83	132.67	15.56	117.10
22	15.45	142.50	11.60	130.90	15.81	115.10
23	16.40	142.50	13.58	128.92	15.84	113.07
24	17.35	142.50	14.70	127.80	15.82	111.98
25	18.30	142.50	15.85	126.65	16.17	110.48
26	19.25	142.50	17.05	125.45	16.69	108.76
27	20.20	142.50	18.23	124.27	17.24	107.03
28	21.15	142.50	19.31	123.19	17.72	105.47
29	22.10	142.50	20.26	122.24	18.07	104.17
30	23.05	142.50	21.04	121.46	18.24	103.22
31	24.00	142.50	21.64	120.86	18.22	102.64
32	24.95	142.50	21.05	121.45	18.23	103.22
33	25.90	142.50	20.26	122.24	18.06	104.18
34	26.85	142.50	19.31	123.19	17.70	105.48
35	27.80	142.50	18.23	124.27	17.22	107.05
36	28.75	142.50	17.05	125.45	16.66	108.78
37	29.70	142.50	15.85	126.65	16.14	110.50
38	30.65	142.50	14.70	127.80	15.80	112.00
39	31.60	142.50	13.40	129.10	15.18	113.92
40	32.55	142.50	11.45	131.05	15.24	115.80
41	33.50	142.50	9.83	132.67	15.56	117.10
42	34.23	142.50	9.16	133.34	16.15	117.19
43	34.95	142.50	8.58	133.92	16.63	117.30
44	35.68	142.50	7.98	134.52	16.59	117.93
45	36.40	142.50	7.82	134.68	16.66	118.02
46	37.13	142.50	7.69	134.81	16.86	117.96
47	37.85	142.50	7.57	134.93	17.15	117.79

48	38.58	142.50	7.44	135.06	17.50	117.56
49	39.30	142.50	8.33	134.17	17.75	116.42
50	40.03	142.50	8.82	133.68	18.06	115.62
51	40.75	142.50	9.28	133.22	18.35	114.88
52	41.47	142.50	9.68	132.82	18.61	114.21
53	42.20	142.50	10.05	132.45	18.82	113.63
54	42.92	142.50	10.43	132.07	18.95	113.12
55	43.65	142.50	10.75	131.75	18.97	112.79
56	44.37	142.50	11.01	131.49	18.87	112.62
57	45.10	142.50	11.23	131.27	18.67	112.60
58	45.82	142.50	11.21	131.29	17.62	113.67
59	46.55	142.50	11.10	131.40	16.21	115.19
60	47.27	142.50	11.16	131.34	15.95	115.39
61	48.00	142.50	11.18	131.32	15.76	115.56

FUERZAS EN LOS CABLES (T, m)

I	S(m)	Pi (T)	Mpi (mT)	Upi (T/m)	Pf (T)	Mpf (mT)	Upf (T/m)
1	0.00	5074.3	390.72	0.00	4454.9	343.03	0.00
2	0.73	5069.0	626.56	0.00	4429.8	547.56	0.00
3	1.45	5057.8	1015.49	70.68	4361.8	875.74	60.96
4	2.18	5064.9	1221.54	70.78	4354.5	1050.23	60.86
5	2.90	5072.3	1390.99	70.89	4350.5	1193.05	60.80
6	3.62	5080.8	1523.95	71.00	4351.1	1305.10	60.81
7	4.35	5090.9	1620.49	71.15	4357.6	1387.07	60.90
8	5.07	5103.3	1680.64	71.32	4370.5	1439.33	61.08
9	5.80	5118.0	1704.30	71.53	4390.1	1461.91	61.35
10	6.52	5132.0	1695.07	52.83	4412.4	1457.38	45.42
11	7.25	5147.8	1658.52	52.99	4438.2	1429.89	45.68
12	7.97	5165.4	1594.30	53.17	4466.9	1378.71	45.98
13	8.70	5184.4	1502.00	53.36	4497.6	1303.04	46.30
14	9.43	5218.8	1384.90	53.72	4541.8	1205.26	46.75
15	10.15	5213.9	1228.45	53.67	4550.6	1072.17	46.84
16	10.88	5209.2	1044.15	53.62	4557.2	913.46	46.91
17	11.60	5204.1	831.95	53.57	4559.8	728.95	46.94
18	12.33	5205.1	592.74	53.58	4590.4	522.74	47.25
19	13.05	5189.1	198.49	-178.94	4591.5	175.63	-158.33
20	13.78	5157.9	57.06	-177.86	4556.2	50.40	-157.11
21	14.50	5126.2	10.25	-283.29	4524.9	9.05	-250.06
22	15.45	5058.1	136.25	-279.53	4447.4	119.80	-245.78
23	16.40	4981.4	661.28	-275.29	4369.2	580.01	-241.46
24	17.35	4938.2	1146.41	72.77	4326.9	1004.49	63.77
25	18.30	4893.7	1559.13	72.12	4269.0	1360.10	62.91
26	19.25	4847.3	1898.93	71.43	4202.4	1646.31	61.93
27	20.20	4802.0	2168.57	70.77	4135.8	1867.72	60.95
28	21.15	4760.0	2371.19	70.15	4075.2	2030.05	60.06
29	22.10	4723.3	2509.97	69.61	4025.1	2138.96	59.32
30	23.05	4693.0	2587.51	69.16	3988.2	2198.92	58.77
31	24.00	4670.1	2605.90	68.82	3966.0	2213.04	58.45
32	24.95	4693.0	2587.47	69.16	3988.5	2199.04	58.78
33	25.90	4723.2	2509.92	69.61	4025.6	2139.18	59.32
34	26.85	4759.9	2371.15	70.15	4075.8	2030.37	60.06
35	27.80	4801.8	2168.51	70.76	4136.5	1868.05	60.96
36	28.75	4847.2	1898.91	71.43	4203.3	1646.66	61.94
37	29.70	4893.6	1559.10	72.12	4269.8	1360.36	62.92
38	30.65	4938.1	1146.38	72.77	4327.6	1004.65	63.78
39	31.60	4988.4	662.21	-275.68	4401.9	584.35	-243.26
40	32.55	5063.6	136.40	-279.83	4474.6	120.53	-247.28
41	33.50	5126.2	10.25	-176.77	4524.9	9.05	-156.03

42	34.23	5152.3	57.00	-177.67	4528.4	50.09	-156.15
43	34.95	5174.8	358.36	-178.44	4532.3	313.86	-156.29
44	35.68	5197.8	591.91	53.50	4556.9	518.92	46.91
45	36.40	5204.0	831.95	53.57	4560.3	729.04	46.94
46	37.13	5209.1	1044.14	53.62	4557.8	913.59	46.92
47	37.85	5213.8	1228.44	53.67	4551.3	1072.35	46.85
48	38.58	5218.8	1384.90	53.72	4542.7	1205.48	46.76
49	39.30	5184.4	1502.00	53.36	4498.5	1303.28	46.30
50	40.03	5165.3	1594.29	53.17	4467.7	1378.96	45.99
51	40.75	5147.8	1658.51	52.99	4438.9	1430.13	45.69
52	41.47	5132.0	1695.06	52.83	4413.1	1457.61	45.43
53	42.20	5118.0	1704.30	71.52	4390.8	1462.12	61.36
54	42.92	5103.2	1680.64	71.32	4371.1	1439.51	61.09
55	43.65	5090.9	1620.48	71.15	4358.0	1387.20	60.90
56	44.37	5080.7	1523.94	71.00	4351.5	1305.20	60.81
57	45.10	5072.2	1390.98	70.89	4350.7	1193.11	60.80
58	45.82	5073.0	1223.49	70.90	4392.3	1059.32	61.38
59	46.55	5077.3	862.00	70.96	4450.9	755.67	62.20
60	47.27	5074.8	627.28	0.00	4458.5	551.10	0.00
61	48.00	5074.2	390.71	0.00	4465.1	343.81	0.00

FUERZAS HORIZONTALES DE DESVIACION

I	S(m)	R(m)	Ti (T)	Uh(T/m)	Tf(T)	Uh(T/m)
1	0.00	0.0	5074.25	0.00	4454.95	0.00
2	0.73	0.0	5068.97	0.00	4429.81	0.00
3	1.45	0.0	5057.81	0.00	4361.75	0.00
4	2.18	0.0	5064.89	0.00	4354.55	0.00
5	2.90	0.0	5072.28	0.00	4350.49	0.00
6	3.62	0.0	5080.76	0.00	4351.14	0.00
7	4.35	0.0	5090.95	0.00	4357.61	0.00
8	5.07	0.0	5103.26	0.00	4370.53	0.00
9	5.80	0.0	5118.01	0.00	4390.11	0.00
10	6.52	0.0	5132.00	0.00	4412.36	0.00
11	7.25	0.0	5147.83	0.00	4438.17	0.00
12	7.97	0.0	5165.36	0.00	4466.87	0.00
13	8.70	0.0	5184.38	0.00	4497.62	0.00
14	9.43	0.0	5218.78	0.00	4541.83	0.00
15	10.15	0.0	5213.88	0.00	4550.59	0.00
16	10.88	0.0	5209.18	0.00	4557.16	0.00
17	11.60	0.0	5204.06	0.00	4559.76	0.00
18	12.33	0.0	5205.08	0.00	4590.42	0.00
19	13.05	0.0	5189.14	0.00	4591.51	0.00
20	13.78	0.0	5157.88	0.00	4556.17	0.00
21	14.50	0.0	5126.25	0.00	4524.86	0.00
22	15.45	0.0	5058.14	0.00	4447.36	0.00
23	16.40	0.0	4981.43	0.00	4369.21	0.00
24	17.35	0.0	4938.21	0.00	4326.92	0.00
25	18.30	0.0	4893.71	0.00	4268.98	0.00
26	19.25	0.0	4847.30	0.00	4202.44	0.00
27	20.20	0.0	4801.97	0.00	4135.77	0.00
28	21.15	0.0	4760.00	0.00	4075.17	0.00
29	22.10	0.0	4723.32	0.00	4025.13	0.00
30	23.05	0.0	4693.04	0.00	3988.25	0.00
31	24.00	0.0	4670.07	0.00	3966.02	0.00
32	24.95	0.0	4692.97	0.00	3988.46	0.00
33	25.90	0.0	4723.22	0.00	4025.56	0.00
34	26.85	0.0	4759.92	0.00	4075.82	0.00

35	27.80	0.0	4801.83	0.00	4136.51	0.00
36	28.75	0.0	4847.25	0.00	4203.34	0.00
37	29.70	0.0	4893.61	0.00	4269.82	0.00
38	30.65	0.0	4938.11	0.00	4327.60	0.00
39	31.60	0.0	4988.41	0.00	4401.86	0.00
40	32.55	0.0	5063.59	0.00	4474.60	0.00
41	33.50	0.0	5126.25	0.00	4524.87	0.00
42	34.23	0.0	5152.31	0.00	4528.35	0.00
43	34.95	0.0	5174.83	0.00	4532.29	0.00
44	35.68	0.0	5197.84	0.00	4556.89	0.00
45	36.40	0.0	5204.03	0.00	4560.34	0.00
46	37.13	0.0	5209.11	0.00	4557.82	0.00
47	37.85	0.0	5213.84	0.00	4551.35	0.00
48	38.58	0.0	5218.76	0.00	4542.65	0.00
49	39.30	0.0	5184.39	0.00	4498.48	0.00
50	40.03	0.0	5165.32	0.00	4467.66	0.00
51	40.75	0.0	5147.80	0.00	4438.93	0.00
52	41.47	0.0	5131.97	0.00	4413.07	0.00
53	42.20	0.0	5118.00	0.00	4390.75	0.00
54	42.92	0.0	5103.24	0.00	4371.08	0.00
55	43.65	0.0	5090.91	0.00	4358.04	0.00
56	44.37	0.0	5080.74	0.00	4351.47	0.00
57	45.10	0.0	5072.23	0.00	4350.70	0.00
58	45.82	0.0	5072.97	0.00	4392.25	0.00
59	46.55	0.0	5077.25	0.00	4450.94	0.00
60	47.27	0.0	5074.79	0.00	4458.49	0.00
61	48.00	0.0	5074.20	0.00	4465.06	0.00

5 VERIFICACIÓN DE LOS ESTADOS LÍMITES DE SERVICIO

Comprobación del ELS de fisuración

5.1 TENSIONES NORMALES (ESTADO LÍMITE DE FISURACIÓN)

$$\sigma_{, \max} < w_k = 0,2 \text{ mm}$$

En el tablero se han comprobado las siguientes condiciones, de acuerdo con la EHE (artículo 49) y el Model Code del CEB de 1990:

a. Hipótesis de carga de construcción:

a.1. Considerando peso propio y el 60 % del pretensado total para el descimbrado del tablero:

$$\begin{aligned} \gamma_{t, \max} &< 0 \text{ Kp/cm}^2 \\ \gamma_{c, \max} &< 0,60 f_{ck,5} \approx 0,30 f_{ck} = 105 \text{ Kp/cm}^2 \end{aligned}$$

(El hormigón deberá alcanzar una resistencia a compresión antes del 1^{er} tesado superior a 220 Kp/cm²)

a2. Considerando peso propio y el 100 % del pretensado inicial (con su valor característico superior):

$$\begin{aligned} \sigma_{t, \max} &< f_{ctk} = 23,35 \text{ Kp/cm}^2 \\ \sigma_{c, \max} &< 0,60 f_{ck} = 210 \text{ Kp/cm}^2 \end{aligned}$$

b. Hipótesis de carga permanente, considerando peso propio, carga permanente y pretensado final (con su valor característico superior e inferior):

$$\begin{aligned} \sigma_{t, \max} &< 0 \text{ Kp/cm}^2 \\ \sigma_{c, \max} &< 0,40 f_{ck} = 140 \text{ Kp/cm}^2 \end{aligned}$$

c. Hipótesis de combinación frecuente:

$$\sigma_{t, \max} < f_{ctk} = 22,4 \text{ Kp/cm}^2$$

d. Hipótesis de combinación característica:

$$\sigma_{c, \max} < 0,60 f_{ck} = 210 \text{ Kp/cm}^2$$

COMBINACION 1 G1 + PRETII

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-182.794	-405.562	-178.107	-411.480
2	-177.822	-411.193	-126.800	-475.622
3	-183.391	-565.251	-174.337	-577.912
4	-174.842	-578.416	-170.446	-584.564
5	-170.975	-585.083	-171.189	-584.784
6	-171.790	-585.379	-176.619	-578.627
7	-177.324	-579.351	-186.758	-566.158
8	-187.618	-567.015	-201.664	-547.371
9	-202.685	-548.399	-220.409	-523.613
10	-221.375	-524.581	-241.235	-496.808
11	-242.325	-497.902	-264.439	-466.976
12	-265.656	-468.170	-290.112	-433.969
13	-291.421	-435.275	-318.386	-397.565
14	-319.770	-398.964	-349.358	-357.588
15	-350.793	-359.029	-383.151	-313.778
16	-384.606	-315.230	-419.852	-265.940
17	-421.284	-267.370	-458.660	-215.101
18	-461.935	-218.379	-538.998	-110.611
19	-466.939	-75.615	-468.184	-74.043
20	-466.413	-72.273	-436.102	-110.549
21	-430.850	-113.126	-483.084	-47.166
22	-479.225	-43.306	-481.720	-166.307
23	-476.412	-160.994	-409.974	-253.904
24	-406.983	-250.911	-351.563	-328.412
25	-348.477	-325.336	-304.227	-387.217
26	-301.006	-384.016	-267.145	-431.369
27	-263.998	-428.242	-239.667	-462.268
28	-236.754	-459.372	-221.066	-481.312
29	-218.522	-478.777	-210.755	-489.639
30	-208.657	-487.547	-208.234	-488.138
31	-206.653	-486.532	-207.388	-485.504
32	-208.979	-487.083	-217.069	-475.769
33	-219.161	-477.866	-235.168	-455.482
34	-237.715	-458.015	-262.370	-423.536
35	-265.281	-426.426	-299.443	-378.652
36	-302.591	-381.791	-347.171	-319.448
37	-350.382	-322.658	-406.119	-244.712
38	-409.198	-247.793	-475.688	-154.810
39	-479.172	-158.294	-477.999	-35.917
40	-482.259	-40.176	-430.371	-105.698
41	-437.284	-105.001	-467.476	-66.876
42	-468.951	-68.354	-424.728	-124.198
43	-495.462	-166.469	-462.712	-212.269
44	-464.305	-213.864	-426.560	-266.648
45	-423.781	-263.876	-388.393	-313.364
46	-386.961	-311.940	-354.465	-357.384
47	-353.006	-355.928	-323.276	-397.505
48	-321.832	-396.076	-294.731	-433.975
49	-293.341	-432.592	-268.725	-467.017
50	-267.411	-465.708	-245.149	-496.839

51	-243.937	-495.642	-223.920	-523.635
52	-222.824	-522.550	-204.952	-547.542
53	-203.966	-546.605	-189.781	-566.442
54	-188.741	-565.438	-179.142	-578.862

COMBINACION 1 G1 + PRETII

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-178.286	-577.997	-173.280	-584.999
56	-172.574	-584.277	-172.168	-584.845
57	-171.577	-584.232	-175.269	-579.069
58	-175.300	-579.088	-226.231	-507.863
59	-167.736	-424.991	-178.179	-411.804
60	-178.031	-411.656	-182.734	-405.717

COMBINACION 2 G1 + PRETII + 0.4 TEMP + SCMAX*0.05

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-183.814	-404.274	-181.280	-407.473
2	-181.056	-407.109	-132.265	-468.721
3	-189.039	-557.353	-182.285	-566.797
4	-182.790	-567.301	-180.684	-570.246
5	-181.214	-570.765	-183.708	-567.276
6	-184.312	-567.869	-191.411	-557.941
7	-192.118	-558.663	-203.817	-542.302
8	-204.676	-543.160	-220.980	-520.360
9	-221.999	-521.390	-241.971	-493.460
10	-242.936	-494.429	-265.036	-463.524
11	-266.124	-464.620	-290.470	-430.574
12	-291.686	-431.768	-318.366	-394.457
13	-319.674	-395.764	-348.853	-354.958
14	-350.237	-356.358	-382.029	-311.899
15	-383.465	-313.339	-418.019	-265.016
16	-419.474	-266.469	-456.908	-214.119
17	-458.341	-215.548	-497.899	-160.228
18	-501.187	-163.487	-580.453	-52.638
19	-507.086	-24.918	-510.473	-20.642
20	-508.714	-18.857	-480.557	-54.412
21	-473.959	-58.689	-526.180	7.254
22	-522.325	11.119	-526.227	-104.067
23	-520.932	-98.735	-454.499	-191.638
24	-451.531	-188.613	-396.146	-266.066
25	-393.075	-262.967	-348.875	-324.779
26	-345.675	-321.549	-311.883	-368.806
27	-308.736	-365.678	-284.459	-399.628
28	-281.546	-396.733	-265.896	-418.618
29	-263.352	-416.084	-255.610	-426.912
30	-253.512	-424.819	-253.098	-425.398
31	-251.517	-423.792	-252.246	-422.772
32	-253.837	-424.351	-261.906	-413.066
33	-263.999	-415.163	-279.969	-392.829
34	-282.516	-395.363	-307.120	-360.955
35	-310.032	-363.844	-344.127	-316.163
36	-347.275	-319.303	-391.775	-257.072
37	-394.995	-260.269	-450.659	-182.424
38	-453.755	-185.483	-520.187	-92.580
39	-523.693	-96.034	-521.075	18.478
40	-525.350	14.238	-473.454	-51.294
41	-481.730	-48.876	-509.754	-13.488
42	-511.232	-14.964	-464.845	-73.539
43	-536.904	-108.515	-501.934	-157.420
44	-503.539	-158.997	-463.591	-214.862
45	-460.827	-212.068	-423.257	-264.608
46	-421.827	-263.182	-387.143	-311.685
47	-385.684	-310.231	-353.756	-354.880
48	-352.310	-353.454	-323.002	-394.440
49	-321.611	-393.058	-294.777	-430.584
50	-293.463	-429.275	-268.974	-463.522

51	-267.761	-462.326	-245.508	-493.445
52	-244.411	-492.361	-224.294	-520.493
53	-223.309	-519.554	-206.865	-542.550
54	-205.826	-541.545	-193.962	-558.137

COMBINACION 2 G1 + PRETII + 0.4 TEMP + SCMAX*0.05

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-193.107	-557.272	-185.824	-567.456
56	-185.118	-566.735	-182.430	-570.494
57	-181.839	-569.882	-183.238	-567.925
58	-183.267	-567.946	-231.896	-499.940
59	-173.222	-418.063	-181.427	-407.702
60	-181.279	-407.554	-183.736	-404.451

COMBINACION 3 G1 + PRETII + SCMIN*0.05

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-182.772	-405.589	-178.159	-411.414
2	-177.814	-411.203	-126.781	-475.646
3	-183.368	-565.283	-174.299	-577.965
4	-174.803	-578.470	-170.392	-584.639
5	-170.921	-585.159	-171.118	-584.882
6	-171.720	-585.477	-176.533	-578.746
7	-177.239	-579.470	-186.657	-566.299
8	-187.517	-567.156	-201.548	-547.535
9	-202.568	-548.562	-220.277	-523.798
10	-221.243	-524.766	-241.087	-497.015
11	-242.177	-498.109	-264.276	-467.205
12	-265.492	-468.399	-289.933	-434.219
13	-291.241	-435.526	-318.191	-397.837
14	-319.576	-399.236	-349.147	-357.882
15	-350.583	-359.323	-382.925	-314.094
16	-384.380	-315.546	-419.611	-266.278
17	-421.042	-267.708	-458.400	-215.465
18	-461.661	-218.762	-538.677	-111.060
19	-466.622	-76.016	-467.803	-74.524
20	-466.020	-72.769	-435.624	-111.152
21	-430.291	-113.832	-482.679	-47.677
22	-478.816	-43.823	-481.435	-166.706
23	-476.113	-161.412	-409.786	-254.167
24	-406.771	-251.207	-351.418	-328.616
25	-348.316	-325.561	-304.101	-387.393
26	-300.860	-384.220	-267.001	-431.571
27	-263.853	-428.444	-239.524	-462.468
28	-236.611	-459.573	-220.923	-481.510
29	-218.379	-478.976	-210.614	-489.836
30	-208.516	-487.744	-208.094	-488.333
31	-206.514	-486.727	-207.250	-485.698
32	-208.840	-487.277	-216.931	-475.961
33	-219.024	-478.058	-235.032	-455.673
34	-237.578	-458.206	-262.235	-423.725
35	-265.146	-426.615	-299.309	-378.839
36	-302.457	-381.978	-347.038	-319.634
37	-350.239	-322.857	-405.954	-244.942
38	-409.017	-248.046	-475.454	-155.137
39	-478.917	-158.651	-477.662	-36.343
40	-481.906	-40.622	-429.891	-106.305
41	-436.735	-105.694	-467.036	-67.431
42	-468.508	-68.913	-424.381	-124.636
43	-495.094	-166.984	-462.419	-212.679
44	-464.000	-214.290	-426.305	-267.005
45	-423.510	-264.255	-388.141	-313.716
46	-386.709	-312.293	-354.230	-357.713
47	-352.771	-356.257	-323.059	-397.808
48	-321.614	-396.380	-294.531	-434.254
49	-293.141	-432.871	-268.543	-467.271
50	-267.228	-465.962	-244.985	-497.069

51	-243.773	-495.871	-223.773	-523.840
52	-222.677	-522.755	-204.823	-547.723
53	-203.838	-546.784	-189.670	-566.597
54	-188.630	-565.593	-179.048	-578.993

COMBINACION 3 G1 + PRETII + SCMIN*0.05

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-178.193	-578.127	-173.204	-585.104
56	-172.499	-584.383	-172.111	-584.926
57	-171.520	-584.313	-175.229	-579.125
58	-175.259	-579.144	-226.208	-507.895
59	-167.714	-425.019	-178.174	-411.810
60	-178.026	-411.662	-182.746	-405.701

COMBINACION 4 G1 + PRETI

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-313.240	-688.657	-279.430	-731.352
2	-278.931	-730.854	-170.567	-867.693
3	-265.463	-1028.624	-232.036	-1075.369
4	-232.849	-1076.193	-211.046	-1106.683
5	-211.897	-1107.538	-201.673	-1121.836
6	-202.645	-1122.827	-203.956	-1120.992
7	-205.136	-1122.158	-217.970	-1104.210
8	-219.404	-1105.615	-243.810	-1071.484
9	-245.515	-1073.181	-279.836	-1025.186
10	-281.455	-1026.793	-323.132	-968.510
11	-324.951	-970.348	-374.161	-901.530
12	-376.194	-903.538	-433.070	-823.999
13	-435.278	-826.177	-498.353	-737.969
14	-502.319	-741.943	-578.302	-635.686
15	-577.730	-635.129	-661.298	-518.264
16	-660.755	-517.722	-751.938	-390.207
17	-751.345	-389.619	-849.732	-252.030
18	-849.851	-252.146	-1014.470	-21.933
19	-890.690	15.982	-931.564	67.598
20	-928.613	70.551	-921.037	60.983
21	-910.838	54.863	-940.674	92.539
22	-934.243	98.971	-891.091	-153.804
23	-882.238	-144.953	-726.439	-362.831
24	-721.456	-357.838	-590.021	-541.644
25	-584.887	-536.506	-478.065	-685.891
26	-472.708	-680.539	-389.226	-797.284
27	-383.992	-792.057	-322.382	-878.216
28	-317.548	-873.360	-276.366	-930.951
29	-272.135	-926.715	-250.161	-957.445
30	-246.680	-953.933	-242.948	-959.151
31	-240.308	-956.487	-244.557	-950.544
32	-247.193	-953.196	-269.694	-921.730
33	-273.173	-925.237	-314.861	-866.938
34	-319.113	-871.150	-381.224	-784.289
35	-386.072	-789.109	-470.057	-671.660
36	-475.298	-676.903	-582.652	-526.773
37	-588.005	-532.117	-719.948	-347.603
38	-725.090	-352.727	-880.968	-134.739
39	-886.776	-140.540	-932.126	111.197
40	-939.225	104.098	-909.960	67.143
41	-922.922	70.122	-930.321	79.465
42	-932.780	77.002	-820.296	-65.040
43	-941.871	-115.087	-851.127	-241.988
44	-853.781	-244.645	-754.803	-383.061
45	-755.518	-383.775	-664.116	-511.596
46	-664.711	-512.169	-580.912	-629.359
47	-581.468	-629.891	-505.257	-736.469
48	-505.820	-737.043	-442.513	-825.575
49	-438.546	-821.610	-381.394	-901.534
50	-379.197	-899.328	-329.772	-968.446

51	-327.726	-966.458	-285.806	-1025.082
52	-283.976	-1023.260	-249.364	-1071.662
53	-247.743	-1070.063	-223.066	-1104.573
54	-221.360	-1102.874	-208.215	-1121.256

COMBINACION 4 G1 + PRETI

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-206.800	-1119.823	-205.176	-1122.093
56	-204.003	-1120.919	-213.939	-1107.024
57	-212.961	-1106.039	-233.552	-1077.244
58	-233.631	-1077.335	-338.435	-930.771
59	-240.306	-781.398	-279.522	-731.877
60	-279.292	-731.642	-313.129	-688.914

COMBINACION 5 G1 + PRETI + 0.4 TEMP

TENSIONES CON AXIL INICIAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-314.252	-687.379	-282.610	-727.336
2	-282.112	-726.838	-175.916	-860.938
3	-270.987	-1020.898	-239.802	-1064.510
4	-240.614	-1065.334	-221.051	-1092.692
5	-221.902	-1093.546	-213.918	-1104.711
6	-214.891	-1105.701	-218.440	-1100.738
7	-219.621	-1101.902	-234.696	-1080.820
8	-236.129	-1082.226	-262.776	-1044.961
9	-264.480	-1046.660	-301.042	-995.530
10	-302.660	-997.139	-346.579	-935.720
11	-348.397	-937.559	-399.848	-865.607
12	-401.883	-867.614	-461.001	-784.940
13	-463.209	-787.117	-528.526	-695.773
14	-532.491	-699.749	-610.716	-590.356
15	-610.144	-589.800	-695.955	-469.798
16	-695.412	-469.256	-788.837	-338.605
17	-788.245	-338.016	-888.874	-197.291
18	-888.993	-197.407	-1055.856	35.943
19	-930.762	66.585	-973.809	120.944
20	-970.859	123.897	-965.454	117.072
21	-953.894	109.232	-983.729	146.908
22	-977.298	153.339	-935.556	-91.622
23	-926.703	-82.772	-770.902	-300.651
24	-765.919	-295.659	-634.483	-479.465
25	-629.349	-474.328	-522.525	-623.716
26	-517.168	-618.363	-433.685	-735.110
27	-428.451	-729.883	-366.840	-816.043
28	-362.006	-811.188	-320.822	-868.781
29	-316.592	-864.545	-294.617	-895.276
30	-291.135	-891.764	-287.402	-896.985
31	-284.762	-894.319	-289.010	-888.379
32	-291.646	-891.031	-314.146	-859.565
33	-317.625	-863.073	-359.312	-804.775
34	-363.564	-808.987	-425.675	-722.128
35	-430.522	-726.948	-514.507	-609.500
36	-519.747	-614.743	-627.100	-464.614
37	-632.454	-469.959	-764.395	-285.445
38	-769.537	-290.570	-925.415	-72.583
39	-931.222	-78.383	-975.160	165.539
40	-982.259	158.440	-952.993	121.484
41	-967.316	126.182	-972.550	132.791
42	-975.009	130.328	-860.360	-14.448
43	-983.249	-57.222	-890.269	-187.251
44	-892.923	-189.907	-791.708	-331.452
45	-792.423	-332.165	-698.785	-463.114
46	-699.379	-463.688	-613.344	-584.004
47	-613.899	-584.537	-535.452	-694.242
48	-536.013	-694.819	-470.469	-786.479
49	-466.501	-782.515	-407.110	-865.571

50	-404.913	-863.365	-353.249	-935.615
51	-351.201	-933.630	-307.042	-995.385
52	-305.211	-993.564	-268.360	-1045.099
53	-266.739	-1043.498	-239.817	-1081.147
54	-238.112	-1079.447	-222.725	-1100.964

COMBINACION 5 G1 + PRETI + 0.4 TEMP

TENSIONES CON AXIL INICIAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-221.309	-1099.532	-217.441	-1104.941
56	-216.267	-1103.768	-223.961	-1093.009
57	-222.983	-1092.024	-241.330	-1066.367
58	-241.408	-1066.460	-343.968	-923.034
59	-245.663	-774.633	-282.705	-727.857
60	-282.476	-727.621	-314.139	-687.637

COMBINACION 6 G1 + G2 + PRETI + 0.6 TEMP

TENSIONES CON AXIL INICIAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-313.278	-688.609	-306.577	-697.071
2	-306.079	-696.572	-221.294	-803.636
3	-317.853	-955.359	-305.136	-973.143
4	-305.948	-973.967	-301.210	-980.593
5	-302.061	-981.448	-305.253	-976.985
6	-306.227	-977.972	-317.310	-962.473
7	-318.490	-963.638	-337.455	-937.116
8	-338.884	-938.527	-365.777	-900.918
9	-367.480	-902.619	-400.643	-856.242
10	-402.260	-857.854	-439.129	-806.293
11	-440.950	-808.129	-481.706	-751.134
12	-483.738	-753.144	-528.514	-690.526
13	-530.721	-692.703	-578.054	-626.511
14	-582.020	-630.486	-638.612	-551.344
15	-638.041	-550.787	-698.574	-466.134
16	-698.032	-465.592	-762.535	-375.388
17	-761.942	-374.799	-830.005	-279.617
18	-830.123	-279.734	-960.772	-97.027
19	-838.696	-49.674	-843.151	-44.048
20	-840.199	-41.096	-792.673	-101.111
21	-781.135	-108.922	-868.538	1.447
22	-862.106	7.879	-869.786	-183.599
23	-860.932	-174.749	-752.070	-326.987
24	-747.086	-321.995	-656.326	-448.918
25	-651.193	-443.780	-578.792	-545.029
26	-573.433	-539.680	-518.109	-617.046
27	-512.878	-611.817	-473.170	-667.346
28	-468.330	-662.498	-442.796	-698.207
29	-438.564	-693.972	-425.978	-711.574
30	-422.500	-708.057	-421.894	-708.904
31	-419.256	-706.236	-420.375	-704.671
32	-423.015	-707.318	-436.132	-688.974
33	-439.612	-692.480	-465.665	-656.046
34	-469.917	-660.257	-510.125	-604.027
35	-514.975	-608.846	-570.804	-530.771
36	-576.046	-536.011	-648.979	-434.018
37	-654.334	-439.360	-745.600	-311.729
38	-750.743	-316.853	-859.686	-164.501
39	-865.492	-170.304	-860.015	20.137
40	-867.113	13.036	-780.284	-96.609
41	-794.586	-91.938	-841.926	-32.157
42	-844.384	-34.621	-768.314	-130.681
43	-888.185	-190.164	-831.401	-269.574
44	-834.056	-272.230	-765.394	-368.251
45	-766.108	-368.965	-701.379	-459.486
46	-701.973	-460.061	-641.201	-545.048
47	-641.756	-545.581	-584.927	-625.053
48	-585.490	-625.627	-537.924	-692.147
49	-533.957	-688.181	-488.900	-751.192

50	-486.704	-748.984	-445.727	-806.288
51	-443.679	-804.304	-406.572	-856.196
52	-404.740	-854.377	-371.287	-901.159
53	-369.673	-899.550	-342.509	-937.538
54	-340.803	-935.839	-321.539	-962.778

COMBINACION 6 G1 + G2 + PRETI + 0.6 TEMP

TENSIONES CON AXIL INICIAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-320.123	-961.346	-308.729	-977.280
56	-307.554	-976.109	-304.083	-980.963
57	-303.101	-979.982	-306.634	-975.043
58	-306.712	-975.135	-390.816	-857.519
59	-291.023	-717.354	-306.665	-697.602
60	-306.435	-697.367	-313.167	-688.865

COMBINACION 7 G1 + 1.1 PRETI + 0.4 TEMP

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====	=====	=====	=====	=====
1	-347.674	-753.597	-309.406	-801.919
2	-308.615	-801.678	-188.886	-952.868
3	-293.007	-1130.091	-256.207	-1181.554
4	-256.751	-1182.948	-233.196	-1215.890
5	-233.751	-1217.364	-223.398	-1231.841
6	-224.064	-1233.495	-226.867	-1229.574
7	-227.750	-1231.436	-243.709	-1209.119
8	-244.866	-1211.251	-274.036	-1170.458
9	-275.498	-1172.905	-316.060	-1116.180
10	-317.443	-1118.506	-366.590	-1049.776
11	-368.215	-1052.323	-426.143	-971.313
12	-428.037	-974.002	-494.901	-880.495
13	-497.023	-883.319	-571.210	-779.571
14	-575.309	-784.313	-664.203	-659.998
15	-663.359	-659.687	-761.113	-522.983
16	-760.352	-522.616	-866.999	-373.475
17	-866.238	-372.980	-981.331	-212.029
18	-981.410	-212.228	-1169.883	51.343
19	-1032.018	83.573	-1084.703	150.102
20	-1081.519	153.429	-1081.534	153.447
21	-1070.668	147.160	-1096.122	179.302
22	-1088.906	186.199	-1036.791	-90.045
23	-1026.838	-80.610	-849.662	-328.382
24	-843.896	-323.286	-694.287	-532.508
25	-688.294	-527.341	-566.531	-697.620
26	-560.238	-692.292	-464.932	-825.572
27	-458.729	-820.446	-388.276	-918.972
28	-382.477	-914.303	-335.295	-980.285
29	-330.140	-976.327	-304.897	-1011.628
30	-300.558	-1008.477	-296.204	-1014.567
31	-292.796	-1012.339	-298.051	-1004.990
32	-300.468	-1008.582	-326.640	-971.982
33	-330.018	-976.467	-378.146	-909.162
34	-382.422	-914.355	-453.878	-814.429
35	-458.868	-820.210	-555.253	-685.420
36	-560.744	-691.568	-683.713	-519.602
37	-689.406	-525.755	-840.308	-314.726
38	-845.852	-320.521	-1023.977	-71.422
39	-1030.339	-77.838	-1085.897	198.788
40	-1093.764	191.053	-1070.059	161.119
41	-1085.079	165.358	-1085.536	165.934
42	-1088.119	163.072	-957.242	-2.196
43	-1092.608	-47.514	-985.911	-196.724
44	-988.623	-199.937	-873.314	-361.191
45	-873.855	-362.320	-767.330	-511.289
46	-767.706	-512.311	-669.998	-648.950
47	-670.302	-649.964	-581.402	-774.288
48	-581.690	-775.383	-507.445	-879.211
49	-502.736	-875.331	-435.729	-969.038

50	-432.961	-967.103	-374.927	-1048.261
51	-372.325	-1046.566	-323.026	-1115.508
52	-320.671	-1113.982	-279.898	-1171.001
53	-277.794	-1169.690	-248.434	-1210.749
54	-246.268	-1209.285	-230.094	-1231.904

COMBINACION 7 G1 + 1.1 PRETI + 0.4 TEMP

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====	=====	=====	=====	=====
55	-228.285	-1230.679	-225.285	-1234.874
56	-223.796	-1233.860	-234.023	-1219.559
57	-232.814	-1218.661	-255.274	-1187.252
58	-255.303	-1187.434	-370.919	-1025.751
59	-263.050	-861.162	-307.075	-805.568
60	-306.950	-805.148	-345.688	-756.231

COMBINACION 8 G1 + G2 + 1.1 PRETI + 0.60 TEMP

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-344.818	-757.202	-331.147	-774.465
2	-330.599	-773.917	-232.011	-898.412
3	-337.852	-1067.378	-319.311	-1093.306
4	-320.204	-1094.213	-311.329	-1106.624
5	-312.266	-1107.563	-313.004	-1106.531
6	-314.076	-1107.617	-324.384	-1093.202
7	-325.681	-1094.484	-345.549	-1066.700
8	-347.122	-1068.251	-376.600	-1027.027
9	-378.474	-1028.898	-415.738	-976.786
10	-417.516	-978.558	-459.748	-919.499
11	-461.750	-921.519	-509.146	-855.237
12	-511.382	-857.447	-564.092	-783.735
13	-566.520	-786.130	-622.929	-707.245
14	-627.292	-711.616	-694.777	-617.241
15	-694.149	-616.628	-766.860	-514.946
16	-766.263	-514.350	-844.229	-405.317
17	-843.577	-404.670	-926.349	-288.918
18	-926.480	-289.046	-1078.987	-75.771
19	-944.000	-27.574	-958.331	-9.477
20	-955.085	-6.230	-913.212	-59.106
21	-900.552	-67.659	-982.354	35.640
22	-975.280	42.714	-971.529	-181.311
23	-961.789	-171.577	-830.586	-355.058
24	-825.104	-349.566	-715.342	-503.063
25	-709.695	-497.412	-621.653	-620.534
26	-615.759	-614.648	-548.030	-709.363
27	-542.276	-703.610	-493.252	-772.168
28	-487.929	-766.834	-456.022	-811.453
29	-451.368	-806.795	-435.231	-829.362
30	-431.405	-825.494	-429.975	-827.494
31	-427.074	-824.558	-429.068	-821.769
32	-431.971	-824.681	-448.689	-801.302
33	-452.517	-805.159	-484.990	-759.746
34	-489.668	-764.378	-539.242	-695.050
35	-544.576	-700.351	-612.859	-604.860
36	-618.625	-610.624	-707.251	-486.686
37	-713.141	-492.562	-823.460	-338.287
38	-829.118	-343.923	-960.409	-160.318
39	-966.796	-166.700	-972.969	56.185
40	-980.777	48.375	-899.603	-54.129
41	-915.304	-49.030	-956.976	3.593
42	-959.680	0.883	-866.575	-116.688
43	-999.135	-178.231	-927.885	-277.871
44	-930.805	-280.793	-847.377	-397.463
45	-848.163	-398.248	-769.951	-507.624
46	-770.604	-508.258	-697.635	-610.302
47	-698.245	-610.888	-630.502	-705.623
48	-631.122	-706.255	-574.455	-785.500
49	-570.093	-781.137	-517.076	-855.279

50	-514.661	-852.849	-467.022	-919.471
51	-464.770	-917.286	-422.276	-976.712
52	-420.261	-974.710	-382.677	-1027.269
53	-380.901	-1025.500	-351.123	-1067.143
54	-349.247	-1065.273	-329.049	-1093.519

COMBINACION 8 G1 + G2 + 1.1 PRETI + 0.60 TEMP

TENSIONES CON AXIL INICIAL
=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-327.491	-1091.944	-316.839	-1106.840
56	-315.547	-1105.552	-314.498	-1107.018
57	-313.420	-1105.938	-320.966	-1095.385
58	-321.051	-1095.488	-418.116	-959.748
59	-308.717	-803.495	-331.246	-775.046
60	-330.993	-774.788	-344.695	-757.484

COMBINACION 9 G1 + G2 + PRETD

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-273.162	-606.942	-272.279	-608.057
2	-269.906	-605.682	-204.071	-688.816
3	-282.086	-812.727	-275.480	-821.965
4	-274.649	-821.135	-273.753	-822.388
5	-273.289	-821.913	-277.673	-815.782
6	-277.753	-815.851	-287.130	-802.736
7	-287.864	-803.501	-302.053	-783.658
8	-303.534	-785.163	-322.504	-758.634
9	-324.750	-760.912	-347.338	-729.324
10	-349.897	-731.905	-374.153	-697.984
11	-377.128	-700.966	-403.424	-664.192
12	-406.746	-667.491	-435.423	-627.387
13	-438.977	-630.927	-468.962	-588.995
14	-474.064	-594.096	-511.441	-541.827
15	-512.453	-542.836	-552.740	-486.497
16	-553.502	-487.249	-596.798	-426.701
17	-597.094	-427.007	-641.499	-364.908
18	-645.035	-368.450	-745.513	-227.936
19	-642.511	-169.716	-631.560	-183.545
20	-628.221	-180.210	-570.086	-253.621
21	-561.602	-257.645	-655.786	-138.712
22	-648.469	-131.392	-668.085	-296.620
23	-659.069	-287.599	-578.135	-400.782
24	-573.260	-395.894	-508.810	-486.025
25	-502.127	-479.335	-454.403	-546.073
26	-446.724	-538.396	-413.608	-584.708
27	-405.915	-577.013	-384.759	-606.599
28	-377.767	-599.605	-365.972	-616.099
29	-360.195	-610.329	-355.701	-616.613
30	-351.435	-612.371	-352.800	-610.462
31	-350.242	-607.888	-349.292	-609.216
32	-351.877	-611.811	-356.807	-604.917
33	-361.080	-609.210	-373.308	-592.110
34	-379.107	-597.911	-400.723	-567.681
35	-407.727	-574.685	-441.306	-527.726
36	-449.017	-535.439	-497.254	-467.982
37	-504.928	-475.650	-569.887	-384.808
38	-576.558	-391.471	-656.036	-280.324
39	-664.604	-288.896	-647.951	-122.324
40	-654.819	-129.194	-561.420	-247.136
41	-571.569	-245.061	-629.651	-171.716
42	-629.979	-172.046	-578.890	-236.560
43	-679.256	-304.505	-644.075	-353.704
44	-646.915	-356.540	-600.511	-421.434
45	-600.910	-421.831	-557.401	-482.676
46	-557.111	-482.385	-516.596	-539.043
47	-515.842	-538.307	-478.258	-590.866
48	-477.249	-589.869	-447.041	-632.113
49	-441.952	-627.005	-413.040	-667.438

50	-409.483	-663.881	-382.993	-700.927
51	-379.656	-697.642	-355.219	-731.815
52	-352.211	-728.865	-329.439	-760.711
53	-326.855	-758.146	-307.684	-784.956
54	-305.409	-782.693	-291.037	-802.791

COMBINACION 9 G1 + G2 + PRETD

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-289.504	-801.327	-279.943	-814.697
56	-279.171	-813.959	-274.556	-820.413
57	-274.469	-820.320	-270.965	-825.221
58	-275.764	-830.013	-341.675	-737.840
59	-260.355	-622.257	-270.782	-609.091
60	-271.485	-609.816	-273.377	-607.427

COMBINACION 10 G1 + G2 + PRETD + TEMP + 0.80 SCMAX-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-296.178	-577.878	-315.783	-553.121
2	-315.033	-548.697	-289.463	-580.986
3	-374.036	-684.139	-410.701	-632.865
4	-409.870	-632.035	-446.544	-580.747
5	-446.095	-580.252	-482.190	-529.775
6	-482.273	-529.839	-517.923	-479.983
7	-518.660	-480.744	-553.689	-431.758
8	-555.169	-433.263	-589.027	-385.915
9	-591.273	-388.192	-623.117	-343.661
10	-625.673	-346.245	-653.750	-306.981
11	-656.728	-309.959	-681.338	-275.543
12	-684.656	-278.847	-705.558	-249.616
13	-709.112	-253.156	-725.898	-229.682
14	-731.000	-234.783	-749.745	-208.569
15	-750.757	-209.578	-766.644	-187.362
16	-767.407	-188.113	-780.476	-169.836
17	-781.292	-169.415	-796.312	-148.410
18	-801.194	-150.069	-884.514	-33.550
19	-778.624	2.164	-760.661	-20.519
20	-761.047	-12.482	-707.163	-80.525
21	-696.248	-87.617	-786.083	25.824
22	-780.642	35.512	-814.807	-91.436
23	-806.015	-82.102	-759.433	-147.244
24	-754.926	-141.842	-723.491	-185.803
25	-717.052	-178.771	-699.551	-203.246
26	-692.193	-195.119	-701.066	-182.712
27	-693.764	-174.471	-707.203	-155.677
28	-700.241	-148.640	-713.544	-130.037
29	-707.767	-124.265	-718.850	-108.766
30	-714.589	-104.518	-721.993	-94.164
31	-719.433	-91.591	-714.805	-98.064
32	-717.390	-100.659	-709.077	-112.284
33	-713.353	-116.573	-702.815	-131.309
34	-708.612	-137.113	-697.870	-152.135
35	-704.887	-159.119	-696.477	-170.880
36	-704.211	-178.563	-715.434	-162.868
37	-723.261	-170.321	-755.141	-125.738
38	-762.072	-132.038	-806.913	-69.330
39	-815.828	-77.416	-779.983	44.402
40	-795.705	48.713	-696.737	-76.262
41	-715.873	-62.837	-767.268	2.062
42	-769.526	4.171	-713.972	-65.982
43	-824.254	-101.732	-794.411	-143.466
44	-800.075	-142.354	-775.839	-176.247
45	-776.488	-176.293	-754.699	-206.765
46	-756.637	-203.357	-742.241	-223.490
47	-741.484	-222.757	-724.265	-246.837
48	-723.255	-245.841	-707.995	-267.182
49	-702.903	-262.078	-683.505	-289.205

50	-679.945	-285.653	-656.882	-317.906
51	-653.545	-314.621	-627.047	-351.677
52	-624.034	-348.733	-593.767	-391.060
53	-591.187	-388.490	-558.887	-433.661
54	-556.616	-431.393	-523.171	-478.163

COMBINACION 10 G1 + G2 + PRETD + TEMP + 0.80 SCMAX-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-521.643	-476.691	-487.601	-524.298
56	-486.831	-523.556	-452.318	-571.821
57	-452.227	-571.734	-412.932	-626.687
58	-417.730	-631.480	-442.159	-597.317
59	-357.650	-499.396	-323.937	-541.968
60	-324.642	-542.690	-297.835	-576.542

COMBINACION 11 G1 + G2 + PRETD + TEMP

TENSIONES CON AXIL FINAL

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Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-275.691	-603.748	-280.230	-598.017
2	-277.857	-595.641	-217.445	-671.928
3	-295.897	-793.413	-294.894	-794.816
4	-294.062	-793.986	-298.763	-787.412
5	-298.302	-786.933	-308.286	-772.972
6	-308.368	-773.037	-323.339	-752.100
7	-324.076	-752.860	-343.867	-725.184
8	-345.347	-726.690	-369.920	-692.325
9	-372.162	-694.609	-400.355	-655.183
10	-402.911	-657.767	-432.771	-616.009
11	-435.744	-618.994	-467.644	-574.385
12	-470.966	-577.682	-505.250	-529.737
13	-508.804	-533.278	-544.395	-483.506
14	-549.495	-488.610	-592.477	-428.502
15	-593.488	-429.512	-639.382	-365.331
16	-640.144	-366.084	-689.046	-297.697
17	-689.342	-298.002	-739.356	-228.061
18	-742.891	-231.603	-848.978	-83.245
19	-742.693	-43.209	-737.172	-50.181
20	-733.835	-46.844	-681.129	-113.399
21	-669.241	-121.721	-763.423	-2.791
22	-756.105	4.528	-779.247	-141.166
23	-770.230	-132.145	-689.293	-245.332
24	-684.418	-240.445	-619.964	-330.581
25	-613.281	-323.891	-565.555	-390.633
26	-557.875	-382.956	-524.756	-429.273
27	-517.063	-421.578	-495.903	-451.170
28	-488.912	-444.174	-477.113	-460.674
29	-471.336	-454.904	-466.839	-461.192
30	-462.574	-456.949	-463.935	-455.046
31	-461.377	-452.470	-460.424	-453.802
32	-463.010	-456.398	-467.938	-449.506
33	-472.210	-453.800	-484.436	-436.703
34	-490.235	-442.504	-511.849	-412.277
35	-518.852	-419.281	-552.429	-372.325
36	-560.140	-380.039	-608.375	-312.585
37	-616.048	-320.253	-681.005	-229.414
38	-687.675	-236.078	-767.151	-124.935
39	-775.719	-133.506	-755.537	13.533
40	-762.405	6.663	-669.003	-111.283
41	-682.554	-104.913	-735.225	-38.401
42	-735.551	-38.733	-679.050	-110.080
43	-782.699	-159.844	-741.928	-216.861
44	-744.770	-219.695	-692.773	-292.410
45	-693.172	-292.808	-644.072	-361.471
46	-643.780	-361.182	-597.677	-425.655
47	-596.921	-424.921	-553.746	-485.300
48	-552.733	-484.309	-516.931	-534.375
49	-511.841	-529.269	-477.330	-577.531
50	-473.774	-573.974	-441.683	-618.852

51	-438.344	-615.570	-408.310	-657.570
52	-405.299	-654.624	-376.926	-694.301
53	-374.344	-691.735	-349.563	-726.391
54	-347.290	-724.125	-327.312	-752.063

COMBINACION 11 G1 + G2 + PRETD + TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-325.776	-750.602	-310.605	-771.817
56	-309.831	-771.082	-299.612	-785.373
57	-299.523	-785.285	-290.409	-798.029
58	-295.207	-802.823	-355.506	-718.497
59	-273.749	-605.344	-278.741	-599.040
60	-279.446	-599.764	-275.904	-604.236

COMBINACION 12 G1 + G2 + PRETD + SCMAX-IPF + 0.6 TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-300.288	-572.687	-321.491	-545.913
2	-321.147	-540.977	-302.118	-565.006
3	-388.046	-664.547	-431.888	-603.236
4	-431.057	-602.406	-473.485	-543.072
5	-473.038	-542.573	-513.421	-486.100
6	-513.503	-486.165	-552.086	-432.209
7	-552.821	-432.971	-589.419	-381.791
8	-590.900	-383.296	-624.837	-335.836
9	-627.086	-338.110	-657.601	-295.437
10	-660.158	-298.018	-685.547	-262.513
11	-688.528	-265.489	-709.073	-236.757
12	-712.390	-240.062	-727.704	-218.646
13	-731.259	-222.185	-741.101	-208.422
14	-746.204	-213.521	-756.649	-198.915
15	-757.660	-199.925	-763.803	-191.335
16	-764.565	-192.087	-766.434	-189.473
17	-767.380	-188.871	-771.409	-183.236
18	-776.627	-184.424	-852.011	-79.003
19	-747.534	-37.096	-724.289	-66.449
20	-725.604	-57.237	-669.254	-128.395
21	-659.944	-133.461	-748.694	-21.390
22	-743.722	-11.109	-779.233	-141.185
23	-770.496	-131.773	-732.505	-184.902
24	-728.090	-179.372	-704.912	-211.786
25	-698.534	-204.669	-688.590	-218.575
26	-681.312	-210.336	-700.684	-183.246
27	-693.479	-174.869	-715.570	-143.976
28	-708.615	-136.929	-728.195	-109.548
29	-722.419	-103.776	-737.398	-82.828
30	-733.138	-78.578	-742.054	-66.110
31	-739.493	-63.538	-733.947	-71.295
32	-736.532	-73.889	-724.911	-90.142
33	-729.186	-94.431	-712.959	-117.124
34	-718.755	-122.928	-699.925	-149.261
35	-706.946	-156.240	-688.040	-182.680
36	-695.779	-190.354	-697.750	-187.597
37	-705.616	-194.997	-729.228	-161.977
38	-736.223	-168.186	-772.407	-117.585
39	-781.409	-125.549	-743.060	-2.224
40	-760.996	4.883	-660.637	-121.848
41	-679.809	-108.379	-733.049	-41.148
42	-735.792	-38.428	-682.638	-105.550
43	-793.265	-145.069	-768.390	-179.856
44	-774.760	-177.756	-759.700	-198.816
45	-760.413	-198.774	-747.687	-216.571
46	-750.183	-212.382	-745.949	-218.303
47	-745.193	-217.571	-736.700	-229.448
48	-735.692	-228.449	-727.805	-239.479
49	-722.713	-234.374	-709.332	-253.087
50	-705.772	-249.536	-687.206	-275.500

51	-683.870	-272.213	-660.495	-304.902
52	-657.483	-301.956	-628.982	-341.814
53	-626.403	-339.243	-594.467	-383.904
54	-592.195	-381.636	-557.626	-429.979

COMBINACION 12 G1 + G2 + PRETD + SCMAX-IPF + 0.6 TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-556.101	-428.504	-519.585	-479.569
56	-518.817	-478.825	-480.473	-532.448
57	-480.382	-532.362	-435.785	-594.728
58	-440.584	-599.520	-458.290	-574.759
59	-373.267	-479.675	-332.052	-531.720
60	-332.757	-532.443	-302.307	-570.895

COMBINACION 13 G1 + G2 + PRETD + 0.60 SCMAX-IPF + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-289.792	-585.942	-302.920	-569.365
2	-301.763	-565.453	-264.772	-612.166
3	-347.596	-721.114	-372.043	-686.927
4	-371.211	-686.097	-397.094	-649.902
5	-396.640	-649.412	-423.407	-611.980
6	-423.489	-612.045	-451.173	-573.331
7	-451.908	-574.093	-480.326	-534.352
8	-481.807	-535.856	-510.542	-495.672
9	-512.789	-497.949	-540.918	-458.612
10	-543.475	-461.194	-569.196	-425.225
11	-572.174	-428.204	-595.805	-395.158
12	-599.123	-398.460	-620.567	-368.471
13	-624.122	-372.011	-642.806	-345.883
14	-647.909	-350.983	-669.910	-320.214
15	-670.922	-321.224	-691.508	-292.436
16	-692.270	-293.189	-711.494	-266.304
17	-712.180	-266.064	-733.145	-236.747
18	-737.690	-238.876	-823.897	-118.320
19	-719.550	-72.433	-701.983	-94.617
20	-701.437	-87.755	-645.133	-158.855
21	-635.677	-164.105	-726.600	-49.290
22	-720.690	-40.193	-750.337	-181.595
23	-741.488	-172.340	-686.319	-249.491
24	-681.720	-244.218	-642.032	-299.719
25	-635.532	-292.773	-610.476	-327.813
26	-603.038	-319.799	-601.414	-322.070
27	-594.014	-313.965	-598.806	-307.265
28	-591.836	-300.239	-598.866	-290.408
29	-593.089	-284.638	-600.279	-274.583
30	-596.016	-270.336	-601.911	-262.093
31	-599.352	-259.519	-595.643	-264.705
32	-598.229	-267.300	-593.227	-274.294
33	-597.502	-278.585	-592.656	-285.361
34	-598.454	-291.164	-595.802	-294.873
35	-602.816	-301.862	-604.904	-298.942
36	-612.632	-306.631	-633.109	-277.995
37	-640.898	-285.502	-681.048	-229.354
38	-687.913	-235.745	-741.414	-160.927
39	-750.243	-169.134	-720.078	-31.244
40	-733.587	-29.728	-636.011	-152.944
41	-652.051	-143.431	-706.471	-74.711
42	-708.247	-73.212	-655.161	-140.247
43	-762.143	-188.591	-732.363	-230.237
44	-737.321	-230.111	-708.941	-269.800
45	-709.528	-269.934	-683.706	-306.044
46	-685.088	-303.414	-665.559	-330.725
47	-664.804	-329.991	-643.891	-359.236
48	-642.882	-358.239	-625.284	-382.850
49	-620.193	-377.743	-599.816	-406.241

50	-596.257	-402.687	-573.737	-434.180
51	-570.401	-430.894	-545.818	-465.272
52	-542.807	-462.326	-515.813	-500.075
53	-513.232	-497.507	-485.617	-536.125
54	-483.344	-533.860	-456.069	-572.002

COMBINACION 13 G1 + G2 + PRETD + 0.60 SCMAX-IPF + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-454.540	-570.531	-428.021	-607.617
56	-427.251	-606.876	-401.614	-642.728
57	-401.524	-642.640	-372.579	-683.119
58	-377.378	-687.910	-413.580	-637.283
59	-329.977	-534.340	-308.658	-561.262
60	-309.363	-561.985	-291.089	-585.061

COMBINACION 14 G1 + G2 + PRETD + SCMIN-IPF

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-236.428	-653.329	-262.823	-619.998
2	-259.238	-619.153	-189.513	-707.200
3	-266.977	-833.856	-250.675	-856.654
4	-249.843	-855.825	-239.092	-870.859
5	-238.612	-870.407	-233.105	-878.108
6	-233.186	-878.176	-232.671	-878.895
7	-233.405	-879.659	-237.701	-873.652
8	-239.182	-875.156	-246.769	-864.546
9	-249.012	-866.829	-258.874	-853.038
10	-261.431	-855.619	-272.435	-840.231
11	-275.408	-843.216	-287.938	-825.694
12	-291.263	-828.988	-305.417	-809.194
13	-308.969	-812.738	-323.928	-791.818
14	-329.029	-796.921	-350.890	-766.349
15	-351.902	-767.358	-376.054	-733.583
16	-376.816	-734.336	-403.326	-697.263
17	-402.974	-698.474	-426.550	-665.505
18	-424.148	-677.349	-485.026	-592.215
19	-382.367	-498.220	-311.063	-588.260
20	-301.468	-592.825	-167.010	-762.616
21	-137.562	-793.111	-348.999	-526.115
22	-339.336	-521.758	-454.446	-595.384
23	-438.753	-595.701	-436.691	-598.584
24	-419.692	-610.652	-397.175	-642.141
25	-379.268	-651.147	-350.983	-690.702
26	-334.452	-695.404	-304.628	-737.111
27	-296.447	-730.099	-278.061	-755.811
28	-271.032	-748.868	-261.965	-761.548
29	-256.188	-755.777	-254.419	-758.251
30	-250.152	-754.011	-254.241	-748.293
31	-251.684	-745.716	-253.453	-743.242
32	-256.039	-745.837	-263.680	-735.150
33	-267.952	-739.444	-282.892	-718.553
34	-288.691	-724.352	-310.415	-693.973
35	-317.402	-700.999	-345.853	-661.212
36	-353.536	-668.964	-394.786	-611.279
37	-395.343	-628.899	-436.117	-571.878
38	-432.899	-592.371	-457.152	-558.454
39	-456.266	-580.246	-364.695	-480.013
40	-360.493	-500.861	-162.371	-751.045
41	-151.337	-775.720	-292.695	-597.215
42	-290.606	-600.597	-315.658	-568.962
43	-400.534	-694.284	-422.746	-663.222
44	-417.130	-677.884	-402.621	-698.173
45	-395.504	-709.082	-369.004	-746.141
46	-365.926	-749.748	-338.755	-787.744
47	-338.004	-787.005	-313.757	-820.912
48	-312.746	-819.919	-295.866	-843.524

49	-290.777	-838.417	-275.187	-860.218
50	-271.634	-856.657	-258.463	-875.076
51	-255.124	-871.794	-244.005	-887.342
52	-240.998	-884.391	-231.540	-897.617
53	-228.954	-895.057	-223.093	-903.252
54	-220.818	-900.990	-219.751	-902.482

COMBINACION 14 G1 + G2 + PRETD + SCMIN-IPF

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-218.214	-901.023	-221.929	-895.827
56	-221.151	-895.097	-229.796	-883.008
57	-229.709	-882.915	-239.464	-869.274
58	-244.262	-874.066	-323.417	-763.372
59	-242.678	-644.580	-265.505	-615.754
60	-264.806	-618.251	-250.704	-636.058

COMBINACION 15 G1 + G2 + PRETD + 0.60 SCMIN-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-251.122	-634.774	-266.605	-615.222
2	-263.505	-613.765	-195.336	-699.847
3	-273.021	-825.404	-260.597	-842.779
4	-259.766	-841.948	-252.956	-851.471
5	-252.483	-851.009	-250.932	-853.178
6	-251.012	-853.246	-254.455	-848.432
7	-255.189	-849.196	-263.442	-837.654
8	-264.923	-839.159	-277.063	-822.181
9	-279.307	-824.463	-294.260	-803.552
10	-296.818	-806.133	-313.122	-783.332
11	-316.097	-786.316	-334.132	-761.094
12	-337.456	-764.389	-357.419	-736.471
13	-360.972	-740.014	-381.942	-710.688
14	-387.043	-715.791	-415.110	-676.540
15	-416.122	-677.550	-446.729	-634.748
16	-447.491	-635.501	-480.714	-589.039
17	-480.623	-589.887	-512.530	-545.266
18	-512.503	-553.789	-589.221	-446.503
19	-486.424	-366.819	-439.262	-426.374
20	-432.169	-427.780	-328.240	-559.018
21	-307.178	-578.925	-471.714	-371.154
22	-462.989	-365.611	-539.902	-475.878
23	-526.879	-472.460	-493.268	-519.464
24	-481.119	-524.749	-441.829	-579.694
25	-428.411	-582.422	-392.351	-632.850
26	-379.360	-632.601	-348.220	-676.149
27	-340.234	-668.865	-320.740	-696.126
28	-313.726	-689.162	-303.568	-703.368
29	-297.791	-697.598	-294.932	-701.595
30	-290.665	-697.355	-293.665	-693.161
31	-291.107	-690.585	-291.789	-689.631
32	-294.374	-692.227	-300.931	-683.057
33	-305.203	-687.351	-319.058	-667.976
34	-324.857	-673.776	-346.538	-643.456
35	-353.532	-650.473	-384.034	-607.817
36	-391.729	-615.554	-435.773	-553.960
37	-439.177	-567.599	-489.625	-497.050
38	-490.362	-512.011	-536.706	-447.202
39	-539.601	-463.706	-477.997	-336.937
40	-478.224	-352.194	-321.990	-549.482
41	-319.429	-563.456	-427.478	-427.015
42	-426.355	-429.177	-420.951	-436.001
43	-512.023	-538.372	-511.277	-539.415
44	-509.044	-549.346	-481.777	-587.478
45	-477.666	-594.182	-444.363	-640.755
46	-442.400	-642.803	-409.892	-688.264
47	-409.139	-687.525	-379.557	-728.894
48	-378.547	-727.899	-356.336	-758.960
49	-351.247	-753.852	-330.328	-783.106

50	-326.774	-779.547	-308.275	-805.416
51	-304.937	-802.133	-288.491	-825.131
52	-285.483	-822.181	-270.700	-842.855
53	-268.114	-840.292	-256.930	-855.933
54	-254.655	-853.671	-248.266	-862.606

COMBINACION 15 G1 + G2 + PRETD + 0.60 SCMIN-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-246.729	-861.145	-245.135	-863.375
56	-244.359	-862.642	-247.700	-857.969
57	-247.613	-857.877	-252.064	-851.653
58	-256.863	-856.445	-330.720	-753.159
59	-249.749	-635.651	-267.615	-613.089
60	-267.478	-614.877	-259.773	-624.605

COMBINACION 16 G1 + G2 + PRETD + SCMAX-EC1 + 0.6 TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-302.101	-570.399	-323.600	-543.250
2	-326.519	-534.192	-314.055	-549.932
3	-399.211	-648.933	-447.647	-581.198
4	-446.815	-580.369	-492.221	-516.871
5	-491.758	-516.395	-536.926	-453.230
6	-537.007	-453.296	-578.074	-395.866
7	-578.808	-396.629	-618.592	-340.993
8	-620.074	-342.497	-655.107	-293.505
9	-657.355	-295.780	-687.086	-254.203
10	-689.645	-256.783	-715.059	-221.243
11	-718.036	-224.223	-736.771	-198.023
12	-740.090	-201.325	-752.478	-184.000
13	-756.034	-187.539	-763.222	-177.486
14	-768.324	-182.588	-773.878	-174.821
15	-774.889	-175.831	-777.539	-172.125
16	-778.302	-172.876	-780.638	-169.610
17	-781.497	-169.128	-781.086	-169.704
18	-789.802	-166.001	-858.103	-70.484
19	-758.413	-23.359	-733.581	-54.716
20	-735.693	-44.497	-674.653	-121.577
21	-671.734	-118.573	-758.312	-9.245
22	-753.038	0.654	-778.105	-142.762
23	-774.910	-125.601	-719.472	-203.129
24	-725.161	-183.469	-700.254	-218.299
25	-703.333	-197.957	-704.490	-196.340
26	-704.531	-177.865	-723.951	-150.707
27	-716.683	-142.419	-737.773	-112.926
28	-730.779	-105.934	-754.596	-72.626
29	-748.819	-66.856	-767.300	-41.011
30	-763.036	-36.767	-774.101	-21.294
31	-771.541	-18.721	-767.426	-24.475
32	-770.011	-27.071	-758.671	-42.930
33	-762.944	-47.223	-745.744	-71.275
34	-751.542	-77.078	-731.582	-104.991
35	-738.600	-111.974	-717.772	-141.101
36	-725.505	-148.784	-706.633	-175.175
37	-718.292	-177.270	-719.954	-174.946
38	-735.235	-169.567	-768.134	-123.560
39	-784.949	-120.599	-749.162	5.482
40	-761.743	5.827	-669.855	-110.207
41	-686.726	-99.644	-737.797	-35.153
42	-740.223	-32.833	-689.420	-96.986
43	-796.922	-139.954	-775.719	-169.605
44	-785.919	-162.150	-771.725	-181.999
45	-778.678	-173.232	-774.861	-178.569
46	-776.991	-174.893	-775.112	-177.521
47	-774.355	-176.789	-765.821	-188.723
48	-764.811	-187.727	-756.343	-199.570
49	-751.252	-194.463	-739.322	-211.148
50	-735.762	-207.596	-717.301	-233.413

51	-713.964	-230.127	-690.285	-263.241
52	-687.273	-260.296	-658.729	-300.214
53	-656.149	-297.644	-621.766	-345.728
54	-619.492	-343.464	-584.580	-392.286

COMBINACION 16 G1 + G2 + PRETD + SCMAX-EC1 + 0.6 TEMP

TENSIONES CON AXIL FINAL

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Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-583.050	-390.816	-544.287	-445.024
56	-543.518	-444.282	-500.928	-503.841
57	-500.837	-503.756	-454.641	-568.359
58	-459.441	-573.149	-474.629	-551.910
59	-389.089	-459.696	-344.444	-516.073
60	-346.303	-515.338	-303.825	-568.978

COMBINACION 17 G1 + G2 + PRETD + TEMP + 0.80 SCMAX-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-297.628	-576.047	-317.471	-550.990
2	-319.331	-543.269	-299.012	-568.927
3	-382.968	-671.648	-423.309	-615.234
4	-422.477	-614.404	-461.533	-559.786
5	-461.071	-559.309	-500.994	-503.479
6	-501.076	-503.544	-538.714	-450.909
7	-539.450	-451.670	-577.028	-399.119
8	-578.509	-400.624	-613.243	-352.050
9	-615.489	-354.329	-646.705	-310.674
10	-649.262	-313.256	-677.359	-273.965
11	-680.335	-276.946	-703.495	-244.557
12	-706.815	-247.858	-725.377	-221.900
13	-728.932	-225.439	-743.595	-204.934
14	-748.696	-210.037	-763.529	-189.294
15	-764.540	-190.304	-777.633	-171.994
16	-778.396	-172.745	-791.839	-153.945
17	-792.586	-153.621	-804.054	-137.583
18	-811.733	-135.330	-889.387	-26.735
19	-787.327	13.153	-768.095	-11.132
20	-769.117	-2.290	-711.482	-75.070
21	-705.680	-75.707	-793.777	35.540
22	-788.094	44.923	-813.905	-92.698
23	-809.546	-77.164	-749.007	-161.825
24	-752.582	-145.121	-719.766	-191.013
25	-720.892	-173.401	-712.271	-185.458
26	-710.768	-169.143	-719.679	-156.681
27	-712.326	-148.512	-724.965	-130.837
28	-717.972	-123.844	-734.665	-100.500
29	-728.887	-94.730	-742.772	-75.313
30	-738.508	-71.069	-747.631	-58.311
31	-745.071	-55.737	-741.588	-60.608
32	-744.173	-63.205	-736.086	-74.513
33	-740.359	-78.806	-729.044	-94.630
34	-734.841	-100.433	-723.196	-116.719
35	-730.211	-123.706	-720.263	-137.618
36	-727.991	-145.306	-722.540	-152.930
37	-733.402	-156.139	-747.722	-136.113
38	-761.281	-133.143	-803.494	-74.111
39	-818.660	-73.456	-784.864	50.566
40	-796.303	49.468	-704.112	-66.949
41	-721.406	-55.850	-771.066	6.858
42	-773.072	8.648	-719.397	-59.131
43	-827.179	-97.641	-800.274	-135.267
44	-809.002	-129.870	-785.459	-162.794
45	-791.100	-155.859	-776.438	-176.363
46	-778.083	-173.366	-765.571	-190.863
47	-764.813	-190.132	-747.562	-214.257
48	-746.550	-213.264	-730.825	-235.255
49	-725.734	-230.149	-707.496	-255.654

50	-703.937	-252.101	-680.959	-284.236
51	-677.620	-280.953	-650.879	-318.349
52	-647.867	-315.404	-617.564	-357.780
53	-614.984	-355.211	-580.726	-403.120
54	-578.453	-400.854	-544.734	-448.009

COMBINACION 17 G1 + G2 + PRETD + TEMP + 0.80 SCMAX-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-543.202	-446.542	-507.363	-496.661
56	-506.591	-495.922	-468.683	-548.935
57	-468.591	-548.850	-428.017	-605.591
58	-432.816	-610.383	-455.230	-579.038
59	-370.307	-483.413	-333.850	-529.450
60	-335.479	-529.007	-299.049	-575.009

COMBINACION 18 G1 + G2 + PRETD + 0.60 SCMAX-EC1 + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-290.879	-584.569	-304.185	-567.767
2	-304.987	-561.383	-271.934	-603.121
3	-354.295	-711.746	-381.498	-673.704
4	-380.666	-672.874	-408.335	-634.181
5	-407.872	-633.705	-437.511	-592.257
6	-437.591	-592.324	-466.766	-551.525
7	-467.501	-552.288	-497.831	-509.872
8	-499.312	-511.378	-528.704	-470.273
9	-530.951	-472.551	-558.609	-433.872
10	-561.168	-436.452	-586.903	-400.463
11	-589.879	-403.444	-612.423	-371.918
12	-615.743	-375.218	-635.432	-347.684
13	-638.987	-351.223	-656.079	-327.321
14	-661.180	-332.423	-680.248	-305.758
15	-681.259	-306.768	-699.749	-280.911
16	-700.512	-281.662	-720.017	-254.386
17	-720.651	-254.218	-738.951	-228.627
18	-745.595	-227.822	-827.552	-113.208
19	-726.077	-64.191	-707.558	-87.577
20	-707.490	-80.112	-648.372	-154.764
21	-642.751	-155.172	-732.370	-42.003
22	-726.279	-33.136	-749.660	-182.542
23	-744.136	-168.637	-678.499	-260.427
24	-679.963	-246.676	-639.238	-303.627
25	-638.412	-288.746	-620.016	-314.472
26	-616.969	-300.316	-615.375	-302.546
27	-607.936	-294.496	-612.128	-288.635
28	-605.134	-281.642	-614.706	-268.256
29	-608.929	-262.486	-618.220	-249.493
30	-613.955	-245.250	-621.139	-235.203
31	-618.580	-232.629	-615.731	-236.613
32	-618.316	-239.210	-613.484	-245.967
33	-617.757	-250.260	-612.328	-257.852
34	-618.126	-263.654	-614.796	-268.310
35	-621.808	-275.302	-622.743	-273.995
36	-630.467	-281.690	-638.438	-270.543
37	-648.503	-274.867	-675.484	-237.135
38	-687.321	-236.574	-738.851	-164.511
39	-752.367	-166.163	-723.740	-26.620
40	-734.036	-29.161	-641.543	-145.959
41	-656.201	-138.190	-709.319	-71.114
42	-710.905	-69.854	-659.231	-135.108
43	-764.338	-185.521	-736.761	-224.087
44	-744.017	-220.748	-716.156	-259.710
45	-720.487	-254.608	-700.011	-283.243
46	-701.173	-280.921	-683.057	-306.255
47	-682.301	-305.522	-661.364	-334.801
48	-660.354	-333.806	-642.407	-358.904
49	-637.316	-353.797	-617.809	-381.077

