ANEJO Nº 6. ESTRUCTURAS

4. Cálculos

Estructura E-10. (PK 315+120)

ESTRUCTURA E-10 (PK 315+250)

ÍNDICE

CÁLCULOS ESTRUCTURALES

1. INTRODUCCIÓN
   - 1.1 DESCRIPCIÓN DE LA SOLUCIÓN ADOPTADA
   - 1.2 INSTRUCCIONES Y NORMAS EMPLEADAS
   - 1.3 CARACTERÍSTICAS DE LOS MATERIALES
   - 1.4 NIVELES DE CONTROL Y COEFICIENTES DE SEGURIDAD
   - 1.5 CARACTERÍSTICAS DE LA CIMENTACIÓN
   - 1.6 PROCEDIMIENTO DE CÁLCULO Y DESCRIPCIÓN DE LOS PROGRAMAS UTILIZADOS
2. TABLERO
   - 2.1 DEFINICIÓN GEOMÉTRICA DEL TABLERO
   - 2.2 CÁLCULO DE LAS ACCIONES
     - 2.2.1. ACCIONES PERMANENTES
       - 2.2.1.1 PESO PROPIO
       - 2.2.1.2 CARGA MUERTA
     - 2.2.2. ACCIONES PERMANENTES DE VALOR NO CONSTANTE
       - 2.2.2.1 REOLÓGICAS: RETRACCIÓN
       - 2.2.2.2 SOBRECARGAS DEL TERRENO
     - 2.2.3. ACCIONES VARIABLES
       - 2.2.3.1. SOBRECARGAS DE USO
       - 2.2.3.2. ACCIONES CLIMÁTICAS
     - 2.2.4. ACCIONES ACCIDENTALES
       - 2.2.4.1. ACCIONES SÍSMICAS
   - 2.3. CÁLCULO COMO EMPARRILLADO
     - 2.3.1. MODELO DE CÁLCULO
     - 2.3.2. CÁLCULO DE LOS COEFICIENTES DE REPARTO
     - 2.3.3. CÁLCULO DE LAS ARMADURAS PASIVAS TRANSVERSALES. MÉTODO DE WOOD
     - 2.3.4. RIOSTRAS SOBRE PILAS Y ESTRIBOS
     - 2.3.5. REACCIONES Y CÁLCULO DE NEOPRENOS EN PLANTA
   - 2.4. COMPROBACIÓN LONGITUDINAL DEL TABLERO
     - 2.4.1. VERIFICACIÓN DE LAS SECCIONES
       - 2.4.1.1. COMPROBACIÓN DE ESTADO LÍMITES FISURACIÓN
       - 2.4.1.2. COMPROBACIÓN DE ESTADOS LÍMITES ÚLTIMOS POR FLEXIÓN LONGITUDINAL
       - 2.4.1.3. VERIFICACIÓN DE LAS SECCIONES A ESFUERZOS DE CORTANTE (E.L.U.)
     - 2.4.2. COMPROBACIÓN DEL PUNZONAMIENTO DEL TABLERO
     - 2.4.3. REFUERZO DE ARMADURAS BAJO APOYOS
     - 2.4.4. VERIFICACIÓN DE LAS ARMADURAS DEL VOLADIZO
3. CÁLCULO DE LA SUBESTRUCTURA
   - 3.1. ACCIONES
   - 3.2. COMBINACIÓN DE ACCIONES
4. PILAS
   - 4.1. CÁLCULO DEL FUSTE
   - 4.2. CÁLCULO DE LA CIMENTACIÓN
5. ESTRIBOS
   - 5.1. CÁLCULO Y DIMENSIONAMIENTO

- PROYECTO DE PRUEBA DE CARGA

Cálculos Estructurales

1. Introducción

1.1. Descripción de la solución adoptada

La Reposición 13, (Estructura E-10) ubicada en el P.K. 315+250, de la obra "Línea de Alta Velocidad Madrid-Barcelona-Frontera Francesa. Tramo: Lleida-Martorell. Subtramo III-B " consta de tres vanos, con luces de 13.00 m, 17.00 m y 13.00 m, con una longitud total de 43.80 m. Está apoyada en los extremos en estribos del tipo cerrado y en los puntos intermedios en pilas con un único fuste de sección circular con diámetro de 1.00 m, la cimentación es del tipo superficial.

El tablero es una sección maciza de hormigón de 7.70 m de ancho con un canto de 0.90m y con voladizos laterales de 1.50 m de longitud con 0.30 m de canto en el arranque y 0.20m en el extremo. La sección tiene bombeo del 2%. El ancho inferior del núcleo es de 3.70 m.

Ambos estribos son cerrados y están cimentados mediante zapatas directamente en el terreno.

Las pilas tienen un único fuste circular de 1.00 m de diámetro, y están empotradas en el tablero.La cimentación es superficial mediante zapatas.

La ejecución del tablero se realizará en una sola fase, con hormigonado completo de la losa sobre cimbra.

1.2. Instrucciones y normas empleadas

Para el cálculo de las acciones que actúan sobre los diversos elementos de la estructura, se ha utilizado la "Instrucción sobre las acciones a considerar en el proyecto de puentes de carreteras (IAP)", aprobada el 12 de febrero de 1998.

Se ha tenido en cuenta la "Norma de Construcción Sismorresistente (Parte General y Edificación) NCS-94", aprobada por Real Decreto 2543/1994 de 29 de Diciembre.

Para el dimensionamiento y comprobación de los elementos de hormigón armado y de hormigón pretensado se ha seguido la "Instrucción de Hormigón Estructural" EHE, aprobada por Real Decreto 2661/1998 de 11 de Diciembre.

- Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.

La aceleración sísmica básica de la zona es a_b =0.04 g y el coeficiente de contribución K=1.0.

La aceleración sísmica de cálculo será entonces:

$\alpha_\chi = \rho\ \alpha_\beta$

$\rho = (\tau/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04$ g

$a_c = 0.052$ g < 0.06 g

Conforme con lo prescrito en la NCS-94, como la aceleración de cálculo es $a_c = 0.052$ g < 0.06 g no se deberán tener en cuenta las acciones sísmicas.

1.3. Características de los materiales

Hormigones - Resistencia Característica

Hormigón en capas de regularización	$\phi_{\chi k} \geq 150$ kp/cm²
Hormigón en zapatas	$\phi_{\chi k} \geq 250$ kp/cm²
Hormigón en alzados estribos	$\phi_{\chi k} \geq 300$ kp/cm²
Hormigón en pilas	$\phi_{\chi k} \geq 300$ kp/cm²
Hormigón en tablero	$\phi_{\chi k} \geq 300$ kp/cm²

Aceros

Armaduras pasivas B-500-S (límite elástico f yk ≥5100 kp/cm²

1.4. Niveles de control y coeficientes de seguridad

Hormigones	:	Nivel de control normal	$\gamma_\chi = 1.50$
Aceros :		Nivel de control normal	$\gamma_\psi = 1.15$
Acciones	:		
		Nivel de control intenso	$\gamma_F = 1.50$ (acciones variables)
		Conforme a la IAP	$\gamma_{G^*} = 1.50$ (acción del terreno)
			$\gamma_G = 1.35$ (acciones permanentes y reológicas

1.5. Características de la cimentación

Se han considerado las siguientes tensiones admisibles en la cimentación:

Estructura	Profundidad de cimentación	Tensión admisible del terreno	Observaciones
Estribo 1	2.50 m	3.00 kp/cm²	
Pila 1	1.50 m	5.00 kp/cm²	
Pila 2	1.50 m	5.00 kp/cm²	
Estribo 2	2.50 m	3.00 kp/cm²	

1.6. Procedimiento de cálculo y descripción de los programas utilizados

El cálculo del tablero se realiza mediante programas de ordenador en modelos estructurales de emparrillado plano y reticulado plano, basados en la matriz de rigidez y equilibrio de los nudos, donde se suponen las hipótesis básicas de la Resistencia de Materiales es decir, de linealidad geométrica y del material, despreciando la deformación por esfuerzo cortante.

Se ejecuta el cálculo con un modelo de emparrillado espacial mediante el programa STATIK·3, del que se obtienen los esfuerzos transversales y los esfuerzos longitudinales incluyendo el efecto del reparto transversal de las cargas y del empotramiento de la pila en el tablero.

Considerando los esfuerzos obtenidos se realizan las comprobaciones de fisuración y el cálculo a rotura del tablero mediante el postprocesador FAGUS·3.

Se completa el cálculo con el dimensionamiento de la armadura de la losa en sentido transversal mediante la aplicación de la regla de WOOD-ARMER y los cálculos de esfuerzos locales, como por ejemplo los de apoyo.

Los estribos y las pilas, tanto en alzado como en fundaciones, se calcularon y dimensionaron en hormigón armado.

Para el desarrollo de los cálculos resueltos por ordenador se han utilizado los siguientes programas:

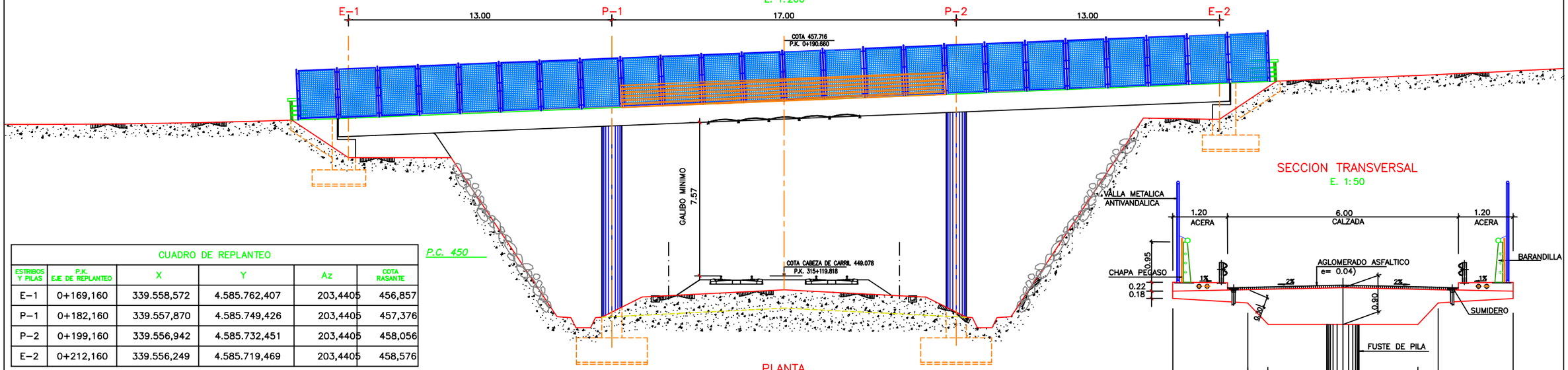
- STATIK-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10, 1997) .

- FAGUS-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10 1997) .

TABLERO

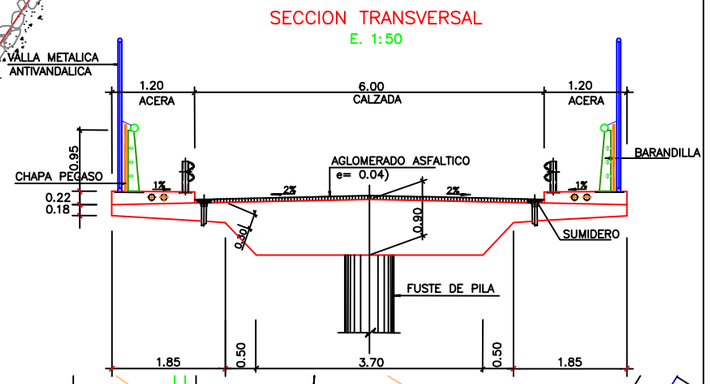
2.1. Geometría (Ver planos)

ALZADO
E. 1:200

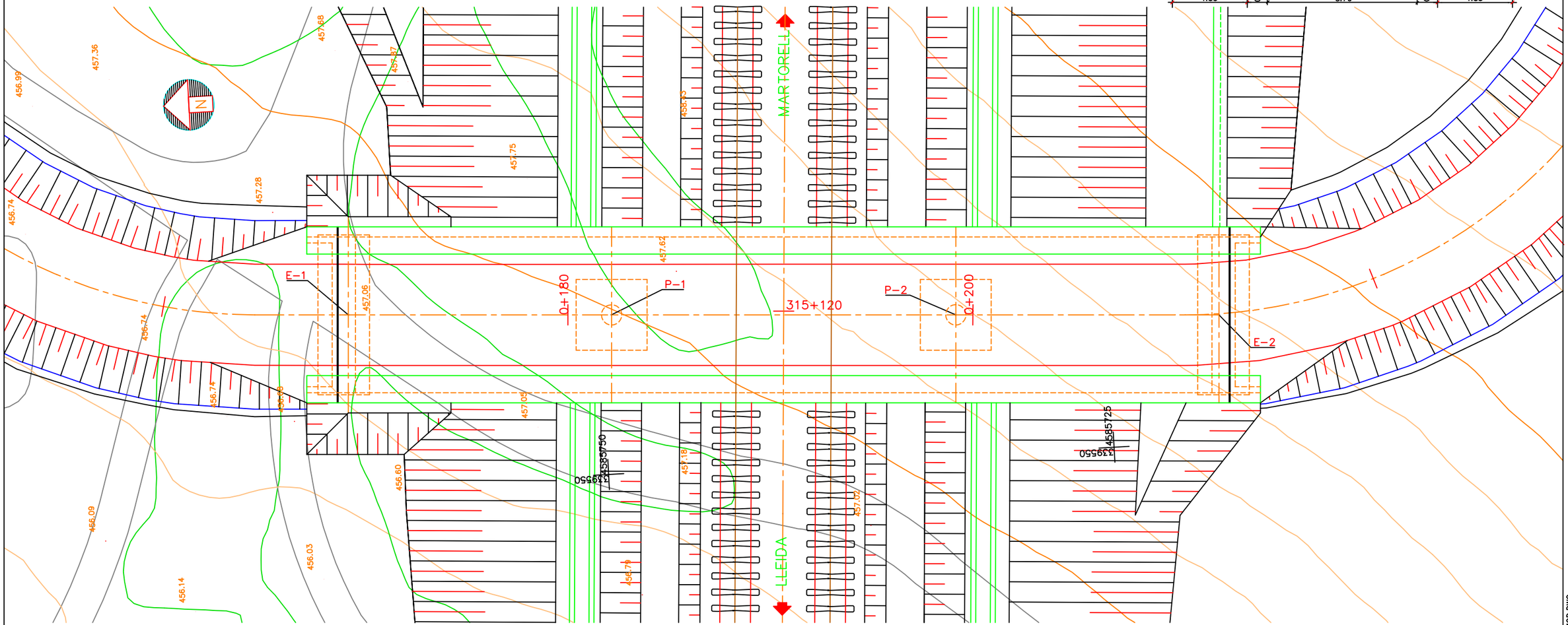


CUADRO DE REPLANTEO					
ESTRIBOS Y PILAS	P.K. EJE DE REPLANTEO	X	Y	Az	COTA RASANTE
E–1	0+169,160	339.558,572	4.585.762,407	203,4405	456,857
P–1	0+182,160	339.557,870	4.585.749,426	203,4405	457,376
P–2	0+199,160	339.556,942	4.585.732,451	203,4405	458,056
E–2	0+212,160	339.556,249	4.585.719,469	203,4405	458,576

SECCION TRANSVERSAL
E. 1:50



PLANTA
E. 1:100



GIF Gestor de Infraestructuras Ferroviarias	TITULO: LIQUIDACION DE LA MODIFICACION Nº1 DEL PROYECTO CONSTRUCTIVO L.A.V. MADRID–ZARAGOZA–BARCELONA–FRONTERA FRANCESA TRAMO: LLEIDA–MARTORELL, SUBTRAMO III–B PLATAFORMA	EL INGENIERO DE C.C. Y P. AUTOR DE LA LIQUIDACION: FDO: D.JAIME GARCIA–GERMAN LOPEZ–BELMONTE	CONFORME: Sacyr EL CONTRATISTA	ESCALA: 1:100 (en A–1) Numérica; Gráfica	FECHA: ABRIL 2.003	TITULO DEL PLANO: PASO SUPERIOR E–10 P.K. 315+120 REPOSICION 13 PLANO GENERAL	Nº DEL PLANO: 2.9–8.1 Hoja 1 de 1

2.9–8.1.DWG/REF:MOD.DWG

2.2. Cálculo de las acciones

2.2. Cálculo de las acciones

2.2.1. Acciones permanentes

2.2.1.1. Peso propio

El peso propio de la estructura de hormigón se calcula con un peso específico

$$\gamma = 2.50 Mp/m^3.$$

2.2.1.2. Carga muerta

Cm = 1.00 t/m cada acera

pav = 0.04 m x 2.30 t/m 3 = 0.092 t/m2

2.2.2. Acciones permanentes de valor no constante

2.2.2.1. Reológicas: Retracción

Se han calculado considerando una humedad relativa del 60%, y un espesor medio de 337 mm. La edad del hormigón al entrar en carga es de 28 días, y el mismo es de endurecimiento normal. Los valores utilizados son:

ε retracción =-0.00029167

Cálculo de la retracción del hormigón

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\,\beta s\,(t - t_s)$

Edad del hormigón al comienzo de la retracción (días)	ts = **28.0**
Edad del hormigón en el instante de evaluación (días)	t = **10000.0**
Coeficiente básico de retracción	$\varepsilon_{cso} = \varepsilon_s\,\beta_{HR}$
Resistencia característica del hormigón	f ck (N / mm2) = **30**
	ε_s = 0.00042
Humedad relativa en tanto por ciento	HR = **70**
	β_{HR} = -1.0184
	ε_{cso} = -0.0004277
Area de la seccion transversal (m^2)	Ac = **4.653**
Perímetro en contacto con la atmósfera (m)	u = **16.255**
Espesor medio (mm)	e = 572
Coeficiente de evolución temporal de la retracción	$\beta s\,(t - ts)$ = 0.6819

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\,\beta s\,(t - t_s)$ = -0.00029167

2.2.2.3. Sobrecargas del terreno

El relleno de tierras en el trasdós de los estribos se realiza con material del terraplén, que tiene las siguientes características:

Peso específico	:	$\gamma_T = 2.0\ Mp/m^3$
Ángulo de fricción interna	:	$\phi = 30°$
Coeficiente de empuje activo	:	$\lambda_\alpha = 0.33$

2.2.3. Acciones variables

2.2.3.1. Sobrecargas de uso

2.2.3.1.1. Tren de cargas

a) Componentes verticales

Como el ancho de plataforma es inferior a 12.0 m, conforme a la IAP se ha utilizado el siguiente tren de cargas:

- Sobrecarga uniforme: 0.40 Mp/m²
- Vehículo de 60 Mp

b) Componentes horizontales

b.1) Frenado y arranque

Se considerará la actuación de esta fuerza sobre la estructura.

$$F_F = \frac{6.00 \text{ x } 43.80 \text{ m x } 0.4 \text{ Mp m}^{-2} + 60 \text{ Mp}}{20}$$

$F_F = 8.28$ Mp

Valor mínimo: $F_F = 12.00$ Mp

b.2) Fuerza centrífuga

La estructura está ubicada en un tramo de radio infinito, por lo tanto esta fuerza no actúa.

2.2.3.2. Acciones climáticas

a.) Viento

CALCULO DE LAS ACCIONES DEBIDAS AL VIENTO CONFORME A LA I.A.P

Proyecto : GIF SUBTRAMO IIIB
Estructura : PS 315+880

Velocidad de referencia : V_{REF} (m/seg) = **28.00**

Velocidad de cálculo : V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

Factor de topografía : C_T = **1.10**

Período de retorno (años) T = **100**

Factor de riesgo : $C_R = (0.562x\{1-0.2x \ln [- \ln (1- 1/T)]\}) 1/2$
$C_R = 1.04$

Factor de altura : $C_Z = K_Z \times LN (Z/ Zo)$ si $Z > Z_{MIN}$
$C_Z = K_Z \times LN (Z_{MIN}/ Zo)$ si $Z < Z_{MIN}$

Los valores de K_Z , Zo y Z_{MIN} se obtendrán de la tabla adjunta .

Tipo de Entorno	K_Z	Zo (m)	Z_{MIN} (m)
I	0.17	0.01	2.00
II	0.19	0.05	4.00
III	0.22	0.30	8.00
IV	0.24	1.00	16.00

K_Z = **0.22**

Zo = **0.3**

Z_{MIN} = **8.00**

OBTENCIÓN DE LA VELOCIDAD DE CÁLCULO PARA EL TABLERO :

En función de la altura Z considerada se obtendrán los valores de C_Z y C_G y en consecuencia de V_C

V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

V_{REF} (m/seg) = 28.00

Para el tablero la altura considerada será : Z (m) = **13.00**

$C_Z = 0.829$

Factor de ráfaga : $C_G = (1 + 7 \times K_Z / C_Z / C_T)^{1/2}$

$C_G = 1.640$

ACCIÓN DEL VIENTO SOBRE EL TABLERO

El empuje producido sobre cualquier elemento del puente se calculará con la siguiente fórmula :

$$F\ (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde :

C_D : Coeficiente de arrastre

A : Área expuesta

$1/2\ \rho\ V_C^2$: Presión básica de cálculo (N/m^2)

ρ : masa específica del aire 1.25 kg/m^3

V_C : Velocidad de cálculo (m/seg)

EMPUJE TRANSVERSAL DE VIENTO

Empuje del Viento : $F\ (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$

TABLERO DE ALMA LLENA

Altura Z del tablero : Z (m) = **13.00**
Ancho del tablero : B (m) = **7.70**
Longitud del tramo : L (m) = **44.00**
Altura de barrera : $h_{BARRERA}$ (m) = **0.20** De tabla se obtiene : η = **2.00**
Altura equivalente : $h_{TABLERO}$ (m) = **1.10**
$h_{BAR.\ OPAC}$(m) = $h_{BARRERA} + \Sigma\ \eta\ h_{BARRERA}$
$h_{BAR.\ OPAC}$(m) = 0.60
$h_{SOBREC.}$ (m) = **2.00**

Sin sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{BARRERA\ OPACA}$
h_{eq} (m) = 1.70

Con sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{SOBRECARGA} + h_{BARRERA}$
h_{eq} (m) = 3.50

Área expuesta : A (m^2) = $L \times h_{eq}$

Sin sobrecarga : A (m^2) = 74.8
Con sobrecarga : A (m^2) = 154.0
Coeficiente de arrastre : $C_D = 2.50 - 0.3 \times (B / h_{eq})$
$1.30 < C_D < 2.40$
Sin sobrecarga : C_D = 1.30
Con sobrecarga : C_D = 1.84

Cálculo del empuje transversal del viento sobre el tablero :

$$F\ (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde : V_C (m/seg) = 43.50
ρ (kg/m^3) = 1.25

Empuje sin la sobrecarga en el tablero : **F (Mp) = 11.50**

Longitud tramo L_T (m) = 44.00 **F (Mp/m) = 0.26**

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : **d (m) = 0.78**

Empuje con la sobrecarga en el tablero : **F (Mp) = 33.51**

Longitud tramo L_T (m) = 44.00 **F (Mp/m) = 0.76**

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : **d (m) = 1.86**

2.2.3.2.b) Nieve

La estructura está en Zona II.

$$q = 0.80 \times S_K$$

$$q = 0.80 \times 40\ Kp/m^2 = 0.032\ Mp/m^2$$

Es despreciable.

2.2.3.2.c) Térmicas

De acuerdo con la I.A.P. se ha considerado un incremento uniforme de temperatura que es función de los siguientes parámetros:

- La estructura está ubicada en la región climática denominada zona IV (Z = 4) .
- La sección del tablero está formada por una losa maciza de hormigón (S = 1), con un canto total de 0.90 m (h = 0.90).

$$\Delta T = K\, z^a\, h^b\, s^c = 23.89 \times 4^{-.292} \times 0.90^{-0.139}$$

Sobre la base de estos datos se obtiene que el rango anual de la temperatura media es de 36.34 °C, y por lo tanto consideraremos un incremento uniforme de temperatura de

$$\Delta T = \pm 36.34\ °C$$

$$\varepsilon_\tau = \pm 36.34 \times 10^{-5}$$

El incremento de temperatura entre caras superior e inferior del tablero, gradiente térmico vertical, será:

- Gradiente térmico vertical positivo °C/m

Losa maciza de hormigón:

$\Delta T_{SI} = K\ \Delta T_{SI}$, ref.

$K = K_1 \cdot K_2$ $K_1 = 0.85$

$K_2 = 1.56$

ΔT_{SI}, ref = 11.50°C

$\Delta T_{SI} = 1.33 \times 11.50°C/m$

$\Delta T_{SI} = 15.30\ °C/m$

- Gradiente térmico vertical inverso

Tableros de hormigón: con pavimento bituminoso 0.0 °C

2.2.4. Acciones accidentales

2.2.4.1. Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.

La aceleración sísmica básica de la zona es ab≤ 0.04 g.

$a_c = \rho\, a_b$

$\rho = (t/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04\ g = 0.052\ g \leq 0.06\ g$ No se consideran las acciones sísmicas.

2.3. Cálculo como emparrillado

2.3. Cálculo como emparrillado

Se ha generado el modelo de emparrillado mediante el programa STATIK3, y se han introducido todas las cargas, lo que nos permitirá obtener los esfuerzos transversales con la influencia de la posición de las cargas, el ancho del tablero, y el apoyo puntual en las pilas, consideradas empotradas y con su correspondiente altura.

Se han introducido las acciones individuales, correspondientes a cada hipótesis básica de cálculo.

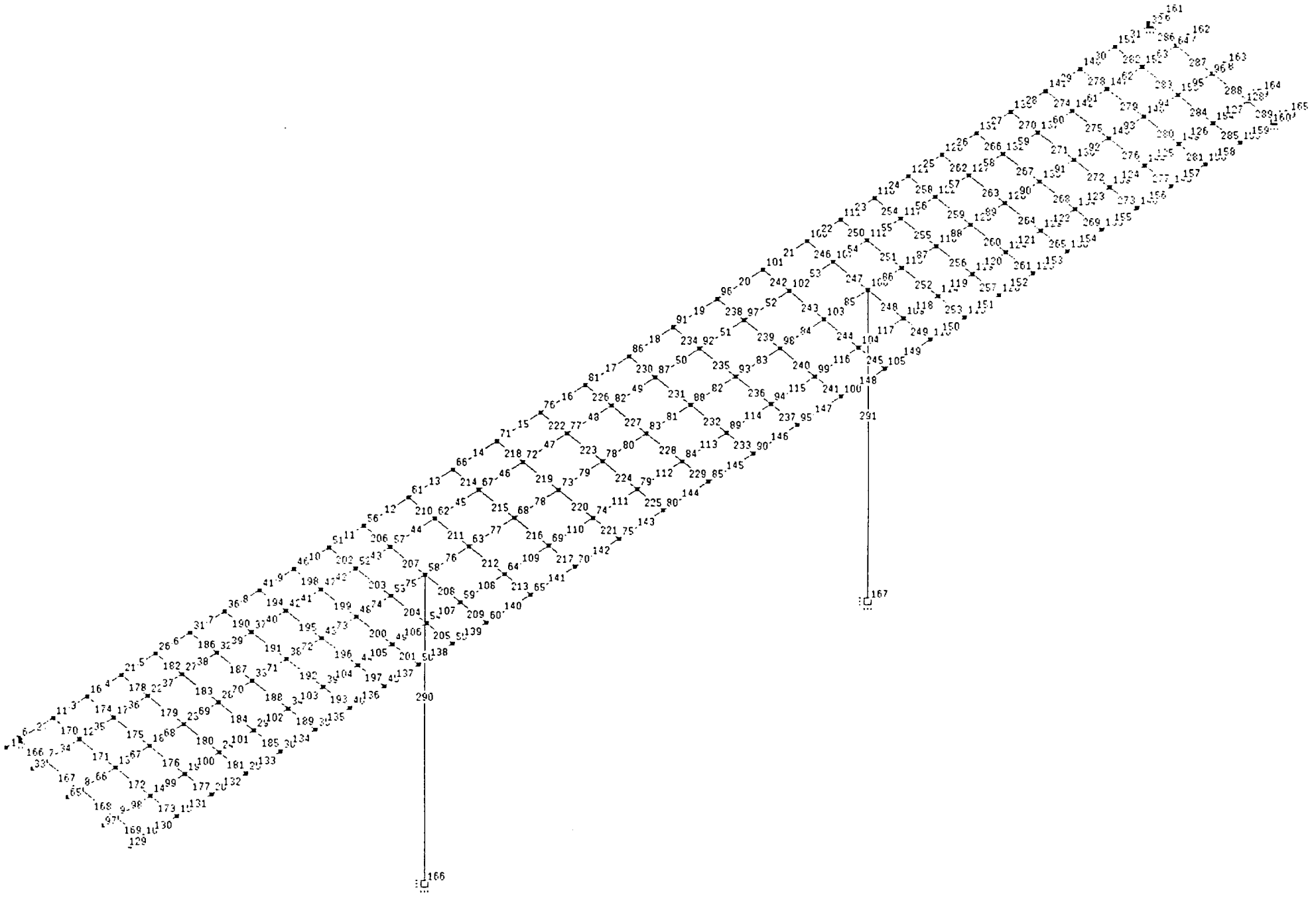
Posteriormente se ha calculado la envolvente pésima de esfuerzos para cada acción, con los diferentes coeficientes de ponderación de la Instrucción.

Por aplicación de la regla de WOOD-ARMER a dichos esfuerzos de cálculo se obtienen las armaduras transversales necesarias.

Finalmente se calculan los coeficientes de reparto transversal.

2.3.1. Modelo de cálculo

Scale 1 : 142.9
Structure - GEOMETRIA



****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (167 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	R XYZ	Specialities
1	0.00000	0.00000	0.00000			
2	1.12000	0.00000	0.00000			
3	2.62000	0.00000	0.00000			
4	4.12000	0.00000	0.00000			
5	5.24000	0.00000	0.00000			
6	0.00000	0.50000	0.00000	SSE	FFF	
7	1.12000	0.50000	0.00000			
8	2.62000	0.50000	0.00000			
9	4.12000	0.50000	0.00000			
10	5.24000	0.50000	0.00000	SSE	FFF	
11	0.00000	1.80000	0.00000			
12	1.12000	1.80000	0.00000			
13	2.62000	1.80000	0.00000			
14	4.12000	1.80000	0.00000			
15	5.24000	1.80000	0.00000			
16	0.00000	3.10000	0.00000			
17	1.12000	3.10000	0.00000			
18	2.62000	3.10000	0.00000			
19	4.12000	3.10000	0.00000			
20	5.24000	3.10000	0.00000			
21	0.00000	4.40000	0.00000			
22	1.12000	4.40000	0.00000			
23	2.62000	4.40000	0.00000			
24	4.12000	4.40000	0.00000			
25	5.24000	4.40000	0.00000			
26	0.00000	5.70000	0.00000			
27	1.12000	5.70000	0.00000			
28	2.62000	5.70000	0.00000			
29	4.12000	5.70000	0.00000			
30	5.24000	5.70000	0.00000			
31	0.00000	7.00000	0.00000			
32	1.12000	7.00000	0.00000			
33	2.62000	7.00000	0.00000			
34	4.12000	7.00000	0.00000			
35	5.24000	7.00000	0.00000			
36	0.00000	8.30000	0.00000			
37	1.12000	8.30000	0.00000			
38	2.62000	8.30000	0.00000			
39	4.12000	8.30000	0.00000			
40	5.24000	8.30000	0.00000			
41	0.00000	9.60000	0.00000			
42	1.12000	9.60000	0.00000			

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
43	2.62000	9.60000	0.00000		
44	4.12000	9.60000	0.00000		
45	5.24000	9.60000	0.00000		
46	0.00000	10.90000	0.00000		
47	1.12000	10.90000	0.00000		
48	2.62000	10.90000	0.00000		
49	4.12000	10.90000	0.00000		
50	5.24000	10.90000	0.00000		
51	0.00000	12.20000	0.00000		
52	1.12000	12.20000	0.00000		
53	2.62000	12.20000	0.00000		
54	4.12000	12.20000	0.00000		
55	5.24000	12.20000	0.00000		
56	0.00000	13.50000	0.00000		
57	1.12000	13.50000	0.00000		
58	2.62000	13.50000	0.00000		
59	4.12000	13.50000	0.00000		
60	5.24000	13.50000	0.00000		
61	0.00000	15.20000	0.00000		
62	1.12000	15.20000	0.00000		
63	2.62000	15.20000	0.00000		
64	4.12000	15.20000	0.00000		
65	5.24000	15.20000	0.00000		
66	0.00000	16.90000	0.00000		
67	1.12000	16.90000	0.00000		
68	2.62000	16.90000	0.00000		
69	4.12000	16.90000	0.00000		
70	5.24000	16.90000	0.00000		
71	0.00000	18.60000	0.00000		
72	1.12000	18.60000	0.00000		
73	2.62000	18.60000	0.00000		
74	4.12000	18.60000	0.00000		
75	5.24000	18.60000	0.00000		
76	0.00000	20.30000	0.00000		
77	1.12000	20.30000	0.00000		
78	2.62000	20.30000	0.00000		
79	4.12000	20.30000	0.00000		
80	5.24000	20.30000	0.00000		
81	0.00000	22.00000	0.00000		
82	1.12000	22.00000	0.00000		
83	2.62000	22.00000	0.00000		
84	4.12000	22.00000	0.00000		
85	5.24000	22.00000	0.00000		
86	0.00000	23.70000	0.00000		
87	1.12000	23.70000	0.00000		
88	2.62000	23.70000	0.00000		
89	4.12000	23.70000	0.00000		
90	5.24000	23.70000	0.00000		
91	0.00000	25.40000	0.00000		
92	1.12000	25.40000	0.00000		
93	2.62000	25.40000	0.00000		
94	4.12000	25.40000	0.00000		
95	5.24000	25.40000	0.00000		

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
96	0.00000	27.10000	0.00000		
97	1.12000	27.10000	0.00000		
98	2.62000	27.10000	0.00000		
99	4.12000	27.10000	0.00000		
100	5.24000	27.10000	0.00000		
101	0.00000	28.80000	0.00000		
102	1.12000	28.80000	0.00000		
103	2.62000	28.80000	0.00000		
104	4.12000	28.80000	0.00000		
105	5.24000	28.80000	0.00000		
106	0.00000	30.50000	0.00000		
107	1.12000	30.50000	0.00000		
108	2.62000	30.50000	0.00000		
109	4.12000	30.50000	0.00000		
110	5.24000	30.50000	0.00000		
111	0.00000	31.80000	0.00000		
112	1.12000	31.80000	0.00000		
113	2.62000	31.80000	0.00000		
114	4.12000	31.80000	0.00000		
115	5.24000	31.80000	0.00000		
116	0.00000	33.10000	0.00000		
117	1.12000	33.10000	0.00000		
118	2.62000	33.10000	0.00000		
119	4.12000	33.10000	0.00000		
120	5.24000	33.10000	0.00000		
121	0.00000	34.40000	0.00000		
122	1.12000	34.40000	0.00000		
123	2.62000	34.40000	0.00000		
124	4.12000	34.40000	0.00000		
125	5.24000	34.40000	0.00000		
126	0.00000	35.70000	0.00000		
127	1.12000	35.70000	0.00000		
128	2.62000	35.70000	0.00000		
129	4.12000	35.70000	0.00000		
130	5.24000	35.70000	0.00000		
131	0.00000	37.00000	0.00000		
132	1.12000	37.00000	0.00000		
133	2.62000	37.00000	0.00000		
134	4.12000	37.00000	0.00000		
135	5.24000	37.00000	0.00000		
136	0.00000	38.30000	0.00000		
137	1.12000	38.30000	0.00000		
138	2.62000	38.30000	0.00000		
139	4.12000	38.30000	0.00000		
140	5.24000	38.30000	0.00000		
141	0.00000	39.60000	0.00000		
142	1.12000	39.60000	0.00000		
143	2.62000	39.60000	0.00000		
144	4.12000	39.60000	0.00000		
145	5.24000	39.60000	0.00000		
146	0.00000	40.90000	0.00000		
147	1.12000	40.90000	0.00000		
148	2.62000	40.90000	0.00000		

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
149	4.12000	40.90000	0.00000		
150	5.24000	40.90000	0.00000		
151	0.00000	42.20000	0.00000		
152	1.12000	42.20000	0.00000		
153	2.62000	42.20000	0.00000		
154	4.12000	42.20000	0.00000		
155	5.24000	42.20000	0.00000		
156	0.00000	43.50000	0.00000	SSE	FFF
157	1.12000	43.50000	0.00000		
158	2.62000	43.50000	0.00000		
159	4.12000	43.50000	0.00000		
160	5.24000	43.50000	0.00000	SSE	FFF
161	0.00000	44.00000	0.00000		
162	1.12000	44.00000	0.00000		
163	2.62000	44.00000	0.00000		
164	4.12000	44.00000	0.00000		
165	5.24000	44.00000	0.00000		
166	2.62000	13.50000	-13.20000	BBE	BBE
167	2.62000	30.50000	-13.20000	BBE	BBE

ELASTICALLY SUPPORTED JOINTS: ('B'=Fixed 'F'=Free)

Joint	V-X [T/M]	V-Y [T/M]	V-Z [T/M]	R-X [TM/ARC]	R-Y [TM/ARC]	R-Z [TM/ARC]
6	2.300E+02	2.300E+02	B	F	F	F
10	2.300E+02	2.300E+02	B	F	F	F
156	2.300E+02	2.300E+02	B	F	F	F
160	2.300E+02	2.300E+02	B	F	F	F

B A R D A T A : (286 bars)

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
1	1	6	0.50000	%Q0001			O oS
2	6	11	1.30000	%Q0001			O oS
3	11	16	1.30000	%Q0001			O oS
4	16	21	1.30000	%Q0001			O oS
5	21	26	1.30000	%Q0001			O oS
6	26	31	1.30000	%Q0001			O oS
7	31	36	1.30000	%Q0001			O oS
8	36	41	1.30000	%Q0001			O oS
9	41	46	1.30000	%Q0001			O oS
10	46	51	1.30000	%Q0001			O oS
11	51	56	1.30000	%Q0001			O oS
12	56	61	1.70000	%Q0001			O oS
13	61	66	1.70000	%Q0001			O oS
14	66	71	1.70000	%Q0001			O oS
15	71	76	1.70000	%Q0001			O oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
16	76	81	1.70000	%Q0001			O oS
17	81	86	1.70000	%Q0001			O oS
18	86	91	1.70000	%Q0001			O oS
19	91	96	1.70000	%Q0001			O oS
20	96	101	1.70000	%Q0001			O oS
21	101	106	1.70000	%Q0001			O oS
22	106	111	1.30000	%Q0001			O oS
23	111	116	1.30000	%Q0001			O oS
24	116	121	1.30000	%Q0001			O oS
25	121	126	1.30000	%Q0001			O oS
26	126	131	1.30000	%Q0001			O oS
27	131	136	1.30000	%Q0001			O oS
28	136	141	1.30000	%Q0001			O oS
29	141	146	1.30000	%Q0001			O oS
30	146	151	1.30000	%Q0001			O oS
31	151	156	1.30000	%Q0001			O oS
32	156	161	0.50000	%Q0001			O oS
33	2	7	0.50000	%Q0002			oS
34	7	12	1.30000	%Q0002			oS
35	12	17	1.30000	%Q0002			oS
36	17	22	1.30000	%Q0002			oS
37	22	27	1.30000	%Q0002			oS
38	27	32	1.30000	%Q0002			oS
39	32	37	1.30000	%Q0002			oS
40	37	42	1.30000	%Q0002			oS
41	42	47	1.30000	%Q0002			oS
42	47	52	1.30000	%Q0002			oS
43	52	57	1.30000	%Q0002			oS
44	57	62	1.70000	%Q0002			oS
45	62	67	1.70000	%Q0002			oS
46	67	72	1.70000	%Q0002			oS
47	72	77	1.70000	%Q0002			oS
48	77	82	1.70000	%Q0002			oS
49	82	87	1.70000	%Q0002			oS
50	87	92	1.70000	%Q0002			oS
51	92	97	1.70000	%Q0002			oS
52	97	102	1.70000	%Q0002			oS
53	102	107	1.70000	%Q0002			oS
54	107	112	1.30000	%Q0002			oS
55	112	117	1.30000	%Q0002			oS
56	117	122	1.30000	%Q0002			oS
57	122	127	1.30000	%Q0002			oS
58	127	132	1.30000	%Q0002			oS
59	132	137	1.30000	%Q0002			oS
60	137	142	1.30000	%Q0002			oS
61	142	147	1.30000	%Q0002			oS
62	147	152	1.30000	%Q0002			oS
63	152	157	1.30000	%Q0002			oS
64	157	162	0.50000	%Q0002			oS
65	3	8	0.50000	%Q0003			oS
66	8	13	1.30000	%Q0003			oS
67	13	18	1.30000	%Q0003			oS
68	18	23	1.30000	%Q0003			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
69	23	28	1.30000	%Q0003			oS
70	28	33	1.30000	%Q0003			oS
71	33	38	1.30000	%Q0003			oS
72	38	43	1.30000	%Q0003			oS
73	43	48	1.30000	%Q0003			oS
74	48	53	1.30000	%Q0003			oS
75	53	58	1.30000	%Q0003			oS
76	58	63	1.70000	%Q0003			oS
77	63	68	1.70000	%Q0003			oS
78	68	73	1.70000	%Q0003			oS
79	73	78	1.70000	%Q0003			oS
80	78	83	1.70000	%Q0003			oS
81	83	88	1.70000	%Q0003			oS
82	88	93	1.70000	%Q0003			oS
83	93	98	1.70000	%Q0003			oS
84	98	103	1.70000	%Q0003			oS
85	103	108	1.70000	%Q0003			oS
86	108	113	1.30000	%Q0003			oS
87	113	118	1.30000	%Q0003			oS
88	118	123	1.30000	%Q0003			oS
89	123	128	1.30000	%Q0003			oS
90	128	133	1.30000	%Q0003			oS
91	133	138	1.30000	%Q0003			oS
92	138	143	1.30000	%Q0003			oS
93	143	148	1.30000	%Q0003			oS
94	148	153	1.30000	%Q0003			oS
95	153	158	1.30000	%Q0003			oS
96	158	163	0.50000	%Q0003			oS
97	4	9	0.50000	%Q0004			oS
98	9	14	1.30000	%Q0004			oS
99	14	19	1.30000	%Q0004			oS
100	19	24	1.30000	%Q0004			oS
101	24	29	1.30000	%Q0004			oS
102	29	34	1.30000	%Q0004			oS
103	34	39	1.30000	%Q0004			oS
104	39	44	1.30000	%Q0004			oS
105	44	49	1.30000	%Q0004			oS
106	49	54	1.30000	%Q0004			oS
107	54	59	1.30000	%Q0004			oS
108	59	64	1.70000	%Q0004			oS
109	64	69	1.70000	%Q0004			oS
110	69	74	1.70000	%Q0004			oS
111	74	79	1.70000	%Q0004			oS
112	79	84	1.70000	%Q0004			oS
113	84	89	1.70000	%Q0004			oS
114	89	94	1.70000	%Q0004			oS
115	94	99	1.70000	%Q0004			oS
116	99	104	1.70000	%Q0004			oS
117	104	109	1.70000	%Q0004			oS
118	109	114	1.30000	%Q0004			oS
119	114	119	1.30000	%Q0004			oS
120	119	124	1.30000	%Q0004			oS
121	124	129	1.30000	%Q0004			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
122	129	134	1.30000	%Q0004			oS
123	134	139	1.30000	%Q0004			oS
124	139	144	1.30000	%Q0004			oS
125	144	149	1.30000	%Q0004			oS
126	149	154	1.30000	%Q0004			oS
127	154	159	1.30000	%Q0004			oS
128	159	164	0.50000	%Q0004			oS
129	5	10	0.50000	%Q0005			O oS
130	10	15	1.30000	%Q0005			O oS
131	15	20	1.30000	%Q0005			O oS
132	20	25	1.30000	%Q0005			O oS
133	25	30	1.30000	%Q0005			O oS
134	30	35	1.30000	%Q0005			O oS
135	35	40	1.30000	%Q0005			O oS
136	40	45	1.30000	%Q0005			O oS
137	45	50	1.30000	%Q0005			O oS
138	50	55	1.30000	%Q0005			O oS
139	55	60	1.30000	%Q0005			O oS
140	60	65	1.70000	%Q0005			O oS
141	65	70	1.70000	%Q0005			O oS
142	70	75	1.70000	%Q0005			O oS
143	75	80	1.70000	%Q0005			O oS
144	80	85	1.70000	%Q0005			O oS
145	85	90	1.70000	%Q0005			O oS
146	90	95	1.70000	%Q0005			O oS
147	95	100	1.70000	%Q0005			O oS
148	100	105	1.70000	%Q0005			O oS
149	105	110	1.70000	%Q0005			O oS
150	110	115	1.30000	%Q0005			O oS
151	115	120	1.30000	%Q0005			O oS
152	120	125	1.30000	%Q0005			O oS
153	125	130	1.30000	%Q0005			O oS
154	130	135	1.30000	%Q0005			O oS
155	135	140	1.30000	%Q0005			O oS
156	140	145	1.30000	%Q0005			O oS
157	145	150	1.30000	%Q0005			O oS
158	150	155	1.30000	%Q0005			O oS
159	155	160	1.30000	%Q0005			O oS
160	160	165	0.50000	%Q0005			O oS
166	6	7	1.12000	%Q0006			oS
167	7	8	1.50000	%Q0006			oS
168	8	9	1.50000	%Q0006			oS
169	9	10	1.12000	%Q0006			oS
170	11	12	1.12000	%Q0007			oS
171	12	13	1.50000	%Q0007			oS
172	13	14	1.50000	%Q0007			oS
173	14	15	1.12000	%Q0007			oS
174	16	17	1.12000	%Q0007			oS
175	17	18	1.50000	%Q0007			oS
176	18	19	1.50000	%Q0007			oS
177	19	20	1.12000	%Q0007			oS
178	21	22	1.12000	%Q0007			oS
179	22	23	1.50000	%Q0007			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
180	23	24	1.50000	%Q0007			oS
181	24	25	1.12000	%Q0007			oS
182	26	27	1.12000	%Q0007			oS
183	27	28	1.50000	%Q0007			oS
184	28	29	1.50000	%Q0007			oS
185	29	30	1.12000	%Q0007			oS
186	31	32	1.12000	%Q0007			oS
187	32	33	1.50000	%Q0007			oS
188	33	34	1.50000	%Q0007			oS
189	34	35	1.12000	%Q0007			oS
190	36	37	1.12000	%Q0007			oS
191	37	38	1.50000	%Q0007			oS
192	38	39	1.50000	%Q0007			oS
193	39	40	1.12000	%Q0007			oS
194	41	42	1.12000	%Q0007			oS
195	42	43	1.50000	%Q0007			oS
196	43	44	1.50000	%Q0007			oS
197	44	45	1.12000	%Q0007			oS
198	46	47	1.12000	%Q0007			oS
199	47	48	1.50000	%Q0007			oS
200	48	49	1.50000	%Q0007			oS
201	49	50	1.12000	%Q0007			oS
202	51	52	1.12000	%Q0007			oS
203	52	53	1.50000	%Q0007			oS
204	53	54	1.50000	%Q0007			oS
205	54	55	1.12000	%Q0007			oS
206	56	57	1.12000	%Q0008			oS
207	57	58	1.50000	%Q0008			oS
208	58	59	1.50000	%Q0008			oS
209	59	60	1.12000	%Q0008			oS
210	61	62	1.12000	%Q0009			oS
211	62	63	1.50000	%Q0009			oS
212	63	64	1.50000	%Q0009			oS
213	64	65	1.12000	%Q0009			oS
214	66	67	1.12000	%Q0009			oS
215	67	68	1.50000	%Q0009			oS
216	68	69	1.50000	%Q0009			oS
217	69	70	1.12000	%Q0009			oS
218	71	72	1.12000	%Q0009			oS
219	72	73	1.50000	%Q0009			oS
220	73	74	1.50000	%Q0009			oS
221	74	75	1.12000	%Q0009			oS
222	76	77	1.12000	%Q0009			oS
223	77	78	1.50000	%Q0009			oS
224	78	79	1.50000	%Q0009			oS
225	79	80	1.12000	%Q0009			oS
226	81	82	1.12000	%Q0009			oS
227	82	83	1.50000	%Q0009			oS
228	83	84	1.50000	%Q0009			oS
229	84	85	1.12000	%Q0009			oS
230	86	87	1.12000	%Q0009			oS
231	87	88	1.50000	%Q0009			oS
232	88	89	1.50000	%Q0009			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
233	89	90	1.12000	%Q0009			oS
234	91	92	1.12000	%Q0009			oS
235	92	93	1.50000	%Q0009			oS
236	93	94	1.50000	%Q0009			oS
237	94	95	1.12000	%Q0009			oS
238	96	97	1.12000	%Q0009			oS
239	97	98	1.50000	%Q0009			oS
240	98	99	1.50000	%Q0009			oS
241	99	100	1.12000	%Q0009			oS
242	101	102	1.12000	%Q0009			oS
243	102	103	1.50000	%Q0009			oS
244	103	104	1.50000	%Q0009			oS
245	104	105	1.12000	%Q0009			oS
246	106	107	1.12000	%Q0010			oS
247	107	108	1.50000	%Q0010			oS
248	108	109	1.50000	%Q0010			oS
249	109	110	1.12000	%Q0010			oS
250	111	112	1.12000	%Q0011			oS
251	112	113	1.50000	%Q0011			oS
252	113	114	1.50000	%Q0011			oS
253	114	115	1.12000	%Q0011			oS
254	116	117	1.12000	%Q0011			oS
255	117	118	1.50000	%Q0011			oS
256	118	119	1.50000	%Q0011			oS
257	119	120	1.12000	%Q0011			oS
258	121	122	1.12000	%Q0011			oS
259	122	123	1.50000	%Q0011			oS
260	123	124	1.50000	%Q0011			oS
261	124	125	1.12000	%Q0011			oS
262	126	127	1.12000	%Q0011			oS
263	127	128	1.50000	%Q0011			oS
264	128	129	1.50000	%Q0011			oS
265	129	130	1.12000	%Q0011			oS
266	131	132	1.12000	%Q0011			oS
267	132	133	1.50000	%Q0011			oS
268	133	134	1.50000	%Q0011			oS
269	134	135	1.12000	%Q0011			oS
270	136	137	1.12000	%Q0011			oS
271	137	138	1.50000	%Q0011			oS
272	138	139	1.50000	%Q0011			oS
273	139	140	1.12000	%Q0011			oS
274	141	142	1.12000	%Q0011			oS
275	142	143	1.50000	%Q0011			oS
276	143	144	1.50000	%Q0011			oS
277	144	145	1.12000	%Q0011			oS
278	146	147	1.12000	%Q0011			oS
279	147	148	1.50000	%Q0011			oS
280	148	149	1.50000	%Q0011			oS
281	149	150	1.12000	%Q0011			oS
282	151	152	1.12000	%Q0011			oS
283	152	153	1.50000	%Q0011			oS
284	153	154	1.50000	%Q0011			oS
285	154	155	1.12000	%Q0011			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
286	156	157	1.12000	%Q0012			oS
287	157	158	1.50000	%Q0012			oS
288	158	159	1.50000	%Q0012			oS
289	159	160	1.12000	%Q0012			oS
290*	166	58	13.20000	PILAS			oS
291*	167	108	13.20000	PILAS			oS

Bars marked with *** are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

Cross sections marked with *** (i.e *HEB200) are rotated 90 degr.
about the local x-axis.