50	-614.252	-377.522	-591.795	-408.927
51	-588.457	-405.643	-563.692	-440.277
52	-560.681	-437.329	-533.661	-475.116
53	-531.080	-472.548	-501.996	-513.220
54	-499.722	-510.956	-472.241	-549.386

COMBINACION 18 G1 + G2 + PRETD + 0.60 SCMAX-EC1 + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-470.710	-547.919	-442.842	-586.890
56	-442.071	-586.150	-413.887	-625.564
57	-413.798	-625.477	-383.893	-667.297
58	-388.692	-672.088	-423.383	-623.574
59	-339.470	-522.353	-316.093	-551.873
60	-317.490	-551.722	-291.999	-583.911

COMBINACION 19 G1 + G2 + PRETD + SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-226.147	-666.311	-260.323	-623.154
2	-255.413	-623.983	-184.639	-713.355
3	-261.872	-840.995	-244.174	-865.745
4	-243.343	-864.915	-229.712	-883.977
5	-229.234	-883.522	-220.853	-895.242
6	-220.933	-895.311	-217.542	-900.052
7	-218.276	-900.816	-219.703	-898.821
8	-221.184	-900.326	-227.391	-891.645
9	-229.634	-893.928	-239.460	-880.186
10	-242.018	-882.768	-253.512	-866.694
11	-256.485	-869.680	-270.027	-850.742
12	-273.349	-854.039	-289.275	-831.768
13	-292.826	-835.312	-310.048	-811.229
14	-315.148	-816.333	-339.762	-781.912
15	-340.773	-782.922	-368.303	-744.423
16	-369.064	-745.176	-395.568	-708.112
17	-395.308	-709.196	-413.669	-683.518
18	-413.161	-692.715	-477.380	-602.907
19	-379.487	-501.856	-322.614	-573.673
20	-316.872	-573.373	-147.810	-786.860
21	-168.937	-753.492	-347.478	-528.035
22	-338.126	-523.285	-443.873	-610.171
23	-431.609	-605.690	-412.212	-632.817
24	-401.314	-636.352	-378.551	-668.185
25	-367.299	-667.884	-333.322	-715.400
26	-322.462	-712.170	-297.376	-747.252
27	-289.664	-739.585	-276.516	-757.972
28	-269.525	-750.976	-262.176	-761.253
29	-256.398	-755.483	-256.057	-755.961
30	-251.790	-751.720	-255.944	-745.911
31	-253.387	-743.334	-250.521	-747.343
32	-253.106	-749.938	-254.319	-748.241
33	-258.590	-752.537	-267.099	-740.638
34	-272.899	-746.437	-290.799	-721.405
35	-297.789	-728.428	-327.628	-686.698
36	-335.315	-694.445	-379.676	-632.408
37	-381.159	-648.734	-426.158	-585.806
38	-426.190	-601.753	-449.697	-568.879
39	-453.947	-583.489	-376.663	-464.900
40	-379.434	-476.944	-159.451	-754.732
41	-198.356	-716.345	-299.995	-587.997
42	-298.222	-590.980	-315.632	-568.995
43	-403.854	-689.642	-410.286	-680.646
44	-409.012	-689.236	-382.470	-726.355
45	-379.552	-731.390	-350.577	-771.910
46	-350.247	-771.674	-324.218	-808.074
47	-323.464	-807.338	-300.364	-839.642
48	-299.354	-838.647	-283.614	-860.658
49	-278.525	-855.550	-264.079	-875.753

50	-260.524	-872.193	-248.492	-889.020
51	-245.155	-885.734	-235.177	-899.688
52	-232.171	-896.736	-223.854	-908.366
53	-221.270	-905.802	-216.546	-912.409
54	-214.271	-910.146	-214.341	-910.047

COMBINACION 19 G1 + G2 + PRETD + SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-212.807	-908.584	-217.685	-901.762
56	-216.908	-901.031	-226.722	-887.305
57	-226.636	-887.213	-237.556	-871.943
58	-242.355	-876.734	-322.564	-764.565
59	-241.851	-645.623	-265.911	-615.242
60	-265.399	-617.501	-254.851	-630.820

COMBINACION 20 G1 + G2 + PRETD + 0.60 SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-244.953	-642.563	-265.106	-617.115
2	-261.210	-616.663	-192.412	-703.539
3	-269.958	-829.688	-256.697	-848.233
4	-255.865	-847.403	-247.328	-859.342
5	-246.856	-858.878	-243.581	-863.458
6	-243.661	-863.527	-245.378	-861.126
7	-246.111	-861.890	-252.643	-852.756
8	-254.124	-854.261	-265.436	-838.441
9	-267.681	-840.722	-282.612	-819.841
10	-285.170	-822.422	-301.769	-799.210
11	-304.742	-802.194	-323.386	-776.122
12	-326.708	-779.420	-347.734	-750.016
13	-351.287	-753.558	-373.614	-722.335
14	-378.714	-727.438	-408.433	-685.878
15	-409.445	-686.888	-442.077	-641.253
16	-442.840	-642.005	-476.060	-595.548
17	-476.022	-596.320	-504.801	-556.074
18	-505.911	-563.008	-584.633	-452.919
19	-484.697	-369.000	-446.193	-417.622
20	-441.412	-416.108	-316.721	-573.565
21	-326.003	-555.153	-470.801	-372.306
22	-462.264	-366.528	-533.558	-484.751
23	-522.593	-478.454	-478.581	-540.003
24	-470.092	-540.169	-430.655	-595.321
25	-421.230	-592.465	-381.755	-647.669
26	-372.167	-642.661	-343.869	-682.234
27	-336.164	-674.556	-319.812	-697.424
28	-312.822	-690.427	-303.694	-703.192
29	-297.917	-697.422	-295.914	-700.222
30	-291.648	-695.981	-294.687	-691.731
31	-292.129	-689.156	-290.029	-692.092
32	-292.615	-694.687	-295.315	-690.911
33	-299.586	-695.206	-309.583	-681.227
34	-315.382	-687.026	-334.769	-659.916
35	-341.764	-666.931	-373.099	-623.110
36	-380.796	-630.843	-426.708	-566.637
37	-430.667	-579.500	-483.649	-505.407
38	-486.337	-517.640	-532.232	-453.458
39	-538.210	-465.652	-485.178	-327.870
40	-489.588	-337.844	-320.238	-551.694
41	-347.641	-527.831	-431.858	-421.485
42	-430.925	-423.406	-420.935	-436.021
43	-514.015	-535.587	-503.802	-549.869
44	-504.174	-556.158	-469.686	-604.387
45	-468.095	-607.566	-433.306	-656.217
46	-432.993	-655.958	-401.169	-700.462
47	-400.415	-699.725	-371.521	-740.132
48	-370.512	-739.136	-348.985	-769.240
49	-343.896	-764.132	-323.663	-792.427

50	-320.108	-788.868	-302.292	-813.783
51	-298.956	-810.497	-283.194	-832.539
52	-280.187	-829.587	-266.088	-849.304
53	-263.504	-846.740	-253.001	-861.427
54	-250.726	-859.165	-245.020	-867.145

COMBINACION 20 G1 + G2 + PRETD + 0.60 SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-243.485	-865.682	-242.588	-866.936
56	-241.813	-866.202	-245.856	-860.548
57	-245.770	-860.456	-250.919	-853.254
58	-255.718	-858.046	-330.208	-753.875
59	-249.253	-636.277	-267.859	-612.782
60	-267.833	-614.427	-262.262	-621.463

COMBINACION 21 G1 + G2 + 0.9 PRETD

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-245.482	-546.707	-250.661	-540.167
2	-248.525	-538.030	-194.274	-606.536
3	-264.836	-716.129	-263.106	-718.549
4	-262.358	-717.802	-264.878	-714.277
5	-264.461	-713.850	-270.843	-704.925
6	-270.915	-704.986	-280.903	-691.018
7	-281.562	-691.708	-294.990	-672.929
8	-296.323	-674.284	-313.164	-650.733
9	-315.186	-652.782	-334.394	-625.920
10	-336.696	-628.243	-356.515	-600.527
11	-359.193	-603.211	-379.959	-574.172
12	-382.948	-577.141	-404.965	-546.350
13	-408.164	-549.537	-430.470	-518.343
14	-435.061	-522.934	-463.131	-483.681
15	-464.041	-484.589	-493.839	-442.918
16	-494.526	-443.595	-526.142	-399.381
17	-526.409	-399.655	-558.134	-355.289
18	-561.316	-358.476	-642.617	-244.782
19	-550.815	-187.401	-531.201	-212.169
20	-528.196	-209.167	-465.144	-288.788
21	-457.681	-292.191	-556.787	-167.044
22	-550.202	-160.456	-579.843	-296.933
23	-571.728	-288.813	-510.342	-374.659
24	-505.955	-370.260	-457.877	-437.495
25	-451.862	-431.474	-417.312	-479.791
26	-410.400	-472.882	-387.468	-504.950
27	-380.544	-498.026	-366.849	-517.178
28	-360.556	-510.883	-353.759	-520.389
29	-348.559	-515.196	-346.807	-517.647
30	-342.968	-513.829	-344.960	-511.043
31	-342.658	-508.725	-341.040	-510.987
32	-343.367	-513.323	-345.515	-510.319
33	-349.361	-514.182	-356.550	-504.128
34	-361.769	-509.349	-375.879	-489.617
35	-382.183	-495.919	-405.533	-463.265
36	-412.473	-470.207	-447.487	-421.242
37	-454.394	-428.142	-502.930	-360.267
38	-508.934	-366.264	-569.011	-282.249
39	-576.722	-289.963	-549.749	-152.277
40	-555.930	-158.460	-457.532	-282.715
41	-466.493	-281.066	-529.495	-201.509
42	-529.789	-201.807	-493.562	-247.554
43	-582.991	-313.685	-560.453	-345.204
44	-563.009	-347.757	-529.480	-394.645
45	-529.839	-395.003	-498.027	-439.491
46	-497.766	-439.228	-467.758	-481.192
47	-467.079	-480.530	-438.820	-520.049
48	-437.913	-519.151	-415.404	-550.628
49	-410.824	-546.031	-388.593	-577.121

50	-385.391	-573.920	-364.451	-603.205
51	-361.446	-600.250	-341.466	-628.191
52	-338.758	-625.537	-319.384	-652.630
53	-317.059	-650.321	-300.039	-674.123
54	-297.991	-672.087	-284.401	-691.093

COMBINACION 21 G1 + G2 + 0.9 PRETD

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-283.021	-689.774	-272.872	-703.968
56	-272.176	-703.303	-265.590	-712.515
57	-265.511	-712.433	-259.033	-721.492
58	-263.353	-725.803	-318.459	-648.740
59	-244.924	-546.641	-249.312	-541.100
60	-249.944	-541.753	-245.676	-547.143

COMBINACION 22 G1 + G2 + 0.9 PRETD + TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-248.011	-543.513	-258.612	-530.126
2	-256.477	-527.989	-207.648	-589.649
3	-278.647	-696.815	-282.520	-691.400
4	-281.771	-690.653	-289.889	-679.301
5	-289.474	-678.869	-301.455	-662.115
6	-301.530	-662.172	-317.111	-640.382
7	-317.774	-641.067	-336.804	-614.454
8	-338.136	-615.810	-360.580	-584.423
9	-362.598	-586.479	-387.410	-551.780
10	-389.710	-554.106	-415.133	-518.554
11	-417.809	-521.239	-444.178	-484.364
12	-447.168	-487.332	-474.792	-448.701
13	-477.990	-451.888	-505.902	-412.854
14	-510.492	-417.448	-544.166	-370.356
15	-545.077	-371.265	-580.482	-321.753
16	-581.168	-322.430	-618.390	-270.377
17	-618.657	-270.651	-655.990	-218.442
18	-659.172	-221.629	-746.082	-100.091
19	-650.996	-60.895	-636.814	-78.805
20	-633.810	-75.802	-576.187	-148.566
21	-565.321	-156.267	-664.423	-31.123
22	-657.837	-24.536	-691.004	-141.478
23	-682.890	-133.359	-621.500	-219.210
24	-617.113	-214.811	-569.032	-282.050
25	-563.017	-276.029	-528.463	-324.350
26	-521.551	-317.442	-498.616	-349.516
27	-491.693	-342.591	-477.993	-361.749
28	-471.700	-355.454	-464.900	-364.964
29	-459.700	-359.770	-457.945	-362.225
30	-454.107	-358.406	-456.095	-355.626
31	-453.793	-353.308	-452.173	-355.574
32	-454.500	-357.909	-456.646	-354.908
33	-460.491	-358.772	-467.678	-348.721
34	-472.897	-353.943	-487.005	-334.213
35	-493.309	-340.515	-516.656	-307.865
36	-523.596	-314.807	-558.608	-265.844
37	-565.515	-272.745	-614.049	-204.873
38	-620.052	-210.870	-680.126	-126.859
39	-687.837	-134.574	-657.335	-16.421
40	-663.516	-22.604	-565.115	-146.862
41	-577.478	-140.917	-635.068	-68.194
42	-635.361	-68.493	-593.722	-121.074
43	-686.435	-169.024	-658.306	-208.361
44	-660.863	-210.912	-621.742	-265.621
45	-622.101	-265.979	-584.698	-318.285
46	-584.435	-318.026	-548.839	-367.804
47	-548.159	-367.145	-514.309	-414.482
48	-513.396	-413.591	-485.295	-452.890
49	-480.712	-448.295	-452.882	-487.215

50	-449.682	-484.013	-423.141	-521.129
51	-420.134	-518.177	-394.557	-553.946
52	-391.846	-551.296	-366.872	-586.220
53	-364.548	-583.911	-341.917	-615.559
54	-339.872	-613.520	-320.675	-640.366

COMBINACION 22 G1 + G2 + 0.9 PRETD + TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-319.294	-639.049	-303.534	-661.088
56	-302.837	-660.426	-290.645	-677.476
57	-290.564	-677.397	-278.478	-694.300
58	-282.796	-698.613	-332.291	-629.397
59	-258.318	-529.727	-257.271	-531.050
60	-257.905	-531.701	-248.203	-543.952

COMBINACION 23 G1 + G2 + 0.9 PRETD + SCMAX-IPF + 0.6 TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-272.609	-512.452	-299.874	-478.023
2	-299.767	-473.323	-292.321	-482.726
3	-370.796	-567.949	-419.514	-499.820
4	-418.765	-499.073	-464.611	-434.960
5	-464.210	-434.510	-506.590	-375.243
6	-506.665	-375.300	-545.858	-320.491
7	-546.519	-321.177	-582.356	-271.062
8	-583.689	-272.416	-615.496	-227.935
9	-617.522	-229.980	-644.656	-192.033
10	-646.958	-194.357	-667.909	-165.057
11	-670.593	-167.733	-685.608	-146.736
12	-688.592	-149.712	-697.246	-137.609
13	-700.446	-140.795	-702.609	-137.770
14	-707.202	-142.359	-708.338	-140.769
15	-709.249	-141.678	-704.902	-147.757
16	-705.589	-148.433	-695.778	-162.153
17	-696.694	-161.519	-688.043	-173.617
18	-692.908	-174.451	-749.116	-95.848
19	-655.838	-54.781	-623.930	-95.073
20	-625.580	-86.194	-564.311	-163.563
21	-556.024	-168.007	-649.694	-49.722
22	-645.454	-40.173	-690.991	-141.497
23	-683.156	-132.987	-664.713	-158.779
24	-660.785	-153.737	-653.979	-163.256
25	-648.269	-156.808	-651.498	-152.293
26	-644.988	-144.822	-674.544	-103.489
27	-668.109	-95.881	-697.661	-54.554
28	-691.404	-48.208	-715.982	-13.838
29	-710.783	-8.643	-728.504	16.139
30	-724.671	19.964	-734.214	33.310
31	-731.910	35.625	-725.694	26.934
32	-728.022	24.599	-713.618	4.456
33	-717.467	0.596	-696.201	-29.142
34	-701.417	-34.367	-675.081	-71.197
35	-681.402	-77.475	-652.267	-118.220
36	-659.235	-125.122	-647.983	-140.857
37	-655.083	-147.489	-662.272	-137.435
38	-668.600	-142.978	-685.381	-119.510
39	-693.527	-126.617	-644.857	-32.177
40	-662.106	-24.384	-556.749	-157.426
41	-574.734	-144.382	-632.892	-70.941
42	-635.602	-68.189	-597.310	-116.543
43	-697.001	-154.248	-684.768	-171.356
44	-690.853	-168.973	-688.669	-172.027
45	-689.341	-171.946	-688.312	-173.386
46	-690.838	-169.225	-697.112	-160.452
47	-696.430	-159.794	-697.262	-158.630
48	-696.356	-157.731	-696.168	-157.993
49	-691.585	-153.400	-684.885	-162.769

50	-681.679	-159.576	-668.664	-177.777
51	-665.660	-174.821	-646.742	-201.277
52	-644.030	-198.628	-618.928	-233.733
53	-616.607	-231.418	-586.822	-273.071
54	-584.777	-271.031	-550.990	-318.281

COMBINACION 23 G1 + G2 + 0.9 PRETD + SCMAX-IPF + 0.6 TEMP

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-549.618	-316.951	-512.513	-368.840
56	-511.823	-368.169	-471.506	-424.551
57	-471.423	-424.474	-423.854	-490.998
58	-428.173	-495.311	-435.075	-485.659
59	-357.836	-404.058	-310.582	-463.729
60	-311.217	-464.380	-274.606	-510.611

COMBINACION 24 G1 + G2 + 0.9 PRETD + TEMP + 0.80 SCMAX-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-268.498	-517.643	-294.166	-485.230
2	-293.653	-481.043	-279.666	-498.707
3	-356.786	-587.542	-398.327	-529.449
4	-397.579	-528.702	-437.670	-472.636
5	-437.267	-472.188	-475.359	-418.918
6	-475.435	-418.974	-511.695	-368.265
7	-512.358	-368.950	-546.626	-321.028
8	-547.958	-322.383	-579.686	-278.013
9	-581.709	-280.062	-610.172	-240.258
10	-612.473	-242.583	-636.112	-209.524
11	-638.793	-212.204	-657.872	-185.523
12	-660.857	-188.497	-675.100	-168.579
13	-678.299	-171.766	-687.406	-159.030
14	-691.998	-163.621	-701.435	-150.423
15	-702.346	-151.332	-707.744	-143.783
16	-708.430	-144.460	-709.820	-142.516
17	-710.606	-142.064	-712.947	-138.791
18	-717.475	-140.096	-781.617	-50.396
19	-686.928	-15.522	-660.303	-49.143
20	-661.022	-41.439	-602.220	-115.692
21	-592.327	-122.164	-687.084	-2.508
22	-682.374	6.449	-726.565	-91.748
23	-718.674	-83.316	-691.641	-121.121
24	-687.621	-116.208	-672.559	-137.273
25	-666.788	-130.910	-662.459	-136.964
26	-655.869	-129.605	-674.926	-102.955
27	-668.393	-95.484	-689.293	-66.256
28	-683.030	-59.919	-701.330	-34.327
29	-696.132	-29.133	-709.956	-9.799
30	-706.122	-5.975	-714.153	5.257
31	-711.850	7.572	-706.553	0.165
32	-708.880	-2.170	-697.786	-17.685
33	-701.633	-21.546	-686.058	-43.328
34	-691.274	-48.552	-673.026	-74.071
35	-679.344	-80.354	-660.704	-106.421
36	-667.667	-113.330	-665.667	-116.128
37	-672.727	-122.813	-688.185	-101.197
38	-694.448	-106.831	-719.888	-71.255
39	-727.946	-78.483	-681.780	14.448
40	-696.816	19.447	-592.849	-111.840
41	-610.798	-98.841	-667.111	-27.731
42	-669.337	-25.589	-628.643	-76.976
43	-727.989	-110.912	-710.788	-134.967
44	-716.168	-133.571	-704.808	-149.458
45	-705.417	-149.465	-695.324	-163.580
46	-697.291	-160.201	-693.403	-165.639
47	-692.721	-164.981	-684.828	-176.019
48	-683.919	-175.124	-676.358	-185.696
49	-671.775	-181.103	-659.057	-198.888

50	-655.853	-195.693	-638.340	-220.184
51	-635.335	-217.229	-613.294	-248.053
52	-610.581	-245.405	-583.712	-282.979
53	-581.392	-280.665	-551.242	-322.828
54	-549.198	-320.787	-516.535	-366.464

COMBINACION 24 G1 + G2 + 0.9 PRETD + TEMP + 0.80 SCMAX-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-515.160	-365.138	-480.529	-413.568
56	-479.837	-412.900	-443.351	-463.924
57	-443.269	-463.847	-401.001	-522.957
58	-405.319	-527.270	-418.944	-508.217
59	-342.218	-423.780	-302.467	-473.977
60	-303.101	-474.628	-270.134	-516.258

COMBINACION 25 G1 + G2 + 0.9 PRETD + 0.60 SCMAX-IPF + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-262.112	-525.707	-281.302	-501.475
2	-280.383	-497.800	-254.974	-529.886
3	-330.346	-624.517	-359.668	-583.511
4	-358.920	-582.764	-388.219	-541.791
5	-387.812	-541.348	-416.577	-501.122
6	-416.651	-501.181	-444.945	-461.613
7	-445.606	-462.299	-473.263	-423.622
8	-474.596	-424.976	-501.202	-387.770
9	-503.225	-389.819	-527.974	-355.208
10	-530.275	-357.532	-551.558	-327.769
11	-554.239	-330.449	-572.339	-305.137
12	-575.325	-308.110	-590.109	-287.435
13	-593.309	-290.621	-604.314	-275.230
14	-608.906	-279.820	-621.600	-262.069
15	-622.511	-262.977	-632.607	-248.858
16	-633.293	-249.535	-640.838	-238.984
17	-641.495	-238.713	-649.779	-227.128
18	-653.971	-228.903	-721.001	-135.165
19	-627.854	-90.118	-601.625	-123.240
20	-601.412	-116.712	-540.190	-194.022
21	-531.756	-198.651	-627.600	-77.622
22	-622.422	-69.257	-662.094	-181.908
23	-654.147	-173.554	-618.527	-223.368
24	-614.415	-218.584	-591.100	-251.189
25	-585.268	-244.912	-573.385	-261.530
26	-566.714	-254.284	-575.275	-242.312
27	-568.644	-234.978	-580.896	-217.844
28	-574.626	-211.518	-586.653	-194.698
29	-581.453	-189.505	-591.384	-175.617
30	-587.549	-171.794	-594.071	-162.672
31	-591.768	-160.357	-587.391	-166.477
32	-589.719	-168.812	-581.935	-179.697
33	-585.782	-183.558	-575.899	-197.380
34	-581.116	-202.603	-570.958	-216.808
35	-577.272	-223.096	-569.130	-234.482
36	-576.088	-241.399	-583.342	-231.255
37	-590.364	-237.995	-614.091	-204.813
38	-620.290	-210.537	-654.390	-162.851
39	-662.361	-170.201	-621.876	-61.197
40	-634.698	-58.994	-532.124	-188.522
41	-546.976	-179.435	-606.313	-104.505
42	-608.057	-102.972	-569.833	-151.240
43	-665.879	-197.771	-648.741	-221.738
44	-653.415	-221.328	-637.910	-243.011
45	-638.458	-243.105	-624.332	-262.859
46	-625.743	-260.258	-616.721	-272.874
47	-616.041	-272.215	-604.454	-288.418
48	-603.546	-287.520	-593.648	-301.363
49	-589.065	-296.769	-575.369	-315.923

50	-572.165	-312.727	-555.195	-336.458
51	-552.191	-333.503	-532.065	-361.648
52	-529.353	-358.998	-505.758	-391.994
53	-503.436	-389.682	-477.972	-425.293
54	-475.926	-423.254	-449.433	-460.303

COMBINACION 25 G1 + G2 + 0.9 PRETD + 0.60 SCMAX-IPF + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-448.058	-458.978	-420.950	-496.888
56	-420.257	-496.220	-392.647	-534.831
57	-392.566	-534.753	-360.648	-579.389
58	-364.967	-583.701	-390.365	-548.183
59	-314.547	-458.723	-287.188	-493.271
60	-287.822	-493.922	-263.388	-524.777

COMBINACION 26 G1 + G2 + 0.9 PRETD + SCMIN-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-208.748	-593.094	-241.205	-552.108
2	-237.858	-551.500	-179.716	-624.921
3	-249.727	-737.259	-238.301	-753.238
4	-237.552	-752.491	-230.217	-762.748
5	-229.784	-762.344	-226.275	-767.250
6	-226.347	-767.311	-226.443	-767.177
7	-227.103	-767.865	-230.638	-762.922
8	-231.971	-764.276	-237.428	-756.645
9	-239.447	-758.699	-245.929	-749.634
10	-248.230	-751.958	-254.797	-742.774
11	-257.474	-745.461	-264.472	-735.674
12	-267.465	-738.638	-274.959	-728.158
13	-278.155	-731.348	-285.437	-721.165
14	-290.027	-725.758	-302.580	-708.203
15	-303.491	-709.111	-317.154	-690.004
16	-317.840	-690.682	-332.669	-669.943
17	-332.289	-671.123	-343.184	-655.886
18	-340.429	-667.376	-382.130	-609.060
19	-290.670	-515.905	-210.705	-616.883
20	-201.443	-621.783	-62.067	-797.784
21	-33.641	-827.658	-249.999	-554.447
22	-241.068	-550.821	-366.204	-595.696
23	-351.412	-596.915	-368.898	-572.462
24	-352.386	-585.018	-346.242	-593.611
25	-329.004	-603.285	-313.892	-624.419
26	-298.127	-629.890	-278.489	-657.354
27	-271.077	-651.111	-260.151	-666.390
28	-253.821	-660.147	-249.752	-665.837
29	-244.553	-660.644	-245.525	-659.284
30	-241.685	-655.469	-246.401	-648.874
31	-244.100	-646.553	-245.201	-645.013
32	-247.528	-647.349	-252.389	-640.552
33	-256.233	-644.417	-266.134	-630.571
34	-271.353	-635.792	-285.571	-615.908
35	-291.858	-622.234	-310.080	-596.752
36	-316.992	-603.732	-345.019	-564.538
37	-344.809	-581.391	-369.161	-547.337
38	-365.275	-567.164	-370.127	-560.378
39	-368.384	-581.313	-266.492	-509.967
40	-261.604	-530.128	-58.483	-786.624
41	-46.261	-811.724	-192.539	-627.008
42	-190.416	-630.357	-230.330	-579.956
43	-304.270	-703.463	-339.124	-654.722
44	-333.224	-669.101	-331.591	-671.385
45	-324.432	-682.254	-309.629	-702.956
46	-306.580	-706.592	-289.918	-729.894
47	-289.241	-729.228	-274.320	-750.095
48	-273.409	-749.201	-264.230	-762.038
49	-259.648	-757.443	-250.740	-769.900

50	-247.541	-766.698	-239.921	-777.354
51	-236.914	-774.402	-230.252	-783.718
52	-227.544	-781.063	-221.486	-789.536
53	-219.158	-787.232	-215.448	-792.419
54	-213.400	-790.384	-213.115	-790.783

COMBINACION 26 G1 + G2 + 0.9 PRETD + SCMIN-IPF

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-211.731	-789.470	-214.857	-785.098
56	-214.157	-784.442	-220.829	-775.111
57	-220.751	-775.028	-227.533	-765.544
58	-231.852	-769.857	-300.202	-674.271
59	-227.247	-568.963	-244.035	-547.763
60	-243.265	-550.188	-223.004	-575.773

COMBINACION 27 G1 + G2 + 0.9 PRETD + 0.60 SCMIN-IPF

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
1	-223.442	-574.539	-244.988	-547.331
2	-242.125	-546.112	-185.539	-617.567
3	-255.770	-728.807	-248.223	-739.362
4	-247.474	-738.615	-244.082	-743.360
5	-243.654	-742.946	-244.102	-742.320
6	-244.174	-742.381	-248.227	-736.714
7	-248.887	-737.402	-256.379	-726.925
8	-257.712	-728.279	-267.723	-714.280
9	-269.742	-716.333	-281.315	-700.148
10	-283.617	-702.472	-295.484	-685.876
11	-298.162	-688.561	-310.667	-671.073
12	-313.658	-674.040	-326.961	-655.435
13	-330.159	-658.623	-343.450	-640.036
14	-348.041	-644.629	-366.800	-618.394
15	-367.711	-619.303	-387.828	-591.170
16	-388.514	-591.847	-410.059	-561.718
17	-409.937	-562.536	-429.164	-535.647
18	-428.784	-543.817	-486.325	-463.348
19	-394.728	-384.504	-338.903	-454.998
20	-332.145	-456.737	-223.298	-594.186
21	-203.257	-613.471	-372.714	-399.486
22	-364.721	-394.675	-451.659	-476.191
23	-439.539	-473.674	-425.475	-493.341
24	-413.814	-499.115	-390.896	-531.164
25	-378.147	-534.561	-355.259	-566.568
26	-343.036	-567.087	-322.080	-596.393
27	-314.864	-589.877	-302.831	-606.705
28	-296.515	-600.442	-291.355	-607.658
29	-286.155	-602.465	-286.038	-602.629
30	-282.198	-598.812	-285.824	-593.741
31	-283.523	-591.422	-283.537	-591.403
32	-285.864	-593.738	-289.639	-588.459
33	-293.484	-592.324	-302.300	-579.994
34	-307.520	-585.214	-321.695	-565.392
35	-327.988	-571.708	-348.261	-543.357
36	-355.184	-550.322	-386.006	-507.219
37	-388.643	-520.092	-422.669	-472.509
38	-422.739	-486.803	-449.681	-449.127
39	-451.719	-464.774	-379.795	-366.891
40	-379.334	-381.461	-218.102	-585.060
41	-214.354	-599.460	-327.321	-456.809
42	-326.166	-458.937	-335.622	-446.995
43	-415.759	-547.552	-427.655	-530.916
44	-425.138	-540.564	-410.747	-560.689
45	-406.596	-567.353	-384.988	-597.570
46	-383.054	-599.647	-361.054	-630.413
47	-360.377	-629.749	-340.120	-658.077
48	-339.211	-657.181	-324.700	-677.474
49	-320.119	-672.878	-305.881	-692.789

50	-302.681	-689.587	-289.733	-707.694
51	-286.727	-704.742	-274.738	-721.507
52	-272.030	-718.853	-260.645	-734.774
53	-258.318	-732.468	-249.285	-745.101
54	-247.237	-743.065	-241.629	-750.907

COMBINACION 27 G1 + G2 + 0.9 PRETD + 0.60 SCMIN-IPF

TENSIONES CON AXIL FINAL

=====

Barra	TS_1	TI_1	TS_2	T1_2
=====				
55	-240.247	-749.592	-238.063	-752.646
56	-237.365	-751.986	-238.733	-750.072
57	-238.655	-749.990	-240.133	-747.923
58	-244.452	-752.235	-307.505	-664.058
59	-234.318	-560.034	-246.145	-545.098
60	-245.937	-546.814	-232.073	-564.321

COMBINACION 28 G1 + G2 + 0.9 PRETD + SCMAX-EC1 + 0.6 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-274.421	-510.164	-301.983	-475.359
2	-305.139	-466.539	-304.257	-467.653
3	-381.961	-552.335	-435.273	-477.782
4	-434.524	-477.035	-483.346	-408.759
5	-482.929	-408.332	-530.095	-342.372
6	-530.169	-342.431	-571.846	-284.148
7	-572.507	-284.835	-611.530	-230.264
8	-612.863	-231.618	-645.767	-185.603
9	-647.790	-187.650	-674.142	-150.799
10	-676.444	-153.122	-697.421	-123.787
11	-700.101	-126.468	-713.304	-108.003
12	-716.292	-110.975	-722.020	-102.964
13	-725.220	-106.148	-724.730	-106.834
14	-729.321	-111.426	-725.568	-116.675
15	-726.478	-117.584	-718.639	-128.547
16	-719.326	-129.223	-709.982	-142.289
17	-710.812	-141.777	-697.720	-160.085
18	-706.082	-156.028	-755.207	-87.329
19	-666.716	-41.044	-633.222	-83.339
20	-635.668	-73.455	-569.711	-156.744
21	-567.814	-153.119	-659.312	-37.577
22	-654.770	-28.410	-689.863	-143.074
23	-687.570	-126.815	-651.679	-177.006
24	-657.855	-157.834	-649.321	-169.769
25	-653.069	-150.095	-667.398	-130.057
26	-668.207	-112.351	-697.812	-70.950
27	-691.312	-63.432	-719.863	-23.505
28	-713.568	-17.213	-742.383	23.084
29	-737.183	28.276	-758.406	57.956
30	-754.569	61.775	-766.261	78.126
31	-763.957	80.442	-759.174	73.753
32	-761.501	71.417	-747.379	51.669
33	-751.225	47.805	-728.987	16.707
34	-734.204	11.483	-706.738	-26.927
35	-713.056	-33.208	-681.999	-76.641
36	-688.961	-83.552	-656.866	-128.435
37	-667.758	-129.762	-652.998	-150.404
38	-667.612	-144.359	-681.109	-125.485
39	-697.067	-121.666	-650.959	-24.472
40	-662.854	-23.439	-565.967	-145.786
41	-581.650	-135.648	-637.640	-64.946
42	-640.033	-62.593	-604.091	-107.979
43	-700.658	-149.134	-692.097	-161.106
44	-702.013	-153.367	-700.694	-155.211
45	-707.607	-146.403	-715.487	-135.383
46	-717.646	-131.736	-726.274	-119.670
47	-725.592	-119.013	-726.383	-117.906
48	-725.475	-117.009	-724.706	-118.084
49	-720.124	-113.489	-714.875	-120.830

50	-711.670	-117.635	-698.759	-135.691
51	-695.754	-132.736	-676.532	-159.617
52	-673.820	-156.968	-648.675	-192.133
53	-646.353	-189.819	-614.120	-234.896
54	-612.074	-232.858	-577.943	-280.588

COMBINACION 28 G1 + G2 + 0.9 PRETD + SCMAX-EC1 + 0.6 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-576.568	-279.263	-537.216	-334.295
56	-536.523	-333.627	-491.962	-395.944
57	-491.879	-395.868	-442.710	-464.629
58	-447.030	-468.940	-451.414	-462.809
59	-373.658	-384.079	-322.973	-448.082
60	-324.762	-447.275	-276.124	-508.694

COMBINACION 29 G1 + G2 + 0.9 PRETD + TEMP + 0.80 SCMAX-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-269.948	-515.812	-295.853	-483.100
2	-297.951	-475.616	-289.215	-486.647
3	-365.718	-575.051	-410.934	-511.818
4	-410.186	-511.071	-452.659	-451.675
5	-452.243	-451.245	-494.163	-392.621
6	-494.237	-392.680	-532.486	-339.191
7	-533.148	-339.877	-569.965	-288.390
8	-571.297	-289.745	-603.903	-244.148
9	-605.924	-246.199	-633.760	-207.270
10	-636.062	-209.595	-659.721	-176.509
11	-662.400	-179.191	-680.029	-154.537
12	-683.017	-157.508	-694.919	-140.863
13	-698.119	-144.048	-705.103	-134.282
14	-709.693	-138.874	-715.219	-131.148
15	-716.129	-132.057	-718.733	-128.415
16	-719.420	-129.091	-721.183	-126.625
17	-721.900	-126.270	-720.689	-127.965
18	-728.014	-125.357	-786.491	-43.580
19	-695.631	-4.532	-667.736	-39.756
20	-669.093	-31.247	-606.540	-110.238
21	-601.759	-110.253	-694.778	7.208
22	-689.827	15.859	-725.663	-93.010
23	-722.205	-78.378	-681.214	-135.703
24	-685.278	-119.486	-668.833	-142.483
25	-670.628	-125.540	-675.180	-119.175
26	-674.444	-103.628	-693.540	-76.924
27	-686.956	-69.524	-707.056	-41.416
28	-700.761	-35.123	-722.452	-4.790
29	-717.252	0.403	-733.878	23.654
30	-730.041	27.475	-739.790	41.109
31	-737.488	43.426	-733.336	37.620
32	-735.663	35.284	-724.794	20.084
33	-728.639	16.221	-712.286	-6.648
34	-717.504	-11.871	-698.352	-38.655
35	-704.667	-44.940	-684.490	-73.157
36	-691.448	-80.074	-672.773	-106.190
37	-682.868	-108.632	-680.766	-111.572
38	-693.658	-107.935	-716.470	-76.035
39	-730.778	-74.523	-686.662	20.613
40	-697.414	20.201	-600.224	-102.527
41	-616.331	-91.854	-670.909	-22.935
42	-672.882	-21.113	-634.069	-70.125
43	-730.915	-106.820	-716.652	-126.767
44	-725.096	-121.086	-714.428	-136.005
45	-720.029	-129.031	-717.064	-133.177
46	-718.738	-130.209	-716.733	-133.013
47	-716.050	-132.356	-708.125	-143.440
48	-707.214	-142.546	-699.189	-153.769
49	-694.606	-149.175	-683.049	-165.337

50	-679.845	-162.140	-662.416	-186.514
51	-659.410	-183.561	-637.126	-214.724
52	-634.413	-212.077	-607.510	-249.699
53	-605.189	-247.386	-573.081	-292.288
54	-571.035	-290.249	-538.097	-336.310

COMBINACION 29 G1 + G2 + 0.9 PRETD + TEMP + 0.80 SCMAX-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-536.720	-334.988	-500.291	-385.932
56	-499.597	-385.267	-459.716	-441.038
57	-459.633	-440.963	-416.086	-501.862
58	-420.405	-506.174	-432.015	-489.938
59	-354.876	-407.796	-312.380	-461.459
60	-313.938	-460.943	-271.348	-514.725

COMBINACION 30 G1 + G2 + 0.9 PRETD + 0.60 SCMAX-EC1 + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-263.199	-524.334	-282.568	-499.876
2	-283.607	-493.729	-262.137	-520.842
3	-337.044	-615.149	-369.124	-570.288
4	-368.375	-569.541	-399.461	-526.070
5	-399.044	-525.641	-430.680	-481.400
6	-430.753	-481.459	-460.538	-439.807
7	-461.198	-440.495	-490.768	-399.143
8	-492.101	-400.498	-519.364	-362.371
9	-521.386	-364.421	-545.665	-330.468
10	-547.967	-332.791	-569.265	-303.007
11	-571.944	-305.689	-588.957	-281.897
12	-591.945	-284.868	-604.974	-266.647
13	-608.174	-269.833	-617.586	-256.669
14	-622.178	-261.261	-631.938	-247.612
15	-632.848	-248.521	-640.849	-237.332
16	-641.536	-238.008	-649.361	-227.065
17	-649.966	-226.867	-655.586	-219.008
18	-661.876	-217.849	-724.656	-130.053
19	-634.381	-81.876	-607.200	-116.200
20	-607.465	-109.069	-543.430	-189.931
21	-538.830	-189.719	-633.371	-70.335
22	-628.011	-62.200	-661.417	-182.854
23	-656.796	-169.851	-610.707	-234.304
24	-612.657	-221.042	-588.305	-255.097
25	-588.148	-240.885	-582.925	-248.189
26	-580.645	-234.802	-589.235	-222.790
27	-582.566	-215.508	-594.218	-199.214
28	-587.924	-192.921	-602.493	-172.546
29	-597.293	-167.353	-609.326	-150.527
30	-605.488	-146.707	-613.299	-135.783
31	-610.996	-133.466	-607.479	-138.385
32	-609.806	-140.721	-602.191	-151.369
33	-606.037	-155.233	-595.570	-169.870
34	-600.788	-175.093	-589.952	-190.246
35	-596.265	-196.536	-586.970	-209.534
36	-593.923	-216.458	-588.671	-223.803
37	-597.970	-227.359	-608.527	-212.594
38	-619.698	-211.366	-651.826	-166.436
39	-664.485	-167.231	-625.537	-56.574
40	-635.146	-58.428	-537.655	-181.538
41	-551.125	-174.195	-609.162	-100.907
42	-610.716	-99.615	-573.902	-146.102
43	-668.073	-194.702	-653.138	-215.588
44	-660.111	-211.965	-645.126	-232.921
45	-649.416	-227.780	-640.637	-240.057
46	-641.828	-237.764	-634.219	-248.405
47	-633.538	-247.746	-621.926	-263.984
48	-621.018	-263.088	-610.770	-277.418
49	-606.189	-272.823	-593.362	-290.760

50	-590.159	-287.563	-573.252	-311.206
51	-570.247	-308.251	-549.938	-336.652
52	-547.228	-334.001	-523.607	-367.034
53	-521.284	-364.722	-494.351	-402.388
54	-492.304	-400.350	-465.605	-437.688

COMBINACION 30 G1 + G2 + 0.9 PRETD + 0.60 SCMAX-EC1 + 0.5 TEMP

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-464.227	-436.366	-435.771	-476.161
56	-435.077	-475.495	-404.920	-517.667
57	-404.839	-517.589	-371.961	-563.567
58	-376.281	-567.879	-400.168	-534.474
59	-324.040	-446.735	-294.623	-483.882
60	-295.950	-483.659	-264.299	-523.627

COMBINACION 31 G1 + G2 + 0.9 PRETD + SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-198.468	-606.076	-238.706	-555.264
2	-234.033	-556.331	-174.842	-631.075
3	-244.622	-744.398	-231.800	-762.329
4	-231.051	-761.582	-220.837	-775.866
5	-220.406	-775.458	-214.022	-784.386
6	-214.094	-784.447	-211.314	-788.334
7	-211.975	-789.022	-212.640	-788.092
8	-213.972	-789.447	-218.050	-783.744
9	-220.069	-785.798	-226.516	-776.783
10	-228.818	-779.106	-235.875	-769.237
11	-238.551	-771.924	-246.561	-760.722
12	-249.551	-763.689	-258.817	-750.732
13	-262.013	-753.922	-271.556	-740.577
14	-276.146	-745.170	-291.451	-723.766
15	-292.362	-724.675	-309.402	-700.844
16	-310.088	-701.522	-324.912	-680.792
17	-324.622	-681.845	-330.304	-673.899
18	-329.442	-682.742	-374.484	-619.753
19	-287.791	-519.541	-222.256	-602.296
20	-216.848	-602.331	-42.868	-822.027
21	-65.016	-788.039	-248.479	-556.367
22	-239.859	-552.349	-355.631	-610.482
23	-344.269	-606.905	-344.419	-606.695
24	-334.009	-610.718	-327.619	-619.655
25	-317.035	-620.023	-296.231	-649.117
26	-286.138	-646.656	-271.236	-667.496
27	-264.293	-660.598	-258.606	-668.551
28	-252.314	-662.255	-249.963	-665.543
29	-244.762	-660.351	-247.163	-656.994
30	-243.323	-653.178	-248.104	-646.491
31	-245.804	-644.171	-242.269	-649.114
32	-244.596	-651.450	-243.027	-653.643
33	-246.871	-657.510	-250.341	-652.656
34	-255.562	-657.875	-265.955	-643.341
35	-272.245	-649.662	-291.855	-622.239
36	-298.771	-629.214	-329.909	-585.668
37	-330.626	-601.226	-359.201	-561.265
38	-358.567	-576.545	-362.672	-570.804
39	-366.065	-584.557	-278.460	-494.854
40	-280.544	-506.210	-55.563	-790.311
41	-93.280	-752.349	-199.838	-617.791
42	-198.033	-620.740	-230.304	-579.989
43	-307.589	-698.821	-326.664	-672.147
44	-325.106	-680.453	-311.439	-699.566
45	-308.481	-704.562	-291.203	-728.724
46	-290.901	-728.518	-275.380	-750.224
47	-274.702	-749.561	-260.927	-768.825
48	-260.018	-767.929	-251.978	-779.172
49	-247.397	-774.576	-239.631	-785.436

50	-236.432	-782.232	-229.950	-791.298
51	-226.946	-788.342	-221.424	-796.064
52	-218.717	-793.409	-213.800	-800.285
53	-211.474	-797.977	-208.900	-801.577
54	-206.853	-799.540	-207.705	-798.349

COMBINACION 31 G1 + G2 + 0.9 PRETD + SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-206.324	-797.031	-210.614	-791.033
56	-209.914	-790.375	-217.756	-779.408
57	-217.678	-779.326	-225.624	-768.213
58	-229.944	-772.525	-299.349	-675.465
59	-226.421	-570.006	-244.440	-547.252
60	-243.858	-549.439	-227.151	-570.536

COMBINACION 32 G1 + G2 + 0.9 PRETD + 0.60 SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
1	-217.273	-582.328	-243.488	-549.225
2	-239.830	-549.010	-182.615	-621.260
3	-252.707	-733.091	-244.322	-744.817
4	-243.574	-744.070	-238.454	-751.231
5	-238.027	-750.815	-236.751	-752.601
6	-236.822	-752.662	-239.150	-749.408
7	-239.810	-750.096	-245.580	-742.027
8	-246.913	-743.381	-256.096	-730.539
9	-258.116	-732.591	-269.667	-716.438
10	-271.969	-718.761	-284.130	-701.754
11	-286.808	-704.439	-299.920	-686.102
12	-302.910	-689.070	-317.276	-668.979
13	-320.473	-672.168	-335.122	-651.683
14	-339.712	-656.276	-360.123	-627.732
15	-361.033	-628.641	-383.177	-597.674
16	-383.863	-598.351	-405.404	-568.227
17	-405.337	-568.969	-421.436	-546.455
18	-422.192	-553.036	-481.737	-469.764
19	-393.000	-386.686	-345.834	-446.246
20	-341.387	-445.065	-211.778	-608.732
21	-222.082	-589.700	-371.802	-400.638
22	-363.996	-395.591	-445.316	-485.062
23	-435.253	-479.668	-410.788	-513.881
24	-402.787	-514.535	-379.722	-546.791
25	-370.966	-544.603	-344.663	-581.387
26	-335.843	-577.147	-317.729	-602.478
27	-310.794	-595.569	-301.903	-608.002
28	-295.611	-601.707	-291.481	-607.482
29	-286.281	-602.289	-287.021	-601.255
30	-283.181	-597.438	-286.847	-592.312
31	-284.545	-589.992	-281.777	-593.863
32	-284.104	-596.199	-284.022	-596.314
33	-287.867	-600.179	-292.825	-593.245
34	-298.044	-598.465	-309.925	-581.851
35	-316.220	-588.165	-337.326	-558.649
36	-344.252	-565.611	-376.941	-519.897
37	-380.133	-531.993	-416.693	-480.866
38	-418.714	-492.432	-445.208	-455.382
39	-450.327	-466.720	-386.976	-357.823
40	-390.699	-367.110	-216.350	-587.273
41	-242.565	-563.836	-331.701	-451.278
42	-330.735	-453.166	-335.607	-447.015
43	-417.750	-544.767	-420.179	-541.370
44	-420.267	-547.375	-398.655	-577.598
45	-397.024	-580.738	-373.933	-613.031
46	-373.647	-612.802	-352.331	-642.612
47	-351.653	-641.949	-332.084	-669.315
48	-331.175	-668.418	-317.349	-687.754
49	-312.768	-683.158	-299.216	-702.109

50	-296.016	-698.908	-283.750	-716.060
51	-280.746	-713.105	-269.441	-728.915
52	-266.733	-726.260	-256.034	-741.223
53	-253.708	-738.915	-245.356	-750.595
54	-243.308	-748.559	-238.383	-755.446

COMBINACION 32 G1 + G2 + 0.9 PRETD + 0.60 SCMIN-EC1

TENSIONES CON AXIL FINAL

Barra	TS_1	TI_1	TS_2	T1_2
55	-237.003	-754.128	-235.517	-756.207
56	-234.819	-755.546	-236.889	-752.651
57	-236.811	-752.568	-238.988	-749.524
58	-243.307	-753.836	-306.993	-664.774
59	-233.822	-560.660	-246.389	-544.791
60	-246.292	-546.364	-234.561	-561.179

5.2. ESTADO LÍMITE DE DEFORMACIONES

En el presente apartado se calcula el valor de la flecha máxima, comprobándose que la relación flecha/luz se encuentra por debajo del valor 1/2000.

5.3. ESTADO LÍMITE DE VIBRACIONES

En este apartado se comprueba que la primera frecuencia de vibración en el modo de flexión se encuentra dentro del rango de valores admitidos por el EC-1.

Se calcula asimismo el valor del coeficiente de impacto según IPF y EC-1.

6 VERIFICACIÓN DEL E.L.U DE ROTURA POR TENSIONES NORMALES

6.1 FLEXIÓN LONGITUDINAL

En este apartado se comprueba el Estado Límite Último de rotura por flexión longitudinal de acuerdo con los criterios de la Normativa española vigente (EHE)

Los cálculos realizados han sido los siguientes:

1. Cálculo de la envolvente de esfuerzos flectores longitudinales para las distintas acciones consideradas en el proyecto del tablero. Los esfuerzos de cálculo se han combinado de acuerdo con los criterios del apartado 2 de este Anejo.

La envolvente de esfuerzos flectores positivos se muestra en las tablas y gráficos adjuntos con la notación $M_{d,pos}$. La envolvente de flectores negativos se denota como $M_{d,neg}$.

2. Cálculo del momento último respuesta para cada una de las secciones (nudos de las barras) en las que se ha discretizado el tablero. El momento último respuesta se ha calculado considerando las distintas capas de armado y la posible tensión previa de las mismas. El cálculo se realiza con un programa de cálculo automático que permite obtener el momento último respuesta y los diagramas momento curvatura considerando las curvas tensión-deformación no lineales de los materiales (acero y hormigón).

Los momentos últimos de respuesta de cada sección se han calculado para un momento positivo ($M_{u,pos}$) y para un momento negativo ($M_{u,neg}$). De un modo análogo se calculan los momentos de descompresión y de fisuración de la sección (momentos totales sobre la sección).

Las unidades de trabajo para los momentos son (mT).

COMBINACION 33 1.35(G1+G2)+1.5(SCMAX-IPF)+ MHIPER-PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	95.810	150.755	-375.672	-408.469	-291.486	-95.320
2	415.286	218.664	-100.145	-781.536	-210.574	-192.940
3	796.842	244.150	182.869	-1142.182	-218.070	-172.754
4	1142.181	218.077	172.754	-1438.343	-202.410	-165.824
5	1438.401	202.513	167.399	-1684.634	-176.058	-157.283
6	1684.650	176.126	157.283	-1882.800	-149.606	-147.168
7	1882.766	149.608	147.168	-2032.769	-123.185	-137.053
8	2032.747	123.128	137.053	-2132.453	-107.585	-130.123
9	2132.446	107.625	130.123	-2183.249	-70.116	-120.007
10	2183.231	70.033	120.007	-2185.819	-32.916	-109.892
11	2185.836	32.925	109.892	-2140.028	-6.842	-102.962
12	2140.028	6.770	102.963	-2043.344	29.451	-91.910
13	2043.359	-29.327	93.292	-1898.621	64.592	-82.238
14	1898.631	-64.589	82.238	-1705.760	100.819	-71.185
15	1705.764	-100.886	71.185	-1463.354	126.517	-63.319
16	1463.365	-126.488	63.318	-1171.255	162.921	-52.265
17	1173.359	-146.991	11.307	-858.610	74.961	-85.066
18	864.081	-121.622	-49.790	-573.001	149.480	221.025
19	579.399	-158.608	-155.616	-300.894	214.531	26.056
20	316.525	-253.985	-74.317	-55.869	384.516	48.389
21	48.932	472.021	-54.123	-464.820	-170.452	22.995
22	472.705	213.608	-36.978	-897.827	-107.147	-81.117
23	898.742	108.974	83.357	-1374.353	-80.807	-87.420
24	1375.861	83.866	91.483	-1801.313	-84.649	-94.141
25	1802.312	86.767	97.425	-2171.698	-85.512	-98.659
26	2172.999	87.830	102.723	-2545.521	-121.070	-161.996
27	2547.111	122.815	168.447	-2844.837	-94.813	-158.499
28	2844.956	94.963	159.444	-3059.342	-64.322	-145.950
29	3059.338	64.404	145.950	-3190.316	-32.947	-130.217
30	3190.313	32.916	130.217	-3237.762	-0.445	-119.743
31	3237.772	0.410	119.743	-3200.964	22.121	-109.434
32	3200.959	-21.994	109.434	-3080.580	53.516	-93.581
33	3080.570	-53.520	93.581	-2876.750	83.486	-82.575
34	2876.738	-83.542	82.575	-2589.150	112.286	-69.081
35	2589.210	-112.200	68.382	-2217.739	138.366	-52.403
36	2217.832	-137.828	48.199	-1821.886	86.141	-3.751
37	1822.520	-84.552	2.991	-1397.834	83.765	11.446
38	1398.898	-81.669	-9.783	-923.175	106.494	25.626
39	924.584	-103.737	-23.240	-481.624	267.144	116.417
40	518.809	-201.367	-83.681	-62.323	525.991	85.486
41	96.532	379.165	-49.051	-346.414	-208.312	16.838
42	354.528	230.222	-54.563	-584.287	-64.092	31.824
43	606.604	115.887	-25.473	-849.066	-73.789	-144.869
44	860.549	53.483	11.873	-1145.424	-117.695	-65.380
45	1146.446	120.313	67.098	-1403.446	-118.903	-103.667
46	1412.517	135.372	150.506	-1661.359	-109.765	-142.014
47	1661.337	109.805	142.014	-1860.763	-73.589	-130.961
48	1860.766	73.650	130.961	-2012.104	-38.395	-120.845
49	2012.113	38.353	120.845	-2115.306	-2.149	-110.730
50	2115.283	2.230	110.729	-2167.738	23.816	-103.800

51	2167.691	-23.681	103.800	-2171.835	60.791	-93.684
52	2171.767	-60.870	93.684	-2127.693	98.373	-83.569
53	2127.688	-98.349	83.569	-2034.701	113.868	-76.640
54	2034.694	-113.816	76.639	-1891.469	140.227	-66.524

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

55	1891.440	-140.077	64.640	-1700.232	166.593	-54.524
56	1700.220	-166.591	53.393	-1460.855	193.049	-43.277
57	1460.849	-193.015	43.276	-1171.489	206.773	-36.347
58	1171.501	-206.790	36.347	-832.952	229.359	-26.231
59	832.931	-229.315	26.231	-449.988	294.323	49.711
60	449.968	-294.320	-49.796	-102.390	146.622	254.468

COMBINACION 34 1.35(G1+G2)+1.5(SCMIN-IPF)+ MHIPER-PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	-113.659	238.619	444.748	-227.375	-29.195	79.826
2	223.306	21.633	-86.428	-430.149	-0.209	87.577
3	429.927	-0.153	-88.780	-590.538	17.440	113.512
4	590.536	-17.428	-113.512	-724.615	9.206	113.512
5	724.571	-9.426	-115.087	-832.443	1.374	115.087
6	832.455	-1.320	-115.087	-914.329	-6.668	115.087
7	914.298	6.718	-115.086	-970.149	-8.089	133.516
8	970.127	8.039	-133.516	-995.045	-16.396	133.516
9	995.008	16.449	-133.516	-989.563	-6.280	127.658
10	989.538	6.201	-127.658	-956.267	-0.046	128.720
11	956.258	0.090	-128.720	-895.307	2.087	128.720
12	895.338	-2.124	-128.720	-805.823	7.372	129.782
13	805.826	-7.350	-131.164	-688.681	11.657	132.226
14	688.677	-11.664	-132.226	-543.890	16.926	133.288
15	543.894	-16.926	-133.288	-371.020	18.666	133.288
16	371.030	-18.625	-133.288	-170.023	24.086	134.350
17	167.909	-40.033	-93.392	72.301	43.618	94.454
18	-91.622	-103.374	-44.979	418.947	270.238	38.183
19	-445.583	-342.161	-27.415	874.611	498.214	27.415
20	-895.638	-548.222	-44.319	1407.785	621.106	-7.142
21	-1489.246	815.964	202.802	661.143	-606.554	-189.255
22	-669.021	563.407	203.237	-58.186	-276.447	-200.051
23	36.468	222.372	172.897	-628.960	-130.147	-119.724
24	589.529	51.625	91.958	-1017.128	-69.234	-91.958
25	980.620	-7.804	27.400	-1290.331	-9.005	-27.400
26	1261.527	-46.250	-71.985	-1473.995	31.111	71.985
27	1472.410	-32.949	-78.437	-1638.445	19.787	78.437
28	1638.323	-19.906	-79.382	-1759.507	8.632	79.382
29	1759.501	-8.606	-79.382	-1835.986	-1.149	79.382
30	1835.961	1.126	-79.382	-1867.698	-9.881	79.382
31	1867.720	9.812	-79.382	-1854.709	-18.555	79.094
32	1854.702	18.646	-79.094	-1796.990	-28.412	79.094
33	1796.967	28.394	-79.094	-1694.537	-39.684	79.094
34	1694.534	39.654	-79.094	-1538.876	-38.912	68.467
35	1538.826	38.816	-67.769	-1321.416	-37.911	76.392
36	1321.327	37.372	-72.188	-1053.161	-50.649	73.251
37	1030.017	-4.905	10.184	-661.160	-9.160	-9.122
38	628.994	-67.243	22.439	-114.456	132.158	-25.487
39	83.696	-198.584	30.836	572.773	487.525	-27.650
40	-609.968	-553.312	-5.087	1394.939	749.243	-14.680
41	-1455.366	673.337	80.874	920.318	-599.097	-69.097
42	-928.441	577.214	106.821	446.825	-411.874	-76.216
43	-469.143	360.016	69.865	84.407	-169.343	-17.885
44	-111.914	92.942	-27.328	-163.837	-90.609	27.328
45	139.384	23.795	-103.239	-340.662	-21.881	103.239
46	331.591	5.470	-150.078	-494.908	-3.727	150.078
47	494.898	3.706	-150.078	-632.161	-1.967	150.078
48	632.143	1.918	-150.078	-743.308	-1.143	150.078
49	743.318	1.054	-150.078	-828.399	0.647	150.078
50	828.400	-0.599	-150.078	-887.476	2.769	150.078

51	887.413	-2.655	-150.078	-920.505	5.269	150.078
52	920.445	-5.372	-150.078	-927.396	8.370	150.078
53	927.369	-8.385	-150.078	-908.260	0.028	150.078
54	908.245	-0.036	-150.078	-863.069	-8.043	150.078

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

55	862.999	7.922	-148.195	-791.722	-15.909	148.195
56	791.674	15.766	-147.063	-694.240	-23.817	147.063
57	694.243	23.824	-147.063	-570.755	-33.947	147.063
58	570.764	33.904	-147.063	-421.171	-45.773	146.559
59	421.160	45.835	-146.559	-242.438	-10.230	109.996
60	237.701	-21.271	-2.151	65.898	173.236	-155.084

COMBINACION 35 1.35(G1+G2)+1.5(SCMAX-EC1)+ MHIPER-PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	101.899	176.664	-396.337	-415.556	-182.597	206.949
2	433.338	267.596	-34.060	-821.643	-249.149	-207.026
3	833.165	245.645	172.144	-1193.451	-261.838	-181.565
4	1193.449	261.847	181.566	-1499.296	-230.659	-244.257
5	1499.300	230.603	244.256	-1761.102	-201.969	-196.198
6	1761.114	202.030	196.198	-1967.346	-166.884	-160.503
7	1967.310	166.904	160.502	-2127.680	-117.273	-155.586
8	2127.658	117.212	155.586	-2230.931	-119.080	-165.785
9	2230.921	119.118	165.785	-2279.174	-68.916	-139.298
10	2279.159	68.845	139.298	-2281.828	-29.537	-91.239
11	2281.835	29.561	91.239	-2230.133	-10.610	-121.984
12	2230.144	10.552	121.983	-2123.941	48.861	-116.130
13	2123.959	-48.748	117.327	-1970.587	91.876	-77.619
14	1970.591	-91.877	77.619	-1761.812	114.596	6.102
15	1761.813	-114.646	-6.102	-1508.044	147.978	-52.132
16	1508.056	-147.942	52.132	-1217.464	180.914	-36.154
17	1219.288	-167.085	0.644	-890.093	155.278	4.123
18	906.941	-103.176	-47.212	-592.820	208.615	127.943
19	615.949	-146.097	-137.125	-332.114	289.399	77.796
20	350.421	-245.806	-62.931	-74.011	419.578	102.099
21	88.546	468.601	-51.470	-497.135	-160.604	36.312
22	504.004	198.122	-48.277	-894.157	65.064	100.476
23	913.101	-18.011	-76.653	-1331.952	6.474	-55.125
24	1366.330	61.957	79.722	-1786.161	-43.670	-72.226
25	1817.927	110.691	128.591	-2223.426	-74.714	-73.989
26	2248.537	122.941	160.630	-2621.218	-101.325	-152.008
27	2622.599	102.841	157.609	-2917.069	-99.113	-189.366
28	2917.061	99.131	189.366	-3145.234	-65.277	-155.576
29	3145.226	65.334	155.576	-3287.597	-32.149	-120.136
30	3287.581	32.122	120.136	-3342.019	-0.816	-77.215
31	3342.032	0.768	77.214	-3309.883	7.401	-108.568
32	3309.875	-7.286	108.568	-3190.412	42.710	-73.650
33	3190.394	-42.716	73.650	-2983.411	74.230	-34.217
34	2983.402	-74.285	34.217	-2692.139	122.178	-34.438
35	2692.190	-122.109	33.833	-2314.466	151.894	1.839
36	2314.538	-151.429	-3.672	-1850.784	179.346	39.721
37	1863.759	-148.397	-107.629	-1367.662	143.979	60.483
38	1395.684	-77.477	-71.798	-909.276	62.279	200.723
39	936.100	-4.354	-205.038	-502.127	194.278	-11.280
40	521.322	-194.350	-79.636	-93.296	488.423	-27.387
41	119.771	389.320	-66.841	-362.366	-207.137	15.043
42	369.416	226.220	-47.611	-607.074	-94.902	75.385
43	618.502	121.590	-113.204	-872.910	-76.481	-18.091
44	896.854	143.021	57.539	-1184.546	-110.367	-54.572
45	1205.868	168.574	120.563	-1491.854	-119.799	-145.881
46	1499.731	134.097	186.486	-1756.234	-85.194	-137.185
47	1756.208	85.245	137.185	-1955.501	-93.762	-143.784
48	1955.499	93.798	143.784	-2104.947	-45.517	-168.351
49	2104.958	45.463	168.350	-2212.870	4.108	-118.297
50	2212.851	-4.022	118.297	-2265.647	11.924	-154.529

51	2265.595	-11.795	154.529	-2268.750	77.294	-135.898
52	2268.684	-77.370	135.899	-2224.469	86.423	-97.511
53	2224.462	-86.399	97.511	-2123.510	126.093	-120.076
54	2123.498	-126.041	120.076	-1979.156	166.325	-68.021

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

55	1979.115	-166.191	66.390	-1780.595	150.109	-65.922
56	1780.577	-150.126	64.941	-1527.404	219.250	-80.854
57	1527.396	-219.216	80.854	-1232.834	197.030	51.047
58	1232.847	-197.061	-51.047	-886.108	242.861	55.964
59	886.092	-242.801	-55.964	-491.621	311.074	96.616
60	495.481	-285.222	-185.297	-107.491	251.769	346.608

COMBINACION 36 1.35(G1+G2)+1.5(SCMIN-EC1)+ MHIPER-PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	8.301	85.804	-29.748	-262.696	-45.995	29.748
2	258.628	38.433	-36.350	-477.801	-17.315	36.350
3	477.579	16.952	-37.553	-668.720	-25.380	37.553
4	668.719	25.391	-37.553	-833.842	-33.613	37.553
5	833.851	33.556	-37.554	-972.884	-41.608	37.554
6	972.897	41.665	-37.553	-1085.936	-49.653	37.553
7	1085.904	49.687	-37.553	-1172.925	-57.767	37.553
8	1172.902	57.716	-37.553	-1233.838	-66.072	37.553
9	1233.811	66.117	-37.553	-1268.752	-63.120	37.553
10	1268.731	63.043	-37.553	-1277.557	-60.426	37.553
11	1277.554	60.464	-37.553	-1260.374	-58.286	37.553
12	1260.394	58.229	-37.553	-1217.114	-56.523	37.553
13	1217.126	56.597	-37.553	-1147.845	-55.829	37.553
14	1147.846	55.827	-37.553	-1052.522	-54.104	37.553
15	1052.524	54.077	-37.553	-931.129	-52.336	37.553
16	931.139	52.367	-37.553	-783.729	-50.448	37.553
17	783.693	50.227	-37.336	-610.074	-50.181	37.336
18	609.185	47.541	-35.615	-407.606	66.713	35.615
19	407.135	-68.364	-36.708	-176.610	224.419	36.708
20	175.839	-226.377	-38.366	85.566	380.879	38.366
21	-102.075	495.047	21.430	-342.435	-207.603	-20.202
22	342.156	206.631	19.096	-734.670	69.707	-19.096
23	733.765	-71.569	16.857	-1076.861	84.398	-16.857
24	1075.377	-87.459	12.794	-1370.844	69.851	-12.794
25	1369.855	-71.969	9.510	-1618.607	55.159	-9.510
26	1617.292	-57.415	5.446	-1819.154	42.276	-5.446
27	1819.133	-42.348	5.350	-1976.234	29.186	-5.350
28	1976.233	-29.167	5.350	-2088.620	17.893	-5.350
29	2088.613	-17.855	5.350	-2156.311	8.099	-5.350
30	2156.291	-8.121	5.350	-2179.242	-0.636	-5.350
31	2179.260	0.577	5.350	-2157.479	-9.337	-5.350
32	2157.472	9.440	5.350	-2091.015	-19.206	-5.350
33	2090.995	19.190	5.350	-1979.820	-30.479	-5.350
34	1979.816	30.440	5.350	-1823.885	-43.616	-5.350
35	1823.888	43.608	5.350	-1623.238	-58.768	-5.350
36	1623.237	58.764	5.299	-1377.871	-75.582	-5.299
37	1377.253	73.963	6.058	-1085.619	-91.568	-6.058
38	1084.572	89.504	4.395	-746.263	-80.012	-4.395
39	744.847	77.257	2.009	-356.272	201.062	-2.009
40	355.232	-203.699	-0.582	86.433	491.534	0.582
41	-80.289	382.826	-29.255	-182.246	-228.229	30.192
42	182.081	227.483	-31.033	-414.326	-73.691	31.033
43	413.673	71.543	-33.633	-616.613	43.419	33.633
44	615.811	-45.744	-35.729	-791.018	48.071	35.729
45	789.997	-50.715	-37.447	-937.253	52.635	37.447
46	937.123	-52.825	-37.664	-1058.178	54.566	37.664
47	1058.161	-54.560	-37.664	-1153.185	56.280	37.664
48	1153.176	-56.304	-37.664	-1222.134	57.068	37.664
49	1222.148	-57.136	-37.665	-1265.036	58.835	37.665

50	1265.030	-58.771	-37.664	-1281.925	60.943	37.664
51	1281.869	-60.824	-37.664	-1272.785	63.436	37.664
52	1272.725	-63.530	-37.664	-1237.509	66.521	37.664
53	1237.492	-66.523	-37.664	-1176.232	58.162	37.664
54	1176.219	-58.149	-37.664	-1088.908	50.066	37.664

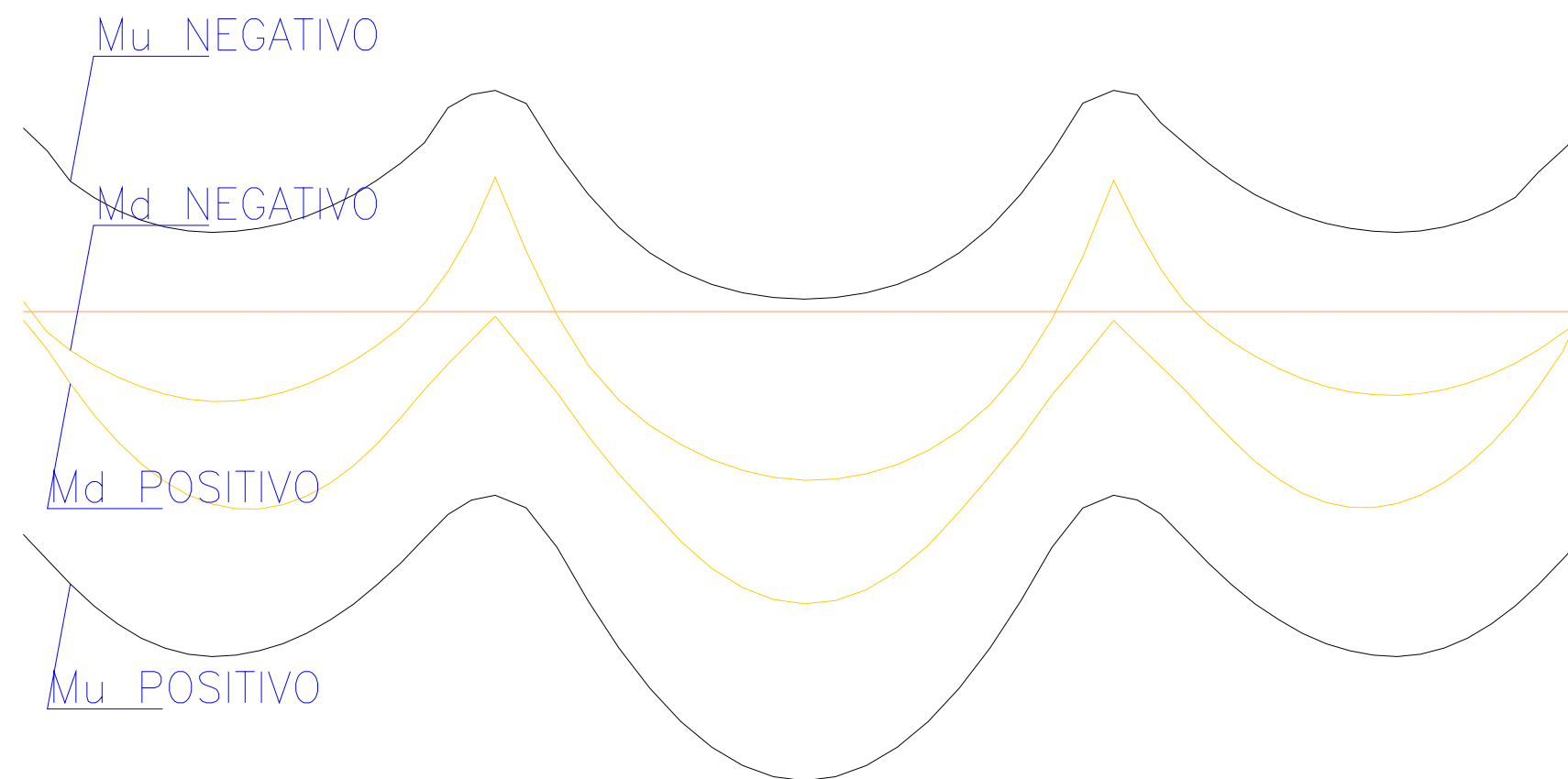
ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	1088.850	-50.062	-37.664	-975.534	42.073	37.664
56	975.505	-42.144	-37.664	-836.085	34.094	37.664
57	836.086	-34.079	-37.664	-670.614	23.957	37.664
58	670.623	-23.994	-37.664	-479.095	12.061	37.664
59	479.082	-12.002	-37.664	-259.845	36.691	37.664
60	259.819	-36.739	-37.578	-11.087	76.951	37.578

RESPUESTA SECCIONAL A FLEXION (mT)								58	45.83	3260.91	-1266.06	2142.78	-522.26	1791.73	-38.65
Isec	Sx(is)	Mu, pos	Mu, neg	Mcr, pos	Mcr, neg	Mdec, pos	Mdec, neg	59	46.55	3022.94	-1547.29	1845.95	-676.12	1447.09	-177.41
1	0.00	2468.54	-2036.06	1440.22	-1071.72	1043.46	-573.23	60	47.28	2747.88	-1786.07	1645.89	-871.95	1248.19	-373.50
2	0.73	2746.06	-1783.74	1637.87	-869.55	1240.16	-371.10	61	48.00	2469.22	-2037.09	1442.58	-1073.02	1045.82	-574.53
3	1.45	3017.44	-1443.99	1953.67	-688.04	1603.92	-204.97								
4	2.17	3258.55	-1264.41	2127.40	-521.93	1776.35	-38.31								
5	2.90	3458.78	-1121.54	2272.89	-385.11	1920.64	99.13								
6	3.62	3617.53	-1012.34	2390.36	-277.13	2037.08	207.72								
7	4.35	3728.18	-938.67	2475.31	-201.82	2121.28	283.50								
8	5.07	3796.42	-894.53	2532.08	-154.95	2177.58	330.68								
9	5.80	3822.24	-878.85	2560.33	-136.64	2205.66	349.11								
10	6.53	3805.20	-891.28	2557.57	-147.55	2203.03	338.10								
11	7.25	3757.70	-923.92	2533.12	-179.59	2178.93	305.84								
12	7.97	3679.85	-977.71	2486.44	-233.17	2132.79	251.90								
13	8.70	3565.53	-1057.89	2412.23	-313.09	2059.36	171.51								
14	9.43	3415.80	-1166.20	2315.31	-419.73	1963.40	64.33								
15	10.15	3240.30	-1294.46	2184.22	-545.32	1833.34	-61.79								
16	10.87	3023.40	-1458.52	2020.94	-701.56	1671.22	-218.50								
17	11.60	2783.73	-1646.41	1839.50	-875.30	1490.91	-392.57								
18	12.32	2512.21	-1871.24	1640.79	-1079.31	1293.28	-596.66								
19	13.05	2247.40	-2259.66	1298.52	-1260.98	902.36	-762.24								
20	13.77	2087.95	-2405.34	1172.84	-1373.50	776.99	-874.46								
21	14.50	2033.91	-2452.43	1128.29	-1406.78	732.53	-907.62								
22	15.45	2174.55	-2307.53	1222.92	-1284.09	826.89	-785.23								
23	16.40	2611.34	-1763.34	1660.28	-971.33	1312.34	-488.68								
24	17.35	3202.29	-1303.01	2076.50	-558.76	1725.75	-75.29								
25	18.30	3728.65	-932.63	2436.63	-203.50	2082.57	281.84								
26	19.25	4174.19	-651.52	2730.72	86.93	2373.24	574.66								
27	20.20	4542.76	-443.85	2965.02	318.75	2604.30	809.01								
28	21.15	4826.46	-301.64	3137.58	490.88	2774.13	983.42								
29	22.10	5030.42	-209.28	3255.83	610.40	2890.27	1104.75								
30	23.05	5153.95	-156.80	3322.11	679.86	2955.22	1175.38								
31	24.00	5196.60	-139.38	3338.14	701.09	2970.76	1197.04								
32	24.95	5153.96	-156.79	3322.25	679.91	2955.36	1175.44								
33	25.90	5030.45	-209.27	3256.14	610.52	2890.58	1104.87								
34	26.85	4826.50	-301.62	3138.03	491.04	2774.57	983.58								
35	27.80	4542.81	-443.84	2965.50	318.90	2604.79	809.17								
36	28.75	4174.25	-651.52	2731.22	87.05	2373.74	574.78								
37	29.70	3728.71	-932.65	2437.05	-203.45	2082.98	281.90								
38	30.65	3202.34	-1303.04	2076.77	-558.77	1726.03	-75.30								
39	31.60	2613.38	-1765.70	1670.08	-974.98	1322.15	-492.33								
40	32.55	2176.20	-2310.07	1227.98	-1288.90	831.96	-790.04								
41	33.50	2033.91	-2452.43	1128.29	-1406.78	732.53	-907.62								
42	34.22	2086.24	-2402.98	1168.10	-1368.16	772.25	-869.12								
43	34.95	2243.96	-2090.98	1424.86	-1266.95	1078.19	-784.08								
44	35.67	2510.17	-1868.93	1631.34	-1074.95	1283.83	-592.30								
45	36.40	2783.77	-1646.45	1839.69	-875.35	1491.10	-392.62								
46	37.12	3023.43	-1458.55	2021.18	-701.59	1671.46	-218.54								
47	37.85	3240.34	-1294.49	2184.53	-545.33	1833.65	-61.80								
48	38.58	3415.85	-1166.22	2315.66	-419.72	1963.75	64.34								
49	39.30	3565.58	-1057.91	2412.62	-313.06	2059.75	171.54								
50	40.03	3679.91	-977.72	2486.83	-233.13	2133.18	251.95								
51	40.75	3757.75	-923.93	2533.50	-179.53	2179.30	305.89								
52	41.47	3805.24	-891.29	2557.92	-147.50	2203.37	338.16								
53	42.20	3822.27	-878.86	2560.64	-136.59	2205.97	349.16								
54	42.92	3796.45	-894.54	2532.35	-154.91	2177.85	330.72								
55	43.65	3728.21	-938.67	2475.51	-201.79	2121.49	283.52								
56	44.37	3617.55	-1012.35	2390.52	-277.11	2037.25	207.73								
57	45.10	3458.79	-1121.54	2272.99	-385.11	1920.75	99.13								

LEYES DE MOMENTOS FLECTORES MAYORADOS



6.2. FLEXIÓN TRANSVERSAL

La flexión transversal en el tablero se ha determinado a partir del modelo de cálculo mediante elementos finitos tipo lámina expuesto en el apartado 3.2

La armadura de flexión calculada debe sumarse a la armadura de rasante del voladizo obtenida a partir del cortante total sobre la sección y de la aplicación de la regla de cosido en el plano de unión del voladizo con el núcleo de la sección transversal.

6.3. TRAVIESAS DE APOYO

En este apartado se incluyen los resultados del cálculo de la flexión transversal que se produce en las traviesas de apoyo en estribos.

La determinación de los esfuerzos de flexión y cortante se realizan a partir de las reacciones que se han calculado en el apartado 3 de este anejo.

6.4. INTRODUCCIÓN DEL PRETENSADO

La regularización de las tensiones normales en el tablero inducidas por el pretensado produce tracciones en la zona de anclajes, cuyo efecto se puede estudiar a partir de dos análisis independientes:

- Estudio de la introducción de una fuerza puntual en el anclaje, que permite el cálculo de los refuerzos de armadura en la zona inmediatamente detrás de la placa de anclaje.
- En las zonas de estribos la fuerza rasante se incrementa por el efecto de introducción de pretensado, cuyo valor total se reparte en planta, a efectos de cálculo, con un ángulo de aproximadamente 35 °. El efecto de esta regularización de tensiones se puede abordar a partir del método de bielas y tirantes, cuyo modelo sería análogo al que se emplea para el cálculo de vigas de gran canto.

En la hoja siguiente se detallan los cálculos de las armaduras a colocar en la zona de introducción de la fuerza de pretensado.

6.5. EVALUACIÓN DEL ELU DE FATIGA

El Estado Límite Último de Fatiga se ha calculado según las indicaciones dadas en el Eurocódigo 2 parte 2 en su artículo 4.3.7.

Se comprueba a fatiga el hormigón a compresión, el acero de armar y de pretensar no hay que comprobarlo a fatiga.

El acero de armar no se comprueba por que no hay soldaduras en los empalmes, y bajo la acción frecuente el Δσs no supera los 70 N/mm2.

Los cálculos han sido realizados con una hoja de cálculo desarrollada al efecto por los ingenieros de PEDELTA S.L.

En él, se considera que un hormigón sometido a compresión presenta una resistencia a fatiga adecuada si se verifica la siguiente expresión:

14 × (1 - S_{cd,max, equ}) / √(1 - R_{equ}) ≥ 6

Siendo:

R_{equ} = S_{cd,min, equ} / S_{cd,max, equ} S_{cd,min, equ} = γ_{sd} × σ_{cd,min, equ} / f_{cd, fat} S_{cd,max, equ} = γ_{sd} × σ_{cd,max, equ} / f_{cd, fat}

σ_{cd,max, equ} = σ_{c, perm} + λ_c × (σ_{c,max, 71} - σ_{c, perm})

σ_{cd,min, equ} = σ_{c, perm} - λ_c × (σ_{c, mperm} - σ_{c,min, 71})

σ_{c, perm} Tensión de compresión en el hormigón bajo la combinación infrecuente de acciones, sin incluir el modelo de carga 71.

σ_{c, max, 71}, σ_{c, min, 71} Tensión de compresión máxima o mínima bajo la combinación infrecuente de acciones, incluyendo el factor dinámico correspondiente.

λ_c Coeficiente corrector para calcular las tensiones superior e inferior del rango tensional de daño equivalente a partir de las tensiones originadas por el modelo de carga 71.

λ_c = λ_{c,0} × λ_{c,1} × λ_{c,2} × λ_{c,3} × λ_{c,4}

λ_{c, 0}

Coeficiente que tiene en cuenta la influencia de la tensión permanente

λ_{c,0} = 0,94 + 0,2 × (σ_{c,perm} / f_{cd,fat}) ≥ 1,0

λ_{c, 1}

Coeficiente que tiene en cuenta la luz del elemento y la composición del tráfico.

λ_{c,2}

Coeficiente que tiene en cuenta el volumen anual de tráfico.

λ_{c,3}

Coeficiente que tiene en cuenta la influencia de la vida de servicio.

λ_{c,4}

Coeficiente que tiene en cuenta la influencia de las múltiples vías.

Se adjuntan a continuación los cálculos realizados.

7. VERIFICACIÓN DEL E.L.U DE ROTURA POR TENSIONES TANGENCIALES

7.1 EVALUACIÓN DEL E.L.U. DE CORTANTE

En este apartado se comprueba el Estado Límite Último de rotura por cortante de acuerdo con los criterios de la Normativa española vigente (EHE, artículo 44)

Los cálculos realizados han sido los siguientes:

- Cálculo de la envolvente de esfuerzos cortantes para las distintas acciones consideradas en el proyecto del tablero. Los esfuerzos de cálculo se han combinado de acuerdo con los criterios del apartado 2 de este Anejo.
- El cálculo de todos los parámetros resistentes se ha realizado de forma automática. Posteriormente se ha determinado la armadura de cortante necesaria A_{sc} por criterios resistentes y se comprueba que verifica los criterios de armadura mínima a cortante (el máximo de los dos valores es el que aparece en los listados).

La envolvente de esfuerzos flectores positivos se muestra en los listados adjuntos con la notación V_{rd} , conjuntamente con el esfuerzo flector y torsor concomitantes.

Donde

$$V_{rd} = V_d + V_{pd} + V_{cd}$$

donde,

- V_{rd} = Valor del esfuerzo cortante efectivo calculado como:
- V_d = Valor de cálculo del esfuerzo cortante producido por las acciones exteriores
- V_{pd} = Valor de cálculo del esfuerzo cortante producido por el pretensado.
- V_{cd} = Valor de cálculo del la componente paralela a la sección de las tensiones normales en piezas de sección variable

- Comprobación del agotamiento por compresión oblicua en el alma.

$$V_{rd} \leq V_{u1}$$

V_{u1} = Esfuerzo cortante de agotamiento por compresión oblicua del alma.

- Comprobación del agotamiento por tracción en el alma.

$$V_{rd} \leq V_{u2}$$

V_{u2} = Esfuerzo cortante de agotamiento por tracción en el alma.

COMBINACION 37 1.35 (G1 + G2) + 1.5 (SCVMAX-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	-395.032	363.423	203.154	152.256	-300.516	-195.994
2	-161.511	301.382	193.669	96.626	-251.305	-115.703
3	-97.341	251.392	115.628	-31.518	-233.218	-120.941
4	30.381	233.349	120.824	-203.155	-240.795	-120.824
5	201.693	240.907	120.670	-287.237	-222.981	-121.482
6	285.508	223.254	121.299	-342.692	-206.040	-117.905
7	340.711	206.336	117.698	-371.561	-190.160	-110.394
8	369.448	190.417	110.170	-503.743	-197.971	-110.170
9	501.543	198.370	109.935	-493.491	-172.254	-99.015
10	491.271	172.576	98.775	-457.294	-148.034	-84.536
11	455.121	148.512	84.294	-552.663	-145.510	-84.294
12	550.591	145.936	84.057	-479.285	-123.738	-65.857
13	477.318	124.321	66.165	-388.835	-104.654	-45.238
14	387.010	105.202	45.601	-299.164	-86.255	-22.266
15	297.531	86.814	22.688	-358.300	-84.274	-21.751
16	356.900	84.927	22.236	-253.657	-67.608	2.006
17	252.491	68.262	-1.455	-210.190	-60.487	-5.759
18	233.779	63.081	-14.809	-347.660	55.719	23.462
19	365.747	-53.160	-18.907	-251.150	211.852	23.706
20	255.754	-210.397	-21.623	309.074	235.103	-5.261
21	-1402.921	854.629	176.115	772.663	-606.270	-195.430
22	-779.626	606.804	193.314	486.272	-288.545	-179.411
23	-506.580	290.133	178.744	262.935	-235.381	-164.841
24	-296.753	238.244	163.656	65.529	-213.931	-149.753
25	-112.323	218.197	148.175	-108.360	-193.089	-134.272
26	49.609	198.910	132.428	-256.579	-172.126	-118.525
27	187.372	179.504	116.542	-352.948	-152.065	-105.801
28	275.083	161.233	103.804	-608.710	-136.253	-122.991
29	336.142	143.476	86.590	-631.444	-125.552	-115.794
30	367.974	126.291	69.544	-628.469	-114.217	-107.222
31	625.506	114.635	107.599	-725.582	-122.374	-106.371
32	722.610	123.016	106.804	-663.350	-112.865	-96.484
33	660.465	113.449	96.978	-583.034	-105.609	-85.233
34	580.344	106.230	85.793	-492.461	-101.327	-72.623
35	128.222	102.559	-15.363	-401.427	-100.380	-58.660
36	127.605	110.142	-23.532	-208.984	-104.387	-63.565
37	151.784	120.995	-30.577	-135.864	-120.062	31.696
38	208.146	134.194	-36.374	-245.957	-110.431	32.062
39	294.265	121.678	-40.794	-352.248	167.993	32.342
40	387.839	-158.408	-43.713	272.861	344.154	-57.536
41	-1327.351	712.937	70.595	963.921	-599.079	-74.151
42	-969.269	599.520	72.165	739.719	-421.842	-64.067
43	-752.860	422.840	63.245	516.121	-273.371	-51.854
44	-537.995	275.199	50.371	353.129	-238.368	-38.981
45	-383.483	241.025	36.919	219.246	-204.601	-25.529
46	-257.632	208.231	22.978	114.736	-182.604	-14.880
47	-160.516	187.199	11.940	38.108	-150.977	-0.550
48	-90.428	156.624	-2.674	-23.260	-121.364	13.126
49	-34.614	128.069	-16.877	-57.948	-91.866	27.330
50	-4.313	99.860	-31.165	-551.919	-86.830	-95.541

51	549.710	87.254	95.305	-468.265	-58.808	-82.375
52	466.003	59.062	82.135	-349.625	-29.668	-64.708
53	-252.871	39.345	-96.623	-378.500	-37.644	-64.468
54	376.345	38.091	64.234	263.656	-21.039	113.708

COMBINACION 37 1.35 (G1 + G2) + 1.5 (SCVMAX-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

55	-325.802	35.441	-115.811	303.786	-19.546	122.972
56	-360.717	35.254	-124.237	340.591	-19.417	131.397
57	-390.400	36.630	-131.642	379.474	-22.861	138.803
58	-420.229	41.451	-137.836	269.317	-29.498	144.997
59	-299.040	49.632	-142.618	277.679	-1.056	149.779
60	-294.326	22.554	-145.783	297.250	29.997	176.504

COMBINACION 38 1.35 (G1 + G2) + 1.5 (SCVMIN-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	-473.134	215.803	443.772	336.038	4.040	3.288
2	-346.497	-18.980	-41.363	468.388	51.886	51.353
3	-496.776	-40.817	-43.499	471.600	82.347	202.818
4	-539.935	-65.727	-196.583	483.858	79.096	199.706
5	-436.015	-61.831	-190.293	465.715	80.284	195.920
6	-410.383	-64.182	-184.688	438.718	83.573	190.067
7	-34.298	-71.373	-97.658	-95.060	90.385	87.564
8	97.182	-89.995	-87.329	410.695	91.319	179.624
9	30.351	-81.982	-87.088	-111.015	111.565	81.775
10	113.197	-111.291	-81.533	-158.652	139.882	80.721
11	160.797	-139.529	-80.485	438.447	151.996	195.719
12	-376.027	-143.895	-185.340	497.970	178.471	168.581
13	-439.682	-171.423	-158.966	589.686	206.697	170.356
14	-536.715	-200.840	-161.630	695.291	237.073	173.020
15	-648.632	-232.296	-165.299	827.591	257.919	173.397
16	-788.082	-254.109	-166.787	1002.744	330.031	253.186
17	-972.744	-340.476	-216.744	1240.368	389.345	259.303
18	-1228.867	-421.060	-183.757	1433.547	585.065	226.944
19	-1429.279	-616.125	-161.824	1940.367	796.066	169.923
20	-1941.051	-814.047	-132.856	2610.580	800.847	-127.636
21	-1565.332	532.427	-202.501	664.882	-541.151	-329.123
22	-676.805	518.688	370.845	450.992	-141.445	-152.146
23	-484.306	122.128	184.389	347.444	-65.857	-109.982
24	-420.121	36.176	160.193	280.969	36.118	143.114
25	-234.110	-57.287	-23.246	266.689	54.043	93.985
26	-11.558	-70.041	-62.125	-106.557	71.716	59.623
27	108.835	-71.087	-57.426	-226.147	76.012	56.347
28	228.760	-75.314	-55.394	-323.519	96.212	53.754
29	326.327	-95.566	-52.849	-402.632	105.717	54.621
30	405.551	-105.181	-53.769	-453.974	130.374	63.197
31	456.981	-129.947	-62.402	-22.493	136.532	88.459
32	320.934	-135.182	-54.005	7.184	151.569	87.144
33	289.708	-145.866	-57.958	64.347	167.629	86.881
34	14.229	-158.365	-77.715	149.779	184.165	87.893
35	-79.670	-176.650	-79.158	286.790	203.181	91.539
36	-226.954	-197.698	-80.807	451.974	222.806	94.710
37	-423.044	-265.096	-20.115	708.804	370.097	240.802
38	-693.598	-350.659	-23.881	1111.354	472.319	210.855
39	-1101.495	-500.984	-147.551	1602.227	860.502	46.408
40	-1605.853	-883.386	-0.461	2618.082	997.452	-133.419
41	-1520.114	333.980	-268.035	785.034	-543.652	-187.869
42	-825.520	528.790	215.256	599.961	-351.766	-153.959
43	-654.770	331.531	186.894	473.037	-53.359	210.717
44	-542.702	27.012	-154.948	440.888	-16.698	167.355
45	-463.324	-3.429	-107.781	309.159	19.861	142.823
46	-307.867	-19.192	-141.986	321.477	21.702	142.923
47	-319.949	-21.089	-142.107	183.347	39.910	132.794
48	-181.566	-39.385	-132.579	44.141	58.901	124.734
49	-42.166	-58.453	-124.507	-78.254	80.488	119.386
50	80.340	-79.950	-119.149	-30.415	82.881	119.149

51	32.527	-82.322	-118.908	-116.183	106.682	116.806
52	118.324	-106.386	-116.566	-176.312	132.413	117.779
53	178.466	-132.057	-117.545	-92.029	124.473	117.545
54	94.104	-124.156	-117.322	-113.599	140.111	122.144

COMBINACION 38 1.35 (G1 + G2) + 1.5 (SCVMIN-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

55	115.476	-139.904	-121.028	-108.883	156.890	129.756
56	110.593	-156.741	-129.573	-75.760	174.561	142.501
57	77.233	-174.381	-142.348	56.447	165.029	142.348
58	-55.301	-164.946	-142.231	4.393	180.185	154.148
59	-3.673	-180.049	-154.073	116.063	236.697	161.118
60	-119.188	-259.110	-84.277	402.927	422.616	-185.715

COMBINACION 39 1.35 (G1 + G2) + 1.5 (SCVMAX-IPF) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-52.001	363.423	203.154	-395.300	-300.516	-195.994
2	386.045	301.382	193.669	-779.116	-251.305	-115.703
3	778.401	251.392	115.628	-1081.743	-233.218	-120.941
4	1080.606	233.349	120.824	-1396.209	-240.795	-120.824
5	1394.747	240.907	120.670	-1592.338	-222.981	-121.482
6	1590.609	223.254	121.299	-1729.758	-206.040	-117.905
7	1727.777	206.336	117.698	-1810.895	-190.160	-110.394
8	1808.782	190.417	110.170	-1965.649	-197.971	-110.170
9	1963.449	198.370	109.935	-1950.872	-172.254	-99.015
10	1948.652	172.576	98.775	-1887.179	-148.034	-84.536
11	1885.006	148.512	84.294	-1931.375	-145.510	-84.294
12	1929.303	145.936	84.057	-1782.320	-123.738	-65.857
13	1780.353	124.321	66.165	-1594.098	-104.654	-45.238
14	1592.274	105.202	45.601	-1371.337	-86.255	-22.266
15	1369.704	86.814	22.688	-1271.755	-84.274	-21.751
16	1270.354	84.927	22.236	-982.607	-67.608	2.006
17	981.441	68.262	-1.455	-732.932	-60.487	-5.759
18	756.521	63.081	-14.809	-523.286	55.719	23.462
19	541.373	-53.160	-18.907	-301.553	211.852	23.706
20	306.157	-210.397	-21.623	300.024	235.103	-5.261
21	-1393.871	854.629	176.115	652.862	-606.270	-195.430
22	-659.825	606.804	193.314	-93.741	-288.545	-179.411
23	73.433	290.133	178.744	-741.560	-235.381	-164.841
24	707.742	238.244	163.656	-1294.569	-213.931	-149.753
25	1247.775	218.197	148.175	-1754.667	-193.089	-134.272
26	1695.916	198.910	132.428	-2124.295	-172.126	-118.525
27	2055.088	179.504	116.542	-2382.996	-152.065	-105.801
28	2305.131	161.233	103.804	-2747.665	-136.253	-122.991
29	2475.097	143.476	86.590	-2830.366	-125.552	-115.794
30	2566.896	126.291	69.544	-2841.509	-114.217	-107.222
31	2838.546	114.635	107.599	-2924.617	-122.374	-106.371
32	2921.645	123.016	106.804	-2802.532	-112.865	-96.484
33	2799.647	113.449	96.978	-2613.406	-105.609	-85.233
34	2610.716	106.230	85.793	-2360.511	-101.327	-72.623
35	1996.272	102.559	-15.363	-2048.084	-100.380	-58.660
36	1774.263	110.142	-23.532	-1569.348	-104.387	-63.565
37	1512.148	120.995	-30.577	-1140.518	-120.062	31.696
38	1212.800	134.194	-36.374	-830.303	-110.431	32.062
39	878.611	121.678	-40.794	-472.782	167.993	32.342
40	508.373	-158.408	-43.713	263.811	344.154	-57.536
41	-1318.301	712.937	70.595	913.826	-599.079	-74.151
42	-919.174	599.520	72.165	425.858	-421.842	-64.067
43	-438.999	422.840	63.245	-2.804	-273.371	-51.854
44	-19.070	275.199	50.371	-375.913	-238.368	-38.981
45	345.559	241.025	36.919	-694.341	-204.601	-25.529
46	655.955	208.231	22.978	-957.616	-182.604	-14.880
47	911.836	187.199	11.940	-1167.372	-150.977	-0.550
48	1115.052	156.624	-2.674	-1326.543	-121.364	13.126
49	1268.669	128.069	-16.877	-1436.905	-91.866	27.330

50	1374.644	99.860	-31.165	-1982.050	-86.830	-95.541
51	1979.841	87.254	95.305	-1925.879	-58.808	-82.375
52	1923.617	59.062	82.135	-1811.745	-29.668	-64.708
53	1209.249	39.345	-96.623	-1818.014	-37.644	-64.468
54	1815.859	38.091	64.234	-1123.545	-21.039	113.708

COMBINACION 39 1.35 (G1 + G2) + 1.5 (SCVMAX-IPF) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	1061.399	35.441	-115.811	-1001.413	-19.546	122.972
56	944.482	35.254	-124.237	-852.521	-19.417	131.397
57	802.712	36.630	-131.642	-679.845	-22.861	138.803
58	639.090	41.451	-137.836	-486.353	-29.498	144.997
59	456.630	49.632	-142.618	-273.421	-1.056	149.779
60	256.774	22.554	-145.783	-46.559	29.997	176.504

COMBINACION 40 1.35 (G1 + G2) + 1.5 (SCVMIN-IPF) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	26.397	41.751	-100.626	-255.275	6.067	111.861
2	249.353	2.640	-100.551	-471.396	30.117	109.971
3	443.243	-18.587	-100.434	-677.971	26.937	106.515
4	609.636	-10.318	-100.280	-848.714	23.686	103.403
5	896.624	-6.274	-92.556	-1019.250	24.728	98.182
6	1074.583	-8.620	-86.951	-1168.496	28.011	92.329
7	1572.915	-15.819	0.079	-1794.817	34.835	-10.174
8	1796.939	-34.452	10.408	-1351.904	35.781	81.886
9	1792.958	-26.447	10.649	-1909.365	56.027	-15.963
10	1911.549	-55.756	16.204	-1969.776	84.345	-17.016
11	1971.928	-84.002	17.253	-1361.763	96.476	97.982
12	1424.177	-88.389	-87.602	-1266.792	122.971	70.843
13	1325.078	-115.907	-61.228	-1117.554	151.177	72.618
14	1170.529	-145.329	-63.892	-919.112	181.563	75.283
15	965.772	-176.803	-67.561	-668.326	202.434	75.659
16	707.836	-198.626	-69.050	-363.425	235.054	80.440
17	395.101	-232.215	-75.041	-4.602	266.768	86.431
18	27.997	-264.794	-82.333	409.214	413.555	93.723
19	-394.371	-412.370	-91.007	882.958	592.311	99.105
20	-876.571	-591.792	-96.466	1218.143	720.118	94.624
21	-271.999	346.987	-24.535	-460.326	-170.202	27.308
22	460.475	171.192	-26.151	-843.366	107.493	22.320
23	819.478	-105.251	-26.246	-1186.151	123.204	21.136
24	1131.222	-118.214	-26.368	-1494.470	109.863	19.558
25	1554.890	-102.085	53.025	-1765.969	98.841	17.715
26	2030.090	-97.553	22.772	-2343.478	99.230	-25.275
27	2345.809	-98.536	26.272	-2599.377	103.459	-27.351
28	2601.987	-102.760	28.305	-2791.655	110.597	-27.958
29	2794.464	-109.941	28.862	-2917.078	120.093	-27.091
30	2920.001	-119.559	27.943	-2973.089	131.304	-24.746
31	2976.092	-130.868	25.540	-2533.463	123.961	9.408
32	2831.904	-122.603	25.046	-2455.883	138.988	8.093
33	2752.779	-133.281	21.093	-2301.869	155.045	7.830
34	2380.442	-145.787	1.336	-2066.059	171.590	8.842
35	2136.222	-164.005	-0.673	-1719.723	190.535	13.054
36	1779.636	-184.593	-6.008	-1280.770	209.701	19.911
37	1328.980	-205.302	-14.115	-750.275	229.620	28.019
38	785.742	-226.579	-23.598	-125.915	277.991	37.502
39	148.090	-276.213	-34.583	596.992	596.452	48.486
40	-588.149	-595.784	-47.189	1293.242	861.115	60.905
41	-290.922	236.049	-81.817	-346.474	-208.311	16.888
42	312.637	211.781	-21.015	-577.965	-53.507	16.065
43	533.623	57.910	-21.074	-789.683	63.294	14.583
44	732.221	-57.974	-0.114	-982.540	68.270	12.521
45	969.641	-67.003	22.672	-1262.260	83.430	12.370
46	1263.553	-82.756	-11.533	-1362.616	85.273	12.470
47	1364.142	-84.655	-11.654	-1587.786	103.445	2.341
48	1589.571	-102.905	-2.126	-1778.768	122.390	-5.719
49	1780.744	-121.935	5.946	-1930.807	143.963	-11.067

50	1932.889	-143.416	11.304	-1888.132	146.345	-11.304
51	1890.244	-145.785	11.546	-1955.379	170.134	-13.647
52	1957.517	-169.829	13.888	-1974.016	195.815	-12.674
53	1976.171	-195.461	12.909	-1821.162	187.856	-12.908
54	1823.239	-187.532	13.132	-1744.466	203.493	-8.309

COMBINACION 40 1.35 (G1 + G2) + 1.5 (SCVMIN-IPF) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	1746.355	-203.225	8.515	-1611.856	220.231	0.213
56	1613.567	-220.087	-0.030	-1420.724	237.906	12.959
57	1422.196	-237.721	-12.805	-1108.823	228.346	12.805
58	1109.968	-228.261	-12.688	-811.731	242.798	30.114
59	812.449	-242.665	-30.039	-450.322	294.291	52.243
60	450.560	-294.289	-52.217	2.633	353.212	-5.314

COMBINACION 41 1.35 (G1 + G2) + 1.5 (SCVMAX-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-400.650	404.674	228.447	154.522	-347.416	-280.747
2	-162.354	348.146	278.811	75.286	-283.751	-242.628
3	-89.054	285.165	239.150	-111.046	-265.732	-206.763
4	82.474	268.776	205.066	-260.800	-249.941	-216.267
5	237.840	252.562	209.979	-326.646	-221.679	-182.763
6	281.709	227.292	180.065	-387.650	-202.205	-166.902
7	337.054	209.010	163.957	-479.771	-196.277	-155.753
8	425.232	204.233	152.722	-496.175	-180.087	-137.664
9	439.285	189.327	134.699	-490.780	-154.504	-117.903
10	433.058	164.793	115.147	-463.722	-131.101	-96.769
11	406.631	142.644	94.363	-492.659	-119.655	-86.159
12	437.530	132.197	84.230	-436.759	-100.253	-63.498
13	384.808	114.008	62.708	-369.884	-83.889	-41.316
14	322.223	98.585	41.284	-383.450	-76.056	-32.142
15	341.075	91.693	32.977	-318.489	-61.546	-11.566
16	282.260	78.179	13.368	-284.100	-51.612	-10.897
17	254.694	69.086	13.760	-190.865	-49.751	17.613
18	260.832	65.274	-10.529	-331.805	65.541	15.498
19	397.388	-50.733	-14.434	-226.923	222.255	13.780
20	290.948	-207.837	-17.043	443.800	246.842	-187.756
21	-1205.485	848.625	195.504	712.727	-643.895	-305.066
22	-718.647	644.351	303.319	411.219	-323.510	-268.765
23	-422.954	324.437	265.385	166.971	-266.842	-230.455
24	-184.494	268.355	225.497	-55.570	-240.991	-190.190
25	32.495	243.134	183.711	-96.907	-215.573	-163.636
26	68.737	218.439	155.693	-219.275	-195.892	-138.823
27	293.106	200.232	159.978	-505.376	-186.137	-147.999
28	437.675	194.099	147.186	-576.812	-167.691	-131.764
29	503.393	177.240	131.176	-616.181	-149.393	-115.002
30	539.056	160.469	114.749	-624.057	-131.813	-97.822
31	545.407	144.480	98.014	-587.120	-116.156	-80.334
32	509.096	130.615	81.081	-527.991	-103.732	-62.648
33	452.793	119.695	64.061	-455.066	-94.895	-44.877
34	384.840	112.427	47.064	-378.474	-90.173	-27.134
35	315.198	109.299	30.207	-56.168	-93.995	49.112
36	193.811	111.047	24.503	-107.520	-107.617	44.350
37	139.782	121.434	-33.038	-186.854	-122.740	40.424
38	203.133	135.184	-38.630	-290.655	-111.481	37.278
39	282.503	124.478	-59.058	-395.884	167.985	34.853
40	394.585	-154.422	-57.298	731.002	401.139	-55.421
41	-1152.113	714.175	97.530	812.462	-629.521	-155.317
42	-816.987	629.895	153.675	560.667	-465.310	-172.147
43	-568.941	465.974	169.191	328.403	-309.017	-131.934
44	-340.360	310.099	127.695	152.842	-265.435	-89.632
45	-168.356	266.891	84.146	-31.297	-233.827	-97.707
46	-1.986	236.956	96.009	-136.206	-211.670	-56.979
47	114.327	214.029	49.126	-166.301	-171.908	-69.877
48	120.830	176.788	67.780	-197.751	-142.467	-53.582
49	147.412	148.269	51.073	-256.019	-125.785	-42.869

50	201.821	132.731	40.374	-228.158	-96.593	-23.940
51	171.206	104.645	21.574	-169.566	-67.743	-2.754
52	111.158	76.675	0.641	-80.301	-39.153	20.673
53	21.832	49.313	-22.406	-59.619	-36.884	30.610
54	2.497	48.218	-31.822	43.740	-24.709	51.117

COMBINACION 41 1.35 (G1 + G2) + 1.5 (SCVMAX-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	-98.039	37.201	-51.665	450.629	-20.332	158.271
56	-378.438	32.792	-126.080	454.355	-25.058	155.181
57	-402.618	34.989	-133.040	460.590	-32.564	152.638
58	-475.401	41.374	-169.966	319.806	-42.499	150.556
59	-329.094	52.075	-168.254	301.218	-16.590	148.844
60	-304.034	26.749	-166.818	299.722	14.244	166.818

COMBINACION 42 1.35 (G1 + G2) + 1.5 (SCVMIN-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-460.033	205.359	392.462	340.560	16.479	23.954
2	-333.296	-24.429	-74.929	493.421	63.175	72.978
3	-475.698	-48.184	-72.254	525.788	91.413	226.202
4	-508.135	-75.610	-219.204	550.533	87.476	223.917
5	-509.151	-72.431	-214.450	566.545	85.175	222.654
6	-507.117	-73.808	-191.306	374.388	93.639	150.600
7	-344.873	-87.362	-160.174	315.509	109.184	161.350
8	-284.811	-103.606	-169.905	367.321	106.031	150.496
9	-336.239	-100.952	-158.107	327.204	134.997	157.310
10	-296.456	-130.616	-164.048	303.755	164.962	162.832
11	-274.028	-161.027	-168.766	346.933	174.192	147.846
12	-318.839	-170.872	-152.636	423.829	204.874	155.677
13	-397.977	-201.977	-159.827	467.155	236.035	165.657
14	-444.064	-233.671	-169.224	524.061	269.534	179.847
15	-504.157	-267.659	-182.883	706.194	283.688	174.124
16	-689.834	-282.220	-176.677	829.299	355.108	257.838
17	-818.462	-367.360	-228.910	1037.684	419.286	254.158
18	-1041.085	-452.327	-184.428	1247.059	623.473	259.264
19	-1253.266	-655.417	-198.217	1788.098	822.263	179.745
20	-1794.893	-840.733	-145.228	2480.963	788.874	-97.912
21	-1659.611	549.661	-381.098	628.676	-531.691	-320.988
22	-634.933	534.113	373.821	431.455	-131.965	-139.312
23	-422.230	135.168	188.073	341.499	-56.769	-96.577
24	-328.107	45.659	164.829	289.889	44.631	157.268
25	-260.630	-51.347	-97.070	202.411	63.435	67.373
26	-158.093	-59.884	-63.092	57.605	79.310	95.163
27	4.637	-60.100	-81.172	-41.673	82.511	92.080
28	111.163	-64.741	-79.514	-127.308	102.742	89.183
29	202.010	-86.564	-76.951	-201.129	113.546	89.360
30	278.917	-99.029	-77.573	-250.916	140.886	96.966
31	329.644	-128.049	-85.734	-179.989	160.022	88.821
32	257.392	-148.638	-78.256	-141.082	176.342	92.171
33	135.108	-171.098	-94.541	-20.926	197.389	102.098
34	55.434	-193.444	-107.753	83.137	217.675	115.466
35	-52.794	-214.548	-119.662	147.952	225.345	111.258
36	-95.706	-220.600	-100.766	293.743	241.204	117.693
37	-270.862	-284.047	-43.302	527.837	384.226	267.766
38	-465.026	-366.375	-75.948	880.428	490.828	286.961
39	-885.285	-520.687	-228.336	1385.710	882.734	151.607
40	-1397.059	-906.201	-108.107	2456.987	979.556	-98.253
41	-1761.592	349.624	-513.727	769.262	-542.510	-189.615
42	-771.052	534.290	205.612	589.884	-350.955	-157.838
43	-591.535	336.021	181.549	473.464	-53.297	204.081
44	-473.005	30.980	-175.767	435.126	-15.947	153.847
45	-439.320	4.140	-130.094	369.482	14.331	146.333
46	-385.689	-3.629	-111.711	339.529	20.018	144.390
47	-369.022	-8.204	-102.745	236.077	34.351	136.564
48	-189.022	-19.434	-125.851	124.773	49.656	129.664
49	-73.123	-35.806	-118.965	22.924	67.806	124.332

50	32.175	-54.885	-113.762	6.828	77.854	121.967
51	50.477	-65.957	-111.648	-69.587	99.679	118.465
52	127.803	-89.145	-108.529	-126.131	124.043	116.957
53	183.894	-114.541	-107.540	-102.898	126.972	115.744
54	158.645	-118.636	-106.991	-123.710	143.046	117.186

COMBINACION 42 1.35 (G1 + G2) + 1.5 (SCVMIN-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	175.815	-135.981	-108.340	-120.197	161.035	120.458
56	167.091	-155.261	-113.498	-88.777	180.785	127.695
57	128.769	-176.150	-121.878	13.471	186.844	130.082
58	17.874	-183.508	-125.581	-27.615	206.269	136.507
59	48.502	-204.120	-133.503	100.715	268.133	137.163
60	-94.470	-289.646	-57.740	390.151	455.237	-146.518

COMBINACION 43 1.35 (G1 + G2) + 1.5 (SCVMAX-EC1) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-57.619	404.674	228.447	-393.034	-347.416	-280.747
2	385.202	348.146	278.811	-800.456	-283.751	-242.628
3	786.688	285.165	239.150	-1161.271	-265.732	-206.763
4	1132.699	268.776	205.066	-1453.854	-249.941	-216.267
5	1430.894	252.562	209.979	-1631.747	-221.679	-182.764
6	1586.810	227.292	180.065	-1774.716	-202.205	-166.902
7	1724.120	209.010	163.957	-1919.105	-196.277	-155.753
8	1864.566	204.233	152.722	-1958.081	-180.087	-137.664
9	1901.191	189.327	134.699	-1948.161	-154.504	-117.903
10	1890.439	164.793	115.147	-1893.607	-131.101	-96.769
11	1836.516	142.644	94.363	-1871.371	-119.655	-86.159
12	1816.242	132.197	84.230	-1739.794	-100.253	-63.498
13	1687.843	114.008	62.708	-1575.148	-83.889	-41.316
14	1527.487	98.585	41.284	-1455.623	-76.056	-32.142
15	1413.248	91.693	32.977	-1231.944	-61.546	-11.566
16	1195.715	78.179	13.368	-1013.050	-51.612	-10.897
17	983.644	69.086	13.760	-713.607	-49.751	17.613
18	783.574	65.274	-10.529	-507.431	65.541	15.498
19	573.014	-50.733	-14.434	-277.326	222.255	13.780
20	341.351	-207.837	-17.043	434.750	246.842	-187.756
21	-1196.435	848.625	195.504	592.926	-643.895	-305.066
22	-598.846	644.351	303.319	-168.794	-323.510	-268.765
23	157.059	324.437	265.385	-837.524	-266.842	-230.455
24	820.001	268.355	225.497	-1415.668	-240.990	-190.190
25	1392.593	243.134	183.711	-1743.214	-215.573	-163.636
26	1715.044	218.439	155.693	-2086.991	-195.892	-138.823
27	2160.822	200.232	159.978	-2535.424	-186.137	-147.999
28	2467.723	194.099	147.186	-2715.767	-167.691	-131.764
29	2642.348	177.240	131.176	-2815.103	-149.393	-115.002
30	2737.978	160.469	114.749	-2837.097	-131.813	-97.822
31	2758.447	144.480	98.014	-2786.155	-116.156	-80.334
32	2708.131	130.615	81.081	-2667.173	-103.732	-62.648
33	2591.975	119.695	64.061	-2485.438	-94.895	-44.877
34	2415.212	112.427	47.064	-2246.523	-90.173	-27.134
35	2183.248	109.299	30.207	-1702.826	-93.995	49.112
36	1840.469	111.047	24.503	-1467.884	-107.617	44.350
37	1500.146	121.434	-33.038	-1191.508	-122.740	40.424
38	1207.787	135.184	-38.630	-875.001	-111.481	37.278
39	866.849	124.478	-59.058	-516.418	167.985	34.853
40	515.119	-154.422	-57.298	721.952	401.139	-55.421
41	-1143.063	714.175	97.530	762.367	-629.521	-155.317
42	-766.892	629.895	153.675	246.806	-465.310	-172.147
43	-255.080	465.974	169.191	-190.522	-309.017	-131.934
44	178.565	310.099	127.695	-576.200	-265.435	-89.632
45	560.686	266.891	84.146	-944.884	-233.827	-97.707
46	911.601	236.956	96.009	-1208.557	-211.670	-56.979
47	1186.679	214.029	49.126	-1371.781	-171.908	-69.877
48	1326.310	176.788	67.780	-1501.034	-142.467	-53.582
49	1450.695	148.269	51.073	-1634.976	-125.785	-42.869

50	1580.778	132.731	40.374	-1658.289	-96.593	-23.940
51	1601.337	104.645	21.574	-1627.180	-67.743	-2.754
52	1568.772	76.675	0.641	-1542.421	-39.153	20.673
53	1483.952	49.313	-22.406	-1499.133	-36.884	30.610
54	1442.011	48.218	-31.822	-1343.461	-24.709	51.117

COMBINACION 43 1.35 (G1 + G2) + 1.5 (SCVMAX-EC1) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	1289.162	37.201	-51.665	-854.570	-20.332	158.271
56	926.761	32.792	-126.080	-738.757	-25.058	155.181
57	790.495	34.989	-133.040	-598.729	-32.564	152.638
58	583.918	41.374	-169.966	-435.864	-42.499	150.556
59	426.576	52.075	-168.254	-249.882	-16.590	148.844
60	247.066	26.749	-166.818	-44.087	14.244	166.818

COMBINACION 44 1.35 (G1 + G2) + 1.5 (SCVMIN-EC1) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	39.498	31.308	-151.937	-250.754	18.507	132.527
2	262.554	-2.809	-134.117	-446.362	41.406	131.596
3	464.321	-25.955	-129.188	-623.784	36.004	129.899
4	641.436	-20.200	-122.901	-782.038	32.067	127.614
5	823.488	-16.874	-116.712	-918.420	29.620	124.916
6	977.849	-18.246	-93.568	-1232.826	38.077	52.862
7	1262.340	-31.808	-62.437	-1384.249	53.634	63.612
8	1414.947	-48.063	-72.168	-1395.278	50.493	52.758
9	1426.368	-45.417	-60.369	-1471.145	79.459	59.573
10	1501.896	-75.081	-66.311	-1507.369	109.425	65.095
11	1537.104	-105.499	-71.028	-1453.277	118.672	50.108
12	1481.365	-115.365	-54.898	-1340.934	149.373	57.939
13	1366.783	-146.460	-62.089	-1240.086	180.516	67.919
14	1263.179	-178.160	-71.487	-1090.342	214.025	82.109
15	1110.247	-212.166	-85.145	-789.722	228.203	76.386
16	806.083	-226.736	-78.939	-536.871	260.131	85.091
17	549.383	-259.100	-87.206	-207.285	296.710	81.286
18	215.778	-296.061	-83.004	222.727	451.963	126.042
19	-218.358	-451.661	-127.400	730.689	618.508	108.927
20	-730.413	-618.479	-108.837	1088.526	708.145	124.349
21	-366.278	364.221	-203.131	-496.532	-160.742	35.444
22	502.347	186.617	-23.175	-862.902	116.973	35.154
23	881.554	-92.211	-22.562	-1192.096	132.292	34.540
24	1223.236	-108.731	-21.733	-1485.550	118.376	33.712
25	1528.369	-96.145	-20.800	-1830.246	108.233	-8.898
26	1883.555	-87.396	21.805	-2179.315	106.824	10.265
27	2241.611	-87.549	2.526	-2414.903	109.958	8.382
28	2484.389	-92.188	4.184	-2595.444	117.127	7.472
29	2670.146	-100.939	4.760	-2715.575	127.922	7.649
30	2793.367	-113.407	4.138	-2770.031	141.816	9.024
31	2848.755	-128.969	2.208	-2690.959	147.451	9.771
32	2768.362	-136.059	0.795	-2604.148	163.760	13.120
33	2598.180	-158.512	-15.490	-2387.143	184.805	23.047
34	2421.647	-180.866	-28.702	-2132.700	205.100	36.415
35	2163.098	-201.903	-41.177	-1858.561	212.698	32.773
36	1910.883	-207.495	-25.967	-1439.001	228.099	42.894
37	1481.162	-224.253	-37.302	-931.242	243.749	54.982
38	1014.315	-242.295	-75.666	-356.842	296.500	113.608
39	364.300	-295.917	-115.368	380.475	618.684	153.686
40	-379.355	-618.599	-154.835	1132.148	843.219	96.071
41	-532.401	251.693	-327.508	-362.247	-207.169	15.142
42	367.105	217.282	-30.658	-588.043	-52.696	12.186
43	596.858	62.399	-26.419	-789.256	63.357	7.947
44	801.918	-54.006	-20.933	-988.303	69.022	-0.986
45	993.644	-59.434	0.359	-1201.937	77.900	15.881
46	1185.730	-67.193	18.741	-1344.564	83.589	13.937
47	1315.069	-71.770	27.708	-1535.056	97.885	6.111
48	1582.115	-82.955	4.602	-1698.136	113.145	-0.789

49	1749.787	-99.288	11.488	-1829.630	131.281	-6.121
50	1884.725	-118.351	16.691	-1850.888	141.317	-8.487
51	1908.195	-129.420	18.805	-1908.783	163.132	-11.988
52	1966.996	-152.588	21.925	-1923.835	187.445	-13.497
53	1981.600	-177.945	22.913	-1832.031	190.354	-14.709
54	1887.779	-182.013	23.462	-1754.577	206.428	-13.267

COMBINACION 44 1.35 (G1 + G2) + 1.5 (SCVMIN-EC1) + V_Pd

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	1806.694	-199.302	21.203	-1623.170	224.377	-9.085
56	1670.065	-218.607	16.045	-1433.741	244.130	-1.847
57	1473.732	-239.490	7.665	-1151.799	250.161	0.539
58	1183.143	-246.823	3.961	-843.739	268.882	12.473
59	864.625	-266.736	-9.469	-465.670	325.727	28.288
60	475.278	-324.824	-25.680	-10.143	385.833	33.884

DIMENSIONAMIENTO A CORTANTE SEGUN NORMATIVA EHE												
SEC	Vd (T)	Nd (T)	Vu1 (T)	Vcu (T)	Vsu (T)	Asc (cm2/m)	Dec (m)	th	the	rho	psi	dp (m)
1	363.	4455.	2386.	322.	277.	73.9	0.6	30.6	30.6	0.02	1.57	0.61
2	301.	4430.	2206.	298.	255.	73.9	0.5	30.6	30.6	0.02	1.59	0.57
3	251.	4362.	723.	115.	137.	40.4	0.6	29.1	29.1	0.02	1.62	0.52
4	233.	4355.	1051.	163.	133.	27.2	0.9	29.1	29.1	0.02	1.51	0.76
5	241.	4350.	1097.	170.	139.	27.2	0.9	29.1	29.1	0.02	1.50	0.79
6	223.	4351.	1133.	175.	144.	27.2	0.9	29.1	29.1	0.02	1.49	0.82
7	206.	4358.	1158.	179.	147.	27.2	0.9	29.1	29.1	0.02	1.49	0.83
8	190.	4371.	1172.	182.	149.	27.2	0.8	29.0	29.0	0.02	1.49	0.85
9	198.	4390.	1177.	183.	150.	27.2	0.9	29.0	29.0	0.02	1.49	0.85
10	173.	4412.	1171.	183.	150.	27.2	0.8	29.0	29.0	0.02	1.49	0.85
11	149.	4438.	1159.	182.	149.	27.2	0.7	28.9	28.9	0.02	1.49	0.84
12	146.	4467.	1140.	181.	147.	27.2	0.7	28.9	28.9	0.02	1.49	0.83
13	171.	4498.	597.	98.	77.	27.2	0.5	28.8	28.8	0.02	1.68	0.43
14	201.	4542.	630.	104.	96.	32.0	0.6	28.7	28.7	0.02	1.66	0.46
15	232.	4551.	670.	111.	121.	37.9	0.6	28.7	28.7	0.02	1.64	0.49
16	254.	4557.	719.	119.	135.	39.4	0.6	28.7	28.7	0.02	1.62	0.52
17	340.	4560.	774.	127.	213.	57.6	0.6	28.7	28.7	0.02	1.60	0.56
18	421.	4590.	836.	138.	283.	70.5	0.7	28.6	28.6	0.02	1.57	0.61
19	616.	4592.	2526.	348.	298.	73.9	0.8	30.3	30.3	0.02	1.55	0.65
20	814.	4556.	2633.	360.	454.	108.6	0.8	30.4	30.4	0.02	1.54	0.68
21	855.	4525.	2671.	363.	492.	116.3	0.8	30.4	30.4	0.02	1.54	0.69
22	607.	4447.	2581.	346.	299.	73.9	0.8	30.6	30.6	0.02	1.55	0.67
23	290.	4369.	817.	129.	161.	42.1	0.7	29.1	29.1	0.02	1.58	0.59
24	238.	4327.	682.	108.	130.	41.1	0.6	29.1	29.1	0.02	1.64	0.49
25	218.	4269.	562.	89.	129.	49.7	0.5	29.2	29.2	0.02	1.70	0.40
26	199.	4202.	1268.	189.	158.	27.2	0.9	29.4	29.4	0.02	1.47	0.91
27	180.	4136.	1356.	199.	168.	27.2	0.8	29.5	29.5	0.02	1.45	0.97
28	161.	4075.	1424.	206.	175.	27.2	0.7	29.6	29.6	0.02	1.44	1.01
29	143.	4025.	1473.	210.	180.	27.2	0.6	29.7	29.7	0.02	1.44	1.05
30	126.	3988.	1504.	213.	183.	27.2	0.5	29.8	29.8	0.02	1.43	1.07
31	130.	3966.	1515.	213.	183.	27.2	0.5	29.9	29.9	0.02	1.43	1.08
32	135.	3988.	1504.	213.	183.	27.2	0.5	29.8	29.8	0.02	1.43	1.07
33	146.	4026.	1473.	210.	180.	27.2	0.6	29.7	29.7	0.02	1.44	1.05
34	158.	4076.	1424.	206.	175.	27.2	0.7	29.6	29.6	0.02	1.44	1.01
35	177.	4137.	379.	60.	117.	67.6	0.3	29.5	29.5	0.02	1.86	0.27
36	198.	4203.	462.	73.	125.	58.8	0.4	29.4	29.4	0.02	1.78	0.33
37	265.	4270.	562.	89.	176.	67.8	0.4	29.2	29.2	0.02	1.70	0.40
38	351.	4328.	681.	108.	243.	76.6	0.5	29.1	29.1	0.02	1.64	0.49
39	501.	4402.	816.	130.	371.	96.8	0.6	29.0	29.0	0.02	1.58	0.59
40	883.	4475.	2579.	348.	536.	131.9	0.7	30.5	30.5	0.02	1.55	0.66
41	713.	4525.	2671.	363.	350.	82.8	0.8	30.4	30.4	0.02	1.54	0.69
42	600.	4528.	2636.	358.	308.	73.9	0.8	30.4	30.4	0.02	1.54	0.68
43	423.	4532.	900.	146.	277.	64.5	0.7	28.7	28.7	0.02	1.55	0.65
44	275.	4557.	837.	137.	138.	34.5	0.7	28.7	28.7	0.02	1.57	0.61
45	241.	4560.	774.	127.	114.	30.7	0.7	28.7	28.7	0.02	1.60	0.56
46	208.	4558.	719.	119.	94.	27.2	0.7	28.7	28.7	0.02	1.62	0.52
47	187.	4551.	670.	111.	87.	27.2	0.6	28.7	28.7	0.02	1.64	0.49
48	157.	4543.	630.	105.	82.	27.2	0.6	28.7	28.7	0.02	1.66	0.46
49	128.	4498.	597.	98.	77.	27.2	0.5	28.8	28.8	0.02	1.68	0.43
50	100.	4468.	571.	94.	74.	27.2	0.4	28.9	28.9	0.02	1.70	0.41
51	87.	4439.	1159.	182.	149.	27.2	0.2	28.9	28.9	0.02	1.49	0.84
52	106.	4413.	1171.	183.	150.	27.2	0.4	29.0	29.0	0.02	1.49	0.85
53	132.	4391.	1177.	183.	150.	27.2	0.6	29.0	29.0	0.02	1.49	0.85
54	124.	4371.	1172.	182.	149.	27.2	0.5	29.0	29.0	0.02	1.49	0.85
55	140.	4358.	1157.	179.	147.	27.2	0.6	29.1	29.1	0.02	1.49	0.83
56	157.	4351.	1133.	175.	144.	27.2	0.7	29.1	29.1	0.02	1.49	0.82

57	174.	4351.	1097.</

50	100.	4468.	676.	36.	64.	43.0	0.3	45.0	28.9	0.02	1.70	0.41
51	87.	4439.	1369.	70.	82.	27.2	0.4	45.0	28.9	0.02	1.49	0.84
52	106.	4413.	1382.	70.	83.	27.2	0.5	45.0	29.0	0.02	1.49	0.85
53	132.	4391.	1387.	70.	83.	27.2	0.5	45.0	29.0	0.02	1.49	0.85
54	124.	4371.	1381.	70.	83.	27.2	0.5	45.0	29.0	0.02	1.49	0.85
55	140.	4358.	1363.	69.	82.	27.2	0.5	45.0	29.1	0.02	1.49	0.83
56	157.	4351.	1333.	68.	89.	30.3	0.5	45.0	29.1	0.02	1.49	0.82
57	174.	4351.	1291.	66.	109.	38.2	0.5	45.0	29.1	0.02	1.50	0.79
58	165.	4392.	787.	41.	124.	71.4	0.3	45.0	29.0	0.02	1.64	0.48
59	180.	4451.	2314.	116.	139.	73.9	0.3	45.0	30.6	0.02	1.62	0.52
60	259.	4458.	2517.	125.	151.	73.9	0.4	45.0	30.5	0.02	1.59	0.57
61	423.	4458.	2770.	137.	286.	127.0	0.4	45.0	30.5	0.02	1.57	0.62

DIMENSIONAMIENTO A CORTANTE SEGUN NORMATIVA EHE

Angulo de la biela comprimida(sex.) = 35.00

SEC	Vd (T)	Nd (T)	Vu1 (T)	Vcu (T)	Vsu (T)	Asc (cm2/m)	Dec (m)	th	the	rho	psi	dp (m)
1	363.	4455.	2561.	250.	234.	73.9	0.5	35.0	30.6	0.02	1.57	0.61
2	301.	4430.	2366.	232.	216.	73.9	0.5	35.0	30.6	0.02	1.59	0.57
3	251.	4362.	801.	82.	169.	63.1	0.4	35.0	29.1	0.02	1.62	0.52
4	233.	4355.	1162.	117.	117.	29.9	0.7	35.0	29.1	0.02	1.51	0.76
5	241.	4350.	1213.	122.	119.	29.3	0.8	35.0	29.1	0.02	1.50	0.79
6	223.	4351.	1253.	125.	114.	27.2	0.8	35.0	29.1	0.02	1.49	0.82
7	206.	4358.	1281.	128.	117.	27.2	0.8	35.0	29.1	0.02	1.49	0.83
8	190.	4371.	1297.	130.	118.	27.2	0.7	35.0	29.0	0.02	1.49	0.85
9	198.	4390.	1304.	131.	119.	27.2	0.8	35.0	29.0	0.02	1.49	0.85
10	173.	4412.	1299.	130.	118.	27.2	0.7	35.0	29.0	0.02	1.49	0.85
11	149.	4438.	1287.	129.	117.	27.2	0.7	35.0	28.9	0.02	1.49	0.84
12	146.	4467.	1267.	128.	116.	27.2	0.6	35.0	28.9	0.02	1.49	0.83
13	171.	4498.	664.	69.	102.	45.9	0.4	35.0	28.8	0.02	1.68	0.43
14	201.	4542.	702.	73.	128.	54.2	0.4	35.0	28.7	0.02	1.66	0.46
15	232.	4551.	747.	78.	155.	61.8	0.4	35.0	28.7	0.02	1.64	0.49
16	254.	4557.	802.	83.	171.	63.6	0.4	35.0	28.7	0.02	1.62	0.52
17	340.	4560.	863.	89.	251.	86.9	0.5	35.0	28.7	0.02	1.60	0.56
18	421.	4590.	934.	96.	325.	103.8	0.5	35.0	28.6	0.02	1.57	0.61
19	616.	4592.	2724.	267.	349.	103.9	0.6	35.0	30.3	0.02	1.55	0.65
20	814.	4556.	2836.	277.	537.	153.4	0.6	35.0	30.4	0.02	1.54	0.68
21	855.	4525.	2874.	280.	575.	162.0	0.6	35.0	30.4	0.02	1.54	0.69
22	607.	4447.	2770.	269.	338.	98.7	0.6	35.0	30.6	0.02	1.55	0.67
23	290.	4369.	905.	92.	198.	65.3	0.5	35.0	29.1	0.02	1.58	0.59
24	238.	4327.	753.	77.	161.	63.7	0.4	35.0	29.1	0.02	1.64	0.49
25	218.	4269.	620.	64.	154.	74.1	0.3	35.0	29.2	0.02	1.70	0.40
26	199.	4202.	1394.	138.	127.	27.2	0.8	35.0	29.4	0.02	1.47	0.91
27	180.	4136.	1486.	146.	136.	27.2	0.8	35.0	29.5	0.02	1.45	0.97
28	161.	4075.	1557.	152.	142.	27.2	0.7	35.0	29.6	0.02	1.44	1.01
29	143.	4025.	1607.	156.	147.	27.2	0.7	35.0	29.7	0.02	1.44	1.05
30	126.	3988.	1638.	159.	149.	27.2	0.6	35.0	29.8	0.02	1.43	1.07
31	130.	3966.	1649.	159.	150.	27.2	0.6	35.0	29.9	0.02	1.43	1.08
32	135.	3988.	1638.	159.	149.	27.2	0.6	35.0	29.8	0.02	1.43	1.07
33	146.	4026.	1607.	156.	147.	27.2	0.7	35.0	29.7	0.02	1.44	1.05
34	158.	4076.	1557.	152.	142.	27.2	0.7	35.0	29.6	0.02	1.44	1.01
35	177.	4137.	416.	44.	133.	95.2	0.2	35.0	29.5	0.02	1.86	0.27
36	198.	4203.	508.	53.	145.	84.9	0.3	35.0	29.4	0.02	1.78	0.33
37	265.	4270.	620.	64.	201.	96.7	0.3	35.0	29.2	0.02	1.70	0.40
38	351.	4328.	753.	77.	273.	108.3	0.4	35.0	29.1	0.02	1.64	0.49
39	501.	4402.	905.	92.	409.	134.7	0.4	35.0	29.0	0.02	1.58	0.59
40	883.	4475.	2770.	270.	614.	179.5	0.6	35.0	30.5	0.02	1.55	0.66
41	713.	4525.	2874.	280.	433.	122.1	0.6	35.0	30.4	0.02	1.54	0.69
42	600.	4528.	2836.	276.	323.	92.3	0.6	35.0	30.4	0.02	1.54	0.68
43	423.	4532.	1003.	102.	320.	95.3	0.5	35.0	28.7	0.02	1.55	0.65
44	275.	4557.	934.	96.	179.	57.3	0.5	35.0	28.7	0.02	1.57	0.61
45	241.	4560.	863.	89.	152.	52.5	0.5	35.0	28.7	0.02	1.60	0.56
46	208.	4558.	802.	83.	125.	46.6	0.5	35.0	28.7	0.02	1.62	0.52
47	187.	4551.	747.	78.	110.	43.8	0.4	35.0	28.7	0.02	1.64	0.49
48	157.	4543.	702.	73.	83.	35.4	0.4	35.0	28.7	0.02	1.66	0.46
49	128.	4498.	664.	69.	61.	27.2	0.4	35.0	28.8	0.02	1.68	0.43
50	100.	4468.	635.	66.	58.	27.2	0.4	35.0	28.9	0.02	1.70	0.41
51	87.	4439.	1287.	129.	117.	27.2	0.4	35.0	28.9	0.02	1.49	0.84
52	106.	4413.	1299.	130.	118.	27.2	0.5	35.0	29.0	0.02	1.49	0.85
53	132.	4391.	1304.	131.	119.	27.2	0.6	35.0	29.0	0.02	1.49	0.85
54	124.	4371.	1297.	130.	118.	27.2	0.6	35.0	29.0	0.02	1.49	0.85
55	140.	4358.	1281.	128.	117.	27.2	0.6	35.0	29.1	0.02	1.49	0.83

56	157.	4351.	1253.	125.	114.	27.2	0.7	35.0	29.1	0.02	1.49	0.82
57	174.	4351.	1213.	122.	111.	27.2	0.7	35.0	29.1	0.02	1.50	0.79
58	165.	4392.	739.	76.	89.	35.8	0.5	35.0	29.0	0.02	1.64	0.48
59	180.	4451.	2174.	215.	198.	73.9	0.3	35.0	30.6	0.02	1.62	0.52
60	259.	4458.	2366.	232.	216.	73.9	0.4	35.0	30.5	0.02	1.59	0.57
61	423.	4458.	2603.	254.	237.	73.9	0.6	35.0	30.5	0.02	1.57	0.62

7.2 EVALUACIÓN DEL E.L.U. DE TORSIÓN

En este apartado se comprueba el Estado Límite Último de rotura por esfuerzo torsor de acuerdo con los criterios de la Normativa española vigente (EHE artículo 45)

Los cálculos realizados han sido los siguientes:

- Cálculo de la envolvente de esfuerzos cortantes para las distintas acciones consideradas en el proyecto del tablero. Los esfuerzos de cálculo se han combinado de acuerdo con los criterios del apartado 2 de este Anejo.
- La envolvente de esfuerzos flectores positivos se muestra en los listados adjuntos con la notación T_d , conjuntamente con el esfuerzo flector y cortante concomitantes.
- Cálculo de T_{u1} (esfuerzo torsor de agotamiento que pueden resistir las bielas comprimidas).
- Dimensionamiento de las armaduras transversal A_{st} y longitudinal A_{sl} requeridas para resistir el esfuerzo torsor T_d , a partir del cálculo de T_{u2} (esfuerzo torsor que pueden resistir las armaduras transversales) y T_{u3} (esfuerzo torsor que pueden resistir las armaduras longitudinales).
- Comprobación de la interacción torsor-cortante (artículo 45.3.2.2) en cada una de las secciones en que se ha discretizado el tablero para el máximo esfuerzo cortante y el torsor concomitante y viceversa.