O = Rotated bars (bar orientations)
oS = Bars without shear deformation

HAUNCHED AND NON DEFAULT ORIENTED MEMBERS:

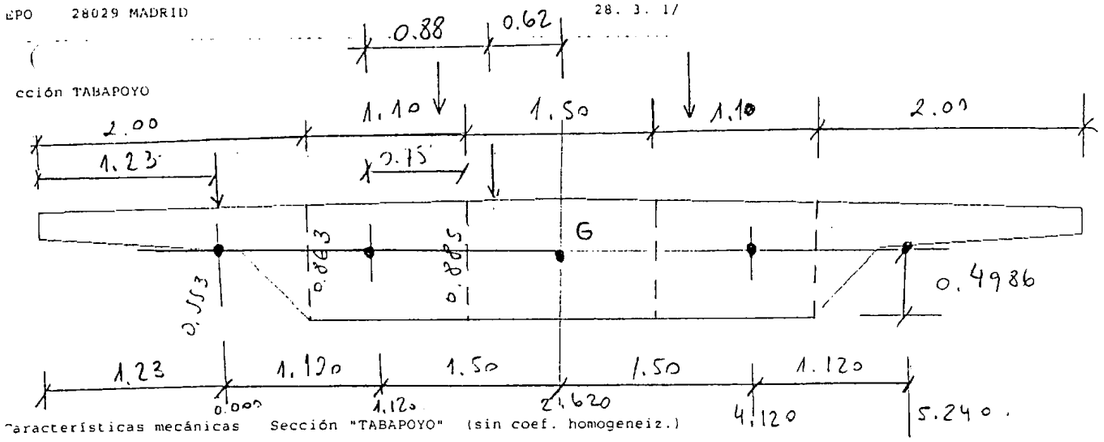
Bar	haunched bars CS-Start	CS-End	Bar orientation x/kl/angle Beta	y/k2	z
1			-8.0000		
2			-8.0000		
3			-8.0000		
4			-8.0000		
5			-8.0000		
6			-8.0000		
7			-8.0000		
8			-8.0000		
9			-8.0000		
10			-8.0000		
11			-8.0000		
12			-8.0000		
13			-8.0000		
14			-8.0000		
15			-8.0000		
16			-8.0000		
17			-8.0000		
18			-8.0000		
19			-8.0000		
20			-8.0000		
21			-8.0000		
22			-8.0000		
23			-8.0000		
24			-8.0000		
25			-8.0000		
26			-8.0000		
27			-8.0000		
28			-8.0000		
29			-8.0000		

Bar	haunched bars CS-Start	CS-End	Bar orientation x/kl/angle Beta	y/k2	z
30			-8.0000		
31			-8.0000		
32			-8.0000		
129			8.0000		
130			8.0000		
131			8.0000		
132			8.0000		
133			8.0000		
134			8.0000		
135			8.0000		
136			8.0000		
137			8.0000		
138			8.0000		
139			8.0000		
140			8.0000		
141			8.0000		
142			8.0000		
143			8.0000		
144			8.0000		
145			8.0000		
146			8.0000		
147			8.0000		
148			8.0000		
149			8.0000		
150			8.0000		
151			8.0000		
152			8.0000		
153			8.0000		
154			8.0000		
155			8.0000		
156			8.0000		
157			8.0000		
158			8.0000		
159			8.0000		
160			8.0000		

CROSS SECTION VALUES: CS-Name	Ax [M2] Ix [M4] zl [M1]	Iy [M4] Fy [M2] zu [M1]	Iz [M4] Fz [M2] yl [M1]	Phi (Degr] yr [M1]
%Q0001	6.9575E-01	2.7466E-02	2.4561E-01	8.01
(L1)	8.0250E-03	6.9575E-01	6.9575E-01	
	-0.4986	0.3644	-0.7703	1.2297
%Q0002	9.4930E-01	6.3194E-02	1.3370E-01	0.00
(L2B)	6.1400E-02	9.4930E-01	9.4930E-01	
	-0.4986	0.3644	-0.7500	0.3500

CROSS SECTION VALUES: CS-Name	Ax [M2] Ix [M4] zl [M1]	Iy [M4] Fy [M2] zu [M1]	Iz [M4] Fz [M2] yl [M1]	Phi (Degr] yr [M1]
%Q0003	1.3500E+00	9.4309E-02	2.5312E-01	0.00
(L2)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.7500	0.7500
%Q0004	9.4930E-01	6.3194E-02	1.3370E-01	0.00
(L2A)	6.1400E-02	9.4930E-01	9.4930E-01	
	-0.4986	0.3644	-0.3500	0.7500
%Q0005	6.9575E-01	2.7466E-02	2.4561E-01	-8.01
(L3)	8.0250E-03	6.9575E-01	6.9575E-01	
	-0.4986	0.3644	-1.2297	0.7703
%Q0006	1.0350E+00	7.2304E-02	1.1990E-01	0.00
(TRANS0)	7.2950E-02	1.0350E+00	1.0350E+00	
	-0.4986	0.4014	-0.5000	0.6500
%Q0007	1.1700E+00	8.1733E-02	1.6478E-01	0.00
(TRANS1)	9.0350E-02	1.1700E+00	1.1700E+00	
	-0.4986	0.4014	-0.6500	0.6500
%Q0008	1.3500E+00	9.4309E-02	2.6660E-01	0.00
(TRANS5)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.6500	0.8500
%Q0009	1.5300E+00	1.0691E-01	3.6847E-01	0.00
(TRANS2)	1.3810E-01	1.5300E+00	1.5300E+00	
	-0.4986	0.4014	-0.8500	0.8500
%Q0010	1.3500E+00	9.4309E-02	2.6660E-01	0.00
(TRANS6)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.8500	0.6500
%Q0011	1.1700E+00	8.1733E-02	1.6478E-01	0.00
(TRANS3)	9.0350E-02	1.1700E+00	1.1700E+00	
	-0.4986	0.4014	-0.6500	0.6500
%Q0012	1.0350E+00	7.2304E-02	1.1990E-01	0.00
(TRANS4)	7.2950E-02	1.0350E+00	1.0350E+00	
	-0.4986	0.4014	-0.6500	0.5000
PILAS	7.8576E-01	4.9180E-02	4.9086E-02	0.00
	9.8175E-02	7.8576E-01	7.8576E-01	
	-0.5000	0.5000	-0.5000	0.5000

cción TABAPOYO



Características mecánicas Sección "TABAPOYO" (sin coef. homogeneiz.)

Area Ax = 46.53E3 cm2 = 4.653 m²
Momento de inercia Iy = 28.62E6 cm4 Iz = 1.372E9 cm4 Ip = 1.400E9 cm4
Const. de torsión Ix = 50.83E6 cm4
Momento estático Zy =998.79E3 cm3 Zz = 6.642E6 cm3
Baricentro ys = 0.0000 m zs = 0.4986 m Angulo= 0.0 Grad
Dist. al borde yl = -3.8500 m yr = 3.8500 m
zo = 0.4014 m zu = -0.4986 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TABAPOYO" (sin coef. homogeneiz.)

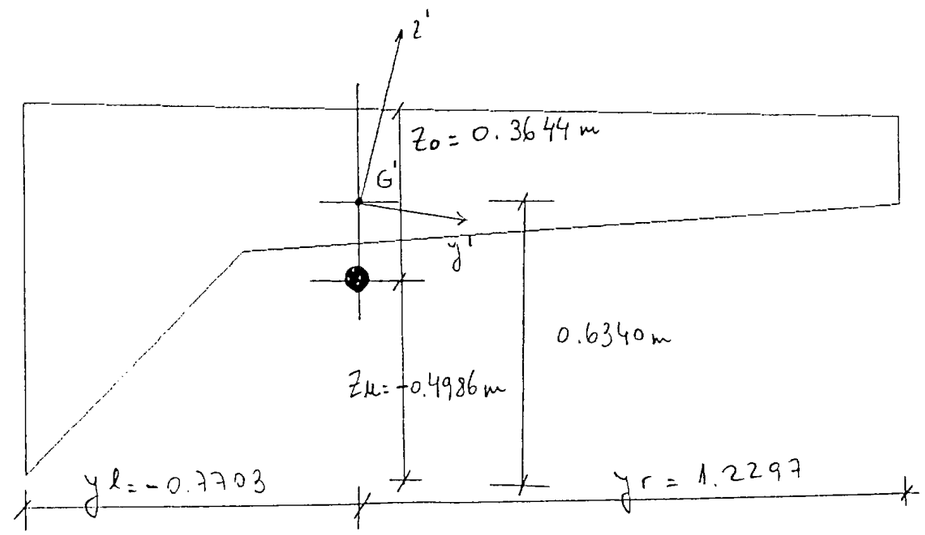
Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

No se ha entrado ninguna armadura!

Sección L1



Características mecánicas Sección "L1" (sin coef. homogeneiz.)

Area Ax = 6.958E3 cm2
Momento de inercia Iy = 1.471E6 cm4 Iz = 24.56E6 cm4 Ip = 26.03E6 cm4
rel. a ejes dados Iye= 1.919E6 cm4 Ize= 24.11E6 cm4 Iyz= -3.2E00 cm4
Const. de torsión Ix = 1.605E6 cm4 $\times 0.5 = 0.008025\ m^4$
Momento estático Zy = 87.62E3 cm3 Zz = 356.13E3 cm3
Baricentro ys = 0.7703 m zs = 0.6340 m Angulo= 8.0 Grad
Dist. al borde yl = -0.7703 m yr = 1.2297 m
zo = 0.2290 m zu = -0.6340 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L1" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	6957.500	529.028	1.60E+06	3)

Puntos de contorno [m]:

1	0.0000	0.0000	2	0.5000	0.5230	3	2.0000	0.6230
4	2.0000	0.8230	5	0.0000	0.8630	6	0.0000	0.0000

No se ha entrado ninguna armadura!

$$I_y = 1{,}471\ 10^6\ cm^4 + 6.958\ 10^3\ cm^2\ (6340\ cm - 49.86 cm)^2$$

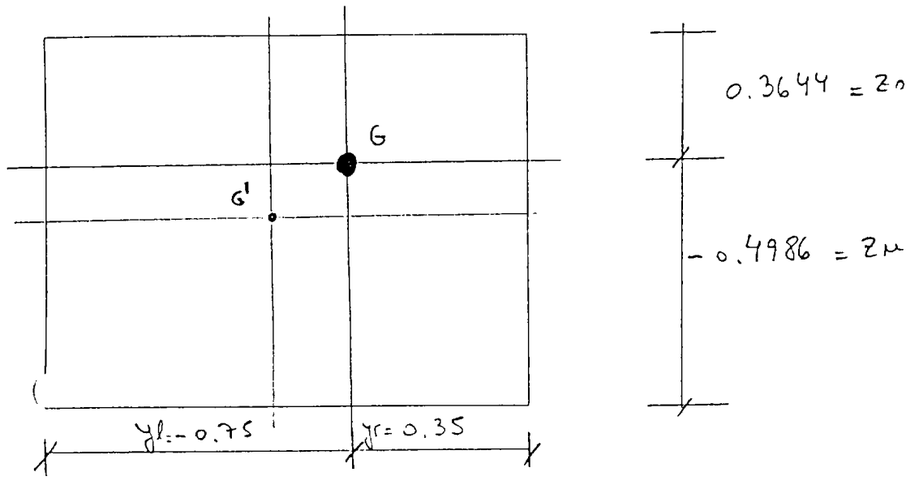
$$I_y = 0.027466\ m^4$$

$$I_x = 0.008025\ m^4$$

$$z_u = -0.4986\ m \qquad z_o = 0.3644\ m$$

$$BETA = -8.00^\circ$$

Sección L2B



Características mecánicas Sección "L2B" (sin coef. homogeneiz.)

Area Ax = 9.493E3 cm2
Momento de inercia Iy = 5.892E6 cm4 Iz = 9.572E6 cm4 Ip = 15.46E6 cm4
Const. de torsión Ix = 12.28E6 cm4
Momento estático Zy =204.81E3 cm3 Zz = 261.06E3 cm3
Baricentro ys = 0.5500 m zs = 0.4315 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5500 m yr = 0.5500 m
zo = 0.4315 m zu = -0.4315 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2B" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	9493.000	392.600	1.23E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.1000	0.0000	3	1.1000	0.8630
4	0.0000	0.8630	5	0.0000	0.0000			

No se ha entrado ninguna armadura!

$I_x = 12.28\ 10^6\ cm^4 \times 0.50 = 0.0614\ m^4$

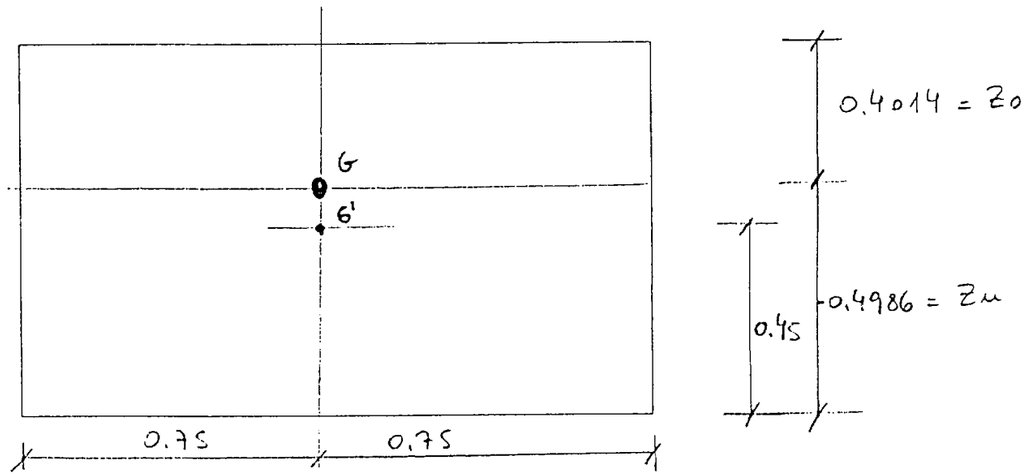
$I_y = 5.892\ 10^6 + 9.493\ 10^3 \times (49.86\ cm - 43.15\ cm)^2$

$I_y = 0.0631940\ m^4$

$I_z = 9.572\ 10^6 + 9.493\ 10^3 \times (75. - 55)^2$

$I_z = 0.133692\ m^4$

Sección L2



Características mecánicas Sección "L2" (sin coef. homogeneiz.)

Area Ax = 13.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.7500 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.5000	0.0000	3	1.5000	0.9000
4	0.0000	0.9000	5	0.0000	0.0000			

No se ha entrado ninguna armadura!

$I_x = 22.82\ 10^6\ cm^4 \times 0.50 = 0.1141\ m^4$

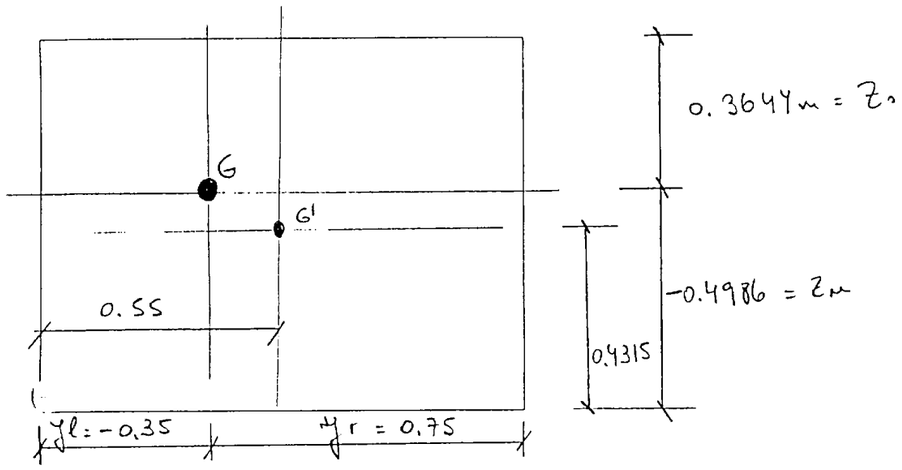
$I_y = 9.112\ 10^6\ cm^4 + 13.50\ 10^3\ cm^2 \times (49.86\ cm - 45.0\ cm)^2$

$I_y = 0.0943086\ m^4$

$Z_u = -0.4986\ m$

$Z_o = 0.4014\ m$

cción L2A



Características mecánicas Sección "L2A" (sin coef. homogeneiz.)

Area Ax = 9.493E3 cm2
Momento de inercia Iy = 5.892E6 cm4 Iz = 9.572E6 cm4 Ip = 15.46E6 cm4
Const. de torsión Ix = 12.28E6 cm4
Momento estático Zy =204.81E3 cm3 Zz = 261.06E3 cm3
Baricentro ys = 0.5500 m zs = 0.4315 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5500 m yr = 0.5500 m
zo = 0.4315 m zu = -0.4315 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2A" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	9493.000	392.600	1.23E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.1000	0.0000	3	1.1000	0.8630
4	0.0000	0.8630	5	0.0000	0.0000		

No se ha entrado ninguna armadura!

$I_x = 12.28\,10^6\,cm^4 \times 0.50 = 0.0614\,m^4$

$I_y = 5.892\,10^6\,cm^4 + 9.493\times10^3\,cm^2 \times (49.86\,cm - 43.15\,cm)^2$

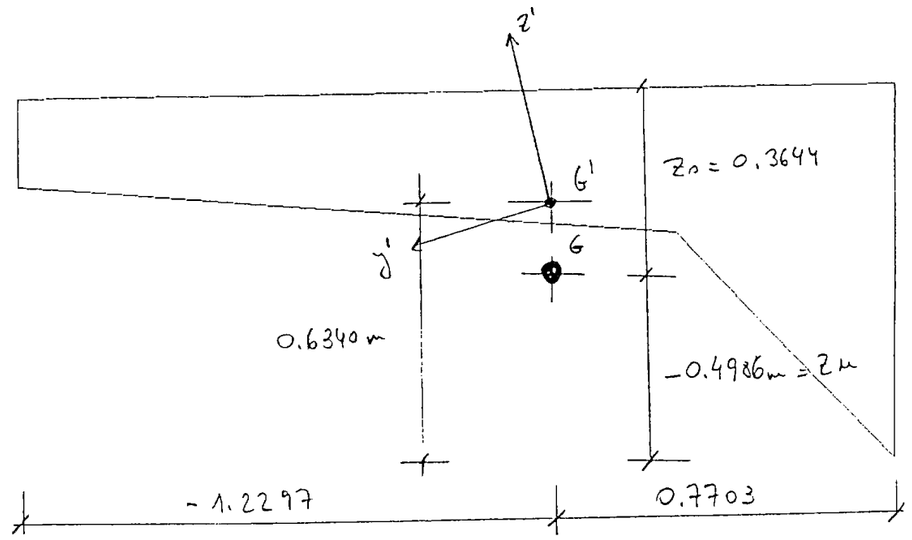
$I_y = 0.063194\,m^4$

$I_z = 9.572\,10^6\,cm^4 + 9.493\times10^3\,cm^2 \times (55.0\,cm - 35.0\,cm)^2$

$I_z = 0.1337\,m^4$

$Z_u = -0.4986\,m \qquad Z_o = 0.3644$

Sección L3



Características mecánicas Sección "L3" (sin coef. homogeneiz.)

Area Ax = 6.957E3 cm2
Momento de inercia Iy = 1.471E6 cm4 Iz = 24.56E6 cm4 Ip = 26.03E6 cm4
rel. a ejes dados Iye= 1.919E6 cm4 Izs= 24.11E6 cm4 Iyz= 3.186E6 cm4
Const. de torsión Ix = 1.605E6 cm4
Momento estático Zy = 87.62E3 cm3 Zz = 356.13E3 cm3
Baricentro ys = 1.2297 m zs = 0.6340 m Angulo= -8.0 Grad
Dist. al borde yl = -1.2297 m yr = 0.7703 m
zo = 0.2290 m zu = -0.6340 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L3" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	6957.500	529.028	1.60E+06	3)

Puntos de contorno [m]:

1	0.0000	0.8230	2	0.0000	0.6230	3	1.5000	0.5230
4	2.0000	0.0000	5	2.0000	0.8630	6	0.0000	0.8230

No se ha entrado ninguna armadura!

$I_x = 1.605\,10^6\,cm^4 \times 0.50 = 0.008025\,m^4$

$I_y = 1.471\,10^6\,cm^4 + 6.957\,10^3\,cm^2\,(63.40\,cm - 49.86\,cm)^2$

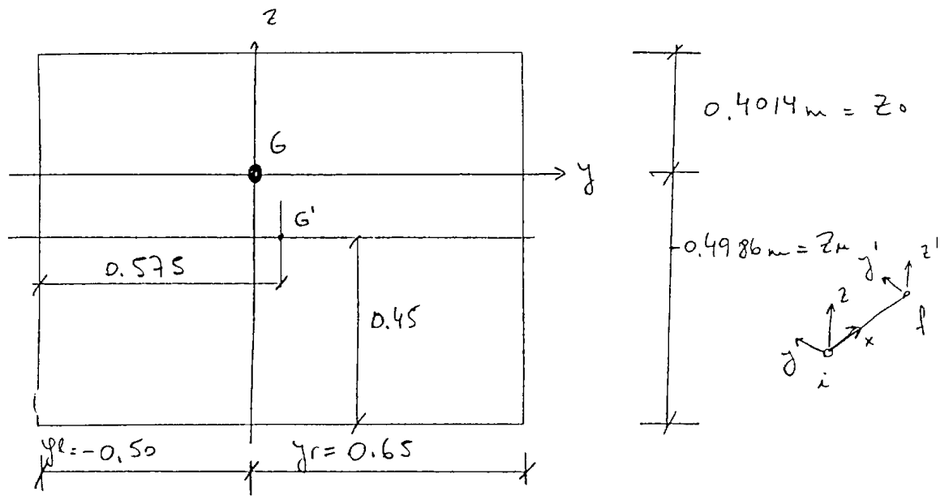
$I_y = 0.027464\,m^4$

$Z_o = 0.3644\,m \qquad Z_u = -0.4986$

$BETA = 8.00^\circ$

(

cción TRANS0



aracterísticas mecánicas Sección "TRANS0" (sin coef. homogeneiz.)

Area Ax = 10.35E3 cm2
Momento de inercia Iy = 6.986E6 cm4 Iz = 11.41E6 cm4 Ip = 18.39E6 cm4
Const. de torsión Ix = 14.59E6 cm4
Momento estático Zy =232.88E3 cm3 Zz = 297.56E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5750 m yr = 0.5750 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Con(no de sección parcial, Sección "TRANS0" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	10350.0	410.000	1.46E+07	1)

Puntos de contorno [m]:

1	-0.5750	0.0000	2	0.5750	0.0000	3	0.5750	0.9000
4	0.5750	0.9000	5	0.5750	0.0000			

No se ha entrado ninguna armadura!

$$I_x = 14.59\,10^6\,cm^4 \times 0.50 = 0.07295\,m^4$$

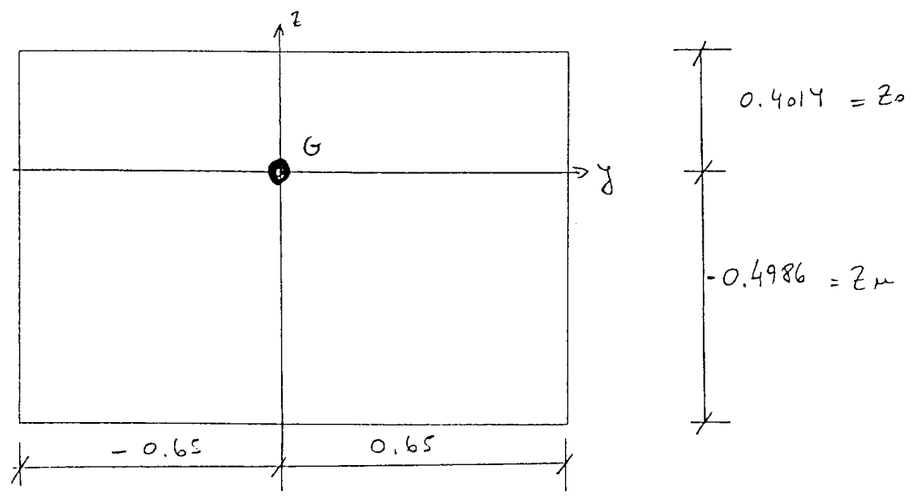
$$I_y = 6.986\,10^6\,cm^4 + 10.35 \times 10^3\,cm^2 \times (49.86cm - 45.0cm)^2$$

$$I_y = 0.0723046\,m^4$$

$$I_z = 11.41\,10^6\,cm^4 + 10.35\,10^3\,cm^2 \times (57.5cm - 50\,cm)^2$$

$$I_z = 0.119921\,m^4$$

Sección TRANS1



Características mecánicas Sección "TRANS1" (sin coef. homogeneiz.)

Area Ax = 11.70E3 cm2
Momento de inercia Iy = 7.897E6 cm4 Iz = 16.48E6 cm4 Ip = 24.37E6 cm4
Const. de torsión Ix = 18.07E6 cm4
Momento estático Zy =263.25E3 cm3 Zz = 380.25E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.6500 m yr = 0.6500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS1" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	11700.0	440.000	1.81E+07	1)

Puntos de contorno [m]:

1	0.6500	0.0000	2	0.6500	0.0000	3	0.6500	0.9000
4	-0.6500	0.9000	5	0.6500	0.0000			

No se ha entrado ninguna armadura!

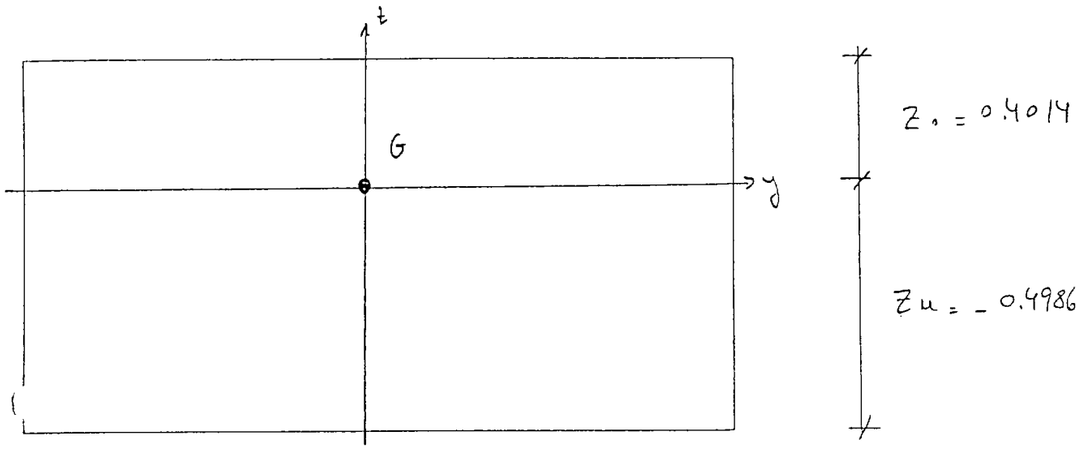
$$I_x = 18.07\,10^6\,cm^4 \times 0.50 = 0.09035\,m^4$$

$$I_y = 7.897\,10^6\,cm^4 + 11.70\,10^3\,cm^2 \times (49.86\,cm - 45.0)^2$$

$$I_y = 0.0817324\,m^4$$

$$z_u = -0.4986\,m \qquad z_o = 0.4014\,m$$

Sección TRANS2



Características mecánicas Sección "TRANS2" (sin coef. homogeneiz.)

Area Ax = 15.30E3 cm2
Momento de inercia Iy = 10.33E6 cm4 Iz = 36.85E6 cm4 Ip = 47.17E6 cm4
Const. de torsión Ix = 27.62E6 cm4
Momento estático Zy =344.25E3 cm3 Zz = 650.25E3 cm3
Baricentro ys = 0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.8500 m yr = 0.8500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS2" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	15300.0	520.000	2.76E+07	1)

Puntos de contorno [m]:
1 0.8500 0.0000 2 0.8500 0.0000 3 0.8500 0.9000
4 0.8500 0.9000 5 -0.8500 0.0000

No se ha entrado ninguna armadura!

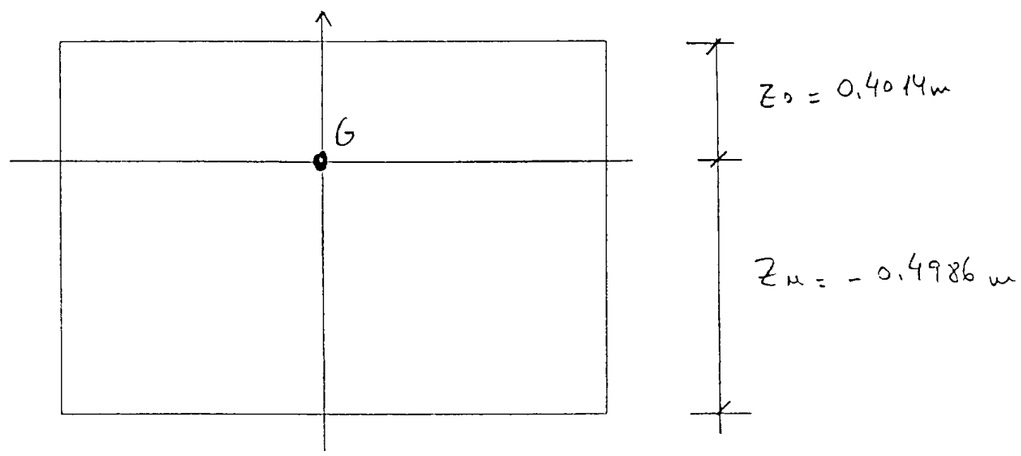
$I_x = 27.62\ 10^6\ cm^4 \times 0.50 = 0.1381\ m^4$

$I_y = 10.33\ 10^6\ cm^4 + 15.30\ 10^3\ cm^2 \times (49.86\ cm - 45.00)^2$

$I_y = 0.106913\ m^4$

$Z_u = -0.4986\ m \qquad Z_o = 0.4014\ m$

Sección TRANS3



Características mecánicas Sección "TRANS3" (sin coef. homogeneiz.)

Area Ax = 11.70E3 cm2
Momento de inercia Iy = 7.897E6 cm4 Iz = 16.48E6 cm4 Ip = 24.37E6 cm4
Const. de torsión Ix = 18.07E6 cm4
Momento estático Zy =263.25E3 cm3 Zz = 380.25E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.6500 m yr = 0.6500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS3" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	11700.0	440.000	1.81E+07	1)

Puntos de contorno [m]:
1 -0.6500 0.0000 2 0.6500 0.0000 3 0.6500 0.9000
4 0.6500 0.9000 5 0.6500 0.0000

No se ha entrado ninguna armadura!

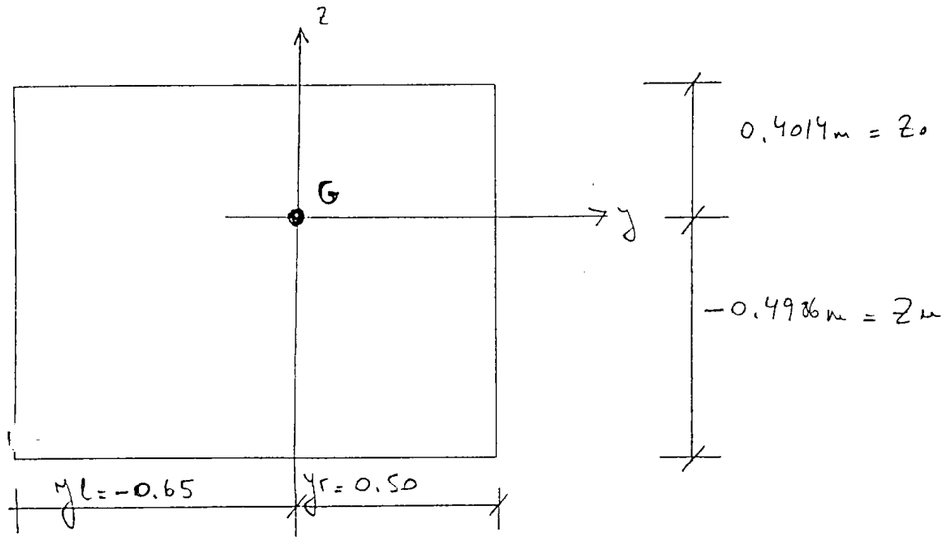
$I_x = 18.07\ 10^6\ cm^4 \times 0.50 = 0.09035\ m^4$

$I_y = 7.897\ 10^6\ cm^4 + 11.70 \times 10^3\ cm^2 \times (49.86\ cm - 45.00)^2$

$I_y = 0,0817335\ m^4$

$Z_u = -0.4986\ m \qquad Z_o = 0,4014\ m$

ección TRANS4



Características mecánicas Sección "TRANS4" (sin coef. homogeneiz.)

Area Ax = 10.35E3 cm2
Momento de inercia Iy = 6.986E6 cm4 Iz = 11.41E6 cm4 Ip = 18.39E6 cm4
Const. de torsión Ix = 14.59E6 cm4
Momento estático Zy =232.88E3 cm3 Zz = 297.56E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5750 m yr = 0.5750 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS4" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	10350.0	410.000	1.46E+07	1)

Puntos de contorno [m]:
1 -0.5750 0.0000 2 0.5750 0.0000 3 0.5750 0.9000
4 -0.5750 0.9000 5 -0.5750 0.0000

No se ha entrado ninguna armadura!

$I_x = 14.59\ 10^6\ cm^4 \times 0.50 = 0.07295\ m^4$

$I_y = 6.986\ 10^6\ cm^4 + 10.35\ 10^3\ cm^2 \times (49.86\ cm - 45.0\ cm)^2$

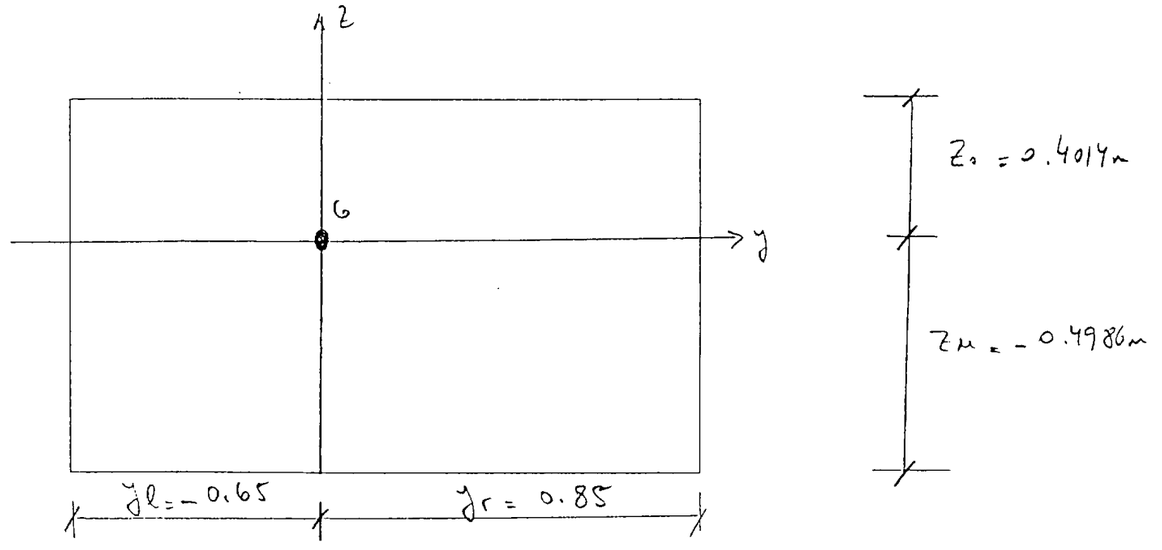
$I_y = 0.0723046\ m^4$

$I_z = 11,41\ 10^6\ cm^4 + 10.35\ 10^3\ cm^2 \times (65.0 - 57,50)^2$

$I_z = 0,11992\ m^4$

$z_M = -0.4986\ m \qquad z_0 = 0.4014\ m$

Sección TRANS5



Características mecánicas Sección "TRANS5" (sin coef. homogeneiz.)

Area Ax = 13.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS5" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:
1 -0.7500 0.0000 2 0.7500 0.0000 3 0.7500 0.9000
4 -0.7500 0.9000 5 0.7500 0.0000

No se ha entrado ninguna armadura!

$I_x = 22.82\ 10^6\ cm^4 \times 0.50 = 0.1141\ m^4$

$I_y = 9,112\ 10^6\ cm^4 + 13,50\ 10^3\ cm^2\ (49.86-45)^2$

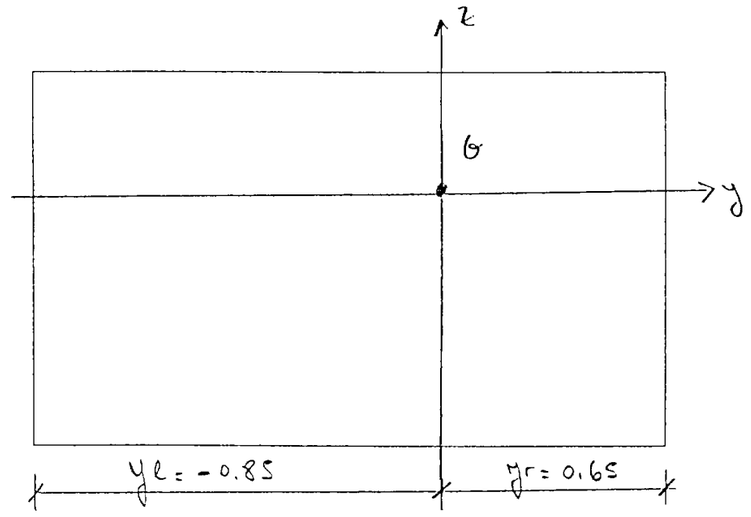
$I_y = 0.094309\ m^4$

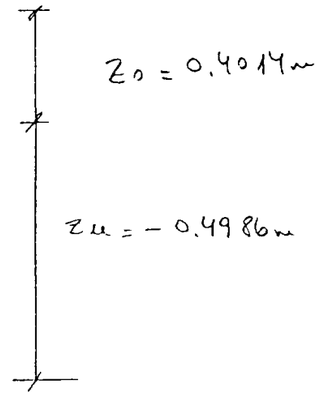
$I_z = 25.31\ 10^6\ cm^4 + 13.50\ 10^3\ cm^2\ (75-65)^2$

$I_z = 0.2666\ m^4$

$z_M = -0.4986\ m \qquad z_0 = 0,4014\ m$

Sección TRANS6





Características mecánicas Sección "TRANS6" (sin coef. homogeneiz.)

Area Ax = 13.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS6" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:

1	0.7500	0.0000	2	0.7500	0.0000	3	0.7500	0.9000
4	0.7500	0.9000	5	0.7500	0.0000			

No se ha entrado ninguna armadura:

$$I_x = 22.82\,10^6\,cm^4 \times 0.50 = 0.1141\ m^4$$

$$I_y = 9.112\,10^6\,cm^4 + 13.50\,10^3\,cm^2\,(49.86-45)^2$$

$$I_y = 0.094309\ m^4$$

$$I_t = 25.31\,10^6\,cm^4 + 13.50\,10^3\,cm^2\,(75-65)^2$$

$$I_t = 0.2666\ m^4$$

$$z_u = -0.4986\ m \qquad z_o = 0.4014$$

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 .. 291	3.2900E+06	1.3700E+06

STS-Run ok

==========
Load case 1: PESO PROPIO
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Mas.forcZ gl const.	-2.500		Stab 1 .. 160

==========
Load case 2: PESO PAVIMENTO
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.106000		Stab 1 .. 32
Force Z pj const.	-0.101000		Stab 33 .. 64
Force Z pj const.	-0.138000		Stab 65 .. 96
Force Z pj const.	-0.101000		Stab 97 .. 128
Force Z pj const.	-0.106000		Stab 129 .. 160

==========
Load case 3: PESO BARRERAS
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-1.000		Stab 1
Moment X lo const.	-1.023		Stab 1
Force Z pj const.	-1.000		Stab 2
Moment X lo const.	-1.023		Stab 2
Force Z pj const.	-1.000		Stab 3
Moment X lo const.	-1.023		Stab 3
Force Z pj const.	-1.000		Stab 4
Moment X lo const.	-1.023		Stab 4
Force Z pj const.	-1.000		Stab 5
Moment X lo const.	-1.023		Stab 5
Force Z pj const.	-1.000		Stab 6
Moment X lo const.	-1.023		Stab 6
Force Z pj const.	-1.000		Stab 7
Moment X lo const.	-1.023		Stab 7
Force Z pj const.	-1.000		Stab 8
Moment X lo const.	-1.023		Stab 8
Force Z pj const.	-1.000		Stab 9
Moment X lo const.	-1.023		Stab 9
Force Z pj const.	-1.000		Stab 10
Moment X lo const.	-1.023		Stab 10
Force Z pj const.	-1.000		Stab 11
Moment X lo const.	-1.023		Stab 11
Force Z pj const.	-1.000		Stab 12
Moment X lo const.	-1.023		Stab 12
Force Z pj const.	-1.000		Stab 13
Moment X lo const.	-1.023		Stab 13
Force Z pj const.	-1.000		Stab 14
Moment X lo const.	-1.023		Stab 14
Force Z pj const.	-1.000		Stab 15
Moment X lo const.	-1.023		Stab 15
Force Z pj const.	-1.000		Stab 16
Moment X lo const.	-1.023		Stab 16
Force Z pj const.	-1.000		Stab 17
Moment X lo const.	-1.023		Stab 17
Force Z pj const.	-1.000		Stab 18
Moment X lo const.	-1.023		Stab 18
Force Z pj const.	-1.000		Stab 19
Moment X lo const.	-1.023		Stab 19
Force Z pj const.	-1.000		Stab 20
Moment X lo const.	-1.023		Stab 20
Force Z pj const.	-1.000		Stab 21
Moment X lo const.	-1.023		Stab 21
Force Z pj const.	-1.000		Stab 22
Moment X lo const.	-1.023		Stab 22
Force Z pj const.	-1.000		Stab 23
Moment X lo const.	-1.023		Stab 23
Force Z pj const.	-1.000		Stab 24
Moment X lo const.	-1.023		Stab 24
Force Z pj const.	-1.000		Stab 25

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Moment X lo const.	-1.023		Stab 25
Force Z pj const.	-1.000		Stab 26
Moment X lo const.	-1.023		Stab 26
Force Z pj const.	-1.000		Stab 27
Moment X lo const.	-1.023		Stab 27
Force Z pj const.	-1.000		Stab 28
Moment X lo const.	-1.023		Stab 28
Force Z pj const.	-1.000		Stab 29
Moment X lo const.	-1.023		Stab 29
Force Z pj const.	-1.000		Stab 30
Moment X lo const.	-1.023		Stab 30
Force Z pj const.	-1.000		Stab 31
Moment X lo const.	-1.023		Stab 31
Force Z pj const.	-1.000		Stab 32
Moment X lo const.	-1.023		Stab 32
Force Z pj const.	-1.000		Stab 129
Moment X lo const.	1.023		Stab 129
Force Z pj const.	-1.000		Stab 130
Moment X lo const.	1.023		Stab 130
Force Z pj const.	-1.000		Stab 131
Moment X lo const.	1.023		Stab 131
Force Z pj const.	-1.000		Stab 132
Moment X lo const.	1.023		Stab 132
Force Z pj const.	-1.000		Stab 133
Moment X lo const.	1.023		Stab 133
Force Z pj const.	-1.000		Stab 134
Moment X lo const.	1.023		Stab 134
Force Z pj const.	-1.000		Stab 135
Moment X lo const.	1.023		Stab 135
Force Z pj const.	-1.000		Stab 136
Moment X lo const.	1.023		Stab 136
Force Z pj const.	-1.000		Stab 137
Moment X lo const.	1.023		Stab 137
Force Z pj const.	-1.000		Stab 138
Moment X lo const.	1.023		Stab 138
Force Z pj const.	-1.000		Stab 139
Moment X lo const.	1.023		Stab 139
Force Z pj const.	-1.000		Stab 140
Moment X lo const.	1.023		Stab 140
Force Z pj const.	-1.000		Stab 141
Moment X lo const.	1.023		Stab 141
Force Z pj const.	-1.000		Stab 142
Moment X lo const.	1.023		Stab 142
Force Z pj const.	-1.000		Stab 143
Moment X lo const.	1.023		Stab 143
Force Z pj const.	-1.000		Stab 144
Moment X lo const.	1.023		Stab 144
Force Z pj const.	-1.000		Stab 145
Moment X lo const.	1.023		Stab 145
Force Z pj const.	-1.000		Stab 146
Moment X lo const.	1.023		Stab 146
Force Z pj const.	-1.000		Stab 147
Moment X lo const.	1.023		Stab 147

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-1.000		Stab 148
Moment X lo const.	1.023		Stab 148
Force Z pj const.	-1.000		Stab 149
Moment X lo const.	1.023		Stab 149
Force Z pj const.	-1.000		Stab 150
Moment X lo const.	1.023		Stab 150
Force Z pj const.	-1.000		Stab 151
Moment X lo const.	1.023		Stab 151
Force Z pj const.	-1.000		Stab 152
Moment X lo const.	1.023		Stab 152
Force Z pj const.	-1.000		Stab 153
Moment X lo const.	1.023		Stab 153
Force Z pj const.	-1.000		Stab 154
Moment X lo const.	1.023		Stab 154
Force Z pj const.	-1.000		Stab 155
Moment X lo const.	1.023		Stab 155
Force Z pj const.	-1.000		Stab 156
Moment X lo const.	1.023		Stab 156
Force Z pj const.	-1.000		Stab 157
Moment X lo const.	1.023		Stab 157
Force Z pj const.	-1.000		Stab 158
Moment X lo const.	1.023		Stab 158
Force Z pj const.	-1.000		Stab 159
Moment X lo const.	1.023		Stab 159
Force Z pj const.	-1.000		Stab 160
Moment X lo const.	1.023		Stab 160

==========
Load case 5: RETRACCION
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000292		Stab 1 .. 160

==========
Load case 6: SOB UNIF 1
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.800000		Stab 1 .. 32

==========
Load case 7: SOB UNIF 2
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 33 .. 64

==========
Load case 8: SOB UNIF 3
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.600000		Stab 65 .. 96

==========
Load case 9: SOB UNIF 4
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 97 .. 128

==========
Load case 10: SOB UNIF 5
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.800000		Stab 129 .. 160

==========
Load case 11: VEHICULO HIPOTESIS 11
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-10.000	0.850000	Stab 2
Force Z gl conc.	-10.000	1.050	Stab 3
Force Z gl conc.	-10.000	1.250	Stab 4
Force Z gl conc.	-4.130	0.850000	Stab 34
Force Z gl conc.	-4.130	1.050	Stab 35
Force Z gl conc.	-4.130	1.250	Stab 36
Force Z gl conc.	-5.870	0.850000	Stab 66
Force Z gl conc.	-5.870	1.050	Stab 67
Force Z gl conc.	-5.870	1.250	Stab 68

Load case 12: VEHICULO HIPOTESIS 12

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	1.100	Stab	5
Force	Z	gl conc.	-10.000	1.300	Stab	6
Force	Z	gl conc.	-10.000	0.200000	Stab	8
Force	Z	gl conc.	-4.130	1.100	Stab	37
Force	Z	gl conc.	-4.130	1.300	Stab	38
Force	Z	gl conc.	-4.130	0.200000	Stab	40
Force	Z	gl conc.	-5.870	1.100	Stab	69
Force	Z	gl conc.	-5.870	1.300	Stab	70
Force	Z	gl conc.	-5.870	0.200000	Stab	72

Load case 13: VEHICULO HIPOTESIS 13

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	0.050000	Stab	9
Force	Z	gl conc.	-10.000	0.250000	Stab	10
Force	Z	gl conc.	-10.000	0.450000	Stab	11
Force	Z	gl conc.	-4.130	0.050000	Stab	41
Force	Z	gl conc.	-4.130	0.250000	Stab	42
Force	Z	gl conc.	-4.130	0.450000	Stab	43
Force	Z	gl conc.	-5.870	0.050000	Stab	73
Force	Z	gl conc.	-5.870	0.250000	Stab	74
Force	Z	gl conc.	-5.870	0.450000	Stab	75

Load case 14: VEHICULO HIPOTESIS 14

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	0.850000	Stab	12
Force	Z	gl conc.	-10.000	0.650000	Stab	13
Force	Z	gl conc.	-10.000	0.450000	Stab	14
Force	Z	gl conc.	-4.130	0.850000	Stab	44
Force	Z	gl conc.	-4.130	0.650000	Stab	45
Force	Z	gl conc.	-4.130	0.450000	Stab	46
Force	Z	gl conc.	-5.870	0.850000	Stab	76
Force	Z	gl conc.	-5.870	0.650000	Stab	77
Force	Z	gl conc.	-5.870	0.450000	Stab	78

Load case 15: VEHICULO HIPOTESIS 15

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	0.200000	Stab	16
Force	Z	gl conc.	-10.000	0	Stab	17
Force	Z	gl conc.	-10.000	1.500	Stab	17
Force	Z	gl conc.	-4.130	0.200000	Stab	48
Force	Z	gl conc.	-4.130	0	Stab	49
Force	Z	gl conc.	-4.130	1.500	Stab	49
Force	Z	gl conc.	-5.870	0.200000	Stab	80
Force	Z	gl conc.	-5.870	0	Stab	81
Force	Z	gl conc.	-5.870	1.500	Stab	81

Load case 16: VEHICULO HIPOTESIS 16

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	1.250	Stab	19
Force	Z	gl conc.	-10.000	1.050	Stab	20
Force	Z	gl conc.	-10.000	0.850000	Stab	21
Force	Z	gl conc.	-4.130	1.250	Stab	51
Force	Z	gl conc.	-4.130	1.050	Stab	52
Force	Z	gl conc.	-4.130	0.850000	Stab	53
Force	Z	gl conc.	-5.870	1.250	Stab	83
Force	Z	gl conc.	-5.870	1.050	Stab	84
Force	Z	gl conc.	-5.870	0.850000	Stab	85

Load case 17: VEHICULO HIPOTESIS 17

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	0.850000	Stab	22
Force	Z	gl conc.	-10.000	1.050	Stab	23
Force	Z	gl conc.	-10.000	1.250	Stab	24
Force	Z	gl conc.	-4.130	0.850000	Stab	54
Force	Z	gl conc.	-4.130	1.050	Stab	55
Force	Z	gl conc.	-4.130	1.250	Stab	56
Force	Z	gl conc.	-5.870	0.850000	Stab	86
Force	Z	gl conc.	-5.870	1.050	Stab	87
Force	Z	gl conc.	-5.870	1.250	Stab	88

Load case 18: VEHICULO HIPOTESIS 18

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	1.100	Stab	25
Force	Z	gl conc.	-10.000	1.300	Stab	26
Force	Z	gl conc.	-10.000	0.200000	Stab	28
Force	Z	gl conc.	-4.130	1.100	Stab	57
Force	Z	gl conc.	-4.130	1.300	Stab	58
Force	Z	gl conc.	-4.130	0.200000	Stab	60
Force	Z	gl conc.	-5.870	1.100	Stab	89
Force	Z	gl conc.	-5.870	1.300	Stab	90
Force	Z	gl conc.	-5.870	0.200000	Stab	92

Load case 19: VEHICULO HIPOTESIS 19

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-10.000	0.050000	Stab	29
Force	Z	gl conc.	-10.000	0.250000	Stab	30
Force	Z	gl conc.	-10.000	0.450000	Stab	31
Force	Z	gl conc.	-4.130	0.050000	Stab	61
Force	Z	gl conc.	-4.130	0.250000	Stab	62
Force	Z	gl conc.	-4.130	0.450000	Stab	63
Force	Z	gl conc.	-5.870	0.050000	Stab	93
Force	Z	gl conc.	-5.870	0.250000	Stab	94
Force	Z	gl conc.	-5.870	0.450000	Stab	95

Load case 20: VEHICULO HIPOTESIS 20

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.850000	Stab	34
Force	Z	gl conc.	-6.670	1.050	Stab	35
Force	Z	gl conc.	-6.670	1.250	Stab	36
Force	Z	gl conc.	-6.670	0.850000	Stab	66
Force	Z	gl conc.	-6.670	1.050	Stab	67
Force	Z	gl conc.	-6.670	1.250	Stab	68
Force	Z	gl conc.	-6.670	0.850000	Stab	98
Force	Z	gl conc.	-6.670	1.050	Stab	99
Force	Z	gl conc.	-6.670	1.250	Stab	100

Load case 21: VEHICULO HIPOTESIS 21

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	1.100	Stab	37
Force	Z	gl conc.	-6.670	1.300	Stab	38
Force	Z	gl conc.	-6.670	0.200000	Stab	40
Force	Z	gl conc.	-6.670	1.100	Stab	69
Force	Z	gl conc.	-6.670	1.300	Stab	70
Force	Z	gl conc.	-6.670	0.200000	Stab	72
Force	Z	gl conc.	-6.670	1.100	Stab	101
Force	Z	gl conc.	-6.670	1.300	Stab	102
Force	Z	gl conc.	-6.670	0.200000	Stab	104