COMBINACION 45 1.35 (G1 + G2) + 1.5 (SCTMAX-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

1	-454.474	227.995	434.545	305.414	-177.425	-403.824
2	-301.851	177.077	406.183	318.334	-139.091	-362.380
3	-322.265	139.476	365.511	226.505	-131.202	-321.748
4	-236.977	132.280	325.745	141.379	-128.954	-295.024
5	-157.392	130.655	299.983	59.257	-137.098	-267.714
6	-58.083	137.004	268.422	5.931	-132.504	-243.741
7	-4.751	132.364	244.566	-35.704	-128.404	-217.931
8	36.914	128.156	218.869	-126.354	-136.504	-218.869
9	127.553	136.331	219.919	-150.301	-121.881	-191.476
10	151.472	121.567	192.634	-159.219	-108.086	-162.532
11	160.349	107.866	163.795	-228.706	-105.668	-163.795
12	229.775	105.334	165.163	-216.099	-93.465	-133.548
13	217.058	93.242	135.016	-192.290	-83.126	-102.038
14	193.114	82.811	103.605	-172.733	-72.579	-69.424
15	173.418	72.221	71.087	-223.895	-70.468	-71.087
16	224.434	70.152	72.846	-194.219	-60.644	-41.869
17	194.576	60.279	43.721	-159.503	-53.594	-16.710
18	159.689	53.213	18.653	-240.215	66.687	-0.359
19	240.226	-67.083	2.391	-135.852	223.136	-2.391
20	135.681	-223.532	4.513	194.917	305.396	-179.035
21	-573.274	656.458	507.973	84.133	-384.028	-542.634
22	-83.473	383.983	544.918	-6.750	-87.144	-491.188
23	0.660	87.582	494.954	-53.477	-58.044	-442.839
24	40.667	59.091	448.142	-105.646	-56.915	-396.261
25	86.358	58.619	403.160	-157.741	-55.665	-351.073
26	132.445	58.113	359.627	-206.170	-53.532	-307.710
27	175.582	56.655	317.978	-246.680	-50.195	-266.288
28	211.634	54.199	278.330	-277.868	-59.304	-246.014
29	279.332	59.138	247.305	-297.380	-58.972	-225.925
30	298.866	58.714	227.364	-304.750	-57.744	-205.272
31	306.266	57.418	206.856	-352.496	-66.189	-206.856
32	353.939	65.995	208.585	-322.455	-66.323	-185.780
33	323.797	65.979	187.651	-285.254	-68.212	-164.134
34	286.481	67.814	166.144	-246.925	-72.471	-141.915
35	247.992	72.074	144.062	-215.028	-79.343	-119.121
36	215.890	78.933	121.404	-197.642	-88.593	-95.761
37	198.281	88.134	98.177	-200.921	-99.367	-75.178
38	201.308	98.915	77.726	-222.435	-83.884	-57.867
39	222.542	83.393	60.544	-239.505	199.655	-47.488
40	239.337	-200.167	50.292	190.430	415.088	-224.363
41	-361.934	521.648	363.207	40.859	-384.421	-398.440
42	-39.457	384.295	400.513	-38.527	-218.953	-369.792
43	35.485	219.094	372.830	-132.566	-87.271	-327.985
44	125.102	87.820	332.019	-180.718	-68.634	-287.173
45	168.922	69.535	292.242	-200.154	-58.324	-258.384
46	200.958	58.263	259.052	-243.784	-56.539	-259.052
47	244.656	56.439	259.839	-235.575	-43.909	-236.248
48	236.526	43.760	237.150	-226.197	-31.684	-211.755
49	227.222	31.469	212.771	-200.656	-17.942	-185.422
50	201.692	17.839	186.551	-222.973	-15.680	-186.551

51	223.966	15.611	187.790	-170.765	-0.789	-158.341
52	171.736	0.485	159.687	-99.934	15.020	-127.990
53	100.901	-15.255	129.441	-99.419	6.879	-129.441
54	100.314	-7.122	130.995	-7.294	11.801	-96.910

COMBINACION 45 1.35 (G1 + G2) + 1.5 (SCTMAX-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2

55	8.037	-12.078	98.563	98.815	17.014	-62.000
56	-98.185	-17.390	63.751	207.433	21.050	-30.661
57	-206.945	-21.365	32.505	229.406	11.239	-32.505
58	-229.118	-11.630	34.440	271.628	20.549	8.829
59	-243.935	-19.267	2.733	292.703	45.561	6.806
60	-282.040	-46.077	-0.139	341.116	86.201	4.699

COMBINACION 46 1.35 (G1 + G2) + 1.5 (SCTMIN-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-344.267	170.472	7.610	252.197	-123.275	-20.557
2	-247.634	125.547	26.438	305.870	-87.287	-5.852
3	-308.119	90.433	15.147	229.377	-85.062	9.425
4	-167.474	100.681	-1.503	163.093	-83.354	8.808
5	-105.592	100.684	1.847	109.355	-75.548	25.847
6	-25.383	91.439	-24.990	-126.084	-75.068	44.835
7	108.615	77.072	-44.318	-256.495	-65.031	64.989
8	237.757	67.368	-64.606	-258.666	-65.140	69.626
9	239.189	67.975	-69.325	-332.694	-41.450	95.251
10	312.996	44.559	-94.984	-381.155	-18.959	123.687
11	361.739	22.567	-123.408	-365.823	-13.713	126.142
12	347.140	17.597	-125.806	-378.098	6.469	157.084
13	360.542	-2.085	-156.649	-370.995	24.384	190.102
14	354.937	-19.733	-189.529	-385.565	39.626	220.707
15	371.349	-34.673	-219.959	-75.034	52.257	231.664
16	303.285	-40.289	-225.827	-36.369	70.456	261.340
17	286.682	-55.430	-255.245	100.644	90.486	305.357
18	-63.353	-84.299	-296.562	46.900	220.671	342.751
19	-14.814	-215.117	-337.937	256.586	387.615	368.128
20	-228.845	-382.545	-366.763	673.168	487.270	297.594
21	-546.089	540.188	-139.342	287.986	-354.648	-26.779
22	-264.640	360.545	49.831	221.516	-62.771	-13.199
23	-203.873	69.556	40.157	173.790	-33.662	3.127
24	41.678	24.383	23.228	109.653	-34.201	22.243
25	137.574	21.344	0.105	83.472	-33.351	39.012
26	187.947	17.101	-22.451	12.820	-32.246	57.507
27	309.239	13.116	-35.108	-123.839	-31.945	67.064
28	406.015	11.276	-54.331	-194.150	-26.355	87.565
29	472.836	4.108	-75.503	-253.358	-18.608	110.802
30	521.448	-4.482	-97.688	-296.800	-9.169	136.822
31	548.887	-13.781	-120.851	-288.815	-2.004	158.987
32	305.775	13.031	-137.315	-279.578	7.093	189.989
33	295.995	3.495	-170.243	-254.625	15.248	223.892
34	270.117	-5.016	-206.095	-217.702	21.975	260.741
35	231.916	-12.011	-244.917	-89.396	25.643	320.131
36	166.105	-17.153	-283.122	-77.822	26.022	355.643
37	114.229	-19.353	-341.791	-68.861	26.365	394.665
38	94.262	-20.794	-386.435	-56.475	54.519	437.149
39	67.784	-49.375	-439.285	-15.650	352.190	483.157
40	23.277	-347.391	-488.082	745.740	615.960	447.495
41	-542.787	421.115	-207.268	585.270	-388.521	71.675
42	-587.634	399.630	-42.186	499.743	-230.954	66.437
43	-498.578	241.786	-38.385	393.842	-101.412	82.802
44	-389.193	112.003	-56.214	320.914	-83.911	101.489
45	-312.913	94.188	-76.397	239.410	-69.966	105.086
46	-233.053	80.375	-79.858	189.681	-59.499	123.276
47	-175.601	69.135	-101.278	153.319	-41.722	128.231
48	-143.608	51.673	-105.548	107.295	-27.173	145.167
49	-96.195	36.851	-123.793	53.293	-15.318	162.163

50	-41.088	24.917	-142.127	44.860	-0.137	178.326
51	-31.854	9.553	-159.655	35.358	17.772	202.362
52	-21.789	-8.806	-185.089	41.283	36.991	229.480
53	-27.405	-28.186	-213.635	44.868	38.041	247.091
54	-31.048	-29.437	-232.708	64.612	45.986	277.338

COMBINACION 46 1.35 (G1 + G2) + 1.5 (SCTMIN-IPF) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	-51.230	-37.671	-264.452	191.878	52.509	339.161
56	-138.544	-44.905	-317.168	193.091	57.114	367.069
57	-149.695	-50.956	-350.324	223.157	56.306	387.578
58	-206.002	-51.230	-385.983	110.259	58.369	420.800
59	-96.283	-53.665	-421.419	140.174	97.907	457.399
60	-130.009	-93.728	-460.297	216.951	145.486	491.018

COMBINACION 47 1.35 (G1 + G2) + 1.5 (SCTMAX-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-548.019	525.200	733.792	187.669	-463.087	-726.631
2	-196.012	463.867	724.538	24.678	-388.706	-578.003
3	-23.836	388.635	578.340	-200.914	-354.266	-533.428
4	192.139	355.166	537.124	-455.458	-353.505	-515.550
5	456.548	353.318	516.137	-559.496	-314.357	-461.204
6	541.937	316.499	466.768	-639.716	-283.775	-421.136
7	618.937	286.471	427.752	-704.539	-261.072	-392.834
8	681.381	264.266	400.576	-835.013	-256.593	-357.390
9	810.231	260.446	366.329	-811.044	-219.448	-311.355
10	785.365	223.741	321.556	-751.157	-184.684	-262.471
11	725.284	189.629	274.000	-849.290	-177.405	-246.386
12	823.861	182.779	259.302	-738.032	-146.485	-196.485
13	713.623	152.510	210.844	-604.781	-119.198	-146.421
14	581.928	125.631	162.277	-505.553	-97.464	-112.267
15	484.741	104.335	129.670	-515.808	-88.628	-86.677
16	497.461	96.002	105.674	-362.014	-66.017	-42.409
17	346.454	73.778	63.043	-271.173	-53.836	-32.809
18	283.167	63.898	33.930	-394.299	64.118	1.400
19	403.763	-53.753	26.484	-244.533	214.254	5.785
20	252.657	-214.545	14.166	660.560	147.656	-318.694
21	-1789.770	1014.282	659.890	1233.583	-830.088	-818.967
22	-1239.974	830.578	816.996	743.896	-487.480	-735.752
23	-762.987	488.970	735.374	339.011	-409.375	-654.130
24	-370.967	412.078	653.370	170.223	-367.764	-573.329
25	-214.539	371.800	572.307	-319.398	-310.771	-509.823
26	240.859	318.473	515.668	-531.449	-274.426	-455.817
27	438.221	284.287	463.052	-697.597	-244.773	-417.357
28	592.146	257.057	426.156	-980.081	-214.778	-399.017
29	677.149	225.794	375.037	-1012.011	-190.626	-357.539
30	716.255	195.820	325.379	-1002.298	-166.587	-315.979
31	966.028	172.159	332.162	-1078.640	-162.908	-283.479
32	1042.281	169.393	301.482	-983.760	-142.466	-243.331
33	948.337	149.578	263.207	-861.304	-125.242	-203.255
34	827.820	133.065	225.052	-721.603	-111.999	-163.303
35	329.160	121.100	98.457	-576.782	-103.122	-124.902
36	278.099	121.385	67.801	-328.409	-100.242	-108.519
37	250.335	125.953	41.463	-199.409	-110.046	3.628
38	255.307	133.848	20.824	-235.578	-106.155	5.524
39	293.007	116.999	4.878	-337.908	172.656	2.847
40	342.668	-166.520	-5.234	930.332	296.602	-185.046
41	-1551.808	854.249	486.055	1103.635	-765.377	-547.721
42	-1107.535	765.685	547.583	1114.575	-633.687	-514.665
43	-776.098	579.885	514.724	448.437	-416.193	-465.206
44	-475.947	418.413	467.377	209.329	-366.989	-417.053
45	-248.780	370.333	419.591	-5.865	-324.693	-381.524
46	-44.932	329.332	384.553	-159.438	-288.792	-336.638
47	98.147	294.773	340.293	-271.035	-243.370	-288.124
48	200.397	250.782	292.550	-352.892	-200.074	-239.341
49	274.250	208.908	244.700	-422.087	-163.500	-206.633

50	336.981	174.041	213.091	-910.270	-145.362	-295.923
51	883.610	148.756	307.215	-806.740	-104.512	-249.219
52	778.917	108.188	261.793	-654.376	-62.869	-198.052
53	25.770	76.432	50.877	-680.688	-65.520	-184.355
54	652.456	70.338	199.678	13.448	-37.752	23.488

COMBINACION 47 1.35 (G1 + G2) + 1.5 (SCTMAX-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	-101.007	57.004	-8.572	40.894	-17.169	83.821
56	-121.922	38.214	-66.542	241.601	-10.827	101.776
57	-313.509	33.891	-81.883	368.180	-12.977	108.917
58	-368.062	35.859	-93.889	264.024	-19.428	113.023
59	-270.252	41.698	-102.744	279.187	9.274	115.665
60	-286.467	12.800	-108.167	306.517	40.658	140.209

COMBINACION 48 1.35 (G1 + G2) + 1.5 (SCTMIN-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

=====

Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
1	-345.989	167.933	14.355	251.099	-117.467	-14.807
2	-251.197	123.009	33.183	311.592	-81.729	-1.593
3	-313.523	87.895	21.892	212.510	-86.410	12.755
4	-198.410	103.854	7.558	147.679	-84.975	11.769
5	-139.235	93.285	10.604	74.741	-75.006	30.229
6	-60.199	95.553	-8.493	1.890	-67.166	49.346
7	3.878	75.736	-28.019	-83.992	-62.626	69.592
8	11.413	55.906	-57.360	-110.405	-58.718	82.117
9	117.497	66.951	-63.246	-168.951	-36.538	106.537
10	49.773	32.802	-100.237	-105.606	-5.776	137.532
11	86.190	9.384	-137.252	-214.239	-3.866	147.980
12	62.045	4.414	-139.650	-216.407	16.784	179.628
13	74.058	-17.972	-177.610	-91.291	44.523	219.421
14	75.233	-39.871	-218.848	-116.284	65.624	260.343
15	102.068	-60.672	-259.595	-25.047	75.114	276.133
16	12.964	-69.787	-275.177	-12.131	94.653	309.031
17	2.390	-89.067	-307.835	39.193	114.900	365.810
18	-15.729	-109.963	-363.320	-48.201	250.232	417.694
19	70.280	-245.532	-417.324	225.027	407.881	428.078
20	-203.396	-403.302	-429.262	623.394	482.743	309.757
21	-730.134	520.228	-198.291	377.511	-369.273	-26.691
22	-379.865	368.958	28.836	294.312	-77.181	-11.754
23	-298.659	77.018	13.187	226.620	-47.557	6.498
24	-232.940	47.609	-5.756	139.977	-47.273	28.159
25	-148.192	47.546	-28.090	89.239	-45.262	48.123
26	-99.189	45.807	-48.707	-7.404	-42.646	70.496
27	31.444	43.642	-61.545	-170.767	-40.454	84.641
28	147.625	42.710	-83.177	-267.703	-32.585	110.477
29	242.663	35.394	-109.100	-352.616	-22.177	139.821
30	326.360	25.465	-138.495	-419.970	-9.675	172.754
31	393.270	13.479	-171.440	-368.848	-10.224	176.924
32	342.396	14.743	-175.586	-378.807	1.405	213.749
33	353.357	3.548	-212.349	-369.911	12.313	254.445
34	346.208	-6.844	-252.946	-346.467	22.610	298.260
35	325.175	-16.581	-296.624	-227.057	30.630	364.817
36	272.834	-25.274	-339.825	-217.854	36.154	407.742
37	228.611	-31.883	-403.675	-202.963	42.380	454.464
38	208.498	-38.540	-453.727	-175.049	76.972	505.131
39	172.535	-72.953	-512.408	-108.168	381.574	559.906
40	108.039	-377.361	-567.559	694.670	610.399	435.798
41	-865.463	393.816	-363.226	657.120	-394.039	87.583
42	-658.980	393.819	-86.082	571.114	-236.693	79.613
43	-574.247	236.550	-78.675	463.299	-107.382	98.726
44	-467.678	107.414	-98.339	379.686	-89.410	121.210
45	-385.268	89.555	-121.362	279.145	-74.190	129.722
46	-290.657	74.928	-128.733	247.035	-65.620	141.431
47	-254.756	66.095	-142.616	189.157	-46.148	151.445
48	-204.728	47.452	-150.833	115.399	-28.963	174.685
49	-132.551	30.548	-174.210	28.859	-13.443	199.345

50	-47.286	15.506	-198.971	53.692	-2.269	204.449
51	-73.035	4.746	-204.136	13.191	19.855	236.235
52	-32.976	-17.216	-235.941	-13.071	44.483	272.460
53	-6.647	-41.365	-272.143	29.481	39.667	274.878
54	-48.676	-36.138	-274.488	21.993	53.614	314.235

COMBINACION 48 1.35 (G1 + G2) + 1.5 (SCTMIN-EC1) + PRETD

ESFUERZOS EN EXTREMO DE BARRA

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Barra	Momento1	Cortante1	Torsor1	Momento2	Cortante2	Torsor2
=====						
55	-40.193	-49.697	-313.726	125.801	67.389	386.838
56	-101.723	-63.522	-375.515	109.996	80.442	427.468
57	-92.605	-77.352	-419.593	181.020	71.156	426.126
58	-185.683	-68.465	-431.505	62.524	82.206	472.431
59	-65.225	-79.186	-478.028	98.399	131.866	524.607
60	-98.798	-128.697	-530.392	206.898	168.899	530.392

DIMENSIONAMIENTO A TORSION SEGUN NORMATIVA EHE							
SECC	Td (mT)	Tu1 (mT)	T-V	Asl (cm2/m)	Ast (cm2/m)	theta	thetae
1	733.79	1580.12	0.28	23.74	8.27	30.55	30.55
2	724.54	1579.04	0.27	23.40	8.18	30.60	30.60
3	578.34	1615.17	0.48	19.88	6.14	29.07	29.07
4	537.12	1614.84	0.28	18.45	5.71	29.08	29.08
5	516.14	1614.65	0.26	17.72	5.48	29.09	29.09
6	466.77	1614.68	0.21	16.03	4.96	29.09	29.09
7	427.75	1614.98	0.17	14.70	4.54	29.07	29.07
8	400.58	1615.57	0.15	13.78	4.25	29.05	29.05
9	366.33	1616.46	0.13	12.62	3.88	29.01	29.01
10	321.56	1617.47	0.10	11.10	3.40	28.97	28.97
11	274.00	1618.64	0.08	9.47	2.89	28.92	28.92
12	259.30	1619.93	0.07	8.99	2.73	28.87	28.87
13	210.84	1621.30	0.12	7.32	2.21	28.81	28.81
14	218.85	1623.27	0.14	7.63	2.29	28.72	28.72
15	259.60	1623.66	0.16	9.05	2.72	28.71	28.71
16	275.18	1623.95	0.17	9.60	2.88	28.70	28.70
17	307.83	1624.06	0.25	10.74	3.22	28.69	28.69
18	363.32	1625.41	0.31	12.71	3.79	28.63	28.63
19	417.32	1585.91	0.09	13.64	4.66	30.31	30.31
20	429.26	1584.43	0.11	13.99	4.80	30.37	30.37
21	659.89	1583.10	0.34	21.46	7.40	30.43	30.43
22	817.00	1579.80	0.39	26.42	9.22	30.57	30.57
23	735.37	1615.51	0.64	25.29	7.80	29.05	29.05
24	653.37	1613.57	0.60	22.39	6.96	29.13	29.13
25	572.31	1610.89	0.63	19.52	6.12	29.25	29.25
26	515.67	1607.78	0.21	17.50	5.55	29.38	29.38
27	463.05	1604.62	0.17	15.63	5.01	29.51	29.51
28	426.16	1601.72	0.14	14.31	4.63	29.63	29.63
29	375.04	1599.29	0.11	12.54	4.09	29.74	29.74
30	325.38	1597.49	0.08	10.85	3.56	29.81	29.81
31	332.16	1596.40	0.08	11.05	3.64	29.86	29.86
32	301.48	1597.50	0.07	10.05	3.30	29.81	29.81
33	263.21	1599.31	0.05	8.80	2.87	29.74	29.74
34	252.95	1601.75	0.04	8.49	2.75	29.63	29.63
35	296.62	1604.66	0.26	10.01	3.21	29.51	29.51
36	339.83	1607.82	0.22	11.53	3.65	29.38	29.38
37	403.68	1610.93	0.26	13.77	4.32	29.24	29.24
38	453.73	1613.60	0.30	15.55	4.83	29.13	29.13
39	512.41	1616.99	0.43	17.67	5.42	28.99	28.99
40	567.56	1580.96	0.16	18.39	6.39	30.52	30.52
41	486.05	1583.10	0.21	15.81	5.45	30.43	30.43
42	547.58	1583.25	0.22	17.81	6.14	30.42	30.42
43	514.72	1622.85	0.58	17.93	5.39	28.74	28.74
44	467.38	1623.93	0.39	16.31	4.89	28.70	28.70
45	419.59	1624.09	0.35	14.65	4.39	28.69	28.69
46	384.55	1623.97	0.32	13.42	4.02	28.70	28.70
47	340.29	1623.69	0.29	11.87	3.56	28.71	28.71
48	292.55	1623.30	0.24	10.20	3.06	28.72	28.72
49	244.70	1621.34	0.18	8.50	2.57	28.81	28.81
50	213.09	1619.96	0.14	7.38	2.24	28.86	28.86
51	307.22	1618.67	0.07	10.62	3.24	28.92	28.92
52	261.79	1617.50	0.05	9.03	2.77	28.97	28.97
53	272.14	1616.49	0.04	9.37	2.88	29.01	29.01
54	274.49	1615.59	0.04	9.44	2.91	29.05	29.05
55	313.73	1615.00	0.06	10.78	3.33	29.07	29.07
56	375.51	1614.70	0.08	12.89	3.99	29.09	29.09

57	419.59	1614.66	0.10	14.41	4.46	29.09	29.09
58	431.50	1616.56	0.11	14.87	4.57	29.01	29.01
59	478.03	1579.95	0.10	15.46	5.39	30.56	30.56
60	530.39	1580.27	0.13	17.17	5.98	30.55	30.55
61	530.39	1580.27	0.13	17.17	5.98	30.55	30.55

DIMENSIONAMIENTO A TORSION SEGUN NORMATIVA EHE							
Angulo de la biela comprimida(sex.) = 45.00							
SECC	Td (mT)	Tu1 (mT)	T-V	Asl (cm2/m)	Ast (cm2/m)	theta	thetae
1	733.79	1256.45	0.40	14.02	14.02	45.00	30.55
2	724.54	1256.45	0.38	13.84	13.84	45.00	30.60
3	578.34	1256.45	0.49	11.05	11.05	45.00	29.07
4	537.12	1256.45	0.32	10.26	10.26	45.00	29.08
5	516.14	1256.45	0.30	9.86	9.86	45.00	29.09
6	466.77	1256.45	0.24	8.92	8.92	45.00	29.09
7	427.75	1256.45	0.20	8.17	8.17	45.00	29.07
8	400.58	1256.45	0.18	7.65	7.65	45.00	29.05
9	366.33	1256.45	0.16	7.00	7.00	45.00	29.01
10	321.56	1256.45	0.12	6.14	6.14	45.00	28.97
11	274.00	1256.45	0.09	5.23	5.23	45.00	28.92
12	259.30	1256.45	0.09	4.95	4.95	45.00	28.87
13	210.84	1256.45	0.10	4.03	4.03	45.00	28.81
14	218.85	1256.45	0.12	4.18	4.18	45.00	28.72
15	259.60	1256.45	0.13	4.96	4.96	45.00	28.71
16	275.18	1256.45	0.14	5.26	5.26	45.00	28.70
17	307.83	1256.45	0.21	5.88	5.88	45.00	28.69
18	363.32	1256.45	0.24	6.94	6.94	45.00	28.63
19	417.32	1256.45	0.13	7.97	7.97	45.00	30.31
20	429.26	1256.45	0.15	8.20	8.20	45.00	30.37
21	659.89	1256.45	0.41	12.60	12.60	45.00	30.43
22	817.00	1256.45	0.52	15.61	15.61	45.00	30.57
23	735.37	1256.45	0.68	14.05	14.05	45.00	29.05
24	653.37	1256.45	0.61	12.48	12.48	45.00	29.13
25	572.31	1256.45	0.60	10.93	10.93	45.00	29.25
26	515.67	1256.45	0.26	9.85	9.85	45.00	29.38
27	463.05	1256.45	0.21	8.84	8.84	45.00	29.51
28	426.16	1256.45	0.18	8.14	8.14	45.00	29.63
29	375.04	1256.45	0.14	7.16	7.16	45.00	29.74
30	325.38	1256.45	0.11	6.22	6.22	45.00	29.81
31	332.16	1256.45	0.11	6.34	6.34	45.00	29.86
32	301.48	1256.45	0.09	5.76	5.76	45.00	29.81
33	263.21	1256.45	0.07	5.03	5.03	45.00	29.74
34	252.95	1256.45	0.06	4.83	4.83	45.00	29.63
35	296.62	1256.45	0.20	5.67	5.67	45.00	29.51
36	339.83	1256.45	0.17	6.49	6.49	45.00	29.38
37	403.68	1256.45	0.19	7.71	7.71	45.00	29.24
38	453.73	1256.45	0.23	8.67	8.67	45.00	29.13
39	512.41	1256.45	0.33	9.79	9.79	45.00	28.99
40	567.56	1256.45	0.24	10.84	10.84	45.00	30.52
41	486.05	1256.45	0.25	9.28	9.28	45.00	30.43
42	547.58	1256.45	0.27	10.46	10.46	45.00	30.42
43	514.72	1256.45	0.53	9.83	9.83	45.00	28.74
44	467.38	1256.45	0.38	8.93	8.93	45.00	28.70
45	419.59	1256.45	0.33	8.01	8.01	45.00	28.69
46	384.55	1256.45	0.30	7.35	7.35	45.00	28.70
47	340.29	1256.45	0.26	6.50	6.50	45.00	28.71
48	292.55	1256.45	0.21	5.59	5.59	45.00	28.72
49	244.70	1256.45	0.16	4.67	4.67	45.00	28.81

50	213.09	1256.45	0.13	4.07	4.07	45.00	28.86
51	307.22	1256.45	0.10	5.87	5.87	45.00	28.92
52	261.79	1256.45	0.07	5.00	5.00	45.00	28.97
53	272.14	1256.45	0.07	5.20	5.20	45.00	29.01
54	274.49	1256.45	0.07	5.24	5.24	45.00	29.05
55	313.73	1256.45	0.08	5.99	5.99	45.00	29.07
56	375.51	1256.45	0.12	7.17	7.17	45.00	29.09
57	419.59	1256.45	0.14	8.01	8.01	45.00	29.09
58	431.50	1256.45	0.16	8.24	8.24	45.00	29.01
59	478.03	1256.45	0.16	9.13	9.13	45.00	30.56
60	530.39	1256.45	0.19	10.13	10.13	45.00	30.55
61	530.39	1256.45	0.19	10.13	10.13	45.00	30.55

DIMENSIONAMIENTO A TORSION SEGUN NORMATIVA EHE

Angulo de la biela comprimida(sex.) = 35.00

SECC	Td (mT)	Tu1 (mT)	T-V	Asl (cm2/m)	Ast (cm2/m)	theta	thetae
1	733.79	1477.99	0.31	20.02	9.81	35.00	30.55
2	724.54	1477.99	0.30	19.77	9.69	35.00	30.60
3	578.34	1477.99	0.46	15.78	7.74	35.00	29.07
4	537.12	1477.99	0.28	14.65	7.18	35.00	29.08
5	516.14	1477.99	0.26	14.08	6.90	35.00	29.09
6	466.77	1477.99	0.21	12.73	6.24	35.00	29.09
7	427.75	1477.99	0.17	11.67	5.72	35.00	29.07
8	400.58	1477.99	0.15	10.93	5.36	35.00	29.05
9	366.33	1477.99	0.14	9.99	4.90	35.00	29.01
10	321.56	1477.99	0.11	8.77	4.30	35.00	28.97
11	274.00	1477.99	0.08	7.47	3.66	35.00	28.92
12	259.30	1477.99	0.07	7.07	3.47	35.00	28.87
13	210.84	1477.99	0.10	5.75	2.82	35.00	28.81
14	218.85	1477.99	0.12	5.97	2.93	35.00	28.72
15	259.60	1477.99	0.14	7.08	3.47	35.00	28.71
16	275.18	1477.99	0.15	7.51	3.68	35.00	28.70
17	307.83	1477.99	0.22	8.40	4.12	35.00	28.69
18	363.32	1477.99	0.26	9.91	4.86	35.00	28.63
19	417.32	1477.99	0.10	11.38	5.58	35.00	30.31
20	429.26	1477.99	0.12	11.71	5.74	35.00	30.37
21	659.89	1477.99	0.35	18.00	8.83	35.00	30.43
22	817.00	1477.99	0.42	22.29	10.93	35.00	30.57
23	735.37	1477.99	0.61	20.06	9.84	35.00	29.05
24	653.37	1477.99	0.57	17.82	8.74	35.00	29.13
25	572.31	1477.99	0.58	15.61	7.65	35.00	29.25
26	515.67	1477.99	0.22	14.07	6.90	35.00	29.38
27	463.05	1477.99	0.17	12.63	6.19	35.00	29.51
28	426.16	1477.99	0.14	11.63	5.70	35.00	29.63
29	375.04	1477.99	0.11	10.23	5.02	35.00	29.74
30	325.38	1477.99	0.09	8.88	4.35	35.00	29.81
31	332.16	1477.99	0.08	9.06	4.44	35.00	29.86
32	301.48	1477.99	0.07	8.22	4.03	35.00	29.81
33	263.21	1477.99	0.06	7.18	3.52	35.00	29.74
34	252.95	1477.99	0.04	6.90	3.38	35.00	29.63
35	296.62	1477.99	0.22	8.09	3.97	35.00	29.51
36	339.83	1477.99	0.19	9.27	4.55	35.00	29.38
37	403.68	1477.99	0.22	11.01	5.40	35.00	29.24
38	453.73	1477.99	0.25	12.38	6.07	35.00	29.13
39	512.41	1477.99	0.36	13.98	6.85	35.00	28.99
40	567.56	1477.99	0.18	15.48	7.59	35.00	30.52
41	486.05	1477.99	0.21	13.26	6.50	35.00	30.43
42	547.58	1477.99	0.23	14.94	7.32	35.00	30.42
43	514.72	1477.99	0.52	14.04	6.88	35.00	28.74

44	467.38	1477.99	0.36	12.75	6.25	35.00	28.70
45	419.59	1477.99	0.32	11.45	5.61	35.00	28.69
46	384.55	1477.99	0.29	10.49	5.14	35.00	28.70
47	340.29	1477.99	0.26	9.28	4.55	35.00	28.71
48	292.55	1477.99	0.21	7.98	3.91	35.00	28.72
49	244.70	1477.99	0.16	6.68	3.27	35.00	28.81
50	213.09	1477.99	0.13	5.81	2.85	35.00	28.86
51	307.22	1477.99	0.08	8.38	4.11	35.00	28.92
52	261.79	1477.99	0.06	7.14	3.50	35.00	28.97
53	272.14	1477.99	0.05	7.42	3.64	35.00	29.01
54	274.49	1477.99	0.05	7.49	3.67	35.00	29.05
55	313.73	1477.99	0.06	8.56	4.20	35.00	29.07
56	375.51	1477.99	0.09	10.24	5.02	35.00	29.09
57	419.59	1477.99	0.11	11.45	5.61	35.00	29.09
58	431.50	1477.99	0.12	11.77	5.77	35.00	29.01
59	478.03	1477.99	0.12	13.04	6.39	35.00	30.56
60	530.39	1477.99	0.14	14.47	7.09	35.00	30.55
61	530.39	1477.99	0.14	14.47	7.09	35.00	30.55

DIMENSIONAMIENTO A RASANTE (Vd)
Y VERIFICACION DE AGOTAMIENTO DEL HORMIGON POR
TENSIONES TANGENCIALES SEGUN NORMATIVA EHE

Seccion = 1

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 363.423 Td (mT) = 733.792

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	700.43	840.51	1050.40	0.00	2.07	42.91

Seccion = 2

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 301.382 Td (mT) = 724.538

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	701.05	841.26	927.73	0.00	1.66	35.65

Seccion = 3

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 251.392 Td (mT) = 578.340

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.41	815.29	874.43	0.00	1.57	31.44

Seccion = 4

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 233.349 Td (mT) = 537.124

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.62	815.54	799.12	0.00	1.34	29.20

Seccion = 5

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 240.907 Td (mT) = 516.137

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.73	815.68	794.96	0.00	1.33	30.15

Seccion = 6

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 223.254 Td (mT) = 466.768

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.71	815.65	712.12	0.00	1.09	27.94

Seccion = 7

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 206.336 Td (mT) = 427.752

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.53	815.43	644.56	0.00	0.91	25.81

Seccion = 8

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 190.417 Td (mT) = 400.576

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.16	814.99	594.60	0.00	0.79	23.80

Seccion = 9

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 198.370 Td (mT) = 366.329

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	678.61	814.33	586.00	0.00	0.77	24.75

Seccion = 10

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 172.576 Td (mT) = 321.556

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	677.98	813.57	503.42	0.00	0.59	21.50

Seccion = 11

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 148.512 Td (mT) = 274.000

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	677.25	812.70	426.67	0.00	0.44	18.46

Seccion = 12

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 145.936 Td (mT) = 259.302

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)

1 676.44 811.73 411.25 0.00 0.41 18.10

Seccion = 13

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 171.423 Td (mT) = 210.844

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	675.57	810.69	343.15	0.00	0.36	21.21

Seccion = 14

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 200.840 Td (mT) = 218.848

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	674.34	809.20	89.71	0.00	0.49	24.77

Seccion = 15

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 232.296 Td (mT) = 259.595

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	674.09	808.91	136.51	0.00	0.63	28.63

Seccion = 16

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 254.109 Td (mT) = 275.177

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	673.91	808.69	157.02	0.00	0.74	31.30

Seccion = 17

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 340.476 Td (mT) = 307.835

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	673.84	808.60	200.40	0.00	1.26	41.93

Seccion = 18

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 421.060 Td (mT) = 363.320

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	672.98	807.58	247.42	0.00	1.85	51.73

Seccion = 19

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 616.125 Td (mT) = 417.324

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	697.06	836.48	491.06	0.00	2.79	72.03

Seccion = 20

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 814.047 Td (mT) = 429.262

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	697.93	837.52	806.60	0.00	4.59	95.41

Seccion = 21

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 854.629 Td (mT) = 659.890

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	698.70	838.44	2028.56	0.00	6.81	100.39

Seccion = 22

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 606.804 Td (mT) = 816.996

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	700.61	840.74	1661.16	0.00	4.73	71.68

Seccion = 23

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 290.133 Td (mT) = 735.374

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.20	815.04	1100.18	0.00	2.38	36.26

Seccion = 24

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 238.244 Td (mT) = 653.370

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	680.40	816.48	927.18	0.00	1.75	29.88

Seccion = 25

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 218.197 Td (mT) = 572.307

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	682.06	818.47	836.55	0.00	1.44	27.49

Seccion = 26

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 198.910 Td (mT) = 515.668

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	683.97	820.76	716.56	0.00	1.09	25.20

Seccion = 27

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 179.504 Td (mT) = 463.052

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	685.90	823.08	639.64	0.00	0.88	22.86

Seccion = 28

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 161.233 Td (mT) = 426.156

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)

1	687.66	825.19	578.38	0.00	0.73	20.64

Seccion = 29

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 143.476 Td (mT) = 375.037

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	689.12	826.95	508.04	0.00	0.58	18.44

Seccion = 30

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 126.291 Td (mT) = 325.379

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	690.21	828.25	440.59	0.00	0.45	16.28

Seccion = 31

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 129.947 Td (mT) = 332.162

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	690.86	829.03	387.36	0.00	0.35	16.79

Seccion = 32

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

$V_d (T) = 135.182 \quad T_d (mT) = 301.482$

Corte	τ_{Vu} (T/m2)	τ_{Tu} (T/m2)	τ_{Vd} (T/m2)	τ_{Td} (T/m2)	T-V	As, ras (cm2/m)
1	690.20	828.24	381.13	0.00	0.34	17.43

Seccion = 33

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 145.866 Td (mT) = 263.207

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	689.11	826.93	336.55	0.00	0.28	18.75

Seccion = 34

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 158.365 Td (mT) = 252.946

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	687.64	825.17	15.40	0.00	0.31	20.27

Seccion = 35

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 176.650 Td (mT) = 296.624

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	685.88	823.05	37.31	0.00	0.37	22.50

Seccion = 36

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 197.698 Td (mT) = 339.825

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)

1	683.94	820.73	56.87	0.00	0.46	25.04

Seccion = 37

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 265.096 Td (mT) = 403.675

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	682.03	818.44	71.74	0.00	0.79	33.40

Seccion = 38

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 350.659 Td (mT) = 453.727

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	680.38	816.46	86.71	0.00	1.31	43.97

Seccion = 39

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 500.984 Td (mT) = 512.408

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	678.27	813.93	164.14	0.00	2.50	62.45

Seccion = 40

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

$V_d (T) = 883.386$ $T_d (mT) = 567.559$

Corte	τ_{Vu} (T/m2)	τ_{Tu} (T/m2)	τ_{Vd} (T/m2)	τ_{Td} (T/m2)	T-V	As, ras (cm2/m)
1	699.94	839.93	754.72	0.00	5.29	104.15

Seccion = 41

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 712.937 Td (mT) = 486.055

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	698.70	838.44	1708.50	0.00	5.00	83.74

Seccion = 42

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 599.520 Td (mT) = 547.583

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	698.61	838.34	1531.37	0.00	4.11	70.40

Seccion = 43

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 422.840 Td (mT) = 514.724

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	674.60	809.52	1304.74	0.00	3.28	52.18

Seccion = 44

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 275.199 Td (mT) = 467.377

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	673.92	808.70	941.43	0.00	1.83	33.90

Seccion = 45

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 241.025 Td (mT) = 419.591

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	673.82	808.58	833.25	0.00	1.47	29.68

Seccion = 46

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 208.231 Td (mT) = 384.553

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	673.89	808.67	741.00	0.00	1.19	25.65

Seccion = 47

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 187.199 Td (mT) = 340.293

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	674.07	808.88	663.24	0.00	0.97	23.07

Seccion = 48

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

$V_d (T) = 156.624$ $T_d (mT) = 292.550$

Corte	τ_{Vu} (T/m2)	τ_{Tu} (T/m2)	τ_{Vd} (T/m2)	τ_{Td} (T/m2)	T-V	As, ras (cm2/m)
1	674.31	809.18	564.26	0.00	0.73	19.31

Seccion = 49

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 128.069 Td (mT) = 244.700

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	675.55	810.66	470.04	0.00	0.52	15.85

Seccion = 50

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 99.860 Td (mT) = 213.091

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	676.42	811.70	391.59	0.00	0.37	12.38

Seccion = 51

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 87.254 Td (mT) = 307.215

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	677.23	812.67	334.70	0.00	0.28	10.85

Seccion = 52

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 106.386 Td (mT) = 261.793

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)

1	677.96	813.55	243.42	0.00	0.16	13.25

Seccion = 53

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 132.057 Td (mT) = 272.143

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	678.59	814.30	93.07	0.00	0.23	16.48

Seccion = 54

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 124.156 Td (mT) = 274.488

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	679.15	814.97	81.31	0.00	0.20	15.52

Seccion = 55

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

Vd (T) = 139.904 Td (mT) = 313.726

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As,ras (cm2/m)
1	679.52	815.42	111.82	0.00	0.25	17.50

Seccion = 56

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos

$V_d(T) = 156.741$ $T_d(mT) = 375.515$

Corte	τ_{Vu} (T/m2)	τ_{Tu} (T/m2)	τ_{Vd} (T/m2)	τ_{Td} (T/m2)	T-V	As,ras (cm2/m)
1	679.70	815.64	142.92	0.00	0.31	19.62

Seccion = 57

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 174.381 Td (mT) = 419.593

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	679.72	815.67	174.04	0.00	0.37	21.83

Seccion = 58

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 164.946 Td (mT) = 431.505

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	678.54	814.25	154.05	0.00	0.34	20.58

Seccion = 59

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 180.049 Td (mT) = 478.028

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	700.53	840.63	158.37	0.00	0.30	21.26

Seccion = 60

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 259.110 Td (mT) = 530.392

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	700.34	840.41	337.80	0.00	1.40	49.88

1	700.34	840.41	257.39	0.00	0.58	30.58

Seccion = 61

Angulo de la biela comprimida (sex) = 30.55

Valores maximos de los esfuerzos
Vd (T) = 422.616 Td (mT) = 530.392

Corte	tau_Vu (T/m2)	tau_Tu (T/m2)	tau_Vd (T/m2)	tau_Td (T/m2)	T-V	As, ras (cm2/m)
1	700.34	840.41	337.80	0.00	1.40	49.88

7.3. EVALUACIÓN DEL E.L.U. DE RASANTE

Se comprueban las secciones de arranque de voladizo a rasante según el artículo 47º de la EHE.

8 APARATOS DE APOYO Y JUNTAS

8.1. REACCIONES VERTICALES

Las reacciones verticales en los distintos apoyos se han calculado a partir de los resultados del apartado 3. Los resultados se resumen en este apartado siguiendo los criterios de numeración de nudos y designación de cargas adoptados en el mencionado apartado 3.

- **g_1** Peso propio de la estructura.
- **g_2** Carga permanente.
- **q** Sobrecarga uniforme (se ha obtenido la envolvente para distintos tipos de tren establecidos en la IPF y en el EC-1)
- **∇T (TEM)** Gradiente de temperatura.
- **P_{ii}** Pretensado inicial de descimbrado (pretensado parcial con pérdidas iniciales).
- **P_i** Pretensado inicial (con pérdidas iniciales).
- **P_∞** Pretensado final (con pérdidas iniciales y diferidas).

Referencia del Proyecto: Paso Inferior Riera de Torrelles

APOYO N = 62

REACCIONES	Flector	Reac_vert	Torsor
G1	0.00000	62.26733	0.00000
G2	0.00000	36.81569	0.00000
Pii	0.00000	43.78411	0.00000
Pi	0.00000	74.25537	0.00000
Pd	0.00000	64.11954	0.00000
TEMP	0.00000	13.09889	0.00000
SC peatonal(100%) Max	0.00000	1.69010	0.00000
SC peatonal(100%) Min	0.00000	-0.23443	0.00000
SC peatonal(50%) Max	0.00000	4.11179	0.00000
SC peatonal(50%) Min	0.00000	-0.00010	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	0.24515	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-10.33841	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	0.21599	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-18.10702	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	0.21599	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-17.21713	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	0.32869	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-19.17485	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	-0.18321	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	-19.57184	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	-0.03605	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	-21.46416	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	-0.00300	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	-1.87304	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	68.39169	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-0.58980	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	67.58761	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	2.09766	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	67.53370	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	2.09766	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	75.18983	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-0.85758	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	78.94758	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	0.04962	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	89.38860	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	13.32625	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	7.44906	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	1.11052	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) = 163.203
Reaccion maxima (ELS) = 252.238
Reaccion minima (ELS) = 141.726
Reaccion minima (ELU) = 124.668

DESPLAZAMIENTOS	GX	FZ	GY
G1	0.00004	0.00000	0.00041
G2	0.00003	0.00000	0.00028
Pii	-0.00027	0.00000	-0.00092
Pi	-0.00047	0.00000	-0.00158
Pd	-0.00040	0.00000	-0.00135
TEMP	0.00009	0.00000	-0.00032
SC peatonal(100%) Max	0.00000	0.00000	0.00002
SC peatonal(100%) Min	0.00000	0.00000	-0.00001
SC peatonal(50%) Max	0.00000	0.00000	0.00002
SC peatonal(50%) Min	0.00000	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00005	0.00000	0.00023
IPF-75 TREN A via 1 (Min)	-0.00002	0.00000	-0.00009
IPF-75 TREN B1 via 1 (Max)	0.00001	0.00000	0.00007
IPF-75 TREN B1 via 1 (Min)	0.00000	0.00000	-0.00001
IPF-75 TREN B2 via 1 (Max)	0.00001	0.00000	0.00007
IPF-75 TREN B2 via 1 (Min)	0.00000	0.00000	-0.00001
EC-1 TREN LM71 via 1 (Max)	0.00002	0.00000	0.00012
EC-1 TREN LM71 via 1 (Min)	-0.00001	0.00000	-0.00005
EC-1 TREN SW/0 via 1 (Max)	0.00006	0.00000	0.00032
EC-1 TREN SW/0 via 1 (Min)	-0.00002	0.00000	-0.00010
EC-1 TREN SW/2 via 1 (Max)	0.00006	0.00000	0.00035
EC-1 TREN SW/2 via 1 (Min)	-0.00003	0.00000	-0.00007
EC-1 TREN 12.5 via 1 (Max)	0.00000	0.00000	0.00003
EC-1 TREN 12.5 via 1 (Min)	0.00000	0.00000	0.00000
IPF-75 TREN A via 2 (Max)	0.00005	0.00000	0.00031
IPF-75 TREN A via 2 (Min)	-0.00002	0.00000	-0.00010
IPF-75 TREN B1 via 2 (Max)	0.00001	0.00000	0.00010
IPF-75 TREN B1 via 2 (Min)	0.00000	0.00000	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00001	0.00000	0.00010
IPF-75 TREN B2 via 2 (Min)	0.00000	0.00000	-0.00001
EC-1 TREN LM71 via 2 (Max)	0.00003	0.00000	0.00016
EC-1 TREN LM71 via 2 (Min)	-0.00001	0.00000	-0.00005
EC-1 TREN SW/0 via 2 (Max)	0.00006	0.00000	0.00045
EC-1 TREN SW/0 via 2 (Min)	-0.00003	0.00000	-0.00013
EC-1 TREN SW/2 via 2 (Max)	0.00006	0.00000	0.00051
EC-1 TREN SW/2 via 2 (Min)	-0.00003	0.00000	-0.00004
EC-1 TREN 12.5 via 2 (Max)	0.00001	0.00000	0.00004
EC-1 TREN 12.5 via 2 (Min)	0.00000	0.00000	0.00000

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) = -0.000664

Giro maximo (ELS) = 0.000040
Giro minimo (ELS) = -0.001189

APOYO N = 63

REACCIONES	Flector	Reac_vert	Torsor
=====			
G1	0.00000	70.32077	0.00000
G2	0.00000	42.33951	0.00000
Pii	0.00000	21.82740	0.00000
Pi	0.00000	35.73052	0.00000
Pd	0.00000	30.69078	0.00000
TEMP	0.00000	3.65886	0.00000
SC peatonal(100%) Max	0.00000	3.24994	0.00000
SC peatonal(100%) Min	0.00000	-0.76443	0.00000
SC peatonal(50%) Max	0.00000	0.09599	0.00000
SC peatonal(50%) Min	0.00000	-2.90714	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	87.05537	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-7.01378	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	101.85627	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-4.74450	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	101.77668	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-4.74450	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	113.04782	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-10.60182	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	117.64799	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	-6.99751	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	131.10159	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	15.85209	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	10.92514	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	1.32101	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	6.52760	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-10.77071	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	8.47079	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	-17.59998	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	8.47079	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	-17.53541	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	11.44757	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-17.75563	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	7.78567	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	-15.18278	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	8.54443	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	-21.49344	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	0.71204	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	-1.21485	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) = 143.351
 Reaccion maxima (ELS) = 289.817
 Reaccion minima (ELS) = 118.542
 Reaccion minima (ELU) = 101.086

DESPLAZAMIENTOS

	GX	FZ	GY
=====			
G1	0.00017	0.00000	0.00038
G2	0.00011	0.00000	0.00026
Pii	-0.00021	0.00000	-0.00095
Pi	-0.00036	0.00000	-0.00162
Pd	-0.00031	0.00000	-0.00140
TEMP	-0.00023	0.00000	-0.00023
SC peatonal(100%) Max	0.00001	0.00000	0.00002
SC peatonal(100%) Min	0.00000	0.00000	-0.00001
SC peatonal(50%) Max	0.00000	0.00000	0.00002
SC peatonal(50%) Min	0.00000	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00010	0.00000	0.00022
IPF-75 TREN A via 1 (Min)	-0.00003	0.00000	-0.00009
IPF-75 TREN B1 via 1 (Max)	0.00003	0.00000	0.00007
IPF-75 TREN B1 via 1 (Min)	0.00000	0.00000	-0.00001
IPF-75 TREN B2 via 1 (Max)	0.00003	0.00000	0.00007
IPF-75 TREN B2 via 1 (Min)	0.00000	0.00000	-0.00001
EC-1 TREN LM71 via 1 (Max)	0.00005	0.00000	0.00011
EC-1 TREN LM71 via 1 (Min)	-0.00001	0.00000	-0.00005
EC-1 TREN SW/0 via 1 (Max)	0.00015	0.00000	0.00030
EC-1 TREN SW/0 via 1 (Min)	-0.00003	0.00000	-0.00010
EC-1 TREN SW/2 via 1 (Max)	0.00017	0.00000	0.00033
EC-1 TREN SW/2 via 1 (Min)	0.00001	0.00000	-0.00009
EC-1 TREN 12.5 via 1 (Max)	0.00001	0.00000	0.00003
EC-1 TREN 12.5 via 1 (Min)	0.00000	0.00000	0.00000
IPF-75 TREN A via 2 (Max)	0.00010	0.00000	0.00030
IPF-75 TREN A via 2 (Min)	-0.00003	0.00000	-0.00010
IPF-75 TREN B1 via 2 (Max)	0.00003	0.00000	0.00010
IPF-75 TREN B1 via 2 (Min)	0.00000	0.00000	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00003	0.00000	0.00010
IPF-75 TREN B2 via 2 (Min)	0.00000	0.00000	-0.00001
EC-1 TREN LM71 via 2 (Max)	0.00005	0.00000	0.00016
EC-1 TREN LM71 via 2 (Min)	-0.00002	0.00000	-0.00005
EC-1 TREN SW/0 via 2 (Max)	0.00014	0.00000	0.00043
EC-1 TREN SW/0 via 2 (Min)	-0.00004	0.00000	-0.00013
EC-1 TREN SW/2 via 2 (Max)	0.00016	0.00000	0.00049
EC-1 TREN SW/2 via 2 (Min)	-0.00001	0.00000	-0.00005
EC-1 TREN 12.5 via 2 (Max)	0.00001	0.00000	0.00004
EC-1 TREN 12.5 via 2 (Min)	0.00000	0.00000	0.00000

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) = -0.000758
 Giro maximo (ELS) = -0.000101
 Giro minimo (ELS) = -0.001189

APOYO N = 64

REACCIONES	Flector	Reac_vert	Torsor
=====			
G1	0.00000	213.22035	0.00000
G2	0.00000	142.22897	0.00000
Pii	0.00000	-41.02703	0.00000
Pi	0.00000	-70.12151	0.00000
Pd	0.00000	-60.72875	0.00000
TEMP	0.00000	-14.74649	0.00000
SC peatonal(100%) Max	0.00000	4.49852	0.00000
SC peatonal(100%) Min	0.00000	-0.16840	0.00000
SC peatonal(50%) Max	0.00000	11.13697	0.00000
SC peatonal(50%) Min	0.00000	-0.04469	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	11.46781	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-4.96792	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	12.82964	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-10.86102	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	12.91229	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-9.98559	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	12.93436	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-12.69828	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	12.51329	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	-11.16469	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	15.25599	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	-8.27711	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	1.27133	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	-0.11445	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	78.70338	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-1.44521	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	200.85255	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	-1.09661	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	188.07944	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	-1.09661	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	172.62067	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-1.89806	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	169.56804	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	0.70880	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	238.92926	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	0.80324	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	21.04850	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	0.06694	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) = 294.721
 Reaccion maxima (ELS) = 509.048
 Reaccion minima (ELS) = 267.638
 Reaccion minima (ELU) = 249.248

DESPLAZAMIENTOS

GX

FZ

GY

=====			
G1	-0.00019	0.00000	0.00015
G2	-0.00012	0.00000	0.00010
Pii	0.00001	0.00000	-0.00011
Pi	0.00002	0.00000	-0.00016
Pd	0.00002	0.00000	-0.00013
TEMP	0.00020	0.00000	0.00004
SC peatonal(100%) Max	0.00000	0.00000	0.00002
SC peatonal(100%) Min	-0.00001	0.00000	-0.00002
SC peatonal(50%) Max	0.00000	0.00000	0.00002
SC peatonal(50%) Min	-0.00001	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00003	0.00000	0.00019
IPF-75 TREN A via 1 (Min)	-0.00008	0.00000	-0.00020
IPF-75 TREN B1 via 1 (Max)	0.00000	0.00000	0.00004
IPF-75 TREN B1 via 1 (Min)	-0.00003	0.00000	-0.00006
IPF-75 TREN B2 via 1 (Max)	0.00000	0.00000	0.00005
IPF-75 TREN B2 via 1 (Min)	-0.00003	0.00000	-0.00006
EC-1 TREN LM71 via 1 (Max)	0.00001	0.00000	0.00010
EC-1 TREN LM71 via 1 (Min)	-0.00004	0.00000	-0.00010
EC-1 TREN SW/0 via 1 (Max)	0.00002	0.00000	0.00023
EC-1 TREN SW/0 via 1 (Min)	-0.00013	0.00000	-0.00029
EC-1 TREN SW/2 via 1 (Max)	0.00000	0.00000	0.00027
EC-1 TREN SW/2 via 1 (Min)	-0.00014	0.00000	-0.00032
EC-1 TREN 12.5 via 1 (Max)	0.00000	0.00000	0.00000
EC-1 TREN 12.5 via 1 (Min)	-0.00001	0.00000	-0.00003
IPF-75 TREN A via 2 (Max)	0.00002	0.00000	0.00025
IPF-75 TREN A via 2 (Min)	-0.00009	0.00000	-0.00016
IPF-75 TREN B1 via 2 (Max)	0.00000	0.00000	0.00007
IPF-75 TREN B1 via 2 (Min)	-0.00003	0.00000	-0.00005
IPF-75 TREN B2 via 2 (Max)	0.00000	0.00000	0.00008
IPF-75 TREN B2 via 2 (Min)	-0.00003	0.00000	-0.00005
EC-1 TREN LM71 via 2 (Max)	0.00001	0.00000	0.00013
EC-1 TREN LM71 via 2 (Min)	-0.00005	0.00000	-0.00008
EC-1 TREN SW/0 via 2 (Max)	0.00001	0.00000	0.00034
EC-1 TREN SW/0 via 2 (Min)	-0.00015	0.00000	-0.00022
EC-1 TREN SW/2 via 2 (Max)	0.00000	0.00000	0.00042
EC-1 TREN SW/2 via 2 (Min)	-0.00017	0.00000	-0.00025
EC-1 TREN 12.5 via 2 (Max)	0.00000	0.00000	0.00002
EC-1 TREN 12.5 via 2 (Min)	-0.00001	0.00000	-0.00002

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) = 0.000126
 Giro maximo (ELS) = 0.000701
 Giro minimo (ELS) = -0.000521

APOYO N = 65

REACCIONES	Flector	Reac_vert	Torsor
=====			
G1	0.00000	209.39070	0.00000
G2	0.00000	139.60217	0.00000
Pii	0.00000	-24.27980	0.00000
Pi	0.00000	-39.36417	0.00000
Pd	0.00000	-33.63422	0.00000
TEMP	0.00000	-2.03953	0.00000
SC peatonal(100%) Max	0.00000	9.85554	0.00000
SC peatonal(100%) Min	0.00000	-0.54855	0.00000
SC peatonal(50%) Max	0.00000	0.56820	0.00000
SC peatonal(50%) Min	0.00000	-4.13560	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	89.09723	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-6.23453	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	228.27513	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-5.78906	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	214.20892	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-5.78906	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	203.67578	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-8.33228	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	193.21870	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	0.06179	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	269.68799	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	0.06862	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	23.80317	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	0.00572	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	19.22895	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-8.71345	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	38.86764	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	-8.79014	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	37.26861	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	-8.79014	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	39.40828	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-12.36543	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	36.33532	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	-0.03620	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	47.53956	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	-0.04317	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	4.00595	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	-0.00360	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) = 315.359
 Reaccion maxima (ELS) = 625.021
 Reaccion minima (ELS) = 298.079
 Reaccion minima (ELU) = 278.511

DESPLAZAMIENTOS

	GX	FZ	GY
=====			
G1	0.00023	0.00000	0.00001
G2	0.00015	0.00000	0.00001
Pii	-0.00005	0.00000	-0.00008
Pi	-0.00008	0.00000	-0.00011
Pd	-0.00007	0.00000	-0.00009
TEMP	-0.00015	0.00000	0.00015
SC peatonal(100%) Max	0.00001	0.00000	0.00002
SC peatonal(100%) Min	0.00000	0.00000	-0.00002
SC peatonal(50%) Max	0.00000	0.00000	0.00001
SC peatonal(50%) Min	0.00000	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00009	0.00000	0.00016
IPF-75 TREN A via 1 (Min)	-0.00002	0.00000	-0.00021
IPF-75 TREN B1 via 1 (Max)	0.00004	0.00000	0.00003
IPF-75 TREN B1 via 1 (Min)	0.00000	0.00000	-0.00007
IPF-75 TREN B2 via 1 (Max)	0.00004	0.00000	0.00004
IPF-75 TREN B2 via 1 (Min)	0.00000	0.00000	-0.00007
EC-1 TREN LM71 via 1 (Max)	0.00005	0.00000	0.00009
EC-1 TREN LM71 via 1 (Min)	-0.00001	0.00000	-0.00011
EC-1 TREN SW/0 via 1 (Max)	0.00016	0.00000	0.00018
EC-1 TREN SW/0 via 1 (Min)	-0.00002	0.00000	-0.00032
EC-1 TREN SW/2 via 1 (Max)	0.00021	0.00000	0.00019
EC-1 TREN SW/2 via 1 (Min)	-0.00002	0.00000	-0.00035
EC-1 TREN 12.5 via 1 (Max)	0.00002	0.00000	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	0.00000	-0.00003
IPF-75 TREN A via 2 (Max)	0.00009	0.00000	0.00022
IPF-75 TREN A via 2 (Min)	-0.00002	0.00000	-0.00017
IPF-75 TREN B1 via 2 (Max)	0.00003	0.00000	0.00006
IPF-75 TREN B1 via 2 (Min)	-0.00001	0.00000	-0.00006
IPF-75 TREN B2 via 2 (Max)	0.00003	0.00000	0.00006
IPF-75 TREN B2 via 2 (Min)	-0.00001	0.00000	-0.00006
EC-1 TREN LM71 via 2 (Max)	0.00005	0.00000	0.00011
EC-1 TREN LM71 via 2 (Min)	-0.00001	0.00000	-0.00009
EC-1 TREN SW/0 via 2 (Max)	0.00014	0.00000	0.00029
EC-1 TREN SW/0 via 2 (Min)	-0.00002	0.00000	-0.00025
EC-1 TREN SW/2 via 2 (Max)	0.00018	0.00000	0.00034
EC-1 TREN SW/2 via 2 (Min)	-0.00003	0.00000	-0.00028
EC-1 TREN 12.5 via 2 (Max)	0.00001	0.00000	0.00001
EC-1 TREN 12.5 via 2 (Min)	0.00000	0.00000	-0.00002

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) = -0.000066
 Giro maximo (ELS) = 0.000465
 Giro minimo (ELS) = -0.000770

APOYO N = 66

REACCIONES	Flector	Reac_vert	Torsor
=====			
G1	0.00000	209.34145	0.00000
G2	0.00000	139.56870	0.00000
Pii	0.00000	-24.98618	0.00000
Pi	0.00000	-40.54156	0.00000
Pd	0.00000	-34.62111	0.00000
TEMP	0.00000	-2.00702	0.00000
SC peatonal(100%) Max	0.00000	4.93116	0.00000
SC peatonal(100%) Min	0.00000	-0.64322	0.00000
SC peatonal(50%) Max	0.00000	10.87414	0.00000
SC peatonal(50%) Min	0.00000	-0.40192	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	11.72876	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-9.07928	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	14.64312	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-14.08538	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	15.07005	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-14.06843	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	14.88247	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-15.88224	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	7.93531	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	-14.03242	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	14.54237	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	-15.65832	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	0.40112	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	-1.30486	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	79.08682	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-6.53524	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	202.53386	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	-8.19691	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	190.22749	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	-8.19691	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	174.60225	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-8.85187	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	169.72691	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	-9.13156	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	232.48175	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	-10.29021	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	20.40857	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	-0.85752	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) = 314.289
 Reaccion maxima (ELS) = 532.446
 Reaccion minima (ELS) = 289.774
 Reaccion minima (ELU) = 266.522

DESPLAZAMIENTOS	GX	FZ	GY
=====			

G1	-0.00024	0.00000	-0.00005
G2	-0.00016	0.00000	-0.00003
Pii	0.00006	0.00000	0.00009
Pi	0.00009	0.00000	0.00013
Pd	0.00007	0.00000	0.00010
TEMP	0.00016	0.00000	-0.00013
SC peatonal(100%) Max	0.00000	0.00000	0.00002
SC peatonal(100%) Min	-0.00001	0.00000	-0.00002
SC peatonal(50%) Max	0.00000	0.00000	0.00001
SC peatonal(50%) Min	-0.00001	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00002	0.00000	0.00017
IPF-75 TREN A via 1 (Min)	-0.00009	0.00000	-0.00024
IPF-75 TREN B1 via 1 (Max)	0.00001	0.00000	0.00001
IPF-75 TREN B1 via 1 (Min)	-0.00004	0.00000	-0.00008
IPF-75 TREN B2 via 1 (Max)	0.00001	0.00000	0.00003
IPF-75 TREN B2 via 1 (Min)	-0.00003	0.00000	-0.00009
EC-1 TREN LM71 via 1 (Max)	0.00001	0.00000	0.00009
EC-1 TREN LM71 via 1 (Min)	-0.00005	0.00000	-0.00013
EC-1 TREN SW/0 via 1 (Max)	0.00003	0.00000	0.00006
EC-1 TREN SW/0 via 1 (Min)	-0.00014	0.00000	-0.00037
EC-1 TREN SW/2 via 1 (Max)	0.00003	0.00000	0.00007
EC-1 TREN SW/2 via 1 (Min)	-0.00019	0.00000	-0.00045
EC-1 TREN 12.5 via 1 (Max)	0.00000	0.00000	0.00001
EC-1 TREN 12.5 via 1 (Min)	-0.00001	0.00000	-0.00003
IPF-75 TREN A via 2 (Max)	0.00002	0.00000	0.00021
IPF-75 TREN A via 2 (Min)	-0.00010	0.00000	-0.00018
IPF-75 TREN B1 via 2 (Max)	0.00000	0.00000	0.00001
IPF-75 TREN B1 via 2 (Min)	-0.00004	0.00000	-0.00006
IPF-75 TREN B2 via 2 (Max)	0.00000	0.00000	0.00005
IPF-75 TREN B2 via 2 (Min)	-0.00004	0.00000	-0.00007
EC-1 TREN LM71 via 2 (Max)	0.00001	0.00000	0.00011
EC-1 TREN LM71 via 2 (Min)	-0.00005	0.00000	-0.00010
EC-1 TREN SW/0 via 2 (Max)	0.00002	0.00000	0.00013
EC-1 TREN SW/0 via 2 (Min)	-0.00016	0.00000	-0.00027
EC-1 TREN SW/2 via 2 (Max)	0.00002	0.00000	0.00018
EC-1 TREN SW/2 via 2 (Min)	-0.00021	0.00000	-0.00033
EC-1 TREN 12.5 via 2 (Max)	0.00000	0.00000	0.00001
EC-1 TREN 12.5 via 2 (Min)	-0.00002	0.00000	-0.00003

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) = 0.000014
 Giro maximo (ELS) = 0.000352
 Giro minimo (ELS) = -0.001027

APOYO N = 67			
REACCIONES	Flector	Reac_vert	Torsor
=====			
G1	0.00000	213.15686	0.00000
G2	0.00000	142.18568	0.00000
Pii	0.00000	-41.36550	0.00000
Pi	0.00000	-70.66792	0.00000
Pd	0.00000	-61.23000	0.00000
TEMP	0.00000	-14.70539	0.00000
SC peatonal(100%) Max	0.00000	9.35709	0.00000
SC peatonal(100%) Min	0.00000	-0.13294	0.00000
SC peatonal(50%) Max	0.00000	0.02673	0.00000
SC peatonal(50%) Min	0.00000	-4.14284	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	88.73616	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-1.31953	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	226.74225	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-1.46571	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	213.43692	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-1.46571	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	202.52734	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-1.62837	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	200.98900	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	-1.57346	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	266.21991	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	-1.80131	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	23.52508	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	-0.15011	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	18.53424	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-2.36847	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	31.87258	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	-5.24359	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	31.18402	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	-5.03895	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	34.60527	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-4.42725	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	29.00928	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	-4.64456	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	35.90834	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	-6.37422	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	2.81571	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	-0.53118	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) =	294.113
Reaccion maxima (ELS) =	595.430
Reaccion minima (ELS) =	272.484
Reaccion minima (ELU) =	256.774

DESPLAZAMIENTOS	GX	FZ	GY
=====			
G1	0.00019	0.00000	-0.00014
G2	0.00013	0.00000	-0.00009
Pii	-0.00001	0.00000	0.00011
Pi	-0.00003	0.00000	0.00015
Pd	-0.00002	0.00000	0.00012
TEMP	-0.00021	0.00000	-0.00005
SC peatonal(100%) Max	0.00001	0.00000	0.00002
SC peatonal(100%) Min	0.00000	0.00000	-0.00002
SC peatonal(50%) Max	0.00000	0.00000	0.00001
SC peatonal(50%) Min	0.00000	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00009	0.00000	0.00016
IPF-75 TREN A via 1 (Min)	-0.00002	0.00000	-0.00025
IPF-75 TREN B1 via 1 (Max)	0.00003	0.00000	0.00001
IPF-75 TREN B1 via 1 (Min)	-0.00001	0.00000	-0.00009
IPF-75 TREN B2 via 1 (Max)	0.00003	0.00000	0.00002
IPF-75 TREN B2 via 1 (Min)	-0.00001	0.00000	-0.00010
EC-1 TREN LM71 via 1 (Max)	0.00005	0.00000	0.00008
EC-1 TREN LM71 via 1 (Min)	-0.00001	0.00000	-0.00013
EC-1 TREN SW/0 via 1 (Max)	0.00013	0.00000	0.00007
EC-1 TREN SW/0 via 1 (Min)	-0.00003	0.00000	-0.00039
EC-1 TREN SW/2 via 1 (Max)	0.00017	0.00000	0.00007
EC-1 TREN SW/2 via 1 (Min)	-0.00003	0.00000	-0.00049
EC-1 TREN 12.5 via 1 (Max)	0.00001	0.00000	0.00001
EC-1 TREN 12.5 via 1 (Min)	0.00000	0.00000	-0.00004
IPF-75 TREN A via 2 (Max)	0.00008	0.00000	0.00020
IPF-75 TREN A via 2 (Min)	-0.00003	0.00000	-0.00020
IPF-75 TREN B1 via 2 (Max)	0.00002	0.00000	0.00001
IPF-75 TREN B1 via 2 (Min)	-0.00001	0.00000	-0.00007
IPF-75 TREN B2 via 2 (Max)	0.00003	0.00000	0.00004
IPF-75 TREN B2 via 2 (Min)	-0.00001	0.00000	-0.00007
EC-1 TREN LM71 via 2 (Max)	0.00004	0.00000	0.00010
EC-1 TREN LM71 via 2 (Min)	-0.00001	0.00000	-0.00011
EC-1 TREN SW/0 via 2 (Max)	0.00010	0.00000	0.00009
EC-1 TREN SW/0 via 2 (Min)	-0.00004	0.00000	-0.00029
EC-1 TREN SW/2 via 2 (Max)	0.00013	0.00000	0.00013
EC-1 TREN SW/2 via 2 (Min)	-0.00004	0.00000	-0.00036
EC-1 TREN 12.5 via 2 (Max)	0.00001	0.00000	0.00001
EC-1 TREN 12.5 via 2 (Min)	0.00000	0.00000	-0.00003

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) =	-0.000114
Giro maximo (ELS) =	0.000202
Giro minimo (ELS) =	-0.001151

APOYO N = 68

REACCIONES	Flector	Reac_vert	Torsor
=====			
G1	0.00000	70.28559	0.00000
G2	0.00000	42.31549	0.00000
Pii	0.00000	22.30260	0.00000
Pi	0.00000	36.53395	0.00000
Pd	0.00000	31.33892	0.00000
TEMP	0.00000	3.67987	0.00000
SC peatonal(100%) Max	0.00000	2.70746	0.00000
SC peatonal(100%) Min	0.00000	-0.99474	0.00000
SC peatonal(50%) Max	0.00000	4.61005	0.00000
SC peatonal(50%) Min	0.00000	-0.21133	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	1.84683	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-11.27222	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	2.35729	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-24.76811	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	2.35729	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-23.11087	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	2.54333	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-24.13621	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	2.60229	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	-22.75360	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	2.93186	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	-26.13928	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	0.24432	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	-2.38146	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	76.42488	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-7.46880	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	86.89921	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	-10.91940	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	88.53384	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	-11.16994	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	95.67278	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-11.68739	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	92.84087	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	-10.52817	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	108.92746	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	-12.69259	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	8.63632	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	-0.96497	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) = 143.940
 Reaccion maxima (ELS) = 246.678
 Reaccion minima (ELS) = 108.174
 Reaccion minima (ELU) = 85.210

DESPLAZAMIENTOS	GX	FZ	GY
=====			

G1	-0.00017	0.00000	-0.00038
G2	-0.00011	0.00000	-0.00026
Pii	0.00021	0.00000	0.00093
Pi	0.00035	0.00000	0.00159
Pd	0.00031	0.00000	0.00138
TEMP	0.00023	0.00000	0.00023
SC peatonal(100%) Max	0.00000	0.00000	0.00001
SC peatonal(100%) Min	-0.00001	0.00000	-0.00002
SC peatonal(50%) Max	0.00000	0.00000	0.00000
SC peatonal(50%) Min	0.00000	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00003	0.00000	0.00010
IPF-75 TREN A via 1 (Min)	-0.00010	0.00000	-0.00031
IPF-75 TREN B1 via 1 (Max)	0.00001	0.00000	0.00004
IPF-75 TREN B1 via 1 (Min)	-0.00002	0.00000	-0.00006
IPF-75 TREN B2 via 1 (Max)	0.00001	0.00000	0.00004
IPF-75 TREN B2 via 1 (Min)	-0.00003	0.00000	-0.00009
EC-1 TREN LM71 via 1 (Max)	0.00002	0.00000	0.00006
EC-1 TREN LM71 via 1 (Min)	-0.00005	0.00000	-0.00016
EC-1 TREN SW/0 via 1 (Max)	0.00005	0.00000	0.00016
EC-1 TREN SW/0 via 1 (Min)	-0.00010	0.00000	-0.00033
EC-1 TREN SW/2 via 1 (Max)	0.00006	0.00000	0.00019
EC-1 TREN SW/2 via 1 (Min)	-0.00012	0.00000	-0.00040
EC-1 TREN 12.5 via 1 (Max)	0.00000	0.00000	0.00001
EC-1 TREN 12.5 via 1 (Min)	-0.00001	0.00000	-0.00003
IPF-75 TREN A via 2 (Max)	0.00003	0.00000	0.00009
IPF-75 TREN A via 2 (Min)	-0.00010	0.00000	-0.00023
IPF-75 TREN B1 via 2 (Max)	0.00001	0.00000	0.00003
IPF-75 TREN B1 via 2 (Min)	-0.00002	0.00000	-0.00004
IPF-75 TREN B2 via 2 (Max)	0.00001	0.00000	0.00003
IPF-75 TREN B2 via 2 (Min)	-0.00003	0.00000	-0.00006
EC-1 TREN LM71 via 2 (Max)	0.00002	0.00000	0.00005
EC-1 TREN LM71 via 2 (Min)	-0.00005	0.00000	-0.00012
EC-1 TREN SW/0 via 2 (Max)	0.00004	0.00000	0.00013
EC-1 TREN SW/0 via 2 (Min)	-0.00011	0.00000	-0.00023
EC-1 TREN SW/2 via 2 (Max)	0.00005	0.00000	0.00016
EC-1 TREN SW/2 via 2 (Min)	-0.00014	0.00000	-0.00027
EC-1 TREN 12.5 via 2 (Max)	0.00000	0.00000	0.00001
EC-1 TREN 12.5 via 2 (Min)	-0.00001	0.00000	-0.00002

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) = 0.000733
 Giro maximo (ELS) = 0.001346

Giro minimo (ELS) = -0.000064

APOYO N = 69

REACCIONES	Flector	Reac_vert	Torsor
=====			
G1	0.00000	62.24726	0.00000
G2	0.00000	36.80199	0.00000
Pii	0.00000	43.88968	0.00000
Pi	0.00000	74.42496	0.00000
Pd	0.00000	64.27954	0.00000
TEMP	0.00000	13.11114	0.00000
SC peatonal(100%) Max	0.00000	2.06724	0.00000
SC peatonal(100%) Min	0.00000	-0.07300	0.00000
SC peatonal(50%) Max	0.00000	0.00716	0.00000
SC peatonal(50%) Min	0.00000	-2.16532	0.00000
IPF-75 TREN A via 1 (Max)	0.00000	77.90000	0.00000
IPF-75 TREN A via 1 (Min)	0.00000	-0.40338	0.00000
IPF-75 TREN B1 via 1 (Max)	0.00000	78.39575	0.00000
IPF-75 TREN B1 via 1 (Min)	0.00000	-0.34188	0.00000
IPF-75 TREN B2 via 1 (Max)	0.00000	78.40113	0.00000
IPF-75 TREN B2 via 1 (Min)	0.00000	-0.41410	0.00000
EC-1 TREN LM71 via 1 (Max)	0.00000	91.75636	0.00000
EC-1 TREN LM71 via 1 (Min)	0.00000	-0.46872	0.00000
EC-1 TREN SW/0 via 1 (Max)	0.00000	92.05094	0.00000
EC-1 TREN SW/0 via 1 (Min)	0.00000	-0.22647	0.00000
EC-1 TREN SW/2 via 1 (Max)	0.00000	103.46690	0.00000
EC-1 TREN SW/2 via 1 (Min)	0.00000	-0.04185	0.00000
EC-1 TREN 12.5 via 1 (Max)	0.00000	8.59740	0.00000
EC-1 TREN 12.5 via 1 (Min)	0.00000	-0.00034	0.00000
IPF-75 TREN A via 2 (Max)	0.00000	5.76570	0.00000
IPF-75 TREN A via 2 (Min)	0.00000	-5.76028	0.00000
IPF-75 TREN B1 via 2 (Max)	0.00000	2.06660	0.00000
IPF-75 TREN B1 via 2 (Min)	0.00000	-9.48070	0.00000
IPF-75 TREN B2 via 2 (Max)	0.00000	2.06660	0.00000
IPF-75 TREN B2 via 2 (Min)	0.00000	-9.06388	0.00000
EC-1 TREN LM71 via 2 (Max)	0.00000	5.02970	0.00000
EC-1 TREN LM71 via 2 (Min)	0.00000	-8.28658	0.00000
EC-1 TREN SW/0 via 2 (Max)	0.00000	0.35574	0.00000
EC-1 TREN SW/0 via 2 (Min)	0.00000	-8.96901	0.00000
EC-1 TREN SW/2 via 2 (Max)	0.00000	0.40092	0.00000
EC-1 TREN SW/2 via 2 (Min)	0.00000	-11.39104	0.00000
EC-1 TREN 12.5 via 2 (Max)	0.00000	0.03341	0.00000
EC-1 TREN 12.5 via 2 (Min)	0.00000	-0.96979	0.00000

COMBINACION DE REACCIONES VERTICALES

Reaccion permanente (ELS) =	163.329
Reaccion maxima (ELS) =	285.187
Reaccion minima (ELS) =	153.278
Reaccion minima (ELU) =	141.927

DESPLAZAMIENTOS

=====			
G1	-0.00004	0.00000	-0.00041
G2	-0.00003	0.00000	-0.00028
Pii	0.00027	0.00000	0.00091
Pi	0.00047	0.00000	0.00156
Pd	0.00040	0.00000	0.00135
TEMP	-0.00009	0.00000	0.00031
SC peatonal(100%) Max	0.00000	0.00000	0.00001
SC peatonal(100%) Min	0.00000	0.00000	-0.00002
SC peatonal(50%) Max	0.00000	0.00000	0.00000
SC peatonal(50%) Min	0.00000	0.00000	-0.00001
IPF-75 TREN A via 1 (Max)	0.00002	0.00000	0.00011
IPF-75 TREN A via 1 (Min)	-0.00005	0.00000	-0.00033
IPF-75 TREN B1 via 1 (Max)	0.00001	0.00000	0.00004
IPF-75 TREN B1 via 1 (Min)	-0.00001	0.00000	-0.00007
IPF-75 TREN B2 via 1 (Max)	0.00001	0.00000	0.00004
IPF-75 TREN B2 via 1 (Min)	-0.00001	0.00000	-0.00009
EC-1 TREN LM71 via 1 (Max)	0.00001	0.00000	0.00006
EC-1 TREN LM71 via 1 (Min)	-0.00003	0.00000	-0.00017
EC-1 TREN SW/0 via 1 (Max)	0.00003	0.00000	0.00016
EC-1 TREN SW/0 via 1 (Min)	-0.00004	0.00000	-0.00035
EC-1 TREN SW/2 via 1 (Max)	0.00004	0.00000	0.00020
EC-1 TREN SW/2 via 1 (Min)	-0.00004	0.00000	-0.00042
EC-1 TREN 12.5 via 1 (Max)	0.00000	0.00000	0.00002
EC-1 TREN 12.5 via 1 (Min)	0.00000	0.00000	-0.00003
IPF-75 TREN A via 2 (Max)	0.00002	0.00000	0.00009
IPF-75 TREN A via 2 (Min)	-0.00005	0.00000	-0.00025
IPF-75 TREN B1 via 2 (Max)	0.00001	0.00000	0.00003
IPF-75 TREN B1 via 2 (Min)	-0.00001	0.00000	-0.00004
IPF-75 TREN B2 via 2 (Max)	0.00001	0.00000	0.00003
IPF-75 TREN B2 via 2 (Min)	-0.00001	0.00000	-0.00007
EC-1 TREN LM71 via 2 (Max)	0.00001	0.00000	0.00005
EC-1 TREN LM71 via 2 (Min)	-0.00002	0.00000	-0.00013
EC-1 TREN SW/0 via 2 (Max)	0.00003	0.00000	0.00013
EC-1 TREN SW/0 via 2 (Min)	-0.00004	0.00000	-0.00024
EC-1 TREN SW/2 via 2 (Max)	0.00003	0.00000	0.00016
EC-1 TREN SW/2 via 2 (Min)	-0.00005	0.00000	-0.00029
EC-1 TREN 12.5 via 2 (Max)	0.00000	0.00000	0.00001
EC-1 TREN 12.5 via 2 (Min)	0.00000	0.00000	-0.00002

COMBINACION DE GIROS DE FLEXION

Acciones permanentes (ELS) =	0.000657
Giro maximo (ELS) =	0.001365
Giro minimo (ELS) =	-0.000181

8.2. REACCIONES HORIZONTALES

En este apartado se resumen las reacciones horizontales que actuan en cada apoyo. El cálculo del reparto de las mismas se ha efectuado de forma proporcional al area tributaria de cada elemento, pila o estribo.

En la tabla que sigue se exponen los valores característicos de las mismas.

Fuerzas horizontales en POTs

	Reacción horizontal longitudinal	Reacción horizontal transversal
Apoyo	Tm	Tm
Estribo 2 derecho	53,7	7,0
Estribo 2 izquierdo	53,7	0
Pila 2 derecho	26,6	16,2
Pila 2 izquierdo	29,8	0
Pila 1 derecho	25,5	16,2
Pila 1 izquierdo	31,3	0
Estribo 1 derecho	12,6	7,0
Estribo 1 izquierdo	14,5	0

Acciones horizontales consideradas

- Frenado + Arranque $F_x= 27.9$ T/vía
- Interacción vía-estructura (efectos térmicos) =51.6 T
- Viento transversal $F_{yw}= 36.39$ T

8.3. VERIFICACIÓN DE APARATOS DE APOYO Y MOVIMIENTOS EN JUNTAS

Aparatos de apoyo tipo POT

En la tabla siguiente se comprueban las condiciones de trabajo de los aparatos de apoyo tipo POT. Se ha verificado la carga admisible en cada uno de ellos. Asimismo se especifica en la hoja que sigue el rango de movimientos horizontales máximos previstos.

Fuerzas verticales en POTs

	Reacción vertical c. permanentes	Reacción vertical máxima
Apoyo	Tm	Tm
Estribo 2 derecho	143,9	246,7
Estribo 2 izquierdo	163,3	285,2
Pila 2 derecho	314,3	532,5
Pila 2 izquierdo	294,1	595,4
Pila 1 derecho	294,7	509
Pila 1 izquierdo	315,4	625
Estribo 1 derecho	163,2	252,2
Estribo 1 izquierdo	143,4	289,8

Juntas de calzada

Los movimientos en juntas coinciden con los previstos en los POTs de estribos. Durante la ejecución del tablero se deberán prever las holguras necesarias entre la junta y el muro de resguardo del estribo teniendo en cuenta que durante los primeros años se van a producir los acortamientos del puente debidos a a las acciones reológicas (retracción y fluencia). Éstas holguras dependen de la temperatura media ambiental en el momento de ejecutar las juntas de calzada.

La normativa IAP especifica los rangos máximos de variación anual de temperatura media efectiva (ΔT) en el tablero para las distintas regiones climáticas españolas. Donde:

$\Delta T = (\text{Temperatura máxima} - \text{Temperatura mínima}).$

Los valores máximos del recorrido de la junta serán inferiores a los detallados a continuación:

Máximo acortamiento = (Temperatura mínima – To) + movimientos reológicos + (frenado/arranque)
Máximo alargamiento = (Temperatura máxima – To) + (frenado/arranque)

En el estribo 2, punto fijo del tablero respecto a movimientos longitudinales, el recorrido necesario de la junta es nulo, mientras que en el estribo 1 se precisa:

Recorrido máximo = ΔT + movimientos reológicos + (frenado/arranque) = 18.2 + 88.2 + 0 = 106.4 mm

To = Temperatura media ambiental durante el montaje de la junta

En la hoja siguiente se espfican los cálculos detallados.

En este cálculo anterior se ha supuesto que la deformación elástica es anterior a la colocación de la junta.

Fecha: Feb. 2002

Proyecto: AVE El Papiol - Sant Vicenç dels Horts
Estructura: P. I. Riera de Torrelles

Movimientos longitudinales en POTs. Valores en mm.

Datos	
Area de la sección transversal, m2	8,66
Módulo de deformación del hormigón, T/m2	3,09E+05
Variación anual de la temperatura, °C	38
Fuerza total de postesado, T	3000
Valor del coeficiente de fluencia	1,77
Deformación por retracción, mm/m	0,25
Axil medio de frenado, T	0,58

		Acortamiento elástico		Fluencia		Retracción		Frenado		Temperatura		Totales	
Apoyo	Distancia a punto fijo, m	Máximo	Mínimo	Máximo	Mínimo	Máximo	Mínimo	Máximo	Mínimo	Máximo	Mínimo	Alargamiento	Acortamiento
Estribo 2 derecho	0	0,0	0,0	0,0	0,0	0,0	0,0	0,000	0,000	0,0	0,0	0,0	0,0
Estribo 2 izquierdo	0	0,0	0,0	0,0	0,0	0,0	0,0	0,000	0,000	0,0	0,0	0,0	0,0
Pila 2 derecho	14,5	0,0	-16,3	0,0	-23,0	0,0	-3,6	0,003	-0,003	5,5	-5,5	5,5	-48,4
Pila 2 izquierdo	14,5	0,0	-16,3	0,0	-23,0	0,0	-3,6	0,003	-0,003	5,5	-5,5	5,5	-48,4
Pila 1 derecho	33,5	0,0	-37,6	0,0	-53,2	0,0	-8,4	0,007	-0,007	12,7	-12,7	12,7	-111,9
Pila 1 izquierdo	33,5	0,0	-37,6	0,0	-53,2	0,0	-8,4	0,007	-0,007	12,7	-12,7	12,7	-111,9
Estribo 1 derecho	48	0,0	-53,8	0,0	-76,2	0,0	-12,0	0,010	-0,010	18,2	-18,2	18,3	-160,3
Estribo 1 izquierdo	48	0,0	-53,8	0,0	-76,2	0,0	-12,0	0,010	-0,010	18,2	-18,2	18,3	-160,3

Valor positivo --> alargamiento
Valor negativo --> acortamiento

9 CÁLCULO DEL ESTRIBO 1

9.1 GEOMETRÍA

9.2 ACCIONES EN CORONACIÓN

9.3 CÁLCULO DE ESFUERZOS Y DIMENSIONAMIENTO

El cálculo y dimensionamiento de los estribos se detalla en las páginas siguientes. Las hipótesis de cálculo se exponen a continuación:

1. El cálculo se realiza en la hipótesis clásica como muro con acciones en coronación debidas a las reacciones horizontales y verticales transmitidas por el tablero. Los empujes del terreno se han calculado para un coeficiente de empuje $K= 0,33$ y una densidad del terreno de $2,0 \text{ T/m}^3$. No se han considerado eventuales empujes hidrostáticos al colocar un adecuado drenaje en el trasdós del estribo.
2. Se ha comprobado que no se supera la carga admisible por pilote, el cálculo de la cual se detalla en el apartado 12.
3. El dimensionamiento de las armaduras de flexión y cortante del muro y zapata se realiza con los criterios de la Normativa vigente para estructuras de hormigón (EHE). Los coeficientes de seguridad de las acciones corresponden con un **nivel de control intenso** $\gamma_{fg}=1,35$ y $\gamma_{fq}=1,50$.
4. Las armaduras horizontales de flexión transversal se colocan de acuerdo con los valores mínimos exigidos por la Normativa EHE.

9.4. CÁLCULO Y DIMENSIONAMIENTO DE LAS ALETAS.

El cálculo del tramo empotrado se ha realizado mediante el método de los elementos finitos, utilizando el programa ROBOT MILLENIUM para obtener los esfuerzos en servicio y de diseño necesarios para el dimensionamiento del mismo.

El dimensionamiento de las aletas tipo muro y la comprobación de la estabilidad al vuelco y el deslizamiento de las mismas se realiza mediante el programa ALE. El mismo programa proporciona los esfuerzos y la armadura necesaria en las secciones de interés de acuerdo con los criterios de la Normativa vigente para estructuras de hormigón armado (EHE). Los coeficientes de seguridad de las acciones corresponden con un nivel de control intenso.

El programa ALE utiliza el programa de cálculo de armaduras ARMA. El programa ARMA permite el cálculo automático de secciones rectangulares sometidas a flexocompresión y/o cortante para el conjunto de elementos (barras del modelo de pórtico plano) que constituyen la estructura y para todas aquellas hipótesis o combinaciones de cálculo que se hayan contemplado en el análisis estructural.

Las armaduras horizontales de flexión transversal se colocan de acuerdo con los valores mínimos exigidos por la Normativa EHE.

El cálculo de empujes se realiza con la teoría de Coulomb, asumiendo un ángulo de rozamiento tierras-muro de $\delta=21,3^\circ$ en el trasdós y de $\delta=0^\circ$ en la base del muro. El drenaje se considera eficaz y, en consecuencia, no se consideran eventuales empujes hidrostáticos en el trasdós del muro.

10 CÁLCULO DEL ESTRIBO 2

10.1 GEOMETRÍA

10.2 ACCIONES EN CORONACIÓN

10.3 CÁLCULO DE ESFUERZOS Y DIMENSIONAMIENTO

El cálculo y dimensionamiento de los estribos se detalla en las páginas siguientes. Las hipótesis de cálculo se exponen a continuación:

1. El cálculo se realiza en la hipótesis clásica como muro con acciones en coronación debidas a las reacciones horizontales y verticales transmitidas por el tablero. Los empujes del terreno se han calculado para un coeficiente de empuje $K= 0,33$ y una densidad del terreno de $2,0 \text{ T/m}^3$. No se han considerado eventuales empujes hidrostáticos al colocar un adecuado drenaje en el trasdós del estribo.
2. Se ha comprobado que no se supera la carga admisible por pilote, el cálculo de la cual se detalla en el apartado 12.
3. El dimensionamiento de las armaduras de flexión y cortante del muro y encepado se realiza con los criterios de la Normativa vigente para estructuras de hormigón (EHE). Los coeficientes de seguridad de las acciones corresponden con un **nivel de control intenso** $\gamma_{fg}=1,35$ y $\gamma_{fq}=1,50$.
4. Las armaduras horizontales de flexión transversal se colocan de acuerdo con los valores mínimos exigidos por la Normativa EHE.

10.4. CÁLCULO Y DIMENSIONAMIENTO DE LAS ALETAS.

El cálculo del tramo empotrado se ha realizado mediante el método de los elementos finitos, utilizando el programa ROBOT MILLENIUM para obtener los esfuerzos en servicio y de diseño necesarios para el dimensionamiento del mismo.

El dimensionamiento de las aletas tipo muro y la comprobación de la estabilidad al vuelco y el deslizamiento de las mismas se realiza mediante el programa ALE. El mismo programa proporciona los esfuerzos y la armadura necesaria en las secciones de interés de acuerdo con los criterios de la Normativa vigente para estructuras de hormigón armado (EHE). Los coeficientes de seguridad de las acciones corresponden con un nivel de control intenso.

El programa ALE utiliza el programa de cálculo de armaduras ARMA. El programa ARMA permite el cálculo automático de secciones rectangulares sometidas a flexocompresión y/o cortante para el conjunto de elementos (barras del modelo de pórtico plano) que constituyen la estructura y para todas aquellas hipótesis o combinaciones de cálculo que se hayan contemplado en el análisis estructural.

Las armaduras horizontales de flexión transversal se colocan de acuerdo con los valores mínimos exigidos por la Normativa EHE.

El cálculo de empujes se realiza con la teoría de Coulomb, asumiendo un ángulo de rozamiento tierras-muro de $\delta=21,3^\circ$ en el trasdós y de $\delta=0^\circ$ en la base del muro. El drenaje se considera eficaz y, en consecuencia, no se consideran eventuales empujes hidrostáticos en el trasdós del muro.

11 CÁLCULO DE LA PILA

11.1 GEOMETRÍA

11.2 ACCIONES EN CORONACIÓN

11.3 CÁLCULO DE ESFUERZOS Y DIMENSIONAMIENTO

El cálculo y dimensionamiento de las pilas se detalla en las páginas siguientes. Las hipótesis de cálculo se exponen a continuación:

1. El cálculo se ha realizado según especificaciones de la EHE a partir de las reacciones en coronación que se detallan.
2. Se ha comprobado que no se supera la carga admisible por pilote, el cálculo de la cual se detalla en el apartado 12 del presente anejo.
3. El dimensionamiento de las armaduras de flexión y cortante del muro y encepado se realiza con los criterios de la Normativa vigente para estructuras de hormigón (EHE). Los coeficientes de seguridad de las acciones corresponden con un **nivel de control intenso** $\gamma_{fg}=1,35$ y $\gamma_{fq}=1,50$.

12 CÁLCULO DE LOS PARÁMETROS GEOTÉCNICOS DE LOS PILOTES

A continuación se detalla el cálculo de los parámetros geotécnicos de los pilotes. En concreto se calcula la carga admisible y el coeficiente de variación del módulo de balasto horizontal con la profundidad.

13 VERIFICACIÓN DE LOS CARRILES POR LA INTERACCIÓN VÍA-ESTRUCTURA

En el presente apartado se realiza la comprobación de las tensiones en el carril por la interacción vía-estructura y el cálculo de las fuerzas horizontales en el punto fijo del tablero, ambos según el EC-1 parte 2.

Por tratarse de un puente de entre 40 y 90 m de longitud de tablero se aplica el método simplificado recogido en el Anejo G del EC-1 para la realización de estos cálculos. Los requisitos adicionales a cumplir para que sean válidas las comprobaciones que se exponen son:

- Carril UIC con una tensión última de rotura a tracción no menor de 900 N/mm^2 .
- Traviesas de hormigón con un espaciamiento máximo de 0.65 m.
- Existencia de al menos un espesor de balasto consolidado de al menos 0.30 m bajo las traviesas.
- Radio en planta del trazado de la vía mayor o igual que 1 500 m.
- Longitud de expansión del tablero no mayor que 90 m para tableros de hormigón.

Todos estos requisitos se cumplen en el presente.

La comprobación de que debido a la interacción entre vía y estructura las tensiones en el carril consiste en comprobar que la longitud de expansión del tablero no supera a la máxima admisible según el gráfico G1 del EC-1.

Para $\theta = 0.000525 \text{ rad}$, y $H = 1.96 \text{ m}$ obtenemos:

$$\delta = \theta \cdot H = 0.0010 \text{ m} = 1.0 \text{ mm}$$

donde:

θ es el giro en el estribo fijo debido a la combinación característica pésima de las acciones variables.

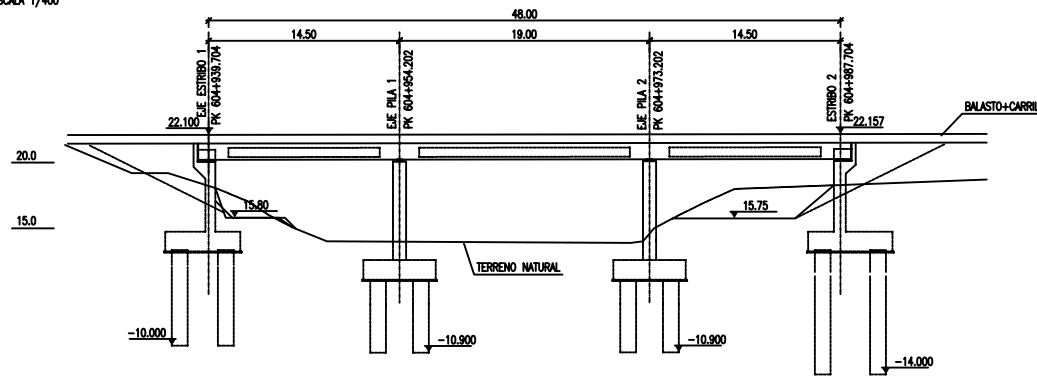
H es la diferencia de cota entre el carril y el punto de rotación de la sección del apoyo fijo.

La rigidez del estribo por metro de ancho del tablero y vía frente a movimientos horizontales, K, es de 10 698 T/m.

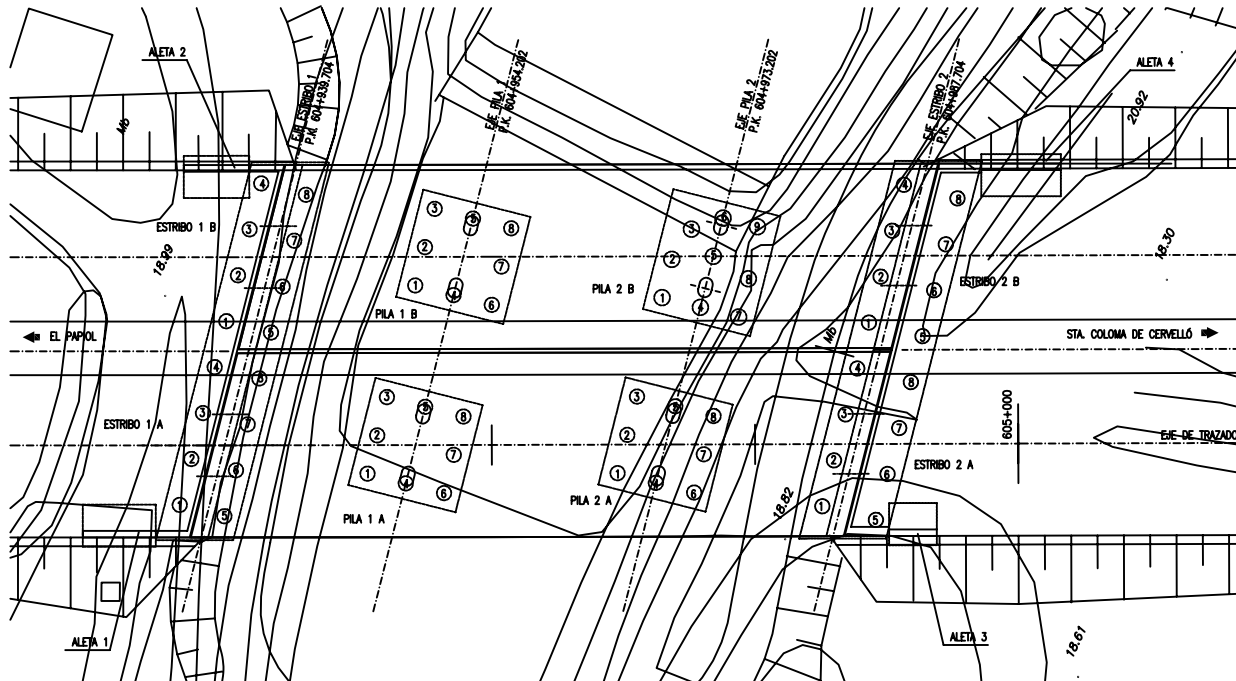
Con estos valores de δ y K obtenemos una longitud de expansión máxima admisible de 85 m según la figura G1 del EC-1, superior a la real, de valor 48 m, con lo cual se cumple la condición de tensiones admisibles en el carril.

En la hoja que sigue se calculan las fuerzas horizontales en el punto fijo del puente debidas al frenado, incremento diferencial de temperatura entre la vía y el tablero y rotación del tablero en el estribo fijo. En los cálculos se ha supuesto que el carril es continuo en ambos extremos del puente (no existe aparato de dilatación de vía).

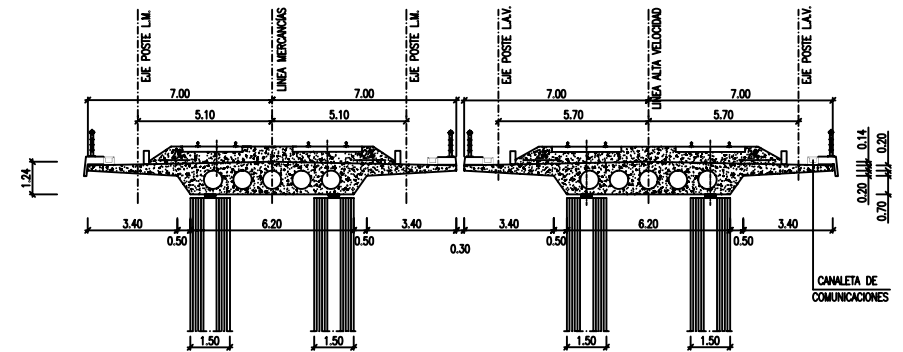
DESARROLLO POR EL EJE DE TRAZADO
ESCALA 1/400



PLANTA
ESCALA 1/400



SECCIÓN TRANSVERSAL
ESCALA 1/200



NIVELES DE CONTROL Y COEFICIENTES DE SEGURIDAD ADOPTADOS

HORMIGONES			
ELEMENTO ESTRUCTURAL	TIPO	CONTROL	γ
TABLERO	HP-40/P/20/IIa	NORMAL	1.50
ALZADOS DE PILAS	HA-30/B/20/IIa	NORMAL	1.50
CEMENTACIONES Y ESTRIBOS	HA-25/B/20/IIa	NORMAL	1.50
NIVELACIÓN	HM-15	NORMAL	1.50

ACEROS			
ACEROS	TIPO	CONTROL	γ
ACERO PARA ARMAR CORRUGADO	B 500 S	NORMAL	1.15
ACERO PARA TESAR	Y 1860 S7	NORMAL	1.15

EJECUCIÓN DE LA OBRA

ELEMENTOS IN SITU CONTROL NORMAL.
COEFICIENTES DE MAYORACIÓN DE LAS ACCIONES SEGÚN EHE.

**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62RMP102 RIERA TORRELLES (MERCANCÍAS)**

II. ANÁLISIS DEL PROYECTO DE LA ESTRUCTURA

CALCULOS DE ESFUERZOS DE SOBRECARGA VTO TORRELLES

NOMBRE DE LA OBRA : VTO. TORRELLES

DESCRIPCION DE LA OBRA : 14.5+19+14.5

Envolvente de momentos por ferrocarril (IAPF/EC) 2 VIAS

SE			V(t)	Mz (mt)
--			-----	-----
V 1	1	M(+)	-73.87	3.48
		M(-)	-23.94	-5.79
	2	M(+)	-192.13	284.92
		M(-)	41.79	-60.59
	3	M(+)	-91.68	489.57
		M(-)	41.79	-121.18
	4	M(+)	-91.68	622.51
		M(-)	41.79	-181.78
	5	M(+)	8.26	687.40
		M(-)	41.79	-242.37
	6	M(+)	8.26	675.43
		M(-)	41.79	-302.96
	7	M(+)	107.57	605.28
		M(-)	41.79	-363.55
	8	M(+)	144.06	459.42
		M(-)	41.79	-424.15
	9	M(+)	179.68	251.46
		M(-)	41.79	-484.74
	10	M(+)	-7.72	100.73
		M(-)	229.01	-624.22
	11	M(+)	-7.72	111.92
		M(-)	229.01	-956.29
V 2	1	M(+)	26.66	111.92
		M(-)	-256.82	-956.29
	2	M(+)	26.66	61.26
		M(-)	-256.82	-468.33
	3	M(+)	-181.45	317.06
		M(-)	-26.66	-293.32
	4	M(+)	-89.94	584.36
		M(-)	-26.66	-242.67
	5	M(+)	-30.18	752.05
		M(-)	-8.64	-193.02
	6	M(+)	0.05	794.76
		M(-)	-4.05	-180.97
	7	M(+)	92.12	751.89
		M(-)	8.64	-193.02
	8	M(+)	89.82	584.59
		M(-)	26.66	-242.69
	9	M(+)	181.34	316.87
		M(-)	26.66	-293.35
	10	M(+)	-26.66	61.26
		M(-)	256.82	-468.33
	11	M(+)	-26.66	111.91
		M(-)	256.82	-956.29
V 3	1	M(+)	7.72	111.91
		M(-)	-229.01	-956.29
	2	M(+)	7.72	100.72
		M(-)	-229.01	-624.22

CALCULOS DE ESFUERZOS DE SOBRECARGA VTO TORRELLES

Envolvente de momentos por ferrocarril (IAPF/EC) 2 VIAS

SE		V(t)	Mz (mt)
--		----	-----
3	M(+)	-179.80	251.61
	M(-)	-41.71	-483.77
4	M(+)	-144.20	459.62
	M(-)	-41.71	-423.30
5	M(+)	-45.65	605.37
	M(-)	-41.71	-362.83
6	M(+)	-8.42	675.34
	M(-)	-41.71	-302.36
7	M(+)	53.66	687.22
	M(-)	-41.71	-241.89
8	M(+)	91.51	622.31
	M(-)	-41.71	-181.42
9	M(+)	153.59	489.18
	M(-)	-41.71	-120.94
10	M(+)	191.95	284.67
	M(-)	-41.71	-60.47
11	M(+)	106.28	3.48
	M(-)	-14.40	-3.48

CALCULOS DE PRUEBA DE CARGA VTO TORRELLES

VTO TORRELLES PRUEBA DE CARGA
CONTROL

	31	30	1	4
:				
NUDOS				
1	0.000			0.0000
2	1.450			0.0000
3	2.900			0.0000
4	4.350			0.0000
5	5.800			0.0000
6	7.250			0.0000
7	8.700			0.0000
8	10.150			0.0000
9	11.600			0.0000
10	13.050			0.0000
11	14.500			0.0000
12	16.400			0.0000
13	18.300			0.0000
14	20.200			0.0000
15	22.100			0.0000
16	24.000			0.0000
17	25.900			0.0000
18	27.800			0.0000
19	29.700			0.0000
20	31.600			0.0000
21	33.500			0.0000
22	34.950			0.0000
23	36.400			0.0000
24	37.850			0.0000
25	39.300			0.0000
26	40.750			0.0000
27	42.200			0.0000
28	43.650			0.0000
29	45.100			0.0000
30	46.550			0.0000
31	48.000			0.0000

:

BARRAS TIPO

1			
8.6658	1.1213	3630000	

:

BARRAS

	1	2	1
1	1	2	1
2	2	3	1
3	3	4	1
4	4	5	1
5	5	6	1
6	6	7	1
7	7	8	1
8	8	9	1
9	9	10	1
10	10	11	1
11	11	12	1
12	12	13	1
13	13	14	1
14	14	15	1
15	15	16	1
16	16	17	1
17	17	18	1
18	18	19	1
19	19	20	1
20	20	21	1
21	21	22	1
22	22	23	1
23	23	24	1
24	24	25	1
25	25	26	1

CALCULOS DE PRUEBA DE CARGA VTO TORRELLES

26	26	27	1
27	27	28	1
28	28	29	1
29	29	30	1
30	30	31	1
:			
APOYOS			
4			
1	1	1	0
11	0	1	0
21	0	1	0
31	0	1	0
:			
CARGAS			
ESTADO DE CARGAS 1			
0			
10			
7	1	40.000	1.030 270
8	1	40.000	1.380 270
13	1	40.000	0.630 270
14	1	40.000	0.530 270
16	1	40.000	0.000 270
17	1	40.000	0.160 270
18	1	40.000	0.320 270
22	1	40.000	0.380 270
23	1	40.000	0.990 270
25	1	40.000	0.150 270
ESTADO DE CARGAS 2			
0			
5			
4	1	40.000	1.100 270
6	1	40.000	0.000 270
24	1	40.000	0.840 270
26	1	40.000	0.000 270
27	1	40.000	0.610 270
ESTADO DE CARGAS 3			
0			
10			
2	1	40.000	0.430 270
3	1	40.000	0.780 270
8	1	40.000	0.930 270
9	1	40.000	1.280 270
11	1	40.000	1.650 270
12	1	40.000	1.810 270
14	1	40.000	0.070 270
17	1	40.000	1.580 270
18	1	40.000	1.740 270
19	1	40.000	1.900 270
ESTADO DE CARGAS 4			
0			
8			
14	1	40.000	0.680 270
15	1	40.000	0.580 270
19	1	40.000	0.380 270
20	1	40.000	0.280 270
22	1	40.000	0.200 270
23	1	40.000	0.810 270
24	1	40.000	1.420 270
29	1	40.000	1.380 270
:			

CALCULOS DE PRUEBA DE CARGA VTO TORRELLES

VTO TORRELLES PRUEBA DE CARGA

Hip. nº 1 ESTADO DE CARGAS 1

Desplazamientos de nudos

Nudo	Dpl. x	Dpl. y	Giro z
1	0.000000	0.000000	0.000029
2	0.000000	0.000043	0.000029
3	0.000000	0.000084	0.000028
4	0.000000	0.000123	0.000026
5	0.000000	0.000158	0.000023
6	0.000000	0.000188	0.000019
7	0.000000	0.000212	0.000014
8	0.000000	0.000228	0.000008
9	0.000000	0.000225	-0.000015
10	0.000000	0.000168	-0.000071
11	0.000000	-0.000000	-0.000168
12	0.000000	-0.000439	-0.000279
13	0.000000	-0.001001	-0.000298
14	0.000000	-0.001517	-0.000234
15	0.000000	-0.001860	-0.000122
16	0.000000	-0.001969	0.000011
17	0.000000	-0.001816	0.000147
18	0.000000	-0.001429	0.000252
19	0.000000	-0.000897	0.000294
20	0.000000	-0.000366	0.000250
21	0.000000	-0.000000	0.000120
22	0.000000	0.000093	0.000017
23	0.000000	0.000077	-0.000033
24	0.000000	0.000016	-0.000045
25	0.000000	-0.000045	-0.000036
26	0.000000	-0.000082	-0.000017
27	0.000000	-0.000095	-0.000002
28	0.000000	-0.000089	0.000010
29	0.000000	-0.000067	0.000019
30	0.000000	-0.000036	0.000024
31	0.000000	-0.000000	0.000026

Reacciones en apoyos

Nudo	Fza. x	Fza. y	Mto. z
1	-0.00	-1.66	-0.00
11	-0.00	184.21	-0.00
21	-0.00	210.86	0.00
31	0.00	6.58	0.00

Esfuerzos en extremos de barras

Barra	Ext.	Axil	Flector	Cortante
1	1	0.00	0.00	1.66
	2	0.00	-2.40	1.66
2	2	0.00	-2.40	1.66
	3	0.00	-4.80	1.66
3	3	0.00	-4.80	1.66
	4	0.00	-7.20	1.66
4	4	0.00	-7.20	1.66
	5	0.00	-9.60	1.66
5	5	0.00	-9.60	1.65
	6	0.00	-12.00	1.65
6	6	0.00	-12.00	1.65
	7	0.00	-14.40	1.65
7	7	0.00	-14.40	1.65
	8	0.00	-33.60	41.65
8	8	0.00	-33.60	41.65
	9	0.00	-96.80	81.65
9	9	0.00	-96.80	81.65

CALCULOS DE PRUEBA DE CARGA
VTO TORRELLES

	10	0.00	-215.20	81.65
10	10	0.00	-215.20	81.65
	11	0.00	-333.60	81.65
11	11	0.00	-333.60	-102.56
	12	0.00	-138.74	-102.56
12	12	0.00	-138.74	-102.56
	13	0.00	56.13	-102.56
13	13	0.00	56.13	-102.56
	14	0.00	200.19	-62.56
14	14	0.00	200.19	-62.56
	15	0.00	264.25	-22.56
15	15	0.00	264.25	-22.56
	16	0.00	307.11	-22.56
16	16	0.00	307.11	-22.56
	17	0.00	273.97	17.44
17	17	0.00	273.97	17.44
	18	0.00	171.23	57.44
18	18	0.00	171.23	57.44
	19	0.00	-1.11	97.44
19	19	0.00	-1.11	97.44
	20	0.00	-186.25	97.44
20	20	0.00	-186.25	97.44
	21	0.00	-371.39	97.44
21	21	0.00	-371.39	-113.42
	22	0.00	-206.94	-113.42
22	22	0.00	-206.94	-113.42
	23	0.00	-85.28	-73.42
23	23	0.00	-85.28	-73.42
	24	0.00	2.78	-33.42
24	24	0.00	2.78	-33.42
	25	0.00	51.24	-33.42
25	25	0.00	51.24	-33.42
	26	-0.00	47.70	6.58
26	26	-0.00	47.70	6.58
	27	-0.00	38.16	6.58
27	27	-0.00	38.16	6.58
	28	-0.00	28.62	6.58
28	28	0.00	28.62	6.58
	29	0.00	19.08	6.58
29	29	0.00	19.08	6.58
	30	0.00	9.54	6.58
30	30	0.00	9.54	6.58
	31	0.00	0.00	6.58

CALCULOS DE PRUEBA DE CARGA VTO TORRELLES

VTO TORRELLES PRUEBA DE CARGA

Hip. nº 2 ESTADO DE CARGAS 2

Desplazamientos de nudos

Nudo	Dpl. x	Dpl. y	Giro z
1	0.000000	-0.000000	-0.000228
2	0.000000	-0.000326	-0.000218
3	0.000000	-0.000621	-0.000186
4	0.000000	-0.000854	-0.000132
5	0.000000	-0.000994	-0.000058
6	0.000000	-0.001021	0.000022
7	0.000000	-0.000935	0.000093
8	0.000000	-0.000761	0.000144
9	0.000000	-0.000528	0.000175
10	0.000000	-0.000264	0.000185
11	0.000000	-0.000000	0.000176
12	0.000000	0.000310	0.000149
13	0.000000	0.000566	0.000120
14	0.000000	0.000763	0.000087
15	0.000000	0.000894	0.000051
16	0.000000	0.000955	0.000012
17	0.000000	0.000940	-0.000029
18	0.000000	0.000842	-0.000074
19	0.000000	0.000657	-0.000122
20	0.000000	0.000378	-0.000172
21	0.000000	-0.000000	-0.000226
22	0.000000	-0.000350	-0.000251
23	0.000000	-0.000710	-0.000240
24	0.000000	-0.001029	-0.000194
25	0.000000	-0.001256	-0.000115
26	0.000000	-0.001354	-0.000018
27	0.000000	-0.001305	0.000084
28	0.000000	-0.001114	0.000176
29	0.000000	-0.000808	0.000243
30	0.000000	-0.000423	0.000283
31	0.000000	-0.000000	0.000296

Reacciones en apoyos

Nudo	Fza. x	Fza. y	Mto. z
1	-0.00	41.24	-0.00
11	-0.00	35.38	-0.00
21	-0.00	71.54	0.00
31	0.00	51.84	0.00

Esfuerzos en extremos de barras

Barra	Ext.	Axil	Flector	Cortante
1	1	0.00	0.00	-41.24
	2	0.00	59.80	-41.24
2	2	0.00	59.80	-41.24
	3	0.00	119.59	-41.24
3	3	0.00	119.59	-41.24
	4	0.00	179.39	-41.24
4	4	0.00	179.39	-41.24
	5	0.00	225.19	-1.24
5	5	0.00	225.19	-1.24
	6	0.00	226.98	-1.24
6	6	0.00	226.98	-1.24
	7	0.00	170.78	38.76
7	7	0.00	170.78	38.76
	8	0.00	114.57	38.76
8	8	0.00	114.57	38.76
	9	0.00	58.37	38.76
9	9	0.00	58.37	38.76

CALCULOS DE PRUEBA DE CARGA
VTO TORRELLES

	10	0.00	2.16	38.76
10	10	0.00	2.17	38.76
	11	0.00	-54.04	38.76
11	11	0.00	-54.04	3.38
	12	0.00	-60.47	3.38
12	12	0.00	-60.47	3.38
	13	0.00	-66.89	3.38
13	13	0.00	-66.89	3.38
	14	0.00	-73.32	3.38
14	14	0.00	-73.32	3.38
	15	0.00	-79.74	3.38
15	15	0.00	-79.74	3.38
	16	0.00	-86.17	3.38
16	16	0.00	-86.17	3.38
	17	0.00	-92.59	3.38
17	17	0.00	-92.59	3.38
	18	0.00	-99.02	3.38
18	18	0.00	-99.02	3.38
	19	0.00	-105.44	3.38
19	19	0.00	-105.44	3.38
	20	0.00	-111.86	3.38
20	20	0.00	-111.86	3.38
	21	0.00	-118.29	3.38
21	21	0.00	-118.29	-68.16
	22	0.00	-19.46	-68.16
22	22	0.00	-19.46	-68.16
	23	0.00	79.37	-68.16
23	23	0.00	79.37	-68.16
	24	0.00	178.20	-68.16
24	24	0.00	178.20	-68.16
	25	0.00	252.63	-28.16
25	25	0.00	252.63	-28.16
	26	0.00	293.46	-28.16
26	26	0.00	293.46	-28.16
	27	0.00	276.29	11.84
27	27	0.00	276.29	11.84
	28	-0.00	225.52	51.84
28	28	0.00	225.52	51.84
	29	0.00	150.35	51.84
29	29	0.00	150.35	51.84
	30	0.00	75.17	51.84
30	30	0.00	75.17	51.84
	31	0.00	0.00	51.84

CALCULOS DE PRUEBA DE CARGA VTO TORRELLES

VTO TORRELLES PRUEBA DE CARGA

Hip. nº 3 ESTADO DE CARGAS 3

Desplazamientos de nudos

Nudo	Dpl. x	Dpl. y	Giro z
1	0.000000	-0.000000	-0.000094
2	0.000000	-0.000129	-0.000079
3	0.000000	-0.000219	-0.000042
4	0.000000	-0.000249	0.000001
5	0.000000	-0.000222	0.000034
6	0.000000	-0.000157	0.000054
7	0.000000	-0.000073	0.000060
8	0.000000	0.000011	0.000054
9	0.000000	0.000076	0.000033
10	0.000000	0.000091	-0.000018
11	0.000000	-0.000000	-0.000116
12	0.000000	-0.000339	-0.000222
13	0.000000	-0.000786	-0.000235
14	0.000000	-0.001195	-0.000189
15	0.000000	-0.001485	-0.000115
16	0.000000	-0.001625	-0.000032
17	0.000000	-0.001601	0.000059
18	0.000000	-0.001395	0.000158
19	0.000000	-0.001010	0.000243
20	0.000000	-0.000504	0.000279
21	0.000000	-0.000000	0.000236
22	0.000000	0.000292	0.000168
23	0.000000	0.000492	0.000108
24	0.000000	0.000610	0.000055
25	0.000000	0.000656	0.000009
26	0.000000	0.000640	-0.000029
27	0.000000	0.000574	-0.000061
28	0.000000	0.000466	-0.000086
29	0.000000	0.000328	-0.000104
30	0.000000	0.000169	-0.000114
31	0.000000	0.000000	-0.000118

Reacciones en apoyos

Nudo	Fza. x	Fza. y	Mto. z
1	-0.00	54.44	-0.00
11	-0.00	235.12	0.00
21	0.00	124.12	0.00
31	0.00	-13.68	0.00

Esfuerzos en extremos de barras

Barra	Ext.	Axil	Flector	Cortante
1	1	0.00	0.00	-54.44
	2	0.00	78.93	-54.44
2	2	0.00	78.93	-54.44
	3	0.00	117.07	-14.44
3	3	0.00	117.07	-14.44
	4	0.00	111.20	25.56
4	4	0.00	111.20	25.56
	5	0.00	74.14	25.56
5	5	0.00	74.14	25.56
	6	0.00	37.07	25.56
6	6	0.00	37.07	25.56
	7	0.00	0.00	25.56
7	7	0.00	0.00	25.56
	8	0.00	-37.06	25.56
8	8	0.00	-37.06	25.56
	9	0.00	-94.93	65.56
9	9	0.00	-94.93	65.56

CALCULOS DE PRUEBA DE CARGA
VTO TORRELLES

	10	0.00	-196.79	105.56
10	10	0.00	-196.79	105.56
	11	0.00	-349.86	105.56
11	11	0.00	-349.86	-129.55
	12	0.00	-113.70	-89.55
12	12	0.00	-113.71	-89.55
	13	0.00	52.85	-49.55
13	13	0.00	52.85	-49.55
	14	0.00	147.00	-49.55
14	14	0.00	147.00	-49.56
	15	0.00	167.96	-9.56
15	15	0.00	167.95	-9.55
	16	0.00	186.11	-9.55
16	16	0.00	186.11	-9.55
	17	0.00	204.26	-9.55
17	17	0.00	204.26	-9.55
	18	0.00	209.61	30.45
18	18	0.00	209.61	30.45
	19	0.00	145.36	70.45
19	19	0.00	145.36	70.45
	20	-0.00	11.51	110.45
20	20	-0.00	11.51	110.45
	21	-0.00	-198.34	110.45
21	21	-0.00	-198.34	-13.68
	22	-0.00	-178.50	-13.68
22	22	-0.00	-178.50	-13.68
	23	-0.00	-158.67	-13.68
23	23	-0.00	-158.67	-13.68
	24	-0.00	-138.84	-13.68
24	24	-0.00	-138.84	-13.68
	25	-0.00	-119.00	-13.68
25	25	-0.00	-119.00	-13.68
	26	-0.00	-99.17	-13.68
26	26	-0.00	-99.17	-13.68
	27	-0.00	-79.34	-13.68
27	27	-0.00	-79.34	-13.68
	28	-0.00	-59.50	-13.68
28	28	-0.00	-59.50	-13.68
	29	-0.00	-39.67	-13.68
29	29	0.00	-39.67	-13.68
	30	0.00	-19.83	-13.68
30	30	0.00	-19.83	-13.68
	31	0.00	0.00	-13.68

CALCULOS DE PRUEBA DE CARGA VTO TORRELLES

VTO TORRELLES PRUEBA DE CARGA

Hip. nº 4 ESTADO DE CARGAS 4

Desplazamientos de nudos

Nudo	Dpl. x	Dpl. y	Giro z
1	0.000000	0.000000	0.000076
2	0.000000	0.000109	0.000074
3	0.000000	0.000211	0.000067
4	0.000000	0.000301	0.000055
5	0.000000	0.000370	0.000039
6	0.000000	0.000413	0.000019
7	0.000000	0.000423	-0.000006
8	0.000000	0.000393	-0.000036
9	0.000000	0.000317	-0.000070
10	0.000000	0.000188	-0.000109
11	0.000000	-0.000000	-0.000152
12	0.000000	-0.000331	-0.000189
13	0.000000	-0.000692	-0.000183
14	0.000000	-0.000998	-0.000132
15	0.000000	-0.001168	-0.000044
16	0.000000	-0.001164	0.000046
17	0.000000	-0.001011	0.000111
18	0.000000	-0.000760	0.000149
19	0.000000	-0.000462	0.000160
20	0.000000	-0.000173	0.000134
21	0.000000	-0.000000	0.000033
22	0.000000	-0.000021	-0.000052
23	0.000000	-0.000124	-0.000084
24	0.000000	-0.000246	-0.000079
25	0.000000	-0.000343	-0.000052
26	0.000000	-0.000394	-0.000018
27	0.000000	-0.000396	0.000014
28	0.000000	-0.000355	0.000043
29	0.000000	-0.000271	0.000071
30	0.000000	-0.000150	0.000096
31	0.000000	-0.000000	0.000107

Reacciones en apoyos

Nudo	Fza. x	Fza. y	Mto. z
1	-0.00	-8.82	0.00
11	-0.00	58.64	-0.00
21	0.00	225.76	0.00
31	0.00	44.42	-0.00

Esfuerzos en extremos de barras

Barra	Ext.	Axil	Flector	Cortante
1	1	0.00	-0.00	8.82
	2	0.00	-12.79	8.82
2	2	0.00	-12.79	8.82
	3	0.00	-25.57	8.82
3	3	0.00	-25.57	8.82
	4	0.00	-38.36	8.82
4	4	0.00	-38.36	8.82
	5	0.00	-51.14	8.82
5	5	0.00	-51.14	8.82
	6	0.00	-63.93	8.82
6	6	0.00	-63.93	8.82
	7	0.00	-76.71	8.82
7	7	0.00	-76.72	8.82
	8	0.00	-89.50	8.82
8	8	0.00	-89.50	8.82
	9	0.00	-102.29	8.82
9	9	0.00	-102.29	8.82

CALCULOS DE PRUEBA DE CARGA
VTO TORRELLES

	10	0.00	-115.07	8.82
10	10	0.00	-115.07	8.82
	11	0.00	-127.86	8.82
11	11	0.00	-127.86	-49.83
	12	0.00	-33.19	-49.83
12	12	0.00	-33.19	-49.83
	13	0.00	61.48	-49.83
13	13	0.00	61.48	-49.83
	14	0.00	156.15	-49.83
14	14	0.00	156.15	-49.83
	15	0.00	202.02	-9.83
15	15	0.00	202.02	-9.83
	16	0.00	167.89	30.17
16	16	0.00	167.89	30.17
	17	0.00	110.55	30.17
17	17	0.00	110.55	30.17
	18	0.00	53.22	30.17
18	18	0.00	53.22	30.18
	19	0.00	-4.11	30.18
19	19	0.00	-4.11	30.18
	20	0.00	-122.24	70.18
20	20	0.00	-122.24	70.18
	21	0.00	-320.38	110.18
21	21	0.00	-320.38	-115.58
	22	0.00	-152.78	-115.58
22	22	0.00	-152.78	-115.58
	23	0.00	-35.18	-75.58
23	23	0.00	-35.18	-75.58
	24	0.00	48.82	-35.58
24	24	0.00	48.82	-35.58
	25	0.00	99.21	4.42
25	25	0.00	99.21	4.42
	26	0.00	92.81	4.42
26	26	0.00	92.81	4.42
	27	0.00	86.41	4.42
27	27	0.00	86.41	4.42
	28	0.00	80.01	4.42
28	28	0.00	80.01	4.42
	29	0.00	73.61	4.42
29	29	0.00	73.61	4.42
	30	0.00	64.40	44.42
30	30	0.00	64.40	44.42
	31	0.00	-0.00	44.42

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Structural Analysis Programs

Nonlin/Adv Version 8.2.3

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D I S P L A C E M E N T D E G R E E S O F F R E E D O M

(A) = Active DOF, equilibrium equation
(-) = Restrained DOF, reaction computed
(+) = Constrained DOF
(>) = External substructure DOF
() = Null DOF

JOINTS			UX	UY	UZ	RX	RY	RZ
1			-	-	-		A	
2	T0	10	A		A		A	
11			-	-	-		A	
12	T0	20	A		A		A	
21			-	-	-		A	
22	T0	30	A		A		A	
31			-	-	-		A	

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A S S E M B L E D J O I N T M A S S E S
IN GLOBAL COORDINATES

JOINT	UX	UY	UZ	RX	RY
RZ					
1	0.003856	0.003856	0.003856	.000000	.000000
.000000					
2	0.007712	0.007712	0.007712	.000000	.000000
.000000					
3	0.007712	0.007712	0.007712	.000000	.000000
.000000					
4	0.007712	0.007712	0.007712	.000000	.000000
.000000					
5	0.007712	0.007712	0.007712	.000000	.000000
.000000					
6	0.007712	0.007712	0.007712	.000000	.000000
.000000					
7	0.007712	0.007712	0.007712	.000000	.000000
.000000					
8	0.007712	0.007712	0.007712	.000000	.000000
.000000					
9	0.007712	0.007712	0.007712	.000000	.000000
.000000					
10	0.007712	0.007712	0.007712	.000000	.000000
.000000					
11	0.008909	0.008909	0.008909	.000000	.000000
.000000					
12	0.010105	0.010105	0.010105	.000000	.000000
.000000					
13	0.010105	0.010105	0.010105	.000000	.000000
.000000					
14	0.010105	0.010105	0.010105	.000000	.000000
.000000					
15	0.010105	0.010105	0.010105	.000000	.000000
.000000					
16	0.010105	0.010105	0.010105	.000000	.000000
.000000					
17	0.010105	0.010105	0.010105	.000000	.000000
.000000					
18	0.010105	0.010105	0.010105	.000000	.000000
.000000					
19	0.010105	0.010105	0.010105	.000000	.000000
.000000					
20	0.010105	0.010105	0.010105	.000000	.000000
.000000					
21	0.008909	0.008909	0.008909	.000000	.000000
.000000					
22	0.007712	0.007712	0.007712	.000000	.000000
.000000					
23	0.007712	0.007712	0.007712	.000000	.000000
.000000					
24	0.007712	0.007712	0.007712	.000000	.000000
.000000					
25	0.007712	0.007712	0.007712	.000000	.000000
.000000					
26	0.007712	0.007712	0.007712	.000000	.000000

.000000						
27	0.007712	0.007712	0.007712	.000000	.000000	
.000000						
28	0.007712	0.007712	0.007712	.000000	.000000	
.000000						
29	0.007712	0.007712	0.007712	.000000	.000000	
.000000						
30	0.007712	0.007712	0.007712	.000000	.000000	
.000000						
31	0.003856	0.003856	0.003856	.000000	.000000	
.000000						

T O T A L A S S E M B L E D J O I N T M A S S E S

IN GLOBAL COORDINATES

	UX	UY	UZ	RX	RY
RZ					
TOTAL	0.255295	0.255295	0.255295	.000000	.000000
.000000					

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3

T O T A L A C C E L E R A T E D M A S S A N D L O C A T I O
N

TOTAL MASS ACTIVATED BY ACCELERATION LOADS, IN GLOBAL COORDINATES

	UX	UY	UZ
MASS	0.229765	.000000	0.229765
X-LOC	24.000000	.000000	24.000000
Y-LOC	.000000	.000000	.000000
Z-LOC	.000000	.000000	.000000

Table: Modal Load Participation Ratios

OutputCase Text	ItemType Text	Item Text	Static Percent	Dynamic Percent
MODAL	Acceleration	UX	5,203E-14	1,601E-16
MODAL	Acceleration	UY	0,0000	0,0000
MODAL	Acceleration	UZ	99,3854	79,5962

Table: Modal Participating Mass Ratios, Part 1 of 3

OutputCase Text	StepType Text	StepNum Unitless	Period Sec	UX Unitless	UY Unitless	UZ Unitless	SumUX Unitless	SumUY Unitless
MODAL	Mode	1,000000	0,195227	0,000000	0,000000	0,013591	0,000000	0,000000
MODAL	Mode	2,000000	0,121948	7,532E-19	0,000000	1,555E-20	7,539E-19	0,000000
MODAL	Mode	3,000000	0,101468	8,473E-19	0,000000	0,782370	1,601E-18	0,000000

Table: Modal Participating Mass Ratios, Part 2 of 3

OutputCase Text	StepType Text	StepNum Unitless	SumUZ Unitless	RX Unitless	RY Unitless	RZ Unitless	SumRX Unitless	SumRY Unitless
MODAL	Mode	1,000000	0,013591	0,000000	0,000000	0,000000	0,000000	0,000000
MODAL	Mode	2,000000	0,013591	0,000000	0,685650	0,000000	0,000000	0,685650
MODAL	Mode	3,000000	0,795962	0,000000	1,434E-19	0,000000	0,000000	0,685650

Table: Modal Participating Mass Ratios, Part 3 of 3

OutputCase Text	StepType Text	StepNum Unitless	SumRZ Unitless
MODAL	Mode	1,000000	0,000000
MODAL	Mode	2,000000	0,000000
MODAL	Mode	3,000000	0,000000

Table: Modal Participation Factors, Part 1 of 2

OutputCase Text	StepType Text	StepNum Unitless	Period Sec	UX Ton-s2	UY Ton-s2	UZ Ton-s2	RX Ton-m-s2	RY Ton-m-s2
MODAL	Mode	1,000000	0,195227	-1,215E-11	0,000000	0,055882	0,000000	-6,856E-11
MODAL	Mode	2,000000	0,121948	4,160E-10	0,000000	-5,977E-11	0,000000	-5,434951
MODAL	Mode	3,000000	0,101468	-4,412E-10	0,000000	-0,423983	0,000000	-2,485E-09

Table: Modal Participation Factors, Part 2 of 2

OutputCase Text	StepType Text	StepNum Unitless	RZ Ton-m-s2	ModalMass Ton-m-s2	ModalStiff Ton-m
MODAL	Mode	1,000000	0,000000	1,0000	1035,811224
MODAL	Mode	2,000000	0,000000	1,0000	2654,671360
MODAL	Mode	3,000000	0,000000	1,0000	3834,464786

Table: Modal Periods And Frequencies

OutputCase Text	StepType Text	StepNum Unitless	Period Sec	Frequency Cyc/sec	CircFreq rad/sec	Eigenvalue rad2/sec2
MODAL	Mode	1,000000	0,195227	5,1222E+00	3,2184E+01	1,0358E+03
MODAL	Mode	2,000000	0,121948	8,2002E+00	5,1524E+01	2,6547E+03
MODAL	Mode	3,000000	0,101468	9,8554E+00	6,1923E+01	3,8345E+03

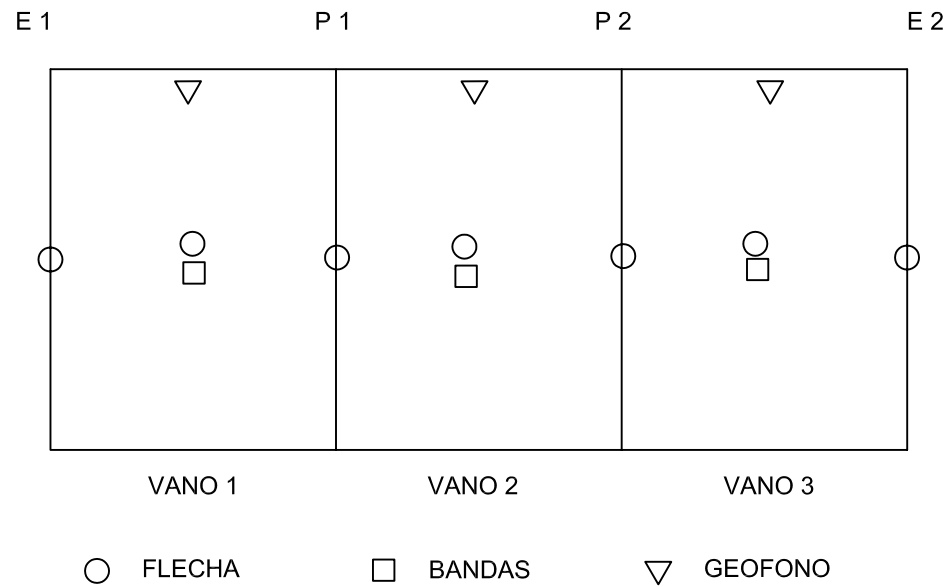
**PROYECTO DE PRUEBA DE CARGA DE LA ESTRUCTURA
62RMP102 RIERA TORRELLES (MERCANCÍAS)**

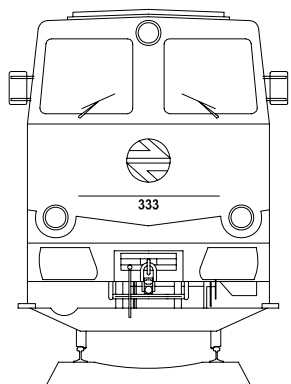
**III. -ESQUEMAS DE INSTRUMENTACIÓN PREVISTA Y TREN DE
CARGAS.**

PASO INFERIOR RIERA TORRELLES

62RMPI02

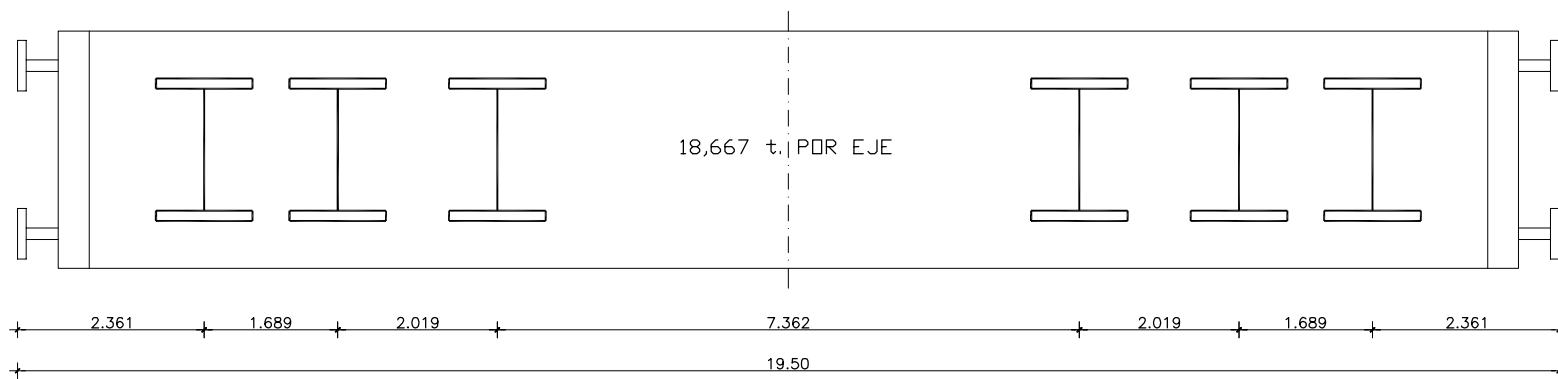
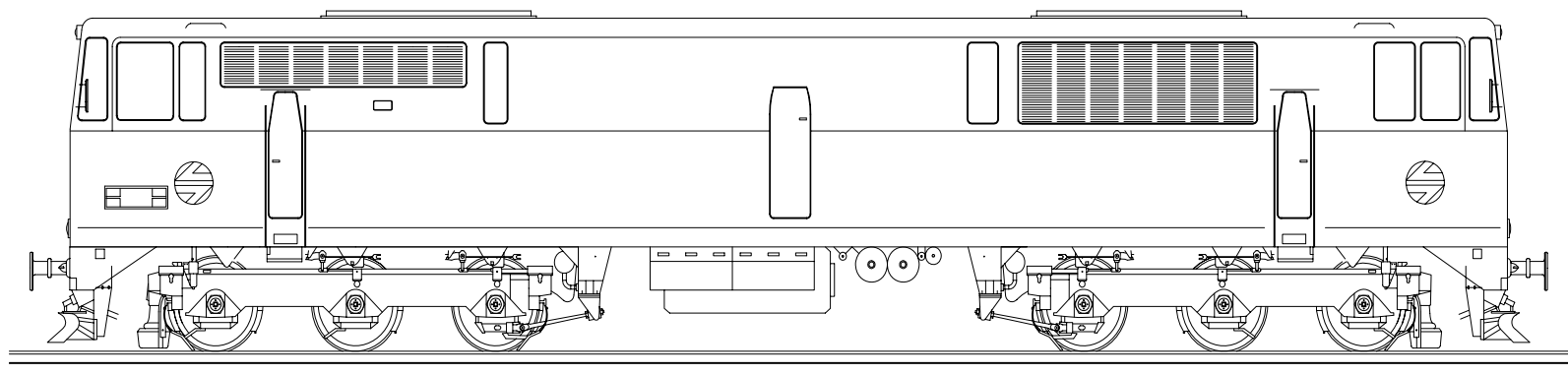
CROQUIS DE INSTRUMENTACIÓN



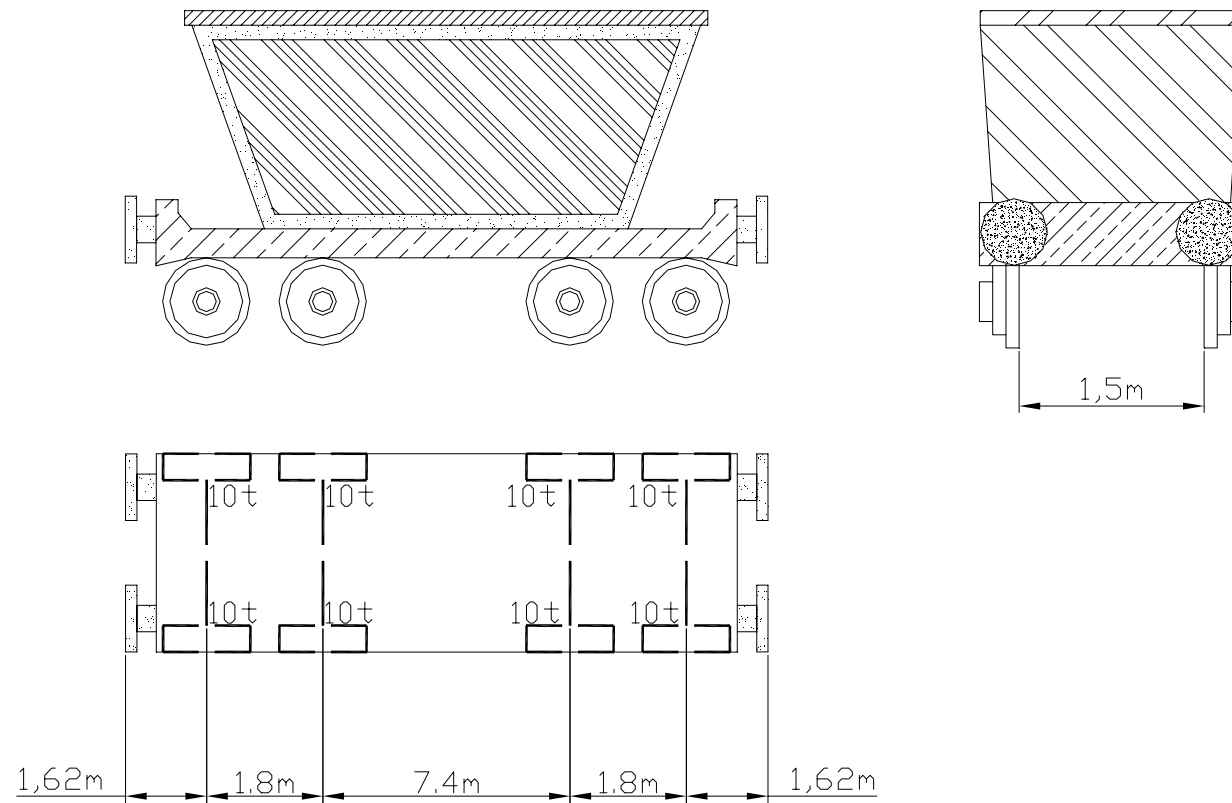


LOCOMOTORA RENFE

ESCALA 1:50

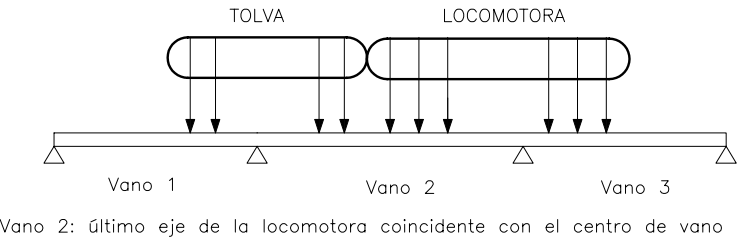


ESQUEMA DE LA TOLVA CEDIDA POR ADIF PARA LAS PRUEBAS DE CARGA

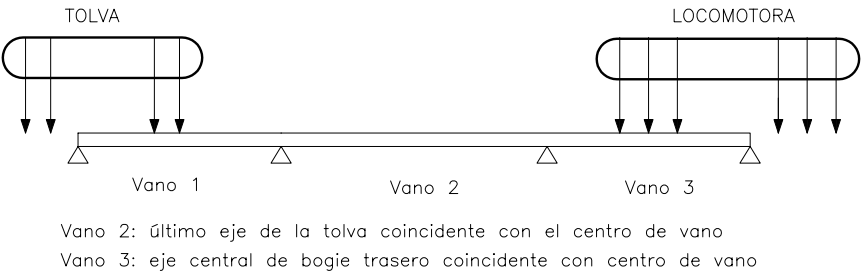


PRUEBA DE CARGA SOBRE LA ESTRUCTURA RIERA TORRELLES

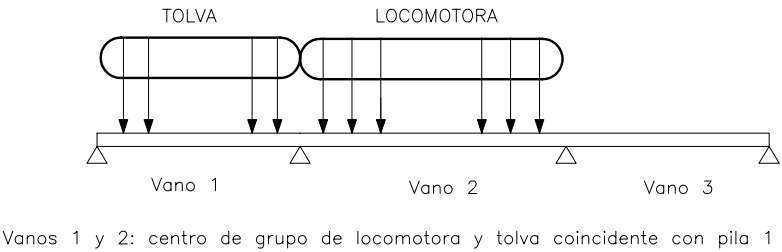
H1



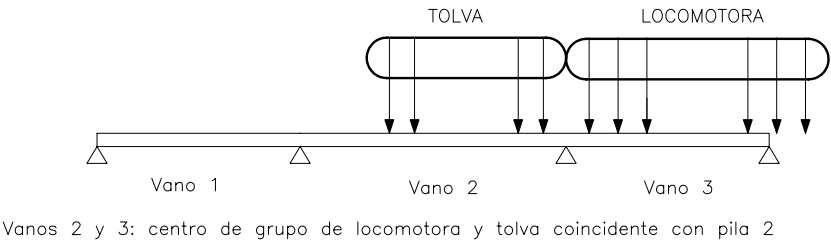
H2



H3



H4

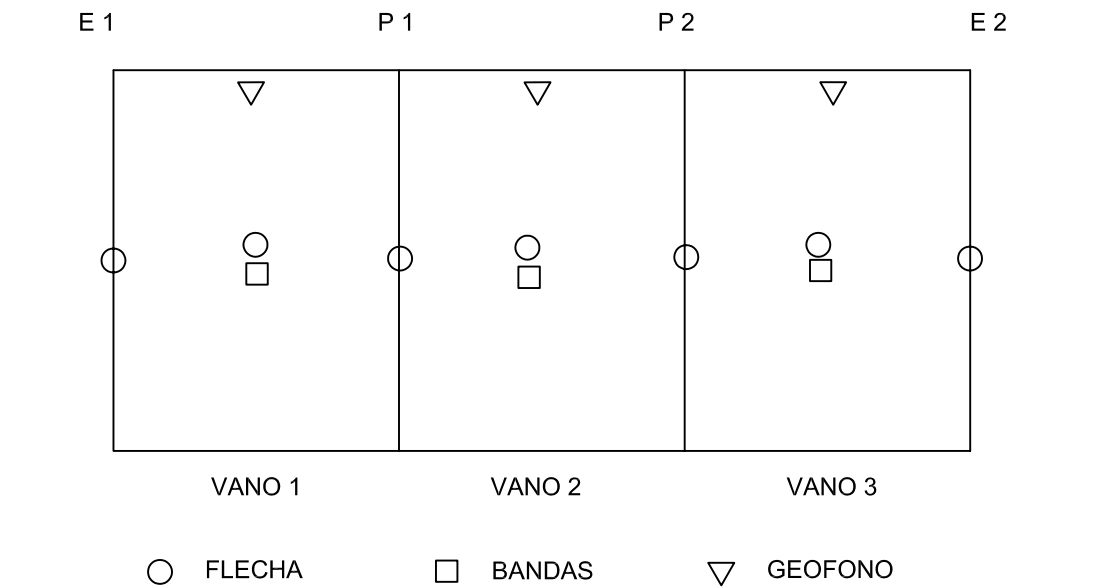


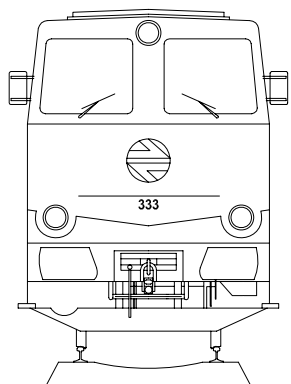
CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMP102)**

III. ESQUEMA DE INSTRUMENTACIÓN Y TREN DE CARGA

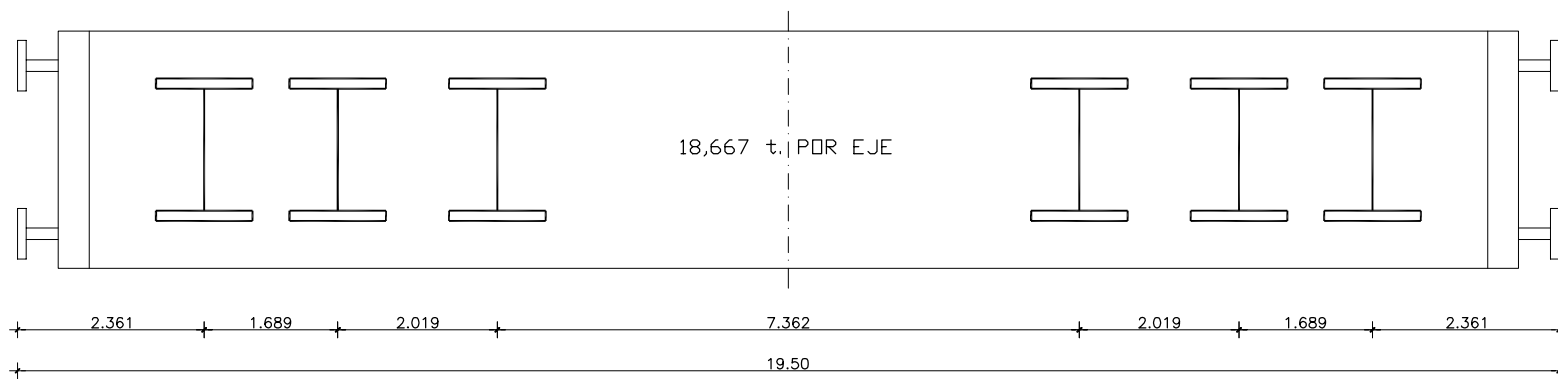
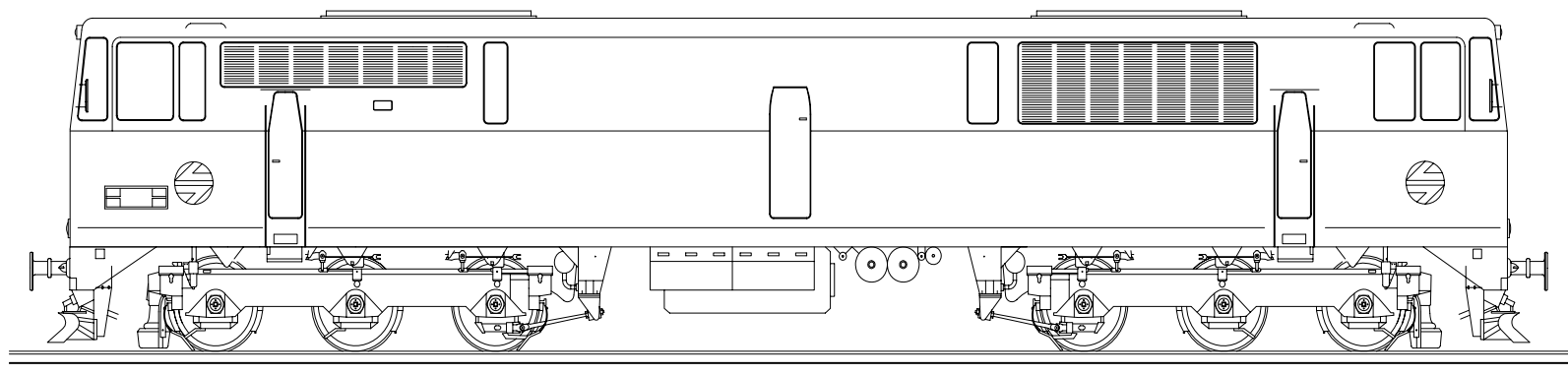
PASO INFERIOR RIERA TORRELLES
62RMPI02
CROQUIS DE INSTRUMENTACIÓN