Load case 22: VEHICULO HIPOTESIS 22

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.050000	Stab	41
Force	Z	gl conc.	-6.670	0.250000	Stab	42
Force	Z	gl conc.	-6.670	0.450000	Stab	43
Force	Z	gl conc.	-6.670	0.050000	Stab	73
Force	Z	gl conc.	-6.670	0.250000	Stab	74
Force	Z	gl conc.	-6.670	0.450000	Stab	75
Force	Z	gl conc.	-6.670	0.050000	Stab	105
Force	Z	gl conc.	-6.670	0.250000	Stab	106
Force	Z	gl conc.	-6.670	0.450000	Stab	107

Load case 23: VEHICULO HIPOTESIS 23

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.850000	Stab	44
Force	Z	gl conc.	-6.670	0.650000	Stab	45
Force	Z	gl conc.	-6.670	0.450000	Stab	46
Force	Z	gl conc.	-6.670	0.850000	Stab	76
Force	Z	gl conc.	-6.670	0.650000	Stab	77
Force	Z	gl conc.	-6.670	0.450000	Stab	78
Force	Z	gl conc.	-6.670	0.850000	Stab	108
Force	Z	gl conc.	-6.670	0.650000	Stab	109
Force	Z	gl conc.	-6.670	0.450000	Stab	110

Load case 24: VEHICULO HIPOTESIS 24

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.200000	Stab	46
Force	Z	gl conc.	-6.670	0	Stab	49
Force	Z	gl conc.	-6.670	1.500	Stab	49
Force	Z	gl conc.	-6.670	0.200000	Stab	80
Force	Z	gl conc.	-6.670	0	Stab	81
Force	Z	gl conc.	-6.670	1.500	Stab	81
Force	Z	gl conc.	-6.670	0.200000	Stab	112
Force	Z	gl conc.	-6.670	0	Stab	113
Force	Z	gl conc.	-6.670	1.500	Stab	113

Load case 25: VEHICULO POSICION 25

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	1.250	Stab	51
Force	Z	gl conc.	-6.670	1.050	Stab	52
Force	Z	gl conc.	-6.670	0.850000	Stab	53
Force	Z	gl conc.	-6.670	1.250	Stab	83
Force	Z	gl conc.	-6.670	1.050	Stab	84
Force	Z	gl conc.	-6.670	0.850000	Stab	85
Force	Z	gl conc.	-6.670	1.250	Stab	115
Force	Z	gl conc.	-6.670	1.050	Stab	116
Force	Z	gl conc.	-6.670	0.850000	Stab	117

Load case 26: VEHICULO POSICION 26

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.850000	Stab	54
Force	Z	gl conc.	-6.670	1.050	Stab	55
Force	Z	gl conc.	-6.670	1.250	Stab	56
Force	Z	gl conc.	-6.670	0.850000	Stab	86
Force	Z	gl conc.	-6.670	1.050	Stab	87
Force	Z	gl conc.	-6.670	1.250	Stab	88
Force	Z	gl conc.	-6.670	0.850000	Stab	118
Force	Z	gl conc.	-6.670	1.050	Stab	119
Force	Z	gl conc.	-6.670	1.250	Stab	120

Load case 27: VEHICULO POSICION 27

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	1.100	Stab	57
Force	Z	gl conc.	-6.670	1.300	Stab	58
Force	Z	gl conc.	-6.670	0.200000	Stab	60
Force	Z	gl conc.	-6.670	1.100	Stab	89
Force	Z	gl conc.	-6.670	1.300	Stab	90
Force	Z	gl conc.	-6.670	0.200000	Stab	92
Force	Z	gl conc.	-6.670	1.100	Stab	121
Force	Z	gl conc.	-6.670	1.300	Stab	122
Force	Z	gl conc.	-6.670	0.200000	Stab	124

Load case 28: VEHICULO POSICION 28

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.050000	Stab	61
Force	Z	gl conc.	-6.670	0.250000	Stab	62
Force	Z	gl conc.	-6.670	0.450000	Stab	63
Force	Z	gl conc.	-6.670	0.050000	Stab	93
Force	Z	gl conc.	-6.670	0.250000	Stab	94
Force	Z	gl conc.	-6.670	0.450000	Stab	95
Force	Z	gl conc.	-6.670	0.050000	Stab	125
Force	Z	gl conc.	-6.670	0.250000	Stab	126
Force	Z	gl conc.	-6.670	0.450000	Stab	127

Load case 29: VEHICULO POSICION 29

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	66
Force	Z	gl conc.	-5.870	1.050	Stab	67
Force	Z	gl conc.	-5.870	1.250	Stab	68
Force	Z	gl conc.	-4.130	0.850000	Stab	98
Force	Z	gl conc.	-4.130	1.050	Stab	99
Force	Z	gl conc.	-4.130	1.250	Stab	100
Force	Z	gl conc.	-10.000	0.850000	Stab	130
Force	Z	gl conc.	-10.000	1.050	Stab	131
Force	Z	gl conc.	-10.000	1.250	Stab	132

Load case 30: VEHICULO POSICION 30

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	1.100	Stab	69
Force	Z	gl conc.	-5.870	1.300	Stab	70
Force	Z	gl conc.	-5.870	0.200000	Stab	72
Force	Z	gl conc.	-4.130	1.100	Stab	101
Force	Z	gl conc.	-4.130	1.300	Stab	102
Force	Z	gl conc.	-4.130	0.200000	Stab	104
Force	Z	gl conc.	-10.000	1.100	Stab	133
Force	Z	gl conc.	-10.000	1.300	Stab	134
Force	Z	gl conc.	-10.000	0.200000	Stab	136

Load case 31: VEHICULO POSICION 31

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.050000	Stab	73
Force	Z	gl conc.	-5.870	0.250000	Stab	74
Force	Z	gl conc.	-5.870	0.450000	Stab	75
Force	Z	gl conc.	-4.130	0.050000	Stab	105
Force	Z	gl conc.	-4.130	0.250000	Stab	106
Force	Z	gl conc.	-4.130	0.450000	Stab	107
Force	Z	gl conc.	-10.000	0.050000	Stab	137
Force	Z	gl conc.	-10.000	0.250000	Stab	138
Force	Z	gl conc.	-10.000	0.450000	Stab	139

Load case 32: VEHICULO POSICION 32

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	76
Force	Z	gl conc.	-5.870	0.650000	Stab	77
Force	Z	gl conc.	-5.870	0.450000	Stab	78
Force	Z	gl conc.	-4.130	0.850000	Stab	108
Force	Z	gl conc.	-4.130	0.650000	Stab	109
Force	Z	gl conc.	-4.130	0.450000	Stab	110
Force	Z	gl conc.	-10.000	0.850000	Stab	140
Force	Z	gl conc.	-10.000	0.650000	Stab	141
Force	Z	gl conc.	-10.000	0.450000	Stab	142

Load case 33: VEHICULO POSICION 33

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.200000	Stab	80
Force	Z	gl conc.	-5.870	0	Stab	81
Force	Z	gl conc.	-5.870	1.500	Stab	81
Force	Z	gl conc.	-4.130	0.200000	Stab	112
Force	Z	gl conc.	-4.130	0	Stab	113
Force	Z	gl conc.	-4.130	1.500	Stab	113
Force	Z	gl conc.	-10.000	0.200000	Stab	144
Force	Z	gl conc.	-10.000	0	Stab	145
Force	Z	gl conc.	-10.000	1.500	Stab	145

Load case 34: VEHICULO POSICION 34

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	1.250	Stab	83
Force	Z	gl conc.	-5.870	1.050	Stab	84
Force	Z	gl conc.	-5.870	0.850000	Stab	85
Force	Z	gl conc.	-4.130	1.250	Stab	115
Force	Z	gl conc.	-4.130	1.050	Stab	116
Force	Z	gl conc.	-4.130	0.850000	Stab	117
Force	Z	gl conc.	-10.000	1.250	Stab	147
Force	Z	gl conc.	-10.000	1.050	Stab	148
Force	Z	gl conc.	-10.000	0.850000	Stab	149

Load case 35: VEHICULO POSICION 35

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	86
Force	Z	gl conc.	-5.870	1.050	Stab	87
Force	Z	gl conc.	-5.870	1.250	Stab	88
Force	Z	gl conc.	-4.130	0.850000	Stab	118
Force	Z	gl conc.	-4.130	1.050	Stab	119
Force	Z	gl conc.	-4.130	1.250	Stab	120
Force	Z	gl conc.	-10.000	0.850000	Stab	150
Force	Z	gl conc.	-10.000	1.050	Stab	151
Force	Z	gl conc.	-10.000	1.250	Stab	152

Load case 36: VEHICULO POSICION 36

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-5.870	1.100	Stab 89
Force Z gl conc.	-5.870	1.300	Stab 90
Force Z gl conc.	-5.870	0.200000	Stab 92
Force Z gl conc.	-4.130	1.100	Stab 121
Force Z gl conc.	-4.130	1.300	Stab 122
Force Z gl conc.	-4.130	0.200000	Stab 124
Force Z gl conc.	-10.000	1.100	Stab 153
Force Z gl conc.	-10.000	1.300	Stab 154
Force Z gl conc.	-10.000	0.200000	Stab 156

Load case 37: VEHICULO HIPOTESIS 37

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-5.870	0.050000	Stab 93
Force Z gl conc.	-5.870	0.250000	Stab 94
Force Z gl conc.	-5.870	0.450000	Stab 95
Force Z gl conc.	-4.130	0.050000	Stab 125
Force Z gl conc.	-4.130	0.250000	Stab 126
Force Z gl conc.	-4.130	0.450000	Stab 127
Force Z gl conc.	-10.000	0.050000	Stab 157
Force Z gl conc.	-10.000	0.250000	Stab 158
Force Z gl conc.	-10.000	0.450000	Stab 159

Load case 46: SOB UNIF VANO 1

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.800000		Stab 1 .. 11 129 .. 139
Force Z pj const.	-0.440000		Stab 33 .. 43 97 .. 107
Force Z pj const.	-0.600000		Stab 65 .. 75

Load case 47: SOB UNIF VANO 2

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 44 .. 53 108 .. 117
Force Z pj const.	-0.600000		Stab 76 .. 85
Force Z pj const.	-0.800000		Stab 12 .. 21 140 .. 149

Load case 48: SOB UNIF VANO 3

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 54 .. 64 118 .. 128
Force Z pj const.	-0.600000		Stab 86 .. 96
Force Z pj const.	-0.800000		Stab 22 .. 32 150 .. 160

Load case 60: FRENADO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force X lo const.	0.054500		Stab 1 .. 160

Load case 62: VIENTO TRANSV SIN SOE.

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Y lo const.	0.260000		Stab 129 .. 160
Force X pj const.	-0.200000		Stab 290 .. 291

Load case 63: VIENTO TRANSV CON SOE

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Y lo const.	0.760000		Stab 129 .. 160
Force X pj const.	-0.200000		Stab 290 .. 291

Load case 64: TEMPERATURA (-)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000363		Stab 1 .. 160

Load case 65: TEMPERATURA (+)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	0.000363		Stab 1 .. 160

Load case 66: GRADIENTE

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Curvat. Y lo const.	0.000170		Stab 1 .. 160

2.3.2. Cálculo de los coeficientes de reparto

Coeficientes de excentricidad a Flexión

Hipotesis	Barras	My (tm)	Iy (m^4)	Coef Flexion
H12	6	20.25	0.0275	1.51
	38	36.31	0.0632	
	70	43.67	0.0943	
	102	23.4	0.0632	
	134	10.87	0.0275	
H15	16	19.053	0.0275	1.38
	48	37.9	0.0632	
	80	46.53	0.0943	
	112	25.43	0.0632	
	144	9.63	0.0275	
H18	26	16.87	0.0275	1.29
	58	36.31	0.0632	
	90	43.722	0.0943	
	122	23.43	0.0632	
	154	10.873	0.0275	

Coeficiente Flexion = 1.39

Coeficiente Cortante = 2.81

Coeficientes de excentricidad cortante

Hipotesis	Barras	Vz (t)	Iy (m^4)	Coef Cortante
H11	2	22.89	0.0275	4.96
	34	10.48	0.0632	
	66	8.12	0.0943	
	98	4.06	0.0632	
	130	0.74	0.0275	
H13	11	8.08	0.0275	1.50
	43	13.22	0.0632	
	75	26.44	0.0943	
	107	4.72	0.0632	
	139	1.75	0.0275	
H14	12	11.55	0.0275	2.00
	44	14.05	0.0632	
	76	25.35	0.0943	
	108	4.55	0.0632	
	140	2.41	0.0275	
H16	21	11.55	0.0275	1.99
	53	14.05	0.0632	
	85	25.35	0.0943	
	117	4.94	0.0632	
	149	2.40	0.0275	
H17	22	8.08	0.0275	1.45
	54	13.22	0.0632	
	86	26.45	0.0943	
	118	6.29	0.0632	
	150	1.75	0.0275	
H19	31	22.90	0.0275	4.96
	63	10.48	0.0632	
	95	8.12	0.0943	
	127	4.06	0.0632	
	159	0.74	0.0275	

Loadcase Factor Stage Init.def Title
11 1.0000 VEHICULO HIPOTESIS 11

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.126491	0.057984	40.227			
10	0.126487	0.065156	6.303			
156	0.059326	0.056961	0.888022			
160	0.059331	0.065923	-0.448044			
166	-0.366341	-0.621683	15.626	2.239	-0.737014	0.065056
167	-0.005295	0.375660	-2.597	-2.148	0.634102	0.073680
Sums :	-3.53E-11	1.67E-11	60.000			
min:	-0.366341	-0.621683	-2.597	-2.148	-0.737014	0.065056
max:	0.126491	0.375660	40.227	2.239	0.634102	0.073680

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	7.18E-14	-1.05E-12	6.95E-14	7.74E-17	-1.07E-12	3.34E-13
1	0.500	7.18E-14	-1.05E-12	6.95E-14	7.74E-17	-1.03E-12	-1.90E-13
2	0	-0.014961	-3.261	22.896	-1.351	-9.755	1.406
2	0.850	-0.014961	-3.261	22.896	-1.351	9.704	-1.366
2	0.850	-0.014961	-1.869	12.993	-1.351	9.704	-1.366
2	1.300	-0.014961	-1.869	12.993	-1.351	15.554	-2.207
3	0	0.038421	-1.560	10.915	-0.881404	4.620	-0.657412
3	1.050	0.038421	-1.560	10.915	-0.881404	16.279	-2.295
3	1.050	0.038421	-0.168092	1.012	-0.881404	16.281	-2.295
3	1.300	0.038421	-0.168092	1.012	-0.881404	16.534	-2.337
4	0	0.083569	-0.533194	3.597	-0.399957	10.726	-1.488
4	1.250	0.083569	-0.533194	3.597	-0.399957	15.222	-2.155
4	1.250	0.083569	0.858537	-6.305	-0.399957	15.222	-2.155
4	1.300	0.083569	0.858537	-6.305	-0.399957	14.907	-2.112
5	0	0.125143	0.441007	-3.350	-0.049571	12.960	-1.809
5	1.300	0.125143	0.441007	-3.350	-0.049571	8.605	-1.235
6	0	0.165467	0.315521	-2.454	0.052411	8.781	-1.231
6	1.300	0.165467	0.315521	-2.454	0.052411	5.591	-0.820693
7	0	0.206219	0.288850	-2.263	0.080786	6.283	-0.886226
7	1.300	0.206219	0.288850	-2.263	0.080786	3.341	-0.512721

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
8	0	0.248424	0.276262	-2.185	0.086995	4.205	-0.603277
8	1.300	0.248424	0.276262	-2.185	0.086995	1.364	-0.244137
9	0	0.294783	0.255121	-2.074	0.076454	2.213	-0.329988
9	1.300	0.294783	0.255121	-2.074	0.076454	-0.482633	0.001670
10	0	0.349055	0.204178	-1.762	0.058909	0.207413	-0.057599
10	1.300	0.349055	0.204178	-1.762	0.058909	-2.083	0.207832
11	0	0.407944	0.141896	-1.257	0.067321	-1.515	0.166952
11	1.300	0.407944	0.141896	-1.257	0.067321	-3.150	0.351417
12	0	0.440530	0.116675	-0.868013	0.110335	-2.042	0.233020
12	1.700	0.440530	0.116675	-0.868013	0.110335	-3.518	0.431367
33	0	3.00E-14	-5.60E-12	-3.17E-12	-6.44E-16	-5.05E-15	2.54E-12
33	0.500	3.00E-14	-5.60E-12	-3.17E-12	-6.44E-16	-1.59E-12	-2.59E-13
34	0	-0.002518	-0.061416	10.482	-8.276	1.657	0.042887
34	0.850	-0.002518	-0.061416	10.482	-8.276	10.565	-0.009311
34	0.850	-0.002518	-0.061416	6.352	-8.276	10.567	-0.009327
34	1.300	-0.002518	-0.061416	6.352	-8.276	13.425	-0.036957
35	0	0.020486	-0.064843	7.246	-6.036	15.319	0.038953
35	1.050	0.020486	-0.064843	7.246	-6.036	22.926	-0.029124
35	1.050	0.020486	-0.064843	3.116	-6.036	22.928	-0.029141
35	1.300	0.020486	-0.064843	3.116	-6.036	23.706	-0.045344
36	0	0.054023	-0.059442	1.217	-2.968	23.903	0.031101
36	1.250	0.054023	-0.059442	1.217	-2.968	25.424	-0.043193
36	1.250	0.054023	-0.059442	-2.913	-2.968	25.423	-0.043209
36	1.300	0.054023	-0.059442	-2.913	-2.968	25.278	-0.046173
37	0	0.087182	-0.056054	-4.627	-0.626269	24.957	0.025834
37	1.300	0.087182	-0.056054	-4.627	-0.626269	18.942	-0.047036
38	0	0.119339	-0.055570	-4.120	0.313490	18.626	0.022660
38	1.300	0.119339	-0.055570	-4.120	0.313490	13.271	-0.049581
39	0	0.150994	-0.056243	-3.587	0.606696	13.269	0.020153
39	1.300	0.150994	-0.056243	-3.587	0.606696	8.606	-0.052963
40	0	0.182360	-0.058250	-3.399	0.675479	8.710	0.018308
40	1.300	0.182360	-0.058250	-3.399	0.675479	4.291	-0.057417
41	0	0.212062	-0.062978	-3.407	0.617467	4.473	0.017646
41	1.300	0.212062	-0.062978	-3.407	0.617467	0.043393	-0.064224
42	0	0.239784	-0.073326	-3.510	0.472629	0.300299	0.018724
42	1.300	0.239784	-0.073326	-3.510	0.472629	-4.262	-0.076602
43	0	0.278019	-0.084771	-2.711	0.481551	-4.089	0.015444

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
43	1.300	0.278019	-0.084771	-2.711	0.481551	-7.613	-0.094758
65	0	8.44E-15	-6.15E-12	-1.01E-12	2.26E-14	3.33E-13	-8.52E-13
65	0.500	8.44E-15	-6.15E-12	-1.01E-12	2.26E-14	-1.70E-13	-3.93E-12
66	0	-0.006242	-0.074536	8.121	-8.398	3.856	0.051352
66	0.850	-0.006242	-0.074536	8.121	-8.398	10.758	-0.011993
66	0.850	-0.006242	-0.074536	2.251	-8.398	10.759	-0.012013
66	1.300	-0.006242	-0.074536	2.251	-8.398	11.771	-0.045544
67	0	-0.020072	-0.094451	7.159	-7.273	15.752	0.056160
67	1.050	-0.020072	-0.094451	7.159	-7.273	23.268	-0.043061
67	1.050	-0.020072	-0.094451	1.289	-7.273	23.269	-0.043024
67	1.300	-0.020072	-0.094451	1.289	-7.273	23.591	-0.066626
68	0	-0.029126	-0.091885	2.540	-4.380	25.420	0.045753
68	1.250	-0.029126	-0.091885	2.540	-4.380	28.595	-0.065091
68	1.250	-0.029126	-0.091885	-3.330	-4.380	28.595	-0.065115
68	1.300	-0.029126	-0.091885	-3.330	-4.380	28.429	-0.073657
69	0	-0.033361	-0.088746	-3.341	-1.548	28.709	0.037421
69	1.300	-0.033361	-0.088746	-3.341	-1.548	24.366	-0.077949
70	0	-0.035127	-0.088221	-4.161	0.186281	24.094	0.031588
70	1.300	-0.035127	-0.088221	-4.161	0.186281	18.685	-0.083101
71	0	-0.036861	-0.088468	-4.537	0.574517	18.463	0.026181
71	1.300	-0.036861	-0.088468	-4.537	0.574517	12.564	-0.088828
72	0	-0.041141	-0.087893	-4.600	1.297	12.509	0.020137
72	1.300	-0.041141	-0.087893	-4.600	1.297	6.529	-0.094124
73	0	-0.052404	-0.084608	-4.643	1.417	6.635	0.013219
73	1.300	-0.052404	-0.084608	-4.643	1.417	0.602162	-0.096771
74	0	-0.079791	-0.080599	-5.102	1.451	0.960007	0.008685
74	1.300	-0.079791	-0.080599	-5.102	1.451	-5.673	-0.096094
75	0	-0.143874	-0.113126	-7.982	1.583	-4.982	0.012294
75	1.300	-0.143874	-0.113126	-7.982	1.583	-15.359	-0.134770
97	0	-9.97E-14	-2.53E-12	-6.99E-13	7.69E-15	2.82E-14	-4.00E-13
97	0.500	-9.97E-14	-2.53E-12	-6.99E-13	7.69E-15	-3.21E-13	-1.67E-12
98	0	-0.034843	-0.038694	4.058	-2.354	2.383	0.021519
98	1.300	-0.034843	-0.038694	4.058	-2.354	7.659	-0.028783
99	0	-0.068254	-0.050111	2.475	-2.380	9.790	0.026625
99	1.300	-0.068254	-0.050111	2.475	-2.380	13.007	-0.038319
100	0	-0.104570	-0.052587	0.666001	-1.764	14.151	0.025974
100	1.300	-0.104570	-0.052587	0.666001	-1.764	15.017	-0.042389

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
101	0	-0.137994	-0.053975	-1.060	-0.785441	15.373	0.024330
101	1.300	-0.137994	-0.053975	-1.060	-0.785441	13.995	-0.045838
102	0	-0.169481	-0.054662	-1.994	-0.022768	13.917	0.021938
102	1.300	-0.169481	-0.054662	-1.994	-0.022768	11.324	-0.049123
103	0	-0.200369	-0.054357	-2.514	0.445641	11.162	0.018790
103	1.300	-0.200369	-0.054357	-2.514	0.445641	7.895	-0.051874
104	0	-0.230761	-0.052335	-2.796	0.712264	7.756	0.014604
104	1.300	-0.230761	-0.052335	-2.796	0.712264	4.122	-0.053421
105	0	-0.259164	-0.047407	-2.971	0.885716	4.044	0.008747
105	1.300	-0.259164	-0.047407	-2.971	0.885716	0.180852	-0.052882
106	0	-0.282596	-0.037119	-3.016	0.990281	0.138719	-0.000368
106	1.300	-0.282596	-0.037119	-3.016	0.990281	-3.782	-0.048622
107	0	-0.297004	-0.008031	-1.700	0.755571	-4.017	-0.018612
107	1.300	-0.297004	-0.008031	-1.700	0.755571	-6.227	-0.029052
129	0	4.23E-13	-4.80E-11	6.62E-12	-1.07E-15	-9.45E-13	9.75E-12
129	0.500	4.23E-13	-4.80E-11	6.62E-12	-1.07E-15	2.37E-12	-1.43E-11
130	0	-0.064576	0.067689	0.739688	-0.218566	1.939	0.282258
130	1.300	-0.064576	0.067689	0.739688	-0.218566	2.901	0.370254
131	0	-0.093721	-0.209195	-1.360	-0.268788	5.707	0.791907
131	1.300	-0.093721	-0.209195	-1.360	-0.268788	3.940	0.519954
132	0	-0.127035	-0.234467	-1.512	-0.216189	6.611	0.920648
132	1.300	-0.127035	-0.234467	-1.512	-0.216189	4.645	0.615841
133	0	-0.164110	-0.172385	-1.049	-0.105575	6.281	0.872487
133	1.300	-0.164110	-0.172385	-1.049	-0.105575	4.917	0.648387
134	0	-0.203337	-0.125521	-0.710379	-0.007606	5.399	0.744504
134	1.300	-0.203337	-0.125521	-0.710379	-0.007606	4.476	0.581328
135	0	-0.243102	-0.101582	-0.542715	0.055566	4.166	0.566515
135	1.300	-0.243102	-0.101582	-0.542715	0.055566	3.460	0.434459
136	0	-0.282022	-0.089460	-0.464671	0.093340	2.685	0.353662
136	1.300	-0.282022	-0.089460	-0.464671	0.093340	2.081	0.237365
137	0	-0.318417	-0.071726	-0.352297	0.118634	1.021	0.114654
137	1.300	-0.318417	-0.071726	-0.352297	0.118634	0.562924	0.021610
138	0	-0.349592	-0.028507	-0.066596	0.127315	-0.652079	-0.132211
138	1.300	-0.349592	-0.028507	-0.066596	0.127315	-0.778654	-0.169270

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
139	0	-0.368224	0.013698	0.187710	0.093445	-1.965	-0.322821
139	1.300	-0.368224	0.013698	0.187710	0.093445	-1.721	-0.305014
min:		-0.368224	-3.261	-7.982	-8.398	-15.359	-2.337
max:		0.440530	0.858537	22.896	1.583	28.709	1.406

Loadcase Factor Stage Init.def Title
12 1.0000 VEHICULO HIPOTESIS 12

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.356267	0.119217	26.355			
10	0.356256	0.135359	-1.790			
156	0.167580	0.116429	2.334			
160	0.167591	0.141617	-1.442			
166	-1.031	-1.294	39.877	4.653	-2.071	0.182707
167	-0.016694	0.777781	-5.337	-4.462	1.781	0.207035
Sums :	-1.00E-10	3.49E-11	60.000			
min:	-1.031	-1.294	-5.337	-4.462	-2.071	0.182707
max:	0.356267	0.777781	39.877	4.653	1.781	0.207035

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	1.37E-13	2.94E-11	3.45E-12	7.81E-16	-2.16E-12	-3.73E-12
1	0.500	1.37E-13	2.94E-11	3.45E-12	7.81E-16	-4.58E-13	1.10E-11
2	0	-0.016069	-2.132	14.244	-1.218	-6.538	1.287
2	1.300	-0.016069	-2.132	14.244	-1.218	9.978	-1.485
3	0	0.122943	-1.604	10.871	-1.108	-1.467	0.232305
3	1.300	0.122943	-1.604	10.871	-1.108	12.665	-1.853
4	0	0.246818	-1.537	10.420	-0.978476	2.571	-0.343902
4	1.300	0.246818	-1.537	10.420	-0.978476	16.117	-2.342
5	0	0.365282	-1.696	11.557	-0.824340	7.100	-0.989046

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
5	1.100	0.365282	-1.696	11.557	-0.824340	19.811	-2.855
5	1.100	0.365282	-0.304692	1.654	-0.824340	19.811	-2.855
5	1.300	0.365282	-0.304692	1.654	-0.824340	20.144	-2.916
6	0	0.480783	-0.781442	5.032	-0.508455	13.706	-1.928
6	1.300	0.480783	-0.781442	5.032	-0.508455	20.247	-2.944
6	1.300	0.480783	-0.781442	5.032	-0.508455	20.248	-2.944
7	0	0.595501	0.065382	-1.020	-0.180607	16.870	-2.386
7	1.300	0.595501	0.065382	-1.020	-0.180607	15.544	-2.301
8	0	0.712738	-0.426990	2.430	0.106270	15.112	-2.155
8	0.200	0.712738	-0.426990	2.430	0.106270	15.598	-2.240
8	0.200	0.712738	0.964741	-7.473	0.106270	15.597	-2.240
8	1.300	0.712738	0.964741	-7.473	0.106270	7.376	-1.179
9	0	0.838741	0.739216	-5.963	0.179405	9.074	-1.327
9	1.300	0.838741	0.739216	-5.963	0.179405	1.322	-0.365602
10	0	0.982928	0.581835	-4.955	0.153659	3.033	-0.505554
10	1.300	0.982928	0.581835	-4.955	0.153659	-3.409	0.250837
11	0	1.134	0.409490	-3.559	0.178235	-1.899	0.138617
11	1.300	1.134	0.409490	-3.559	0.178235	-6.526	0.671154
12	0	1.212	0.347214	-2.510	0.293701	-3.617	0.347955
12	1.700	1.212	0.347214	-2.510	0.293701	-7.864	0.938219
33	0	-1.37E-13	-1.99E-11	-5.01E-12	-1.19E-15	-2.03E-13	7.82E-12
33	0.500	-1.37E-13	-1.99E-11	-5.01E-12	-1.19E-15	-2.71E-12	-2.15E-12
34	0	0.006267	-0.159494	4.670	-8.199	-0.093201	0.109912
34	1.300	0.006267	-0.159494	4.670	-8.199	5.978	-0.097430
35	0	0.074586	-0.175620	6.980	-8.036	6.502	0.105016
35	1.300	0.074586	-0.175620	6.980	-8.036	15.576	-0.123291
36	0	0.169190	-0.166604	7.656	-7.251	15.165	0.087503
36	1.300	0.169190	-0.166604	7.656	-7.251	25.119	-0.129083
37	0	0.262361	-0.161108	7.895	-6.009	24.773	0.074975
37	1.100	0.262361	-0.161108	7.895	-6.009	33.456	-0.102224
37	1.100	0.262361	-0.161108	3.765	-6.009	33.458	-0.102266
37	1.300	0.262361	-0.161108	3.765	-6.009	34.210	-0.134486
38	0	0.353211	-0.158138	2.044	-3.821	33.659	0.064575
38	1.300	0.353211	-0.158138	2.044	-3.821	36.317	-0.140983
38	1.300	0.353211	-0.158138	2.044	-3.821	36.317	-0.141004
39	0	0.443040	-0.158002	-3.952	-1.432	35.940	0.056159
39	1.300	0.443040	-0.158002	-3.952	-1.432	30.803	-0.149243

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
40	0	0.531310	-0.161114	-5.755	0.574990	30.658	0.049574
40	0.200	0.531310	-0.161114	-5.755	0.574990	29.507	0.017372
40	0.200	0.531310	-0.161114	-9.885	0.574990	29.505	0.017330
40	1.300	0.531310	-0.161114	-9.885	0.574990	18.634	-0.159875
41	0	0.614730	-0.171123	-9.876	1.323	18.515	0.046085
41	1.300	0.614730	-0.171123	-9.876	1.323	5.675	-0.176375
42	0	0.690970	-0.193078	-9.647	1.220	6.178	0.045663
42	1.300	0.690970	-0.193078	-9.647	1.220	-6.364	-0.205339
43	0	0.769748	-0.210549	-7.687	1.266	-5.899	0.031003
43	1.300	0.769748	-0.210549	-7.687	1.266	-15.892	-0.242710
65	0	-1.54E-12	1.40E-12	-4.09E-13	-3.67E-16	-2.89E-15	-6.26E-12
65	0.500	-1.54E-12	1.40E-12	-4.09E-13	-3.67E-16	-2.07E-13	-5.56E-12
66	0	-0.011795	-0.206237	4.765	-11.382	1.984	0.142276
66	1.300	-0.011795	-0.206237	4.765	-11.382	8.179	-0.125832
67	0	-0.039707	-0.263938	7.544	-12.477	10.322	0.157365
67	1.300	-0.039707	-0.263938	7.544	-12.477	20.128	-0.185754
68	0	-0.059366	-0.260113	8.073	-12.005	21.473	0.130407
68	1.300	-0.059366	-0.260113	8.073	-12.005	31.968	-0.207740
69	0	-0.069728	-0.253397	7.450	-10.057	32.817	0.107974
69	1.100	-0.069728	-0.253397	7.490	-10.057	41.055	-0.170730
69	1.100	-0.069728	-0.253397	1.620	-10.057	41.056	-0.170796
69	1.300	-0.069728	-0.253397	1.620	-10.057	41.360	-0.221442
70	0	-0.074454	-0.250968	1.377	-6.719	41.879	0.090490
70	1.300	-0.074454	-0.250968	1.377	-6.719	43.669	-0.235736
70	1.300	-0.074454	-0.250968	1.377	-6.719	43.669	-0.235769
71	0	-0.076136	-0.249879	-4.914	-2.850	43.722	0.073915
71	1.300	-0.076136	-0.249879	-4.914	-2.850	37.334	-0.250928
72	0	-0.086647	-0.247061	-5.106	0.509968	37.066	0.056181
72	0.200	-0.086647	-0.247061	-5.106	0.509968	36.046	0.006801
72	0.200	-0.086647	-0.247061	-10.976	0.509968	36.044	0.006737
72	1.300	-0.086647	-0.247061	-10.976	0.509968	23.972	-0.264996
73	0	-0.109680	-0.237656	-11.745	2.571	23.848	0.036716
73	1.300	-0.109680	-0.237656	-11.745	2.571	8.579	-0.272237
74	0	-0.166577	-0.226656	-13.243	3.488	9.166	0.024269
74	1.300	-0.166577	-0.226656	-13.243	3.488	-8.050	-0.270444
75	0	-0.300038	-0.318468	-20.229	4.207	-6.449	0.034514
75	1.300	-0.300038	-0.318468	-20.229	4.207	-32.746	-0.379494

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
97	0	4.84E-13	-8.34E-12	-1.10E-13	1.88E-14	-1.65E-13	-1.66E-12
97	0.500	4.84E-13	-8.34E-12	-1.10E-13	1.89E-14	-2.21E-13	-5.83E-12
98	0	-0.083706	-0.115716	3.676	-5.144	1.957	0.067294
98	1.300	-0.083706	-0.115716	3.676	-5.144	6.995	-0.083137
99	0	-0.173205	-0.145038	3.398	-5.849	8.703	0.079036
99	1.300	-0.173205	-0.145038	3.398	-5.849	13.121	-0.109513
100	0	-0.274573	-0.150725	3.019	-5.871	14.665	0.075246
100	1.300	-0.274573	-0.150725	3.019	-5.871	18.589	-0.120696
101	0	-0.369385	-0.154357	1.936	-5.060	19.962	0.070223
101	1.300	-0.369385	-0.154357	1.936	-5.060	22.479	-0.130441
102	0	-0.459224	-0.155746	-0.314942	-3.471	23.403	0.063020
102	1.300	-0.459224	-0.155746	-0.314942	-3.471	22.994	-0.139450
103	0	-0.547159	-0.154492	-2.869	-1.574	23.430	0.053831
103	1.300	-0.547159	-0.154492	-2.869	-1.574	19.760	-0.147008
104	0	-0.633166	-0.149624	-5.254	0.206062	19.707	0.042462
104	1.300	-0.633166	-0.149624	-5.254	0.206062	12.877	-0.152048
105	0	-0.713482	-0.139034	-6.734	1.506	12.633	0.027722
105	1.300	-0.713482	-0.139034	-6.734	1.506	3.878	-0.153022
106	0	-0.780879	-0.117645	-7.381	2.267	3.674	0.005820
106	1.300	-0.780879	-0.117645	-7.381	2.267	-5.922	-0.147119
107	0	-0.830107	-0.050671	-4.460	1.942	-6.584	-0.040001
107	1.300	-0.830107	-0.050671	-4.460	1.942	-12.381	-0.105872
129	0	1.33E-12	-9.62E-11	1.36E-11	1.11E-15	-1.33E-12	9.67E-12
129	0.500	1.33E-12	-9.62E-11	1.36E-11	1.11E-15	5.47E-12	-3.84E-11
130	0	-0.153293	-0.538540	-3.100	-0.643662	4.736	0.702451
130	1.300	-0.153293	-0.538540	-3.100	-0.643662	0.706078	0.002349
131	0	-0.243192	-0.656167	-4.292	-0.744803	7.823	1.084
131	1.300	-0.243192	-0.656167	-4.292	-0.744803	2.244	0.230891
132	0	-0.340646	-0.718644	-4.657	-0.750734	9.887	1.378
132	1.300	-0.340646	-0.718644	-4.657	-0.750734	3.633	0.444222
133	0	-0.447105	-0.688298	-4.379	-0.647593	10.992	1.527
133	1.300	-0.447105	-0.688298	-4.379	-0.647593	5.299	0.632380
134	0	-0.558892	-0.578505	-3.583	-0.449138	10.873	1.496
134	1.300	-0.558892	-0.578505	-3.583	-0.449138	6.215	0.744054
135	0	-0.671822	-0.444691	-2.640	-0.207333	9.481	1.284

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
135	1.300	-0.671822	-0.444691	-2.640	-0.207333	6.048	0.706362
136	0	-0.782810	-0.317506	-1.755	0.021533	6.882	0.903791
136	1.300	-0.782810	-0.317506	-1.755	0.021533	4.600	0.491033
137	0	-0.888886	-0.214773	-1.048	0.197358	3.388	0.397658
137	1.300	-0.888886	-0.214773	-1.048	0.197358	2.026	0.118453
138	0	-0.965018	-0.085070	-0.161729	0.287465	-0.556182	-0.175491
138	1.300	-0.965018	-0.085070	-0.161729	0.287465	-0.766430	-0.286083
139	0	-1.052	0.030547	0.526329	0.237943	-3.656	-0.645839
139	1.300	-1.052	0.030547	0.526329	0.237943	-2.974	-0.606127
	min:	-1.052	-2.132	-20.229	-12.477	-32.746	-2.944
	max:	1.212	0.964741	14.244	4.207	43.722	1.527

Loadcase Factor Stage Init.def Title
13 1.0000 VEHICULO HIPOTESIS 13

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.570715	0.074503	14.915			
10	0.570708	0.105836	-7.570			
156	0.275936	0.070252	3.378			
160	0.275944	0.109736	-2.878			
166	-1.639	-0.860789	55.444	3.060	-3.243	0.284786
167	-0.054322	0.500460	-3.285	-2.928	2.775	0.324107
Sums :	-1.65E-10	2.39E-11	60.000			
min:	-1.639	-0.860789	-7.570	-2.928	-3.243	0.284786
max:	0.570715	0.500460	55.444	3.060	2.775	0.324107

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	-8.05E-14	2.51E-11	2.02E-12	-3.16E-17	-4.81E-12	-1.87E-12
1	0.500	-8.05E-14	2.51E-11	2.02E-12	-3.16E-17	-3.79E-12	1.07E-11
2	0	0.050768	-1.403	8.571	-0.849102	-5.990	0.958860
2	1.300	0.050768	-1.403	8.571	-0.849102	5.151	-0.864901
3	0	0.250819	-1.098	7.003	-0.829354	-3.149	0.464081
3	1.300	0.250819	-1.098	7.003	-0.829354	5.955	-0.963911
4	0	0.437055	-1.065	6.758	-0.793100	-1.969	0.286992
4	1.300	0.437055	-1.065	6.758	-0.793100	6.817	-1.097
5	0	0.620303	-1.065	6.734	-0.777255	-0.916715	0.121705
5	1.300	0.620303	-1.065	6.734	-0.777255	7.837	-1.263
6	0	0.803102	-1.071	6.775	-0.764288	0.224092	-0.061093
6	1.300	0.803102	-1.071	6.775	-0.764288	9.031	-1.454
7	0	0.986173	-1.097	6.962	-0.746362	1.581	-0.274075
7	1.300	0.986173	-1.097	6.962	-0.746362	10.631	-1.701
8	0	1.172	-1.241	7.952	-0.688208	3.491	-0.562373
8	1.300	1.172	-1.241	7.952	-0.688208	13.829	-2.176
9	0	1.367	-1.748	11.446	-0.456609	8.157	-1.235
9	0.0499	1.367	-1.748	11.446	-0.456609	8.728	-1.326
9	0.0501	1.367	-0.356429	1.543	-0.456609	8.730	-1.326
9	1.300	1.367	-0.356429	1.543	-0.456609	10.658	-1.772
10	0	1.575	-1.042	6.289	-0.215304	7.273	-1.150
10	0.250	1.575	-1.042	6.289	-0.215304	8.845	-1.410
10	0.250	1.575	0.349613	-3.614	-0.215304	8.845	-1.410
10	1.300	1.575	0.349613	-3.614	-0.215304	5.051	-1.043
11	0	1.777	-0.381440	1.825	0.089659	4.101	-0.775083
11	0.450	1.777	-0.381440	1.825	0.089659	4.922	-0.946682
11	0.450	1.777	1.010	-8.078	0.089659	4.921	-0.946600
11	1.300	1.777	1.010	-8.078	0.089659	-1.944	-0.087986
12	0	1.863	0.677065	-4.715	0.399680	1.305	-0.459542
12	1.700	1.863	0.677065	-4.715	0.399680	-6.710	0.691469
33	0	-8.76E-13	-3.09E-11	-2.10E-12	1.88E-16	-2.81E-13	1.53E-11
33	0.500	-8.76E-13	-3.09E-11	-2.10E-12	1.88E-16	-1.33E-12	-1.34E-11
34	0	0.044586	-0.235035	1.385	-5.938	-0.579117	0.156383
34	1.300	0.044586	-0.235035	1.385	-5.938	1.221	-0.149162
35	0	0.163529	-0.266696	2.576	-6.147	1.046	0.155965
35	1.300	0.163529	-0.266696	2.576	-6.147	4.395	-0.190740
36	0	0.317521	-0.258547	2.593	-6.029	3.689	0.133939

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
36	1.300	0.317521	-0.258547	2.593	-6.029	7.059	-0.202172
37	0	0.467416	-0.253574	2.619	-5.936	6.189	0.117190
37	1.300	0.467416	-0.253574	2.619	-5.936	9.593	-0.212459
38	0	0.612289	-0.251950	2.814	-5.827	6.719	0.102883
38	1.300	0.612289	-0.251950	2.814	-5.827	12.378	-0.224652
39	0	0.755653	-0.252622	3.320	-5.599	11.618	0.089944
39	1.300	0.755653	-0.252622	3.320	-5.599	15.934	-0.238464
40	0	0.896483	-0.255395	3.722	-4.931	15.604	0.077897
40	1.300	0.896483	-0.255395	3.722	-4.931	20.443	-0.254116
41	0	1.029	-0.260636	1.748	-3.305	20.478	0.066064
41	0.0499	1.029	-0.260636	1.748	-3.305	20.565	0.053066
41	0.0501	1.029	-0.260636	-2.384	-3.305	20.565	0.052958
41	1.300	1.029	-0.260636	-2.384	-3.305	17.585	-0.272763
42	0	1.146	-0.274217	-4.755	-1.560	17.994	0.054476
42	0.250	1.146	-0.274217	-4.755	-1.560	16.806	-0.014042
42	0.250	1.146	-0.274217	-8.885	-1.560	16.804	-0.014113
42	1.300	1.146	-0.274217	-8.885	-1.560	7.476	-0.302005
43	0	1.283	-0.261753	-5.051	0.309151	7.677	0.016054
43	0.450	1.283	-0.261753	-5.051	0.309151	3.767	-0.101701
43	0.450	1.283	-0.261753	-13.221	0.309151	3.764	-0.101765
43	1.300	1.283	-0.261753	-13.221	0.309151	-7.452	-0.324224
65	0	-1.65E-13	-5.80E-12	-8.88E-16	3.78E-15	-4.30E-14	-1.16E-11
65	0.500	-1.65E-13	-5.80E-12	-6.88E-16	3.78E-15	-4.34E-14	-1.45E-11
66	0	-0.008166	-0.330042	1.409	-9.405	0.577546	0.227714
66	1.300	-0.008166	-0.330042	1.409	-9.405	2.409	-0.201340
67	0	-0.027603	-0.421961	2.266	-10.554	3.011	0.251526
67	1.300	-0.027603	-0.421961	2.266	-10.554	5.960	-0.296966
68	0	-0.041344	-0.415244	2.556	-10.888	6.275	0.206136
68	1.300	-0.041344	-0.415244	2.556	-10.888	9.601	-0.331661
69	0	-0.048426	-0.404478	2.601	-10.874	9.744	0.172383
69	1.300	-0.048426	-0.404478	2.601	-10.874	13.125	-0.353439
70	0	-0.051539	-0.401786	2.567	-10.570	13.269	0.145312
70	1.300	-0.051539	-0.401786	2.567	-10.570	16.606	-0.377010
71	0	-0.054067	-0.401716	2.285	-9.760	16.926	0.119785
71	1.300	-0.054067	-0.401716	2.285	-9.760	19.896	-0.402445
72	0	-0.060136	-0.398369	1.607	-7.945	20.508	0.091861
72	1.300	-0.060136	-0.398369	1.607	-7.945	22.598	-0.426016

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
73	0	-0.075849	-0.382716	1.356	-4.841	23.439	0.060015
73	0.0499	-0.075849	-0.382716	1.356	-4.841	23.506	0.040929
73	0.0501	-0.075849	-0.382716	-4.512	-4.841	23.506	0.040830
73	1.300	-0.075849	-0.382716	-4.512	-4.841	17.867	-0.437516
74	0	-0.113629	-0.364004	-6.199	-1.067	19.052	0.039011
74	0.250	-0.113629	-0.364004	-6.199	-1.067	17.504	-0.051542
74	0.250	-0.113629	-0.364004	-12.069	-1.067	17.501	-0.052037
74	1.300	-0.113629	-0.364004	-12.069	-1.067	4.830	-0.434195
75	0	-0.202043	-0.509851	-20.578	2.984	6.793	0.054486
75	0.450	-0.202043	-0.509851	-20.578	2.984	-2.465	-0.174880
75	0.450	-0.202043	-0.509851	-26.448	2.984	-2.471	-0.175013
75	1.300	-0.202043	-0.509851	-26.448	2.984	-24.548	-0.606320
97	0	-5.49E-13	-1.43E-11	-8.42E-14	2.92E-15	-7.38E-14	-1.35E-12
97	0.500	-5.49E-13	-1.43E-11	-8.42E-14	2.92E-15	-1.16E-13	-8.52E-12
98	0	-0.098550	-0.204806	1.189	-5.056	1.126	0.126835
98	1.300	-0.098550	-0.204806	1.189	-5.056	2.672	-0.139413
99	0	-0.232232	-0.245297	0.560083	-5.567	3.483	0.137777
99	1.300	-0.232232	-0.245297	0.560083	-5.567	4.212	-0.181110
100	0	-0.391149	-0.247514	0.634553	-5.755	5.184	0.125418
100	1.300	-0.391149	-0.247514	0.634553	-5.755	6.009	-0.196350
101	0	-0.541980	-0.249286	0.650567	-5.765	7.009	0.114120
101	1.300	-0.541980	-0.249286	0.650567	-5.765	7.855	-0.209951
102	0	-0.686097	-0.250469	0.416947	-5.550	8.858	0.101808
102	1.300	-0.686097	-0.250469	0.416947	-5.550	9.400	-0.223802
103	0	-0.828072	-0.250019	-0.159567	-4.993	10.432	0.088102
103	1.300	-0.828072	-0.250019	-0.159567	-4.993	10.224	-0.236921
104	0	-0.967622	-0.246724	-1.341	-3.887	11.292	0.072526
104	1.300	-0.967622	-0.246724	-1.341	-3.887	9.549	-0.248215
105	0	-1.098	-0.239105	-3.738	-2.065	10.498	0.053883
105	1.300	-1.098	-0.239105	-3.738	-2.065	5.638	-0.256954
106	0	-1.211	-0.224428	-6.282	0.012456	6.223	0.028350
106	1.300	-1.211	-0.224428	-6.282	0.012456	-1.943	-0.263406
107	0	-1.314	-0.156047	-4.721	1.037	-2.452	-0.030771
107	1.300	-1.314	-0.156047	-4.721	1.037	-8.589	-0.233632
129	0	3.24E-13	-1.64E-10	2.05E-11	2.39E-17	-1.66E-12	2.37E-11
129	0.500	3.24E-13	-1.64E-10	2.05E-11	2.39E-17	8.57E-12	-5.82E-11

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
130	0	-0.168976	-0.913672	-5.244	-0.662229	4.882	0.766486
130	1.300	-0.168976	-0.913872	-5.244	-0.662229	-1.936	-0.419548
131	0	-0.334850	-0.809962	-5.085	-0.732555	5.141	0.718032
131	1.300	-0.334850	-0.809962	-5.085	-0.732555	-1.469	-0.334919
132	0	-0.502422	-0.840056	-5.215	-0.750158	5.881	0.823364
132	1.300	-0.502422	-0.840056	-5.215	-0.750158	-0.899400	-0.268711
133	0	-0.677649	-0.858896	-5.274	-0.750603	6.565	0.906895
133	1.300	-0.677649	-0.858896	-5.274	-0.750603	-0.292107	-0.209669
134	0	-0.858094	-0.857467	-5.243	-0.721139	7.052	0.952411
134	1.300	-0.858094	-0.857467	-5.243	-0.721139	0.235686	-0.162296
135	0	-1.040	-0.834404	-5.081	-0.644189	7.100	0.933662
135	1.300	-1.040	-0.834404	-5.081	-0.644189	0.494848	-0.151063
136	0	-1.221	-0.770309	-4.625	-0.492431	6.298	0.795627
136	1.300	-1.221	-0.770309	-4.629	-0.492431	0.280471	-0.205775
137	0	-1.402	-0.620455	-3.547	-0.255366	4.146	0.467609
137	1.300	-1.402	-0.620455	-3.547	-0.255388	-0.464921	-0.338982
138	0	-1.575	-0.370223	-1.757	-0.005971	0.764744	-0.040931
138	1.300	-1.575	-0.370223	-1.757	-0.005971	-1.520	-0.522221
139	0	-1.725	-0.106651	-0.112078	0.106710	-2.402	-0.546416
139	1.300	-1.725	-0.106651	-0.112078	0.106710	-2.547	-0.685062
	min:	-1.725	-1.748	-26.448	-10.888	-24.948	-2.176
	max:	1.863	1.010	11.446	2.984	23.506	0.958660

Loadcase	Factor	Stage	Init.def	Title
14	1.0000			VEHICULO HIPOTESIS 14

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.647634	-0.073082	7.153			
10	0.647639	-0.047158	-10.476			
156	0.390235	-0.077846	3.801			
160	0.390230	-0.041929	-5.428			
166	-1.730	1.024	56.508	-4.021	-2.915	0.241741
167	-0.345981	-0.784014	8.435	3.932	2.340	0.289956
Sums :	-2.00E-10	-1.68E-11	60.000			
min:	-1.730	-0.784014	-10.476	-4.021	-2.915	0.241741
max:	0.647639	1.024	56.508	3.932	2.340	0.289956

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.981	-1.570	11.552	-0.405653	-5.099	0.365924
12	0.850	1.981	-1.570	11.552	-0.405653	4.718	-0.968178
12	0.850	1.981	-0.178115	1.649	-0.405653	4.720	-0.968475
12	1.700	1.981	-0.178115	1.649	-0.405653	6.122	-1.120
13	0	1.866	-1.163	8.877	-0.030892	3.364	-0.819953
13	0.650	1.866	-1.163	8.877	-0.030892	9.133	-1.576
13	0.650	1.866	0.228415	-1.026	-0.030892	9.134	-1.576
13	1.700	1.866	0.228415	-1.026	-0.030892	8.058	-1.336
14	0	1.751	-0.537146	4.276	0.263660	9.390	-1.622
14	0.450	1.751	-0.537146	4.276	0.263660	11.314	-1.863
14	0.450	1.751	0.854585	-5.626	0.263660	11.314	-1.863
14	1.700	1.751	0.854585	-5.626	0.263660	4.262	-0.795275
15	0	1.654	0.623125	-4.038	0.361146	8.899	-1.534
15	1.700	1.654	0.623125	-4.038	0.361146	2.035	-0.474533
16	0	1.562	0.596762	-3.855	0.375666	7.071	-1.266
16	1.700	1.562	0.596762	-3.855	0.375666	0.517135	-0.251964
17	0	1.472	0.592469	-3.822	0.383119	5.730	-1.068
17	1.700	1.472	0.592469	-3.822	0.383119	-0.767757	-0.060518
18	0	1.381	0.591353	-3.817	0.384672	4.511	-0.884986
18	1.700	1.381	0.591353	-3.817	0.384672	-1.978	0.120314