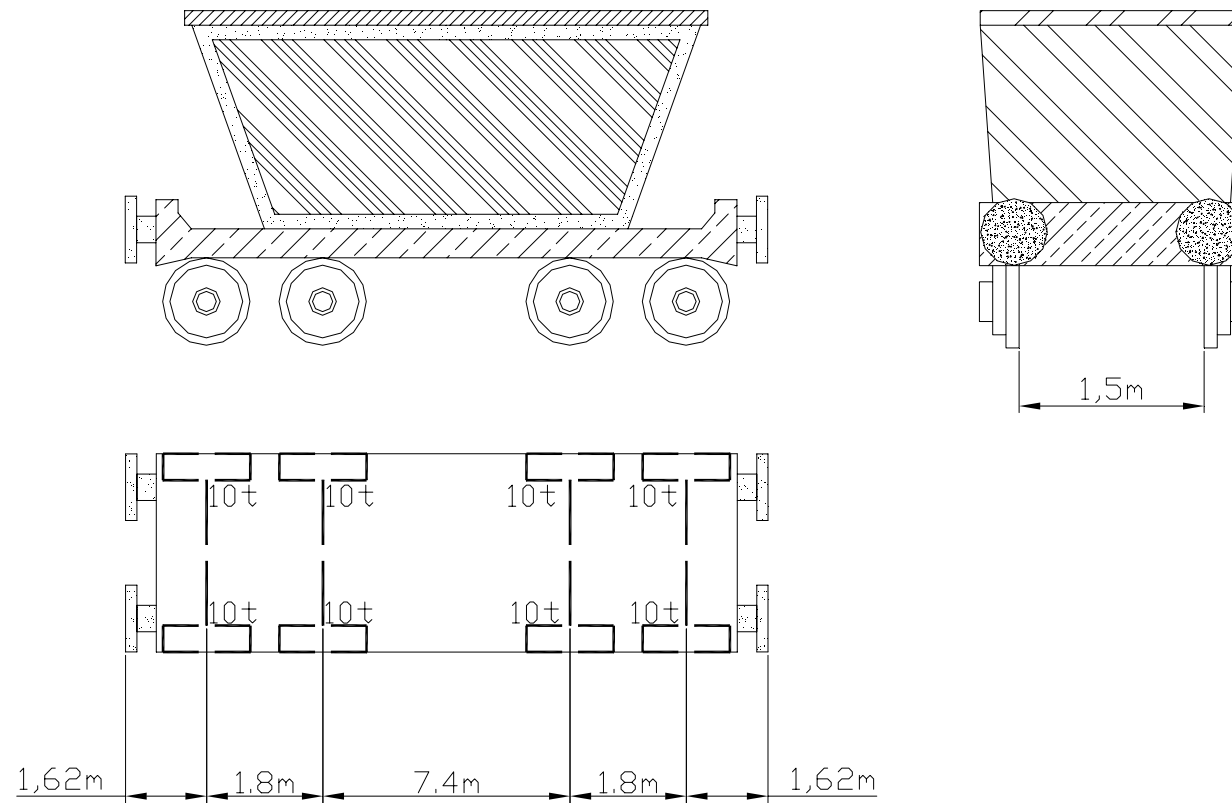


LOCOMOTORA RENFE

ESCALA 1:50

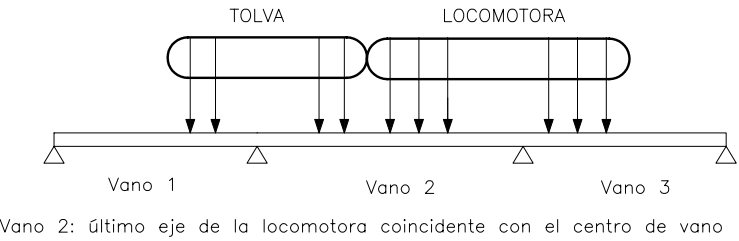


ESQUEMA DE LA TOLVA CEDIDA POR ADIF PARA LAS PRUEBAS DE CARGA

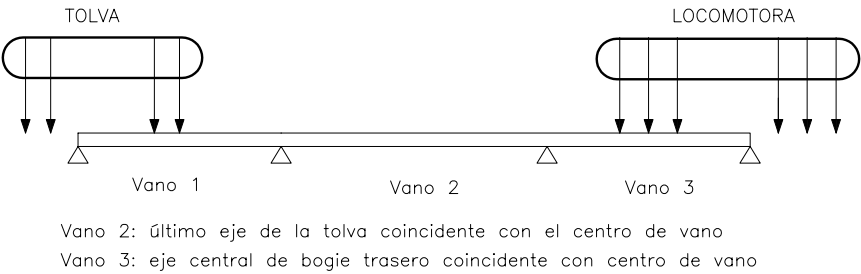


PRUEBA DE CARGA SOBRE LA ESTRUCTURA RIERA TORRELLES

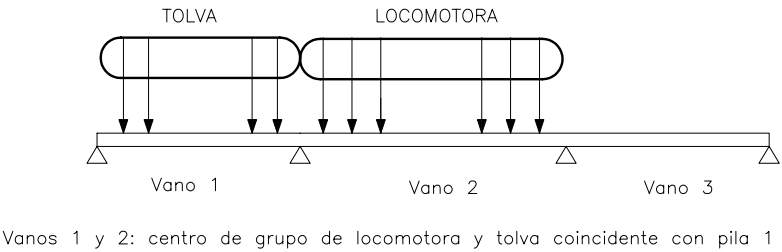
H1



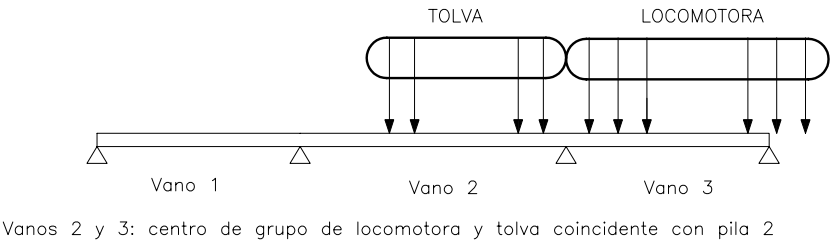
H2



H3



H4



CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

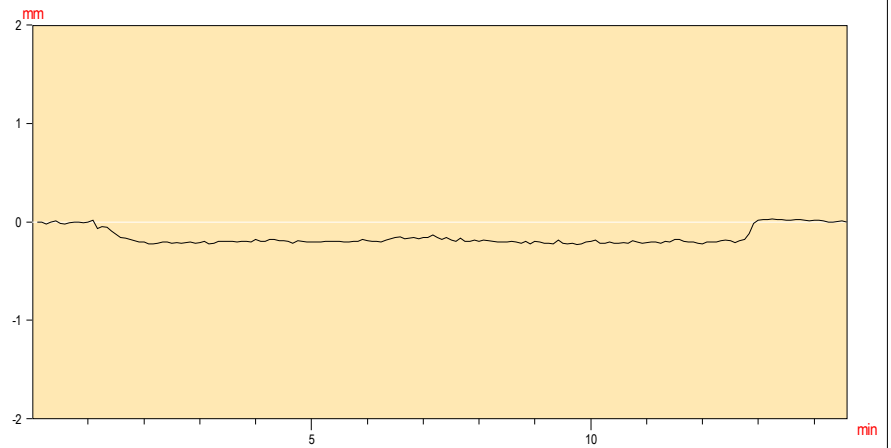
IV. REGISTRO DE MEDIDAS

Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

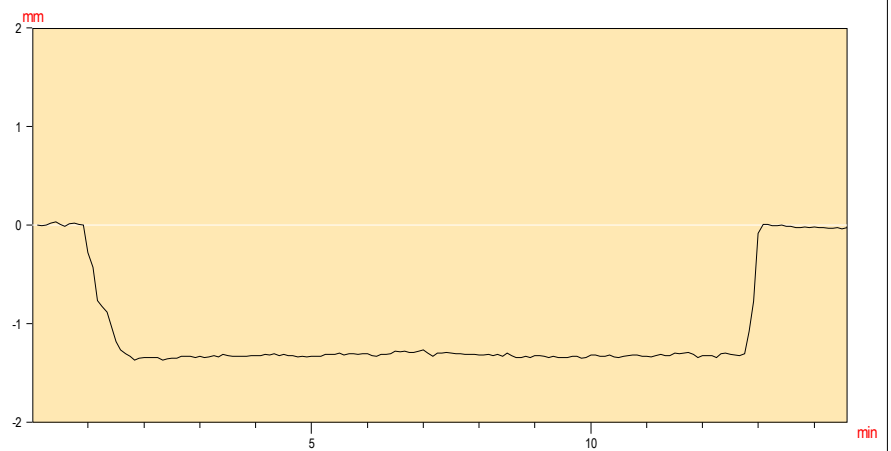
Organismo : ADIF



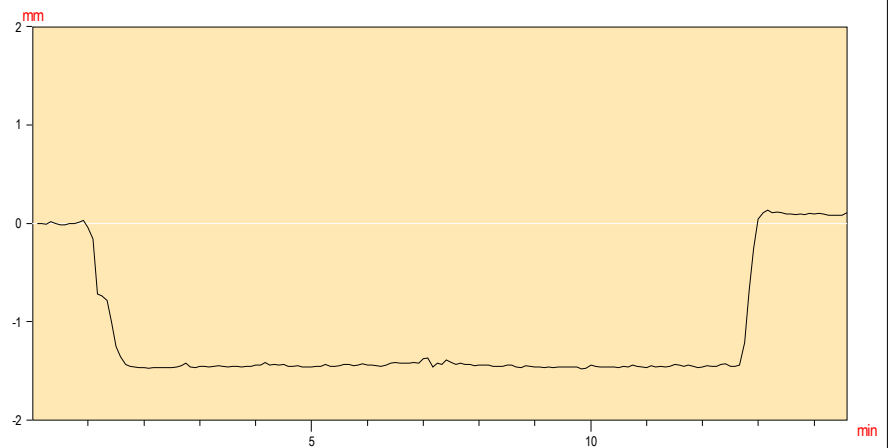
Prueba : H-1
Fecha : 03/01/07
Hora : 23:23:05
Valor Inicial = -0.00
Valor de Prueba = -0.18
Valor Residual = 0.00
Canal f5



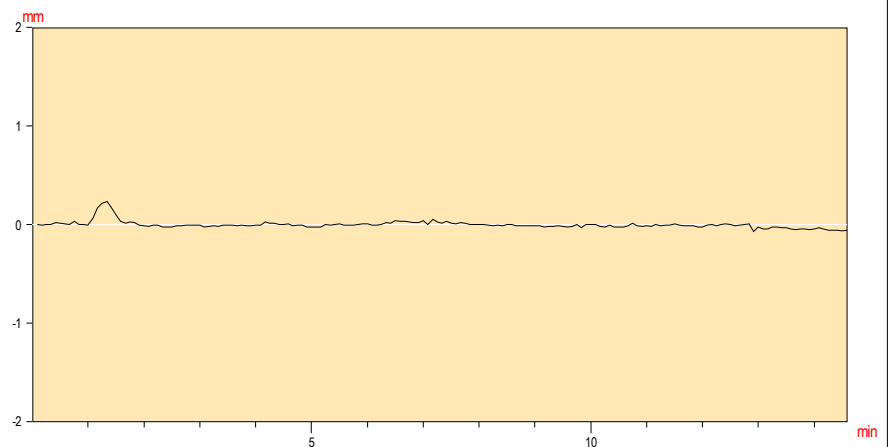
Prueba : H-1
Fecha : 03/01/07
Hora : 23:23:05
Valor Inicial = 0.02
Valor de Prueba = -1.42
Valor Residual = -0.03
Canal f6



Prueba : H-1
Fecha : 03/01/07
Hora : 23:23:05
Valor Inicial = -0.00
Valor de Prueba = -1.45
Valor Residual = 0.08
Canal f7



Prueba : H-1
Fecha : 03/01/07
Hora : 23:23:05
Valor Inicial = 0.01
Valor de Prueba = -0.01
Valor Residual = 0.00
Canal f8

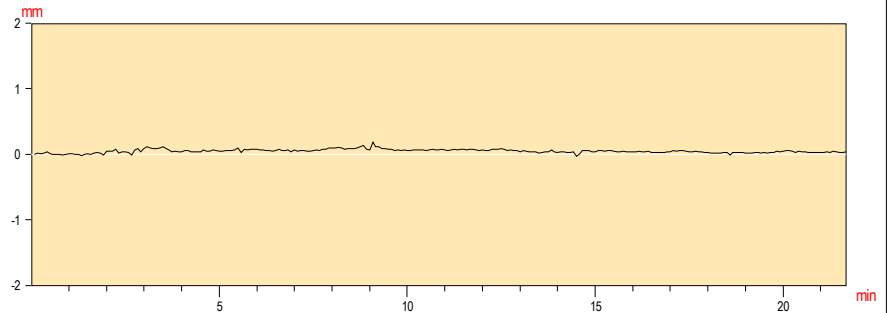


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

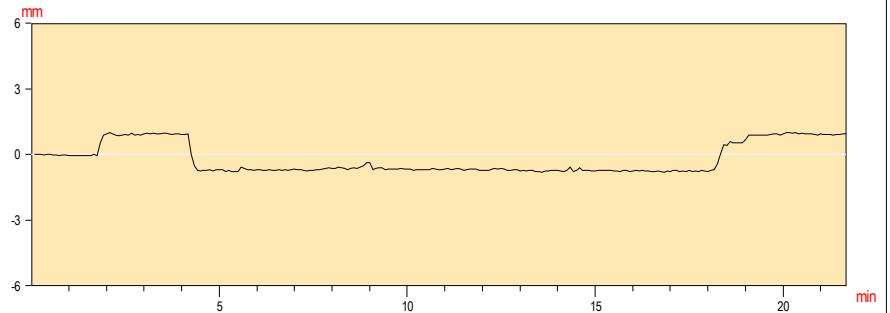
Organismo : ADIF



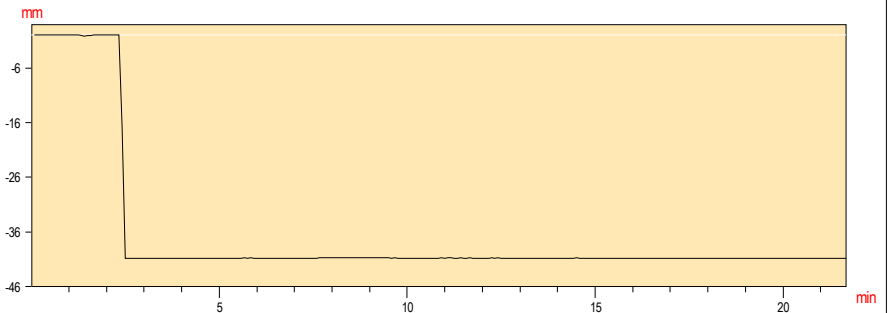
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = -0.00
Valor de Prueba = -0.03
Valor Residual = 0.02
Canal F1



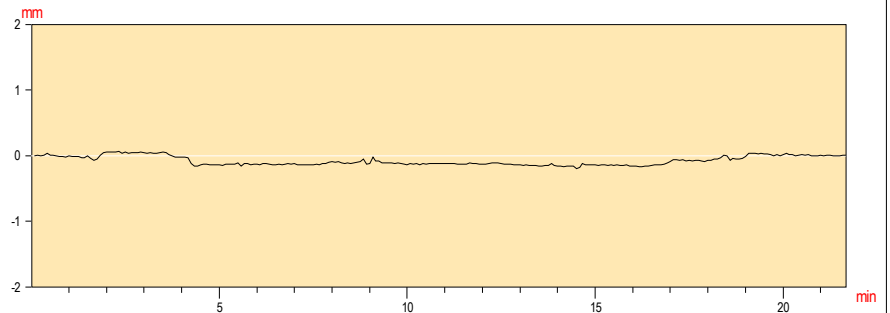
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = -0.01
Valor de Prueba = -1.02
Valor Residual = 0.18
Canal F2



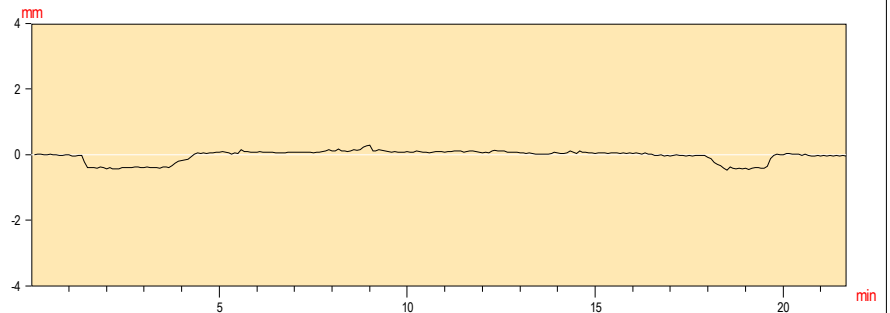
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.00
Valor de Prueba = -0.15
Valor Residual = -0.13
Canal F3



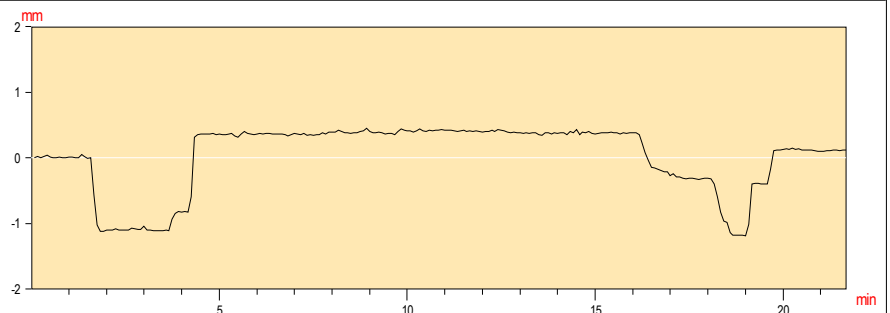
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = -0.01
Valor de Prueba = -0.16
Valor Residual = 0.00
Canal F4



Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = -0.00
Valor de Prueba = 0.88
Valor Residual = -0.02
Canal F5



Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.01
Valor de Prueba = 0.44
Valor Residual = 0.11
Canal F6

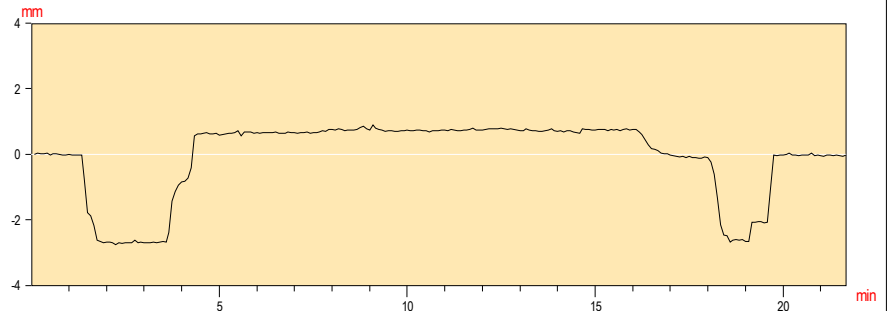


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

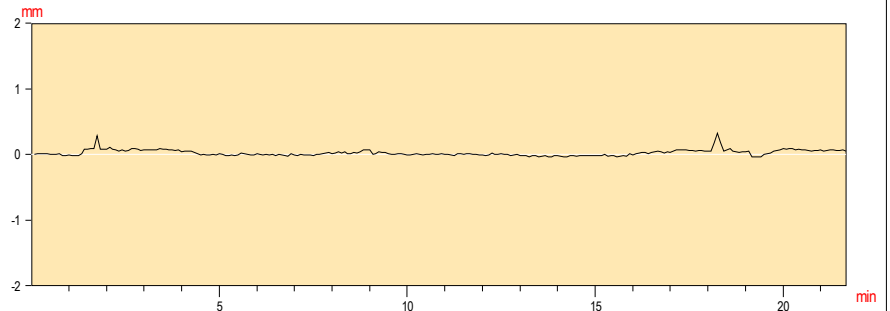
Organismo : ADIF



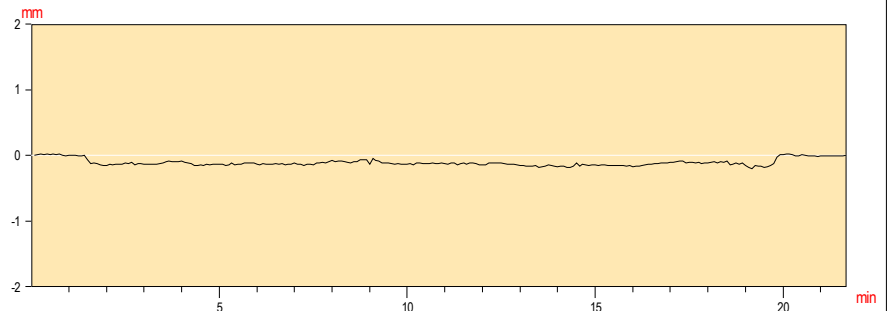
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.01
Valor de Prueba = 0.80
Valor Residual = -0.02
Canal F7



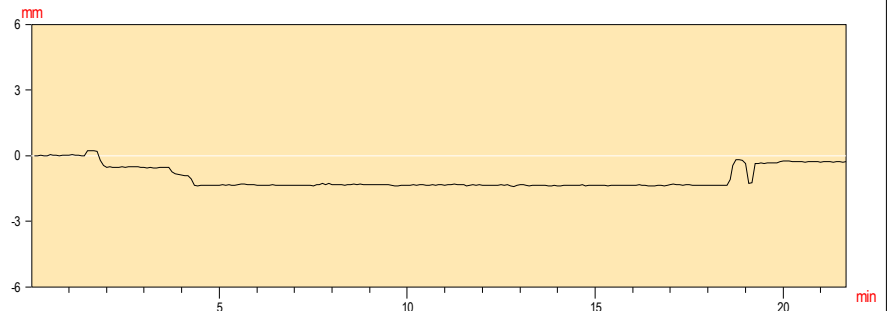
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.02
Valor de Prueba = -0.01
Valor Residual = -0.01
Canal F8



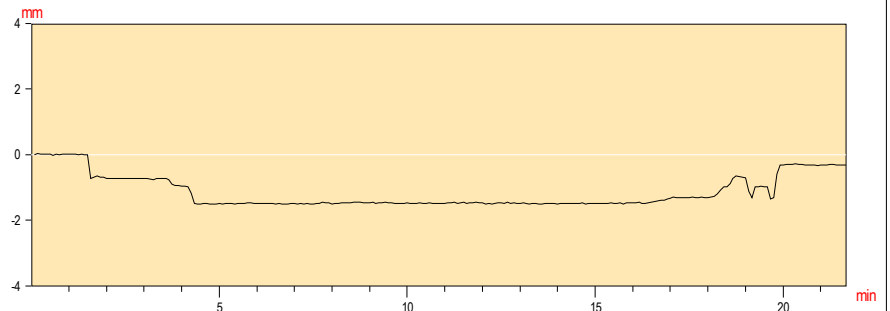
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.01
Valor de Prueba = -0.13
Valor Residual = -0.00
Canal F9



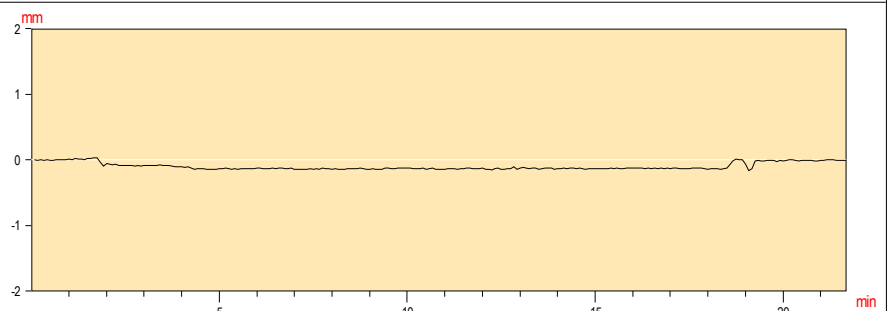
Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.00
Valor de Prueba = -1.32
Valor Residual = -0.09
Canal F10



Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.00
Valor de Prueba = -1.40
Valor Residual = -0.15
Canal F11



Prueba : H-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = -0.00
Valor de Prueba = -0.14
Valor Residual = -0.00
Canal F12

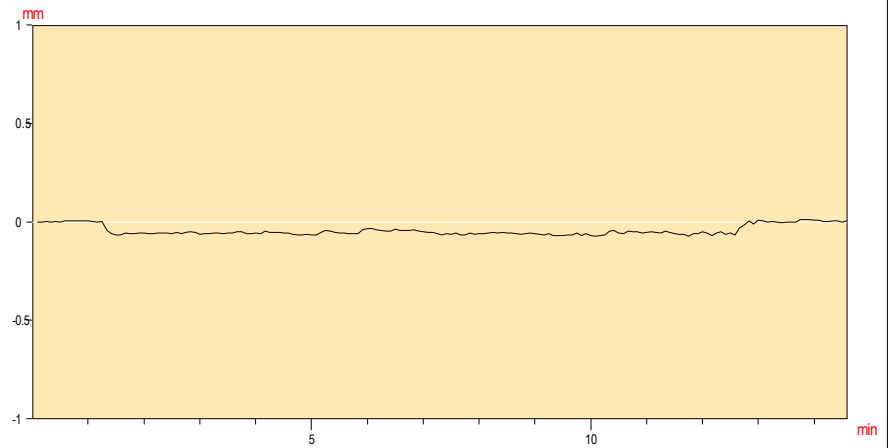


Prueba de carga de la Estructura : VIADUCTO DE RIERA TORRELLES

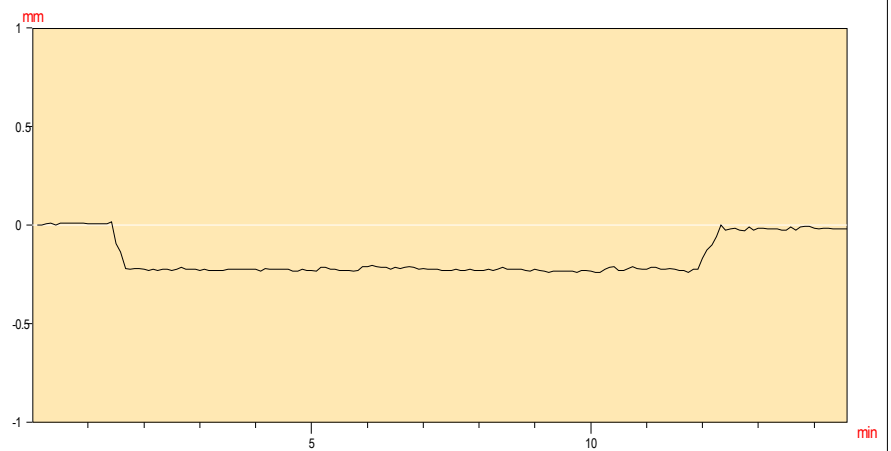
Organismo : ADIF



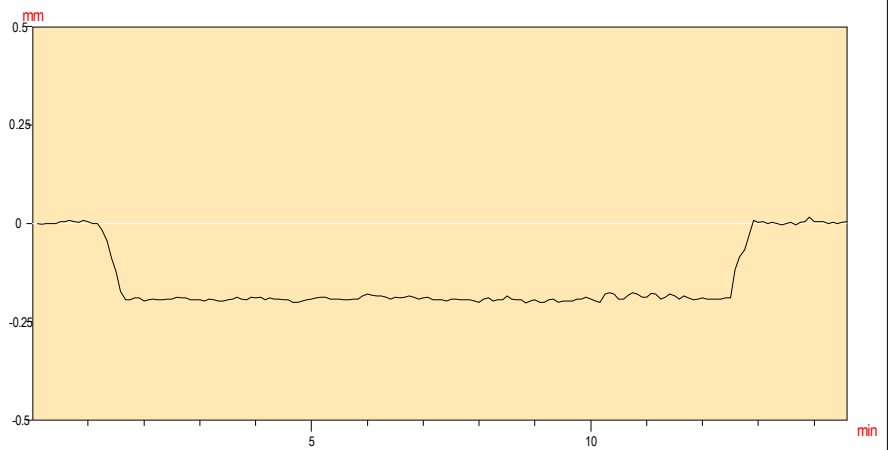
Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.00
Valor de Prueba = -0.08
Valor Residual = 0.00
Canal **F1**



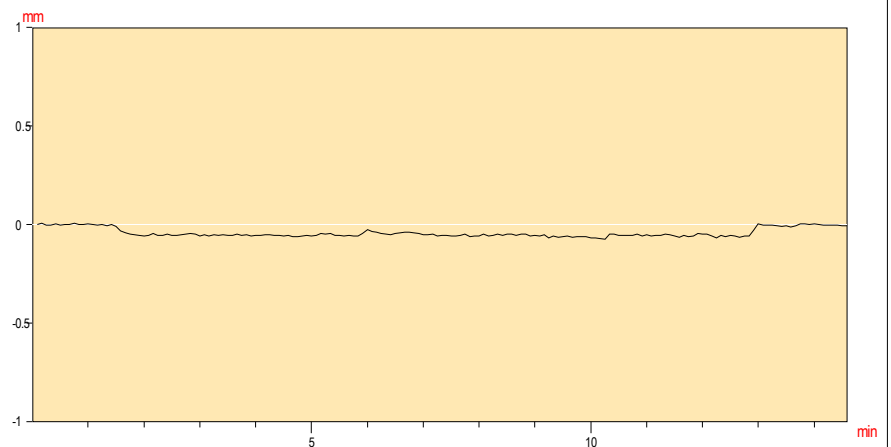
Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.02
Valor de Prueba = -0.20
Valor Residual = -0.03
Canal **F2**



Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.00
Valor de Prueba = -0.19
Valor Residual = -0.01
Canal **F3**



Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.00
Valor de Prueba = -0.05
Valor Residual = -0.00
Canal **F4**

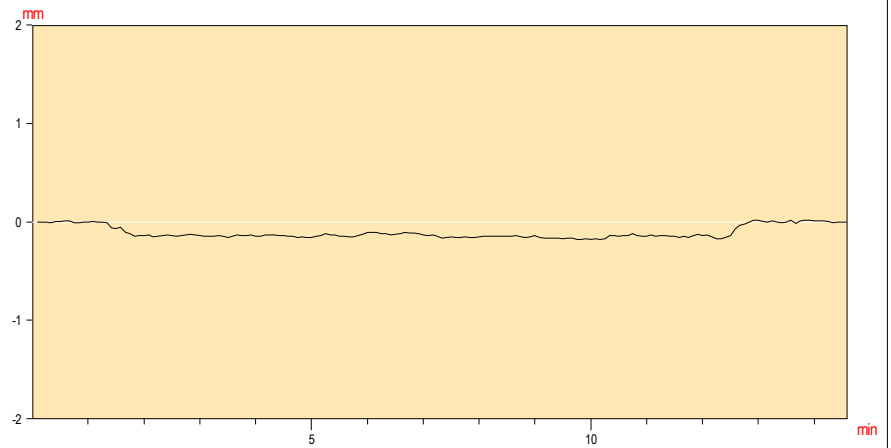


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

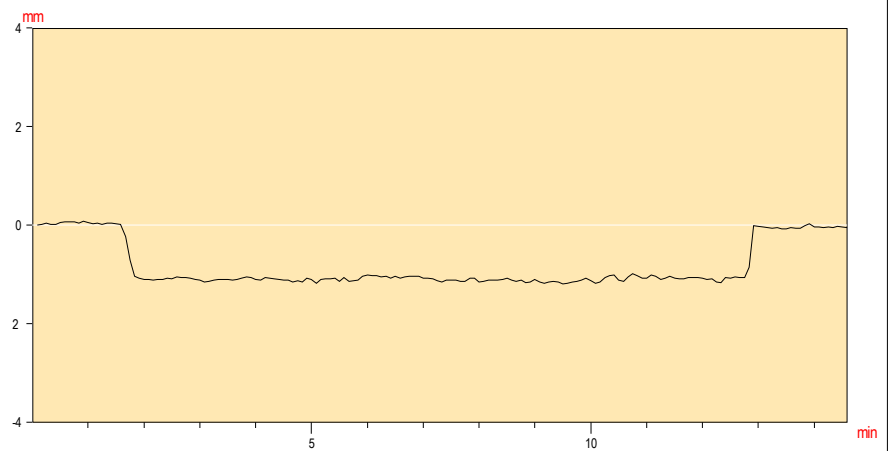
Organismo : ADIF



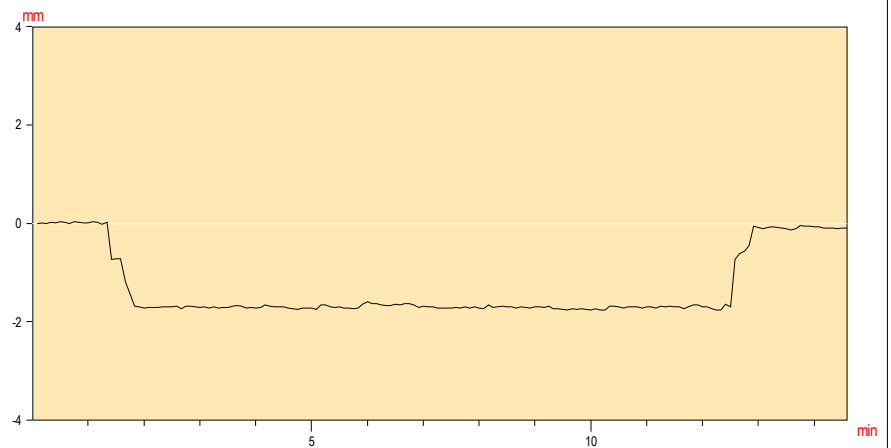
Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = -0.00
Valor de Prueba = -0.15
Valor Residual = -0.01
Canal **F5**



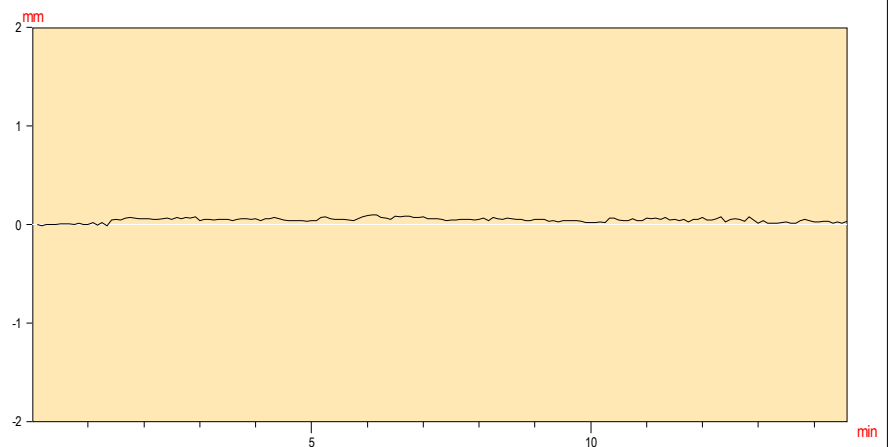
Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.01
Valor de Prueba = -1.14
Valor Residual = -0.02
Canal **F6**



Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.00
Valor de Prueba = -1.72
Valor Residual = -0.03
Canal **F7**



Prueba : **H-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.00
Valor de Prueba = -0.01
Valor Residual = 0.02
Canal **F8**

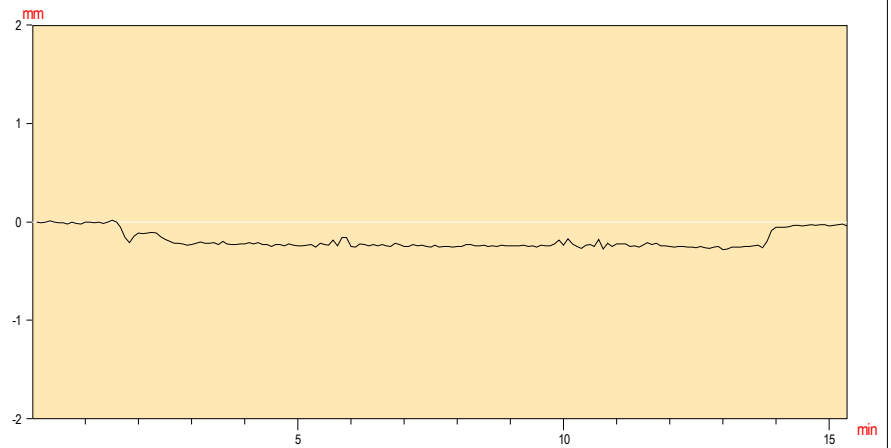


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

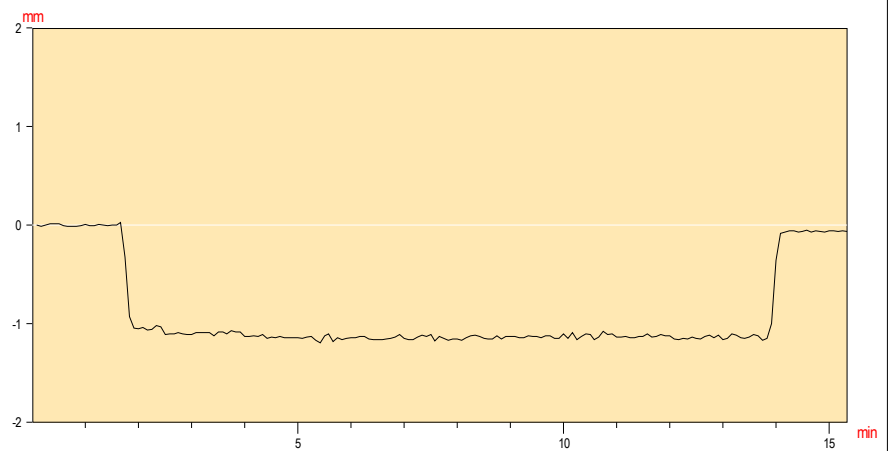
Organismo : ADIF



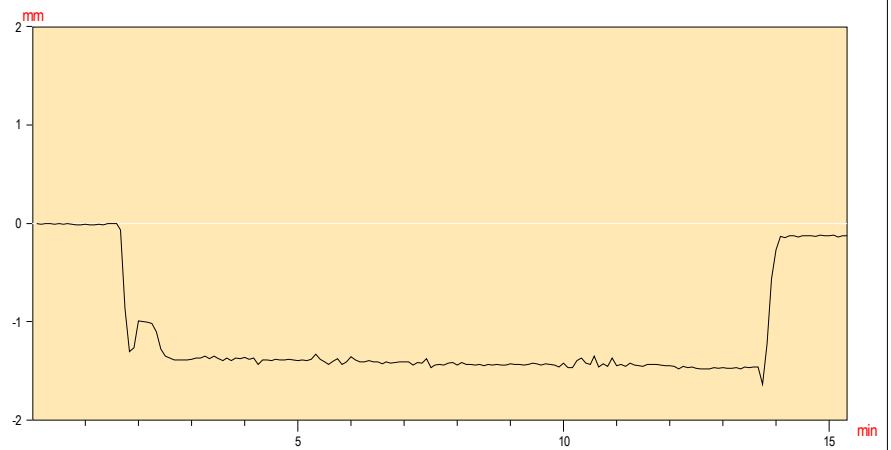
Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = -0.00
Valor de Prueba = -0.25
Valor Residual = -0.02
Canal F5



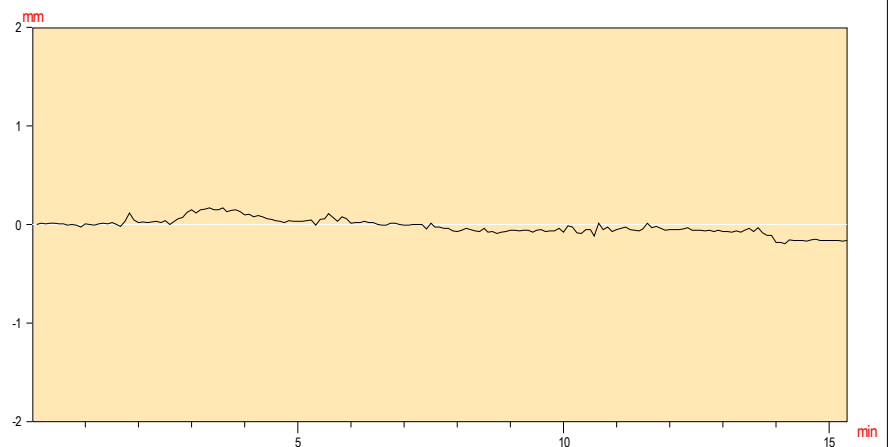
Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = 0.00
Valor de Prueba = -1.16
Valor Residual = -0.06
Canal F6



Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = 0.00
Valor de Prueba = -1.34
Valor Residual = -0.12
Canal F7



Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = 0.02
Valor de Prueba = -0.15
Valor Residual = 0.00
Canal F8

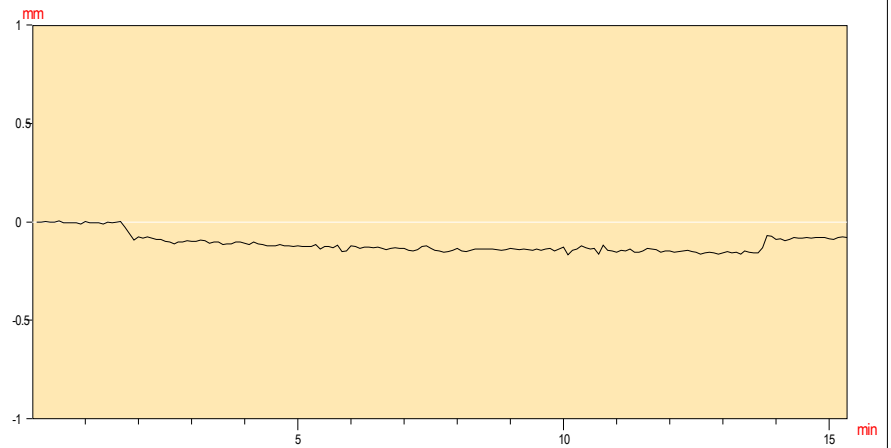


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

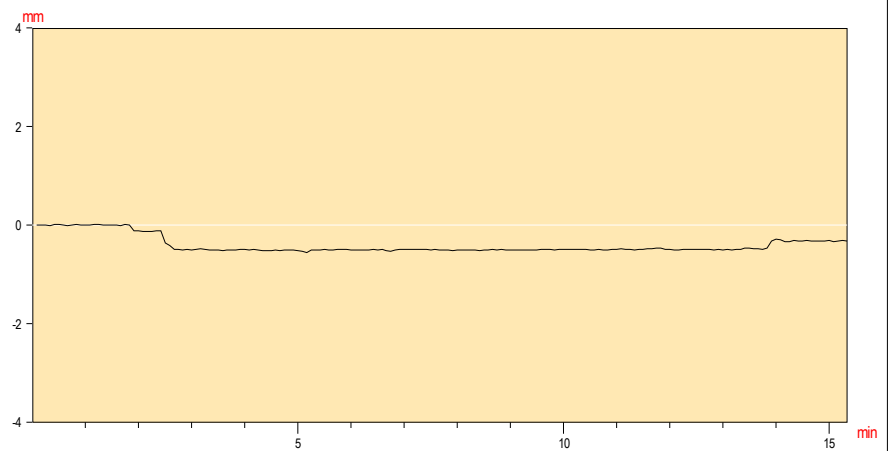
Organismo : ADIF



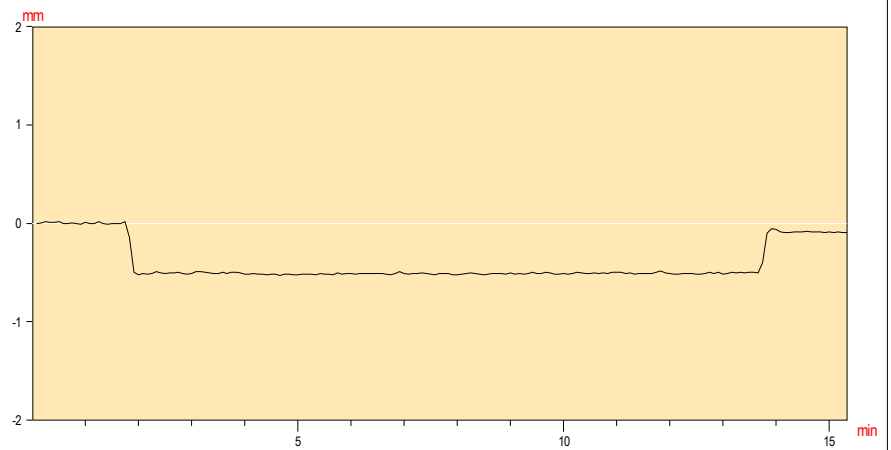
Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = 0.00
Valor de Prueba = -0.14
Valor Residual = -0.07
Canal F9



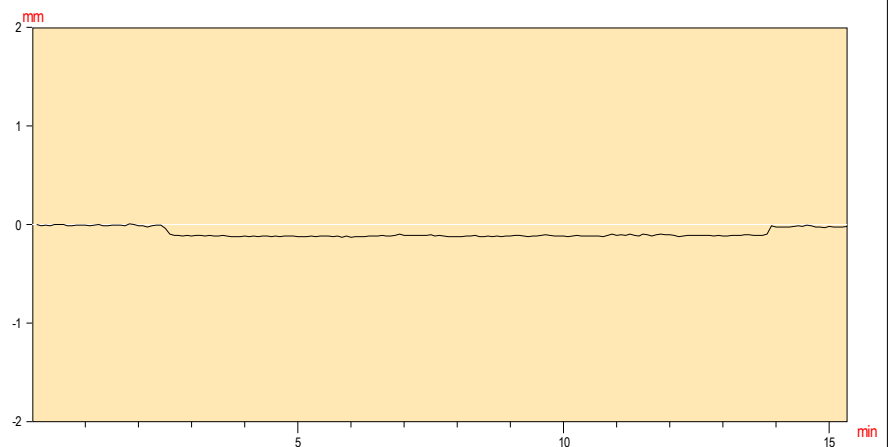
Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = 0.00
Valor de Prueba = -0.30
Valor Residual = -0.16
Canal F10



Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = 0.01
Valor de Prueba = -0.49
Valor Residual = -0.05
Canal F11



Prueba : H-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = 0.00
Valor de Prueba = -0.11
Valor Residual = -0.03
Canal F12

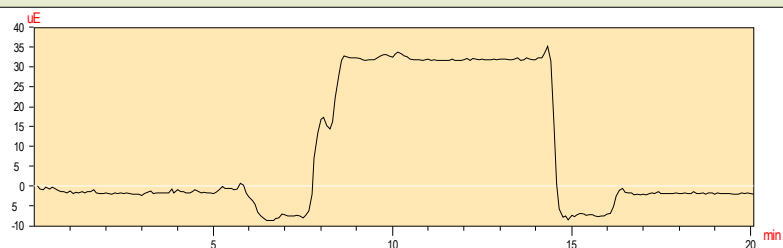


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

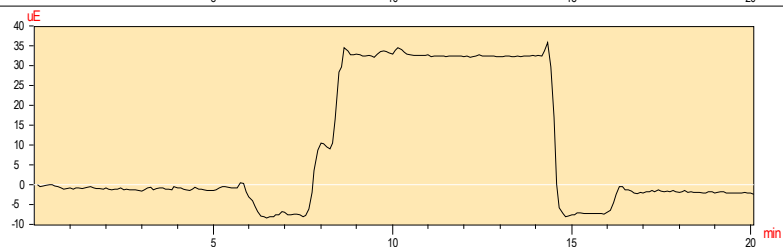
Organismo : ADIF



Prueba : E-1
Fecha : 03/01/07
Hora : 23:23:05
Valor Inicial = -0.47
Valor de Prueba = 34.50
Valor Residual = -2.11
Canal B3



Prueba : E-1
Fecha : 03/01/07
Hora : 23:23:05
Valor Inicial = -0.94
Valor de Prueba = 36.97
Valor Residual = -1.23
Canal B4

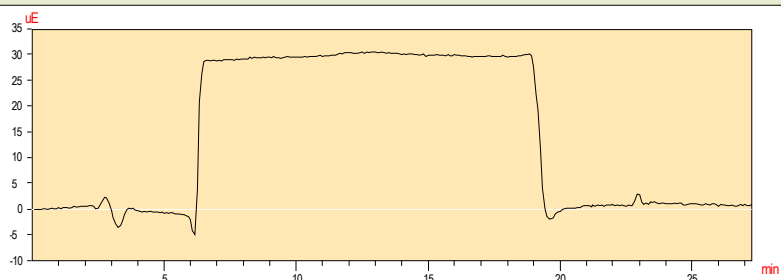


Prueba de carga de la Estructura : VIADUCTO RIERE TORRELLES

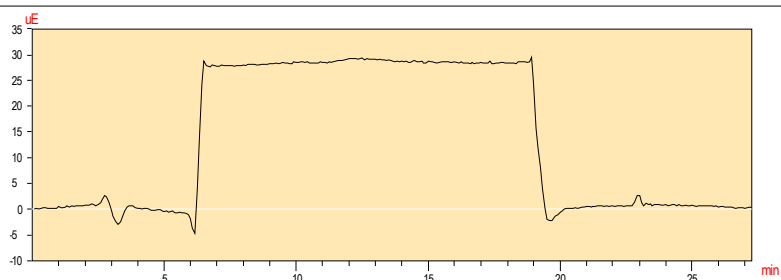
Organismo : ADIF



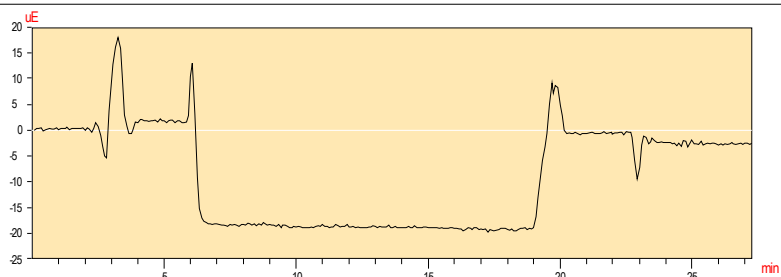
Prueba : E-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.00
Valor de Prueba = 31.57
Valor Residual = 1.29
Canal B1



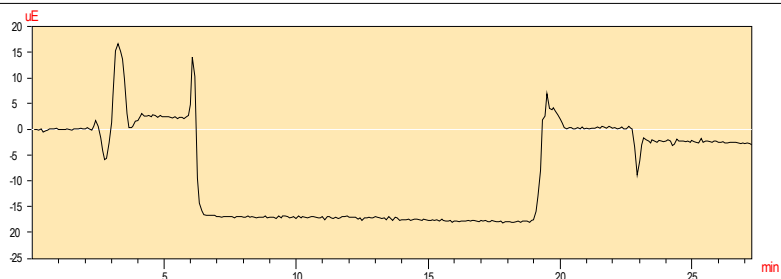
Prueba : E-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.12
Valor de Prueba = 30.93
Valor Residual = 0.23
Canal B2



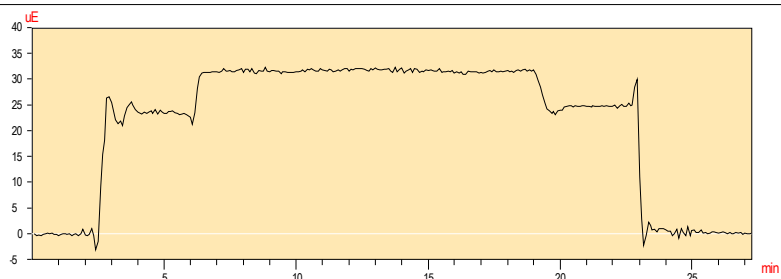
Prueba : E-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 0.35
Valor de Prueba = -16.50
Valor Residual = -5.16
Canal B3



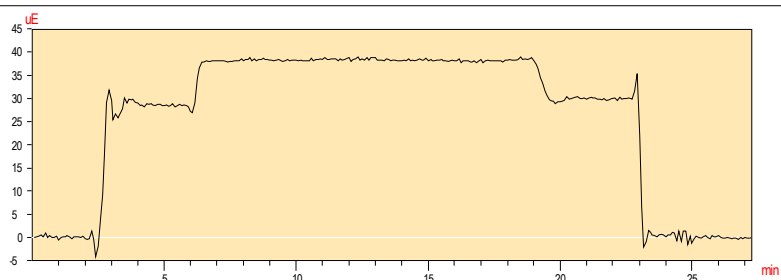
Prueba : E-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = -0.23
Valor de Prueba = -15.51
Valor Residual = -5.28
Canal B4



Prueba : E-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = -0.47
Valor de Prueba = 33.85
Valor Residual = 0.35
Canal B5



Prueba : E-2
Fecha : 03/01/07
Hora : 22:55:41
Valor Inicial = 1.06
Valor de Prueba = 38.32
Valor Residual = 0.00
Canal B6

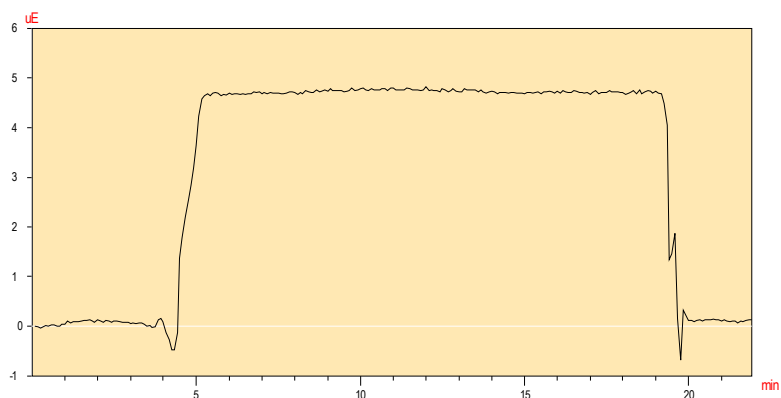


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

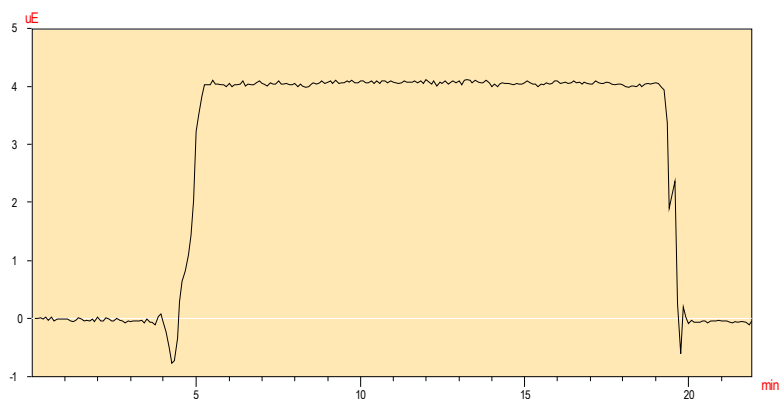
Organismo : ADIF



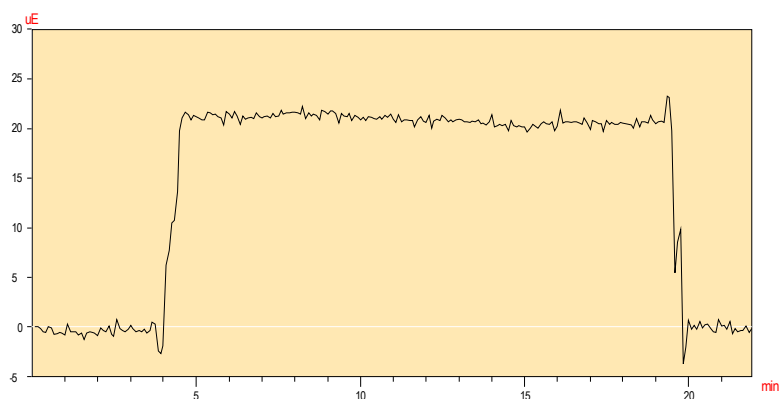
Prueba : **E-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.23
Valor de Prueba = 4.79
Valor Residual = 0.19
Canal **B1**



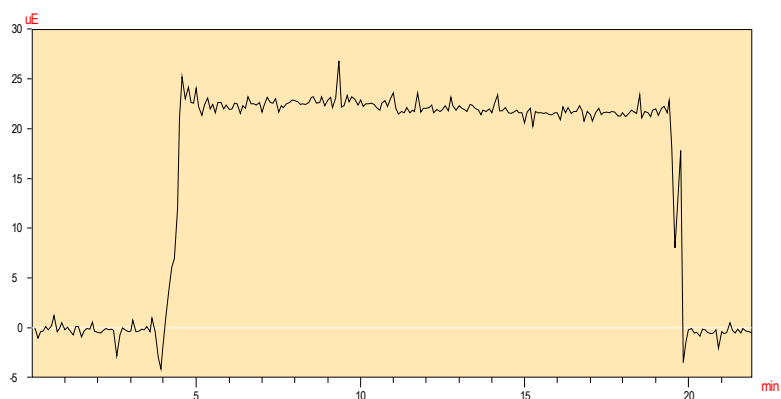
Prueba : **E-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.00
Valor de Prueba = 4.18
Valor Residual = -0.05
Canal **B2**



Prueba : **E-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = -0.94
Valor de Prueba = 22.61
Valor Residual = 0.35
Canal **B3**



Prueba : **E-3**
Fecha : 03/01/07
Hora : 22:21:46
Valor Inicial = 0.23
Valor de Prueba = 24.87
Valor Residual = 0.18
Canal **B4**

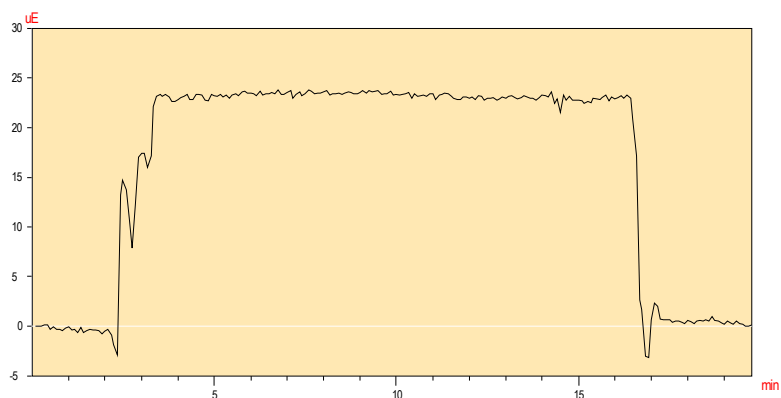


Prueba de carga de la Estructura : VIADUCTO RIERA TORRELLES

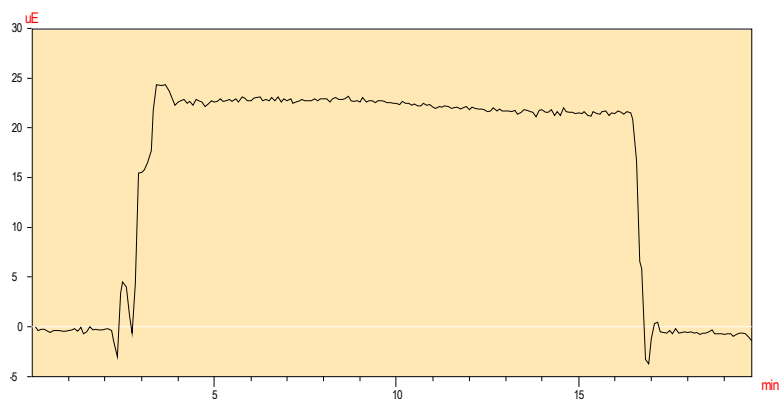
Organismo : ADIF



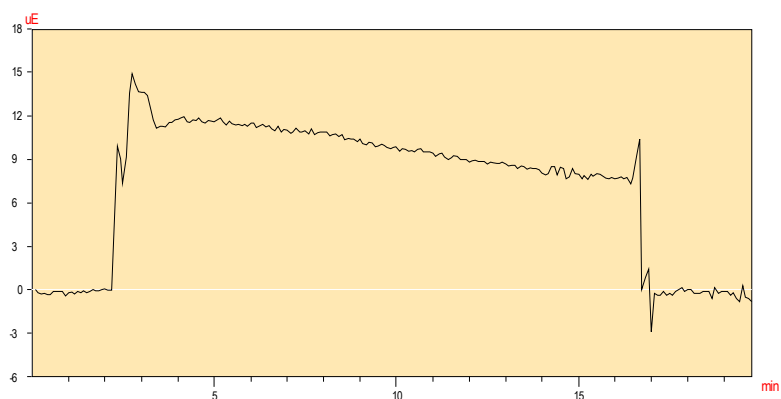
Prueba : E-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = -0.17
Valor de Prueba = 25.60
Valor Residual = 0.39
Canal B3



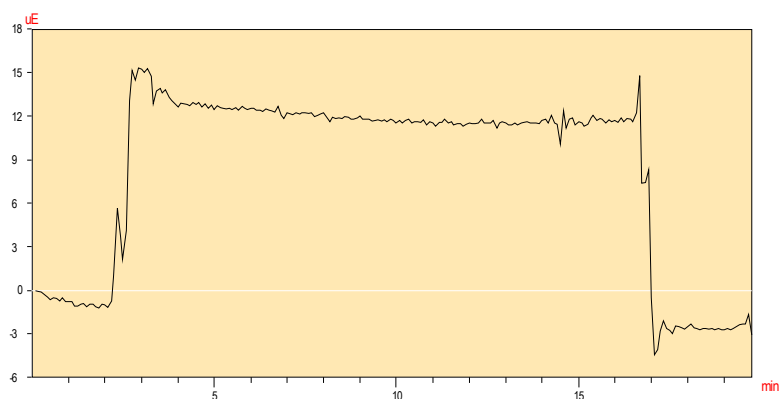
Prueba : E-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = -0.42
Valor de Prueba = 23.07
Valor Residual = -0.14
Canal B4



Prueba : E-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = -0.15
Valor de Prueba = 10.15
Valor Residual = 0.19
Canal B5



Prueba : E-4
Fecha : 03/01/07
Hora : 22:39:29
Valor Inicial = -0.06
Valor de Prueba = 13.49
Valor Residual = -0.24
Canal B6



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

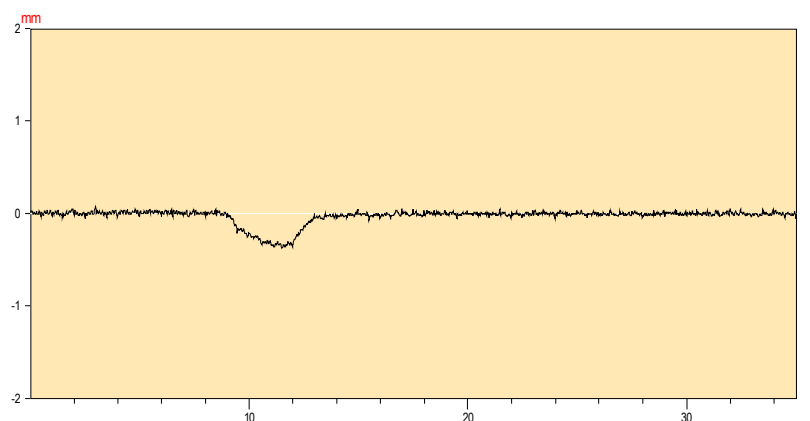
Hora : 22:15:53

Valor Inicial = 0.00

Valor de Prueba = -0.31

Valor Residual = 0.01

Canal F1



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

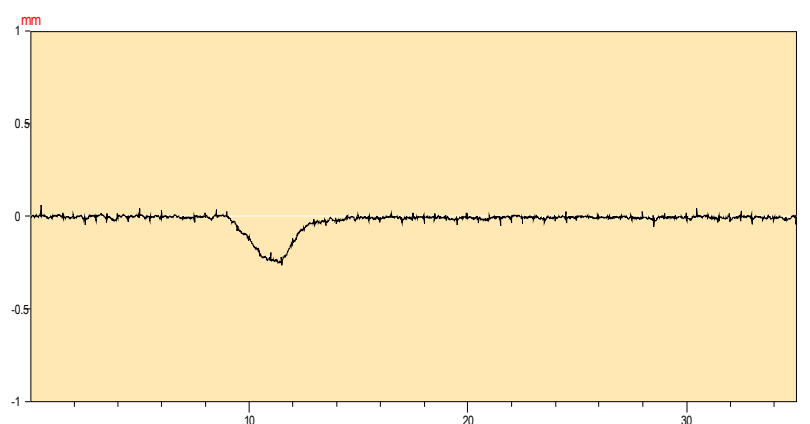
Hora : 22:10:40

Valor Inicial = -0.02

Valor de Prueba = -0.24

Valor Residual = -0.02

Canal F1



Prueba : **DINAMICA 30**

Fecha : 03/01/07

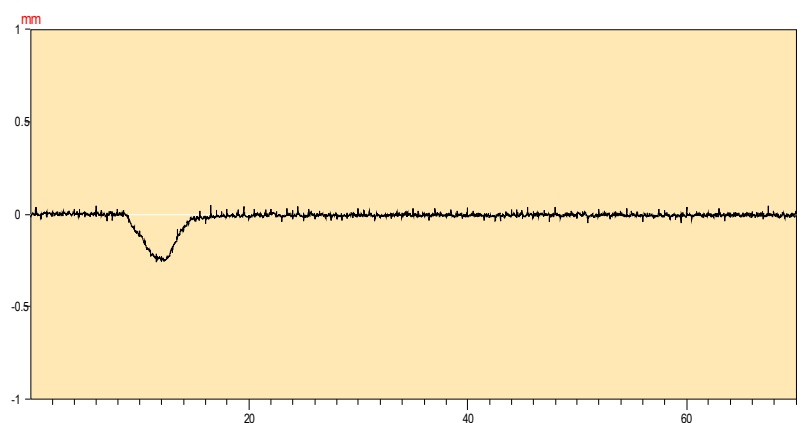
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -0.26

Valor Residual = -0.02

Canal F1



Prueba : **DINAMICA 5**

Fecha : 03/01/07

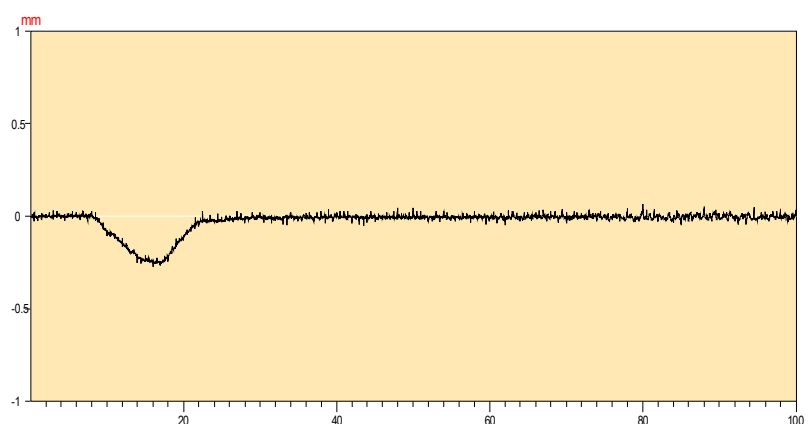
Hora : 21:58:08

Valor Inicial = -0.01

Valor de Prueba = -0.30

Valor Residual = -0.00

Canal F1



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

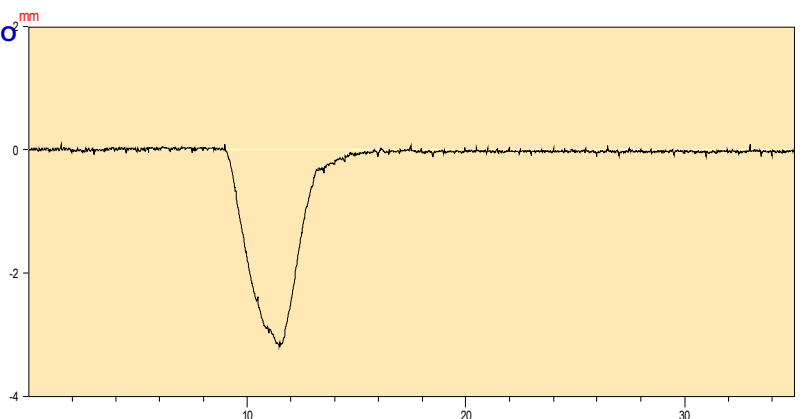
Hora : 22:15:53

Valor Inicial = -0.01

Valor de Prueba = -3.12

Valor Residual = -0.02

Canal **F2**



Prueba : **DINAMICA M A X**

Fecha : 03/01/07

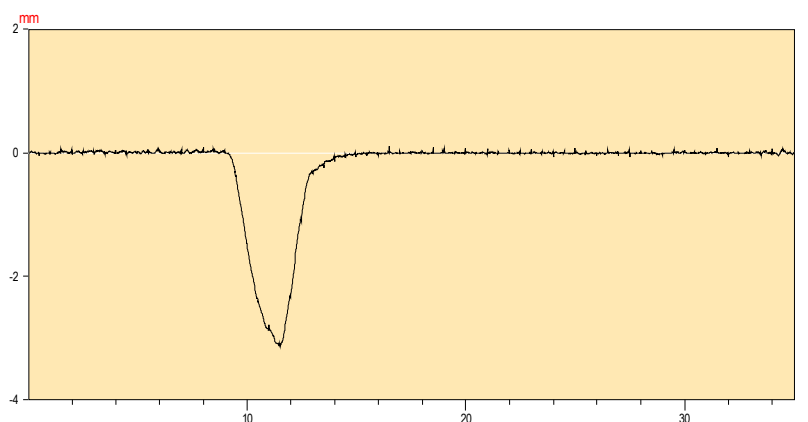
Hora : 22:10:40

Valor Inicial = -0.02

Valor de Prueba = -3.03

Valor Residual = -0.01

Canal **F2**



Prueba : **DINAMICA 3 0**

Fecha : 0301/07

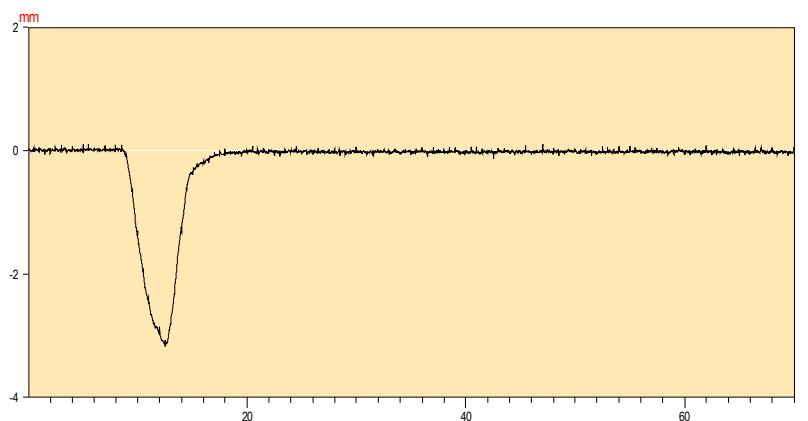
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -3.12

Valor Residual = -0.03

Canal **F2**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

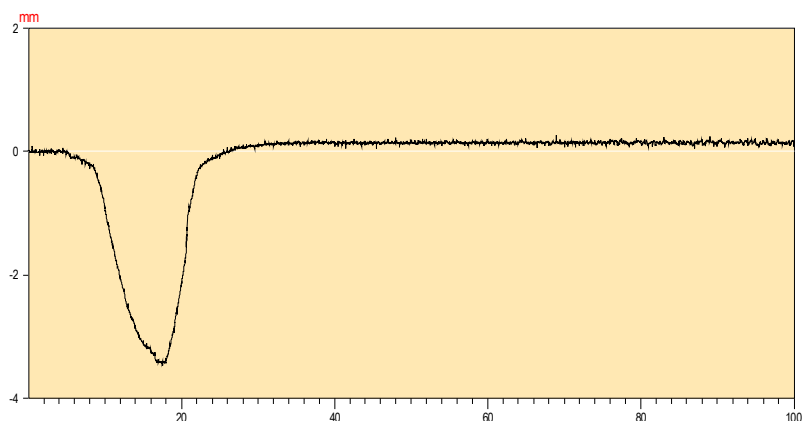
Hora : 21:58:08

Valor Inicial = -0.01

Valor de Prueba = -3.34

Valor Residual = 0.12

Canal **F2**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

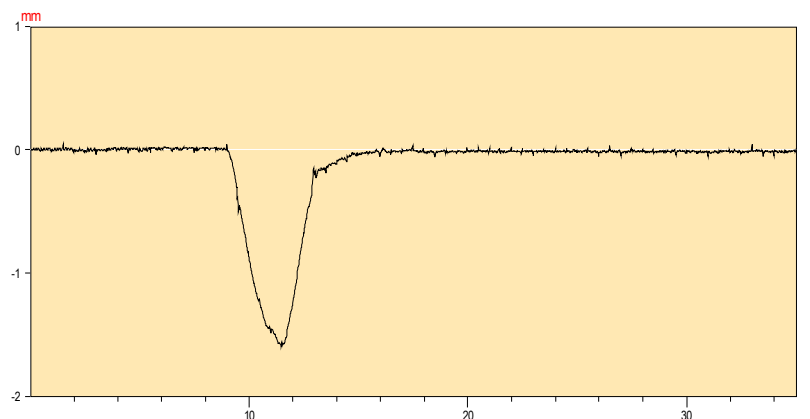
Hora : 22:15:53

Valor Inicial = -0.03

Valor de Prueba = -1.68

Valor Residual = -0.03

Canal **F3**



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

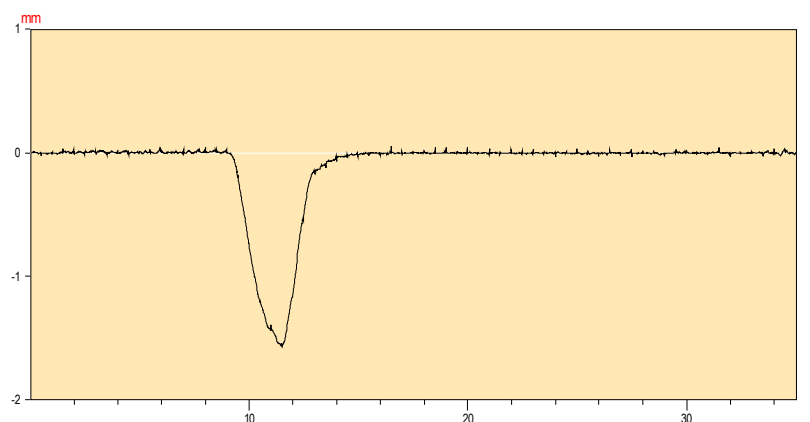
Hora : 22:10:40

Valor Inicial = 0.00

Valor de Prueba = -1.35

Valor Residual = 0.02

Canal **F3**



Prueba : **DINAMICA 3 0**

Fecha : 03/01/07

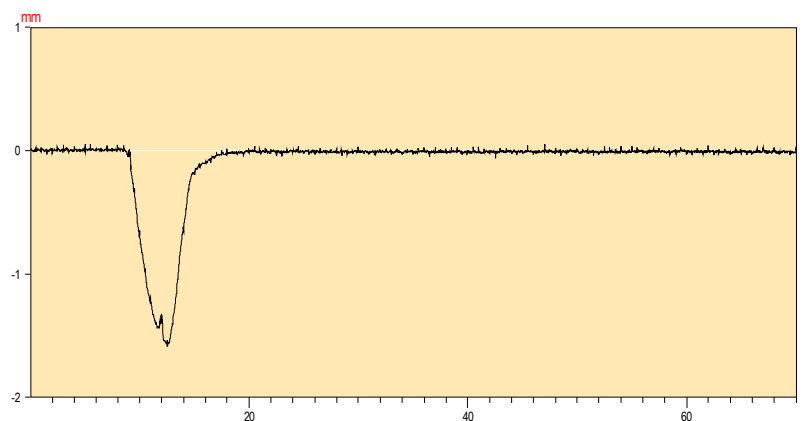
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -1.53