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
19	0	1.294	0.585144	-3.797	0.378401	3.284	-0.699281
19	1.700	1.294	0.585144	-3.797	0.378401	-3.171	0.295462
20	0	1.217	0.553102	-3.646	0.360113	1.936	-0.494719
20	1.700	1.217	0.553102	-3.646	0.360113	-4.261	0.445554
21	0	1.162	0.472947	-3.128	0.359144	0.586372	-0.296056
21	1.700	1.162	0.472947	-3.128	0.359144	-4.731	0.507953
44	0	1.427	0.083943	14.052	-2.795	-9.706	-0.233892
44	0.850	1.427	0.083943	14.052	-2.795	2.236	-0.162555
44	0.850	1.427	0.083943	9.922	-2.795	2.240	-0.162526
44	1.700	1.427	0.083943	9.922	-2.795	10.672	-0.091188
45	0	1.335	0.103071	8.200	-0.394724	9.354	-0.236700
45	0.650	1.335	0.103071	8.200	-0.394724	14.683	-0.171721
45	0.650	1.335	0.103071	4.070	-0.394724	14.685	-0.171686
45	1.700	1.335	0.103071	4.070	-0.394724	18.958	-0.063478
46	0	1.281	0.090739	0.582586	1.717	18.431	-0.216010
46	0.450	1.281	0.090739	0.582586	1.717	18.873	-0.175192
46	0.450	1.281	0.090739	-3.147	1.717	18.873	-0.175162
46	1.700	1.281	0.090739	-3.147	1.717	14.939	-0.061752
47	0	1.214	0.086715	-3.017	2.651	15.037	-0.204926
47	1.700	1.214	0.086715	-3.017	2.651	9.908	-0.057510
48	0	1.143	0.085532	-2.490	2.862	10.875	-0.157169
48	1.700	1.143	0.085532	-2.490	2.862	6.642	-0.051764
49	0	1.071	0.085307	-2.342	2.930	7.777	-0.190342
49	1.700	1.071	0.085307	-2.342	2.930	3.795	-0.045319
50	0	1.001	0.084562	-2.302	2.946	4.976	-0.183106
50	1.700	1.001	0.084562	-2.302	2.946	1.063	-0.039350
51	0	0.930042	0.081480	-2.315	2.909	2.276	-0.174283
51	1.700	0.930042	0.081480	-2.315	2.909	-1.660	-0.035767
52	0	0.856681	0.072190	-2.439	2.785	-0.377674	-0.161778
52	1.700	0.856681	0.072190	-2.439	2.785	-4.523	-0.039055
53	0	0.787361	0.043080	-2.218	2.718	-3.250	-0.140451
53	1.700	0.787361	0.043080	-2.218	2.718	-7.022	-0.067215
76	0	-0.428075	0.307467	25.351	-7.563	-27.563	-0.598204
76	0.850	-0.428075	0.307467	25.351	-7.563	-6.019	-0.336909
76	0.850	-0.428075	0.307467	19.481	-7.563	-6.011	-0.336804
76	1.700	-0.428075	0.307467	19.481	-7.563	10.544	-0.075509
77	0	-0.307777	0.130097	11.237	-2.412	7.593	-0.370463
77	0.650	-0.307777	0.130097	11.237	-2.412	14.895	-0.285922

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
77	0.650	-0.307777	0.130097	5.367	-2.412	14.898	-0.285876
77	1.700	-0.307777	0.130097	5.367	-2.412	20.533	-0.149298
78	0	-0.273298	0.146402	4.552	1.926	19.045	-0.384714
78	0.450	-0.273298	0.146402	4.552	1.926	21.093	-0.318858
78	0.450	-0.273298	0.146402	-1.318	1.926	21.094	-0.318808
78	1.700	-0.273298	0.146402	-1.318	1.926	19.446	-0.135830
79	0	-0.263858	0.152773	-2.096	4.317	18.526	-0.378716
79	1.700	-0.263858	0.152773	-2.096	4.317	14.964	-0.119003
80	0	-0.262181	0.152929	-2.366	5.155	14.581	-0.365950
80	1.700	-0.262181	0.152929	-2.366	5.155	10.559	-0.105970
81	0	-0.262265	0.152632	-2.352	5.415	10.470	-0.353015
81	1.700	-0.262265	0.152632	-2.352	5.415	6.472	-0.093540
82	0	-0.263634	0.152482	-2.329	5.494	6.468	-0.340338
82	1.700	-0.263634	0.152482	-2.329	5.494	2.510	-0.081119
83	0	-0.270618	0.152963	-2.325	5.510	2.563	-0.328325
83	1.700	-0.270618	0.152963	-2.325	5.510	-1.389	-0.068288
84	0	-0.296994	0.158339	-2.449	5.519	-1.180	-0.319230
84	1.700	-0.296994	0.158339	-2.449	5.519	-5.343	-0.050054
85	0	-0.389443	0.172823	-4.367	5.730	-4.711	-0.306163
85	1.700	-0.389443	0.172823	-4.367	5.730	-12.136	-0.012364
106	0	-1.747	-0.014709	4.551	-3.723	-9.503	-0.129879
108	1.700	-1.747	-0.014709	4.551	-3.723	-1.766	-0.154888
109	0	-1.700	0.067739	4.937	-1.899	-0.176822	-0.202757
109	1.700	-1.700	0.067739	4.937	-1.899	8.217	-0.087601
110	0	-1.649	0.079741	1.677	0.603659	7.750	-0.205561
110	1.700	-1.649	0.079741	1.677	0.603659	10.601	-0.070001
111	0	-1.582	0.084429	0.056140	2.079	9.400	-0.203109
111	1.700	-1.582	0.084429	0.056140	2.079	9.496	-0.059579
112	0	-1.512	0.085440	-0.545864	2.685	8.266	-0.197330
112	1.700	-1.512	0.085440	-0.545864	2.685	7.338	-0.052081
113	0	-1.441	0.085522	-0.763634	2.895	6.132	-0.190724
113	1.700	-1.441	0.085522	-0.763634	2.895	4.834	-0.045337
114	0	-1.370	0.086215	-0.831333	2.965	3.646	-0.184601
114	1.700	-1.370	0.086215	-0.831333	2.965	2.233	-0.038036
115	0	-1.298	0.089498	-0.868392	3.010	1.067	-0.180305
115	1.700	-1.298	0.089498	-0.868392	3.010	-0.409271	-0.028157

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
116	0	-1.222	0.099276	-0.925528	3.053	-1.545	-0.180346
116	1.700	-1.222	0.099276	-0.925528	3.053	-3.118	-0.011577
117	0	-1.120	0.118670	0.217933	2.845	-4.536	-0.189433
117	1.700	-1.120	0.118670	0.217933	2.845	-4.165	0.012647
140	0	-2.136	-0.333144	-2.404	-0.463896	-0.772527	-0.404798
140	1.700	-2.136	-0.333144	-2.404	-0.463896	-4.859	-0.971142
141	0	-2.097	0.029898	-0.147304	-0.251642	0.544233	-0.243504
141	1.700	-2.097	0.029898	-0.147304	-0.251642	0.293617	-0.192677
142	0	-2.014	0.285429	1.640	0.063354	1.415	-0.108624
142	1.700	-2.014	0.285429	1.640	0.063354	4.203	0.376404
143	0	-1.925	0.378782	2.296	0.263517	1.588	-0.072561
143	1.700	-1.925	0.378782	2.296	0.263517	5.492	0.591369
144	0	-1.835	0.401916	2.456	0.348183	1.096	-0.129464
144	1.700	-1.835	0.401916	2.456	0.348183	5.271	0.553794
145	0	-1.744	0.405193	2.479	0.377699	0.215903	-0.239823
145	1.700	-1.744	0.405193	2.479	0.377699	4.425	0.449506
146	0	-1.653	0.405690	2.478	0.387796	-0.840811	-0.375302
146	1.700	-1.653	0.405690	2.478	0.387796	3.372	0.314371
147	0	-1.559	0.411857	2.503	0.394728	-1.569	-0.524812
147	1.700	-1.559	0.411857	2.503	0.394728	2.265	0.175345
148	0	-1.458	0.437455	2.650	0.397111	-3.191	-0.682561
148	1.700	-1.458	0.437455	2.650	0.397111	1.315	0.060693
149	0	-1.344	0.444054	2.681	0.370244	-4.009	-0.791556
149	1.700	-1.344	0.444054	2.681	0.370244	0.547870	-0.036705
	min:	-2.136	-1.570	-5.626	-7.562	-27.563	-1.863
	max:	1.981	0.654585	25.351	5.730	21.094	0.571369

Loadcase	Factor	Stage	Init.def	Title
15	1.0000			VEHICULO HIPOTESIS 15

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.528423	0.002300	3.960			
10	0.528423	-0.002785	-9.374			
156	0.528423	-0.002300	3.960			
160	0.528423	0.002785	-9.374			
166	-1.057	1.910	35.414	-8.404	-0.292662	-0.024550
167	-1.057	-1.910	35.414	8.404	-0.292662	0.024550
Sums :	-1.87E-10	9.27E-13	60.000			
min:	-1.057	-1.910	-9.374	-8.404	-0.292662	-0.024550
max:	0.528423	1.910	35.414	8.404	-0.292662	0.024550

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.507	-0.771054	5.709	-0.513219	-10.488	1.184
12	1.700	1.507	-0.771054	5.709	-0.513219	-0.782081	-0.126378
13	0	1.439	-0.987060	7.301	-0.503702	-7.515	0.777587
13	1.700	1.439	-0.987060	7.301	-0.503702	4.897	-0.900416
14	0	1.405	-1.099	7.934	-0.545886	-2.456	0.106238
14	1.700	1.405	-1.099	7.934	-0.545886	11.038	-1.763
15	0	1.397	-1.209	8.649	-0.511940	3.562	-0.720506
15	1.700	1.397	-1.209	8.649	-0.511940	18.265	-2.776
16	0	1.397	-1.745	12.430	-0.202002	12.777	-2.005
16	0.200	1.397	-1.745	12.430	-0.202002	15.260	-2.354
16	0.200	1.397	-0.353230	2.527	-0.202002	15.263	-2.354
16	1.700	1.397	-0.353230	2.527	-0.202002	19.053	-2.884
17	0	1.397	0.353230	-2.527	0.202002	19.053	-2.884
17	1.7E-4	1.397	0.353230	-2.527	0.202002	19.053	-2.884
17	1.500	1.397	0.353230	-2.527	0.202002	15.263	-2.354
17	1.500	1.397	1.745	-12.430	0.202002	15.260	-2.354
17	1.700	1.397	1.745	-12.430	0.202002	12.777	-2.005
18	0	1.397	1.209	-8.649	0.511940	18.265	-2.776
18	1.700	1.397	1.209	-8.649	0.511940	3.562	-0.720506
19	0	1.405	1.099	-7.934	0.545886	11.038	-1.763

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
19	1.700	1.405	1.099	-7.934	0.545886	-2.450	0.106236
20	0	1.439	0.987060	-7.301	0.503702	4.897	-0.900416
20	1.700	1.439	0.987060	-7.301	0.503702	-7.515	0.777587
21	0	1.507	0.771054	-5.709	0.513219	-0.782081	-0.126378
21	1.700	1.507	0.771054	-5.709	0.513219	-10.488	1.164
44	0	0.948071	0.068811	7.346	-3.833	-20.421	-0.203802
44	1.700	0.948071	0.068811	7.346	-3.833	-7.932	-0.086823
45	0	0.915570	0.032415	8.681	-3.931	-9.890	-0.158320
45	1.700	0.915570	0.032415	8.681	-3.931	4.868	-0.103215
46	0	0.924465	0.008662	8.615	-4.181	2.822	-0.131977
46	1.700	0.924465	0.008662	8.615	-4.181	17.468	-0.117252
47	0	0.926294	0.000665	9.316	-3.687	16.055	-0.124002
47	1.700	0.926294	0.000665	9.316	-3.687	31.893	-0.122872
48	0	0.925801	-0.000307	7.400	-1.465	31.504	-0.123151
48	0.200	0.925801	-0.000307	7.400	-1.465	32.983	-0.123213
48	0.200	0.925801	-0.000307	3.270	-1.465	32.965	-0.123213
48	1.700	0.925801	-0.000307	3.270	-1.465	37.869	-0.123673
49	0	0.925801	0.000307	-3.270	1.465	37.869	-0.123673
49	1.7E-4	0.925801	0.000307	-3.270	1.465	37.886	-0.123673
49	1.500	0.925801	0.000307	-3.270	1.465	32.985	-0.123213
49	1.500	0.925801	0.000307	-7.400	1.465	32.983	-0.123213
49	1.700	0.925801	0.000307	-7.400	1.465	31.504	-0.123151
50	0	0.926294	-0.000665	-9.316	3.687	31.893	-0.122872
50	1.700	0.926294	-0.000665	-9.316	3.687	16.055	-0.124002
51	0	0.924465	-0.008662	-8.615	4.181	17.468	-0.117252
51	1.700	0.924465	-0.008662	-8.615	4.181	2.822	-0.131977
52	0	0.915570	-0.032415	-8.681	3.931	4.868	-0.103215
52	1.700	0.915570	-0.032415	-8.681	3.931	-9.890	-0.158320
53	0	0.948071	-0.068811	-7.346	3.833	-7.932	-0.086823
53	1.700	0.948071	-0.068811	-7.346	3.833	-20.421	-0.203802
76	0	-0.863785	0.068842	17.191	-8.896	-36.710	-0.310988
76	1.700	-0.863785	0.068842	17.191	-8.896	-9.486	-0.193956
77	0	-0.638549	-0.014736	10.671	-8.344	-11.790	-0.213656
77	1.700	-0.638549	-0.014736	10.671	-8.344	6.351	-0.238707
78	0	-0.574242	-0.004510	10.134	-7.808	5.803	-0.229596
76	1.700	-0.574242	-0.004510	10.134	-7.808	23.031	-0.237263

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
79	0	-0.557422	-0.001347	9.376	-6.137	23.424	-0.232973
79	1.700	-0.557422	-0.001347	9.376	-6.137	39.363	-0.235262
80	0	-0.554613	-0.000458	9.077	-2.392	39.911	-0.233680
80	0.200	-0.554613	-0.000458	9.077	-2.392	41.725	-0.233772
80	0.200	-0.554613	-0.000458	3.207	-2.392	41.727	-0.233772
80	1.700	-0.554613	-0.000458	3.207	-2.392	46.537	-0.234458
81	0	-0.554613	0.000458	-3.207	2.392	46.537	-0.234458
81	1.7E-4	-0.554613	0.000458	-3.207	2.392	46.537	-0.234458
81	1.500	-0.554613	0.000458	-3.207	2.392	41.727	-0.233772
81	1.500	-0.554613	0.000458	-9.077	2.392	41.725	-0.233772
81	1.700	-0.554613	0.000458	-9.077	2.392	39.911	-0.233680
82	0	-0.557422	0.001347	-9.376	6.137	39.363	-0.235262
82	1.700	-0.557422	0.001347	-9.376	6.137	23.424	-0.232973
83	0	-0.574242	0.004510	-10.134	7.808	23.031	-0.237263
83	1.700	-0.574242	0.004510	-10.134	7.808	5.803	-0.229596
84	0	-0.638549	0.014736	-10.671	8.344	6.351	-0.238707
84	1.700	-0.638549	0.014736	-10.671	8.344	-11.790	-0.213656
85	0	-0.863785	-0.068842	-17.191	8.896	-9.486	-0.193956
85	1.700	-0.863785	-0.068842	-17.191	8.896	-38.710	-0.310988
106	0	-1.638	-0.115891	2.988	-4.529	-15.244	-0.009203
106	1.700	-1.638	-0.115891	2.988	-4.529	-10.166	-0.206217
109	0	-1.687	-0.033618	5.897	-4.847	-7.848	-0.091358
109	1.700	-1.687	-0.033618	5.897	-4.847	2.177	-0.148509
110	0	-1.702	-0.010901	5.230	-4.228	3.817	-0.113453
110	1.700	-1.702	-0.010901	5.230	-4.228	12.708	-0.131985
111	0	-1.705	-0.002860	4.122	-3.131	14.444	-0.121213
111	1.700	-1.705	-0.002860	4.122	-3.131	21.451	-0.126075
112	0	-1.706	-0.000512	1.572	-1.183	22.755	-0.123330
112	1.700	-1.706	-0.000512	1.572	-1.183	25.427	-0.124200
113	0	-1.706	0.000512	-1.572	1.183	25.427	-0.124200
113	1.700	-1.706	0.000512	-1.572	1.183	22.755	-0.123330
114	0	-1.705	0.002860	-4.122	3.131	21.451	-0.126075
114	1.700	-1.705	0.002860	-4.122	3.131	14.444	-0.121213
115	0	-1.702	0.010901	-5.230	4.228	12.708	-0.131985
115	1.700	-1.702	0.010901	-5.230	4.228	3.817	-0.113453
116	0	-1.687	0.033618	-5.897	4.847	2.177	-0.148509
116	1.700	-1.687	0.033618	-5.897	4.847	-7.848	-0.091358

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
117	0	-1.638	0.115891	-2.988	4.529	-10.166	-0.206217
117	1.700	-1.638	0.115891	-2.988	4.529	-15.244	-0.009203
140	0	-1.864	-0.509523	-3.246	-0.582016	-2.228	-0.494184
140	1.700	-1.864	-0.509523	-3.246	-0.582016	-7.746	-1.360
141	0	-1.939	-0.386727	-2.588	-0.631405	0.896835	-0.081695
141	1.700	-1.939	-0.386727	-2.588	-0.631405	-3.503	-0.739130
142	0	-1.964	-0.285594	-1.969	-0.553202	4.763	0.446028
142	1.700	-1.964	-0.285594	-1.969	-0.553202	1.435	-0.039483
143	0	-1.971	-0.218098	-1.531	-0.401412	8.201	0.916682
143	1.700	-1.971	-0.218098	-1.531	-0.401412	5.596	0.545914
144	0	-1.972	-0.084172	-0.594388	-0.150588	9.636	1.114
144	1.700	-1.972	-0.084172	-0.594388	-0.150588	8.626	0.971106
145	0	-1.972	0.084172	0.594388	0.150588	8.626	0.971106
145	1.700	-1.972	0.084172	0.594388	0.150588	9.636	1.114
146	0	-1.971	0.218098	1.531	0.401412	5.596	0.545914
146	1.700	-1.971	0.218098	1.531	0.401412	8.201	0.916682
147	0	-1.964	0.285594	1.969	0.553202	1.435	-0.039483
147	1.700	-1.964	0.285594	1.969	0.553202	4.763	0.446028
148	0	-1.939	0.386727	2.588	0.631405	-3.503	-0.739130
148	1.700	-1.939	0.386727	2.588	0.631405	0.896835	-0.081695
149	0	-1.864	0.509523	3.246	0.582016	-7.746	-1.360
149	1.700	-1.864	0.509523	3.246	0.582016	-2.228	-0.494184
	min:	-1.972	-1.745	-17.191	-6.896	-38.710	-2.884
	max:	1.507	1.745	17.191	8.896	46.537	1.164

Loadcase	Factor	Stage	Init.def	Title
16	1.0000			VEHICULO HIPOTESIS 16

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.390235	0.077848	3.801			
10	0.390230	0.041925	-5.426			
156	0.647634	0.073082	7.153			
160	0.647639	0.047158	-10.476			
166	-0.345981	0.784014	8.439	-3.932	2.340	-0.289956
167	-1.730	-1.024	56.508	4.021	-2.915	-0.241741
Sums :	-1.62E-10	1.87E-11	60.000			
min:	-1.730	-1.024	-10.476	-3.932	-2.915	-0.289956
max:	0.647639	0.784014	56.508	4.021	2.340	-0.241741

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.162	-0.472947	3.128	-0.359144	-4.731	0.507952
12	1.700	1.162	-0.472947	3.128	-0.359144	0.586372	-0.296056
13	0	1.217	-0.553102	3.646	-0.360113	-4.261	0.445554
13	1.700	1.217	-0.553102	3.646	-0.360113	1.936	-0.494719
14	0	1.294	-0.585144	3.797	-0.378401	-3.171	0.295462
14	1.700	1.294	-0.585144	3.797	-0.378401	3.284	-0.699263
15	0	1.381	-0.591353	3.817	-0.384672	-1.978	0.120314
15	1.700	1.381	-0.591353	3.817	-0.384672	4.511	-0.884986
16	0	1.472	-0.592469	3.822	-0.383119	-0.767757	-0.060518
16	1.700	1.472	-0.592469	3.822	-0.383119	5.730	-1.068
17	0	1.562	-0.596762	3.855	-0.375666	0.517135	-0.251964
17	1.700	1.562	-0.596762	3.855	-0.375666	7.071	-1.266
18	0	1.654	-0.623125	4.038	-0.361146	2.035	-0.474533
18	1.700	1.654	-0.623125	4.038	-0.361146	8.899	-1.524
19	0	1.751	-0.854585	5.626	-0.263660	4.282	-0.795275
19	1.250	1.751	-0.854585	5.626	-0.263660	11.314	-1.863
19	1.250	1.751	0.537146	-4.276	-0.263660	11.314	-1.863
19	1.700	1.751	0.537146	-4.276	-0.263660	9.390	-1.622
20	0	1.866	-0.228415	1.026	0.030892	8.058	-1.336

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
20	1.050	1.866	-0.228415	1.026	0.030892	9.134	-1.576
20	1.050	1.866	1.163	-8.877	0.030892	9.133	-1.576
20	1.700	1.866	1.163	-8.877	0.030892	3.364	-0.819953
21	0	1.981	0.178115	-1.649	0.405653	6.122	-1.120
21	0.850	1.981	0.178115	-1.649	0.405653	4.720	-0.968475
21	0.850	1.981	1.570	-11.552	0.405653	4.718	-0.968178
21	1.700	1.981	1.570	-11.552	0.405653	-5.099	0.365924
44	0	0.787361	-0.043080	2.218	-2.718	-7.022	-0.667215
44	1.700	0.787361	-0.043080	2.218	-2.718	-3.250	-0.140451
45	0	0.856681	-0.072190	2.439	-2.785	-4.523	-0.039055
45	1.700	0.856681	-0.072190	2.439	-2.785	-0.377674	-0.161778
46	0	0.930042	-0.081480	2.315	-2.909	-1.660	-0.035767
46	1.700	0.930042	-0.081480	2.315	-2.909	2.276	-0.174283
47	0	1.001	-0.084562	2.302	-2.946	1.063	-0.026350
47	1.700	1.001	-0.084562	2.302	-2.946	4.976	-0.183108
48	0	1.071	-0.085307	2.342	-2.930	3.755	-0.045319
48	1.700	1.071	-0.085307	2.342	-2.930	7.777	-0.190342
49	0	1.143	-0.085532	2.490	-2.862	6.643	-0.051764
49	1.700	1.143	-0.085532	2.490	-2.862	10.675	-0.197169
50	0	1.214	-0.086715	3.017	-2.651	9.508	-0.057510
50	1.700	1.214	-0.086715	3.017	-2.651	15.037	-0.204926
51	0	1.281	-0.090739	3.147	-1.717	14.935	-0.061753
51	1.250	1.281	-0.090739	3.147	-1.717	18.873	-0.175162
51	1.250	1.281	-0.090739	-0.982586	-1.717	18.873	-0.175162
51	1.700	1.281	-0.090739	-0.982586	-1.717	18.431	-0.216010
52	0	1.335	-0.103071	-4.070	0.394724	18.958	-0.063478
52	1.050	1.335	-0.103071	-4.070	0.394724	14.685	-0.171686
52	1.050	1.335	-0.103071	-8.200	0.394724	14.683	-0.171721
52	1.700	1.335	-0.103071	-8.200	0.394724	9.354	-0.228700
53	0	1.427	-0.083943	-9.922	2.795	10.672	-0.091188
53	0.850	1.427	-0.083943	-9.922	2.795	2.240	-0.162326
53	0.850	1.427	-0.083943	-14.052	2.795	2.236	-0.162565
53	1.700	1.427	-0.083943	-14.052	2.795	-9.706	-0.233892
76	0	-0.389443	-0.172823	4.367	-5.730	-12.136	-0.012364
76	1.700	-0.389443	-0.172823	4.367	-5.730	-4.711	-0.306163
77	0	-0.296994	-0.156339	2.449	-5.519	-5.343	-0.050054
77	1.700	-0.296994	-0.158339	2.449	-5.519	-1.180	-0.319230
78	0	-0.270618	-0.152963	2.325	-5.510	-1.369	-0.068288

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
78	1.700	-0.270618	-0.152963	2.325	-5.510	2.563	-0.328329
79	0	-0.263634	-0.152482	2.329	-5.494	2.510	-0.081119
79	1.700	-0.263634	-0.152482	2.329	-5.494	6.468	-0.340338
80	0	-0.262265	-0.152632	2.352	-5.415	6.472	-0.093540
80	1.700	-0.262265	-0.152632	2.352	-5.415	10.470	-0.353015
81	0	-0.262181	-0.152929	2.366	-5.155	10.559	-0.105970
81	1.700	-0.262181	-0.152929	2.366	-5.155	14.581	-0.365950
82	0	-0.263858	-0.152773	2.096	-4.317	14.964	-0.119003
82	1.700	-0.263858	-0.152773	2.096	-4.317	18.526	-0.378716
83	0	-0.273298	-0.146402	1.318	-1.926	19.446	-0.135830
83	1.250	-0.273298	-0.146402	1.318	-1.926	21.094	-0.318808
83	1.250	-0.273298	-0.146402	-4.552	-1.926	21.053	-0.318856
83	1.700	-0.273298	-0.146402	-4.552	-1.926	19.045	-0.384714
84	0	-0.307777	-0.130097	-5.367	2.412	20.533	-0.149298
84	1.050	-0.307777	-0.130097	-5.367	2.412	14.898	-0.285878
84	1.050	-0.307777	-0.130097	-11.237	2.412	14.895	-0.285922
84	1.700	-0.307777	-0.130097	-11.237	2.412	7.563	-0.370461
85	0	-0.428075	-0.307467	-19.481	7.563	10.544	-0.075505
85	0.850	-0.428075	-0.307467	-19.481	7.563	-6.011	-0.336604
85	0.850	-0.428075	-0.307467	-25.351	7.563	-6.019	-0.336905
85	1.700	-0.428075	-0.307467	-25.351	7.563	-27.563	-0.598204
108	0	-1.120	-0.118870	-0.217933	-2.845	-4.165	0.012647
108	1.700	-1.120	-0.118870	-0.217933	-2.845	-4.536	-0.169433
109	0	-1.222	-0.099276	0.925528	-3.053	-3.118	-0.011577
109	1.700	-1.222	-0.099276	0.925528	-3.053	-1.545	-0.180346
110	0	-1.298	-0.089498	0.868392	-3.010	-0.409271	-0.028157
110	1.700	-1.298	-0.089498	0.868392	-3.010	1.067	-0.180305
111	0	-1.370	-0.086215	0.831333	-2.965	2.233	-0.038036
111	1.700	-1.370	-0.086215	0.831333	-2.965	3.646	-0.184601
112	0	-1.441	-0.085522	0.763634	-2.895	4.834	-0.045337
112	1.700	-1.441	-0.085522	0.763634	-2.895	6.132	-0.190724
113	0	-1.512	-0.085440	0.545864	-2.685	7.338	-0.052081
113	1.700	-1.512	-0.085440	0.545864	-2.685	8.266	-0.197330
114	0	-1.582	-0.084429	-0.056140	-2.079	9.496	-0.059579
114	1.700	-1.582	-0.084429	-0.056140	-2.079	9.400	-0.203109
115	0	-1.649	-0.079741	-1.677	-0.603659	10.601	-0.070001
115	1.700	-1.649	-0.079741	-1.677	-0.603659	7.750	-0.205561

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
116	0	-1.700	-0.067739	-4.937	1.899	8.217	-0.087601
116	1.700	-1.700	-0.067739	-4.937	1.899	-0.176822	-0.202757
117	0	-1.747	0.014709	-4.551	3.723	-1.766	-0.154886
117	1.700	-1.747	0.014709	-4.551	3.723	-9.503	-0.129879
140	0	-1.344	-0.444054	-2.681	-0.370244	0.547670	-0.036705
140	1.700	-1.344	-0.444054	-2.681	-0.370244	-4.009	-0.791596
141	0	-1.458	-0.437455	-2.650	-0.397111	1.315	0.060693
141	1.700	-1.458	-0.437455	-2.650	-0.397111	-3.191	-0.682981
142	0	-1.559	-0.411857	-2.503	-0.394726	2.265	0.175345
142	1.700	-1.559	-0.411857	-2.503	-0.394726	-1.989	-0.524812
143	0	-1.653	-0.405690	-2.478	-0.387796	3.372	0.314371
143	1.700	-1.653	-0.405690	-2.478	-0.387796	-0.640811	-0.375302
144	0	-1.744	-0.405193	-2.479	-0.377695	4.425	0.449006
144	1.700	-1.744	-0.405193	-2.479	-0.377695	0.215903	-0.239822
145	0	-1.835	-0.401916	-2.456	-0.348183	5.271	0.553794
145	1.700	-1.835	-0.401916	-2.456	-0.348183	1.096	-0.129464
146	0	-1.925	-0.376782	-2.296	-0.263517	5.452	0.571369
146	1.700	-1.925	-0.376782	-2.296	-0.263517	1.586	-0.072561
147	0	-2.014	-0.285429	-1.640	-0.063354	4.203	0.376404
147	1.700	-2.014	-0.285429	-1.640	-0.063354	1.415	-0.108824
148	0	-2.097	-0.029898	0.147304	0.251642	0.293817	-0.192677
148	1.700	-2.097	-0.029898	0.147304	0.251642	0.544233	-0.243504
149	0	-2.136	0.333144	2.404	0.463856	-4.859	-0.971142
149	1.700	-2.136	0.333144	2.404	0.463856	-0.772527	-0.404798
	min:	-2.136	-0.854585	-25.351	-5.730	-27.563	-1.863
	max:	1.981	1.570	5.626	7.563	21.094	0.571369

Loadcase Factor Stage Init.def Title
17 1.0000 VEHICULO HIPOTESIS 17

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.275936	-0.070252	3.378			
10	0.275944	-0.109739	-2.878			
156	0.570715	-0.074503	14.915			
160	0.570708	-0.105836	-7.570			
166	-0.054322	-0.500460	-3.285	2.928	2.775	-0.324107
167	-1.639	0.860785	55.444	-3.060	-3.243	-0.284786
Sums :	-1.22E-10	-2.24E-11	60.000			
min:	-1.639	-0.500460	-7.570	-3.060	-3.243	-0.324107
max:	0.570715	0.860785	55.444	2.928	2.775	-0.284786

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	1.777	-1.010	8.078	-0.089659	-1.944	-0.087984
22	0.850	1.777	-1.010	8.078	-0.089659	4.921	-0.946600
22	0.850	1.777	0.381440	-1.825	-0.089659	4.922	-0.946682
22	1.300	1.777	0.381440	-1.825	-0.089659	4.101	-0.775083
23	0	1.575	-0.349613	3.614	0.215304	5.051	-1.043
23	1.050	1.575	-0.349613	3.614	0.215304	8.845	-1.410
23	1.050	1.575	1.042	-6.289	0.215304	8.845	-1.410
23	1.300	1.575	1.042	-6.289	0.215304	7.273	-1.150
24	0	1.367	0.356429	-1.543	0.456609	10.658	-1.772
24	1.250	1.367	0.356429	-1.543	0.456609	8.730	-1.326
24	1.250	1.367	1.748	-11.446	0.456609	8.728	-1.326
24	1.300	1.367	1.748	-11.446	0.456609	8.157	-1.239
25	0	1.172	1.241	-7.952	0.688206	13.829	-2.176
25	1.300	1.172	1.241	-7.952	0.688206	3.491	-0.562373
26	0	0.986173	1.097	-6.962	0.746362	10.631	-1.701
26	1.300	0.986173	1.097	-6.962	0.746362	1.581	-0.274079
27	0	0.803102	1.071	-6.775	0.764286	9.031	-1.454
27	1.300	0.803102	1.071	-6.775	0.764286	0.224092	-0.061093
28	0	0.620303	1.065	-6.734	0.777255	7.837	-1.263
28	1.300	0.620303	1.065	-6.734	0.777255	-0.916715	0.121705

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
25	0	0.437055	1.065	-6.758	0.793100	6.817	-1.097
25	1.300	0.437055	1.065	-6.758	0.793100	-1.969	0.266952
30	0	0.250819	1.098	-7.003	0.829354	5.955	-0.963513
30	1.300	0.250819	1.098	-7.003	0.829354	-3.149	0.464081
31	0	0.050768	1.403	-8.571	0.849102	5.151	-0.864901
31	1.300	0.050768	1.403	-8.571	0.849102	-5.990	0.958860
32	0	-2.83E-13	6.20E-11	1.02E-11	1.28E-16	-4.55E-12	-2.95E-11
32	0.500	-2.83E-13	6.20E-11	1.02E-11	1.28E-16	5.71E-13	1.54E-12
54	0	1.283	0.261753	13.221	-0.309191	-7.452	-0.324224
54	0.850	1.283	0.261753	13.221	-0.309191	3.784	-0.101765
54	0.850	1.283	0.261753	9.091	-0.309191	3.787	-0.101701
54	1.300	1.283	0.261753	9.091	-0.309191	7.877	0.016054
55	0	1.148	0.274217	8.885	1.560	7.476	-0.302005
55	1.050	1.148	0.274217	8.885	1.560	16.804	-0.014113
55	1.050	1.148	0.274217	4.755	1.560	16.806	-0.014042
55	1.300	1.148	0.274217	4.755	1.560	17.994	0.054476
56	0	1.029	0.260636	2.384	3.305	17.585	-0.272763
56	1.250	1.029	0.260636	2.384	3.305	20.565	0.052598
56	1.250	1.029	0.260636	-1.746	3.305	20.565	0.053066
56	1.300	1.029	0.260636	-1.746	3.305	20.476	0.066064
57	0	0.896483	0.255395	-3.722	4.931	20.443	-0.254116
57	1.300	0.896483	0.255395	-3.722	4.931	15.604	0.077897
58	0	0.755653	0.252622	-3.320	5.599	15.934	-0.238464
58	1.300	0.755653	0.252622	-3.320	5.599	11.616	0.089944
59	0	0.612269	0.251950	-2.814	5.827	12.178	-0.224652
59	1.300	0.612269	0.251950	-2.814	5.827	8.719	0.102683
60	0	0.467416	0.253574	-2.615	5.936	9.583	-0.212457
60	1.300	0.467416	0.253574	-2.615	5.936	6.185	0.117190
61	0	0.317521	0.258547	-2.593	6.029	7.059	-0.202172
61	1.300	0.317521	0.258547	-2.593	6.029	3.689	0.132939
62	0	0.163529	0.266696	-2.576	6.147	4.395	-0.190740
62	1.300	0.163529	0.266696	-2.576	6.147	1.046	0.155965
63	0	0.044586	0.235035	-1.385	5.938	1.221	-0.149162
63	1.300	0.044586	0.235035	-1.385	5.938	-0.579117	0.156383
64	0	-6.38E-13	4.57E-11	-8.79E-13	-1.08E-16	4.94E-13	-2.09E-11
64	0.500	-6.38E-13	4.57E-11	-8.79E-13	-1.08E-16	5.41E-14	1.97E-12
86	0	-0.202043	0.509851	26.448	-2.984	-24.948	-0.608320

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
86	0.850	-0.202043	0.509851	26.448	-2.984	-2.471	-0.175013
86	0.850	-0.202043	0.509851	20.578	-2.984	-2.465	-0.174880
86	1.300	-0.202043	0.509851	20.578	-2.984	6.793	0.054486
87	0	-0.113629	0.364004	12.069	1.067	4.830	-0.434195
87	1.050	-0.113629	0.364004	12.069	1.067	17.501	-0.052037
87	1.050	-0.113629	0.364004	6.199	1.067	17.504	-0.051943
87	1.300	-0.113629	0.364004	6.199	1.067	19.052	0.039011
88	0	-0.075849	0.382716	4.512	4.841	17.867	-0.437516
88	1.250	-0.075849	0.382716	4.512	4.841	23.506	0.040830
88	1.250	-0.075849	0.382716	-1.358	4.841	23.506	0.040929
88	1.300	-0.075849	0.382716	-1.358	4.841	23.439	0.060015
89	0	-0.060136	0.398369	-1.607	7.945	22.598	-0.426018
89	1.300	-0.060136	0.398369	-1.607	7.945	20.509	0.091861
90	0	-0.054067	0.401716	-2.285	9.760	19.696	-0.402445
90	1.300	-0.054067	0.401716	-2.285	9.760	16.926	0.119785
91	0	-0.051539	0.401786	-2.567	10.570	16.606	-0.377010
91	1.300	-0.051539	0.401786	-2.567	10.570	13.269	0.145312
92	0	-0.048428	0.404478	-2.601	10.874	13.125	-0.353439
92	1.300	-0.048428	0.404478	-2.601	10.874	5.744	0.172383
93	0	-0.041344	0.415244	-2.556	10.888	9.601	-0.331681
93	1.300	-0.041344	0.415244	-2.556	10.888	6.275	0.208136
94	0	-0.027603	0.421901	-2.268	10.554	5.960	-0.296946
94	1.300	-0.027603	0.421901	-2.268	10.554	3.011	0.251526
95	0	-0.008166	0.330042	-1.409	9.405	2.409	-0.201340
95	1.300	-0.008166	0.330042	-1.409	9.405	0.577546	0.227714
96	0	-2.10E-12	1.99E-11	-1.62E-13	-1.46E-15	1.27E-13	1.05E-12
96	0.500	-2.10E-12	1.99E-11	-1.62E-13	-1.46E-15	4.61E-14	1.10E-11
118	0	-1.314	0.156047	4.721	-1.037	-8.569	-0.233632
118	1.300	-1.314	0.156047	4.721	-1.037	-2.452	-0.030771
119	0	-1.211	0.224426	6.282	-0.012458	-1.943	-0.263406
119	1.300	-1.211	0.224426	6.282	-0.012458	6.223	0.028350
120	0	-1.098	0.239105	3.736	2.065	5.638	-0.256954
120	1.300	-1.098	0.239105	3.736	2.065	10.498	0.053863
121	0	-0.967622	0.246724	1.341	3.887	9.549	-0.248215
121	1.300	-0.967622	0.246724	1.341	3.887	11.292	0.072526
122	0	-0.828072	0.250019	0.159567	4.993	10.224	-0.236921
122	1.300	-0.828072	0.250019	0.159567	4.993	10.432	0.088103

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
123	0	-0.686097	0.250469	-0.416947	5.550	9.400	-0.223803
123	1.300	-0.686097	0.250469	-0.416947	5.550	8.858	0.101808
124	0	-0.541980	0.249286	-0.650567	5.765	7.859	-0.209951
124	1.300	-0.541980	0.249286	-0.650567	5.765	7.009	0.114120
125	0	-0.391149	0.247514	-0.634553	5.755	6.009	-0.196350
125	1.300	-0.391149	0.247514	-0.634553	5.755	5.184	0.125418
126	0	-0.232232	0.245297	-0.560083	5.567	4.212	-0.181110
126	1.300	-0.232232	0.245297	-0.560083	5.567	3.483	0.137777
127	0	-0.098550	0.204806	-1.189	5.056	2.672	-0.139412
127	1.300	-0.098550	0.204806	-1.189	5.056	1.126	0.126825
128	0	7.18E-13	2.34E-11	-1.41E-13	9.31E-16	8.30E-14	-1.54E-12
128	0.500	7.18E-13	2.34E-11	-1.41E-13	9.31E-16	1.22E-14	1.02E-11
150	0	-1.725	0.106651	0.112076	-0.106710	-2.547	-0.685062
150	1.300	-1.725	0.106651	0.112076	-0.106710	-2.402	-0.546418
151	0	-1.579	0.370223	1.757	0.005971	-1.520	-0.522221
151	1.300	-1.579	0.370223	1.757	0.005971	0.784744	-0.040931
152	0	-1.402	0.620455	3.547	0.255388	-0.464521	-0.338982
152	1.300	-1.402	0.620455	3.547	0.255388	4.146	0.467609
153	0	-1.221	0.770309	4.629	0.492431	0.280471	-0.205775
153	1.300	-1.221	0.770309	4.629	0.492431	6.298	0.795627
154	0	-1.040	0.834404	5.081	0.644189	0.494848	-0.151063
154	1.300	-1.040	0.834404	5.081	0.644189	7.100	0.932662
155	0	-0.858094	0.857467	5.243	0.721139	0.235688	-0.162296
155	1.300	-0.858094	0.857467	5.243	0.721139	7.052	0.952411
156	0	-0.677649	0.858896	5.274	0.750603	-0.292107	-0.209669
156	1.300	-0.677649	0.858896	5.274	0.750603	6.565	0.906895
157	0	-0.502422	0.840056	5.215	0.750158	-0.899400	-0.266711
157	1.300	-0.502422	0.840056	5.215	0.750158	5.861	0.823364
158	0	-0.334850	0.809962	5.085	0.732555	-1.469	-0.334919
158	1.300	-0.334850	0.809962	5.085	0.732555	5.141	0.718032
159	0	-0.168976	0.913872	5.244	0.682229	-1.936	-0.419548
159	1.300	-0.168976	0.913872	5.244	0.682229	4.882	0.768486
160	0	-3.66E-14	-3.21E-11	9.65E-12	1.89E-17	-4.26E-12	1.13E-11
160	0.500	-3.66E-14	-3.21E-11	9.65E-12	1.89E-17	5.64E-13	-4.78E-12

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	min:	-1.725	-1.010	-11.446	-2.984	-24.948	-2.176
	max:	1.777	1.748	26.448	10.888	23.506	0.958860

Loadcase Factor Stage Init.def Title
18 1.0000 VEHICULO HIPOTESIS 18

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.167580	-0.116429	2.334			
10	0.167591	-0.141617	-1.442			
156	0.356267	-0.119217	26.359			
160	0.356258	-0.139359	-1.790			
166	-0.016694	-0.777781	-5.337	4.462	1.781	-0.207035
167	-1.031	1.294	39.877	-4.653	-2.071	-0.182707
Sums :	-7.17E-11	-3.40E-11	60.000			
min:	-1.031	-0.777781	-5.337	-4.653	-2.071	-0.207035
max:	0.356267	1.294	39.877	4.462	1.781	-0.182707

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	1.134	-0.409490	3.559	-0.178239	-6.526	0.671154
22	1.300	1.134	-0.409490	3.559	-0.178239	-1.699	0.138817
23	0	0.982928	-0.581839	4.955	-0.153659	-3.409	0.250837
23	1.300	0.982928	-0.581839	4.955	-0.153659	3.033	-0.505554
24	0	0.838741	-0.739216	5.963	-0.179405	1.322	-0.365602
24	1.300	0.838741	-0.739216	5.963	-0.179405	9.074	-1.327
25	0	0.712738	-0.964741	7.473	-0.106270	7.376	-1.176
25	1.100	0.712738	-0.964741	7.473	-0.106270	15.597	-2.240
25	1.100	0.712736	0.426990	-2.430	-0.106270	15.596	-2.240
25	1.300	0.712736	0.426990	-2.430	-0.106270	15.112	-2.155
26	0	0.595501	-0.065382	1.020	0.180607	15.544	-2.301
26	1.300	0.595501	-0.065382	1.020	0.180607	16.870	-2.386

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
26	1.300	0.595501	-0.065382	1.020	0.180607	16.870	-2.386
27	0	0.480783	0.781442	-5.032	0.508455	20.246	-2.944
27	1.300	0.480783	0.781442	-5.032	0.508455	13.706	-1.928
28	0	0.365282	0.304692	-1.654	0.824340	20.144	-2.916
28	0.200	0.365282	0.304692	-1.654	0.824340	19.813	-2.859
28	0.200	0.365282	1.696	-11.557	0.824340	19.811	-2.855
28	1.300	0.365282	1.696	-11.557	0.824340	7.100	-0.989046
29	0	0.246618	1.527	-10.420	0.978476	16.117	-2.342
29	1.300	0.246618	1.527	-10.420	0.978476	2.571	-0.343902
30	0	0.122943	1.604	-10.871	1.108	12.665	-1.853
30	1.300	0.122943	1.604	-10.871	1.108	-1.467	0.232305
31	0	-0.016069	2.132	-14.244	1.218	9.978	-1.485
31	1.300	-0.016069	2.132	-14.244	1.218	-8.539	1.287
32	0	-3.63E-13	1.05E-11	2.13E-12	-4.06E-16	-2.48E-12	-1.21E-11
32	0.500	-3.63E-13	1.05E-11	2.13E-12	-4.06E-16	-1.41E-12	-6.86E-12
54	0	0.789748	0.210549	7.667	-1.268	-15.892	-0.242716
54	1.300	0.789748	0.210549	7.667	-1.268	-5.899	0.031003
55	0	0.690970	0.193078	9.647	-1.220	-6.364	-0.205339
55	1.300	0.690970	0.193078	9.647	-1.220	6.178	0.045663
56	0	0.614730	0.171123	9.876	-1.323	5.675	-0.176375
56	1.300	0.614730	0.171123	9.876	-1.323	18.515	0.046085
57	0	0.531310	0.161114	9.885	-0.574990	18.634	-0.155878
57	1.100	0.531310	0.161114	9.885	-0.574990	29.505	0.017336
57	1.100	0.531310	0.161114	5.755	-0.574990	29.507	0.017372
57	1.300	0.531310	0.161114	5.755	-0.574990	30.658	0.049574
58	0	0.443040	0.158002	3.952	1.432	30.803	-0.149243
58	1.300	0.443040	0.158002	3.952	1.432	35.935	0.056139
58	1.300	0.442040	0.158002	3.952	1.432	35.940	0.056155
59	0	0.353211	0.158138	-2.044	3.821	36.317	-0.141004
59	1.300	0.353211	0.158138	-2.044	3.821	33.659	0.064575
60	0	0.262361	0.161108	-3.765	6.009	34.210	-0.134466
60	0.200	0.262361	0.161108	-3.765	6.009	33.456	-0.102266
60	0.200	0.262361	0.161108	-7.895	6.009	33.456	-0.102224
60	1.300	0.262361	0.161108	-7.895	6.009	24.773	0.074975
61	0	0.169190	0.166604	-7.656	7.251	25.119	-0.129083
61	1.300	0.169190	0.166604	-7.656	7.251	15.165	0.087503
62	0	0.074586	0.175620	-6.980	8.036	15.576	-0.123291

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
62	1.300	0.074586	0.175620	-6.980	8.036	6.502	0.105015
63	0	0.006287	0.159494	-4.670	8.199	5.976	-0.097430
63	1.300	0.006287	0.159494	-4.670	8.199	-0.093201	0.109812
64	0	-6.94E-13	8.58E-12	-2.71E-12	2.70E-15	1.11E-12	-6.08E-12
64	0.500	-6.94E-13	8.58E-12	-2.71E-12	2.70E-15	-2.44E-13	-1.80E-12
86	0	-0.300038	0.318468	20.229	-4.207	-32.746	-0.379494
86	1.300	-0.300038	0.318468	20.229	-4.207	-6.449	0.034514
87	0	-0.166577	0.226656	13.243	-3.488	-8.050	-0.270444
87	1.300	-0.166577	0.226656	13.243	-3.488	9.166	0.024209
88	0	-0.109680	0.237656	11.745	-2.571	8.579	-0.272237
88	1.300	-0.109680	0.237656	11.745	-2.571	23.848	0.036716
89	0	-0.086647	0.247061	10.976	-0.509968	23.972	-0.264998
89	1.100	-0.086647	0.247061	10.976	-0.509968	36.044	0.006737
89	1.100	-0.086647	0.247061	5.106	-0.509968	36.046	0.006801
89	1.300	-0.086647	0.247061	5.106	-0.509968	37.066	0.056181
90	0	-0.078136	0.249879	4.914	2.850	37.334	-0.250928
90	1.300	-0.078136	0.249879	4.914	2.850	43.722	0.073882
90	1.300	-0.078136	0.249879	4.914	2.850	43.722	0.073915
91	0	-0.074454	0.250968	-1.377	6.719	43.669	-0.235769
91	1.300	-0.074454	0.250968	-1.377	6.719	41.879	0.090496
92	0	-0.069728	0.253397	-1.620	10.057	41.380	-0.221442
92	0.200	-0.069728	0.253397	-1.620	10.057	41.056	-0.170796
92	0.200	-0.069728	0.253397	-7.490	10.057	41.055	-0.170730
92	1.300	-0.069728	0.253397	-7.490	10.057	32.817	0.107974
93	0	-0.059366	0.260113	-8.073	12.005	31.568	-0.207740
93	1.300	-0.059366	0.260113	-8.073	12.005	21.473	0.130407
94	0	-0.039707	0.263938	-7.544	12.477	20.128	-0.185754
94	1.300	-0.039707	0.263938	-7.544	12.477	10.322	0.157365
95	0	-0.011795	0.206237	-4.765	11.382	8.179	-0.125832
95	1.300	-0.011795	0.206237	-4.765	11.382	1.984	0.142276
96	0	-2.24E-12	7.71E-12	-1.33E-13	-5.81E-15	2.83E-13	2.05E-12
96	0.500	-2.24E-12	7.71E-12	-1.33E-13	-5.81E-15	2.16E-13	5.91E-12
118	0	-0.830107	0.050671	4.460	-1.942	-12.381	-0.105873
118	1.300	-0.830107	0.050671	4.460	-1.942	-6.584	-0.040001
119	0	-0.780879	0.117645	7.381	-2.267	-5.922	-0.147119
119	1.300	-0.780879	0.117645	7.381	-2.267	3.674	0.005820

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
120	0	-0.713482	0.139034	6.734	-1.506	3.878	-0.153022
120	1.300	-0.713482	0.139034	6.734	-1.506	12.633	0.027722
121	0	-0.633166	0.149624	5.254	-0.206062	12.877	-0.152048
121	1.300	-0.633166	0.149624	5.254	-0.206062	19.707	0.042462
122	0	-0.547159	0.154492	2.869	1.574	19.700	-0.147008
122	1.300	-0.547159	0.154492	2.869	1.574	23.430	0.053831
123	0	-0.459224	0.155746	0.314943	3.471	22.994	-0.139450
123	1.300	-0.459224	0.155746	0.314943	3.471	23.403	0.063020
124	0	-0.369385	0.154357	-1.936	5.060	22.479	-0.130441
124	1.300	-0.369385	0.154357	-1.936	5.060	19.962	0.070223
125	0	-0.274573	0.150725	-3.019	5.871	18.589	-0.120696
125	1.300	-0.274573	0.150725	-3.019	5.871	14.665	0.075246
126	0	-0.173205	0.145038	-3.398	5.849	13.121	-0.109513
126	1.300	-0.173205	0.145038	-3.398	5.849	8.703	0.079038
127	0	-0.083706	0.115716	-3.876	5.144	6.995	-0.083137
127	1.300	-0.083706	0.115716	-3.876	5.144	1.957	0.067294
128	0	1.64E-13	5.97E-12	-4.49E-13	1.94E-16	2.40E-13	-1.38E-12
128	0.500	1.64E-13	5.97E-12	-4.49E-13	1.94E-16	1.53E-14	1.60E-12
150	0	-1.052	-0.030547	-0.526329	-0.237943	-2.974	-0.606127
150	1.300	-1.052	-0.030547	-0.526329	-0.237943	-3.658	-0.645839
151	0	-0.985018	0.085070	0.161729	-0.287465	-0.766430	-0.286083
151	1.300	-0.985018	0.085070	0.161729	-0.287465	-0.556182	-0.175491
152	0	-0.888886	0.214773	1.048	-0.197358	2.026	0.116453
152	1.300	-0.888886	0.214773	1.048	-0.197358	3.388	0.397658
153	0	-0.782810	0.317506	1.755	-0.021533	4.600	0.491033
153	1.300	-0.782810	0.317506	1.755	-0.021533	6.882	0.902791
154	0	-0.671822	0.444691	2.640	0.207333	6.048	0.706261
154	1.300	-0.671822	0.444691	2.640	0.207333	9.481	1.284
155	0	-0.558892	0.578505	3.583	0.449138	6.215	0.744054
155	1.300	-0.558892	0.578505	3.583	0.449138	10.873	1.496
156	0	-0.447105	0.688298	4.379	0.647593	5.299	0.632380
156	1.300	-0.447105	0.688298	4.379	0.647593	10.992	1.527
157	0	-0.340646	0.718644	4.657	0.750734	3.833	0.444222
157	1.300	-0.340646	0.718644	4.657	0.750734	9.887	1.378
158	0	-0.243192	0.656167	4.292	0.744803	2.244	0.230891

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
158	1.300	-0.243192	0.656167	4.292	0.744803	7.822	1.084
159	0	-0.153293	0.538540	3.100	0.643662	0.706078	0.002345
159	1.300	-0.153293	0.538540	3.100	0.643662	4.736	0.702451
160	0	-1.68E-12	-2.63E-13	3.41E-12	-7.26E-17	-2.32E-12	-5.16E-13
160	0.500	-1.68E-12	-2.63E-13	3.41E-12	-7.26E-17	-6.16E-13	-6.47E-13
	min:	-1.052	-0.964741	-14.244	-4.207	-32.746	-2.944
	max:	1.134	2.132	20.229	12.477	43.722	1.527

Loadcase	Factor	Stage	Init.def	Title
19	1.0000			VEHICULO HIPOTESIS 19

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.059326	-0.056961	0.888022			
10	0.059331	-0.065923	-0.448044			
156	0.126491	-0.057984	40.227			
160	0.126487	-0.065156	6.303			
166	-0.005295	-0.375660	-2.597	2.148	0.634102	-0.073680
167	-0.366341	0.621683	15.628	-2.239	-0.737014	-0.065050
Sums :	-2.44E-11	-1.63E-11	60.000			
min:	-0.366341	-0.375660	-2.597	-2.239	-0.737014	-0.073680
max:	0.126491	0.621683	40.227	2.148	0.634102	-0.065050

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	0.407944	-0.141896	1.257	-0.067321	-3.150	0.351417
22	1.300	0.407944	-0.141896	1.257	-0.067321	-1.515	0.166952
23	0	0.349055	-0.204178	1.762	-0.058905	-2.083	0.207832
23	1.300	0.349055	-0.204178	1.762	-0.058905	0.207413	-0.057599
24	0	0.294783	-0.255121	2.074	-0.076454	-0.482633	0.001670
24	1.300	0.294783	-0.255121	2.074	-0.076454	2.213	-0.329888
25	0	0.248424	-0.276262	2.185	-0.086999	1.364	-0.244137
25	1.300	0.248424	-0.276262	2.185	-0.086999	4.205	-0.603277
26	0	0.206219	-0.288850	2.263	-0.080788	3.341	-0.512721
26	1.300	0.206219	-0.288850	2.263	-0.080788	6.283	-0.688226
27	0	0.165467	-0.315521	2.454	-0.052411	5.591	-0.820693
27	1.300	0.165467	-0.315521	2.454	-0.052411	8.761	-1.231
28	0	0.125143	-0.441007	3.350	0.049571	6.605	-1.235
28	1.300	0.125143	-0.441007	3.350	0.049571	12.960	-1.809
29	0	0.083569	-0.858537	6.305	0.399957	14.907	-2.112
29	0.0499	0.083569	-0.858537	6.305	0.399957	15.222	-2.155
29	0.0501	0.083569	0.533194	-3.597	0.399957	15.222	-2.155
29	1.300	0.083569	0.533194	-3.597	0.399957	10.726	-1.488
30	0	0.038421	0.168092	-1.012	0.881404	16.534	-2.337
30	0.250	0.038421	0.168092	-1.012	0.881404	16.281	-2.295
30	0.250	0.038421	1.560	-10.915	0.881404	16.279	-2.295
30	1.300	0.038421	1.560	-10.915	0.881404	4.820	-0.657412
31	0	-0.014961	1.869	-12.993	1.351	15.554	-2.207
31	0.450	-0.014961	1.869	-12.993	1.351	9.708	-1.366
31	0.450	-0.014961	3.261	-22.896	1.351	9.704	-1.366
31	1.300	-0.014961	3.261	-22.896	1.351	-9.755	1.406
32	0	2.49E-13	2.46E-11	3.75E-12	-2.92E-16	-1.06E-12	-8.39E-12
32	0.500	2.49E-13	2.46E-11	3.75E-12	-2.92E-16	8.14E-13	3.92E-12
54	0	0.278019	0.084771	2.711	-0.481551	-7.613	-0.094756
54	1.300	0.278019	0.084771	2.711	-0.481551	-4.089	0.015444
55	0	0.239784	0.073328	3.510	-0.472629	-4.262	-0.076602
55	1.300	0.239784	0.073328	3.510	-0.472629	0.300299	0.018724
56	0	0.212062	0.062978	3.407	-0.617467	0.043393	-0.064224
56	1.300	0.212062	0.062978	3.407	-0.617467	4.473	0.017648
57	0	0.182360	0.058250	3.399	-0.675479	4.291	-0.057417
57	1.300	0.182160	0.058250	3.399	-0.675479	8.710	0.018306
58	0	0.150994	0.056243	3.587	-0.606696	8.606	-0.052963

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
58	1.300	0.150994	0.056243	3.587	-0.606696	13.269	0.020153
59	0	0.119339	0.055570	4.120	-0.313490	13.271	-0.049581
59	1.300	0.119339	0.055570	4.120	-0.313490	18.626	0.022660
60	0	0.087182	0.056054	4.627	0.626269	18.942	-0.647036
60	1.300	0.087182	0.056054	4.627	0.626269	24.957	0.025834
61	0	0.054023	0.059442	2.913	2.968	25.278	-0.046173
61	0.0499	0.054023	0.059442	2.913	2.968	25.423	-0.043209
61	0.0501	0.054023	0.059442	-1.217	2.968	25.424	-0.043193
61	1.300	0.054023	0.059442	-1.217	2.968	23.903	0.031101
62	0	0.020486	0.064843	-3.116	6.036	23.706	-0.045344
62	0.250	0.020486	0.064843	-3.116	6.036	22.928	-0.029141
62	0.250	0.020486	0.064843	-7.246	6.036	22.926	-0.029124
62	1.300	0.020486	0.064843	-7.246	6.036	15.219	0.038953
63	0	-0.002518	0.061418	-6.352	8.276	13.425	-0.036957
63	0.450	-0.002518	0.061418	-6.352	8.276	10.567	-0.009327
63	0.450	-0.002518	0.061418	-10.482	8.276	10.565	-0.009311
63	1.300	-0.002518	0.061418	-10.482	8.276	1.657	0.042887
64	0	-7.82E-13	9.33E-13	-9.61E-13	8.34E-16	4.85E-13	-2.30E-12
64	0.500	-7.82E-13	9.33E-13	-9.61E-13	8.34E-16	3.91E-15	-1.83E-12
86	0	-0.143874	0.113126	7.982	-1.583	-15.359	-0.134770
86	1.300	-0.143874	0.113126	7.982	-1.583	-4.982	0.012294
87	0	-0.079791	0.080599	5.102	-1.451	-5.673	-0.096094
87	1.300	-0.079791	0.080599	5.102	-1.451	0.960007	0.008685
88	0	-0.052404	0.084608	4.643	-1.417	0.602162	-0.096771
88	1.300	-0.052404	0.084608	4.643	-1.417	6.639	0.013219
89	0	-0.041141	0.087893	4.600	-1.297	6.529	-0.094124
89	1.300	-0.041141	0.087893	4.600	-1.297	12.509	0.020137
90	0	-0.036861	0.088468	4.537	-0.974517	12.564	-0.088828
90	1.300	-0.036861	0.088468	4.537	-0.974517	18.463	0.026181
91	0	-0.035127	0.088221	4.161	-0.186281	18.685	-0.083101
91	1.300	-0.035127	0.088221	4.161	-0.186281	24.094	0.031586
92	0	-0.033361	0.088746	3.341	1.548	24.366	-0.077949
92	1.300	-0.033361	0.088746	3.341	1.548	28.709	0.037421
93	0	-0.029126	0.091885	3.330	4.380	28.429	-0.073697
93	0.0499	-0.029126	0.091885	3.330	4.380	28.595	-0.069115
93	0.0501	-0.029126	0.091885	-2.540	4.380	28.595	-0.069091
93	1.300	-0.029126	0.091885	-2.540	4.380	25.420	0.045753

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
94	0	-0.020072	0.094451	-1.289	7.273	23.591	-0.066626
94	0.250	-0.020072	0.094451	-1.289	7.273	23.269	-0.043026
94	0.250	-0.020072	0.094451	-7.159	7.273	23.268	-0.043001
94	1.300	-0.020072	0.094451	-7.159	7.273	15.752	0.056160
95	0	-0.006242	0.074536	-2.251	8.398	11.771	-0.045544
95	0.450	-0.006242	0.074536	-2.251	8.398	10.759	-0.012013
95	0.450	-0.006242	0.074536	-8.121	8.398	10.758	-0.011993
95	1.300	-0.006242	0.074536	-8.121	8.398	3.856	0.051352
96	0	1.55E-14	1.35E-11	1.94E-13	-1.31E-14	8.62E-14	-1.67E-12
96	0.500	1.55E-14	1.35E-11	1.94E-13	-1.31E-14	1.83E-13	5.09E-12
118	0	-0.297004	0.008031	1.700	-0.755571	-6.227	-0.029052
118	1.300	-0.297004	0.008031	1.700	-0.755571	-4.017	-0.018612
119	0	-0.282596	0.037119	3.016	-0.990281	-3.782	-0.046622
119	1.300	-0.282596	0.037119	3.016	-0.990281	0.138719	-0.000368
120	0	-0.259164	0.047407	2.571	-0.885716	0.180652	-0.052862
120	1.300	-0.259164	0.047407	2.571	-0.885716	4.044	0.008747
121	0	-0.230761	0.052339	2.796	-0.712264	4.122	-0.053431
121	1.300	-0.230761	0.052339	2.796	-0.712264	7.756	0.014604
122	0	-0.200389	0.054357	2.514	-0.445641	7.895	-0.051674
122	1.300	-0.200389	0.054357	2.514	-0.445641	11.162	0.018790
123	0	-0.169481	0.054662	1.994	0.022766	11.324	-0.045123
123	1.300	-0.169481	0.054662	1.994	0.022766	13.917	0.021938
124	0	-0.137994	0.053975	1.060	0.785441	13.995	-0.045636
124	1.300	-0.137994	0.053975	1.060	0.785441	15.373	0.024330
125	0	-0.104570	0.052587	-0.666001	1.764	15.017	-0.042386
125	1.300	-0.104570	0.052587	-0.666001	1.764	14.151	0.025974
126	0	-0.068254	0.050111	-2.475	2.380	13.007	-0.038319
126	1.300	-0.068254	0.050111	-2.475	2.380	9.790	0.026825
127	0	-0.034843	0.038694	-4.058	2.354	7.659	-0.028783
127	1.300	-0.034843	0.038694	-4.058	2.354	2.383	0.021539
128	0	-8.05E-14	-5.35E-13	-2.36E-13	-6.82E-15	5.19E-14	6.56E-13
128	0.500	-8.05E-14	-5.35E-13	-2.36E-13	-6.82E-15	-6.61E-14	3.88E-13
150	0	-0.368224	-0.013698	-0.187710	-0.093445	-1.721	-0.305014
150	1.300	-0.368224	-0.013698	-0.187710	-0.093445	-1.965	-0.322821
151	0	-0.349592	0.028507	0.066596	-0.127315	-0.778654	-0.169270
151	1.300	-0.349592	0.028507	0.066596	-0.127315	-0.692079	-0.132211

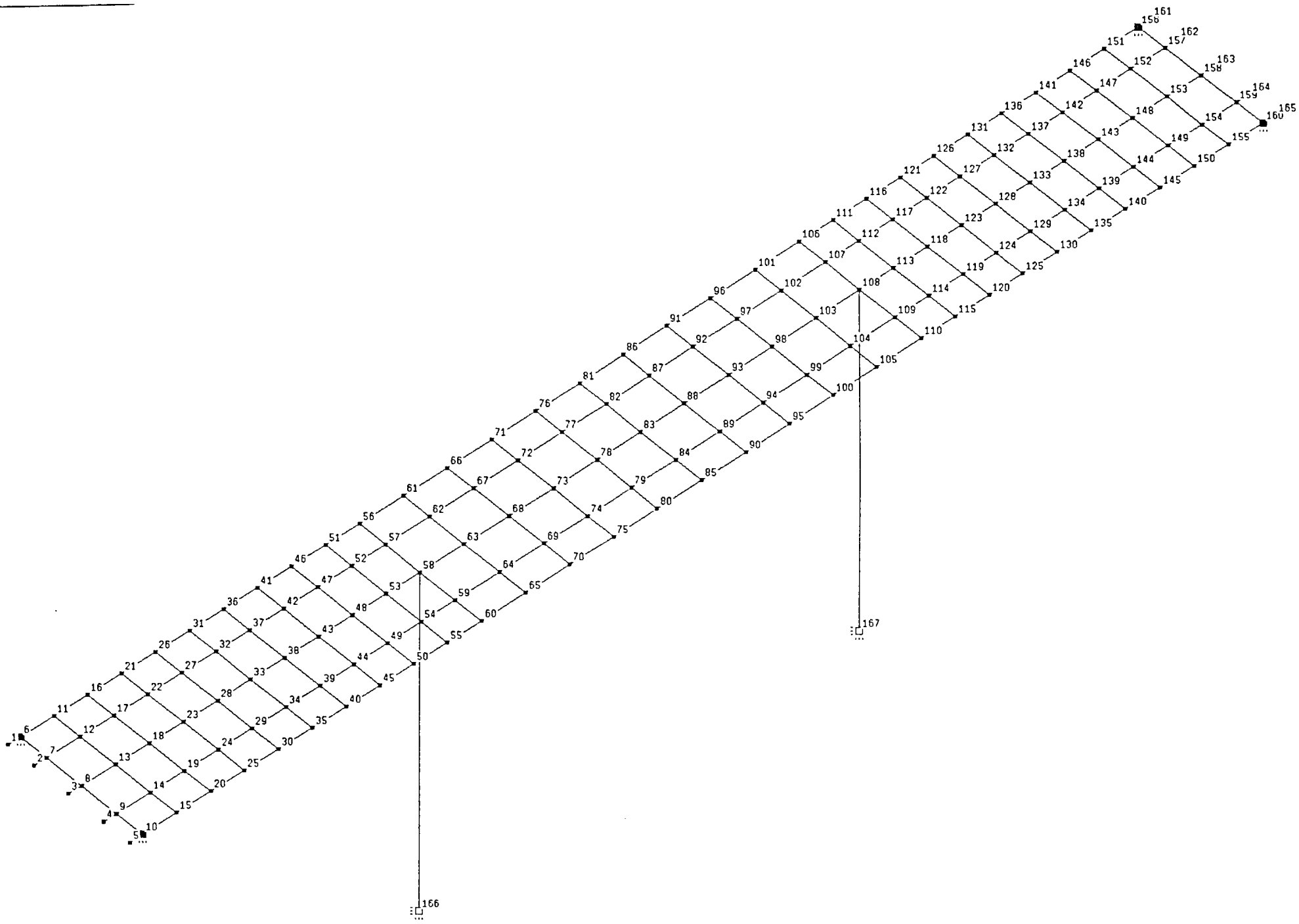
SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
152	0	-0.318417	0.071726	0.352297	-0.118634	0.562924	0.021610
152	1.300	-0.318417	0.071726	0.352297	-0.118634	1.021	0.114854
153	0	-0.282022	0.089460	0.464671	-0.093340	2.081	0.237365
153	1.300	-0.282022	0.089460	0.464671	-0.093340	2.685	0.353662
154	0	-0.243102	0.101582	0.542715	-0.055568	3.460	0.434459
154	1.300	-0.243102	0.101582	0.542715	-0.055568	4.166	0.566515
155	0	-0.203337	0.125521	0.710379	0.007606	4.476	0.581328
155	1.300	-0.203337	0.125521	0.710379	0.007606	5.399	0.744504
156	0	-0.164110	0.172385	1.049	0.105575	4.917	0.648387
156	1.300	-0.164110	0.172385	1.049	0.105575	6.261	0.872487
157	0	-0.127035	0.234467	1.512	0.216189	4.645	0.615841
157	1.300	-0.127035	0.234467	1.512	0.216189	6.611	0.920648
158	0	-0.093721	0.209195	1.360	0.268788	3.940	0.519954
158	1.300	-0.093721	0.209195	1.360	0.268788	5.707	0.791907
159	0	-0.064576	-0.067689	-0.739888	0.218566	2.901	0.370254
159	1.300	-0.064576	-0.067689	-0.739888	0.218566	1.939	0.282258
160	0	6.69E-14	-5.29E-12	2.62E-12	-1.08E-16	-1.03E-12	9.50E-13
160	0.500	6.69E-14	-5.29E-12	2.62E-12	-1.08E-16	2.79E-13	-1.69E-12
	min:	-0.368224	-0.858537	-22.896	-1.583	-15.359	-2.337
	max:	0.407944	3.261	7.982	8.398	28.709	1.406

2.3.3. Cálculo de las armaduras pasivas transversales. Método de Wood.

Scale 1 : 142.9
Structure - NUDOS

ARMADURAS



LOAD COMBINATION DY: 'COMB1'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION DZ: 'COMB2'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
12	1.5000			VEHICULO HIPOTESIS 12
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EA: 'COMB3'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
13	1.5000			VEHICULO HIPOTESIS 13
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EB: 'COMB4'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
14	1.5000			VEHICULO HIPOTESIS 14
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EC: 'COMB5'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
15	1.5000			VEHICULO HIPOTESIS 15
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION ED: 'COMB6'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
20	1.5000			VEHICULO HIPOTESIS 20
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EE: 'COMB7'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
21	1.5000			VEHICULO HIPOTESIS 21
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMEINATION EF: 'COMB8'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
22	1.5000			VEHICULO HIPOTESIS 22
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EG: 'COMB9'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
23	1.5000			VEHICULO HIPOTESIS 23
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EH: 'COMB10'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
24	1.5000			VEHICULO HIPOTESIS 24
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EI: 'COMB11'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EJ: 'COMB12'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EK: 'COMB13'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
12	1.5000			VEHICULO HIPOTESIS 12
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EL: 'COMB14'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
13	1.5000			VEHICULO HIPOTESIS 13
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EM: 'COMB15'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
14	1.5000			VEHICULO HIPOTESIS 14
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EN: 'COMB16'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
15	1.5000			VEHICULO HIPOTESIS 15
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

RESUMEN DE ARMADURAS DE WOOD-ARMER

NUDO	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
8	0 a 1.15	15.98	26.26	14.26	15.32
13	1.15 a 2.45	22.56	18.33	1.75	7.14
18	2.45 a 3.75	29.13	13.59	0.00	7.22
23	3.75 a 5.05	34.73	12.47	1.08	6.17
28	5.05 a 6.35	42.76	10.29	1.14	8.28
33	6.35 a 7.65	40.00	9.34	1.33	8.34
38	7.65 a 8.95	32.21	8.07	1.87	9.61
43	8.95 a 10.25	25.57	7.03	3.48	11.92
48	10.25 a 11.55	16.72	6.70	12.99	14.36
53	11.55 a 12.85	3.97	6.49	25.79	22.28

Nudo	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
58	12.85 a 14.55	2.90	3.97	49.40	33.91
63	14.55 a 16.25	9.00	5.74	15.98	17.16
68	16.25 a 17.95	22.18	4.64	1.40	6.18
73	17.95 a 19.65	35.80	3.61	0.00	3.20
78	19.65 a 21.35	44.43	2.03	0.00	2.56
83	21.35 a 23.05	47.04	2.02	0.00	2.47
88	23.05 a 24.75	43.86	2.62	0.00	2.57
93	24.75 a 26.45	34.69	3.55	0.00	3.30
98	26.45 a 28.15	20.59	4.66	1.96	7.14
103	28.15 a 29.85	4.93	6.41	18.54	18.49

Nudo	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
108	29.85 a 31.15	1.85	4.32	48.90	31.15
113	31.15 a 32.45	3.28	5.90	24.11	18.90
118	32.45 a 33.75	11.37	5.78	11.31	12.44
123	33.75 a 35.05	18.10	6.05	2.88	10.53
128	35.05 a 36.35	23.93	7.00	1.37	8.00
133	36.35 a 37.65	27.47	7.54	0.88	6.90
138	37.65 a 38.95	28.48	8.01	0.67	6.84
143	38.95 a 40.25	26.69	8.69	1.02	7.35
148	40.25 a 41.55	22.89	10.24	2.10	8.64
153	41.55 a 42.85	18.19	14.11	5.49	8.70
158	42.85 a 44	11.00	17.46	9.87	4.70

Armadura inferior longitudinal: $47.04 \frac{cm^2}{m} \times 3.70m = 174.05 cm^2$

centro Vano $\phi 25/0.10 \rightarrow 18\phi 25 + 18\phi 25$ ($176.76 cm^2$)

Armadura inferior longitudinal base: $22.56 \frac{cm^2}{m} \times 3.60m = 83.50 cm^2$

$\phi 25/0.20 \rightarrow 18\phi 25$

Armadura sup. longitudinal apoyo: $49.40 cm^2/m$

En el nicho central: $\phi 20/0.20 + \phi 25/0.20 + 14\phi 20$
(4.70m)

Voladizos

Armadura sup. longitudinal base: $15.70 cm^2/m$

269.14.

2.3.4. Riostras sobre pilas y estribos

lane (2-D) frame -analysis

STRUCTURAL - DATA

RIOSTRA ESTRIBOS

roject title :

O I N T D A T A : (9 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000			
2	0.850000	0.000000	0.000000	B B	F	
3	1.850000	0.000000	0.000000			
4	2.850000	0.000000	0.000000			
5	3.850000	0.000000	0.000000			
6	4.850000	0.000000	0.000000			
7	5.850000	0.000000	0.000000			
8	6.850000	0.000000	0.000000	F B	F	
9	7.700000	0.000000	0.000000			

A R D A T A : (8 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	2	0.850000	RIOSTRAE			oS
2	2	3	1.000000	RIOSTRAE			oS
3	3	4	1.000000	RIOSTRAE			oS
4	4	5	1.000000	RIOSTRAE			oS
5	5	6	1.000000	RIOSTRAE			oS
6	6	7	1.000000	RIOSTRAE			oS
7	7	8	1.000000	RIOSTRAE			oS
8	8	9	0.850000	RIOSTRAE			oS

oS = Bars without shear deformation

ROSS SECTION VALUES:

CS-Name	Ax [M2] / zl [M1]	Iy [M4] / zu [M1]	Fz [M2]
RIOSTRAE	6.7500E-01 / -0.4500	4.5562E-02 / 0.4500	5.6250E-01

CS-Name	Ax [M2] / zl [M1]	Iy [M4] / zu [M1]	Fz [M2]

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 .. 8	3.5500E+06	1.3000E+06

STS-Run ok

Load case 1: carga permanente

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-9.950		Stab 1 8 2 .. 7

Load case 2: Sobrecarga maxima

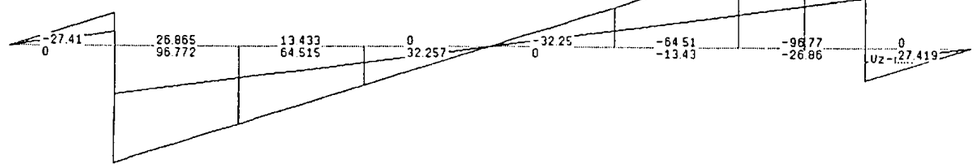
Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-12.550		Stab 1 8 2 .. 7

ENVELOPE SPECIFIC.: AB ''

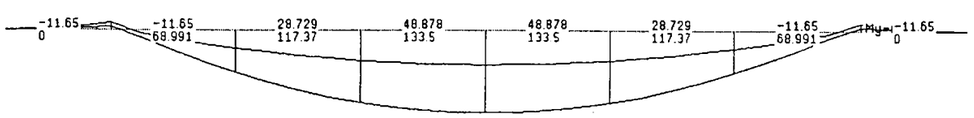
Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		carga permanente
B	PLUS	2	1.500		Sobrecarga maxima

Scale 1 : 50.2
Int. Forces envelope Vz, GWSP AB, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 1.00E-02
  min: -9.68E+01 max: 4.03E+01 [t]
- Envelope Shear force Vz-max, Scale 1.00E-02
  min: -4.03E+01 max: 9.68E+01 [t]
- Text envelopes [t]

Vd=82.64t



Scale 1 : 50.2
Int. Forces envelope My, GWSP AB, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -1.17E+01 max: 5.56E+01 [tm]
- Envelope Moment My-max, Scale 5.00E-03
  min: -4.85E+00 max: 1.34E+02 [tm]
- Text envelopes [tm]



Características mecánicas Sección "RIOSTRAE" (sin coef. homogeneiz.)

Area	Ax = 6.750E3 cm2			
Momento de inercia	Iy = 4.556E6 cm4	Iz = 3.164E6 cm4	Ip = 7.720E6 cm4	
Const. de torsión			Ix = 6.276E6 cm4	
Momento estático	Zy =151.88E3 cm3	Zz = 126.56E3 cm3		
Baricentro	ys = 0.00 cm	zs = 45.00 cm	Angulo= 0.0 Grad	
Dist. al borde	yl = -37.50 cm	yr = 37.50 cm		
	zo = 45.00 cm	zu = -45.00 cm		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSTRAE" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	6750.000	330.000	6.28E+06	1)

Puntos de contorno [cm]:
1 37.50 0.00 2 37.50 90.00 3 -37.50 90.00
4 -37.50 0.00

Armadura "B1" As-tot =2.00 cm2 (0.03 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-33.50	86.00
					33.50	86.00
BOTTOM / RQS	AEH500	10.0	2	1.00	-33.50	4.00
					33.50	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	75.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	67.00	-33.50	45.00	33.50	45.00
SWT	Torsion	75.00	90.00	0.00	0.00	0.00	90.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "RIOSTRAE"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	1335.00	0.00	

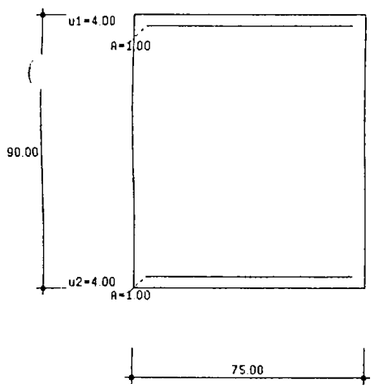
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

o Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-33.50	86.00	33.50	86.00	1.00	----	1.00
. AEH500	-33.50	4.00	33.50	4.00	1.00	38.77	38.77

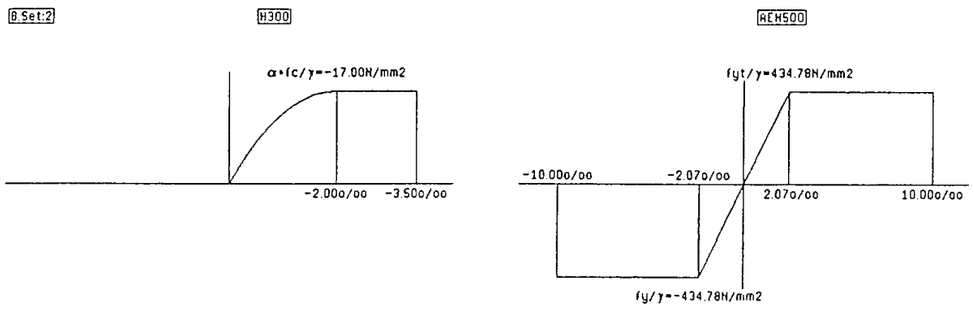
←7φ32

'nx.x/h = 0.20 As-top/bot = 1.00/38.77 As = 0.59 % = 39.77

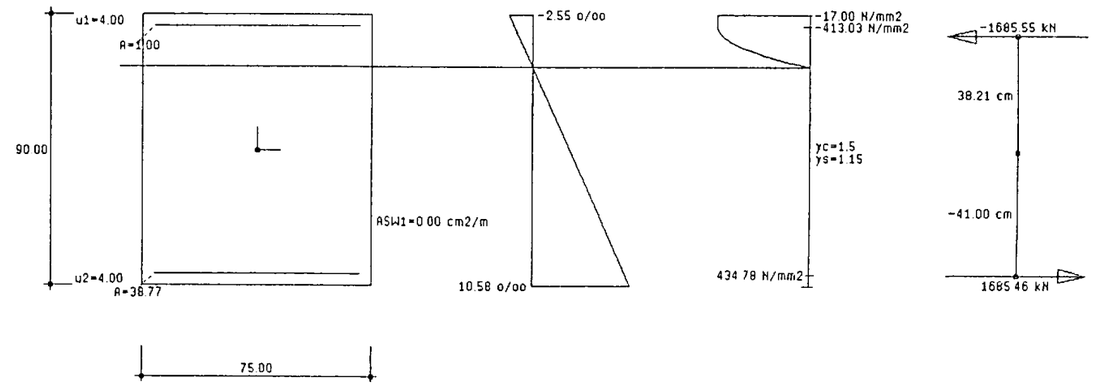
ɛcción RIOSTRAE



Material acorde a la sección: "RIOSTRAE"



Dimensionamiento, Sección "RIOSTRAE"



Características mecánicas Sección "RIOSTRAE" (sin coef. homogeneiz.)

Area Ax = 6.750E3 cm2
Momento de inercia Iy = 4.556E6 cm4 Iz = 3.164E6 cm4 Ip = 7.720E6 cm4
Const. de torsión Ix = 6.276E6 cm4
Momento estático Zy =151.88E3 cm3 Zz = 126.56E3 cm3
Baricentro ys = 0.00 cm zs = 45.00 cm Angulo= 0.0 Grad
Dist. al borde yl = -37.50 cm yr = 37.50 cm
zo = 45.00 cm zu = -45.00 cm

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSTRAE" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	6750.000	330.000	6.28E+06	1)

Puntos de contorno [cm]:
1 37.50 0.00 2 37.50 90.00 3 -37.50 90.00
4 -37.50 0.00

Armadura "B1" As-tot =39.77 cm2 (0.59 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-33.50	86.00
					33.50	86.00
BOTTOM / RQS	AEH500	10.0	2	38.77	-33.50	4.00
					33.50	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	75.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	67.00	-33.50	45.00	33.50	45.00
SWT	Torsion	75.00	90.00	0.00	0.00	0.00	90.00

Punto de resultados:

Comb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
SW1	Res.Kmb.			
Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)				

Dimensionamiento a flexión: Viga Sección "RIOSTRAE"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-116.50	0.00	

Parámetros de cálculo empleados:

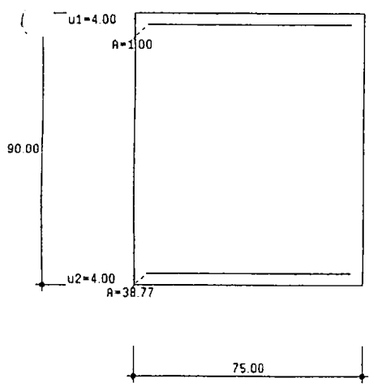
Set Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

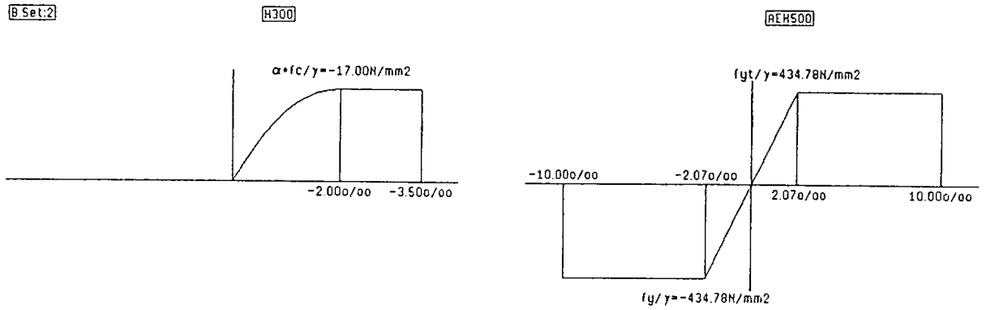
No	Armad. long.	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1	AEH500	-33.50	86.00	33.50	86.00	1.00	3.17	3.17
	AEH500	-33.50	4.00	33.50	4.00	1.00	----	1.00

Max.x/h = 0.05 As-top/bot = 3.17/1.00 As = 0.06 % = 4.17

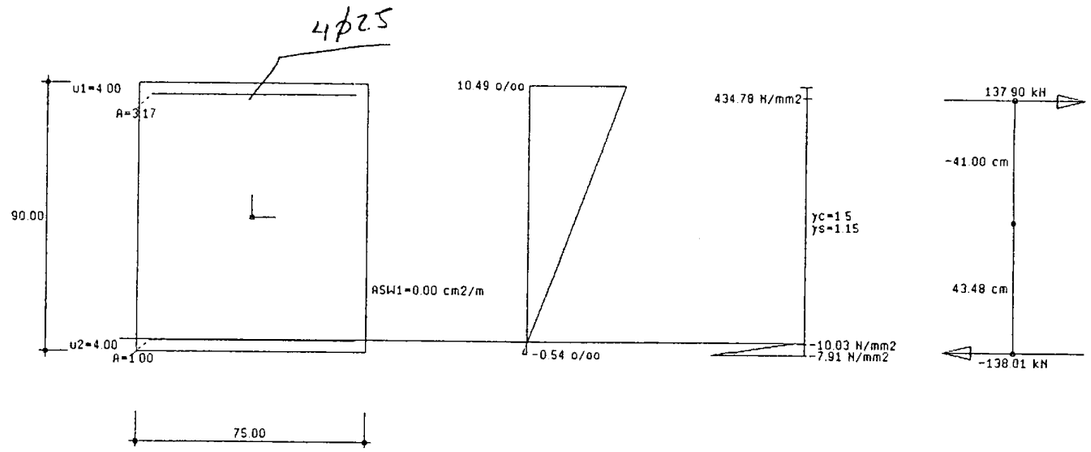
Sección RIOSTRAE



Material acorde a la sección: "RIOSTRAE"



Dimensionamiento,Sección "RIOSTRAE"



CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título: Riotra de pilas
Fecha: 24/5/01 13.48.28

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 200 cm, alto 90 cm y canto 86 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 247 T
Cortante reducido a un canto útil del borde del apoyo = 247 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 98 cm2 lo que implica una cuantía geométrica igual a 0.00570
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 247 T < Vu1 = 1032.00 T
Es necesario disponer armadura a cortante al ser Vrd = 247.00 T > Vu2 = 80.42 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°
Vcu = 67.01 T. Vsu= 179.99 T.
As cálculo = 58.14 cm2/m. As mínima = 20.00 cm2/m
Mínimo de armadura a disponer = 58.14 cm2/m

$$A_{st} = \frac{0.85\,m}{0.10\,m} \cdot 4 \times 2 \times 1.13\,cm^2 = 78.19\,cm^2$$

4 c φ12 /0.10

2.3.5. Reacciones y cálculo de neoprenos en planta

PS 315+880

CARACTERÍSTICAS DE LOS NEOPRENOS

APOYOS	DIMENSIONES	δadm.	OBSERVACION
	mm	mm	
E-1	200 x 400 x 52 (37)	25.9	
E-2	200 x 400 x 52 (37)	25.9	

RESUMEN DE LOS DESPLAZAMIENTOS DE LOS APARATOS DE APOYO

APOYOS	DESPLAZAMIENTOS (mm)							
	Reológicos	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{H1}	δ_{H2}	δadm.
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm	mm
E-1	6.42	8.00	6.65	0.00	21.00	18.95	25.93	25.90
E-2	6.42	8.00	6.65	0.00	21.00	18.95	25.93	25.90

$$\delta_{H1} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (0{,}5 \times 0.6 \times \delta_{V\ C/SC})^2)^{0,5}$$

$$\delta_{H2} = ((\delta_R + 0.6 \times \delta_T + 0.6\ \delta_F)^2 + (\delta_{V\ C/SC})^2)^{0,5}$$

RESUMEN DE LOS DESPLAZAMIENTOS DE LAS JUNTAS DE DILATACION

APOYOS	DESPLAZAMIENTOS (mm)			δ_{MAX}	δ_{MIN}
	Reológicos	Térmicos	Frenado	mm	mm
	δ_R	δ_T	δ_F		
E-1	6.42	8.00	6.65	21	15
E-2	6.42	8.00	6.65	21	15

J.D. ESTRIBOS DE 30 mm DE RECORRIDO, CON 15 mm DE APERTURA INICIAL

COMPROBACION DE TENSIONES DE LOS APARATOS DE APOYO

ESTRIBO 1 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) :	100.9	σ_{max} (tm^{-2}) =	1261	$< 1500\ tm^{-2}$
REACCION MINIMA (t):	16.00	σ_{min} (tm^{-2}) =	200	$> 200\ tm^{-2}$

ESTRIBO 2 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) :	101.12	σ_{max} (tm^{-2}) =	1264	$< 1500\ tm^{-2}$
REACCION MINIMA (t):	16.00	σ_{min} (tm^{-2}) =	200	$> 200\ tm^{-2}$

RESUMEN DE LAS FUERZAS HORIZONTALES

APOYOS	FUERZAS HORIZONTALES (t)					
	Reológicas	Térmicas	Frenado	Viento (s/S.C.)	Viento (c/S.C.)	Resultante
	F_R	F_T	F_F	$F_{V\ S/SC}$	$F_{V\ C/SC}$	F_{FT}
E-1	1.45	1.80	1.53	1.90	4.90	4.3
E-2	1.45	1.80	1.53	1.90	4.90	4.3

CALCULO DE LAS RIGIDECES PARA STATIK3

APOYOS	RIGIDECES HORIZONTALES (t/m)						
	ALTURA PILAR	I PILAR	E PILAR	F APOYO	T APOYO	K LONG	K TRANSV
E-1	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59
E-2	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59

RESUMEN DE LOS DESPLAZAMIENTOS TOTALES (APOYOS+PILARES)

APOYOS	DESPLAZAMIENTOS (mm)						
	Reológicos+Acort. Elas	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{H1}	δ_{H2}
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm
E-1	6.42	8.00	6.65	0.00	21.00	18.95	25.93
E-2	6.42	8.00	6.65	0.00	21.00	18.95	25.93

$\delta_{H1} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (0{,}5 \times 0.6 \times \delta_{V\ C/SC})^2)^{0,5}$

$\delta_{H2} = ((\delta_R + 0.6 \times \delta_T + 0.6\ \delta_F)^2 + (\delta_{V\ C/SC})^2)^{0,5}$

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
E	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
AT	PL.PERM	5	1.000	RETRACCION
AU	PLUS	6	1.000	SOB UNIF 1
AV	PLUS	7	1.000	SOB UNIF 2
AW	PLUS	8	1.000	SOB UNIF 3
AX	PLUS	9	1.000	SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OF	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OF	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OF	30	1.000	VEHICULO POSICION 30
DG	OF	31	1.000	VEHICULO POSICION 31
DH	OF	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OF	35	1.000	VEHICULO POSICION 35
DL	OF	36	1.000	VEHICULO POSICION 36
DM	OF	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

COMPROBACION DE TENSIONES DE LOS APARATOS DE APOYO

ESTRIBO 1 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) :	100.9	σ_{max} (tm^{-2}) =	1261 < 1500 tm^{-2}
REACCION MINIMA (t):	16.00	σ_{min} (tm^{-2}) =	200 > 200 tm^{-2}

ESTRIBO 2 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) :	101.12	σ_{max} (tm^{-2}) =	1264 < 1500 tm^{-2}
REACCION MINIMA (t):	16.00	σ_{min} (tm^{-2}) =	200 > 200 tm^{-2}

RESUMEN DE LAS FUERZAS HORIZONTALES

APOYOS	FUERZAS HORIZONTALES (t)					
	Reológicas	Térmicas	Frenado	Viento (s/S.C.)	Viento (c/S.C.)	Resultante
	F_R	F_T	F_F	$F_{V\ S/SC}$	$F_{V\ C/SC}$	F_{FT}
E-1	1.45	1.80	1.53	1.90	4.90	4.3
E-2	1.45	1.80	1.53	1.90	4.90	4.3

CALCULO DE LAS RIGIDECES PARA STATIK3

APOYOS	RIGIDECES HORIZONTALES (t/m)						
	ALTURA PILAR	I PILAR	E PILAR	F APOYO	T APOYO	K LONG	K TRANSV
E-1	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59
E-2	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59

RESUMEN DE LOS DESPLAZAMIENTOS TOTALES (APOYOS+PILARES)

APOYOS	DESPLAZAMIENTOS (mm)						
	Reológicos+Acort. Elas	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{H1}	δ_{H2}
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm
E-1	6.42	8.00	6.65	0.00	21.00	18.95	25.93
E-2	6.42	8.00	6.65	0.00	21.00	18.95	25.93

$\delta_{H1} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (0{,}5 \times 0.6 \times \delta_{V\ C/SC})^2)^{0,5}$

$\delta_{H2} = ((\delta_R + 0.6 \times \delta_T + 0.6\ \delta_F)^2 + (\delta_{V\ C/SC})^2)^{0,5}$

CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título: Riotra de estribos
Fecha: 24/5/01 13.46.18

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 75 cm, alto 90 cm y canto 86 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 96 T
Cortante reducido a un canto útil del borde del apoyo = 80 T
Axil de cálculo (Tracciones positivas) = -50 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 56 cm2 lo que implica una cuantía geométrica igual a 0.00868
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 96 T < Vu1 = 387.00 T
Es necesario disponer armadura a cortante al ser Vrd = 80.00 T > Vu2 = 42.01 T
Valores de las tensiones: Eje X = -7.41 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 41.80°
Vcu = 29.30 T. Vsu= 50.70 T.
As cálculo = 16.38 cm2/m. As mínima = 7.50 cm2/m
Mínimo de armadura a disponer = 16.38 cm2/m

$$A_{st} = \frac{0.865\,m}{0.15\,m} \times 2 \times 2 \times 0.78\,cm^2 = 18\,cm^2$$

2 cercos ϕ 10 a 0.15 m

Plane (2-D) frame -analysis

STRUCTURAL - DATA

RIOSTRA PILAS

Project title :

JOINT DATA : (7 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000	B	B	
2	0.391667	0.000000	0.000000			
3	0.783333	0.000000	0.000000			
4	1.175000	0.000000	0.000000			
5	1.566667	0.000000	0.000000			
6	1.958333	0.000000	0.000000			
7	2.350000	0.000000	0.000000			

BAR DATA : (6 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	2	0.391667	RIOSPIL			oS
2	2	3	0.391667	RIOSPIL			oS
3	3	4	0.391667	RIOSPIL			oS
4	4	5	0.391667	RIOSPIL			oS
5	5	6	0.391667	RIOSPIL			oS
6	6	7	0.391667	RIOSPIL			oS

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2]	Iy [M4]	Fz [M2]
	zl [M1]	zu [M1]	
RIOSPIL	1.8000E+00	1.2150E-01	1.5000E+00
	-0.4500	0.4500	

CS-Name	Ax [M2]	Iy [M4]	Fz [M2]
	zl [M1]	zu [M1]	

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 .. 6	3.5500E+06	1.3000E+06

STS-Run ok

==========
Load case 1: cargas permanentes
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-50.280		Stab 1 .. 6

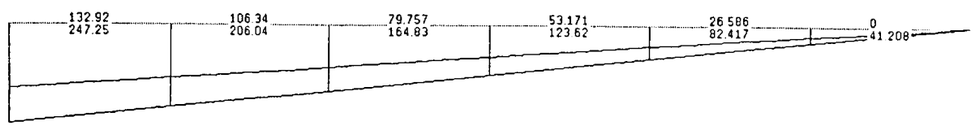
==========
Load case 2: sobrecargas maximas
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-24.890		Stab 1 .. 6

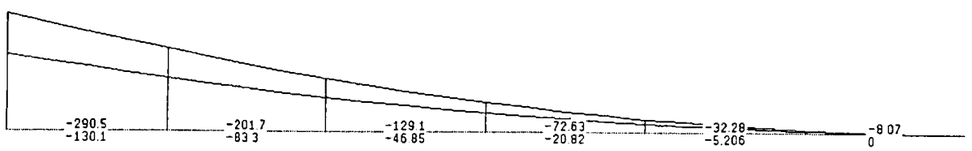
ENVELOPE SPECIFIC.: AA ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		cargas permanentes
B	PLUS	2	1.500		sobrecargas maximas

Scale 1 : 15.3
Int. Forces envelope Vz, GWSP AA, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 1.00E-03
  min: 2.66E-07 max: 1.60E+02 [t]
- Envelope Shear force Vz-max, Scale 1.00E-03
  m: 4.12E-07 max: 2.47E+02 [t]
- Te.. envelopes [t]



Scale 1 : 15.3
Int. Forces envelope My, GWSP AA, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 1.00E-03
  min: -2.91E+02 max: 2.65E-13 [tm]
- Envelope Moment My-max, Scale 1.00E-03
  min: -1.87E+02 max: 1.12E-12 [tm]
- 1 envelopes [tm]



Características mecánicas Sección "RIOSPIL" (sin coef. homogeneiz.)

Area	Ax = 18.00E3 cm2			
Momento de inercia	Iy = 12.15E6 cm4	Iz = 60.00E6 cm4	Ip = 72.15E6 cm4	
Const. de torsión			Ix = 34.87E6 cm4	
Momento estático	Zy =405.00E3 cm3	Zz = 900.00E3 cm3		
Baricentro	ys = -0.00 cm	zs = 45.00 cm	Angulo= 0.0 Grad	
Dist. al borde	yl = -100.00 cm	yr = 100.00 cm		
	zo = 45.00 cm	zu = -45.00 cm		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSPIL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	18000.0	580.000	3.49E+07	1)

Puntos de contorno [cm]:
1 100.00 0.00 2 100.00 90.00 3 -100.00 90.00
4 -100.00 0.00

Armadura "B1" As-tot =2.00 cm2 (0.01 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-96.00	86.00
					96.00	86.00
BOTTOM / RQS	AEH500	10.0	2	1.00	-96.00	4.00
					96.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	200.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	192.00	-96.00	45.00	96.00	45.00
SWT	Torsion	200.00	90.00	0.00	0.00	0.00	90.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "RIOSPIL"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-2905.00	0.00	

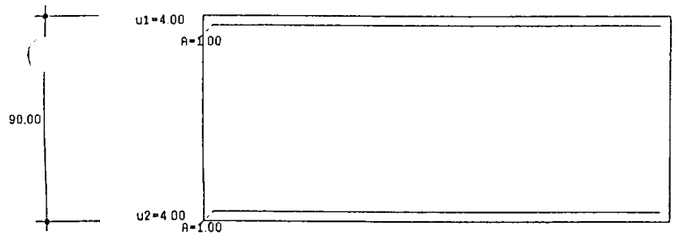
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

o Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-96.00	86.00	96.00	86.00	1.00	83.30	83.30
AEH500	-96.00	4.00	96.00	4.00	1.00	----	1.00

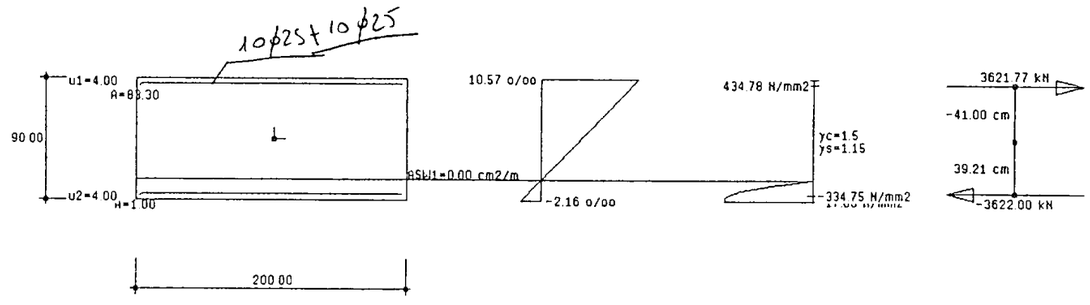
ax.x/h = 0.18 As-top/bot = 83.30/1.00 As = 0.47 % = 84.30

$(10\phi25 + 10\phi25) = 98.20\,cm^2$

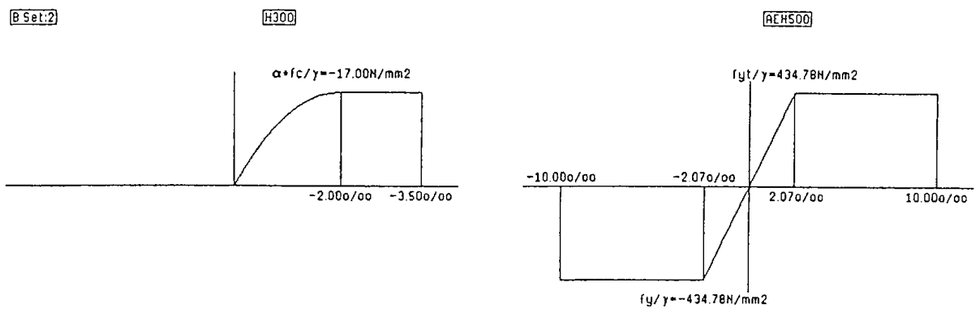
ección RIOSPIL



Dimensionamiento, Sección "RIOSPIL"



tat al acorde a la sección: "RIOSPIL"



FC	PLUS	63	0.300000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	20.036			
	1.761	1.141	100.469			
	Min: AP AR AS AT AX AY EU...			Max: A B D E F G J AL AN AO		
10	2.283	-3.686	16.626			
	-0.568555	1.136	97.227			
	Min: AP AR AS AT AU AV BC...			Max: A B D G H I AE AN AO		
156	-1.091	2.568	20.407			
	1.761	-2.257	100.840			
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.		
160	2.283	2.571	16.997			
	-0.568596	-2.254	97.599			
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...		
166	3.374	-1.935	218.118	15.604	23.708	-0.028301
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09
	Min: CF CH CI CL DC DN DG...			Max: DS DT DV DW DX DY EM...		
167	3.374	-1.829	219.077	9.951	23.708	0.028301
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...		

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	26.641			
	2.283	1.009	60.789			
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F M AL AN		
10	-1.090	1.006	57.547			
	2.284	-3.686	23.231			
	Min: A C D H I AE AN			Max: AP AQ AS AT AU AV AW...		
156	-1.091	2.567	27.013			
	2.283	-2.125	61.160			
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F O AK AL AN		
160	-1.091	-2.122	57.919			
	2.284	2.570	23.603			
	Min: A C D H I AG AK AN			Max: AP AQ AS AT AU AV AW...		
166	-2.615	3.395	313.122	-17.884	-3.159	0.221212
	5.989	-4.252	319.171	36.214	26.867	-0.249513
	Min: A C D E F M AN			Max: AP AQ AS AT AW AX AY...		
167	-2.615	-7.158	314.081	43.438	-3.159	-0.221212

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
	5.989	0.488267	320.130	-10.660	26.867	0.249513
	Min: A C D E F O AK AN			Max: AP AQ AS AT AW AX AY...		

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-0.167731	-3.836	34.498			
	0.835704	1.280	53.022			
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DO DQ...		
10	1.360	-3.839	31.088			
	0.356995	1.277	49.781			
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR		
156	0.835745	-2.396	53.394			
	-0.167690	2.720	34.870			
	Min: CF CH CI CL DL DN DG...			Max: DS DT DV DW DX DY ET...		
160	0.356954	-2.393	50.152			
	1.360	2.723	31.460			
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EE...		
166	3.374	-8.324	297.858	52.598	23.708	-0.028301
	5.36E-09	6.034	296.749	-29.975	2.74E-08	-1.18E-08
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
167	5.35E-09	-9.797	297.708	55.530	2.73E-08	1.16E-08
	3.374	4.560	298.816	-27.044	23.708	0.028301
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

DEFORMATIONS: **
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-9.927	-4.388	-1.45E-08	-0.001116	0.000178	-1.26E-05
		4.745	16.012	-2.36E-09	-0.000181	0.000186	2.63E-05
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...		
2	1.300	-9.912	15.434	-1.030	-0.000782	-7.75E-05	-1.13E-05
		4.718	-4.186	-0.728517	-0.000510	0.000182	1.76E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
31	0	-9.912	-10.583	-1.061	0.000805	-7.66E-05	1.14E-05
		4.718	9.037	-0.759594	0.000534	0.000189	-1.75E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		
31	1.300	-9.927	9.239	-1.74E-08	0.001141	0.000180	1.29E-05
		4.745	-11.161	-3.23E-09	0.000205	0.000188	-2.61E-05
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...		