Valor Residual = -0.01

Canal **F3**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

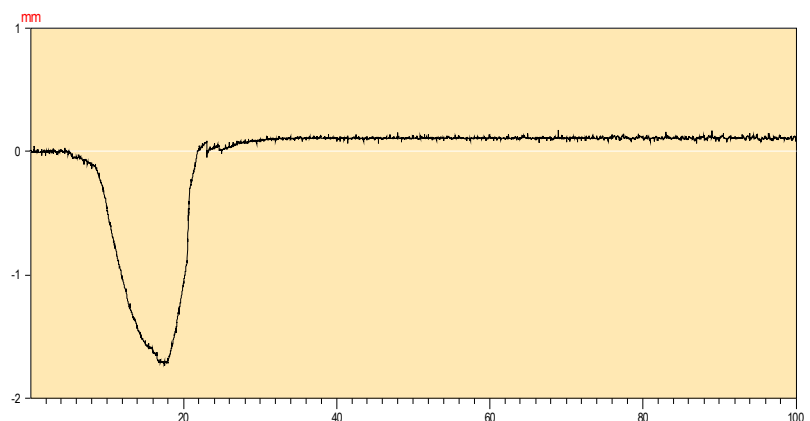
Hora : 21:58:08

Valor Inicial = -0.01

Valor de Prueba = -1.71

Valor Residual = 0.22

Canal **F3**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

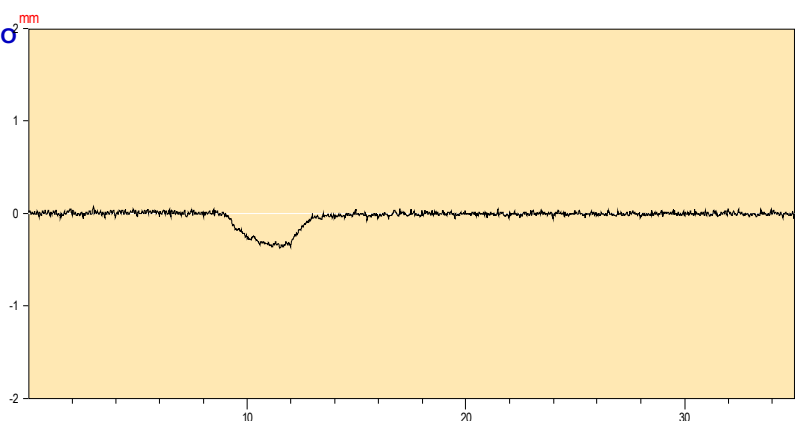
Hora : 22:15:53

Valor Inicial = -0.01

Valor de Prueba = -0.42

Valor Residual = 0.01

Canal **F4**



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

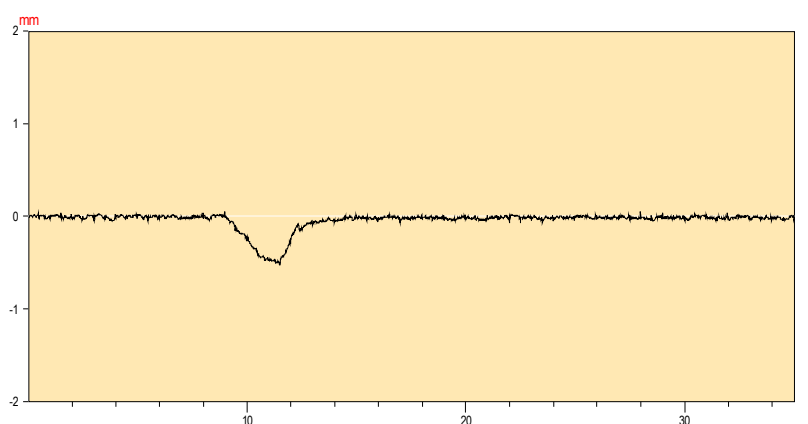
Hora : 22:10:40

Valor Inicial = 0.01

Valor de Prueba = -0.48

Valor Residual = -0.03

Canal **F4**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

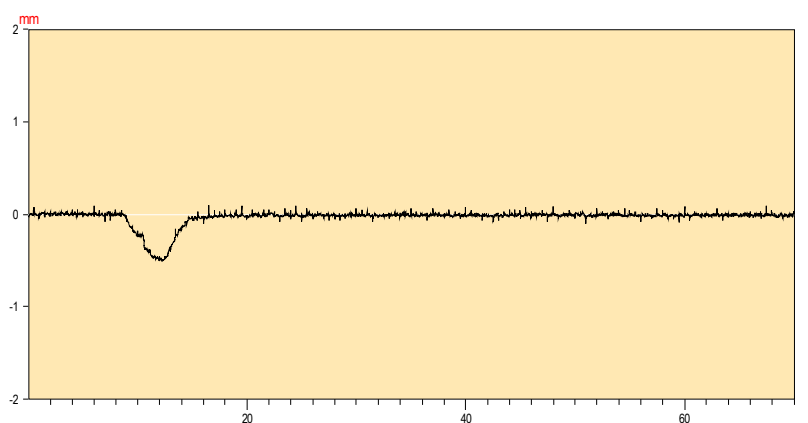
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -0.49

Valor Residual = -0.02

Canal **F4**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

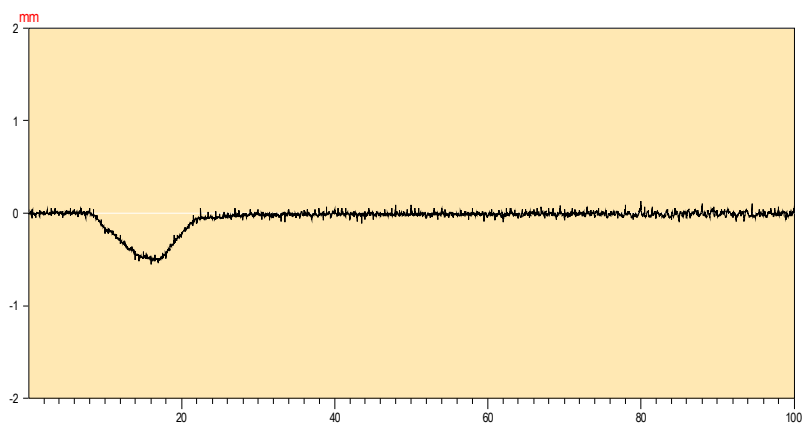
Hora : 21:58:08

Valor Inicial = -0.01

Valor de Prueba = -0.51

Valor Residual = -0.01

Canal **F4**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

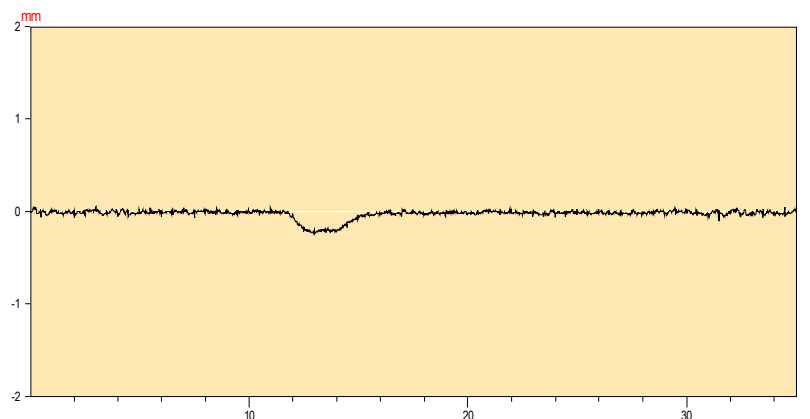
Hora : 22:18:52

Valor Inicial = -0.00

Valor de Prueba = -0.24

Valor Residual = -0.02

Canal **F5**



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

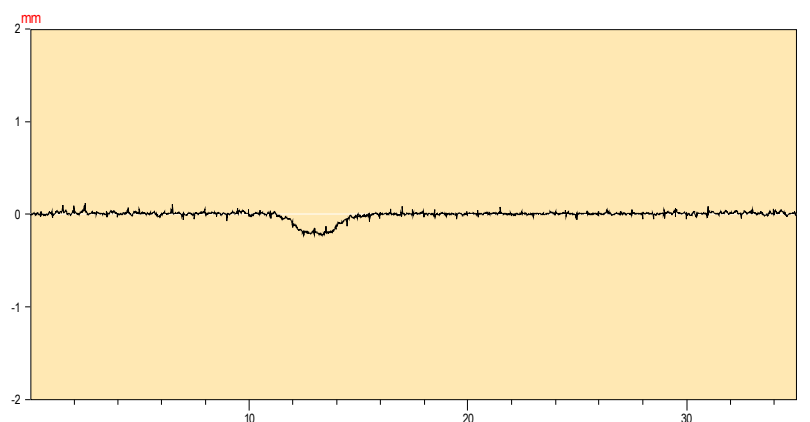
Hora : 22:10:40

Valor Inicial = 0.02

Valor de Prueba = -0.23

Valor Residual = -0.01

Canal **F5**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

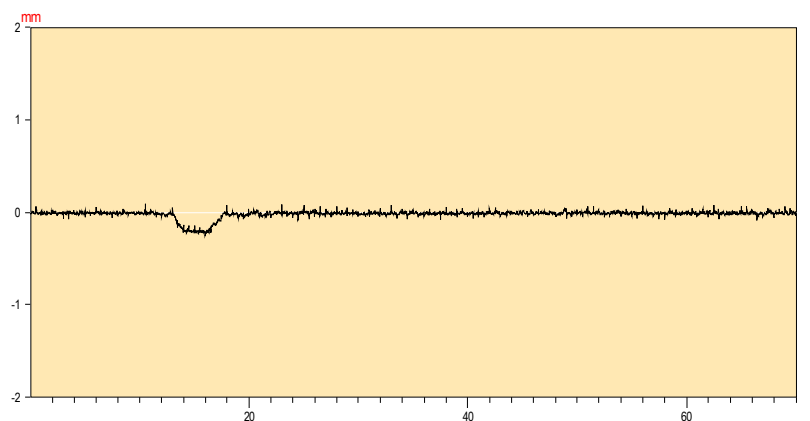
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -0.21

Valor Residual = -0.00

Canal **F5**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

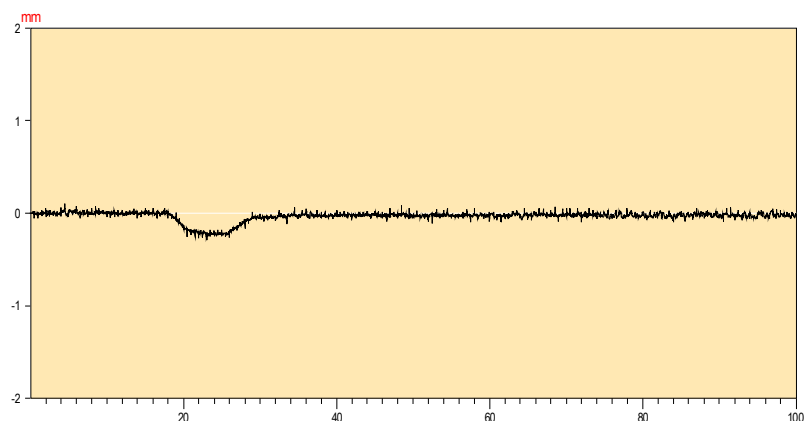
Hora : 22:58:08

Valor Inicial = -0.01

Valor de Prueba = -0.25

Valor Residual = -0.03

Canal **F5**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

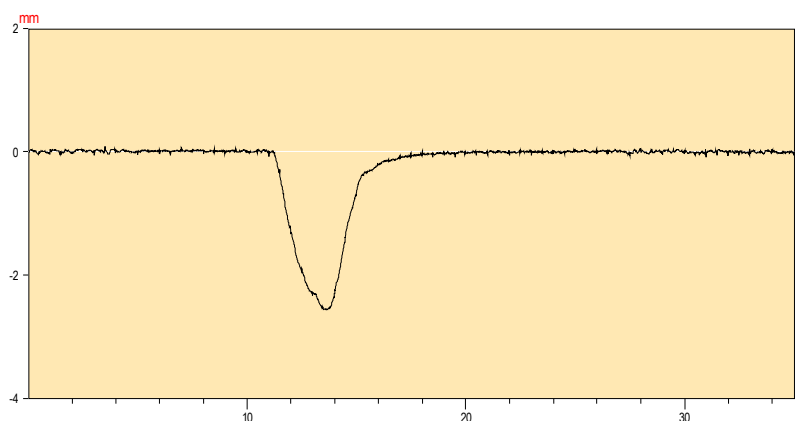
Hora : 22:18:52

Valor Inicial = 0.01

Valor de Prueba = -2.53

Valor Residual = -0.01

Canal **F6**



Prueba : **DINAMICA M A X**

Fecha : 03/01/07

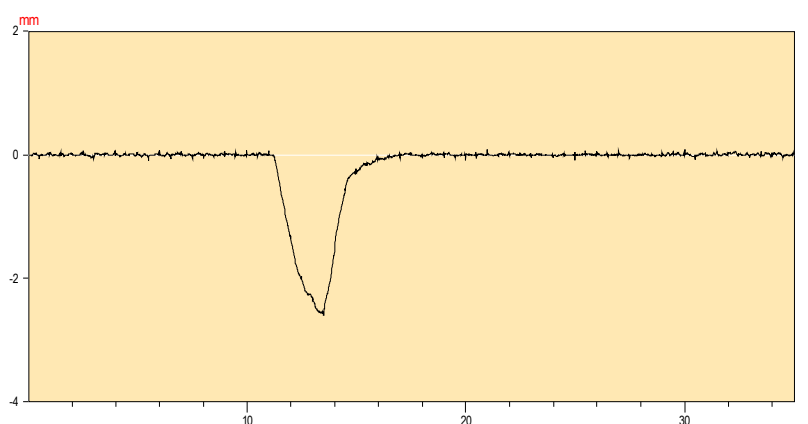
Hora : 22:10:40

Valor Inicial = -0.01

Valor de Prueba = -2.50

Valor Residual = -0.00

Canal **F6**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

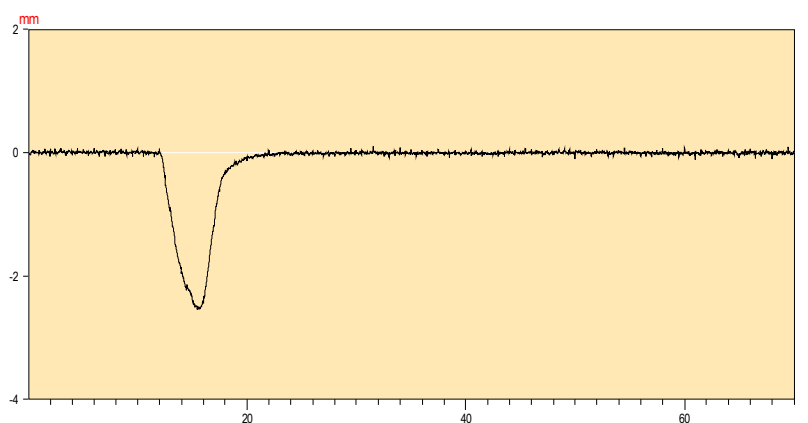
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -2.53

Valor Residual = -0.03

Canal **F6**



Prueba : **DINAMICA 5**

Fecha : 01/03/07

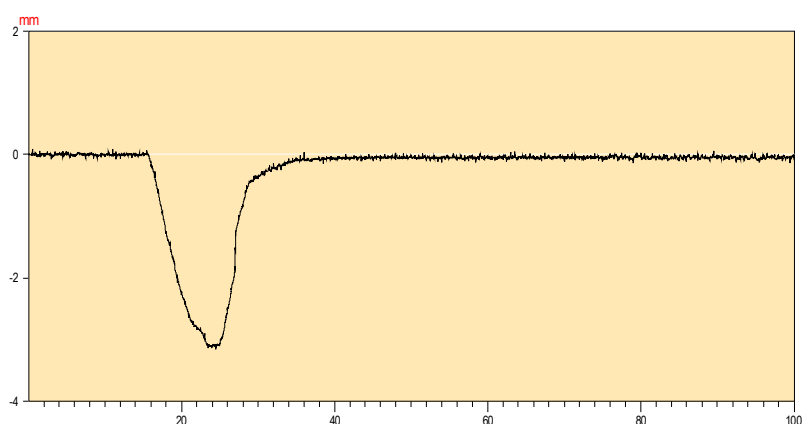
Hora : 21:58:08

Valor Inicial = -0.02

Valor de Prueba = -3.09

Valor Residual = -0.04

Canal **F6**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

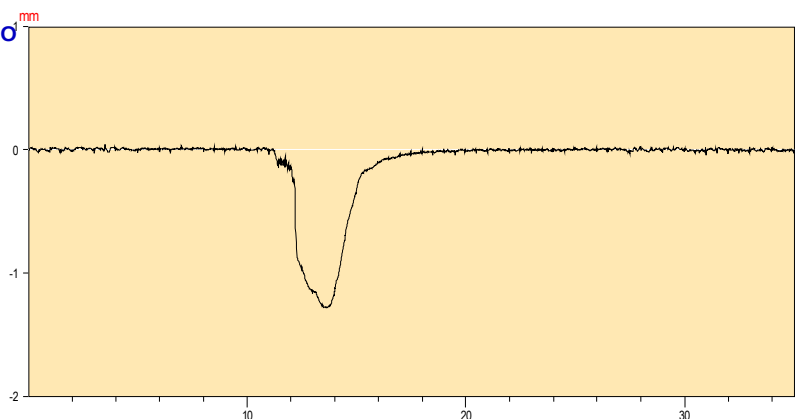
Hora : 22:18:52

Valor Inicial = -0.02

Valor de Prueba = -1.36

Valor Residual = -0.01

Canal **F7**



Prueba : **DINAMICA M A X**

Fecha : 03/01/07

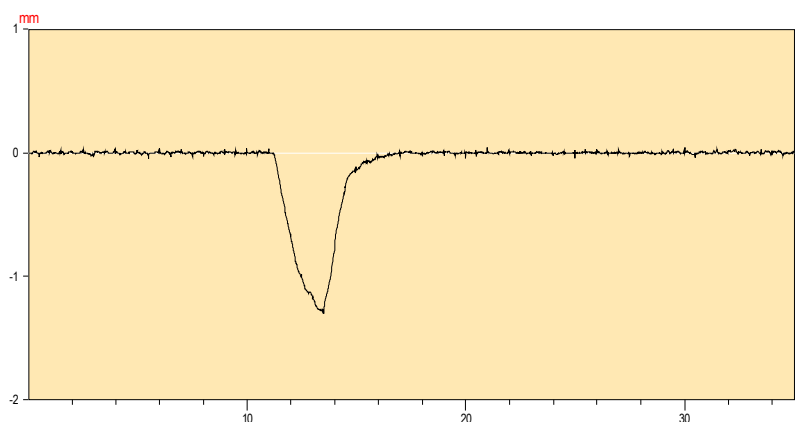
Hora : 22:10:40

Valor Inicial = 0.02

Valor de Prueba = -1.28

Valor Residual = -0.00

Canal **F7**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

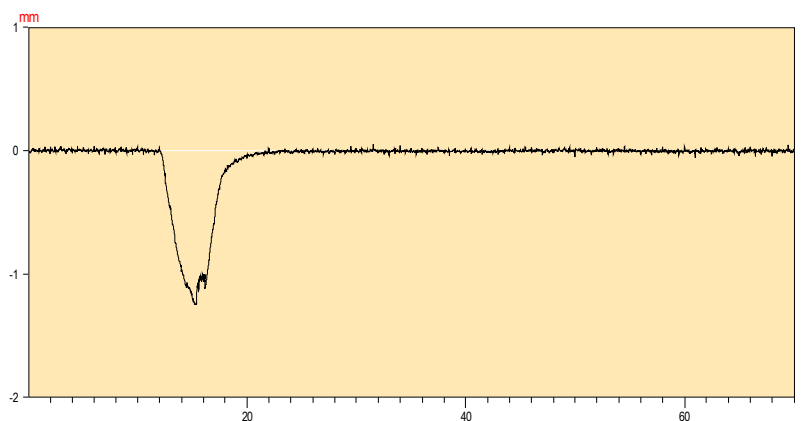
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -1.24

Valor Residual = -0.02

Canal **F7**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

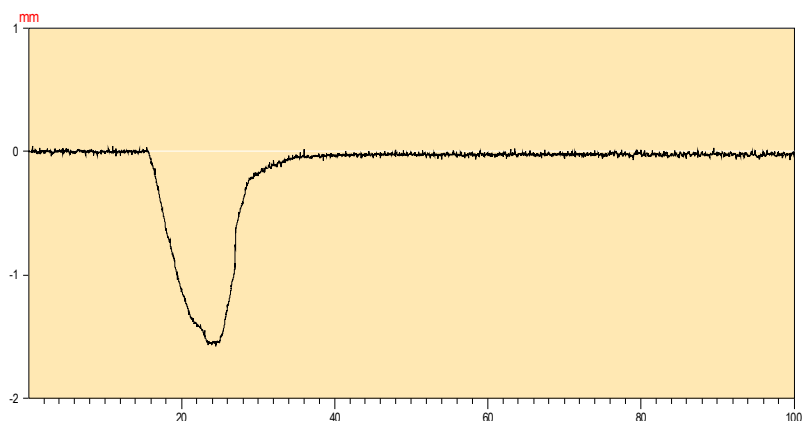
Hora : 21:58:08

Valor Inicial = -0.02

Valor de Prueba = -1.53

Valor Residual = -0.06

Canal **F7**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : DINAMICA FRENADO

Fecha : 03/01/07

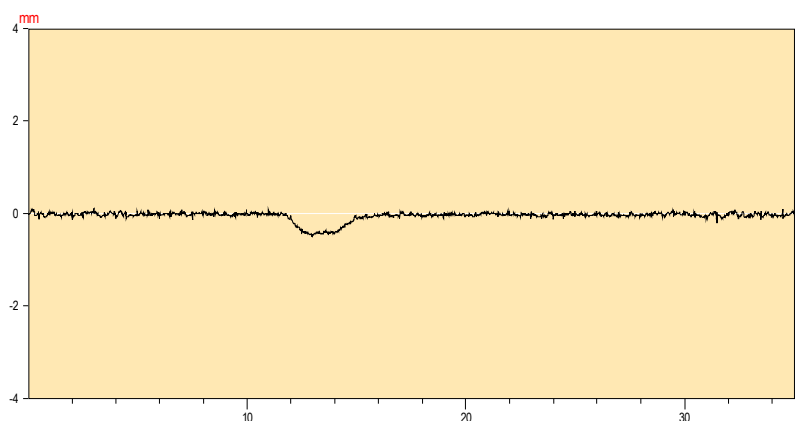
Hora : 22:18:52

Valor Inicial = 0.03

Valor de Prueba = -0.49

Valor Residual = -0.02

Canal F8



Prueba : DINAMICA MAX

Fecha : 03/01/07

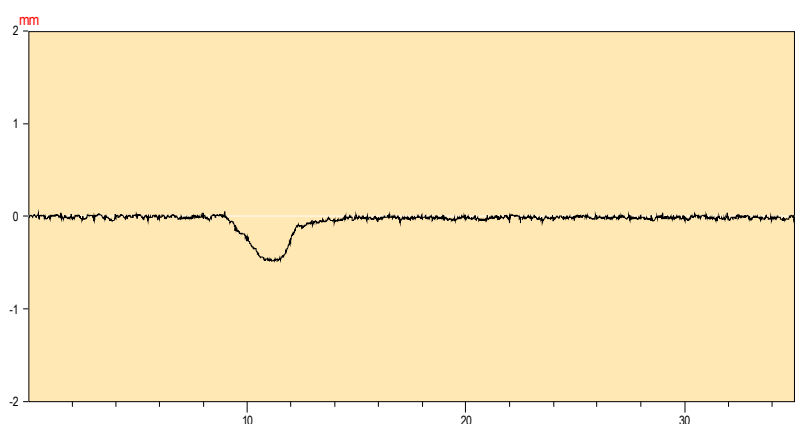
Hora : 22:10:40

Valor Inicial = 0.01

Valor de Prueba = -0.43

Valor Residual = -0.04

Canal F8



Prueba : DINAMICA 30

Fecha : 03/01/07

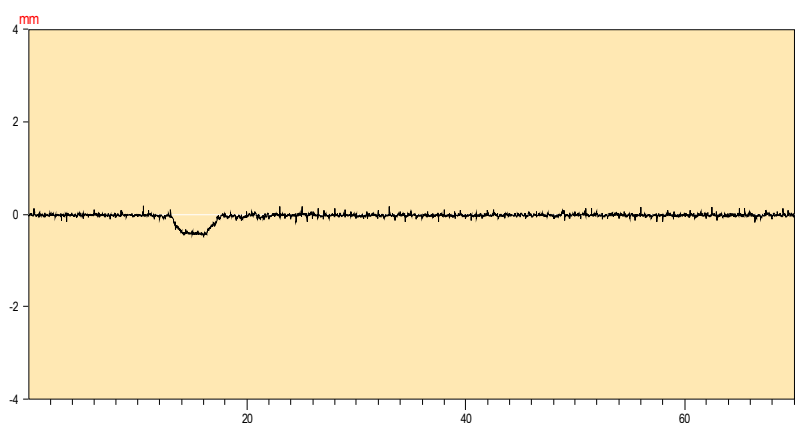
Hora : 22:06:15

Valor Inicial = -0.01

Valor de Prueba = -0.42

Valor Residual = 0.00

Canal F8



Prueba : DINAMICA 5

Fecha : 03/01/07

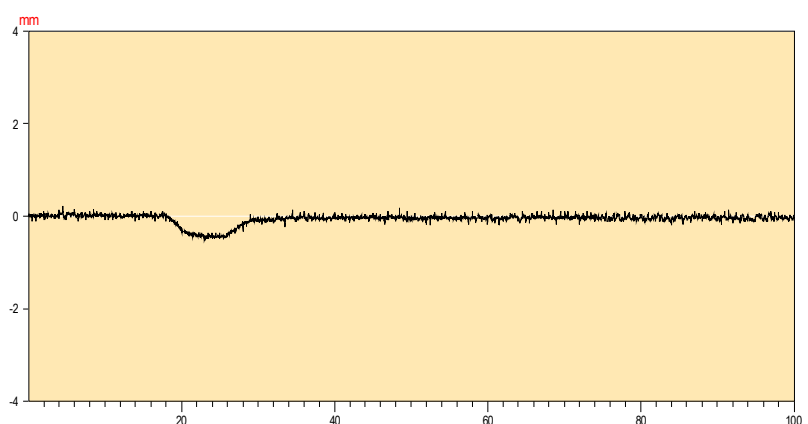
Hora : 21:58:08

Valor Inicial = -0.03

Valor de Prueba = -0.52

Valor Residual = 0.01

Canal F8



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

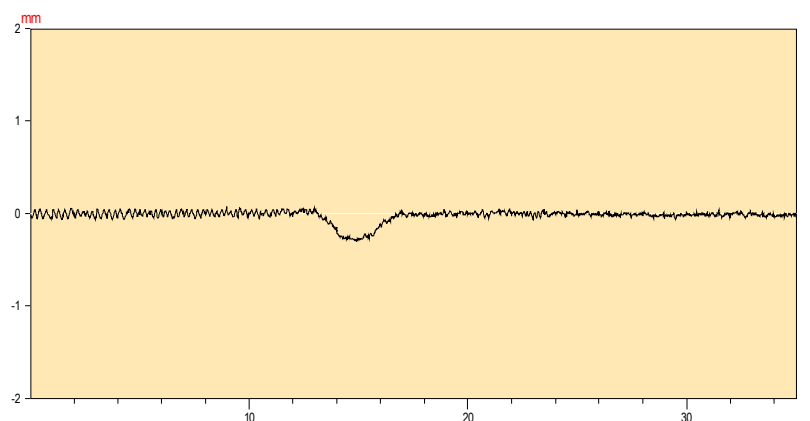
Hora : 22:26:29

Valor Inicial = 0.00

Valor de Prueba = -0.29

Valor Residual = -0.03

Canal F9



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

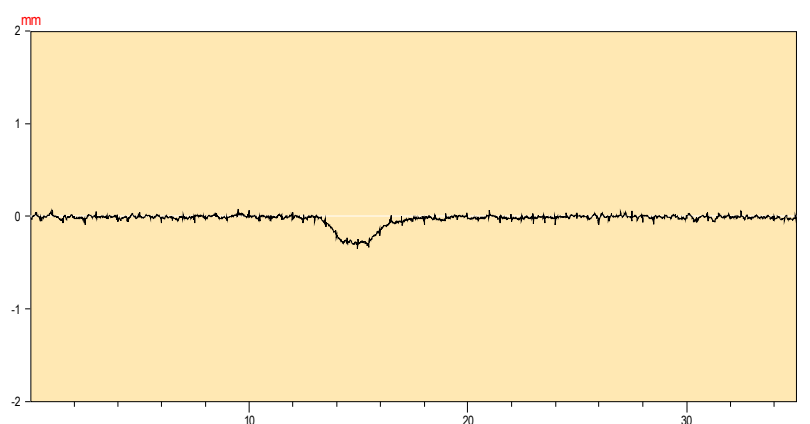
Hora : 22:10:40

Valor Inicial = 0.01

Valor de Prueba = -0.31

Valor Residual = -0.04

Canal F9



Prueba : **DINAMICA 30**

Fecha : 03/01/07

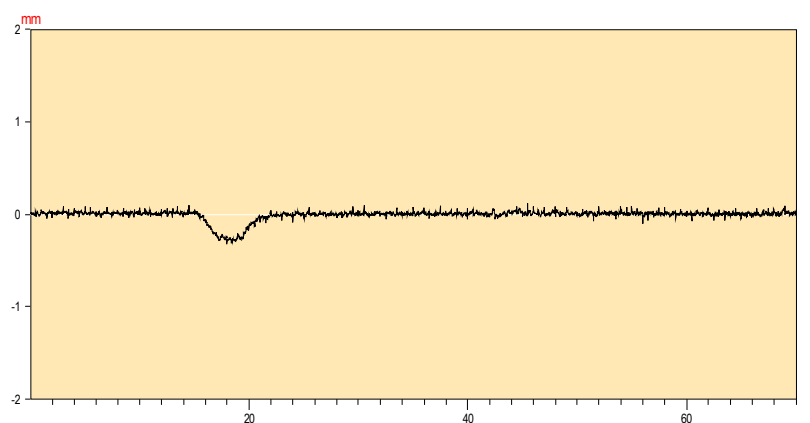
Hora : 22:06:15

Valor Inicial = 0.01

Valor de Prueba = -0.29

Valor Residual = 0.02

Canal F9



Prueba : **DINAMICA 5**

Fecha : 03/01/07

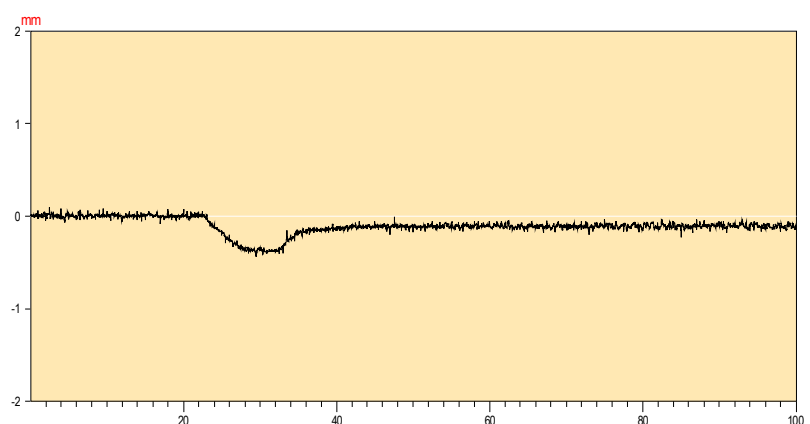
Hora : 21:58:08

Valor Inicial = 0.00

Valor de Prueba = -0.37

Valor Residual = -0.09

Canal F9



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

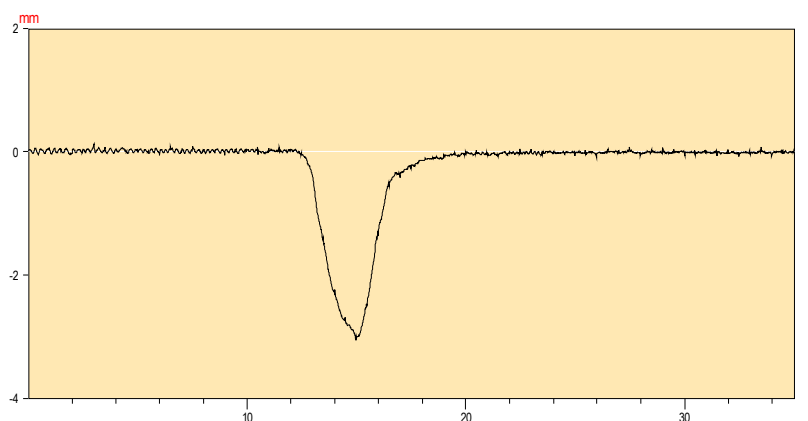
Hora : 22:26:29

Valor Inicial = 0.01

Valor de Prueba = -3.15

Valor Residual = 0.00

Canal **F10**



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

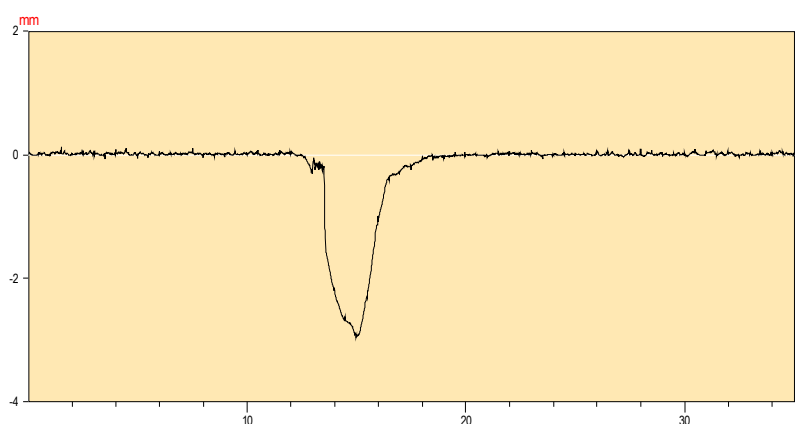
Hora : 22:10:40

Valor Inicial = -0.01

Valor de Prueba = -2.94

Valor Residual = 0.03

Canal **F10**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

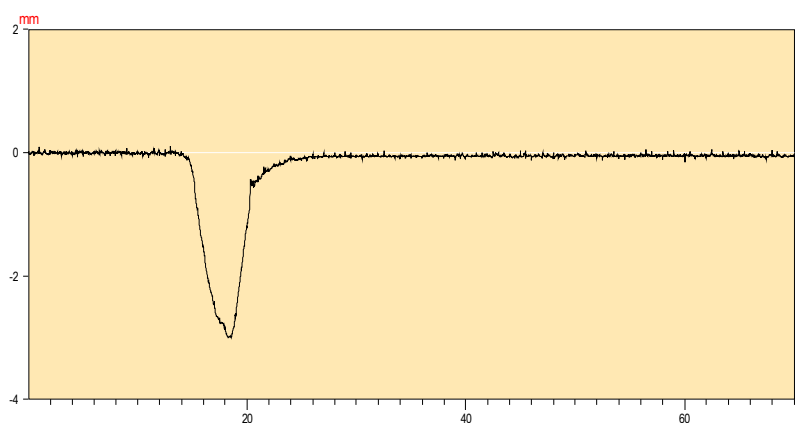
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -2.86

Valor Residual = -0.06

Canal **F10**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

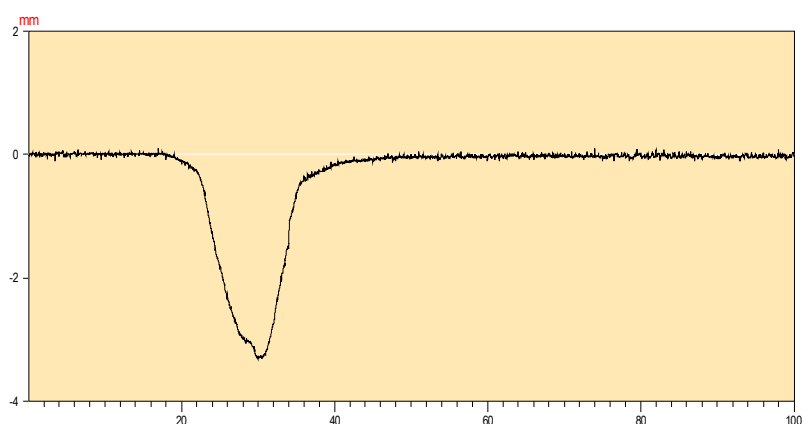
Hora : 21:17:58:08

Valor Inicial = 0.01

Valor de Prueba = -3.29

Valor Residual = -0.05

Canal **F10**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

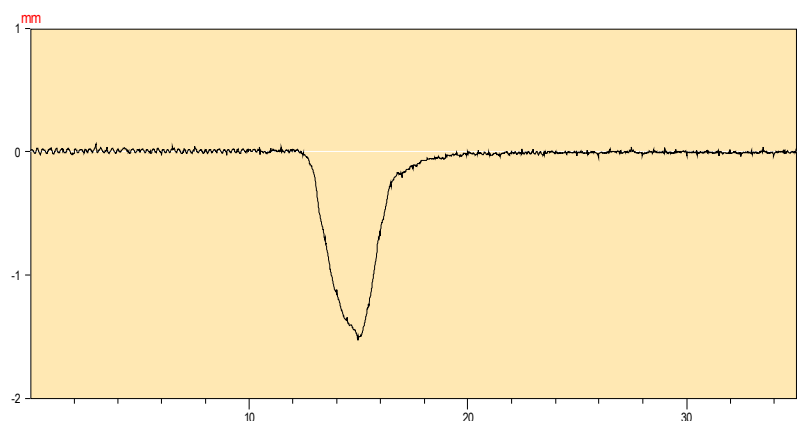
Hora : 22:26:29

Valor Inicial = -0.01

Valor de Prueba = -1.53

Valor Residual = 0.01

Canal **F11**



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

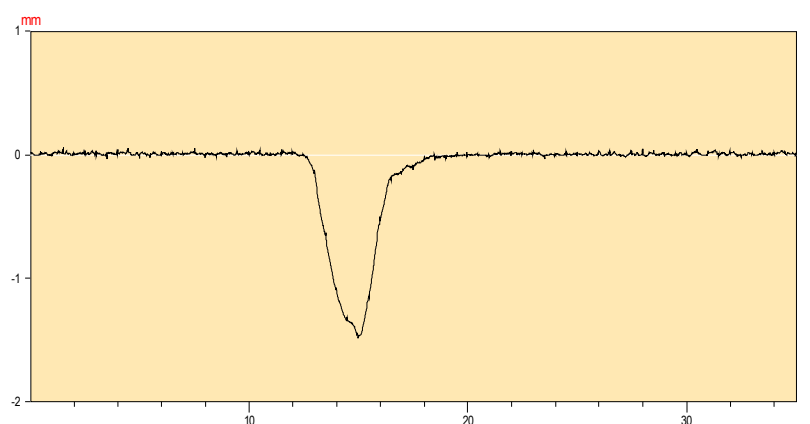
Hora : 22:10:40

Valor Inicial = -0.01

Valor de Prueba = -1.47

Valor Residual = 0.02

Canal **F11**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

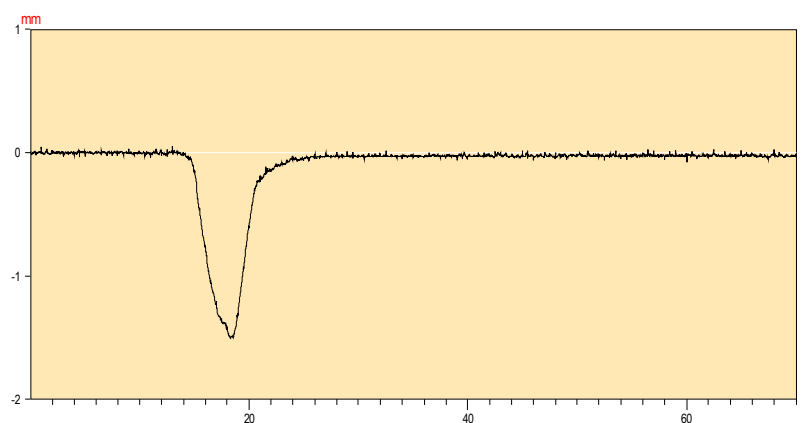
Hora : 22:06:15

Valor Inicial = 0.00

Valor de Prueba = -1.46

Valor Residual = -0.05

Canal **F11**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

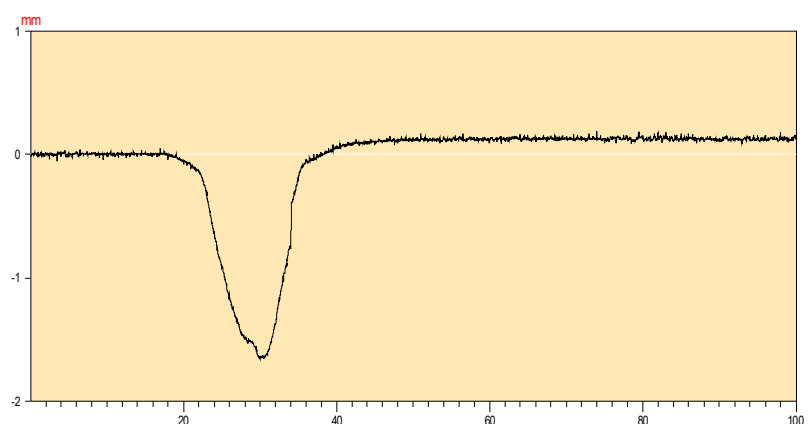
Hora : 21:58:08

Valor Inicial = 0.01

Valor de Prueba = -1.59

Valor Residual = 0.28

Canal **F11**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

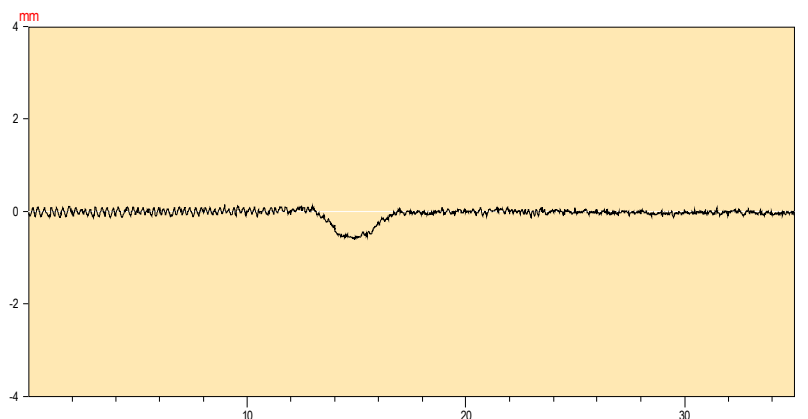
Hora : 22:26:29

Valor Inicial = 0.05

Valor de Prueba = -0.58

Valor Residual = -0.03

Canal **F12**



Prueba : **DINAMICA MAX**

Fecha : 03/01/07

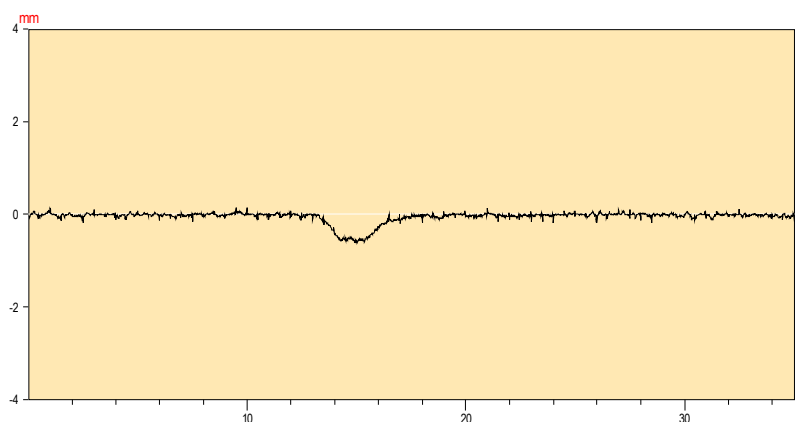
Hora : 22:10:40

Valor Inicial = -0.01

Valor de Prueba = -0.54

Valor Residual = -0.03

Canal **F12**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

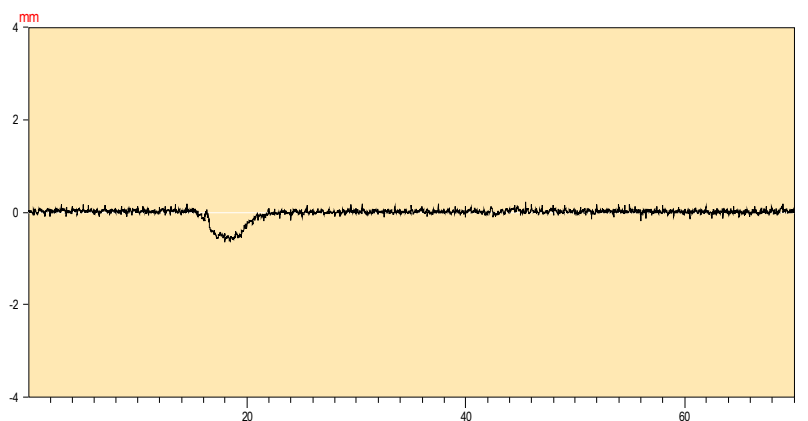
Hora : 22:06:15

Valor Inicial = 0.02

Valor de Prueba = -0.52

Valor Residual = -0.00

Canal **F12**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

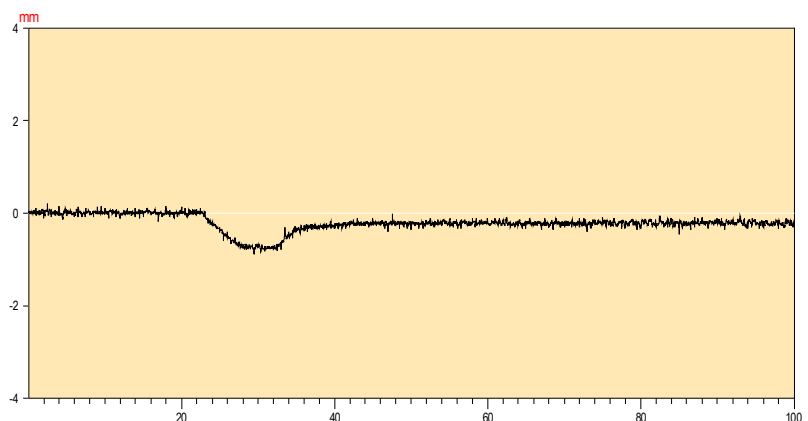
Hora : 21:58:08

Valor Inicial = -0.02

Valor de Prueba = -0.59

Valor Residual = -0.15

Canal **F12**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : DINAMICA FRENADO

Fecha : 01/03/07

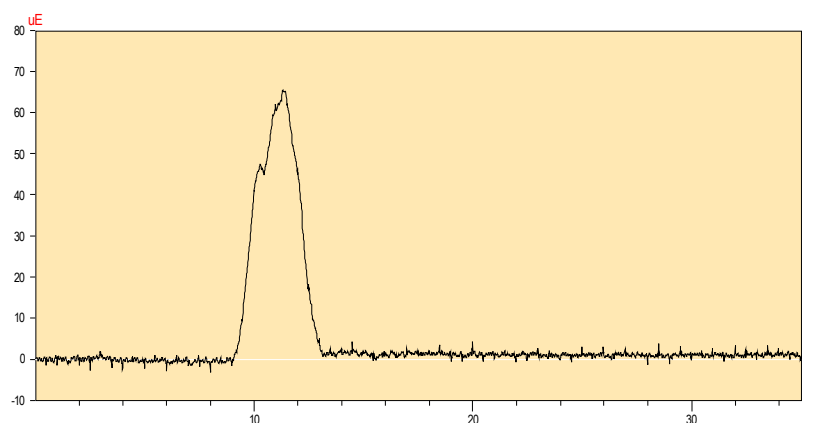
Hora : 22:15:53

Valor Inicial = -0.23

Valor de Prueba = 64.91

Valor Residual = 0.82

Canal B1



Prueba : DINAMICA MAX

Fecha : 03/01/07

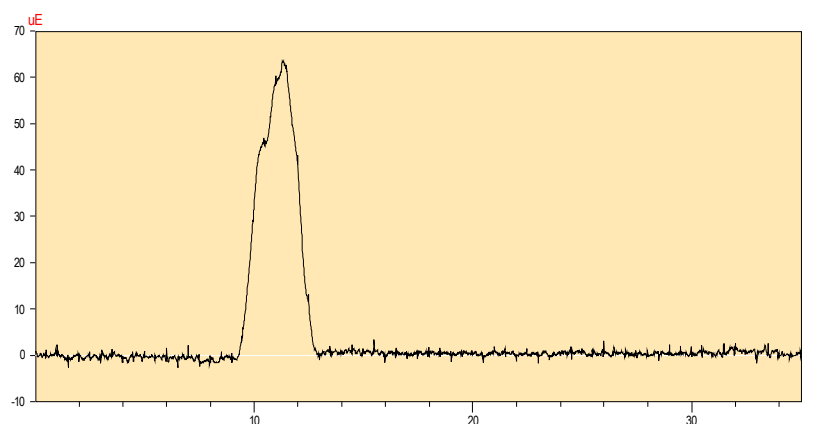
Hora : 22:10:40

Valor Inicial = -0.12

Valor de Prueba = 63.62

Valor Residual = -0.12

Canal B1



Prueba : DINAMICA 30

Fecha : 03/01/07

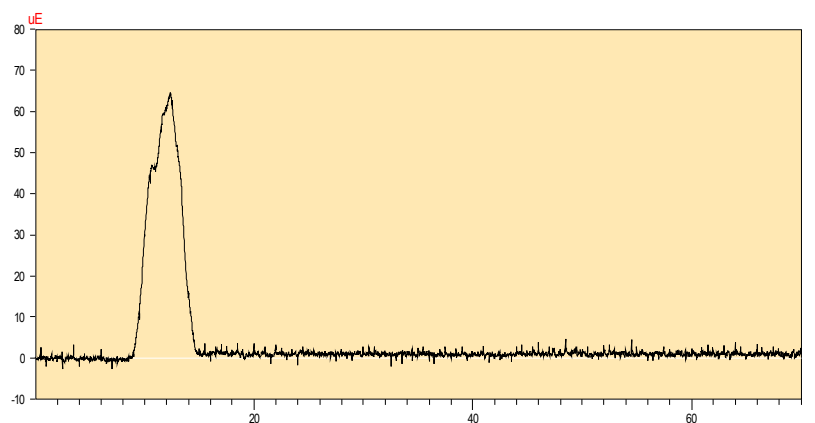
Hora : 22:06:15

Valor Inicial = -0.12

Valor de Prueba = 62.21

Valor Residual = 0.12

Canal B1



Prueba : DINAMICA 5

Fecha : 03/01/07

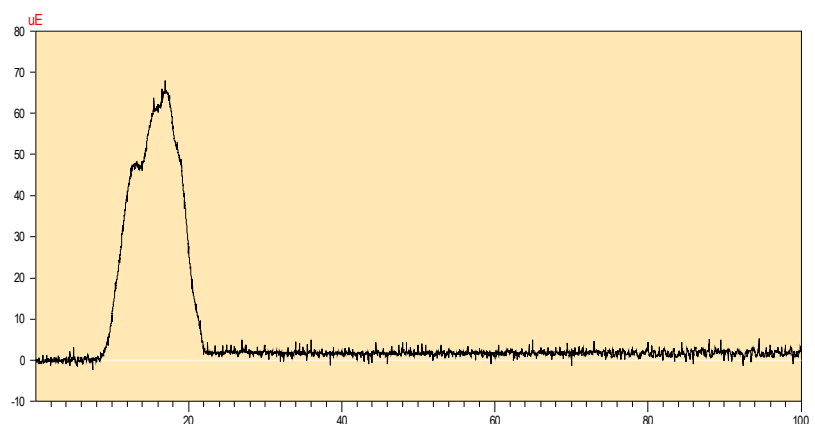
Hora : 21:58:08

Valor Inicial = -0.12

Valor de Prueba = 65.38

Valor Residual = 2.00

Canal B1



Prueba de carga de la Estructura : R I E R A T O R R E L L E S

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 03/01/07

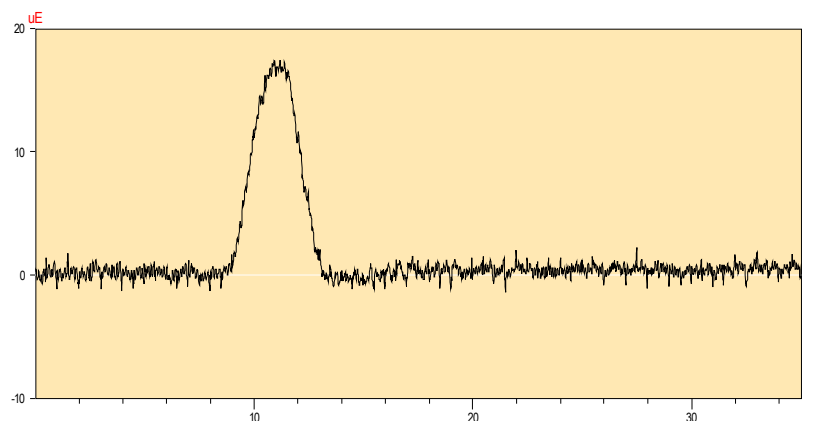
Hora : 22:15:53

Valor Inicial = 0.35

Valor de Prueba = 16.90

Valor Residual = 1.64

Canal **B2**



Prueba : **DINAMICA MAX**

Fecha :- 03/01/07

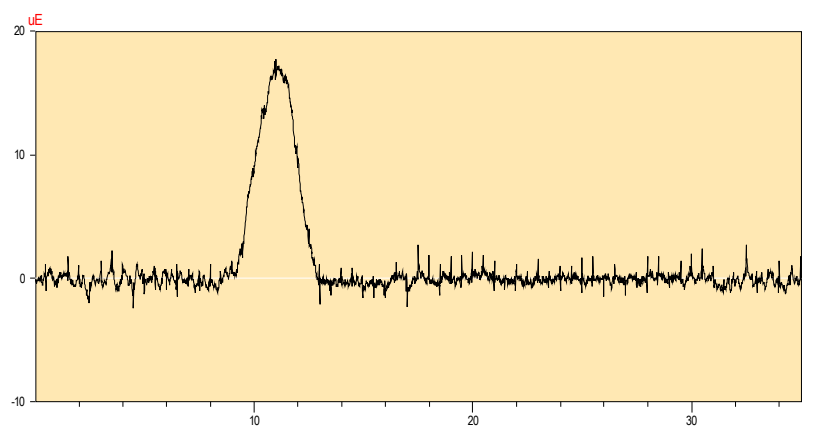
Hora : 22:10:40

Valor Inicial = 1.17

Valor de Prueba = 16.90

Valor Residual = 0.35

Canal **B2**



Prueba : **DINAMICA 30**

Fecha : 03/01/07

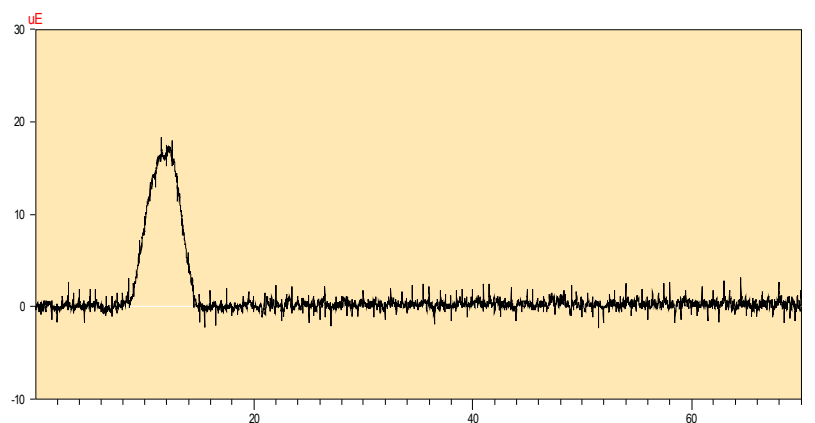
Hora : 22:06:15

Valor Inicial = -0.47

Valor de Prueba = 16.43

Valor Residual = 0.23

Canal **B2**



Prueba : **DINAMICA 5**

Fecha : 03/01/07

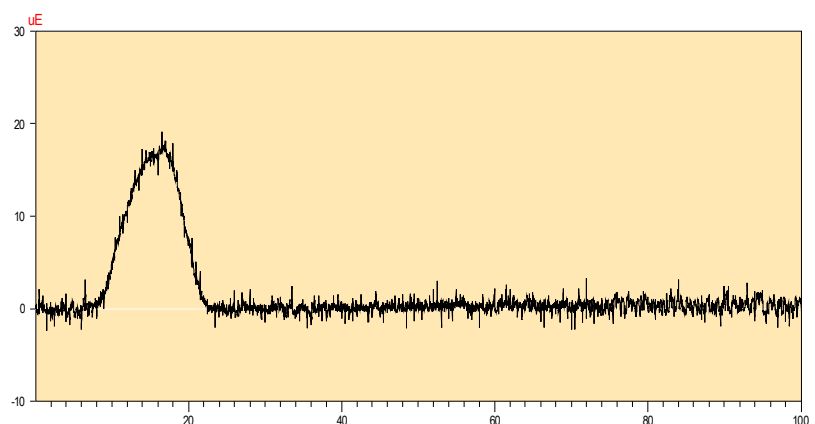
Hora : 21:58:08

Valor Inicial = -0.12

Valor de Prueba = 17.25

Valor Residual = -0.12

Canal **B2**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : DINAMICA FRENADO