DEFORMATIONS: **
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
75	0	-9.759	-1.872	-1.330	-2.92E-05	-0.001310	-1.79E-05
		4.522	10.104	-1.311	5.37E-06	0.001076	2.09E-05
		Min: A E D E F G M AL AN AO			Max: AP AR AS AT AX AY EU...		
75	1.300	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05
		Min: A E D E F G M AL AN AO			Max: AP AR AS AT AX AY EU...		
76	0	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05
		Min: A E D E F G M AL AN AO			Max: AP AR AS AT AX AY EU...		
76	1.700	-9.702	8.576	-3.304	-0.001163	-0.001535	-2.04E-05
		4.457	-1.219	-2.834	-0.000935	0.001276	2.28E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
85	0	-9.702	-3.725	-3.248	0.001143	-0.001535	2.04E-05
		4.457	6.071	-2.779	0.000916	0.001276	-2.28E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		
85	1.700	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05
		Min: A E D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...		
86	0	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05
		Min: A B D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...		
86	1.300	-9.759	6.724	-1.391	-2.60E-06	-0.001310	1.79E-05
		4.522	-5.252	-1.371	-3.72E-05	0.001078	-2.09E-05
		Min: A E D E F G O AK AL AN.			Max: AP AR AS AT AX AY BW...		
130	0	-9.931	16.026	-1.74E-09	-0.000134	-0.000184	-2.10E-05
		4.741	-4.375	-1.39E-08	-0.001072	-0.000176	1.79E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
130	1.300	-9.911	-4.173	-0.659427	-0.000459	-0.000213	-1.24E-05
		4.719	15.447	-0.965400	-0.000733	5.27E-05	1.65E-05
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...		
159	0	-9.911	9.024	-0.690504	0.000482	-0.000214	1.23E-05
		4.719	-10.596	-0.996477	0.000756	5.17E-05	-1.66E-05
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...		
159	1.300	-9.931	-11.174	-2.41E-09	0.000158	-0.000186	2.07E-05
		4.741	9.226	-1.66E-08	0.001096	-0.000178	-1.82E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

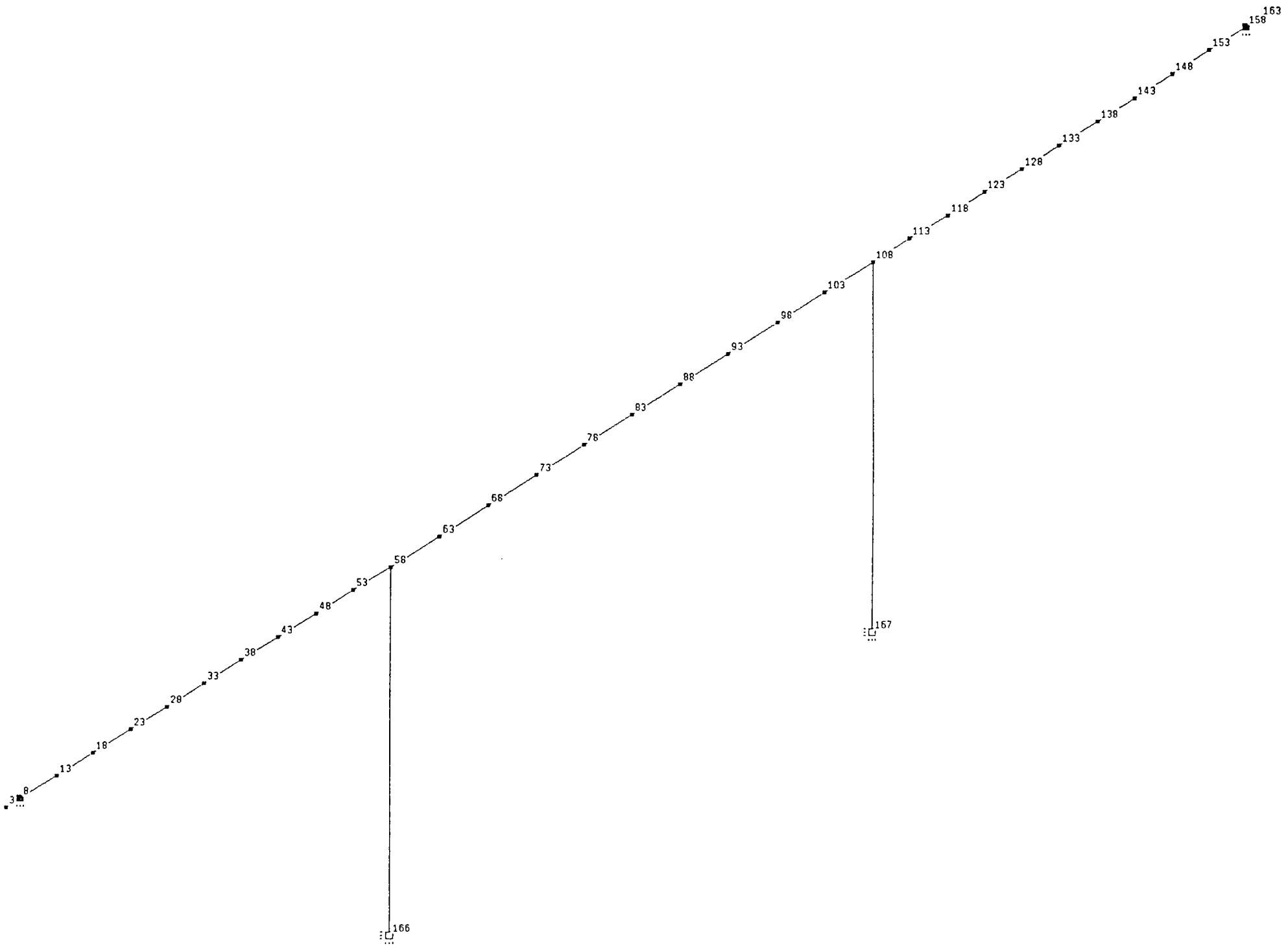
Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-3.632	-5.566	-1.43E-08	-0.001098	0.000283	2.93E-05
		0.729265	16.677	-9.22E-09	-0.000709	0.000154	-2.00E-05
		Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...			
2	1.300	-3.666	-5.281	-1.474	-0.001105	0.000194	2.26E-05
		0.755751	16.016	-0.908772	-0.000646	7.11E-05	-2.06E-05
		Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...			
31	0	0.755785	-11.165	-0.939849	0.000669	7.20E-05	2.07E-05
		-3.666	10.132	-1.505	0.001128	0.000195	-2.25E-05
		Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...			
31	1.300	0.729085	-11.826	-1.07E-08	0.000733	0.000156	2.02E-05
		-3.634	10.417	-1.63E-08	0.001122	0.000285	-2.91E-05
		Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...			
75	0	-5.237	-2.959	-2.341	0.000825	-0.000232	2.96E-06
		-1.03E-09	10.666	-0.931812	-8.42E-05	7.32E-13	7.37E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
75	1.300	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
76	0	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
76	1.700	-5.245	-2.305	-1.599	-0.000298	-0.000260	2.44E-06
		-4.04E-09	9.138	-2.679	-0.000971	6.64E-13	1.02E-12
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
85	0	-3.98E-09	-4.286	-2.623	0.000951	6.61E-13	-1.01E-12
		-5.245	7.157	-1.544	0.000279	-0.000260	-2.44E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
85	1.700	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
86	0	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
86	1.300	-1.08E-09	-5.814	-0.992653	5.24E-05	7.30E-13	-7.10E-13
		-5.237	7.810	-2.402	-0.000856	-0.000232	-2.96E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
130	0	-1.552	-5.553	-1.37E-08	-0.001054	-0.000282	-2.40E-05
		-5.915	16.691	-8.59E-09	-0.000661	-0.000152	2.53E-05
		Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...			
130	1.300	-1.526	-5.268	-1.409	-0.001057	-0.000219	-1.74E-05
		-5.949	16.029	-0.839682	-0.000594	-9.58E-05	2.59E-05
		Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...			

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

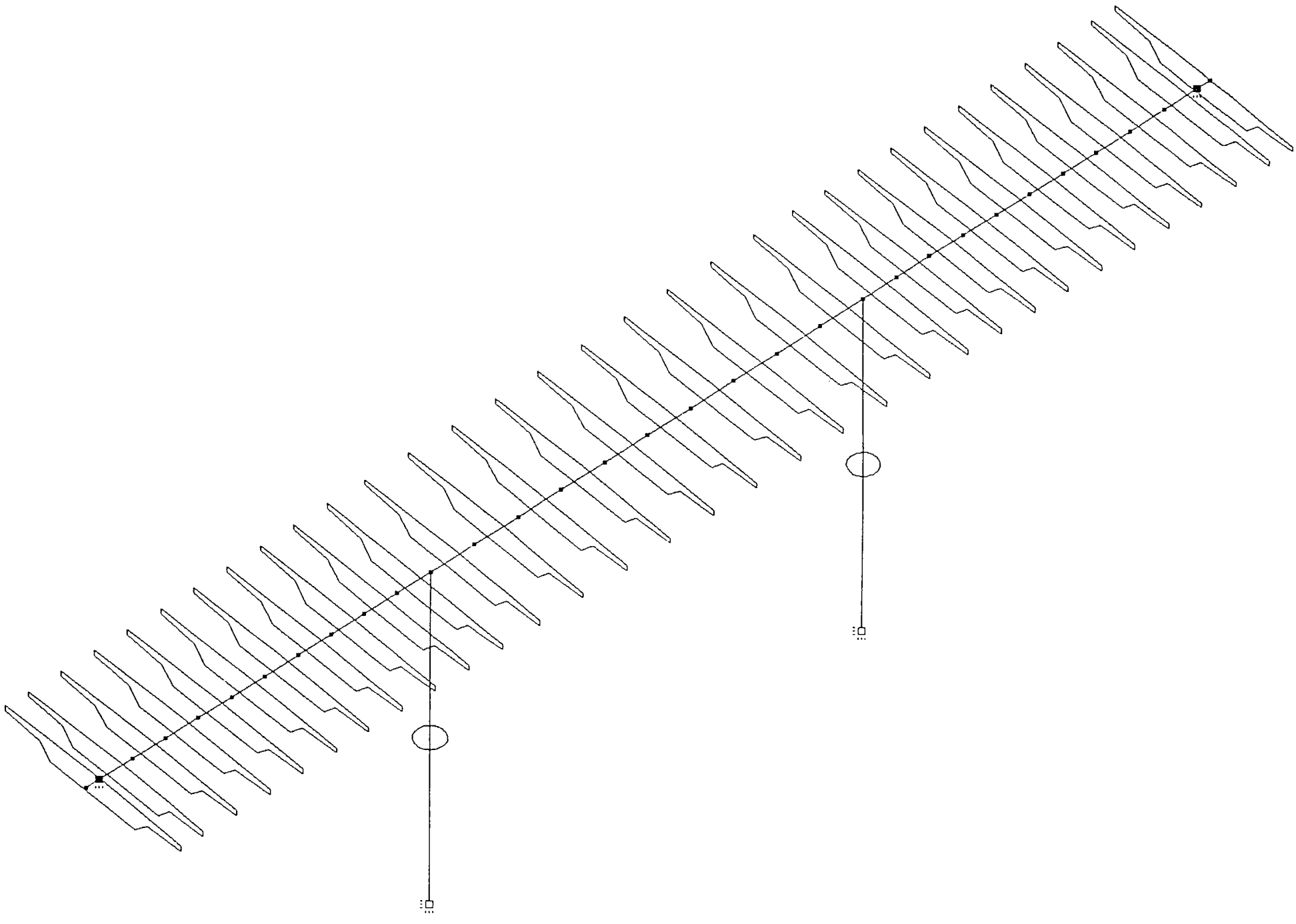
Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
159	0	-5.949	-11.178	-0.870759	0.000617	-9.68E-05	-2.60E-05
		-1.526	10.119	-1.440	0.001080	-0.000220	1.73E-05
		Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...			
159	1.300	-5.915	-11.839	-9.85E-09	0.000685	-0.000154	-2.56E-05
		-1.552	10.404	-1.55E-08	0.001078	-0.000284	2.37E-05
		Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...			

2.4. Comprobación Longitudinal del tablero

Scale 1 : 129.0
Structure - GEOMETRIA



Scale 1 : 147.9
Structure - SECCIONES



****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (35 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
3	2.62000	0.00000	0.00000			
8	2.62000	0.50000	0.00000	SSB	FFF	
13	2.62000	1.80000	0.00000			
18	2.62000	3.10000	0.00000			
23	2.62000	4.40000	0.00000			
28	2.62000	5.70000	0.00000			
33	2.62000	7.00000	0.00000			
38	2.62000	8.30000	0.00000			
43	2.62000	9.60000	0.00000			
48	2.62000	10.90000	0.00000			
53	2.62000	12.20000	0.00000			
58	2.62000	13.50000	0.00000			
63	2.62000	15.20000	0.00000			
68	2.62000	16.90000	0.00000			
73	2.62000	18.60000	0.00000			
78	2.62000	20.30000	0.00000			
83	2.62000	22.00000	0.00000			
88	2.62000	23.70000	0.00000			
93	2.62000	25.40000	0.00000			
98	2.62000	27.10000	0.00000			
103	2.62000	28.80000	0.00000			
108	2.62000	30.50000	0.00000			
113	2.62000	31.80000	0.00000			
118	2.62000	33.10000	0.00000			
123	2.62000	34.40000	0.00000			
128	2.62000	35.70000	0.00000			
133	2.62000	37.00000	0.00000			
138	2.62000	38.30000	0.00000			
143	2.62000	39.60000	0.00000			
148	2.62000	40.90000	0.00000			
153	2.62000	42.20000	0.00000			
158	2.62000	43.50000	0.00000	SSE	FFF	
163	2.62000	44.00000	0.00000			
166	2.62000	13.50000	-13.20000	BBB	BBB	
167	2.62000	30.50000	-13.20000	BEE	EBB	

ELASTICALLY SUPPORTED JOINTS: (*B*=Fixed *F*=Free)

Joint	V-X [T/M]	V-Y [T/M]	V-Z [T/M]	R-X [TM/ARC]	R-Y [TM/ARC]	R-Z [TM/ARC]
8	3.892E+02	3.892E+02	B	F	F	F
158	3.892E+02	3.892E+02	B	F	F	F

B A R D A T A : (34 bars)

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
65	3	8	0.50000	TABAPOYO			oS
66	8	13	1.30000	TABAPOYO			oS
67	13	18	1.30000	TABAPOYO			oS
68	18	23	1.30000	TABAPOYO			oS
69	23	28	1.30000	TABAPOYO			oS
70	28	33	1.30000	TABAPOYO			oS
71	33	38	1.30000	TABAPOYO			oS
72	38	43	1.30000	TABAPOYO			oS
73	43	48	1.30000	TABAPOYO			oS
74	48	53	1.30000	TABAPOYO			oS
75	53	58	1.30000	TABAPOYO			oS
76	58	63	1.70000	TABAPOYO			oS
77	63	68	1.70000	TABAPOYO			oS
78	68	73	1.70000	TABAPOYO			oS
79	73	78	1.70000	TABAPOYO			oS
80	78	83	1.70000	TABAPOYO			oS
81	83	88	1.70000	TABAPOYO			oS
82	88	93	1.70000	TABAPOYO			oS
83	93	98	1.70000	TABAPOYO			oS
84	98	103	1.70000	TABAPOYO			oS
85	103	108	1.70000	TABAPOYO			oS
86	108	113	1.30000	TABAPOYO			oS
87	113	118	1.30000	TABAPOYO			oS
88	118	123	1.30000	TABAPOYO			oS
89	123	128	1.30000	TABAPOYO			oS
90	128	133	1.30000	TABAPOYO			oS
91	133	138	1.30000	TABAPOYO			oS
92	138	143	1.30000	TABAPOYO			oS
93	143	148	1.30000	TABAPOYO			oS
94	148	153	1.30000	TABAPOYO			oS
95	153	158	1.30000	TABAPOYO			oS
96	158	163	0.50000	TABAPOYO			oS
290*	166	58	13.20000	PILAS			oS
291*	167	108	13.20000	PILAS			oS

Bars marked with "*" are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

oS = Bars without shear deformation

CROSS SECTION VALUES: CS-Name	Ax [M2] Ix [M4] zl [M1]	Iy [M4] Fy [M2] zu [M1]	Iz [M4] Fz [M2] yl [M1]	Phi [Degr] yr [M1]
PILAS	7.8576E-01	4.9180E-02	4.9086E-02	0.00
	9.8175E-02	7.8576E-01	7.8576E-01	
	-0.5000	0.5000	-0.5000	0.5000
TABAPOYO	4.6531E-00	2.8617E-01	1.3718E+01	0.00
	5.0835E-01	4.6531E+00	4.6531E+00	
	-0.4986	0.4014	-3.8500	3.8500

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
65 .. 291	3.2900E+06	1.3700E+06

STS-Run ok

****
Load case 1: PESO PROPIO
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Mas.forc2 gl const.	-2.500		Stab 65 .. 96

****
Load case 2: PESO PAVIMENTO
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.552000		Stab 65 .. 96

****
Load case 3: PESO BARRERAS
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-2.046		Stab 65 .. 96

****
Load case 5: RETRACCION
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000292		Stab 65 .. 96

****
Load case 6: SOB UNIF 1
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 65 .. 75

****
Load case 7: SOBRECARGA UNIF 2
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 76 .. 85

****
Load case 8: SOB UNIF 3
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 86 .. 96

****
Load case 9: SOB UNIF EXC
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-1.600		Stab 65
Moment X lo const.	-3.080		Stab 65
Force Z gl const.	-1.600		Stab 66
Moment X lo const.	-3.080		Stab 66
Force Z gl const.	-1.600		Stab 67
Moment X lo const.	-3.080		Stab 67
Force Z gl const.	-1.600		Stab 68
Moment X lo const.	-3.080		Stab 68
Force Z gl const.	-1.600		Stab 69
Moment X lo const.	-3.080		Stab 69
Force Z gl const.	-1.600		Stab 70
Moment X lo const.	-3.080		Stab 70
Force Z gl const.	-1.600		Stab 71
Moment X lo const.	-3.080		Stab 71
Force Z gl const.	-1.600		Stab 72
Moment X lo const.	-3.080		Stab 72
Force Z gl const.	-1.600		Stab 73
Moment X lo const.	-3.080		Stab 73
Force Z gl const.	-1.600		Stab 74
Moment X lo const.	-3.080		Stab 74
Force Z gl const.	-1.600		Stab 75
Moment X lo const.	-3.080		Stab 75
Force Z gl const.	-1.600		Stab 76
Moment X lo const.	-3.080		Stab 76
Force Z gl const.	-1.600		Stab 77
Moment X lo const.	-3.080		Stab 77
Force Z gl const.	-1.600		Stab 78
Moment X lo const.	-3.080		Stab 78
Force Z gl const.	-1.600		Stab 79
Moment X lo const.	-3.080		Stab 79
Force Z gl const.	-1.600		Stab 80
Moment X lo const.	-3.080		Stab 80
Force Z gl const.	-1.600		Stab 81
Moment X lo const.	-3.080		Stab 81
Force Z gl const.	-1.600		Stab 82
Moment X lo const.	-3.080		Stab 82
Force Z gl const.	-1.600		Stab 83
Moment X lo const.	-3.080		Stab 83
Force Z gl const.	-1.600		Stab 84
Moment X lo const.	-3.080		Stab 84
Force Z gl const.	-1.600		Stab 85
Moment X lo const.	-3.080		Stab 85
Force Z gl const.	-1.600		Stab 86
Moment X lo const.	-3.080		Stab 86
Force Z gl const.	-1.600		Stab 87
Moment X lo const.	-3.080		Stab 87
Force Z gl const.	-1.600		Stab 88
Moment X lo const.	-3.080		Stab 88
Force Z gl const.	-1 600		Stab 89

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Moment	X	lo const.	-3.080		Stab	89
Force	Z	gl const.	-1.600		Stab	90
Moment	X	lo const.	-3.080		Stab	90
Force	Z	gl const.	-1.600		Stab	91
Moment	X	lo const.	-3.080		Stab	91
Force	Z	gl const.	-1.600		Stab	92
Moment	X	lo const.	-3.080		Stab	92
Force	Z	gl const.	-1.600		Stab	93
Moment	X	lo const.	-3.080		Stab	93
Force	Z	gl const.	-1.600		Stab	94
Moment	X	lo const.	-3.080		Stab	94
Force	Z	gl const.	-1.600		Stab	95
Moment	X	lo const.	-3.080		Stab	95
Force	Z	gl const.	-1.600		Stab	96
Moment	X	lo const.	-3.080		Stab	96

Load case 10: SOE UNIF EXC

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Moment	X	lo const.	3.080		Stab	65
Force	Z	lo const.	-1.600		Stab	65
Moment	X	lo const.	3.080		Stab	66
Force	Z	lo const.	-1.600		Stab	66
Moment	X	lo const.	3.080		Stab	67
Force	Z	lo const.	-1.600		Stab	67
Moment	X	lo const.	3.080		Stab	68
Force	Z	lo const.	-1.600		Stab	68
Moment	X	lo const.	3.080		Stab	69
Force	Z	lo const.	-1.600		Stab	69
Moment	X	lo const.	3.080		Stab	70
Force	Z	lo consc.	-1.600		Stab	70
Moment	X	lo const.	3.080		Stab	71
Force	Z	lo const.	-1.600		Stab	71
Moment	X	lo const.	3.080		Stab	72
Force	Z	lo const.	-1.600		Stab	72
Moment	X	lo const.	3.080		Stab	73
Force	Z	lo const.	-1.600		Stab	73
Moment	X	lo const.	3.080		Stab	74
Force	Z	lo const.	-1.600		Stab	74
Moment	X	lo const.	3.080		Stab	75
Force	Z	lo const.	-1.600		Stab	75
Moment	X	lo const.	3.080		Stab	76
Force	Z	lo const.	-1.600		Stab	76
Moment	X	lo const.	3.080		Stab	77

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	lo const.	-1.600		Stab	77
Moment	X	lo const.	3.080		Stab	78
Force	Z	lo const.	-1.600		Stab	78
Moment	X	lo const.	3.080		Stab	79
Force	Z	lo const.	-1.600		Stab	79
Moment	X	lo const.	3.080		Stab	80
Force	Z	lo const.	-1.600		Stab	80
Moment	X	lo const.	3.080		Stab	81
Force	Z	lo const.	-1.600		Stab	81
Moment	X	lo const.	3.080		Stab	82
Force	Z	lo const.	-1.600		Stab	82
Moment	X	lo const.	3.080		Stab	83
Force	Z	lo const.	-1.600		Stab	83
Moment	X	lo const.	3.080		Stab	84
Force	Z	lo const.	-1.600		Stab	84
Moment	X	lo const.	3.080		Stab	85
Force	Z	lo const.	-1.600		Stab	85
Moment	X	lo const.	3.080		Stab	86
Force	Z	lo const.	-1.600		Stab	86
Moment	X	lo const.	3.080		Stab	87
Force	Z	lo const.	-1.600		Stab	87
Moment	X	lo const.	3.080		Stab	88
Force	Z	lo const.	-1.600		Stab	88
Moment	X	lo const.	3.080		Stab	89
Force	Z	lo const.	-1.600		Stab	89
Moment	X	lo const.	3.080		Stab	90
Force	Z	lo const.	-1.600		Stab	90
Moment	X	lo const.	3.080		Stab	91
Force	Z	lo const.	-1.600		Stab	91
Moment	X	lo const.	3.080		Stab	92
Force	Z	lo const.	-1.600		Stab	92
Moment	X	lo const.	3.080		Stab	93
Force	Z	lo const.	-1.600		Stab	93
Moment	X	lo const.	3.080		Stab	94
Force	Z	lo const.	-1.600		Stab	94
Moment	X	lo const.	3.080		Stab	95
Force	Z	lo const.	-1.600		Stab	95
Moment	X	lo const.	3.080		Stab	96
Force	Z	lo const.	-1.600		Stab	96

Load case 11: VEHICULO HIPOTESIS 11

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	66
Moment	X	lo conc.	-30.000	0.850000	Stab	66
Force	Z	gl conc.	-20.000	1.050	Stab	67
Moment	X	lo conc.	-30.000	1.050	Stab	67
Force	Z	gl conc.	-20.000	1.250	Stab	68
Moment	X	lo conc.	-30.000	1.250	Stab	68

Load case 12: VEHICULO HIPOTESIS 12

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	69
Force	Z	gl conc.	-20.000	1.300	Stab	70
Force	Z	gl conc.	-20.000	0.200000	Stab	72
Moment	X	lo conc.	-30.000	1.100	Stab	69
Moment	X	lo conc.	-30.000	1.300	Stab	70
Moment	X	lo conc.	-30.000	0.200000	Stab	72

Load case 13: VEHICULO HIPOTESIS 13

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	73
Force	Z	gl conc.	-20.000	0.250000	Stab	74
Force	Z	gl conc.	-20.000	0.450000	Stab	75
Moment	X	lo conc.	-30.000	0.050000	Stab	73
Moment	X	lo conc.	-30.000	0.250000	Stab	74
Moment	X	lo conc.	-30.000	0.450000	Stab	75

Load case 14: VEHICULO HIPOTESIS 14

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	76
Force	Z	gl conc.	-20.000	0.650000	Stab	77
Force	Z	gl conc.	-20.000	0.450000	Stab	78
Moment	X	lo conc.	-30.000	0.850000	Stab	76
Moment	X	lo conc.	-30.000	0.650000	Stab	77
Moment	X	lo conc.	-30.000	0.450000	Stab	78

Load case 15: VEHICULO HIPOTESIS 15

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.200000	Stab	80
Force	Z	gl conc.	-20.000	0	Stab	81
Force	Z	gl conc.	-20.000	1.500	Stab	81
Moment	X	lo conc.	-30.000	0.200000	Stab	80
Moment	X	lo conc.	-30.000	0	Stab	81
Moment	X	lo conc.	-30.000	1.500	Stab	81

Load case 16: VEHICULO HIPOTESIS 16

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.250	Stab	83
Force	Z	gl conc.	-20.000	1.050	Stab	84
Force	Z	gl conc.	-20.000	0.850000	Stab	85
Moment	X	lo conc.	-30.000	1.250	Stab	83
Moment	X	lo conc.	-30.000	1.050	Stab	84
Moment	X	lo conc.	-30.000	0.850000	Stab	85

Load case 17: VEHICULO HIPOTESIS 17

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	86
Force	Z	gl conc.	-20.000	1.050	Stab	87
Force	Z	gl conc.	-20.000	1.250	Stab	88
Moment	X	lo conc.	-30.000	0.850000	Stab	86
Moment	X	lo conc.	-30.000	1.050	Stab	87
Moment	X	lo conc.	-30.000	1.250	Stab	88

Load case 18: VEHICULO HIPOTESIS 18

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	89
Force	Z	gl conc.	-20.000	1.300	Stab	90
Force	Z	gl conc.	-20.000	0.200000	Stab	92
Moment	X	lo conc.	-30.000	1.100	Stab	89
Moment	X	lo conc.	-30.000	1.300	Stab	90
Moment	X	lo conc.	-30.000	0.200000	Stab	92

Load case 19: VEHICULO HIPOTESIS 19

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	93
Force	Z	gl conc.	-20.000	0.250000	Stab	94
Force	Z	gl conc.	-20.000	0.450000	Stab	95
Moment	X	lo conc.	-30.000	0.050000	Stab	93
Moment	X	lo conc.	-30.000	0.250000	Stab	94
Moment	X	lo conc.	-30.000	0.450000	Stab	95

Load case 20: VEHICULO HIPOTESIS 20

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	66
Force	Z	gl conc.	-20.000	1.050	Stab	67
Force	Z	gl conc.	-20.000	1.250	Stab	68

Load case 21: VEHICULO HIPOTESIS 21

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	69
Force	Z	gl conc.	-20.000	1.300	Stab	70
Force	Z	gl conc.	-20.000	0.200000	Stab	72

Load case 22: VEHICULO HIPOTESIS 22

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	73
Force	Z	gl conc.	-20.000	0.250000	Stab	74
Force	Z	gl conc.	-20.000	0.450000	Stab	75

Load case 23: VEHICULO HIPOTESIS 23

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.850000	Stab 76
Force Z gl conc.	-20.000	0.650000	Stab 77
Force Z gl conc.	-20.000	0.450000	Stab 78

Load case 24: VEHICULO HIPOTESIS 24

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.200000	Stab 80
Force Z gl conc.	-20.000	0	Stab 81
Force Z gl conc.	-20.000	1.500	Stab 81

Load case 25: VEHICULO POSICION 25

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	1.250	Stab 83
Force Z gl conc.	-20.000	1.050	Stab 84
Force Z gl conc.	-20.000	0.850000	Stab 85

Load case 26: VEHICULO POSICION 26

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.850000	Stab 86
Force Z gl conc.	-20.000	1.050	Stab 87
Force Z gl conc.	-20.000	1.250	Stab 88

Load case 27: VEHICULO POSICION 27

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	1.100	Stab 89
Force Z gl conc.	-20.000	1.300	Stab 90
Force Z gl conc.	-20.000	0.200000	Stab 92

Load case 28: VEHICULO POSICION 28

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.050000	Stab 93
Force Z gl conc.	-20.000	0.250000	Stab 94
Force Z gl conc.	-20.000	0.450000	Stab 95

Load case 29: VEHICULO POSICION 29

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.850000	Stab 66
Force Z gl conc.	-20.000	1.050	Stab 67
Force Z gl conc.	-20.000	1.250	Stab 68
Moment X lo conc.	30.000	0.850000	Stab 66
Moment X lo conc.	30.000	1.050	Stab 67
Moment X lo conc.	30.000	1.250	Stab 68

Load case 30: VEHICULO POSICION 30

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	1.100	Stab 69
Force Z gl conc.	-20.000	1.300	Stab 70
Force Z gl conc.	-20.000	0.200000	Stab 72
Moment X lo conc.	30.000	1.100	Stab 69
Moment X lo conc.	30.000	1.300	Stab 70
Moment X lo conc.	30.000	0.200000	Stab 72

Load case 31: VEHICULO POSICION 31

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.050000	Stab 73
Force Z gl conc.	-20.000	0.250000	Stab 74
Force Z gl conc.	-20.000	0.450000	Stab 75
Moment X lo conc.	30.000	0.050000	Stab 73
Moment X lo conc.	30.000	0.250000	Stab 74
Moment X lo conc.	30.000	0.450000	Stab 75

Load case 32: VEHICULO POSICION 32

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.850000	Stab 76
Force Z gl conc.	-20.000	0.650000	Stab 77
Force Z gl conc.	-20.000	0.450000	Stab 78
Moment X lo conc.	30.000	0.850000	Stab 76
Moment X lo conc.	30.000	0.650000	Stab 77
Moment X lo conc.	30.000	0.450000	Stab 78

Load case 33: VEHICULO POSICION 33

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.200000	Stab 80
Force Z gl conc.	-20.000	0	Stab 81
Force Z gl conc.	-20.000	1.500	Stab 81
Moment X lo conc.	30.000	0.200000	Stab 80
Moment X lo conc.	30.000	0	Stab 81
Moment X lo conc.	30.000	1.500	Stab 81

Load case 34: VEHICULO POSICION 34

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	1.250	Stab 83
Force Z gl conc.	-20.000	1.050	Stab 84
Force Z gl conc.	-20.000	0.850000	Stab 85
Moment X lo conc.	30.000	1.250	Stab 83
Moment X lo conc.	30.000	1.050	Stab 84
Moment X lo conc.	30.000	0.850000	Stab 85

Load case 35: VEHICULO POSICION 35

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.850000	Stab 86
Force Z gl conc.	-20.000	1.050	Stab 87
Force Z gl conc.	-20.000	1.250	Stab 88
Moment X lo conc.	30.000	0.850000	Stab 86
Moment X lo conc.	30.000	1.050	Stab 87
Moment X lo conc.	30.000	1.250	Stab 88

Load case 36: VEHICULO POSICION 36

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	1.100	Stab 89
Force Z gl conc.	-20.000	1.300	Stab 90
Force Z gl conc.	-20.000	0.200000	Stab 92
Moment X lo conc.	30.000	1.100	Stab 89
Moment X lo conc.	30.000	1.300	Stab 90
Moment X lo conc.	30.000	0.200000	Stab 92

Load case 37: VEHICULO HIPOTESIS 37

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-20.000	0.050000	Stab 93
Force Z gl conc.	-20.000	0.250000	Stab 94
Force Z gl conc.	-20.000	0.450000	Stab 95
Moment X lo conc.	30.000	0.050000	Stab 93
Moment X lo conc.	30.000	0.250000	Stab 94
Moment X lo conc.	30.000	0.450000	Stab 95

Load case 60: FRENADO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force X lo const.	0.272700		Stab 65 .. 96

Load case 62: VIENTO TRANSV SIN SOB.

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force X gl const.	-0.260000		Stab 65 .. 96
Force X pj const.	-0.200000		Stab 290 .. 291

Load case 63: VIENTO TRANSV CON SOB

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force X gl const.	-0.760000		Stab 65 .. 96
Force X pj const.	-0.200000		Stab 290 .. 291

Load case 64: TEMPERATURA (-)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000363		Stab 65 .. 96

Load case 65: TEMPERATURA (+)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	0.000363		Stab 65 .. 96

Load case 66: GRADIENTE

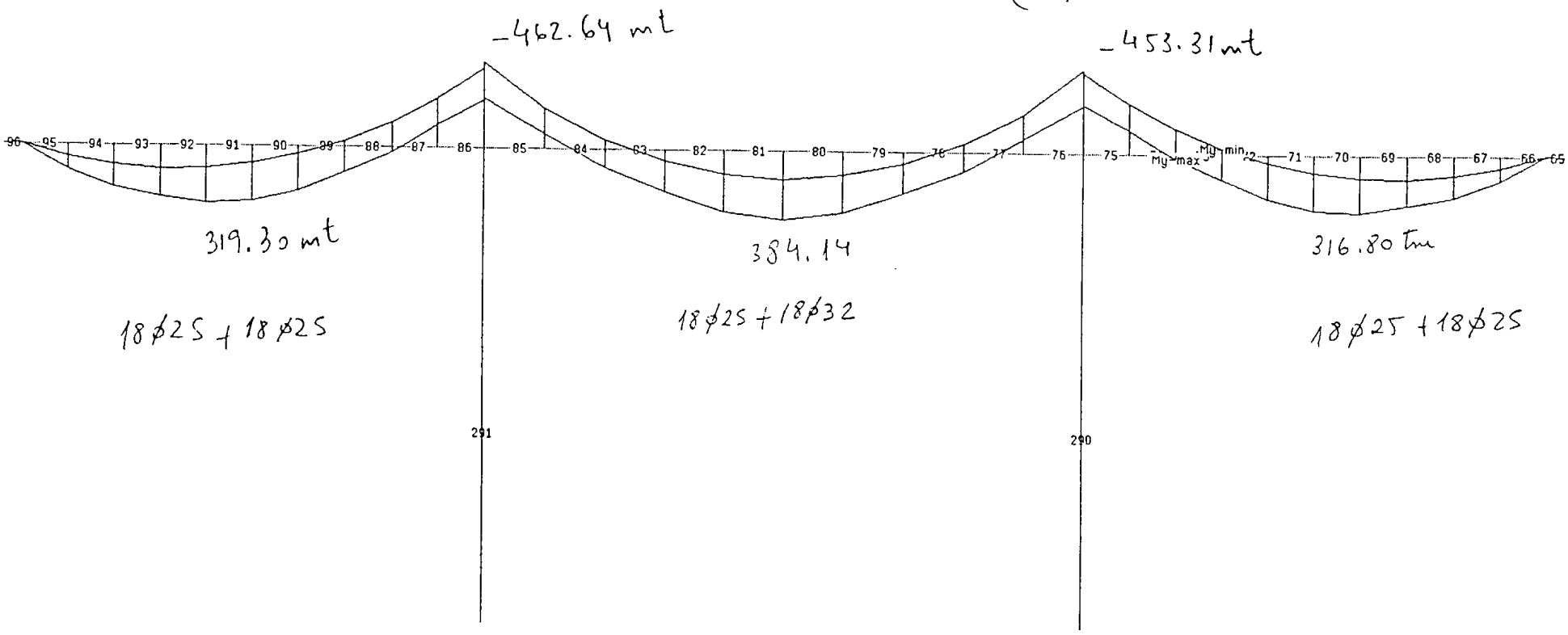
Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Curvat. Y lo const.	0.000170		Stab 65 .. 96

S T

2.4.1.1. Comprobación de estados límitesfisuración

Scale 1 : 173.7
Int. Forces envelope My, GWSP EO (COMBINACION FRECUENTE), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -4.63E+02 max: 1.60E+02 [tm]
- Envelope Moment My-max, Scale 5.00E-03
  min: -2.67E+02 max: 3.84E+02 [tm]

(23φ25 + 14φ20 + φ20/20 × 7.60m)



ENVELOPE SPECIFIC.: EO 'COMBINACION FRECUENTE'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	0.600000		SOB UNIF 1
F	PLUS	7	0.600000		SOBRECARGA UNIF 2
G	PLUS	8	0.600000		SOB UNIF 3
H	PLUS	11	0.840000		VEHICULO HIPOTESIS 11
I	OR	12	0.840000		VEHICULO HIPOTESIS 12
J	OR	13	0.840000		VEHICULO HIPOTESIS 13
K	OR	14	0.840000		VEHICULO HIPOTESIS 14
L	OR	15	0.840000		VEHICULO HIPOTESIS 15
M	OR	16	0.840000		VEHICULO HIPOTESIS 16
N	OR	17	0.840000		VEHICULO HIPOTESIS 17
O	OR	18	0.840000		VEHICULO HIPOTESIS 18
P	OR	19	0.840000		VEHICULO HIPOTESIS 19
Q	OR	20	0.840000		VEHICULO HIPOTESIS 20
R	OR	21	0.840000		VEHICULO HIPOTESIS 21
S	OR	22	0.840000		VEHICULO HIPOTESIS 22
T	OR	23	0.840000		VEHICULO HIPOTESIS 23
U	OR	24	0.840000		VEHICULO HIPOTESIS 24
V	OR	25	0.840000		VEHICULO POSICION 25
W	OR	26	0.840000		VEHICULO POSICION 26
X	OR	27	0.840000		VEHICULO POSICION 27
Y	OR	28	0.840000		VEHICULO POSICION 28
Z	OR	29	0.840000		VEHICULO POSICION 29
AA	OR	30	0.840000		VEHICULO POSICION 30
AB	OR	31	0.840000		VEHICULO POSICION 31
AC	OR	32	0.840000		VEHICULO POSICION 32
AD	OR	33	0.840000		VEHICULO POSICION 33
AE	OR	34	0.840000		VEHICULO POSICION 34
AF	OR	35	0.840000		VEHICULO POSICION 35
AG	OR	36	0.840000		VEHICULO POSICION 36
AH	OR	37	0.840000		VEHICULO HIPOTESIS 37
AI	PLUS	60	0.600000		FRENADO
AJ	PLUS	63	0.100000		VIENTO TRANSV CON SOB
AK	PLUS	64	0.200000		TEMPERATURA (-)
AL	OR	65	0.200000		TEMPERATURA (+)
AM	PLUS	66	0.200000		GRADIENTE

ALTERNATIVE ENVELOPE :

AN	PERM.	1	1.000	PESO PROPIO
AO	PL.PERM	2	1.500	PESO PAVIMENTO
AP	OR	2	1.000	PESO PAVIMENTO
AQ	PL.PERM	3	1.000	PESO BARRERAS
AR	PLUS	9	0.600000	SOB UNIF EXC
AS	PLUS	10	0.600000	SOB UNIF EXC
AT	PLUS	11	0.840000	VEHICULO HIPOTESIS 11
AU	OR	12	0.840000	VEHICULO HIPOTESIS 12
AV	OR	13	0.840000	VEHICULO HIPOTESIS 13
AW	OR	14	0.840000	VEHICULO HIPOTESIS 14
AX	OR	15	0.840000	VEHICULO HIPOTESIS 15

AY	OR	16	0.840000	VEHICULO HIPOTESIS 16
AZ	OR	17	0.840000	VEHICULO HIPOTESIS 17
BA	OR	18	0.840000	VEHICULO HIPOTESIS 18
BB	OR	19	0.840000	VEHICULO HIPOTESIS 19
BC	OR	20	0.840000	VEHICULO HIPOTESIS 20
BD	OR	21	0.840000	VEHICULO HIPOTESIS 21
BE	OR	22	0.840000	VEHICULO HIPOTESIS 22
BF	OR	23	0.840000	VEHICULO HIPOTESIS 23
BG	OR	24	0.840000	VEHICULO HIPOTESIS 24
BH	OR	25	0.840000	VEHICULO POSICION 25
BI	OR	26	0.840000	VEHICULO POSICION 26
BJ	OR	27	0.840000	VEHICULO POSICION 27
BK	OR	28	0.840000	VEHICULO POSICION 28
BL	OR	29	0.840000	VEHICULO POSICION 29
BM	OR	30	0.840000	VEHICULO POSICION 30
BN	OR	31	0.840000	VEHICULO POSICION 31
BO	OR	32	0.840000	VEHICULO POSICION 32
BP	OR	33	0.840000	VEHICULO POSICION 33
BQ	OR	34	0.840000	VEHICULO POSICION 34
BR	OR	35	0.840000	VEHICULO POSICION 35
BS	OR	36	0.840000	VEHICULO POSICION 36
BT	OR	37	0.840000	VEHICULO HIPOTESIS 37
BU	PLUS	60	0.600000	FRENADO
BV	PLUS	63	0.100000	VIENTO TRANSV CON SOB
BW	PLUS	64	0.200000	TEMPERATURA (-)
BX	OR	65	0.200000	TEMPERATURA (+)
BY	PLUS	66	0.200000	GRADIENTE

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-8.17E-10	-9.94E-11	-7.25E-08	9.92E-14	-8.29E-13	5.30E-10
		9.01E-13	3.47E-09	-8.08E-08	-1.90E-13	-2.20E-13	-5.00E-10
		Min: A B D F L AI AK AM			Max: A C D E G I AL		
65	0.500	-0.081810	3.43E-09	-8.213	1.77E-13	-2.053	1.22E-09
		1.08E-12	3.47E-09	-7.115	-1.90E-13	-1.779	1.23E-09
		Min: AN AO AQ AR AS AT BU...			Max: A C D G I AK		
66	0	1.649	-2.767	73.437	3.48E-14	-2.053	-3.80E-08
		-0.630755	-3.255	110.846	-2.68E-14	-1.779	-4.43E-08
		Min: A B D E F L AI AK			Max: A C D G H AL AM		
66	1.300	1.501	-2.767	42.637	3.48E-14	65.674	-3.597
		-0.695688	-3.255	84.993	25.200	136.597	-4.231
		Min: A C D F L AI AK			Max: A E D E G H AL AM		
67	0	1.501	-2.767	42.637	3.48E-14	65.674	-3.597
		-0.695688	-3.255	84.993	25.200	136.597	-4.231
		Min: A C D F L AI AK			Max: A B D E G H AL AM		
67	1.300	1.289	-2.767	24.137	3.48E-14	109.077	-7.194

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.695688	-3.255	46.838	50.400	229.007	-8.463
		Min: A C D F L AI AK			Max: A E D E G H AL AM		
68	0	1.289	-2.767	24.137	3.48E-14	109.077	-7.194
		-0.695688	-3.255	46.838	50.400	229.007	-8.463
		Min: A C D F L AI AK			Max: A E D E G H AL AM		
68	1.300	1.076	-2.767	5.637	3.48E-14	128.430	-10.791
		-0.795944	-3.255	40.609	4.05E-14	281.248	-12.694
		Min: A C D F L AI AK			Max: A B D E G I AL AM		
69	0	1.076	-2.767	5.637	2.35E-13	128.430	-10.791
		-0.795944	-3.255	40.609	3.18E-13	281.246	-12.694
		Min: A C D F L AI AK			Max: A E D E G I AL AM		
69	1.300	0.863157	-2.767	-12.863	2.35E-13	123.733	-14.388
		-0.795944	-3.255	2.455	25.200	316.800	-16.925
		Min: A C D F L AI AK			Max: A E D E G I AL AM		
70	0	0.863157	-2.767	-12.863	2.40E-13	123.733	-14.388
		-0.795944	-3.255	2.455	25.200	316.800	-16.925
		Min: A C D F L AI AK			Max: A B D E G I AL AM		
70	1.300	0.650451	-2.767	-31.363	2.40E-13	94.986	-17.985
		-0.795944	-3.255	-18.900	25.200	306.110	-21.156
		Min: A C D F L AI AK			Max: A E D E G I AL AM		
71	0	0.650451	-2.767	-31.363	3.23E-14	94.986	-17.985
		-0.795944	-3.255	-35.700	50.400	306.110	-21.156
		Min: A C D F L AI AK			Max: A E D E G I AL AM		
71	1.300	0.437745	-2.767	-49.862	3.23E-14	42.190	-21.583
		-0.795944	-3.255	-57.054	50.400	245.820	-25.388
		Min: A C D F L AI AK			Max: A E D E G I AL AM		
72	0	0.437745	-2.767	-49.862	-2.20E-13	42.190	-21.583
		-0.795944	-3.255	-57.054	50.400	245.820	-25.388
		Min: A C D F L AI AK			Max: A E D E G I AL AM		
72	1.300	0.225039	-2.767	-68.362	-2.20E-13	-34.656	-25.180
		-0.795944	-3.255	-95.209	75.600	139.289	-29.619
		Min: A C D F L AI AK			Max: A B D E G I AL AM		
73	0	0.225039	-2.767	-68.362	-3.62E-13	-34.656	-25.180
		-0.795944	-3.255	-95.209	75.600	139.289	-29.619
		Min: A C D F L AI AK			Max: A B D E G I AL AM		
73	1.300	0.012337	-2.767	-88.407	-3.62E-13	-136.729	-28.777
		-0.740640	-3.255	-95.929	25.200	27.468	-33.850
		Min: A B D F L AI AK			Max: A C D E G J AL AM		
74	0	0.012337	-2.767	-88.407	-6.23E-13	-136.729	-28.777
		-0.740640	-3.255	-95.929	25.200	27.468	-33.850
		Min: A B D F L AI AK			Max: A C D E G J AL AM		
74	1.300	-0.265306	-2.767	-118.754	-6.23E-13	-267.158	-32.374
		-0.675703	-3.255	-122.236	50.400	-125.284	-38.081

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A B D E F L AI AK			Max: A C D G J AL AM		
75	0	-0.265306	-2.767	-118.754	-7.73E-13	-267.158	-32.374
		-0.675703	-3.255	-122.236	50.400	-125.284	-38.081
		Min: A B D E F L AI AK			Max: A C D G J AL AM		
75	1.300	-0.478012	-2.767	-140.109	-7.73E-13	-435.419	-35.971
		-0.354707	-2.279	-112.540	-6.13E-13	-262.317	-29.629
		Min: A B D E F L AI AK			Max: A C D G O AL AM		
76	0	-4.027	1.15E-09	166.074	-37.800	-453.307	-35.902
		2.447	-0.816198	114.873	-25.394	-257.553	-28.964
		Min: A B D E F L AL			Max: A C D G O AI AK AM		
76	1.700	-1.588	0.816198	116.690	25.394	-206.732	-41.452
		0.560163	0.590543	122.326	-21.576	-74.093	-39.918
		Min: A E D E F I AL			Max: A C D G K AI AK AM		
77	0	-1.588	0.816198	116.690	25.394	-206.732	-41.452
		0.560163	0.590543	122.326	-21.576	-74.093	-39.918
		Min: A B D E F I AL			Max: A C D G K AI AK AM		
77	1.700	-0.865035	0.816198	77.565	25.394	-44.387	-40.065
		-0.440823	0.590543	92.533	3.624	107.950	-38.914
		Min: A C D E I AL			Max: A B D F G K AI AK AM		
78	0	-0.865035	0.816198	77.565	25.394	-44.387	-40.065
		-0.440823	0.590543	92.533	3.624	107.950	-38.914
		Min: A C D E I AL			Max: A B D F G K AI AK AM		
78	1.700	-0.575585	0.816198	52.125	25.394	65.382	-38.677
		-1.838	9.21E-10	79.952	-37.800	232.449	-35.902
		Min: A C D E G I AL			Max: A E D F L AI AK AM		
79	0	-0.575585	0.816198	52.125	25.394	65.382	-38.677
		-1.838	8.19E-10	79.952	-37.800	232.449	-35.902
		Min: A C D E G I AL			Max: A B D F L AI AK AM		
79	1.700	-0.575585	0.816198	27.933	25.394	133.432	-37.290
		-2.116	8.19E-10	52.027	-37.800	344.631	-35.902
		Min: A C D E G I AL			Max: A E D F L AI AK AM		
80	0	-0.575585	0.816198	27.933	25.394	133.432	-37.290
		-2.116	7.85E-10	52.027	-37.800	344.631	-35.902
		Min: A C D E G I AL			Max: A B D F L AI AK AM		
80	1.700	-0.575585	0.816198	3.741	25.394	160.355	-35.902
		-2.394	7.85E-10	7.302	-12.600	384.141	-35.902
		Min: A C D E G I AL			Max: A B D F L AI AK AM		
81	0	-0.575585	0.816198	-4.840	-25.394	160.355	-35.902
		-2.394	7.21E-10	-8.400	12.600	384.141	-35.902
		Min: A C D E G O AI AL			Max: A B D F L AK AM		
81	1.700	-0.853739	-0.816198	-29.032	-25.394	131.565	-37.290
		-2.394	7.21E-10	-53.125	37.800	342.764	-35.902
		Min: A C D E G O AI AL			Max: A B D F L AK AM		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
82	0	-0.853739	-0.816198	-29.032	-25.394	131.565	-37.290
		-2.394	6.96E-10	-53.125	37.800	342.764	-35.902
		Min: A C D E G O AI AL			Max: A B D F L AK AM		
82	1.700	-1.132	-0.816198	-53.224	-25.394	61.648	-38.677
		-2.394	6.96E-10	-81.051	37.800	228.715	-35.902
		Min: A C D E G O AI AL			Max: A B D F L AK AM		
83	0	-1.132	-0.816198	-53.224	-25.394	61.648	-38.677
		-2.394	7.08E-10	-81.051	37.800	228.715	-35.902
		Min: A C D E G O AI AL			Max: A B D F L AK AM		
83	1.700	-1.699	-0.816198	-78.663	-25.394	-49.988	-40.065
		-1.275	-0.590543	-93.632	-3.624	102.348	-38.914
		Min: A C D G O AI AL			Max: A B D E F M AK AM		
84	0	-1.699	-0.816198	-78.663	-25.394	-49.988	-40.065
		-1.275	-0.590543	-93.632	-3.624	102.348	-38.914
		Min: A C D G O AI AL			Max: A B D E F M AK AM		
84	1.700	-2.700	-0.816198	-117.788	-25.394	-214.200	-41.452
		-0.552453	-0.590543	-123.424	21.576	-81.561	-39.918
		Min: A E D F G O AI AL			Max: A C D E M AK AM		
85	0	-2.700	-0.816198	-117.788	-25.394	-214.200	-41.452
		-0.552453	-0.590543	-123.424	21.576	-81.561	-39.918
		Min: A E D F G O AI AL			Max: A C D E M AK AM		
85	1.700	-5.417	6.16E-10	-167.172	37.800	-462.643	-35.902
		1.057	0.816198	-115.972	25.394	-266.885	-28.964
		Min: A E D F G L AI AL			Max: A C D E I AK AM		
86	0	0.543500	2.767	139.629	-2.75E-13	-429.182	-35.971
		0.666805	2.279	112.061	-2.02E-13	-256.080	-29.629
		Min: A E D F G L AK			Max: A C D E I AI AL AM		
86	1.300	0.543500	2.767	118.274	-2.75E-13	-261.544	-32.374
		0.133104	3.255	121.756	-50.400	-119.671	-38.081
		Min: A E D F G L AK			Max: A C D E N AI AL AM		
87	0	0.543500	2.767	118.274	-8.58E-14	-261.544	-32.374
		0.133104	3.255	121.756	-50.400	-119.671	-38.081
		Min: A E D F G L AK			Max: A C D E N AI AL AM		
87	1.300	0.608434	2.767	87.927	-8.58E-14	-131.739	-28.777
		-0.144540	3.255	95.449	-25.200	32.458	-33.850
		Min: A E D F L AK			Max: A C D E G N AI AL AM		
88	0	0.608434	2.767	87.927	8.24E-14	-131.739	-28.777
		-0.144540	3.255	95.449	-25.200	32.458	-33.850
		Min: A E D F L AK			Max: A C D E G N AI AL AM		
88	1.300	0.608434	2.767	67.882	8.24E-14	-30.290	-25.180
		-0.412549	3.255	94.729	-75.600	143.655	-29.619
		Min: A C D F L AK			Max: A B D E G O AI AL AM		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
89	0	0.608434	2.767	67.882	3.29E-13	-30.290	-25.180
		-0.412549	3.255	94.729	-75.600	143.655	-29.619
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
89	1.300	0.608434	2.767	49.383	3.29E-13	45.933	-21.583
		-0.625255	3.255	56.575	-50.400	249.562	-25.388
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
90	0	0.608434	2.767	49.383	1.88E-13	45.933	-21.583
		-0.625255	3.255	56.575	-50.400	249.562	-25.388
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
90	1.300	0.608434	2.767	30.883	1.88E-13	98.105	-17.985
		-0.837961	3.255	35.220	-50.400	309.229	-21.156
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
91	0	0.608434	2.767	30.883	-2.66E-15	98.105	-17.985
		-0.837961	3.255	18.420	-25.200	309.229	-21.156
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
91	1.300	0.608434	2.767	12.383	-2.66E-15	126.228	-14.388
		-1.051	3.255	-2.935	-25.200	319.294	-16.925
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
92	0	0.608434	2.767	12.383	1.45E-13	126.228	-14.388
		-1.051	3.255	-2.935	-25.200	319.294	-16.925
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
92	1.300	0.608434	2.767	-6.117	1.45E-13	130.301	-10.791
		-1.263	3.255	-41.089	1.07E-14	283.119	-12.694
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
93	0	0.608434	2.767	-6.117	9.70E-14	130.301	-10.791
		-1.263	3.255	-41.089	1.37E-13	283.119	-12.694
		Min: A C D F L AK			Max: A B D E G O AI AL AM		
93	1.300	0.608434	2.767	-24.617	9.70E-14	110.324	-7.194
		-1.376	3.255	-47.318	-50.400	230.255	-8.463
		Min: A C D F L AK			Max: A E D E G P AI AL AM		
94	0	0.608434	2.767	-24.617	1.51E-13	110.324	-7.194
		-1.376	3.255	-47.318	-50.400	230.255	-8.463
		Min: A C D F L AK			Max: A B D E G P AI AL AM		
94	1.300	0.608434	2.767	-43.116	1.51E-13	66.297	-3.597
		-1.589	3.255	-85.472	-25.200	137.221	-4.231
		Min: A C D F L AK			Max: A B D E G P AI AL AM		
95	0	0.608434	2.767	-43.116	2.98E-13	66.297	-3.597
		-1.589	3.255	-85.472	-25.200	137.221	-4.231
		Min: A C D F L AK			Max: A B D E G P AI AL AM		
95	1.300	0.543500	2.767	-73.917	2.98E-13	-2.053	-3.76E-08
		-1.736	3.255	-111.326	5.76E-13	-1.779	-4.41E-08
		Min: A B D F G L AK			Max: A C D E P AI AL AM		
96	0	0.081810	3.91E-09	8.213	6.19E-13	-2.053	1.06E-11

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		5.92E-14	3.96E-09	7.115	-1.35E-13	-1.779	-3.08E-10
		Min: A E D E G G AI AL			Max: A C D F L AK AM		
96	0.500	8.11E-10	4.00E-09	8.21E-08	4.67E-13	-1.52E-12	1.99E-09
		5.99E-14	3.96E-09	7.12E-08	-1.35E-13	3.88E-14	1.67E-09
		Min: A E D E G F AI AL AM			Max: A C D F L AK		
290		0	-255.453	0.576378	-4.439	-0.739005	-7.455	-1.902
			-255.453	0.576378	3.646	0.757716	16.175	-1.902
		Min: AN AO AQ AS BR			Max: AN AO AQ AR AZ BV		
290	13.200	-271.302	0.522081		-7.047	0.453014	-90.862	4.176
		-271.302	0.522081		6.518	-0.434303	90.662	4.176
		Min: AN AO AQ AS BL			Max: AN AO AQ AR AT BV		
291		0	-255.453	-0.576378	-4.439	0.739005	-7.455	1.902
			-255.453	-0.576378	3.646	-0.757716	16.175	1.902
		Min: AN AO AQ AS BN			Max: AN AO AQ AR AV BV		
291	13.200	-304.883	-0.310567		-7.047	-0.453014	-90.862	-2.100
		-304.883	-0.310567		6.518	0.434303	90.862	-2.100
		Min: AN AO AQ AS BR			Max: AN AO AQ AR AZ BV		

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL CENTRO DE VANO
Fecha: 23/5/01 18.28.28

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 420 cm Alto = 90 cm Canto útil = 84.90 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 233.23 cm2
Diámetro equivalente = 32.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 384.14 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0065408
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 14.48 cm
Area de hormigón eficaz, Ac,eficaz = 9450.00 cm2
Resistencia a tracción del hormigón, fct,m = .4 Kp/cm2
Momento de fisuración, Mfis = 160.95 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 890.0 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2124.2 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 16.38 cm
Alargamiento medio de las fisuras, Esm = 0.000968898
Apertura de fisura, Wk = 0.270 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.270 mm
Apertura de fisura máxima, Wmax = 0.300 mm

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL CENTRO DE VANO
Fecha: 23/5/01 18.31.17

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 420 cm Alto = 90 cm Canto útil = 85.25 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 176.71 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 319.3 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0049355
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 11.67 cm
Area de hormigón eficaz, Ac,eficaz = 9450.00 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 160.95 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 1157.3 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2295.9 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 16.02 cm
Alargamiento medio de las fisuras, Esm = 0.001002137
Apertura de fisura, Wk = 0.273 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.273 mm
Apertura de fisura máxima, Wmax = 0.300 mm

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL APOYO
Fecha: 23/5/01 18.36.07

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 460 cm Alto = 90 cm Canto útil = 85.25 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 276.12 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 462.64 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0070411
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 8.18 cm
Area de hormigón eficaz, Ac,eficaz = 10350.00 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 176.27 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 822.5 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2158.6 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 13.32 cm
Alargamiento medio de las fisuras, Esm = .001000968
Apertura de fisura, Wk = 0.227 mm

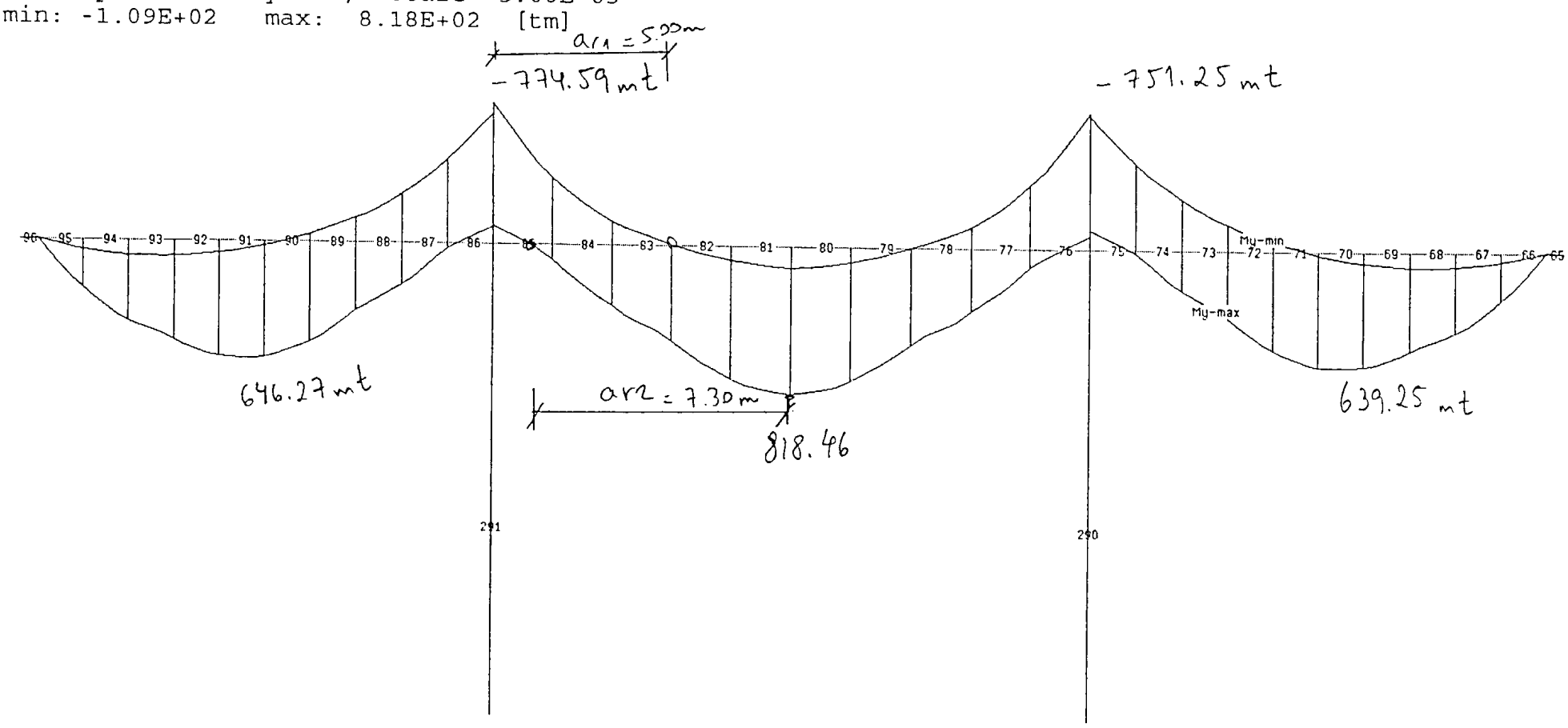
Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.227 mm
Apertura de fisura máxima, Wmax = 0.300 mm

2.4.1.2. Comprobación de estados límites últimos por flexión longitudinal

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Scale 1 : 173.7
Int. Forces envelope My, GWSP ER (COMBINACION FZAS EXTERIORES), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -7.75E+02 max: 1.18E+02 [tm]
- Envelope Moment My-max, Scale 5.00E-03
  min: -1.09E+02 max: 8.18E+02 [tm]



ENVELOPE SPECIFIC.: ER 'COMBINACION FZAS EXTERIORES'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	2	2.025		PESO PAVIMENTO
D	OR	2	1.000		PESO PAVIMENTO
E	PL.PERM	3	1.350		PESO BARRERAS
F	OR	3	1.000		PESO BARRERAS
G	PL.PERM	5	1.350		RETRACCION
H	OR	5	1.000		RETRACCION
I	PLUS	6	1.500		SOB UNIF 1
J	PLUS	7	1.500		SOBRECARGA UNIF 2
K	PLUS	8	1.500		SOB UNIF 3
L	PLUS	11	2.100		VEHICULO HIPOTESIS 11
M	OR	11	2.100		VEHICULO HIPOTESIS 12
N	OR	13	2.100		VEHICULO HIPOTESIS 13
O	OR	14	2.100		VEHICULO HIPOTESIS 14
P	OR	15	2.100		VEHICULO HIPOTESIS 15
Q	OR	16	2.100		VEHICULO HIPOTESIS 16
R	OR	17	2.100		VEHICULO HIPOTESIS 17
S	OR	18	2.100		VEHICULO HIPOTESIS 18
T	OR	19	2.100		VEHICULO HIPOTESIS 19
U	OR	20	2.100		VEHICULO HIPOTESIS 20
V	OR	21	2.100		VEHICULO HIPOTESIS 21
W	OR	22	2.100		VEHICULO HIPOTESIS 22
X	OR	23	2.100		VEHICULO HIPOTESIS 23
Y	OR	24	2.100		VEHICULO HIPOTESIS 24
Z	OR	25	2.100		VEHICULO POSICION 25
AA	OR	26	2.100		VEHICULO POSICION 26
AB	OR	27	2.100		VEHICULO POSICION 27
AC	OR	28	2.100		VEHICULO POSICION 28
AD	OR	29	2.100		VEHICULO POSICION 29
AE	OR	30	2.100		VEHICULO POSICION 30
AF	OR	31	2.100		VEHICULO POSICION 31
AG	OR	32	2.100		VEHICULO POSICION 32
AH	OR	33	2.100		VEHICULO POSICION 33
AI	OR	34	2.100		VEHICULO POSICION 34
AJ	OR	35	2.100		VEHICULO POSICION 35
AK	OR	36	2.100		VEHICULO POSICION 36
AL	OR	37	2.100		VEHICULO HIPOTESIS 37
AM	PLUS	60	1.500		FRENADO
AN	PLUS	63	0.450000		VIENTO TRANSV CON SOB
AO	PLUS	64	0.900000		TEMPERATURA (-)
AP	OR	65	0.900000		TEMPERATURA (+)
AQ	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AR	PERM.	1	1.350	PESO PROPIO
AS	OR	1	1.000	PESO PROPIO
AT	PL.PERM	2	2.025	PESO PAVIMENTO
AU	OR	2	1.000	PESO PAVIMENTO
AV	PL.PERM	3	1.350	PESO BARRERAS
AW	OR	3	1.000	PESO BARRERAS
AX	PL.PERM	5	1.350	RETRACCION

AY	OR	5	1.000	RETRACCION
AZ	PLUS	9	1.500	SOB UNIF EXC
BA	PLUS	10	1.500	SOB UNIF EXC
BE	PLUS	11	2.100	VEHICULO HIPOTESIS 11
BC	OR	12	2.100	VEHICULO HIPOTESIS 12
BD	OR	13	2.100	VEHICULO HIPOTESIS 13
BE	OR	14	2.100	VEHICULO HIPOTESIS 14
BF	OR	15	2.100	VEHICULO HIPOTESIS 15
BG	OR	16	2.100	VEHICULO HIPOTESIS 16
BH	OR	17	2.100	VEHICULO HIPOTESIS 17
BI	OR	18	2.100	VEHICULO HIPOTESIS 18
BJ	OR	19	2.100	VEHICULO HIPOTESIS 19
BK	OR	20	2.100	VEHICULO HIPOTESIS 20
BL	OR	21	2.100	VEHICULO HIPOTESIS 21
BM	OR	22	2.100	VEHICULO HIPOTESIS 22
BN	OR	23	2.100	VEHICULO HIPOTESIS 23
BO	OR	24	2.100	VEHICULO HIPOTESIS 24
BP	OR	25	2.100	VEHICULO POSICION 25
BQ	OR	26	2.100	VEHICULO POSICION 26
BR	OR	27	2.100	VEHICULO POSICION 27
BS	OR	28	2.100	VEHICULO POSICION 28
BT	OR	29	2.100	VEHICULO POSICION 29
BU	OR	30	2.100	VEHICULO POSICION 30
BV	OR	31	2.100	VEHICULO POSICION 31
BW	OR	32	2.100	VEHICULO POSICION 32
BX	OR	33	2.100	VEHICULO POSICION 33
BY	OR	34	2.100	VEHICULO POSICION 34
BZ	OR	35	2.100	VEHICULO POSICION 35
CA	OR	36	2.100	VEHICULO POSICION 36
CB	OR	37	2.100	VEHICULO HIPOTESIS 37
CC	PLUS	60	1.500	FRENADO
CD	PLUS	63	0.450000	VIENTO TRANSV CON SOB
CE	PLUS	64	0.900000	TEMPERATURA (-)
CF	OR	65	0.900000	TEMPERATURA (+)
CG	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65		-2.05E-09	-2.48E-10	-9.43E-08	2.48E-13	-1.50E-12	1.32E-09
		-9.23E-12	8.66E-09	-9.87E-08	-4.75E-13	5.40E-13	-1.25E-09
		Min: A C F H J P AM AO AQ			Max: B D E G I K M AP		
65	0.125	-0.051131	-2.48E-10	-3.048	2.48E-13	-0.190500	1.29E-09
		-8.65E-12	8.66E-09	-1.779	-4.75E-13	-0.111177	-1.67E-10
		Min: AR AT AV AY AZ BA BF...			Max: B D F G K M AP		
65	0.250	-0.102263	-2.48E-10	-6.096	2.48E-13	-0.761998	1.26E-09
		-8.88E-12	8.66E-09	-3.558	-4.75E-13	-0.444707	9.16E-10
		Min: AR AT AV AY AZ BA BF...			Max: B D F G K M AO		
65	0.375	-0.153394	8.57E-09	-9.144	4.43E-13	-1.714	1.98E-09

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-8.88E-12	8.66E-09	-5.336	-4.75E-13	-1.001	2.00E-09
		Min: AR AT AV AY AZ BA BE...			Max: B D F G K M AO		
65	0.500	-0.204525	8.57E-09	-12.192	4.43E-13	-3.048	3.05E-09
		-8.88E-12	8.66E-09	-7.115	-4.75E-13	-1.779	3.08E-09
		Min: AR AT AV AY AZ BA BE...			Max: B D F G K M AO		
66		0 8.630	-6.917	102.359	8.71E-14	-3.048	-9.49E-08
		-0.353668	-8.137	180.260	-6.69E-14	-1.779	-1.11E-07
		Min: A C E G I J P AM AO			Max: B D F H K L AP AQ		
66	0.325	8.660	-6.917	44.589	8.71E-14	13.464	-2.248
		-0.515936	-8.137	225.480	-6.69E-14	71.521	-2.645
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.650	8.527	-6.917	39.964	8.71E-14	27.204	-4.496
		-0.515936	-8.137	217.556	-6.69E-14	143.514	-5.289
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.975	8.394	-6.917	35.339	8.71E-14	39.441	-6.745
		-0.515936	-8.137	167.631	63.000	207.682	-7.934
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	1.300	8.261	-6.917	30.714	8.71E-14	50.175	-8.993
		-0.515936	-8.137	159.706	63.000	260.874	-10.578
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67		0 8.261	-6.917	30.714	8.71E-14	50.175	-8.993
		-0.515936	-8.137	159.706	63.000	260.874	-10.578
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.325	8.125	-6.917	26.089	8.71E-14	59.405	-11.241
		-0.515936	-8.137	151.781	63.000	311.451	-13.223
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.650	7.995	-6.917	21.464	8.71E-14	67.133	-13.489
		-0.515936	-8.137	143.856	63.000	359.532	-15.867
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.975	7.862	-6.917	16.839	8.71E-14	73.357	-15.737
		-0.515936	-8.137	135.932	63.000	404.958	-18.512
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	1.300	7.729	-6.917	12.214	8.71E-14	78.078	-17.985
		-0.515936	-8.137	86.007	126.000	437.388	-21.156
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68		0 7.729	-6.917	12.214	8.71E-14	78.078	-17.985
		-0.515936	-8.137	86.007	126.000	437.388	-21.156
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68	0.325	7.596	-6.917	7.590	8.71E-14	81.296	-20.234
		-0.515936	-8.137	78.082	126.000	464.052	-23.801
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68	0.650	7.463	-6.917	2.965	8.71E-14	83.011	-22.482
		-0.515936	-8.137	70.157	126.000	488.141	-26.445
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68	0.975	7.330	-6.917	-1.660	8.71E-14	83.222	-24.730
		-0.766575	-8.137	100.048	1.01E-13	510.444	-29.090
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
68	1.300	7.197	-6.917	-6.285	8.71E-14	81.932	-26.978
		-0.766575	-8.137	92.123	1.01E-13	541.671	-31.734
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69		0 7.197	-6.917	-6.285	5.88E-13	81.932	-26.978
		-0.766575	-8.137	92.123	7.95E-13	541.671	-31.734
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	0.325	7.064	-6.917	-10.910	5.88E-13	79.138	-29.226
		-0.766575	-8.137	84.198	7.95E-13	570.324	-34.379
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	0.650	6.931	-6.917	-15.535	5.88E-13	74.840	-31.475
		-0.766575	-8.137	76.273	7.95E-13	596.400	-37.024
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	0.975	6.799	-6.917	-20.160	5.88E-13	69.040	-33.723
		-0.766575	-8.137	68.349	7.95E-13	619.901	-39.668
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	1.300	6.666	-6.917	-24.785	5.88E-13	61.736	-35.971
		-0.766575	-8.137	18.424	63.000	632.427	-42.313
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70		0 6.666	-6.917	-24.785	5.99E-13	61.736	-35.971
		-0.766575	-8.137	18.424	63.000	632.427	-42.313
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	0.325	6.533	-6.917	-29.410	5.99E-13	52.930	-38.219
		-0.766575	-8.137	10.499	63.000	637.127	-44.957
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	0.650	6.400	-6.917	-34.035	5.99E-13	42.620	-40.467
		-0.766575	-8.137	2.574	63.000	639.251	-47.602
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	0.975	6.267	-6.917	-38.660	5.99E-13	30.807	-42.715
		-0.766575	-8.137	-5.351	63.000	636.800	-50.246
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	1.300	6.134	-6.917	-43.285	5.99E-13	17.491	-44.964
		-0.766575	-8.137	-13.275	63.000	635.773	-52.891
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71		0 6.134	-6.917	-43.285	8.07E-14	17.491	-44.964
		-0.766575	-8.137	-55.275	126.000	635.773	-52.891
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	0.325	6.001	-6.917	-47.910	8.07E-14	2.672	-47.212
		-0.766575	-8.137	-63.200	126.000	616.521	-55.535
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	0.650	5.868	-6.917	-52.535	8.07E-14	-13.651	-49.460
		-0.766575	-8.137	-71.125	126.000	594.693	-58.180
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	0.975	5.735	-6.917	-57.160	8.07E-14	-31.476	-51.708
		-0.766575	-8.137	-79.050	126.000	570.290	-60.824
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	1.300	5.602	-6.917	-61.785	8.07E-14	-50.805	-53.956
		-0.766575	-8.137	-86.974	126.000	543.311	-63.469

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72		0 5.602	-6.917	-61.785	-5.51E-13	-50.805	-53.956
		-0.766575	-8.137	-86.974	126.000	543.311	-63.469
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	0.325	5.469	-6.917	-66.410	-5.51E-13	-71.636	-56.205
		-0.766575	-8.137	-136.899	189.000	508.507	-66.113
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	0.650	5.336	-6.917	-71.035	-5.51E-13	-93.971	-58.453
		-0.766575	-8.137	-144.824	189.000	462.727	-68.758
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	0.975	5.203	-6.917	-75.660	-5.51E-13	-117.809	-60.701
		-0.766575	-8.137	-152.749	189.000	414.371	-71.402
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	1.300	5.070	-6.917	-80.285	-5.51E-13	-143.150	-62.949
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
73		0 5.070	-6.917	-80.285	-9.06E-13	-143.150	-62.949
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
73	0.325	4.937	-6.917	-84.910	-9.06E-13	-169.994	-65.197
		-0.628383	-8.137	-120.874	63.000	325.038	-76.692
		Min: B D F G J P AM AO			Max: A C E H I K N AP AQ		
73	0.650	4.804	-6.917	-116.023	-9.06E-13	-202.824	-67.445
		-0.628383	-8.137	-102.310	63.000	288.950	-79.336
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
73	0.975	4.672	-6.917	-122.388	-9.06E-13	-241.566	-69.694
		-0.628383	-8.137	-108.495	63.000	254.694	-81.981
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
73	1.300	4.539	-6.917	-128.753	-9.06E-13	-282.376	-71.942
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74		0 4.539	-6.917	-128.753	-1.56E-12	-282.376	-71.942
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	0.325	4.406	-6.917	-135.117	-1.56E-12	-325.255	-74.190
		-0.628383	-8.137	-162.865	126.000	177.002	-87.270
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	0.650	4.273	-6.917	-141.482	-1.56E-12	-370.203	-76.438
		-0.628383	-8.137	-169.050	126.000	123.066	-89.914
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	0.975	4.140	-6.917	-147.847	-1.56E-12	-417.219	-78.686
		-0.628383	-8.137	-175.235	126.000	67.120	-92.559
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	1.300	3.844	-6.917	-182.933	-1.56E-12	-474.409	-80.935
		-0.466039	-8.137	-152.698	126.000	17.269	-95.203
		Min: A C E G I J P AM AO			Max: B D F H K N AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
75		0 3.844	-6.917	-182.933	-1.93E-12	-474.409	-80.935
		-0.466039	-8.137	-152.698	126.000	17.269	-95.203
		Min: A C E G I J P AM AO			Max: B D F H K N AP AQ		
75	0.325	3.712	-6.917	-190.858	-1.93E-12	-535.150	-83.183
		0.336450	-5.698	-86.835	-1.53E-12	-17.089	-68.518
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
75	0.650	3.579	-6.917	-198.783	-1.93E-12	-598.467	-85.431
		0.336450	-5.698	-91.460	-1.53E-12	-46.062	-70.369
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
75	0.975	3.446	-6.917	-206.708	-1.93E-12	-664.359	-87.679
		0.336450	-5.698	-96.085	-1.53E-12	-76.538	-72.221
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
75	1.300	3.313	-6.917	-214.632	-1.93E-12	-732.827	-89.927
		0.336450	-5.698	-100.710	-1.53E-12	-102.517	-74.073
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
76		0 -6.805	2.89E-09	273.382	-94.500	-751.251	-89.755
		15.042	-2.040	105.743	-63.486	-76.899	-72.411
		Min: A C E H I J P AP			Max: B D F G K S AM AO AQ		
76	0.425	-6.805	2.89E-09	263.019	-94.500	-637.266	-89.755
		14.868	-2.040	99.695	-63.486	-33.244	-73.278
		Min: A C E H I J P AP			Max: B D F G K S AM AO AQ		
76	0.850	-6.805	2.89E-09	252.656	-94.500	-527.685	-89.755
		14.694	-2.040	93.647	-63.486	7.841	-74.145
		Min: A C E H I J P AP			Max: B D F G K S AM AO AQ		
76	1.275	-0.708267	2.040	188.646	63.486	-429.741	-104.498
		14.520	-2.040	87.599	-63.486	46.356	-75.012
		Min: A C E H I J M AP			Max: B D F G K S AM AO AQ		
76	1.700	-0.708267	2.040	178.283	63.486	-351.769	-103.630
		10.323	1.476	160.662	-53.940	104.148	-99.794
		Min: A C E H I J M AP			Max: B D F G K O AM AO AQ		
77		0 -0.708267	2.040	178.283	63.486	-351.769	-103.630
		10.323	1.476	160.662	-53.940	104.149	-99.794
		Min: A C E H I J M AP			Max: B D F G K O AM AO AQ		
77	0.425	-0.708267	2.040	167.919	63.486	-278.201	-102.763
		10.150	1.476	154.614	-53.940	171.145	-99.167
		Min: A C E H I J M AP			Max: B D F G K O AM AO AQ		
77	0.850	1.054	2.040	128.996	63.486	-216.988	-101.896
		8.214	1.476	135.126	9.060	235.121	-98.539
		Min: A C E H I M AP			Max: B D F G J K O AM AO AQ		
77	1.275	1.054	2.040	120.673	63.486	-163.934	-101.029
		8.040	1.476	127.038	9.060	290.831	-97.912
		Min: A C E H I M AP			Max: B D F G J K O AM AO AQ		
77	1.700	1.404	2.040	85.048	63.486	-116.253	-100.162
		7.515	1.476	146.252	9.060	344.940	-97.284
		Min: B D F H I M AP			Max: A C E G J K O AM AO AQ		
78		0 1.404	2.040	85.048	63.486	-116.253	-100.162
		7.515	1.476	146.252	9.060	344.940	-97.284

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F H I M AF		Max: A C E G J K O AM AO AQ			
78	0.425	1.404	2.040	79.000	63.486	-81.392	-99.294
		7.342	1.476	135.889	9.060	404.894	-96.657
		Min: B D F H I M AF		Max: A C E G J K O AM AO AQ			
78	0.850	2.128	2.040	69.833	63.486	-50.272	-98.427
		6.444	1.476	86.644	72.060	444.815	-96.030
		Min: B D F H I K M AP		Max: A C E G J O AM AO AQ			
78	1.275	2.128	2.040	63.785	63.486	-21.878	-97.560
		6.270	1.476	76.281	72.060	479.436	-95.402
		Min: B D F H I K M AP		Max: A C E G J O AM AO AQ			
78	1.700	2.128	2.040	57.737	63.486	3.945	-96.693
		4.022	2.30E-09	143.160	-94.500	535.656	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	0	2.128	2.040	57.737	63.486	3.945	-96.693
		4.022	2.05E-09	143.160	-94.500	535.656	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	0.425	2.128	2.040	51.689	63.486	27.196	-95.825
		3.848	2.05E-09	132.797	-94.500	594.297	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	0.850	2.128	2.040	45.641	63.486	47.881	-94.958
		3.674	2.05E-09	122.433	-94.500	648.533	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	1.275	2.128	2.040	39.593	63.486	65.994	-94.091
		3.501	2.05E-09	112.070	-94.500	698.365	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	1.700	2.128	2.040	33.545	63.486	81.536	-93.224
		3.327	2.05E-09	101.707	-94.500	743.793	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	0	2.128	2.040	33.545	63.486	81.536	-93.224
		3.327	1.96E-09	101.707	-94.500	743.793	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	0.425	2.128	2.040	27.497	63.486	94.507	-92.357
		3.153	1.96E-09	49.344	-31.500	775.366	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	0.850	2.128	2.040	21.449	63.486	104.908	-91.489
		2.979	1.96E-09	38.981	-31.500	794.135	-85.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	1.275	2.128	2.040	15.401	63.486	112.739	-90.622
		2.805	1.96E-09	28.617	-31.500	808.500	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	1.700	2.128	2.040	9.353	63.486	117.999	-89.755
		2.631	1.96E-09	18.254	-31.500	818.460	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
81	0	2.128	-2.040	-12.099	-63.486	117.999	-89.755
		2.631	1.80E-09	-21.000	31.500	818.460	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	0.425	1.954	-2.040	-18.147	-63.486	111.572	-90.622

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		2.631	1.80E-09	-31.363	31.500	807.333	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	0.850	1.780	-2.040	-24.195	-63.486	102.574	-91.489
		2.631	1.80E-09	-41.726	31.500	791.801	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	1.275	1.607	-2.040	-30.243	-63.486	91.006	-92.357
		2.631	1.80E-09	-52.090	31.500	771.866	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	1.700	1.433	-2.040	-36.291	-63.486	76.868	-93.224
		2.631	1.80E-09	-104.453	94.500	739.125	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	0	1.433	-2.040	-36.291	-63.486	76.868	-93.224
		2.631	1.74E-09	-104.453	94.500	739.125	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	0.425	1.259	-2.040	-42.339	-63.486	60.159	-94.091
		2.631	1.74E-09	-114.816	94.500	692.531	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	0.850	1.085	-2.040	-48.387	-63.486	40.880	-94.958
		2.631	1.74E-09	-125.179	94.500	641.532	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	1.275	0.911158	-2.040	-54.435	-63.486	19.030	-95.825
		2.631	1.74E-09	-135.542	94.500	586.129	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	1.700	0.737312	-2.040	-60.483	-63.486	-5.390	-96.693
		2.631	1.74E-09	-145.905	94.500	526.321	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
83	0	0.737312	-2.040	-60.483	-63.486	-5.390	-96.693
		2.631	1.77E-09	-145.905	94.500	526.321	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
83	0.425	0.563466	-2.040	-66.531	-63.486	-32.381	-97.560
		4.706	-1.476	-79.026	-72.060	462.934	-95.402
		Min: B D F H I K S AM AP		Max: A C E G J Q AO AQ			
83	0.850	0.389619	-2.040	-72.579	-63.486	-61.942	-98.427
		4.706	-1.476	-89.390	-72.060	433.145	-96.030
		Min: B D F H I K S AM AP		Max: A C E G J Q AO AQ			
83	1.275	-0.507851	-2.040	-81.746	-63.486	-94.229	-99.294
		5.429	-1.476	-138.634	-9.060	392.058	-96.657
		Min: B D F H K S AM AP		Max: A C E G I J Q AO AQ			
83	1.700	-0.681697	-2.040	-87.794	-63.486	-130.256	-100.162
		5.429	-1.476	-148.998	-9.060	330.936	-97.284
		Min: B D F H K S AM AP		Max: A C E G I J Q AO AQ			
84	0	-0.681697	-2.040	-87.794	-63.486	-130.256	-100.162
		5.429	-1.476	-148.998	-9.060	330.936	-97.284
		Min: B D F H K S AM AP		Max: A C E G I J Q AO AQ			
84	0.425	-1.206	-2.040	-123.419	-63.486	-179.104	-101.029
		5.780	-1.476	-129.784	-9.060	275.661	-97.912
		Min: A C E H K S AM AP		Max: B D F G I J Q AO AQ			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
84	0.850	-1.380	-2.040	-131.742	-63.486	-233.325	-101.896
		5.780	-1.476	-137.872	-9.060	218.784	-98.539
		Min: A C E H K S AM AP		Max: B D F G I J Q AO AQ			
84	1.275	-3.316	-2.040	-170.665	-63.486	-295.705	-102.763
		7.542	-1.476	-157.360	53.940	153.641	-99.167
		Min: A C E H J K S AM AP		Max: B D F G I Q AO AQ			
84	1.700	-3.490	-2.040	-181.028	-63.486	-370.440	-103.630
		7.542	-1.476	-163.408	53.940	85.478	-99.794
		Min: A C E H J K S AM AP		Max: B D F G I Q AO AQ			
85	0	-3.490	-2.040	-181.028	-63.486	-370.440	-103.630
		7.542	-1.476	-163.408	53.940	85.478	-99.794
		Min: A C E H J K S AM AP		Max: B D F G I Q AO AQ			
85	0.425	-3.664	-2.040	-191.391	-63.486	-449.579	-104.498
		11.565	2.040	-90.345	63.486	26.518	-75.012
		Min: A C E H J K S AM AP		Max: B D F G I M AO AQ			
85	0.850	-9.934	1.54E-09	-255.401	94.500	-548.690	-89.755
		11.565	2.040	-96.393	63.486	-13.163	-74.145
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
85	1.275	-10.108	1.54E-09	-265.764	94.500	-659.438	-89.755
		11.565	2.040	-102.441	63.486	-55.415	-73.278
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
85	1.700	-10.282	1.54E-09	-276.128	94.500	-774.590	-89.755
		11.565	2.040	-108.489	63.486	-100.238	-72.411
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
86	0	5.867	6.917	213.433	-6.87E-13	-717.233	-89.927
		2.890	5.698	99.510	-5.05E-13	-92.923	-74.073
		Min: A C E G J K P AO		Max: B D F H I M AM AP AQ			
86	0.325	5.867	6.917	205.508	-6.87E-13	-649.155	-87.679
		2.757	5.698	94.885	-5.05E-13	-61.334	-72.221
		Min: A C E G J K P AO		Max: B D F H I M AM AP AQ			
86	0.650	5.867	6.917	197.583	-6.87E-13	-583.653	-85.431
		2.624	5.698	90.260	-5.05E-13	-31.248	-70.369
		Min: A C E G J K P AO		Max: B D F H I M AM AP AQ			
86	0.975	5.867	6.917	189.659	-6.87E-13	-520.726	-83.183
		2.491	5.698	85.635	-5.05E-13	-2.665	-68.518
		Min: A C E G J K P AO		Max: B D F H I M AM AP AQ			
86	1.300	5.867	6.917	181.734	-6.87E-13	-460.375	-80.935
		1.556	8.137	151.499	-126.000	31.303	-95.203
		Min: A C E G J K P AO		Max: B D F H I R AM AP AQ			
87	0	5.867	6.917	181.734	-2.14E-13	-460.375	-80.935
		1.556	8.137	151.499	-126.000	31.303	-95.203
		Min: A C E G J K P AO		Max: B D F H I R AM AP AQ			
87	0.325	6.029	6.917	146.648	-2.14E-13	-403.574	-78.686
		1.261	8.137	174.035	-126.000	80.764	-92.559
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
87	0.650	6.029	6.917	140.283	-2.14E-13	-356.948	-76.438
		1.128	8.137	167.850	-126.000	136.321	-89.914

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
87	0.975	6.029	6.917	133.918	-2.14E-13	-312.391	-74.190
		0.994810	8.137	161.665	-126.000	189.867	-87.270
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
87	1.300	6.029	6.917	127.553	-2.14E-13	-269.902	-71.942
		0.861869	8.137	113.480	-63.000	230.903	-84.625
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0	6.029	6.917	127.553	2.06E-13	-269.902	-71.942
		0.861865	8.137	113.480	-63.000	230.903	-84.625
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0.325	6.029	6.917	121.188	2.06E-13	-229.481	-69.694
		0.728928	8.137	107.295	-63.000	266.779	-81.981
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0.650	6.029	6.917	114.824	2.06E-13	-191.129	-67.445
		0.595986	8.137	101.110	-63.000	300.645	-79.336
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0.975	6.029	6.917	83.710	2.06E-13	-158.688	-65.197
		0.463121	8.137	119.674	-63.000	336.343	-76.692
		Min: E D F G J P AO		Max: A C E H I K R AM AP AQ			
88	1.300	6.029	6.917	79.085	2.06E-13	-132.234	-62.949
		0.191911	8.137	159.474	-189.000	374.355	-74.047
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0	6.029	6.917	79.085	8.23E-13	-132.234	-62.949
		0.191911	8.137	159.474	-189.000	374.355	-74.047
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0.325	6.029	6.917	74.460	8.23E-13	-107.283	-60.701
		0.058970	8.137	151.549	-189.000	424.897	-71.402
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0.650	6.029	6.917	69.835	8.23E-13	-83.835	-58.453
		-0.073971	8.137	143.624	-189.000	472.862	-68.758
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0.975	6.029	6.917	65.210	8.23E-13	-61.890	-56.205
		-0.206912	8.137	135.700	-189.000	518.253	-66.113
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	1.300	6.029	6.917	60.585	8.23E-13	-41.448	-53.956
		-0.339854	8.137	85.775	-126.000	552.667	-63.469
		Min: B D F G J P AC		Max: A C E H I K S AM AP AQ			
90	0	6.029	6.917	60.585	4.71E-13	-41.448	-53.956
		-0.339854	8.137	85.775	-126.000	552.667	-63.469
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	0.325	6.029	6.917	55.960	4.71E-13	-22.510	-51.708
		-0.472795	8.137	77.850	-126.000	575.256	-60.824
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	0.650	6.029	6.917	51.335	4.71E-13	-5.074	-49.460
		-0.605736	8.137	69.925	-126.000	603.270	-58.180
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	0.975	6.029	6.917	46.710	4.71E-13	10.858	-47.212

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.738677	8.137	62.001	-126.000	624.708	-55.535
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	1.300	6.029	6.917	42.085	4.71E-13	25.288	-44.964
		-0.871619	8.137	54.076	-126.000	643.570	-52.891
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0	6.029	6.917	42.085	-6.64E-15	25.288	-44.964
		-0.871619	8.137	12.076	-63.000	643.570	-52.891
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0.325	6.029	6.917	37.461	-6.64E-15	38.214	-42.715
		-1.005	8.137	4.151	-63.000	646.207	-50.246
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0.650	6.029	6.917	32.836	-6.64E-15	49.637	-40.467
		-1.138	8.137	-3.774	-63.000	646.268	-47.602
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0.975	6.029	6.917	28.211	-6.64E-15	59.557	-38.219
		-1.270	8.137	-11.699	-63.000	643.754	-44.957
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	1.300	6.029	6.917	23.586	-6.64E-15	67.974	-35.971
		-1.403	8.137	-19.623	-63.000	638.664	-42.313
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0	6.029	6.917	23.586	3.61E-13	67.974	-35.971
		-1.403	8.137	-19.623	-63.000	638.664	-42.313
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0.325	6.029	6.917	18.961	3.61E-13	74.888	-33.723
		-1.536	8.137	-69.548	2.13E-14	625.749	-39.666
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0.650	6.029	6.917	14.336	3.61E-13	80.298	-31.475
		-1.669	8.137	-77.473	2.13E-14	601.858	-37.024
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0.975	6.029	6.917	9.711	3.61E-13	84.206	-29.226
		-1.802	8.137	-85.398	2.13E-14	575.392	-34.379
		Min: B D F G J P AC		Max: A C E H I K S AM AP AQ			
92	1.300	6.029	6.917	5.086	3.61E-13	86.610	-26.978
		-1.935	8.137	-93.322	2.13E-14	546.350	-31.734
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
93	0	6.029	6.917	5.086	2.43E-13	86.610	-26.978
		-1.935	8.137	-93.322	3.44E-13	546.350	-31.734
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
93	0.325	6.029	6.917	0.460898	2.43E-13	87.512	-24.730
		-2.068	8.137	-101.247	3.44E-13	514.732	-29.090
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
93	0.650	6.029	6.917	-4.164	2.43E-13	86.910	-22.482
		-1.950	8.137	-71.357	-126.000	492.039	-26.445
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
93	0.975	6.029	6.917	-8.789	2.43E-13	84.805	-20.234
		-2.083	8.137	-79.282	-126.000	467.561	-23.801
		Min: B D F G J P AC		Max: A C E H I K T AM AP AQ			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
93	1.300	6.029	6.917	-13.414	2.43E-13	81.197	-17.985
		-2.216	8.137	-87.206	-126.000	440.506	-21.156
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0	6.029	6.917	-13.414	3.77E-13	81.197	-17.985
		-2.216	8.137	-87.206	-126.000	440.506	-21.156
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0.325	6.029	6.917	-18.039	3.77E-13	76.086	-15.737
		-2.349	8.137	-137.131	-63.000	407.726	-18.512
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0.650	6.029	6.917	-22.664	3.77E-13	69.472	-13.489
		-2.482	8.137	-145.056	-63.000	361.871	-15.867
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0.975	6.029	6.917	-27.289	3.77E-13	61.354	-11.241
		-2.615	8.137	-152.981	-63.000	313.440	-13.223
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	1.300	6.029	6.917	-31.914	3.77E-13	51.734	-8.993
		-2.748	8.137	-160.906	-63.000	262.434	-10.578
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0	6.029	6.917	-31.914	7.46E-13	51.734	-8.993
		-2.748	8.137	-160.906	-63.000	262.434	-10.578
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0.325	6.029	6.917	-36.539	7.46E-13	40.610	-6.745
		-2.881	8.137	-168.830	-63.000	208.852	-7.934
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0.650	6.029	6.917	-41.164	7.46E-13	27.984	-4.496
		-3.014	8.137	-218.755	1.44E-12	144.294	-5.289
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0.975	6.029	6.917	-45.789	7.46E-13	13.854	-2.248
		-3.147	8.137	-226.680	1.44E-12	71.911	-2.645
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	1.300	5.867	6.917	-103.558	7.46E-13	-3.048	-9.41E-08
		-3.118	8.137	-181.460	1.44E-12	-1.779	-1.10E-07
		Min: A C E G J K P AO		Max: B D F H I T AM AP AQ			
96	0	0.204525	9.77E-09	12.192	1.55E-12	-3.048	2.66E-11
		-1.43E-11	9.89E-09	7.115	-3.37E-13	-1.779	-7.69E-10
		Min: A C E H I K S AM AP		Max: B D F G J P AO AQ			
96	0.125	0.153394	9.77E-09	9.144	1.55E-12	-1.714	1.25E-09
		-1.43E-11	9.89E-09	5.336	-3.37E-13	-1.001	4.68E-10
		Min: A C E H I K S AM AP		Max: B D F G J P AO AQ			
96	0.250	0.102262	9.99E-09	6.096	1.17E-12	-0.761998	2.48E-09
		-1.43E-11	9.89E-09	3.558	-3.37E-13	-0.444707	1.70E-09
		Min: A C E H I K T AM AP		Max: B D F G J P AO AQ			
96	0.375	0.051131	9.99E-09	3.048	1.17E-12	-0.190500	3.73E-09
		-1.43E-11	9.89E-09	1.779	-3.37E-13	-0.111177	2.94E-09
		Min: A C E H I K T AM AP		Max: B D F G J P AO AQ			
96	0.500	2.02E-09	9.99E-09	1.17E-12	-3.54E-12	4.97E-09	
		-1.43E-11	9.89E-09	7.12E-08	-3.37E-13	4.28E-13	4.18E-09

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
290	0	-360.888	-2.195	-11.098	-1.848	-18.638	17.438
		-360.888	-2.195	7.531	1.932	57.877	17.438
	Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ BH CD			
290	3.300	-360.888	-2.195	-11.098	-1.848	-55.260	10.195
		-360.888	-2.195	7.828	1.932	83.219	10.195
	Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ BH CD			
290	6.600	-484.462	-2.859	-17.618	1.133	-110.878	-1.675
		-484.462	-2.859	14.645	-1.048	128.537	-1.675
	Min: AR AT AV AX BA BV			Max: AR AT AV AX AZ BD CD			
290	9.900	-400.509	-2.330	-17.618	1.133	-169.016	-7.667
		-400.509	-2.330	14.942	-1.048	177.355	-7.667
	Min: AR AT AV AX BA BT			Max: AR AT AV AX AZ EE CD			
290	13.200	-400.509	-2.330	-17.618	1.133	-227.154	-15.358
		-400.509	-2.330	15.239	-1.048	227.154	-15.358
	Min: AR AT AV AX BA BT			Max: AR AT AV AX AZ BE CD			
291	0	-360.888	2.195	-11.098	1.848	-18.638	-17.438
		-360.888	2.195	7.531	-1.932	57.877	-17.438
	Min: AR AT AV AX BA BV			Max: AR AT AV AX AZ BD CD			
291	3.300	-360.888	2.195	-11.098	1.848	-55.260	-10.195
		-360.888	2.195	7.828	-1.932	83.219	-10.195
	Min: AR AT AV AX BA BV			Max: AR AT AV AX AZ BD CD			
291	6.600	-484.462	2.859	-17.618	-1.133	-110.878	1.675
		-484.462	2.859	14.645	1.048	128.537	1.675
	Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ BH CD			
291	9.900	-484.462	2.859	-17.618	-1.133	-169.016	11.111
		-484.462	2.859	14.942	1.048	177.355	11.111
	Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ BH CD			
291	13.200	-484.462	2.859	-17.618	-1.133	-227.154	20.546
		-484.462	2.859	15.239	1.048	227.154	20.546
	Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ BH CD			

aracterísticas mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

rea	Ax = 46.53E3 cm2			
omento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4	
onst. de torsión			Ix = 50.83E6 cm4	
omento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3		
aricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad	
ist. al borde	yl = -3.8500 m	yr = 3.8500 m		
	zo = 0.4014 m	zu = -0.4986 m		

-N-Punto de aplic. de fuerzas en el baricentro de la sección
-T-Punto de aplic. de fuerzas en el baricentro de la sección
chubmittelpunkt y = 0.0000 m z = 0.4986 m

ontorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

ección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
S 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

untos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

rmadura "B1" As-tot =2.0000 cm2 (0.00 o/o)

ombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
R 2 / CS 1	AEH500	1.0	2	1.0000	-3.7500	0.7800
					3.7500	0.7800
R 1 / CS 1	AEH500	1.0	2	1.0000	-1.8000	0.0600
					1.8000	0.0600

imensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	646.2700	0.0000	

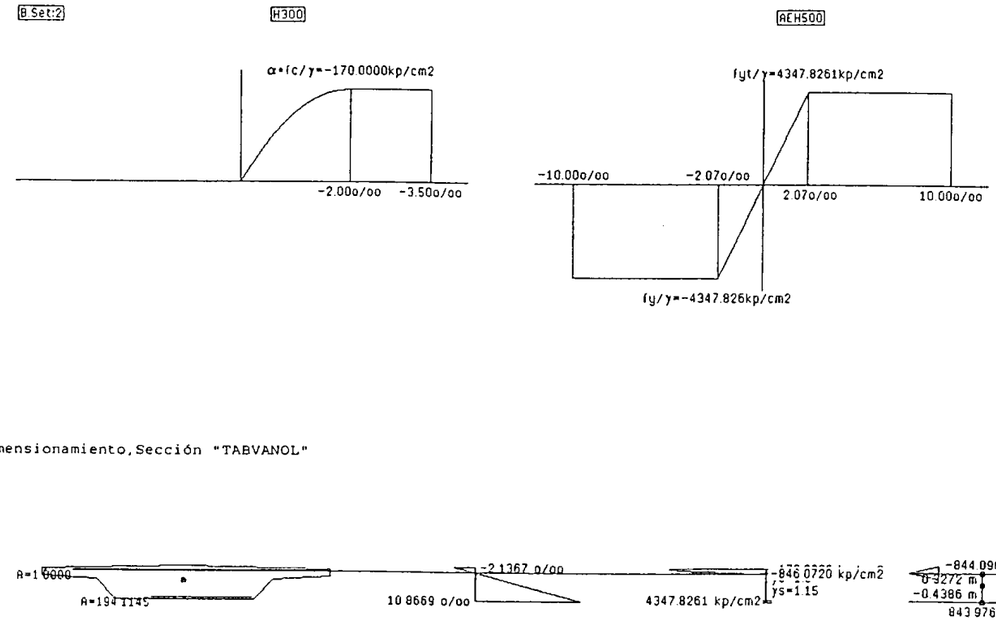
rámetros de cálculo empleados:
t:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
t 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	----	1.0000
AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	194.1145	194.1145

x.x/h = 0.18 As-top/bot = 1.0000/194.1145 As = 0.42 % = 195.1145

18 ϕ 25 + 18 ϕ 32 (233.10 cm²)

Material acorde a la sección: "TABVANOL"



Dimensionamiento, Sección "TABVANOL"

Características mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

Area	Ax = 46.53E3 cm2			
Momento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4	
Const. de torsión			Ix = 50.83E6 cm4	
Momento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3		
Baricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad	
Dist. al borde	yl = -3.8500 m	yr = 3.8500 m		
	zo = 0.4014 m	zu = -0.4986 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = 0.0000 m z = 0.4986 m

Contorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

rmadura "B1" As-tot =195.1145 cm2 (0.42 o/o)

ombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
R 2 / CS 1	AEH500	1.0	2	1.0000	-3.7500	0.7800
					3.7500	0.7800
R 1 / CS 1	AEH500	1.0	2	194.1145	-1.8000	0.0600
					1.8000	0.0600

imensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

o	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	-774.5900	0.0000	

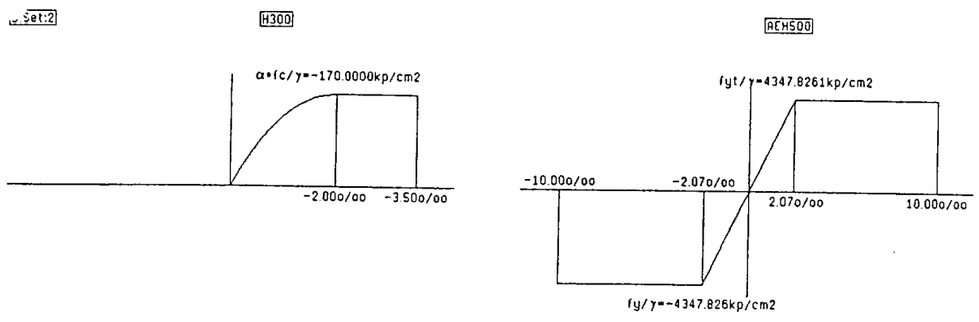
ir ros de cálculo empleados:
t:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
t 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	257.6408	257.6408
AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	----	1.0000

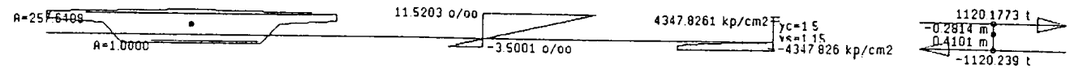
x.x/h = 0.27 As top/bot = 257.6408/1.0000 As = 0.56 % = 258.6408

$\phi 20/0.20 \times 7.60m +$
$23\,\phi 25 + 14\,\phi 20 \quad (276.21cm^2)$

terial acorde a la sección: "TABVANOL"