Fecha : 03/01/07

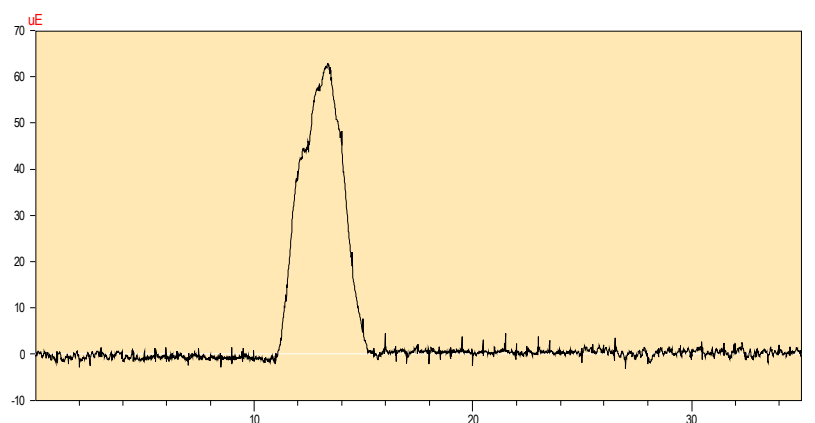
Hora : 22:18:52

Valor Inicial = 0.00

Valor de Prueba = 62.21

Valor Residual = 0.12

Canal B3



Prueba : DINAMICA MAX

Fecha : 03/01/07

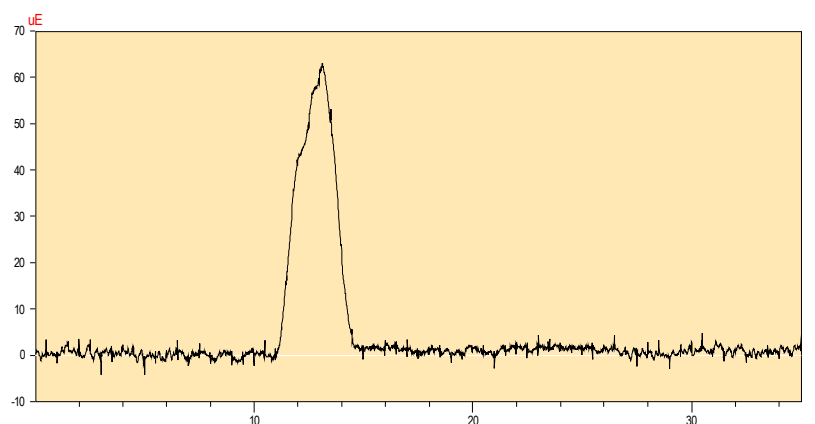
Hora : 22:10:40

Valor Inicial = 0.00

Valor de Prueba = 63.03

Valor Residual = 1.29

Canal B3



Prueba : DINAMICA 30

Fecha : 03/01/07

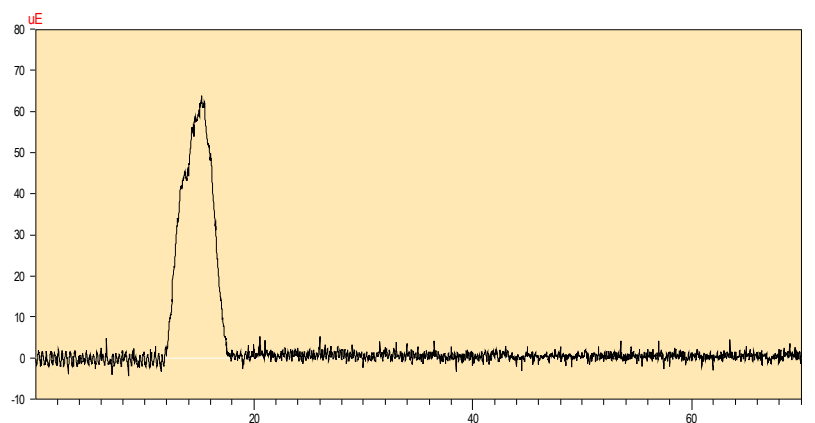
Hora : 22:06:15

Valor Inicial = 0.94

Valor de Prueba = 60.10

Valor Residual = 0.59

Canal B3



Prueba : DINAMICA 5

Fecha : 03/01/07

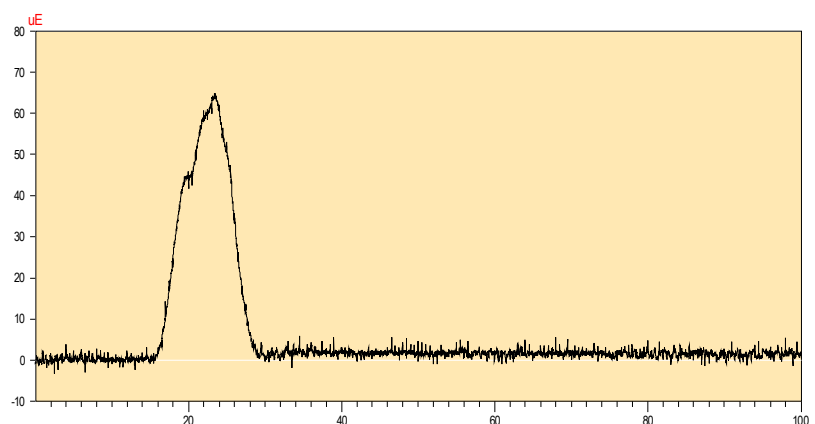
Hora : 21:58:08

Valor Inicial = -0.47

Valor de Prueba = 61.39

Valor Residual = 1.88

Canal B3



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 26/06/07

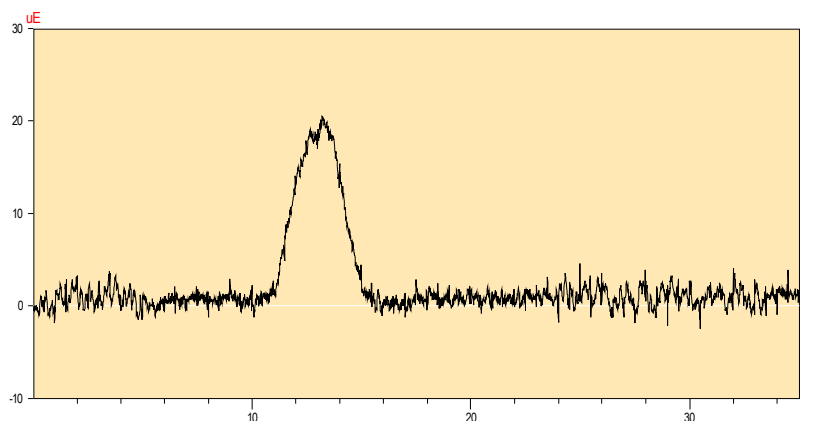
Hora : 18:18:52

Valor Inicial = -0.94

Valor de Prueba = 20.54

Valor Residual = 1.06

Canal **B4**



Prueba : **DINAMICA MAX**

Fecha : 26/06/07

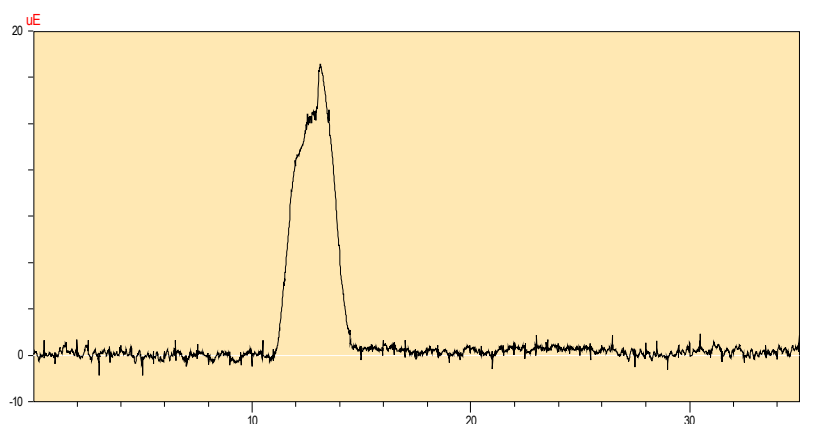
Hora : 18:10:40

Valor Inicial = -0.59

Valor de Prueba = 17.88

Valor Residual = 4.23

Canal **B4**



Prueba : **DINAMICA 30**

Fecha : 26/06/07

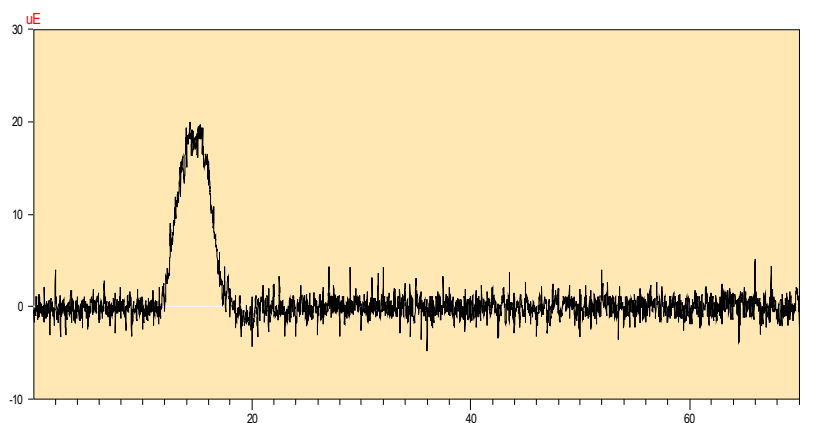
Hora : 18:06:15

Valor Inicial = -0.47

Valor de Prueba = 18.55

Valor Residual = 0.23

Canal **B4**



Prueba : **DINAMICA 5**

Fecha : 26/06/07

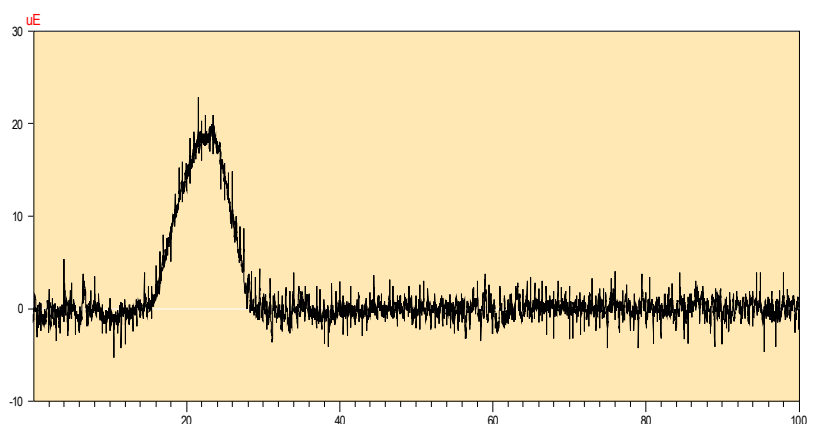
Hora : 17:58:08

Valor Inicial = -0.94

Valor de Prueba = 18.31

Valor Residual = 0.59

Canal **B4**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FREANDO**

Fecha : 26/06/07

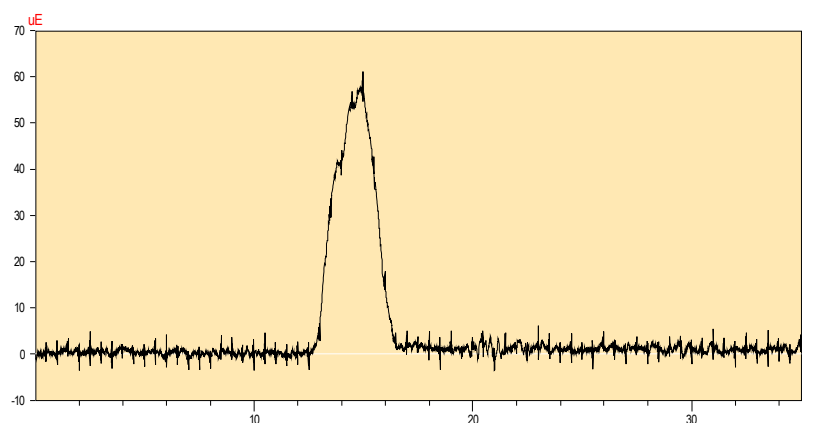
Hora : 18:26:29

Valor Inicial = 0.70

Valor de Prueba = 56.93

Valor Residual = 0.59

Canal **B5**



Prueba : **DINAMICA MAX**

Fecha : 26/06/07

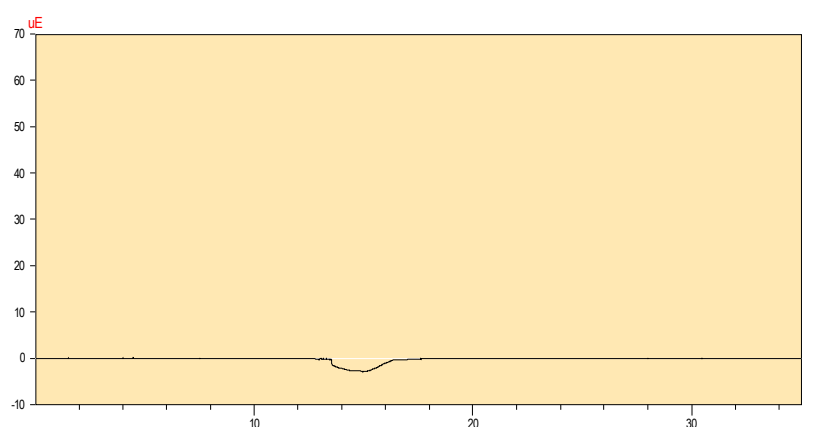
Hora : 18:10:40

Valor Inicial = 0.47

Valor de Prueba = 52.82

Valor Residual = 1.53

Canal **B5**



Prueba : **DINAMICA 30**

Fecha : 26/06/07

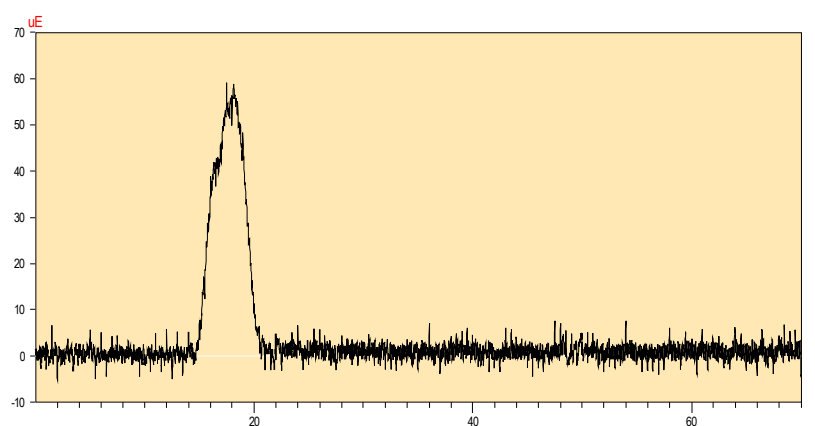
Hora : 18:06:15

Valor Inicial = 1.17

Valor de Prueba = 56.11

Valor Residual = 0.00

Canal **B5**



Prueba : **DINAMICA 5**

Fecha : 26/06/07

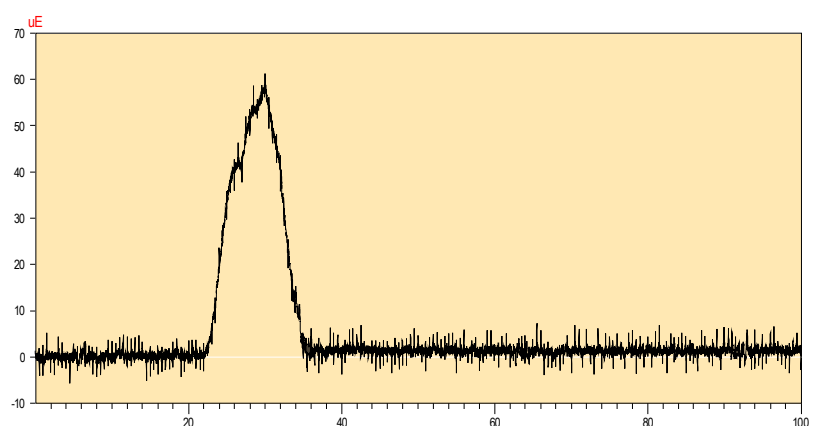
Hora : 17:58:08

Valor Inicial = -1.29

Valor de Prueba = 56.69

Valor Residual = 0.59

Canal **B5**



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : ADIF



Prueba : **DINAMICA FRENADO**

Fecha : 26/06/07

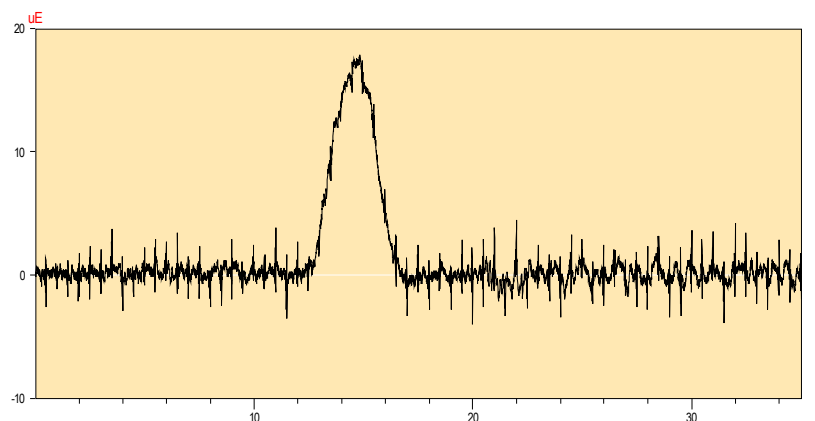
Hora : 18:26:29

Valor Inicial = 0.23

Valor de Prueba = 17.72

Valor Residual = -1.41

Canal **B6**



Prueba : **DINAMICA MAX**

Fecha : 26/06/07

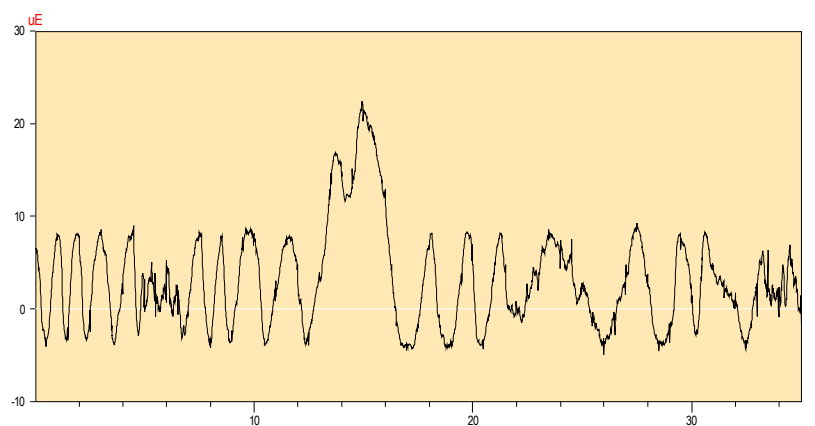
Hora : 18:10:40

Valor Inicial = -2.35

Valor de Prueba = 20.66

Valor Residual = 1.64

Canal **B6**



Prueba : **DINAMICA 30**

Fecha : 26/06/07

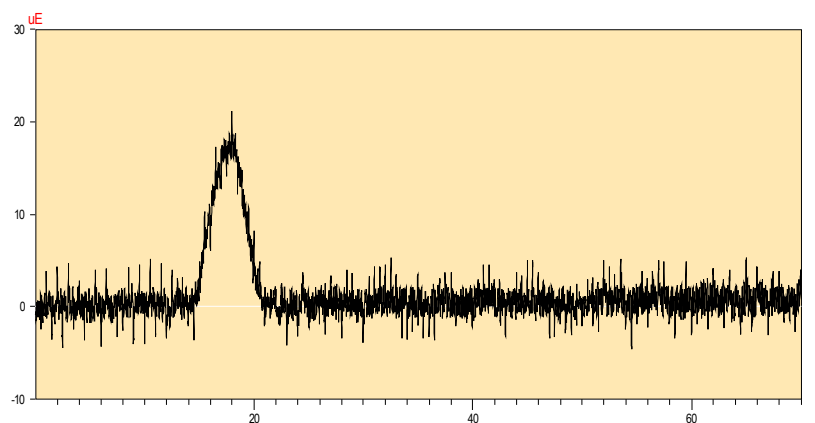
Hora : 18:06:15

Valor Inicial = -0.12

Valor de Prueba = 18.19

Valor Residual = 1.76

Canal **B6**



Prueba : **DINAMICA 5**

Fecha : 26/06/07

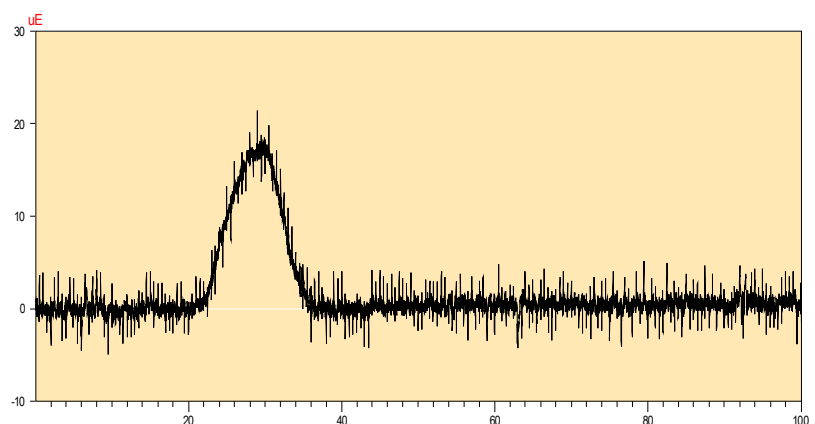
Hora : 17:58:08

Valor Inicial = 0.12

Valor de Prueba = 17.96

Valor Residual = 2.23

Canal **B6**



Prueba de carga de la Estructura : RIERA TORELLES

Organismo : GIF



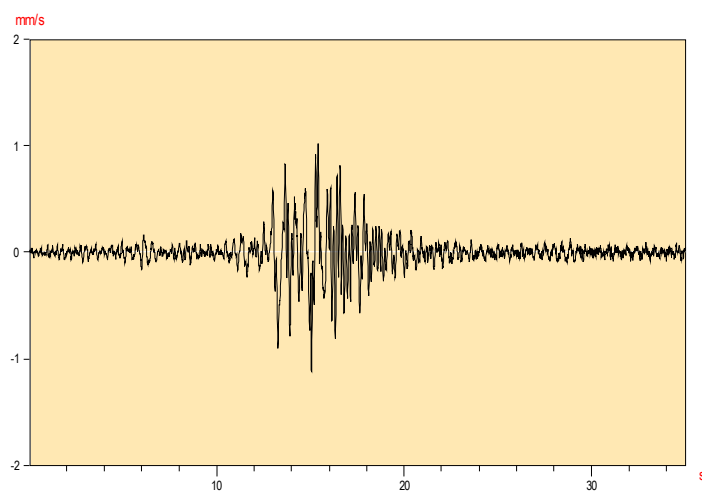
Prueba : **DINAMICA**

Fecha : 03/01/07

Hora : 21:26:29

Valor de Prueba = 0.89

Canal G



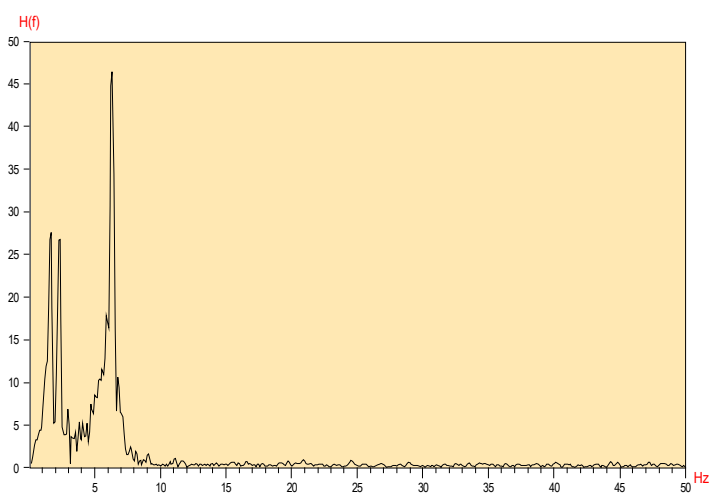
Prueba : **DINAMICA**

Fecha : 03/01/07

Hora : 21:26:29

Frecuencia de Vibración = 6.3

Canal G



Prueba : **DINAMICA**

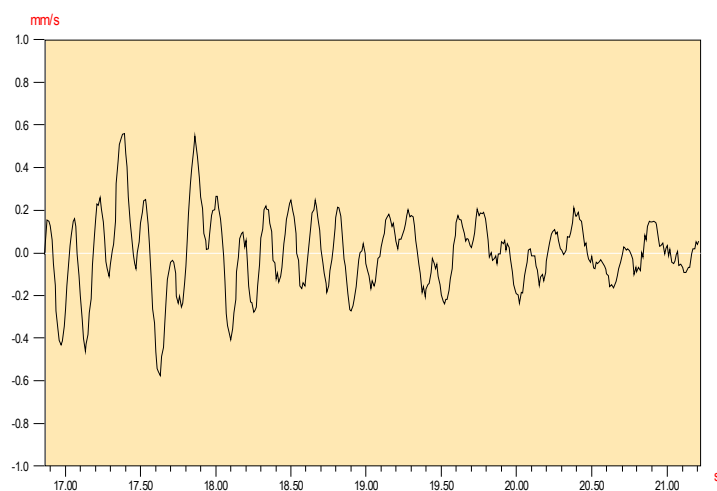
Fecha : 03/01/07

Hora : 21:26:29

Indice Amortiguamiento = 0.10

Amortiguamiento (%) = 1.6

Canal G



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : GIF



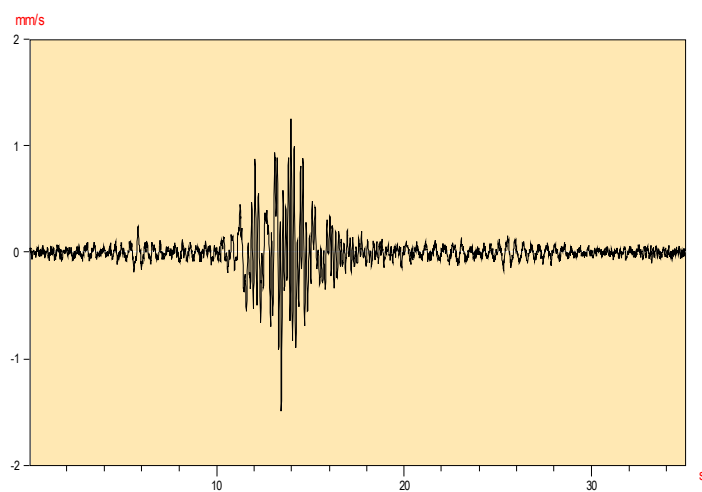
Prueba : **DINAMICA**

Fecha : 03/01/07

Hora : 21:18:52

Valor de Prueba = -0.64

Canal G



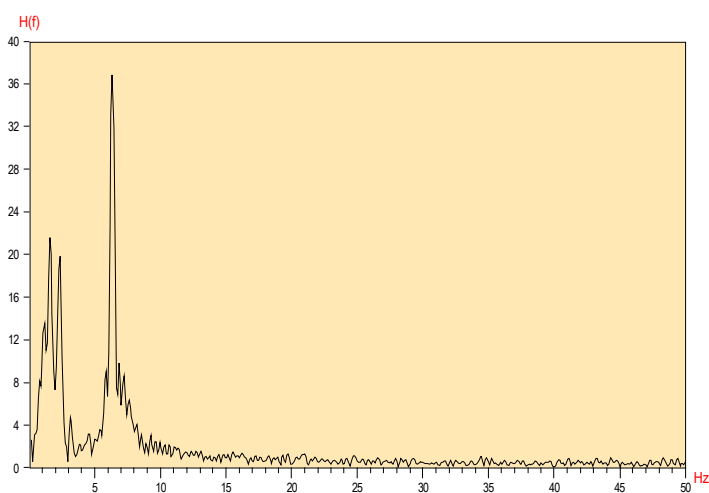
Prueba : **DINAMICA**

Fecha : 03/01/07

Hora : 21:26:29

Frecuencia de Vibración = 6.3

Canal G



Prueba : **DINAMICA**

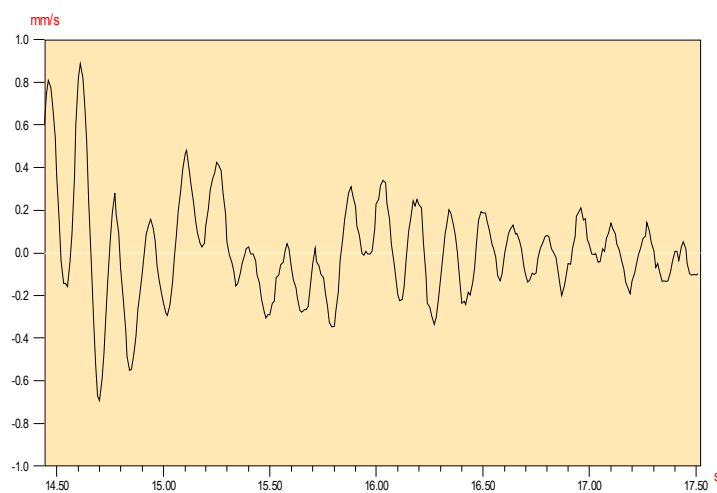
Fecha : 03/01/07

Hora : 21:18:52

Indice Amortiguamiento = 0.09

Amortiguamiento (%) = 1.4

Canal G



Prueba de carga de la Estructura : RIERA TORRELLES

Organismo : GIF



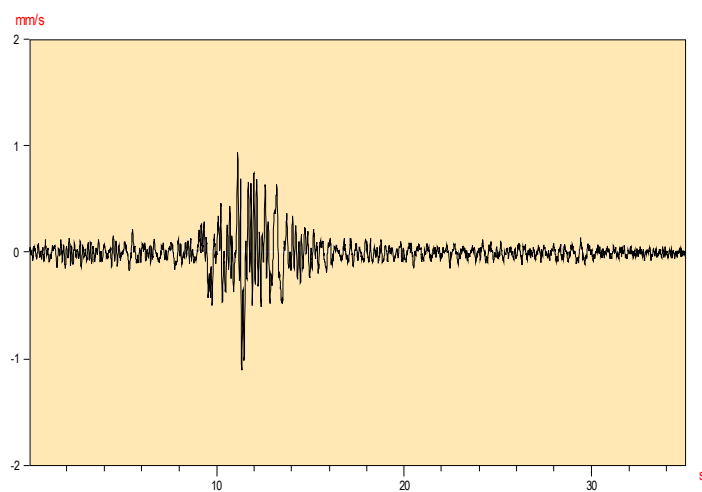
Prueba : **DINAMICA**

Fecha : 03/01/07

Hora : 21:15:53

Valor de Prueba = -0.22

Canal G



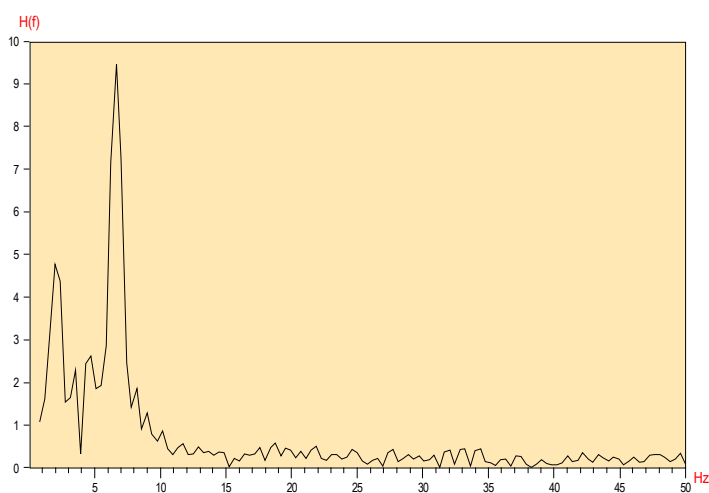
Prueba : **DINAMICA**

Fecha : 03/01/07

Hora : 21:15:53

Frecuencia de Vibración = 6.3

Canal G



Prueba : **DINAMICA**

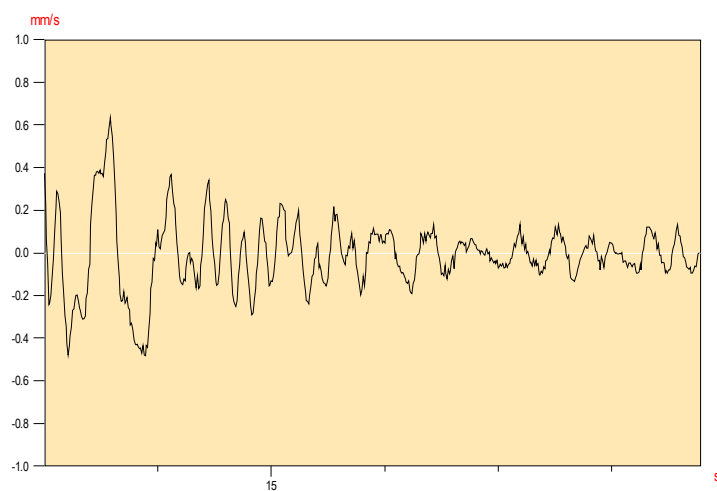
Fecha : 04/01/07

Hora : 21:15:53

Indice Amortiguamiento = 0.07

Amortiguamiento (%) = 1.2

Canal G



CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTIERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

V. REPORTAJE FOTOGRAFICO



FOTOGRAFIA N°1: Detalle de la prueba estática con vanos continuos.



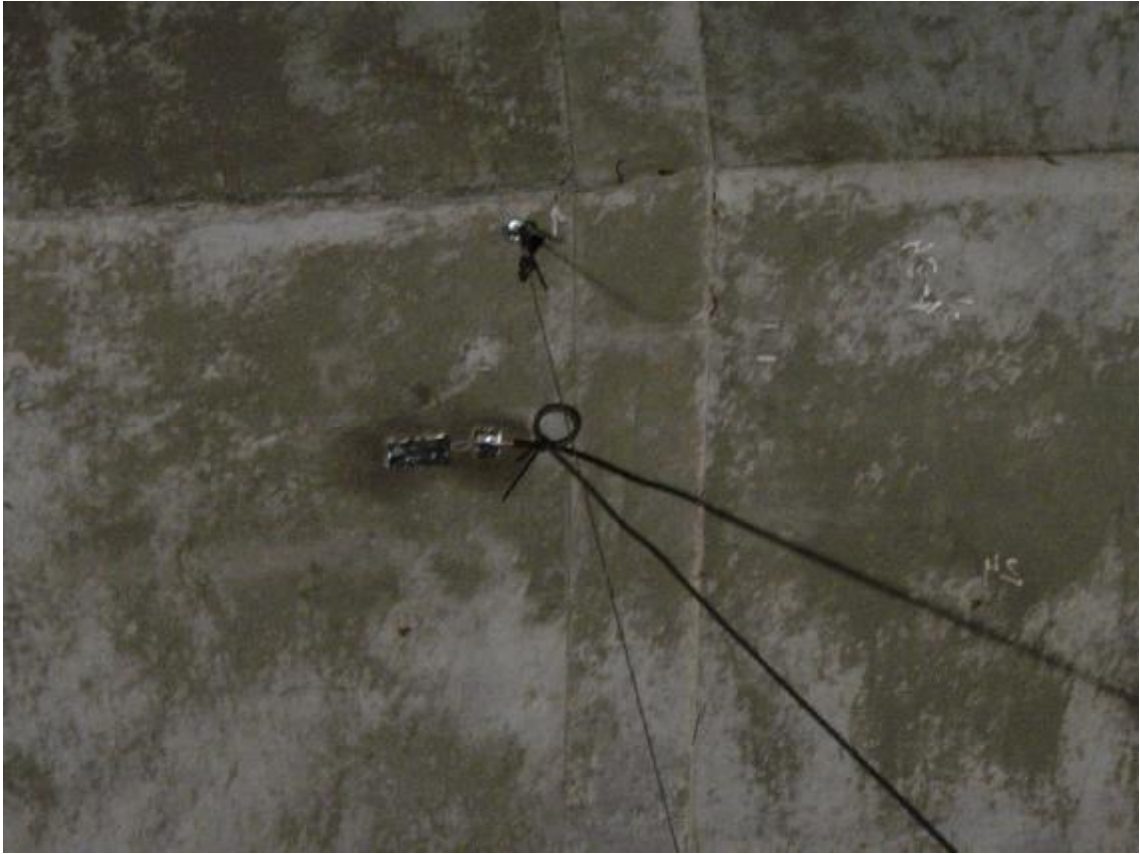
FOTOGRAFIA N°2: Detalle de la prueba estática con vanos alternos.



FOTOGRAFIA N°3: Detalle de una de las pruebas dinámicas.



FOTOGRAFIA N°4: Vista de la instrumentación utilizada en centro de vano.



FOTOGRAFIA N°5: Vista de la instrumentación puesta en el testero de la viga.



FOTOGRAFIA N°6: Vista de la instrumentación utilizada en las pilas.

CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

VI. ACTA DE PRUEBA DE CARGA

ACTA DE PRUEBA DE CARGA

TIPO DE PRUEBA:	Recepción de obra nueva	FECHA DE PRUEBA:	03/01/2007 y 04/01/2007

IDENTIFICACIÓN ESTRUCTURA

ORGANISMO, COMPAÑÍA:	ADIF
LÍNEA:	L.A.V. Madrid - Zaragoza - Barcelona - Frontera Francesa
TRAMO:	VILAFRANCA DEL PENEDES-BARCELONA. Subtramo: Vlb
P.K.:	Obra: 604+940; Línea: 603+245
PROVINCIA:	BARCELONA
DENOMINACIÓN	VIADUCTO RIERA TORRELLES RAMAL MERCANCIAS
REFERENCIA:	62RMP102
DESCRIPCIÓN DE LA ESTRUCTURA O PARTE DE ELLA: Dicha estructura es una estructura hiperestática de 3 vanos de luces 14,5 + 19 + 14,5 m y 48 m de longitud total y 7,00 m de altura máxima de pila.	

ASISTENTES

NOMBRES	ORGANISMO, COMPAÑÍA
D. JUAN CARLOS GARRIDO BARO	OFITECO

CONDICIONES ATMOSFÉRICAS

Temperatura	10,3°C	Humedad relativa	68%

PUNTOS DE MEDIDA INSTALADOS

		Vano 1	Vano 2	Vano 3	
FLECHAS	EQUIPO ÓPTICO				
	TRANS. DE DESPLAZAMIENTO	4	4	4	
DEFORMACIONES UNITARIAS	BANDAS EXTENSOMÉTRICAS	2	2	2	
REGISTRO DE VIBRACIONES	GEOFONOS	2	2	2	
OTROS					

TRENES DE CARGA UTILIZADOS

VEHÍCULO		NÚMERO	MATRÍCULAS	PESO UNITARIO (T)	
PREVISTO	REAL			PREVISTO	REAL
Loc. RENFE + Tolv. RENFE	Loc. RENFE + Tolv. RENFE	1		112 T (18,7 T/eje)+ 80 T (20 T/eje)	112 T (18,7 T/eje)+ 80 T (20 T/eje)
Loc. RENFE + Tolv. RENFE	Loc. RENFE + Tolv. RENFE	1		112 T (18,7 T/eje)+ 80 T (20 T/eje)	112 T (18,7 T/eje)+ 80 T (20 T/eje)

PORCENTAJE DE SOLICITACIÓN RESPECTO A INSTRUCCIÓN: 38%

SENTIDO DE CIRCULACIÓN PARA LAS PRUEBAS DINÁMICAS: Sentido Vilafranca del Penedes-Barcelona y Barcelona-Vilafranca del Penedes

HORA DE COMIENZO: 22 horas y 21 minutos

RESULTADOS BÁSICOS ALCANZADOS EN LA ESTRUCTURA

				Vano 1	Vano 2	Vano 3	
PORCENTAJE DE RESPUESTA RESPECTO AL PROYECTO DE PRUEBA DE CARGA	Estática	En general	Flechas	87%	80%	92%	
			Deformaciones unitarias	68%	74%	72%	
		Pruebas simplificadas	Flechas				
			Deformaciones unitarias				
	Dinámica	Frecuencia propia de vibración		126%	126%	126%	
PORCENTAJE DE RECUPERACIÓN	Estática	En general	Flechas	97%	96%	86%	
			Deformaciones unitarias	98%	99%	99%	
ANOMALIAS EN LA INSPECCIÓN VISUAL							
OBSERVACIONES							
CONDICIONES DE PUESTA EN SERVICIO		APTO ☒	NO APTO ☐	RESTRICCIONES			

D. JUAN CARLOS GARRIDO BARO
por OFITECO



CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

VII. FICHA DE SEGUIMIENTO

MODELO A1 DE COMUNICACIÓN DE INSPECCIONES AL REGISTRO

TIPO DE INSPECCIÓN ⁽¹⁾: Principal

FECHA DE INSPECCIÓN: 14/11/2006

IDENTIFICACIÓN DE LA ESTRUCTURA

ADMINISTRADOR:	ADIF
LÍNEA:	LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
TRAMO:	VILAFRANCA DEL PENEDES-BARCELONA. Subtramo: Vlb
P.K.:	Obra: 604+940; Línea: 603+245
PROVINCIA:	BARCELONA
DENOMINACIÓN:	VIADUCTO RIERA TORRELLES MERCANCIAS
REFERENCIA:	62RMP102
AÑO APROXIMADO DE CONSTRUCCIÓN:	2005

DATOS DEL RESPONSABLE DE LA INSPECCIÓN

ENTIDAD:	OFITECO
INGENIERO RESPONSABLE:	JUAN CARLOS GARRIDO BARO
DIRECCIÓN:	C/ TOMAS REDONDO, 3 EDIFICIO LUARCA-PLANTA 1, NAVE 1 28033 MADRID
TELÉFONO, FAX, E-MAIL:	913822260, 913820084, juancarlos.garrido@ofiteco.es

CARACTERÍSTICAS BÁSICAS Y TIPOLOGÍA ⁽²⁾

Nº DE TRAMOS:		3	LUCES DE CADA TRAMO(m):		14,5+19+14,5				
LONGITUD TOTAL(m):		48							
OBSTÁCULO SALVADO:	CARRETERA	""	FF. CC.	""	CAUCE	""	OTROS	X	ÁNGULO DE INCIDENCIA (°)
LÍNEA ELECTRIFICADA:	SI	X	NO	""					
VÍA:	ÚNICA	""	DOBLE	X	Nº DE VÍAS 2				
	SOLDADA	X	CON JUNTAS	""					
	ENCARRILADORA	SI	""	NO	X				
	CONTRACARRILES	SI	""	NO	X				
	APARATOS DE DILATACIÓN	SI	""	NO	X				
	RECTA	X	CURVA A DCHA	""	CURVA A IZQ.	""			
TIPOLOGÍA PUENTE:	METÁLICO	""	°						
	FÁBRICA	""							
	HORMIGÓN	X	TRAMOS EN ARCO	""	X				
	OTROS	""	TRAMOS RECTOS						
TIPO DE MATERIAL	ESTRIBOS:	HORMIGÓN	X	PIEDRA	""	LADRILLO	""		
	PILAS:	HORMIGÓN	X	PIEDRA	""	LADRILLO	""		
	ARCOS:	HORMIGÓN	""	PIEDRA	""	LADRILLO	""	METÁLICAS	""
	TABLERO:	HORMIGÓN	X	LOSA	""	VIGAS	""	TABLÓN	X
		METÁLICO	""	VIGAS ALMA LLENA	""	CELOSÍA	""		

DAÑOS DE CLASE 1 ⁽³⁾

Elemento estructural	Tipo de daños	Localizado o Generalizado	Plazo de Reparación (meses)	Limitación de Circulación	Requiere inspección especial
A ESTRIBO nº	A GOLPES, ROTURAS	L	6	A VELOCIDAD	SI
B PILA nº	B FISURAS, GRIETAS	G	12	B CARGAS	NO
C ARCO nº	C DESCALCES EN CIMENTACIONES		24	C GÁLIBO	
D TABLERO METÁLICO nº	D DESPLOMES, BASCULAMIENTOS		36	D SEÑALIZAR	
E TABLERO DE HORMIGÓN nº	E OXIDACIONES, CORROSIONES				
F VIA I, II, ...	F ASIENTOS, DESNIVELACIONES				
G OTROS:	G OTROS:				

EVALUACIÓN GLOBAL DE EVOLUCIÓN DE DAÑOS RESPECTO A INSPECCIÓN ANTERIOR

SIN EVOLUCIÓN	POCO IMPORTANTE	IMPORTANTE

RESULTADO DE LA INSPECCIÓN

FAVORABLE	DESFAVORABLE (Con daños de clase 1)

Firma del inspector



INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL Penedés BARCELONA

IDENTIFICACIÓN

ID (Identificador de la estructura)	62RMP102 VIADUCTO RIERA TORRELLES
P.K. INICIAL (sentido Madrid-Barcelona)	603+245
P.K. FINAL (sentido Madrid-Barcelona)	603+725
TIPO	Puente (10 m < luz <= 50 m) ▼
SUBTRAMO	VI ▼
FECHA DE LA INSPECCIÓN	14/11/2006
OBSERVACIONES	

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDÉS- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMPI02 VIADUCTO RIERA TORRELLES
14/11/2006

DATOS GENERALES

NOMBRE	VIADUCTO RIERA TORRELLES	
TIPOLOGÍA GENERAL	VIGA IN SITU	▼
TIPOLOGÍA ESTRUCTURAL	ESTRUCTURA CONTINUA	▼
Nº DE VÍAS		
VELOCIDAD MÁXIMA (km/h)		
TIPO DE ACCESO	VEHÍCULO AUTOMOVIL	▼
OBSTÁCULO SALVADO	ARROYO	▼
NOMBRE OBSTÁCULO SALVADO		
OTRO OBSTÁCULO SALVADO	CAMINO, VÍA PECUARIA O PASO DE FAUNA	▼
NOMBRE OTRO OBSTÁCULO SALVADO		
OBSERVACIONES		

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDES- BARCELONA

ID (Identificador de la estructura) 62RMPI02 VIADUCTO RIERA TORRELLES

FECHA DE LA INSPECCIÓN 14/11/2006

PARÁMETROS GEOMÉTRICOS

LONGITUD TOTAL (m)	48.00	
Nº DE VANOS	3	
LONGITUD MEDIA DEL VANO (m)	16.00	
LUZ DE CADA VANO (m)	14.5+19+14.5	
ALTURA MÁXIMA DE ESTRIBOS (m)		
ANCHURA MÁXIMA DE ESTRIBOS (m)	14.00	
ALTURA MÁXIMA DE PILAS (m)	7.00	
ANCHURA MÁXIMA DE PILAS (m)	1.50	
ESPESOR MÁXIMO DE PILAS (m)	1.50	
GÁLIBO INFERIOR (m)		
ANCHURA MÁXIMA DE TRAMOS (m)		
CANTO MÁXIMO DE TRAMOS EN CENTRO DE VANOS (m)		
Nº DE ELEMENTOS PRINCIPALES EN EL TRAMO	1	
SEPARACIÓN ENTRE ELEMENTOS PRINCIPALES (m)		
CANTO DE ELEMENTOS PRINCIPALES	CONSTANTE	▼
CANTO MÁXIMO DE ELEMENTOS PRINCIPALES EN CENTRO DE VANOS (m)		
GÁLIBO IZQUIERDO (m)		
GÁLIBO DERECHO (m)		
ENTREVÍA (m)		
TRAZADO DE VÍA EN PLANTA (m)		-m (curva a la izquierda) ▼
PERALTE DE VÍA DE ENTRADA (m)		
PERALTE DE VÍA DE CENTRO (m)		
PERALTE DE VÍA DE SALIDA (m)		
OBSERVACIONES		

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDÉS- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMPI02 VIADUCTO RIERA TORRELLES
14/11/2006

MATERIALES

MATERIAL CONSTITUYENTE	HORMIGÓN PRETENSADO	▼

TRAMOS

TIPOLOGÍA DE TRAMOS	TABLERO EN CAJÓN	▼

TIPOLOGÍA ESTRUCTURAL DE TRAMOS	ESTRUCTURA CONTINUA	▼

MATERIAL EN TRAMOS	HORMIGÓN PRETENSADO	▼

IMPERMEABILIZACIÓN DE ESTRUCTURA DE TRAMOS	SI	▼

ELEMENTOS DE DRENAJE EN TRAMOS	LONGITUDINALES Y TRANSVERSALES	▼

ESTRIBOS

TIPOLOGÍA DE ESTRIBOS	MUROS FRONTAL Y EN VUELTAS	▼

MATERIAL BASE EN ESTRIBOS	HORMIGÓN ARMADO O EN MASA	▼

PROTECCIÓN EN PIE DE ESTRIBOS	PEDRAPLÉN O ESCOLLERA	▼

TIPOLOGÍA DE CIMENTACIÓN EN ESTRIBOS	CIMENTACIÓN DIRECTA	▼

MATERIAL BASE EN CIMENTACIÓN DE ESTRIBOS	HORMIGÓN ARMADO O EN MASA	▼

PILAS

TIPOLOGÍA DE PILAS	TABIQUE	▼

SECCIÓN DE PILAS	CONSTANTE	▼

TAJAMARES	NO	▼

MATERIAL BASE EN PILAS	HORMIGÓN ARMADO O EN MASA	▼

TIPOLOGÍA DE CIMENTACIÓN EN PILAS	ENCEPADO Y PILOTES	▼

MATERIAL BASE EN CIMENTACIÓN DE PILAS	HORMIGÓN ARMADO O EN MASA	▼

APARATOS Y JUNTAS DE DILATACIÓN

APARATOS DE APOYO	TIPO POT	▼

JUNTAS DE DILATACIÓN	SOBRE PILAS Y EN ESTRIBOS	▼

TIPOLOGÍA DE JUNTAS DE DILATACIÓN	OTRAS	▼

APARATOS DE DILATACIÓN DE CARRILES	AMBOS LADOS	▼

VARIOS

PASEOS DE SERVICIO	AMBOS LADOS	▼

OBSERVACIONES

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDES- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMP102 VIADUCTO RIERA TORRELLES
14/11/2006

ESTADO ACTUAL MUROS DE PORTICO

Punzonado bajo apoyos	0: No existen defectos	▼
Daños en unión frente y laterales	0: No existen defectos	▼
Juntas degradadas	0: No existen defectos	▼
Golpes y roturas	0: No existen defectos	▼
Fisuras y grietas	0: No existen defectos	▼
Coqueras y nidos de grava	0: No existen defectos	▼
Meteorización y degradación	0: No existen defectos	▼
Desprendimientos	0: No existen defectos	▼
Carbonatación y desagregación	0: No existen defectos	▼
Armaduras vistas someras	0: No existen defectos	▼
Corrosión y disgregación	0: No existen defectos	▼
Humedades y filtraciones	0: No existen defectos	▼
Incrustaciones calcáreas y eflorescencias	0: No existen defectos	▼
Desagüe de mechinales	0: No existen defectos	▼
Abombamientos	0: No existen defectos	▼
Desplomes o basculamientos	0: No existen defectos	▼
Asentamientos	0: No existen defectos	▼
Descalces	0: No existen defectos	▼
Socavaciones	0: No existen defectos	▼
Depósitos en coronación	0: No existen defectos	▼
Daños en coronación	0: No existen defectos	▼
Daños en espaldón	0: No existen defectos	▼
Balasto encastrado	0: No existen defectos	▼
Daños en protección de pie de estribos	0: No existen defectos	▼
Daños en cimentaciones vistas	0: No existen defectos	▼
Vegetación aflorando	0: No existen defectos	▼
Vegetación adosada	0: No existen defectos	▼

OBSERVACIONES ESTRIBOS

EST. GENERAL MUROS PORTICO

2: Defectos con riesgo de evolución patológica



INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILAFRANCA DEL PENEDES- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMP102 VIADUCTO RIERA TORRELLES
14/11/2006

ESTADO ACTUAL MUROS DE ACOMPAÑAMIENTO

Daños en unión frente y laterales	0: No existen defectos	▼
Juntas degradadas	0: No existen defectos	▼
Golpes y roturas	1: Defectos con incidencia en la estética	▼
Fisuras y grietas	1: Defectos con incidencia en la estética	▼
Coqueras y nidos de grava	1: Defectos con incidencia en la estética	▼
Meteorización y degradación	0: No existen defectos	▼
Desprendimientos	0: No existen defectos	▼
Carbonatación y desagregación	0: No existen defectos	▼
Armaduras vistas someras	0: No existen defectos	▼
Corrosión y disgregación	0: No existen defectos	▼
Humedades y filtraciones	0: No existen defectos	▼
Incrustaciones calcáreas y eflorescencias	0: No existen defectos	▼
Desagüe de mechinales		▼
Abombamientos	0: No existen defectos	▼
Desplomes o basculamientos	0: No existen defectos	▼
Asentamientos	0: No existen defectos	▼
Descalces	0: No existen defectos	▼
Socavaciones	0: No existen defectos	▼
Depósitos en coronación	0: No existen defectos	▼
Daños en coronación	0: No existen defectos	▼
Daños en protección de pie de estribos	0: No existen defectos	▼
Daños en cimentaciones vistas	0: No existen defectos	▼
Vegetación aflorando	1: Defectos con incidencia en la estética	▼
Vegetación adosada	0: No existen defectos	▼
OBSERVACIONES ESTRIBOS		
ESTADO GENERAL MUROS ACOMP.	0: No existen defectos	▼

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDÉS- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMPI02 VIADUCTO RIERA TORRELLES
14/11/2006

ESTADO ACTUAL PILAS

Punzonado bajo apoyos	0: No existen	▼
Daños en unión frente y laterales	0: No existen	▼
Juntas degradadas	0: No existen	▼
Golpes y roturas	0: No existen	▼
Fisuras y grietas	0: No existen	▼
Coqueras y nidos de grava	0: No existen	▼
Meteorización y degradación	0: No existen	▼
Desprendimientos	0: No existen	▼
Carbonatación y desagregación	0: No existen	▼
Armaduras vistas someras	0: No existen	▼
Corrosión y disgregación	0: No existen	▼
Humedades y filtraciones	1: Defectos con incidencia en la estética	▼
Incrustaciones calcáreas y eflorescencias	1: Defectos con incidencia en la estética	▼
Abombamientos	0: No existen	▼
Desplomes o basculamientos	0: No existen	▼
Asentamientos	0: No existen	▼
Descalces	0: No existen	▼
Socavaciones	0: No existen	▼
Depósitos en coronación	0: No existen	▼
Daños en coronación	0: No existen	▼
Daños en cimentaciones vistas	0: No existen	▼
Vegetación aflorando	1: Defectos con incidencia en la estética	▼
Vegetación adosada	0: No existen	▼

OBSERVACIONES PILAS

ESTADO GENERAL PILAS

1: Defectos con incidencia en la estética



INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDÉS- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMPI02 VIADUCTO RIERA TORRELLES
14/11/2006

ESTADO ACTUAL APARATOS DE APOYO

Envejecimiento	1: Defectos con incidencia en la estética	▼
Corrosión	0: No existen	▼
Suciedad y aterramiento	1: Defectos con incidencia en la estética	▼
Bloqueo o encastramiento	0: No existen	▼
Desplazamiento o deslizamiento	0: No existen	▼
Aplastamiento	0: No existen	▼
Reglaje incorrecto	0: No existen	▼
Desnivelaciones	0: No existen	▼
Falta de contacto	0: No existen	▼
Cunas de apoyo deterioradas	0: No existen	▼
Vegetación adosada	1: Defectos con incidencia en la estética	▼

OBSERVACIONES APARATOS DE APOYO

ESTADO GENERAL APARATOS DE APOYO

1: Defectos con incidencia en la estética ▼

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDES- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMP102 VIADUCTO RIERA TORRELLES

14/11/2006

<u>ESTADO ACTUAL ESTRUCTURA DE TRAMOS</u>		
Pintura envejecida y desprendida	1: Defectos con incidencia en la estética	▼
Oxidación superficial	1: Defectos con incidencia en la estética	▼
Corrosiones locales activas	0: No existen	▼
Entalladuras y pérdidas de sección	0: No existen	▼ ;
Elementos metálicos deformados o rotos	0: No existen	▼
Tornillos flojos o faltan	0: No existen	▼
Soldaduras fisuradas	0: No existen	▼
Fisuras y grietas longitudinales bóvedas	0: No existen	▼
Fisuras y grietas transversales clave	0: No existen	▼
Fisuras y grietas transversales riñones	0: No existen	▼
Fisuras y grietas transversales arranques	0: No existen	▼
Fisuras y grietas longitudinales tímpanos	0: No existen	▼
Fisuras y grietas verticales tímpanos	0: No existen	▼
Separación y filtraciones tímpano-bóveda	0: No existen	▼
Fisuras y grietas longitudinales losas	0: No existen	▼
Fisuras y grietas transversales losas	0: No existen	▼
Fisuras y grietas verticales losas	0: No existen	▼
Fisuras y grietas longitudinales en alas superiores vigas	0: No existen	▼
Fisuras y grietas transversales en alas superiores vigas	0: No existen	▼
Fisuras y grietas longitudinales conexión alas-alma	0: No existen	▼
Fisuras y grietas transversales alma vigas	0: No existen	▼
Fisuras y grietas inclinadas alma vigas	0: No existen	▼
Fisuras y grietas longitudinales alma vigas	0: No existen	▼
Fisuras y grietas longitudinales ala inferior	0: No existen	▼
Fisuras y grietas transversales ala inferior	0: No existen	▼
Fisuras y daños en testeros	0: No existen	▼
Golpes y roturas	0: No existen	▼
Coqueras y nidos de grava	0: No existen	▼
Meteorización y degradación	1: Defectos con incidencia en la estética	▼
Desprendimientos	0: No existen	▼
Carbonatación y desagregación	0: No existen	▼
Armaduras vistas someras	0: No existen	▼
Corrosión y disgregación	0: No existen	▼
Humedades y filtraciones	1: Defectos con incidencia en la estética	▼
Desagües obturados	0: No existen	▼
Incrustaciones calcáreas y eflorescencias	1: Defectos con incidencia en la estética	▼
Abombamientos	0: No existen	▼
Asentamientos y desnivelaciones	0: No existen	▼
Juntas longitudinales degradadas	0: No existen	▼
Juntas transversales degradadas	0: No existen	▼
Vegetación aflorando	0: No existen	▼
Vegetación adosada	0: No existen	▼
OBSERVACIONES ESTRUCTURA DE TRAMOS	EXISTEN UNA SERIE DE PRELOSAS DEL TABLERO QUE PRESENTAN GOLPES Y ROTURAS E INCLUSO ALGUNA DE ELLAS ARMADURAS VISTAS SOMERAS	
ESTADO GENERAL ESTRUCTURA DE TRAMOS	1: Defectos con incidencia en la estética	▼

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILLAFRANCA DEL PENEDES- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMPI02 VIADUCTO RIERA TORRELLES
14/11/2006

ESTADO ACTUAL RESTO DE ELEMENTOS

Impermeabilización	0: No existen	▼
Drenaje longitudinal	0: No existen	▼
Drenaje transversal	0: No existen	▼
Muretes guardabalasto	0: No existen	▼
Juntas de dilatación	0: No existen	▼
Juntas de longitudinales	0: No existen	▼
Conducciones y canaletas	0: No existen	▼
Anclajes de postes	0: No existen	▼
Barandillas	1: Defectos con incidencia en la estética	▼

OBSERVACIONES RESTO DE ELEMENTOS

ESTADO GENERAL RESTO DE ELEMENTOS

1: Defectos con incidencia en la estética ▼

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILAFRANCA DEL PENEDES- BARCELONA

ID (Identificador de la estructura)
FECHA DE LA INSPECCIÓN

62RMPI02 VIADUCTO RIERA TORRELLES
14/11/2006

ESTADO ACTUAL

ESTADO GENERAL

ESTADO GENERAL MUROS DE PORTICO

ESTADO GENERAL MUROS ACOMPAÑAMIENTO

ESTADO GENERAL PILAS

ESTADO GENERAL APARATOS DE APOYO

ESTADO GENERAL ESTRUCTURA DE TRAMOS

ESTADO GENERAL RESTO DE ELEMENTOS

OBSERVACIONES

0: No existen ▼

1: Defectos con incidencia en la estética

1: Defectos con incidencia en la estética

INSPECCIONES ESTRUCTURAS
LAV MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA
VILAFRANCA DEL PENEDES- BARCELONA

ID (Identificador de la estructura)

62RMP102 VIADUCTO RIERA TORRELLES

FECHA DE LA INSPECCIÓN

14/11/2006

IDENTIFICACIÓN ARCHIVOS FOTOGRÁFICOS

NOMBRE ARCHIVO

FOTOGRAFÍA Nº 1	ALZADO DERECHO ▼	62PIRM0201
FOTOGRAFÍA Nº 2	ALZADO IZQUIERDO ▼	62PIRM0202
FOTOGRAFÍA Nº 3	ESTRIBO DE ENTRADA ▼	62PIRM0203
FOTOGRAFÍA Nº 4	ESTRIBO DE SALIDA ▼	62PIRM0204
FOTOGRAFÍA Nº 5	VISTA INFERIOR ▼	62PIRM0205
FOTOGRAFÍA Nº 6	VISTA SUPERIOR DESDE ENTRADA ▼	62PIRM0206
FOTOGRAFÍA Nº 7	VISTA SUPERIOR DESDE SALIDA ▼	62PIRM0207
FOTOGRAFÍA Nº 8	DETALLE DE HUMEDAD Y EFLORESCIENCIA	62PIRM0208
FOTOGRAFÍA Nº 9	DETALLE DE APOYO ENTRE LOSA Y ESTRIBO	62PIRM0209
FOTOGRAFÍA Nº 10	DETALLE DE LA JUNTA DE ENTRADA	62PIRM0210
FOTOGRAFÍA Nº 11	DETALLE DE LA JUNTA DE SALIDA	62PIRM0211
FOTOGRAFÍA Nº 12		
FOTOGRAFÍA Nº 13		
FOTOGRAFÍA Nº 14		
FOTOGRAFÍA Nº 15		
FOTOGRAFÍA Nº 16		
FOTOGRAFÍA Nº 17		
OBSERVACIONES		



FOTOGRAFIA N°1: Alzado derecho en dirección Barcelona.



FOTOGRAFIA N°2: Alzado izquierdo dirección Barcelona.



FOTOGRAFIA N°3: Entrada superior con dirección Barcelona.



FOTOGRAFIA N°4: Salida superior con dirección Barcelona.



FOTOGRAFIA N°5: Estribo de entrada con dirección Barcelona.



FOTOGRAFIA N°6: Estribo de entrada con dirección Barcelona.



FOTOGRAFIA N°7: Estribo de salida con dirección Barcelona.



FOTOGRAFIA N°8: Vista inferior.



FOTOGRAFIA N°9: Detalle de la humedad y su marca de eflorescencia.



FOTOGRAFIA N°10: Apoyo de la losa sobre el estribo.



FOTOGRAFIA N°11: Vista del otro apoyo entre losa y estribo.



FOTOGRAFIA N°12: Detalle del estado de las barandillas.



FOTOGRAFIA N°13: Detalle del muro guardabalasto.



FOTOGRAFIA N°14: Detalle de la evacuación del drenaje de agua.



FOTOGRAFIA N°15: Detalle de las juntas de dilatación a la entrada del viaducto.



FOTOGRAFIA N°16: Detalle de la junta de dilatación a la salida del viaducto.

CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.
TRAMO: VILLAFRANCA DEL PENEDES-BARCELONA
AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

VIII. PLANIMETRÍA Y NIVELACIÓN

PLANIMETRÍA Y NIVELACIÓN

La Estructura RIERA TORRELLES (mercancías) (62RMPI02) de la L.A.V. Madrid – Zaragoza – Barcelona – Frontera Francesa, Tramo Vilafranca del Penedés - Barcelona, no ha sido objeto de control topográfico dentro de los trabajos realizados por OFITECO en el marco del contrato de “Consultoría y Asistencia Técnica para la Realización de Pruebas de Carga para la recepción de puentes de la L.A.V. Madrid – Zaragoza – Barcelona – Frontera Francesa, Tramo Vilafranca del Penedés - Barcelona (Exp: AV 004/06)” suscrito el 18 de Julio de 2006 por la UTE PC ADIF VILLAFRANCA con el ADMINISTRADOR DE INFRAESTRUCTURAS FERROVIARIAS (ADIF).

CONTRATO DE CONSULTORÍA Y ASISTENCIA TÉCNICA PARA LA REALIZACIÓN DE PRUEBAS DE CARGA PARA LA RECEPCIÓN DE PUENTES DE LA LÍNEA DE ALTA VELOCIDAD MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA.
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AV 004/06

**INFORME DE RESULTADOS PRUEBA DE CARGA DE LA
ESTRUCTURA VIADUCTO RIERA TORRELLES (MERCANCÍAS)
(62RMPI02)**

IX. INSPECCIÓN DEL CAUCE

ÍNDICE

1.-INTRODUCCIÓN	3
2.-DATOS PREVIOS	3
3.-ENTORNO	4
4.-VISITA A CAMPO.....	4
5.-EVALUACIÓN DE LA SITUACIÓN REAL DEL CAUCE Y LA ESTRUCTURA.....	5
6.-CONCLUSIONES	6

ANEJO 9A: CARTOGRAFÍA

ANEJO 9B: CROQUIS DE CAUCE

ANEJO 9C: FICHA DE CAMPO

ANEJO 9D: REPORTAJE FOTOGRÁFICO

1.-INTRODUCCIÓN

El presente anejo tiene por objeto el análisis desde el punto de vista de riesgo de socavación del viaducto de Riera Torrelles perteneciente a la línea de Alta Velocidad Madrid-Zaragoza-Barcelona-Frontera Francesa. Tramo: Vilafranca del Penedés-Barcelona. Tramo Vlb P.K. Línea: 603+245.

Los resultados alcanzados se han obtenido a partir de la metodología estándar empleada por TIFSA en este tipo de estudios.

2.-DATOS PREVIOS

Se incluye a continuación una tabla resumen de los datos relativos a la estructura:

Nombre:	Viaducto de Riera Torrelles Mercancías	P.K.:	603 + 245
Línea:	Madrid-Zaragoza-Barcelona-Front. Francesa	Provincia	Barcelona
Tipología:	Doble tablero de losa aligerada sobre pilas de hormigón	Material:	Hormigón pretensado
Número de vanos:	Tres	Luz:	14.5 en extremos, 19 en central
Coordenadas U.T.M.	X= 417892 Y= 4582373 (aprox.) Institut Cartogràfic de Catalunya	Huso:	30
		Escala:	1:10.000
Datos topográficos:	Hoja nº 285-126, Sant Vicenç del Horts		
Confederación:	Agencia Catalana del Agua		

3.-ENTORNO

El puente de estudio se encuentra ubicado en el municipio de Sant Vicenç del Horts, el cual presenta una precipitación media anual de 482 mm y una temperatura media anual de 16°C.

El viaducto se asienta en la terraza derecha del río Llobregat, caracterizado por pendientes suaves. La litología se caracteriza por arcillas y limos, con cierta cantidad de clastos angulosos.

Existe aprovechamiento agrícola en el entorno próximo.

El cauce no se encuentra muy encajado, y la vegetación se compone de matorral y cañaverales.

No existe protección artificial del cauce.

En el Apéndice 9A (Cartografía) se indica la situación del puente sobre el Mapa Topográfico Nacional. Asimismo, en el Apéndice 9B (Croquis de Cauce) se incluyen la vista en planta del cauce y la sección transversal del mismo a la altura del puente, vista desde aguas arriba.

4.-VISITA A CAMPO

Fecha de la visita: 23/06/2008

Trabajos realizados: Inspección visual de la estructura y de cada uno de sus elementos, haciendo hincapié en el estado del conjunto suelo-cimentación. También se estudió la

posible existencia de erosiones en el. En el Apéndice 9C (Ficha de Campo) se describen con más detalle las observaciones realizadas durante la inspección. Asimismo, en el Apéndice 9D (Reportaje Fotográfico) se muestran las fotografías tomadas durante la visita a campo.

5.-EVALUACIÓN DE LA SITUACIÓN REAL DEL CAUCE Y LA ESTRUCTURA

Las características del terreno del lecho, cobertura en márgenes y erosión en las mismas nos aportan los datos necesarios para estimar el índice de socavación, que para el caso de estudio es de:

Terreno del lecho (L)	Tipo de Protección (TP)	Estado de Protección (EP)
6		
	Índice de Márgenes (M)	Índice de Socavabilidad (IS)
	2	0

El lecho del cauce está constituido fundamentalmente por limos y arcillas.

El rango que conlleva el índice obtenido aparece reflejado en la siguiente tabla:

Índice de Socavabilidad	Rango
IS<5	→ Riesgo de socavación
IS≥5	→ Aparentemente sin problemas

6.-CONCLUSIONES

- El índice de Socavación obtenido ($IS=0$) refleja el riesgo de erosión y socavación de la estructura.
- La ausencia de cobertura vegetal de las márgenes no proporciona a la cimentación una garantía importante de cara a asegurar la integridad y el perfecto estado de la misma
- La escasa granulometría del material constituyente del lecho puede propiciar la erosión del mismo. El descenso del nivel de lecho del cauce puede provocar el descalce y su disgregación.
- Se observa cierta socavación por erosión en la base de la pila 1.
- En la inspección no se han observado daños en la estructura o en su entorno que comprometan la estabilidad de la misma, por lo que a priori puede funcionar sin problemas hidráulicos normales.

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MERCANCÍAS (62RMPI02)

ANEJO 9A: CARTOGRAFÍA

VIADUCTO DE RIERA DE TORRELLES



LÍNEA: L.A.V. MADRID - ZARAGOZA -
BARCELONA - FRONTERA FRANCESA
PUENTE: VIADUCTO DE RIERA TORRELLES
MERCANCÍAS

CLIENTE:



TÍTULO:
MAPA DE
SITUACIÓN

REFERENCIA:
62RMP102

ESCALAS:
1 / 10.000

FECHA:
25 / 06 / 08

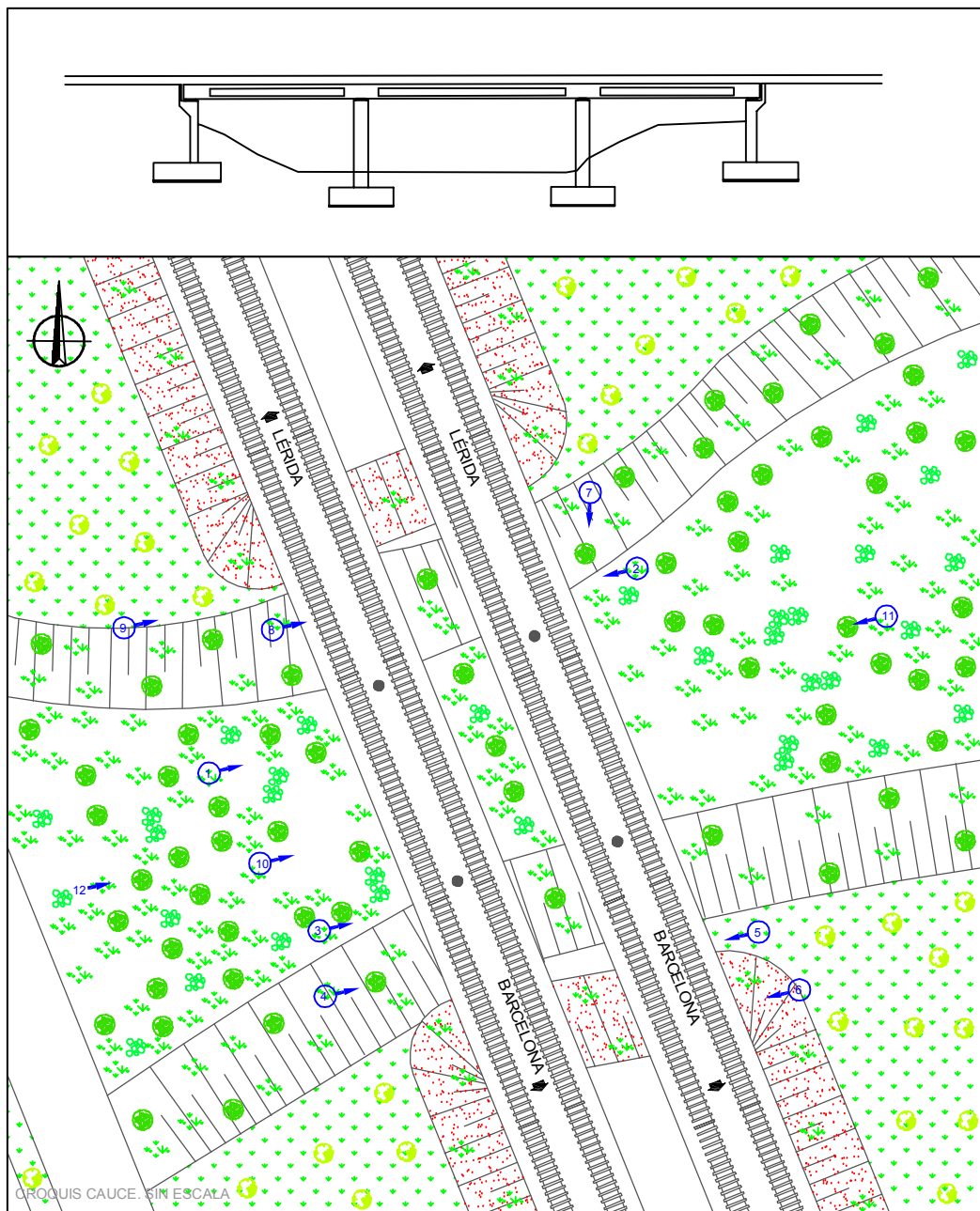
HOJA 1 DE 1

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PUENTES DE LA LÍNEA MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA. TRAMO:VILAFRANCA DEL
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INSPECCION DEL CAUCE DE LA ESTRUCTURA VIADUCTO DE RIERA TORRELLES
MERCANCÍAS (62RMPI02)

ANEJO 9B: CROQUIS DE CAUCE



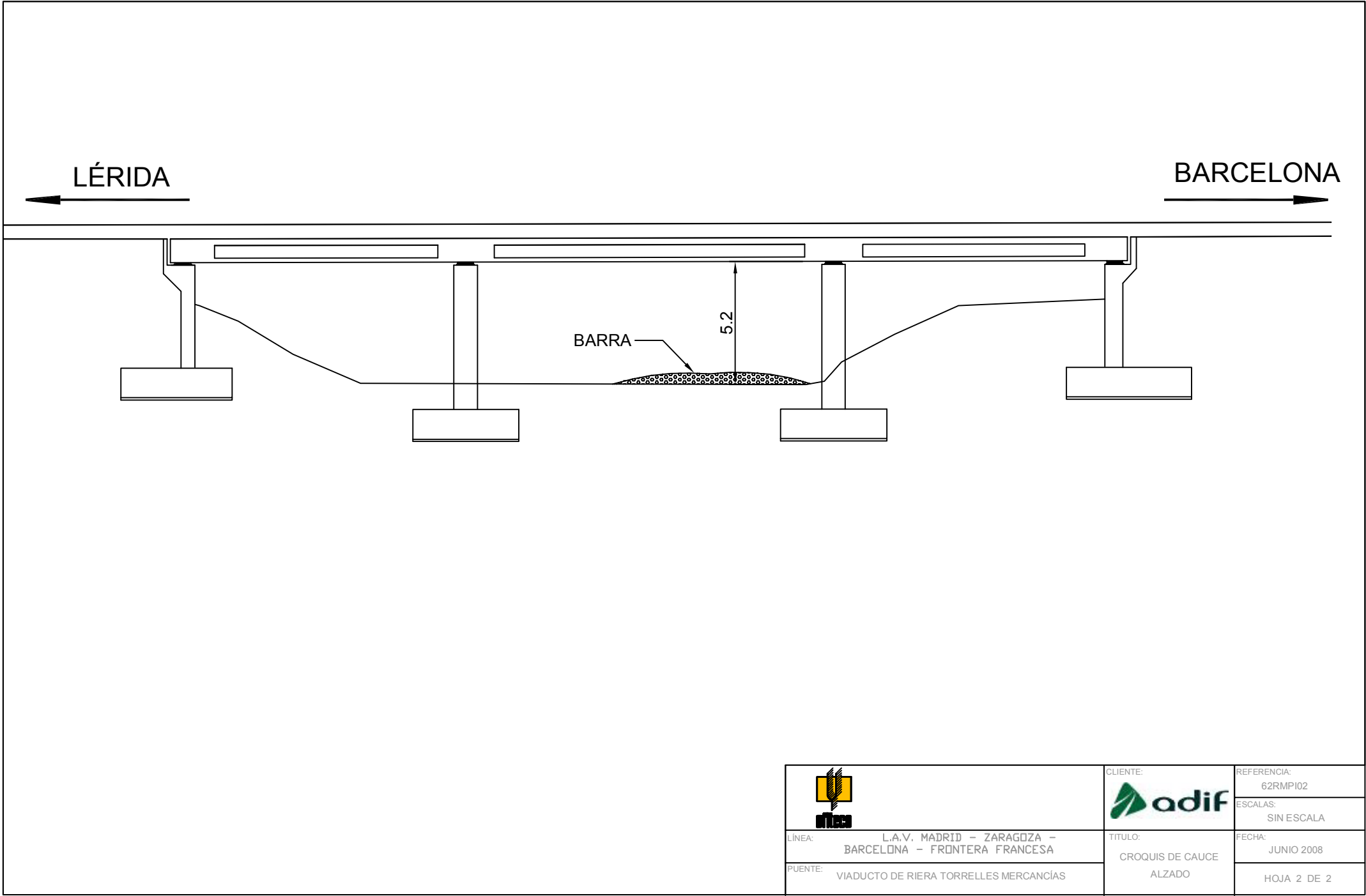
LEYENDA

- 5 N° DE FOTOGRAFÍA
- VEG. ARBÓREA
- VEG. ARBUSTIVA
- VEG. HERBÁCEA

- CULT. ARBÓREOS
- CULT. HERBÁCEOS
- TIERRA
- ROCA
- PROFUNDIDAD AGUA

- PAVIMENTO
- EDIFICACIÓN
- OBSTRUCCIÓN
- EROSIÓN/SOCAV.
- TALUD VERTICAL

	CLIENTE: 	REFERENCIA: 62RMP102
LÍNEA: L.A.V. MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA	TÍTULO: CROQUIS DE CAUCE PLANTA	ESCALAS: SIN ESCALA
PUENTE: VIADUCTO DE RIERA TORRELLES MERCANCÍAS		FECHA: JUNIO 2008 HOJA 1 DE 2



	CLIENTE:	REFERENCIA:
		62RMP102
		ESCALAS:
LÍNEA:	TÍTULO:	FECHA:
L.A.V. MADRID - ZARAGOZA - BARCELONA - FRONTERA FRANCESA	CROQUIS DE CAUCE	JUNIO 2008
PUENTE:	ALZADO	HOJA 2 DE 2
VIADUCTO DE RIERA TORRELLES MERCANCÍAS		

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PUENTES DE LA LÍNEA MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA. TRAMO:VILLAFRANCA DEL
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INSPECCION DEL CAUCE DE LA ESTRUCTURA VIADUCTO DE RIERA TORRELLES
MERCANCÍAS (62RMPI02)

ANEJO 9C: FICHA DE CAMPO

INSPECCIÓN DE ESTRIBOS

ESTRIBO 1

Localización	4	1= LLANURA D, 2= MARGEN D, 3= CAUCE, 4= MARGEN I, 5= LLANURA I
Material del muro	1	1= HORM. 2= SILL. 3= LADR. 4= MAMPOST. 5= TIERRA REFOR. 6= ACERO 7= OTRO
Tipo de estribo	1	1= CERRADO, 2 = ABIERTO, 3 = FLOTANTE
Cimentación	---	1= DIRECTA, 2 = PILOTES, 3= PILOTES ENCAMISADOS, 4= PANTALLAS, 5= OTRAS
Estado del estribo	1	1= BUENO, 2= DAÑOS, 3= DAÑOS MUY AVANZADOS / DESPLOME
Protección	3	1= ESCOLLERA, 2= GAVIONES, 3= OTRO
Estado de la protección	1	1= BUENO, 2= DAÑOS, 3= DAÑOS MUY AVANZADOS / DESPLOME
Terreno	6	1= ARTIFICIAL, 2= ROCA, 3= BOLOS, 4= GRAVA, 5= ARENA, 6= LIMO / ARCILLA
Ángulo de ataque del agua	1	1= NO INCIDE, 2= 0° a 5°, 3= 6° a 35°, 4= 36° a 50°, 5=51° a 90°, 6 = NEGATIVO
Nivel máximo del agua	---	EN METROS, MEDIDO DESDE EL TERRENO
Nivel actual del agua	0	EN METROS, MEDIDO DESDE EL TERRENO
Socavación	1	1= NINGUNA, 2= LEVE, 3= AVANZADA, 4= DESCALCE
Profundidad de socavación	0	EN METROS, MEDIDO DESDE EL TERRENO ACTUAL

ESTRIBO 2

Localización	2	1= LLANURA D, 2= MARGEN D, 3= CAUCE, 4= MARGEN I, 5= LLANURA I
Material del muro	1	1= HORM. 2= SILL. 3= LADR. 4= MAMPOST. 5= TIERRA REFOR. 6= ACERO 7= OTRO
Tipo de estribo	1	1= CERRADO, 2 = ABIERTO, 3 = FLOTANTE
Cimentación	-	1= DIRECTA, 2 = PILOTES, 3= PILOTES ENCAMISADOS, 4= PANTALLAS, 5= OTRAS
Estado del estribo	1	1= BUENO, 2= DAÑOS, 3= DAÑOS MUY AVANZADOS / DESPLOME
Protección	3	1= ESCOLLERA, 2= GAVIONES, 3= OTRO
Estado de la protección	1	1= BUENO, 2= DAÑOS, 3= DAÑOS MUY AVANZADOS / DESPLOME
Terreno	6	1= ARTIFICIAL, 2= ROCA, 3= BOLOS, 4= GRAVA, 5= ARENA, 6= LIMO / ARCILLA
Ángulo de ataque del agua	1	1= NO INCIDE, 2= 0° a 5°, 3= 6° a 35°, 4= 36° a 50°, 5=51° a 90°, 6 = NEGATIVO
Nivel máximo del agua	---	EN METROS, MEDIDO DESDE EL TERRENO
Nivel actual del agua	0	EN METROS, MEDIDO DESDE EL TERRENO
Socavación	1	1= NINGUNA, 2= LEVE, 3= AVANZADA, 4= DESCALCE
Profundidad de socavación	0	EN METROS, MEDIDO DESDE EL TERRENO ACTUAL

ALETAS

			PROTECCIÓN		SOCAVACIÓN	
Ángulo	Estado	Tipo	Estado	Tipo	Profundidad	
Aleta E1 izquierda						
Aleta E1 derecha						
Aleta E2 izquierda						
Aleta E2 derecha						
1= 0° a 5°	1= BUENO	1= ESCOLLERA	1= BUENO	1= NINGUNA		
2= 6° a 30°	2= DAÑOS	2= GAVIONES	2= DAÑOS	2= LEVE		
3= 31° a 60°	3= DAÑOS MUY AVANZADOS	3= OTROS	3= DAÑOS MUY AVANZADOS	3= AVANZADA		
4= 61° a 85°				4= DESCALCE		
5= 86° a 90°						

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MERCANCÍAS (62RMP102)

INSPECCIÓN DEL CAUCE
CARACTERIZACIÓN

Anchura aguas arriba	25	En metros
Anchura aguas abajo	25	En metros
Profundidad	1,3	En metros
Situación del cauce	4	1= LIBRE, 2= EN LLANURA DE INUNDACIÓN, 3= ENCAÑONADO 4= ENCAUZADO
Terreno del lecho	4,6	1= ARTIFICIAL, 2= ROCA, 3= BOLOS, 4= GRAVA, 5= ARENA, 6= LIMO/ ARCILLA
Estado del cauce	1	1= SECO, 2= RÉGIMEN NORMAL, 3= AVENIDA, 4= MAREA OCEÁNICA
Tipo de protección	1	1= ESCOLLERA, 2= GAVIONES, 3= OTRO
Estado de la protección	2	1= BUENO, 2= DAÑOS, 3= DAÑOS MUY AVANZADOS / DESPLOME
Tipo de cauce	6	1= ARTIFICIAL, 2= ARROYO, 3= ESTABLE, 4= SEMIESTABLE, 5= RAMIFICADO, 6= TORRENTE

ÁNGULOS CON EL PUENTE

Ángulo de entrada en aguas bajas	1
Ángulo de salida en aguas bajas	1
Ángulo de entrada en aguas altas	1
Ángulo de salida en aguas altas	1

1= 90° a 80°, 2= 79° a 45°, 3= 44° a 10°, 4= 9° a 0

MÁRGENES

Margen derecha aguas arriba	COBERTURA	3
	TERRENO	4 + 6
	EROSIÓN	3
Margen derecha aguas abajo	COBERTURA	4
	TERRENO	4 + 6
	EROSIÓN	2
Margen izquierda aguas arriba	COBERTURA	5
	TERRENO	6
	EROSIÓN	2
Margen izquierda aguas abajo	COBERTURA	5 + 4
	TERRENO	6
	EROSIÓN	3
COBERTURA: 1= artificial, 2= bosque, 3= matorral, 4= pastos, 5= árido		
TERRENO: 1= artificial, 2= roca, 3= bolos, 4= grava, 5= arena, 6= limo/ arcilla		
EROSIÓN: 1= no hay, 2= suave, 3= severa		

Oficina Técnica de Estudios y Control de Obras, S.A. - OFITECO

JUNIO - 2008

BARRAS U OBSTRUCCIONES

		SITUACIÓN	OCUPACIÓN	DISTANCIA
Barra 1		2	50	Bajo la estructura
Barra 2				
AGUAS ARRIBA	Barra 3			
	Barra 4			
	Barra 5			
AGUAS ABAJO	Barra 1			
	Barra 2			
	Barra 3			
	Barra 4			
	Barra 5			
		1= IZQUIERDA	En % de la anchura	En metros al puente.
		2= CENTRAL	del río.	
		3= DERECHA		

CROQUIS DE ÁNGULOS y ALTURA LIBRE DE PILA

Estribos Aletas



Pilas



COMENTARIOS

En el momento de la inspección el tiempo era soleado y el cauce que salva el puente estaba seco.

Estribos y Aletas:

Los estribos de hormigón armado son cerrados, sin aletas. Ambos se encuentran en buen estado y están protegidos por mantos de limo/arcilla.

Cauce:

El cauce de Torrelles discurre recto bajo la estructura y en su entorno.

El torrente se encuentra encauzado por la propia excavación del mismo en la terraza.

Existe una barra en el margen derecho, bajo la estructura, que ocupa aproximadamente el 50% de la anchura del cauce.

Nivel del agua:

Inexistente. No se aprecian marcas que indiquen el nivel máximo del agua a su paso bajo la estructura.

ANEJO 9D: REPORTAJE FOTOGRÁFICO



FOTOGRAFÍA Nº 1: CAUCE DESDE AGUAS ARRIBA



FOTOGRAFÍA N° 2: DRENAJE ESTRIBO DERECHO (E2) A AGUAS ABAJO



. FOTOGRAFÍA N° 3: DRENAJE ESTRIBO DERECHO A AGUAS ARRIBA



FOTOGRAFÍA N° 4: ESTRIBO1 DESDE AGUAS ARRIBA



FOTOGRAFÍA Nº 5: ESTRIBO2 DESDE AGUAS ABAJO.



FOTOGRAFÍA Nº 6: ESTRIBO DERECHO



FOTOGRAFÍA Nº 7: ESTRIBO DERECHO 2



FOTOGRAFÍA Nº 8: ESTRIBO IZQUIERDO.



FOTOGRAFÍA Nº 9: ESTRIBO IZQUIERDO 2.



FOTOGRAFÍA N° 10: SOCAVAMIENTO AGUAS ARRIBA.



FOTOGRAFÍA Nº 11: TORRELLES DESDE AGUAS ABAJO.



FOTOGRAFÍA Nº 12: TORRELLES DESDE AGUAS ARRIBA.