Dimensionamiento, Sección "TABVANOL"



Características mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

Area	Ax = 46.53E3 cm2		
Momento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4
Const. de torsión			Ix = 50.83E6 cm4
Momento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3	
Baricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad
Dist. al borde	yl = -3.8500 m	yr = 3.8500 m	
	zo = 0.4014 m	zu = -0.4986 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = 0.0000 m z = 0.4986 m

Contorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

Armadura "B1" As-tot =258.6408 cm2 (0.56 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 2 / CS 1	AEH500	1.0	2	257.6408	-3.7500	0.7800
					3.7500	0.7800
LR 1 / CS 1	AEH500	1.0	2	1.0000	-1.8000	0.0600
					1.8000	0.0600

Dimensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	818.4600	0.0000	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

ENVELOPE SPECIFIC.: ES 'COMBINACION FZAS EXTERIORES'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	2	2.025		PESO PAVIMENTO
D	OR	2	1.000		PESO PAVIMENTO
E	PL.PERM	3	1.350		PESO BARRERAS
F	OR	3	1.000		PESO BARRERAS
G	PL.PERM	5	1.350		RETRACCION
H	OR	5	1.000		RETRACCION
I	PLUS	6	1.500		SOB UNIF 1
J	PLUS	7	1.500		SOBRECARGA UNIF 2
K	PLUS	8	1.500		SOB UNIF 3
L	PLUS	11	4.220		VEHICULO HIPOTESIS 11
M	OR	12	4.220		VEHICULO HIPOTESIS 12
N	OR	13	4.220		VEHICULO HIPOTESIS 13
O	OR	14	4.220		VEHICULO HIPOTESIS 14
P	OR	15	4.220		VEHICULO HIPOTESIS 15
Q	OR	16	4.220		VEHICULO HIPOTESIS 16
R	OR	17	4.220		VEHICULO HIPOTESIS 17
S	OR	18	4.220		VEHICULO HIPOTESIS 18
T	OR	19	4.220		VEHICULO HIPOTESIS 19
U	OR	20	4.220		VEHICULO HIPOTESIS 20
V	OR	21	4.220		VEHICULO HIPOTESIS 21
W	OR	22	4.220		VEHICULO HIPOTESIS 22
X	OR	23	4.220		VEHICULO HIPOTESIS 23
Y	OR	24	4.220		VEHICULO HIPOTESIS 24
Z	OR	25	4.220		VEHICULO POSICION 25
AA	OR	26	4.220		VEHICULO POSICION 26
AB	OR	27	4.220		VEHICULO POSICION 27
AC	OR	28	4.220		VEHICULO POSICION 28
AD	OR	29	4.220		VEHICULO POSICION 29
AE	OR	30	4.220		VEHICULO POSICION 30
AF	OR	31	4.220		VEHICULO POSICION 31
AG	OR	32	4.220		VEHICULO POSICION 32
AH	OR	33	4.220		VEHICULO POSICION 33
AI	OR	34	4.220		VEHICULO POSICION 34
AJ	OR	35	4.220		VEHICULO POSICION 35
AK	OR	36	4.220		VEHICULO POSICION 36
AL	OR	37	4.220		VEHICULO HIPOTESIS 37
AM	PLUS	60	1.500		FRENADO
AN	PLUS	63	0.450000		VIENTO TRANSV CON SOB
AO	PLUS	64	0.900000		TEMPERATURA (-)
AP	OR	65	0.900000		TEMPERATURA (+)
AQ	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AR	PERM.	1	1.350	PESO PROPIO
AS	OR	1	1.000	PESO PROPIO
AT	PL.PERM	2	2.025	PESO PAVIMENTO
AU	OR	2	1.000	PESO PAVIMENTO
AV	PL.PERM	3	1.350	PESO BARRERAS
AW	OR	3	1.000	PESO BARRERAS
AX	PL.PERM	5	1.350	RETRACCION

AY	OR	5	1.000	RETRACCION
AZ	PLUS	9	1.500	SOB UNIF EXC
BA	PLUS	10	1.500	SOB UNIF EXC
BB	PLUS	11	4.220	VEHICULO HIPOTESIS 11
BC	OR	12	4.220	VEHICULO HIPOTESIS 12
BD	OR	13	4.220	VEHICULO HIPOTESIS 13
BE	OR	14	4.220	VEHICULO HIPOTESIS 14
BF	OR	15	4.220	VEHICULO HIPOTESIS 15
BG	OR	16	4.220	VEHICULO HIPOTESIS 16
BH	OR	17	4.220	VEHICULO HIPOTESIS 17
BI	OR	18	4.220	VEHICULO HIPOTESIS 18
BJ	OR	19	4.220	VEHICULO HIPOTESIS 19
BK	OR	20	4.220	VEHICULO HIPOTESIS 20
BL	OR	21	4.220	VEHICULO HIPOTESIS 21
BM	OR	22	4.220	VEHICULO HIPOTESIS 22
BN	OR	23	4.220	VEHICULO HIPOTESIS 23
BO	OR	24	4.220	VEHICULO HIPOTESIS 24
BP	OR	25	4.220	VEHICULO POSICION 25
BQ	OR	26	4.220	VEHICULO POSICION 26
BR	OR	27	4.220	VEHICULO POSICION 27
BS	OR	28	4.220	VEHICULO POSICION 28
BT	OR	29	4.220	VEHICULO POSICION 29
BU	OR	30	4.220	VEHICULO POSICION 30
BV	OR	31	4.220	VEHICULO POSICION 31
BW	OR	32	4.220	VEHICULO POSICION 32
BX	OR	33	4.220	VEHICULO POSICION 33
BY	OR	34	4.220	VEHICULO POSICION 34
BZ	OR	35	4.220	VEHICULO POSICION 35
CA	OR	36	4.220	VEHICULO POSICION 36
CB	OR	37	4.220	VEHICULO HIPOTESIS 37
CC	PLUS	60	1.500	FRENADO
CD	PLUS	63	0.450000	VIENTO TRANSV CON SOE
CE	PLUS	64	0.900000	TEMPERATURA (-)
CF	OR	65	0.900000	TEMPERATURA (+)
CG	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-8.21E-12	1.74E-08	-1.22E-07	-9.54E-13	6.01E-13	-2.51E-06
		-2.05E-09	-4.99E-10	-7.12E-08	4.98E-13	-1.24E-12	2.66E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.125	-8.21E-12	1.74E-08	-3.048	-9.54E-13	-0.190500	-3.35E-10
		-0.051131	-4.99E-10	-1.779	4.98E-13	-0.111177	2.60E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.250	-8.21E-12	1.74E-08	-6.096	-9.54E-13	-0.761998	1.84E-09
		-0.102263	-4.99E-10	-3.558	4.98E-13	-0.444707	2.54E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.375	-8.21E-12	1.74E-08	-9.144	-9.54E-13	-1.714	4.02E-09

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.153394	-4.99E-10	-5.336	4.98E-13	-1.001	2.47E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.500	-8.21E-12	1.74E-08	-12.192	-9.54E-13	-3.048	6.19E-09
		-0.204525	-4.99E-10	-7.115	4.98E-13	-1.779	2.41E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
66		0 8.794	-13.901	37.688	1.75E-13	-1.779	-1.91E-07
		-0.738234	-16.352	332.190	-1.34E-13	-3.048	-2.23E-07
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.325	8.661	-13.901	33.063	1.75E-13	9.718	-4.518
		-0.738234	-16.352	324.265	-1.34E-13	103.626	-5.314
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.650	8.528	-13.901	28.438	1.75E-13	19.712	-9.036
		-0.738234	-16.352	316.340	-1.34E-13	207.724	-10.629
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.975	8.395	-13.901	23.813	1.75E-13	28.203	-13.553
		-0.738234	-16.352	224.015	126.600	298.697	-15.943
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	1.300	8.262	-13.901	19.188	1.75E-13	35.190	-18.071
		-0.738234	-16.352	216.091	126.600	370.214	-21.257
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67		0 8.262	-13.901	19.188	1.75E-13	35.190	-18.071
		-0.738234	-16.352	216.091	126.600	370.214	-21.257
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.325	8.129	-13.901	14.563	1.75E-13	40.675	-22.589
		-0.738234	-16.352	208.166	126.600	439.156	-26.571
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.650	7.996	-13.901	9.938	1.75E-13	44.656	-27.107
		-0.738234	-16.352	200.241	126.600	505.522	-31.886
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.975	7.863	-13.901	5.313	1.75E-13	47.134	-31.624
		-0.738234	-16.352	192.316	126.600	569.313	-37.200
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	1.300	7.730	-13.901	0.687888	1.75E-13	46.109	-36.142
		-1.242	-16.352	175.982	2.03E-13	536.923	-42.514
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68		0 7.730	-13.901	0.687886	1.75E-13	48.109	-36.142
		-1.242	-16.352	175.982	2.03E-13	536.923	-42.514
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68	0.325	7.597	-13.901	-3.937	1.75E-13	47.581	-40.660
		-1.242	-16.352	168.057	2.03E-13	592.830	-47.826
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68	0.650	7.464	-13.901	-8.562	1.75E-13	45.550	-45.178
		-1.242	-16.352	160.133	2.03E-13	646.161	-53.143
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68	0.975	7.331	-13.901	-13.187	1.75E-13	42.016	-49.696
		-1.242	-16.352	152.208	2.03E-13	696.916	-58.457
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
68	1.300	6.754	-16.352	-51.430	379.800	500.888	-63.771
		-1.242	-16.352	144.283	2.03E-13	745.096	-63.771
		Min: B D F G J L AM AO			Max: A C E H I K M AP AQ		
69		0 6.754	-16.352	-51.430	379.800	500.888	-63.771
		-1.242	-16.352	144.283	1.60E-12	745.096	-63.771
		Min: B D F G J L AM AO			Max: A C E H I K M AP AQ		
69	0.325	6.621	-16.352	-56.055	379.800	483.422	-69.085
		-1.242	-16.352	136.358	1.60E-12	790.700	-69.085
		Min: B D F G J L AM AO			Max: A C E H I K N AP AQ		
69	0.650	6.488	-16.352	-60.680	379.800	464.452	-74.400
		-1.242	-16.352	128.433	1.60E-12	833.729	-74.400
		Min: B D F G J L AM AO			Max: A C E H I K M AP AQ		
69	0.975	6.355	-16.352	-65.696	379.800	505.016	-79.714
		-1.242	-16.352	120.900	1.60E-12	813.145	-79.714
		Min: A C E G J L AM AO			Max: B D F H I K M AP AQ		
69	1.300	6.222	-16.352	-72.061	379.800	482.630	-85.026
		-0.964122	-16.352	41.819	6.01E-13	472.373	-85.028
		Min: A C E G J L AM AO			Max: B D F H I K N AP AQ		
70		0 6.222	-16.352	-72.061	379.800	482.630	-85.028
		-0.964122	-16.352	41.819	6.22E-13	472.373	-85.026
		Min: A C E G J L AM AO			Max: B D F H I K N AP AQ		
70	0.325	6.089	-16.352	-78.426	379.800	458.176	-90.342
		-0.964122	-16.352	35.634	6.22E-13	484.959	-90.342
		Min: A C E G J L AM AO			Max: B D F H I K N AP AQ		
70	0.650	5.794	-16.352	-85.432	379.800	509.435	-95.657
		-0.801778	-16.352	30.090	6.22E-13	417.753	-95.657
		Min: A C E G I J L AM AO			Max: B D F H K N AP AQ		
70	0.975	5.661	-16.352	-93.357	379.800	480.382	-100.971
		-0.801778	-16.352	25.465	6.22E-13	426.781	-100.971
		Min: A C E G I J L AM AO			Max: B D F H K N AP AQ		
70	1.300	5.528	-16.352	-101.282	379.800	448.753	-106.285
		-0.801778	-16.352	20.840	6.22E-13	434.306	-106.285
		Min: A C E G I J L AM AO			Max: B D F H K N AP AQ		
71		0 5.025	-16.352	-109.691	253.200	769.672	-106.285
		-0.801778	-16.352	20.840	-3.88E-13	434.306	-106.285
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	0.325	4.892	-16.352	-117.616	253.200	732.734	-111.599
		-0.801778	-16.352	16.215	-3.88E-13	440.327	-111.599
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	0.650	4.759	-16.352	-125.541	253.200	693.221	-116.914
		-0.801778	-16.352	11.591	-3.88E-13	444.846	-116.914
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	0.975	4.626	-16.352	-133.465	253.200	651.133	-122.228
		-0.801778	-16.352	6.966	-3.88E-13	447.861	-122.228
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	1.300	4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-3.88E-13	449.374	-127.542

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72		0 4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-6.12E-13	449.374	-127.542
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.325	4.360	-16.352	-233.715	379.800	548.679	-132.856
		-0.801778	-16.352	-2.284	-6.12E-13	449.383	-132.856
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.650	4.227	-16.352	-241.640	379.800	471.434	-138.171
		-0.801778	-16.352	-6.909	-6.12E-13	447.889	-138.171
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.975	4.094	-16.352	-249.564	379.800	391.614	-143.485
		-0.801778	-16.352	-11.534	-6.12E-13	444.692	-143.485
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	1.300	3.961	-16.352	-257.489	379.800	309.218	-148.799
		-0.801778	-16.352	-16.159	-6.12E-13	440.392	-148.799
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
73		0 3.961	-16.352	-257.489	379.800	309.217	-148.799
		-0.801778	-16.352	-16.159	-2.89E-12	440.392	-148.799
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
73	0.325	3.828	-16.352	-265.414	379.800	224.246	-154.113
		0.810842	-11.450	-47.936	-1.53E-12	178.478	-107.917
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	0.650	3.695	-16.352	-273.339	379.800	136.698	-159.428
		0.810842	-11.450	-52.561	-1.53E-12	162.147	-111.639
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	0.975	3.562	-16.352	-281.264	379.800	46.576	-164.742
		0.810842	-11.450	-57.186	-1.53E-12	144.313	-115.360
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	1.300	3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-1.53E-12	124.976	-119.081
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74		0 3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-2.52E-12	124.976	-119.081
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.325	3.296	-16.352	-297.113	379.800	-141.397	-175.371
		0.810842	-11.450	-66.436	-2.52E-12	104.135	-122.803
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.650	3.163	-16.352	-305.038	379.800	-239.246	-180.685
		0.810842	-11.450	-71.061	-2.52E-12	81.792	-126.524
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.975	3.030	-16.352	-312.963	379.800	-339.671	-185.999
		0.810842	-11.450	-75.686	-2.52E-12	57.945	-130.245
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	1.300	2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-2.52E-12	32.596	-135.966
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

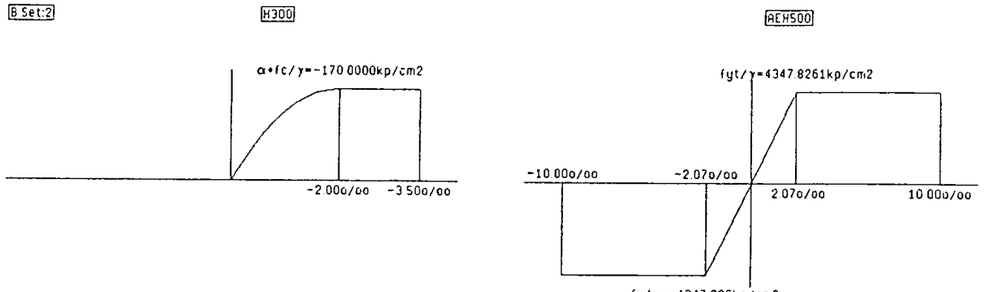
Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
75		0 2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-3.08E-12	32.596	-133.966
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
75	0.325	2.765	-16.352	-328.812	379.800	-548.248	-196.628
		0.810842	-11.450	-84.936	-3.08E-12	5.743	-137.688
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
75	0.650	2.909	-16.352	-409.633	379.800	-505.888	-201.942
		0.810842	-11.450	-89.561	-3.08E-12	-22.613	-141.409
		Min: A C E G I J N AM AO			Max: B D F H K S AP AQ		
75	0.975	2.776	-16.352	-417.558	379.800	-640.307	-207.256
		0.810842	-11.450	-94.186	-3.08E-12	-52.471	-145.130
		Min: A C E G I J N AM AO			Max: B D F H K S AP AQ		
75	1.300	2.644	-16.352	-425.483	379.800	-777.301	-212.570
		0.810842	-11.450	-98.811	-3.08E-12	-83.833	-148.852
		Min: A C E G I J N AM AO			Max: B D F H K S AP AQ		
76		0 7.040	-4.100	96.301	-127.576	-215.069	-145.511
		3.526	2.967	434.962	-234.993	-616.520	-205.582
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	0.425	6.866	-4.100	90.253	-127.576	-175.427	-147.254
		3.526	2.967	424.595	-234.993	-433.863	-204.322
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	0.850	6.692	-4.100	84.205	-127.576	-138.355	-148.997
		3.526	2.967	414.236	-234.993	-255.611	-203.061
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	1.275	6.518	-4.100	78.156	-127.576	-103.853	-150.739
		3.526	2.967	319.473	-108.393	-117.633	-201.800
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	1.700	6.344	-4.100	72.108	-127.576	-71.922	-152.482
		3.526	2.967	309.109	-108.393	15.941	-200.539
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
77		0 6.344	-4.100	72.108	-127.576	-71.922	-152.482
		3.526	2.967	309.109	-108.393	15.941	-200.539
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
77	0.425	6.170	-4.100	66.060	-127.576	-42.561	-154.225
		3.526	2.967	298.748	-108.393	145.110	-199.278
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
77	0.850	5.997	-4.100	60.012	-127.576	-15.770	-155.967
		-0.641686	5.23E-09	274.803	-189.900	19.158	-180.365
		Min: B D F H K S AM AP			Max: A C E G I J P AO AQ		
77	1.275	5.823	-4.100	53.964	-127.576	8.450	-157.710
		-0.641686	5.23E-09	264.440	-189.900	133.747	-180.365
		Min: B D F H K S AM AP			Max: A C E G I J P AO AQ		
77	1.700	5.649	-4.100	47.916	-127.576	30.100	-159.453
		-0.641686	5.23E-09	254.077	-189.900	243.932	-180.365
		Min: B D F H K S AM AP			Max: A C E G I J P AO AQ		
78		0 5.649	-4.100	47.916	-127.576	30.100	-159.453
		-0.641686	4.63E-09	254.077	-189.900	243.932	-180.365

No Armad. long.		y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
	AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	----	1.0000
1	AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	248.5995	248.5995

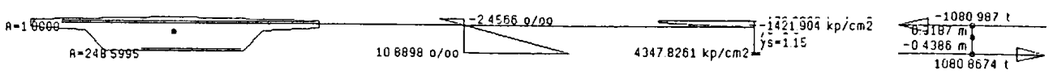
Max.x/h = 0.20 As-top/bot = 1.0000/248.5995 As = 0.54 % = 249.5995

18 ϕ25 + 18 ϕ32 + 4 ϕ25.
(252,74 cm²)

Material acorde a la sección: "TABVANOL"

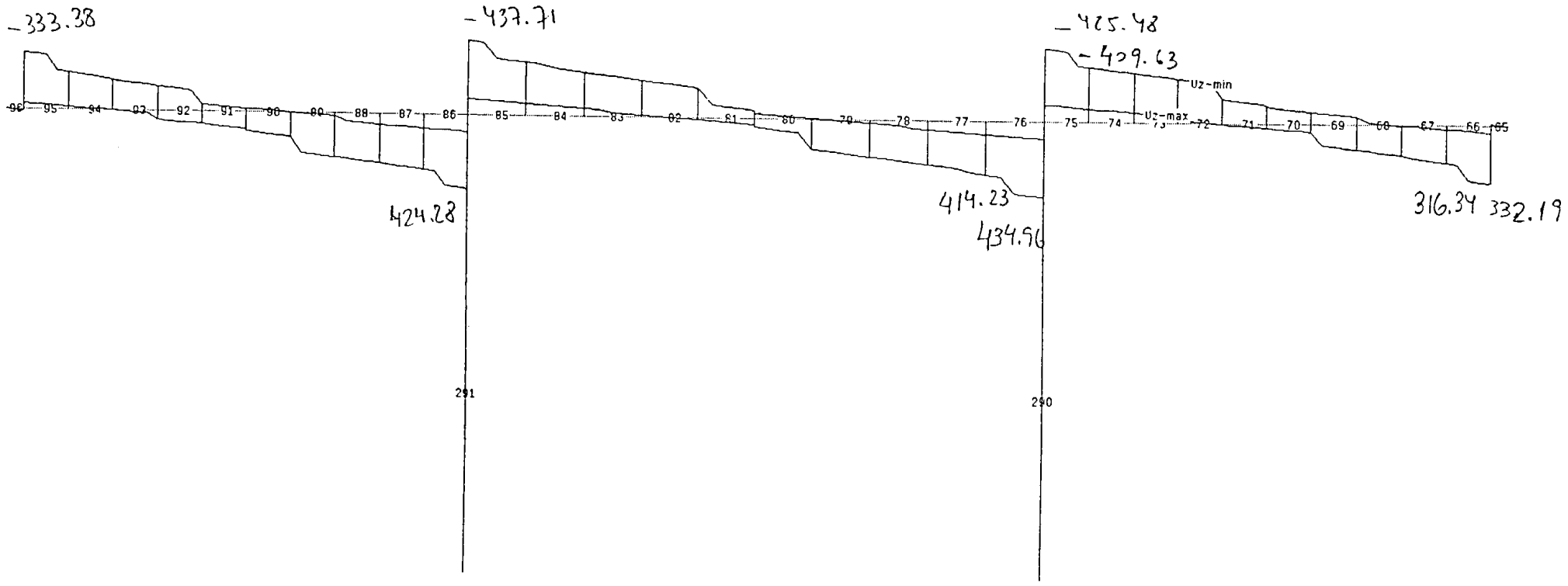


Dimensionamiento, Sección "TABVANOL"



2.4.1.3. Verificación de las secciones a esfuerzos de cortante (E.L.U.)

Scale 1 : 173.7
Int. Forces envelope Vz, GWSP ES (COMBINACION FZAS EXTERIORES), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 5.00E-03
  min: -4.38E+02 max: 9.76E+01 [t]
- Envelope Shear force Vz-max, Scale 5.00E-03
  min: -9.90E+01 max: 4.35E+02 [t]



ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F H K S AM AP		Max: A C E G I J P AO AQ			
78	0.425	5.475	-4.100	41.868	-127.576	49.179	-161.195
		-0.641686	4.63E-09	243.713	-189.900	349.712	-180.365
		Min: B D F H K S AM AP		Max: A C E G I J P AO AQ			
78	0.850	-2.783	2.967	25.996	144.807	320.860	-192.974
		-0.641686	4.63E-09	233.350	-189.900	451.088	-180.365
		Min: B D F H K O AM AP		Max: A C E G I J P AO AQ			
78	1.275	-2.956	2.967	19.948	144.807	330.623	-191.713
		-0.641686	4.63E-09	222.987	-189.900	548.060	-180.365
		Min: B D F H K O AM AP		Max: A C E G I J P AO AQ			
78	1.700	-3.130	2.967	13.900	144.807	337.816	-190.452
		-0.641686	4.63E-09	212.624	-189.900	640.627	-180.365
		Min: B D F H K O AM AP		Max: A C E G I J P AO AQ			
79	0	-4.175	2.967	13.900	144.807	502.695	-190.452
		0.403304	4.11E-09	212.624	-189.900	475.748	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	0.425	-4.369	2.967	7.852	144.807	507.316	-189.191
		0.403304	4.11E-09	202.261	-189.900	563.911	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	0.850	-4.523	2.967	1.804	144.807	509.370	-187.930
		0.403304	4.11E-09	191.897	-189.900	647.670	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	1.275	-4.697	2.967	-4.244	144.807	508.851	-186.669
		0.403304	4.11E-09	181.534	-189.900	727.024	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	1.700	-4.871	2.967	-10.292	144.807	505.762	-185.408
		0.403304	4.11E-09	171.171	-189.900	801.974	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	0	-4.871	2.967	-10.292	144.807	505.762	-185.408
		0.403304	3.94E-09	171.171	-189.900	801.974	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	0.425	-5.044	2.967	-16.340	144.807	500.103	-184.147
		0.403304	3.94E-09	76.408	-63.300	853.529	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	0.850	-5.218	2.967	-22.388	144.807	491.873	-182.887
		0.403304	3.94E-09	66.045	-63.300	883.800	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	1.275	-5.392	2.967	-28.436	144.807	481.073	-181.626
		0.403304	3.94E-09	55.682	-63.300	909.667	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	1.700	-5.566	2.967	-34.484	144.807	467.703	-180.365
		0.403304	3.94E-09	45.318	-63.300	931.130	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
81	0	-11.847	3.62E-09	-48.064	63.300	1085.477	-180.365
		6.684	-2.967	31.738	-144.807	313.356	-180.365
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	0.425	-12.021	3.62E-09	-58.427	63.300	1062.847	-180.365

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		6.684	-2.967	25.690	-144.807	325.559	-181.626
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	0.850	-12.195	3.62E-09	-68.790	63.300	1035.814	-180.365
		6.684	-2.967	19.642	-144.807	335.193	-182.887
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	1.275	-12.368	3.62E-09	-79.154	63.300	1004.375	-180.365
		6.684	-2.967	13.594	-144.807	342.255	-184.147
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	1.700	-12.542	3.62E-09	-173.917	189.900	951.653	-180.365
		6.684	-2.967	7.546	-144.807	346.748	-185.408
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
82	0	-11.497	3.50E-09	-173.917	189.900	786.774	-180.365
		5.639	-2.967	7.546	-144.807	511.627	-185.408
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	0.425	-11.671	3.50E-09	-184.280	189.900	710.657	-180.365
		5.639	-2.967	1.498	-144.807	513.549	-186.669
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	0.850	-11.845	3.50E-09	-194.643	189.900	630.136	-180.365
		5.639	-2.967	-4.550	-144.807	512.900	-187.930
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	1.275	-12.019	3.50E-09	-205.006	189.900	545.210	-180.365
		5.639	-2.967	-10.598	-144.807	509.682	-189.191
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	1.700	-12.193	3.50E-09	-215.370	189.900	455.880	-180.365
		5.639	-2.967	-16.646	-144.807	503.892	-190.452
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	0	-12.193	3.56E-09	-215.370	189.900	455.880	-180.365
		5.639	-2.967	-16.646	-144.807	503.892	-190.452
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	0.425	-12.366	3.56E-09	-225.733	189.900	362.146	-180.365
		5.639	-2.967	-22.694	-144.807	495.533	-191.713
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	0.850	-12.540	3.56E-09	-236.096	189.900	264.007	-180.365
		5.639	-2.967	-28.742	-144.807	484.603	-192.974
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	1.275	-12.714	3.56E-09	-246.459	189.900	161.464	-180.365
		13.723	4.100	-44.614	127.576	211.754	-161.195
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
83	1.700	-12.888	3.56E-09	-256.822	189.900	54.517	-180.365
		13.723	4.100	-50.662	127.576	191.508	-159.453
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
84	0	-12.888	3.51E-09	-256.822	189.900	54.517	-180.365
		13.723	4.100	-50.662	127.576	191.508	-159.453
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
84	0.425	-13.062	3.51E-09	-267.185	189.900	-56.834	-180.365
		13.723	4.100	-56.710	127.576	168.692	-157.710
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
84	0.850	-13.236	3.51E-09	-277.549	189.900	-172.590	-180.365
		13.723	4.100	-62.758	127.576	143.305	-155.967
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
84	1.275	-9.241	-2.967	-301.492	108.393	-47.805	-199.278
		13.723	4.100	-68.806	127.576	115.347	-154.225
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
84	1.700	-9.415	-2.967	-311.855	108.393	-178.142	-200.539
		13.723	4.100	-74.854	127.576	84.819	-152.482
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	0	-9.415	-2.967	-311.855	108.393	-178.142	-200.539
		13.723	4.100	-74.854	127.576	84.819	-152.482
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	0.425	-9.585	-2.967	-322.218	108.393	-312.882	-201.800
		13.723	4.100	-80.902	127.576	51.721	-150.739
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	0.850	-9.763	-2.967	-332.581	108.393	-452.027	-203.061
		13.723	4.100	-86.950	127.576	16.052	-148.997
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	1.275	-9.937	-2.967	-427.345	234.993	-631.446	-204.322
		13.723	4.100	-92.998	127.576	-22.187	-147.254
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	1.700	-10.111	-2.967	-437.708	234.993	-815.270	-205.582
		13.723	4.100	-99.046	127.576	-62.996	-145.511
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
86	0	3.365	11.450	97.611	-1.01E-12	-68.240	-148.852
		5.157	16.352	424.263	-379.800	-761.707	-212.570
		Min: B D F H I M AM AP AQ		Max: A C E G J K R AO			
86	0.325	3.232	11.450	92.986	-1.01E-12	-37.268	-145.130
		5.197	16.352	416.358	-379.800	-625.103	-207.256
		Min: B D F H I M AM AP AQ		Max: A C E G J K R AO			
86	0.650	3.099	11.450	88.362	-1.01E-12	-7.799	-141.409
		5.197	16.352	408.434	-379.800	-491.074	-201.942
		Min: B D F H I M AM AP AQ		Max: A C E G J K R AO			
86	0.975	2.966	11.450	83.737	-1.01E-12	20.167	-137.688
		4.919	16.352	327.613	-379.800	-533.824	-196.628
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
86	1.300	2.833	11.450	79.112	-1.01E-12	46.630	-133.966
		4.919	16.352	319.688	-379.800	-428.638	-191.313
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0	2.833	11.450	79.112	-5.45E-13	46.630	-133.966
		4.919	16.352	319.688	-379.800	-428.638	-191.313
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0.325	2.700	11.450	74.487	-5.45E-13	71.590	-130.245
		4.919	16.352	311.763	-379.800	-326.027	-185.999
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0.650	2.567	11.450	69.862	-5.45E-13	95.046	-126.524
		4.919	16.352	303.838	-379.800	-225.992	-180.685

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0.975	2.434	11.450	65.237	-5.45E-13	117.000	-122.803
		4.919	16.352	295.914	-379.800	-128.532	-175.371
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	1.300	2.301	11.450	60.612	-5.45E-13	137.450	-119.081
		4.919	16.352	287.989	-379.800	-33.648	-170.056
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0	2.301	11.450	60.612	7.48E-13	137.450	-119.081
		4.919	16.352	287.989	-379.800	-33.648	-170.056
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0.325	2.168	11.450	55.987	7.48E-13	156.398	-115.360
		4.919	16.352	280.064	-379.800	58.661	-164.742
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0.650	2.035	11.450	51.362	7.48E-13	173.842	-111.639
		4.919	16.352	272.139	-379.800	148.394	-159.428
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0.975	1.902	11.450	46.737	7.48E-13	189.783	-107.917
		4.919	16.352	264.214	-379.800	235.551	-154.113
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	1.300	0.156708	16.352	14.960	2.70E-13	451.307	-148.799
		4.919	16.352	256.290	-379.800	320.133	-148.799
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0	0.156708	16.352	14.960	2.43E-12	451.307	-148.799
		4.919	16.352	256.290	-379.800	320.133	-148.799
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0.325	0.023767	16.352	10.335	2.43E-12	455.417	-143.485
		4.919	16.352	248.365	-379.800	402.139	-143.485
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0.650	-0.109174	16.352	5.710	2.43E-12	458.025	-138.171
		4.919	16.352	240.440	-379.800	481.570	-138.171
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0.975	-0.242116	16.352	1.085	2.43E-12	459.129	-132.856
		4.919	16.352	232.515	-379.800	558.425	-132.856
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	1.300	-0.375057	16.352	-3.540	2.43E-12	458.730	-127.542
		4.919	16.352	140.191	-253.200	615.825	-127.542
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0	-0.375057	16.352	-3.540	1.29E-12	458.730	-127.542
		4.919	16.352	140.191	-253.200	615.825	-127.542
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0.325	-0.507998	16.352	-8.165	1.29E-12	456.828	-122.228
		4.919	16.352	132.266	-253.200	660.099	-122.228
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0.650	-0.640939	16.352	-12.790	1.29E-12	453.422	-116.914
		4.919	16.352	124.341	-253.200	701.798	-116.914
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0.975	-0.773881	16.352	-17.415	1.29E-12	448.514	-111.599

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		4.919	16.352	116.416	-253.200	740.921	-111.599
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	1.300	-0.906822	16.352	-22.040	1.29E-12	442.103	-106.285
		4.919	16.352	108.491	-253.200	777.468	-106.285
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
91	0	-0.906822	16.352	-22.040	2.29E-12	442.103	-106.285
		5.423	16.352	100.082	-379.800	456.550	-106.285
		Min: B D F H I R AM AP AQ		Max: A C E G J K T AO			
91	0.325	-1.040	16.352	-26.665	2.29E-12	434.188	-100.971
		5.423	16.352	92.157	-379.800	487.789	-100.971
		Min: B D F H I R AM AP AQ		Max: A C E G J K T AO			
91	0.650	-1.173	16.352	-31.290	2.29E-12	424.770	-95.657
		5.423	16.352	84.232	-379.800	516.452	-95.657
		Min: B D F H I R AM AP AQ		Max: A C E G J K T AO			
91	0.975	-1.468	16.352	-36.833	2.29E-12	491.586	-90.342
		5.585	16.352	77.226	-379.800	464.803	-90.342
		Min: B D F H I K R AM AP AQ		Max: A C E G J T AO			
91	1.300	-1.601	16.352	-43.018	2.29E-12	478.610	-85.028
		5.585	16.352	70.861	-379.800	488.868	-85.028
		Min: B D F H I K R AM AP AQ		Max: A C E G J T AO			
92	0	-1.601	16.352	-43.018	5.94E-13	478.610	-85.028
		5.585	16.352	70.861	-379.800	488.868	-85.028
		Min: B D F H I K R AM AP AQ		Max: A C E G J T AO			
92	0.325	-2.012	16.352	-122.099	4.26E-14	818.993	-79.714
		5.585	16.352	64.497	-379.800	510.863	-79.714
		Min: B D F H I K S AM AP AQ		Max: A C E G J T AO			
92	0.650	-2.145	16.352	-129.633	4.26E-14	839.186	-74.400
		5.585	16.352	59.480	-379.800	469.910	-74.400
		Min: A C E H I K S AM AP AQ		Max: B D F G J T AO			
92	0.975	-2.278	16.352	-137.558	4.26E-14	795.768	-69.085
		5.585	16.352	54.855	-379.800	488.489	-69.085
		Min: A C E H I K S AM AP AQ		Max: B D F G J T AO			
92	1.300	-2.410	16.352	-145.483	4.26E-14	749.774	-63.771
		5.585	16.352	50.231	-379.800	505.566	-63.771
		Min: A C E H I K S AM AP AQ		Max: B D F G J T AO			
93	0	-2.410	16.352	-145.483	6.91E-13	749.774	-63.771
		5.585	16.352	50.231	-379.800	505.566	-63.771
		Min: A C E H I K S AM AP AQ		Max: B D F G J T AO			
93	0.325	-2.543	16.352	-153.407	6.91E-13	701.204	-58.457
		6.030	13.901	11.987	4.87E-13	46.304	-49.696
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			
93	0.650	-2.676	16.352	-161.332	6.91E-13	650.059	-53.143
		6.030	13.901	7.363	4.87E-13	49.448	-45.178
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			
93	0.975	-2.809	16.352	-169.257	6.91E-13	596.338	-47.828
		6.030	13.901	2.738	4.87E-13	51.090	-40.660
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
93	1.300	-2.942	16.352	-177.182	6.91E-13	540.042	-42.514
		6.030	13.901	-1.887	4.87E-13	51.228	-36.142
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			
94	0	-2.942	16.352	-177.182	1.05E-12	540.042	-42.514
		6.030	13.901	-1.887	7.58E-13	51.228	-36.142
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			
94	0.325	-2.572	16.352	-193.516	-126.600	572.042	-37.200
		6.030	13.901	-6.512	7.58E-13	49.863	-31.624
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
94	0.650	-2.704	16.352	-201.441	-126.600	507.861	-31.886
		6.030	13.901	-11.137	7.58E-13	46.995	-27.107
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
94	0.975	-2.837	16.352	-209.365	-126.600	441.105	-26.571
		6.030	13.901	-15.762	7.58E-13	42.624	-22.589
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
94	1.300	-2.970	16.352	-217.290	-126.600	371.774	-21.257
		6.030	13.901	-20.387	7.58E-13	36.749	-18.071
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0	-2.970	16.352	-217.290	-126.600	371.774	-21.257
		6.030	13.901	-20.387	1.50E-12	36.749	-18.071
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0.325	-3.103	16.352	-225.215	-126.600	299.867	-15.943
		6.030	13.901	-25.012	1.50E-12	29.372	-13.553
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0.650	-3.236	16.352	-317.540	2.90E-12	208.504	-10.629
		6.030	13.901	-29.637	1.50E-12	20.492	-9.036
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0.975	-3.369	16.352	-325.465	2.90E-12	104.016	-5.314
		6.030	13.901	-34.262	1.50E-12	10.108	-4.518
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	1.300	-3.502	16.352	-333.389	2.90E-12	-3.048	-2.22E-07
		6.030	13.901	-38.887	1.50E-12	-1.779	-1.89E-07
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
96	0	0.204525	2.01E-08	7.115	2.35E-12	-1.779	-4.15E-11
		-6.55E-12	1.96E-08	12.192	3.11E-12	-3.048	5.34E-11
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.125	0.153394	2.01E-08	5.336	2.35E-12	-1.001	2.47E-09
		-6.55E-12	1.96E-08	9.144	3.11E-12	-1.714	2.51E-09
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.250	0.102262	2.01E-08	3.558	2.35E-12	-0.444707	4.98E-09
		-6.55E-12	1.96E-08	6.096	3.11E-12	-0.761998	4.96E-09
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.375	0.051131	2.01E-08	1.779	2.35E-12	-0.111177	7.49E-09
		-6.55E-12	1.96E-08	3.048	3.11E-12	-0.190500	7.42E-09
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.500	2.01E-09	2.01E-08	7.11E-08	2.35E-12	-4.80E-12	1.00E-08
		-6.55E-12	1.96E-08	1.22E-07	3.11E-12	-1.43E-12	9.87E-09

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min: B D F G T AM AO AQ				Max: AR AT AV AY AZ BA BI...		
290	0	-433.416	-3.572	-31.459	2.547	53.551	19.808
		-433.416	-3.572	27.892	-2.463	-14.312	19.808
	Min: AR AT AV AX BA ET CD				Max: AR AT AV AX AZ BB		
290	3.300	-433.416	-3.572	-31.162	2.547	-49.773	8.020
		-433.416	-3.572	27.892	-2.463	77.732	8.020
	Min: AR AT AV AX BA ET CD				Max: AR AT AV AX AZ BB		
290	6.600	-433.416	-3.572	-30.865	2.547	-152.116	-3.767
		-433.416	-3.572	27.892	-2.463	169.776	-3.767
	Min: AR AT AV AX BA ET CD				Max: AR AT AV AX AZ BE		
290	9.900	-433.416	-3.572	-30.568	2.547	-253.480	-15.554
		-433.416	-3.572	27.892	-2.463	261.820	-15.554
	Min: AR AT AV AX BA ET CD				Max: AR AT AV AX AZ BE		
290	13.200	-433.416	-3.572	-30.271	2.547	-353.864	-27.341
		-433.416	-3.572	27.892	-2.463	353.864	-27.341
	Min: AR AT AV AX BA ET CD				Max: AR AT AV AX AZ BE		
291	0	-602.123	4.634	-31.459	-2.547	53.551	-23.407
		-602.123	4.634	27.892	2.463	-14.312	-23.407
	Min: AR AT AV AX BA EZ CD				Max: AR AT AV AX AZ BH		
291	3.300	-602.123	4.634	-31.162	-2.547	-49.773	-8.113
		-602.123	4.634	27.892	2.463	77.732	-8.113
	Min: AR AT AV AX BA EZ CD				Max: AR AT AV AX AZ BH		
291	6.600	-602.123	4.634	-30.865	-2.547	-152.116	7.180
		-602.123	4.634	27.892	2.463	169.776	7.180
	Min: AR AT AV AX BA EZ CD				Max: AR AT AV AX AZ BH		
291	9.900	-602.123	4.634	-30.568	-2.547	-253.480	22.474
		-602.123	4.634	27.892	2.463	261.820	22.474
	Min: AR AT AV AX BA EZ CD				Max: AR AT AV AX AZ BH		
291	13.200	-602.123	4.634	-30.271	-2.547	-353.864	37.768
		-602.123	4.634	27.892	2.463	353.864	37.768
	Min: AR AT AV AX BA EZ CD				Max: AR AT AV AX AZ BH		

CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título:
Fecha: 24/5/01 13.42.42

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 370 cm, alto 90 cm y canto 87 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 437 T
Cortante reducido a un canto útil del borde del apoyo = 417 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 229 cm2 lo que implica una cuantía geométrica igual a 0.00711
Inclinación de bielas de compresión 45º
Inclinación de las armaduras con el eje de la pieza 90º
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 437 T < Vu1 = 1931.40 T
Es necesario disponer armadura a cortante al ser Vrd = 417.00 T > Vu2 = 161.76 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00º

Vcu = 134.80 T. Vsu= 282.20 T.
As cálculo = 90.10 cm2/m. As mínima = 37.00 cm2/m
Mínimo de armadura a disponer = 90.10 cm2/m

2.4.2. Comprobación del punzonamiento del tablero

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
E	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
AT	PL.PERM	5	1.000	RETRACCION
AU	PLUS	6	1.000	SOB UNIF 1
AV	PLUS	7	1.000	SOB UNIF 2
AW	PLUS	8	1.000	SOB UNIF 3
AX	PLUS	9	1.000	SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOE
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	20.036			
	1.761	1.141	100.469			
	Min: AP AR AS AT AX AY BU...			Max: A B D E F G J AL AN AO		
10	2.283	-3.686	16.626			
	-0.568555	1.138	97.227			
	Min: AP AR AS AT AU AV BC...			Max: A B D G H I AB AN AO		
156	-1.091	2.568	20.407			
	1.761	-2.257	100.840			
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.		
160	2.283	2.571	16.997			
	-0.569596	-2.254	97.599			
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...		
166	3.374	-1.935	218.118	15.604	23.708	-0.028301
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09
	Min: CF CH CI CL DC DN DO...			Max: DS DT DV DW DX DY EM...		
167	3.374	-1.829	219.077	9.951	23.708	0.028301
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...		

Articulo 46 EHE

Dimensiones del soporte

Ancho (m)	0.89
Canto (m)	1.20
Canto útil (m)	1.15

u1 (m)	18.64

Losa sin armadura de punzonamiento

Nd (t)	568.50
β	1.15
Fsd,ef	653.78
τsd (t/m2)	***30.49***

ξ	1.417
ϕ (pm)	25
nº (pm)	5.71428
As (cm2)	28.05
ρ	2.439E-03
fck (Mpa)	25
τrd (MPa)	0.311
τrd (t/m2)	***31.07***

τsd (t/m2)	***< τrd (t/m2)***

2.4.3. Refuerzo de armaduras bajo apoyos

2.4.4. Refuerzo de armadura bajo apoyos

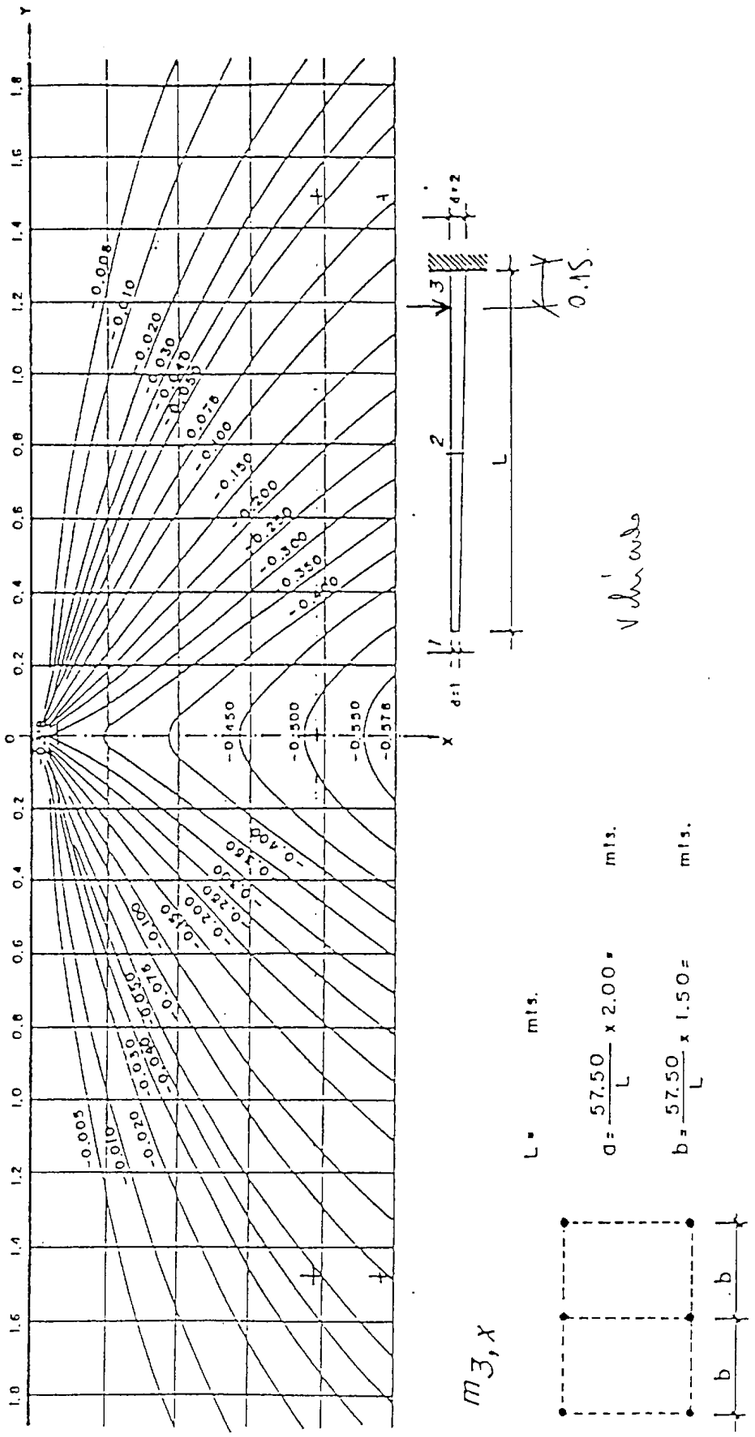
Estribos : Nmaxd = 151.68 Mp (en cada apoyo)

$$As = \frac{0.25 \times Nmaxd}{4.20\ Mp/cm^2}$$

$As = 9.10\ cm^2$

Adoptamos 6 x Φ 16 en cada dirección.

2.4.4. Verificación de las armaduras del voladizo



Cálculo de la armadura del voladizo

Datos :

Longitud del voladizo (m) = **1.50**

Canto mínimo (m) = **0.20**
Canto máximo (m) = **0.30**
Canto util (m) = **0.27**

Carga acera (t/m)= **1.00**

Ancho Acera (m) = **0.85**

Distancia G acera (m) = **1.33**

Peso Propio:

Mpp (mt/m) = -2.615625 V (t/m) = 0.87

Carga muerta :

Mcm (mt/m) = -1.325 V (t/m) = 1.00

Sobrecarga uniforme :

Msu (mt/m) = -0.45 V (t/m) = 0.60

Vehículo 60 t : Coeficientes bajo carga = 0.15
Coeficientes a 1.50 m = 0

Mveh (mt/m) = -1.5 V (t/m) = 10

Momento total diseño : Md (mt/m) = -8.24

As (cm^2/m) = 8.98 ϕ 16 / 20

Cortante total de diseño : Vd (t/m) = 3.43 a un canto útil

Vcu (t/m) = 13.35 verifica

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-8.77E-07	-9.44E-05	30.731			
10	8.77E-07	-9.44E-05	30.731			
156	-8.77E-07	9.44E-05	30.731			
160	8.77E-07	9.44E-05	30.731			
166	1.29E-10	0.739549	193.743	-3.253	1.02E-09	-1.01E-09
167	1.31E-10	-0.739549	193.743	3.253	1.04E-09	1.01E-09
Sums :	4.25E-12	-3.55E-15	510.411			
min:	-8.77E-07	-0.739549	30.731	-3.253	1.02E-09	-1.01E-09
max:	8.77E-07	0.739549	193.743	3.253	1.04E-09	1.01E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	4.63E-06	0.000410	0.337475	-0.000675	0.000150	1.63E-05
2	2.58E-06	0.000412	0.156680	-0.000622	0.000111	1.25E-09
3	1.54E-10	0.000412	0.048380	-0.000586	1.18E-16	4.65E-13
4	-2.56E-06	0.000412	0.156680	-0.000622	-0.000111	-1.25E-09
5	-4.63E-06	0.000410	0.337475	-0.000675	-0.000150	-1.63E-05
6	3.81E-06	0.000410	-3.07E-96	-0.000675	0.000150	1.68E-09
7	1.95E-06	0.000412	-0.154471	-0.000622	0.000111	1.25E-09
8	-6.06E-11	0.000412	-0.244623	-0.000586	1.18E-16	4.65E-13
9	-1.95E-06	0.000412	-0.154471	-0.000622	-0.000111	-1.25E-09
10	-3.81E-06	0.000410	-3.07E-96	-0.000675	-0.000150	-1.68E-09
11	-3.13E-07	0.000411	-0.869963	-0.000623	6.78E-05	1.35E-09
12	1.76E-05	0.000412	-0.940651	-0.000577	5.45E-05	9.42E-10
13	-8.18E-10	0.000412	-0.984826	-0.000546	4.76E-16	4.78E-13
14	-1.52E-05	0.000412	-0.940651	-0.000577	-5.45E-05	-9.41E-10
15	3.11E-07	0.000411	-0.869963	-0.000623	-6.78E-05	-1.34E-09
16	-1.57E-06	0.000411	-1.596	-0.000477	2.02E-05	-3.78E-11
17	-8.41E-07	0.000412	-1.618	-0.000456	1.73E-05	3.54E-10
18	-1.48E-09	0.000412	-1.631	-0.000440	5.39E-16	3.85E-13
19	8.38E-07	0.000412	-1.618	-0.000456	-1.73E-05	-3.54E-10
20	1.57E-06	0.000411	-1.596	-0.000477	-2.02E-05	3.85E-11
21	-1.54E-06	0.000412	-2.103	-0.000295	7.15E-07	-2.33E-10
22	-9.27E-07	0.000412	-2.103	-0.000287	1.06E-06	-1.58E-11
23	-1.92E-09	0.000412	-2.104	-0.000281	5.45E-17	2.21E-13
24	9.23E-07	0.000412	-2.103	-0.000287	-1.06E-06	1.62E-11
25	1.54E-06	0.000412	-2.103	-0.000295	-7.15E-07	2.33E-10
26	-1.31E-06	0.000412	-2.361	-0.000101	-6.04E-06	-2.91E-10
27	-7.55E-07	0.000412	-2.354	-9.89E-05	-4.60E-06	-2.06E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-2.09E-05	0.000411	-2.351	-9.71E-05	-1.04E-15	4.71E-14
29	7.54E-07	0.000412	-2.354	-9.89E-05	4.60E-06	2.06E-10
30	1.30E-06	0.000412	-2.361	-0.000101	6.04E-06	2.91E-10
31	-7.38E-07	0.000412	-2.373	7.86E-05	-8.57E-06	-7.52E-10
32	-2.95E-07	0.000411	-2.364	8.02E-05	-6.74E-06	-5.00E-10
33	-2.00E-09	0.000411	-2.359	8.12E-05	-2.73E-15	-1.11E-13
34	2.91E-07	0.000411	-2.364	8.02E-05	6.74E-06	5.00E-10
35	7.34E-07	0.000412	-2.373	7.86E-05	8.57E-06	7.51E-10
36	9.23E-07	0.000412	-2.174	0.000218	-1.20E-05	-1.88E-09
37	9.66E-07	0.000411	-2.162	0.000222	-9.63E-06	-9.44E-10
38	-1.69E-09	0.000412	-2.154	0.000225	-4.94E-15	-2.37E-13
39	-9.72E-07	0.000411	-2.162	0.000222	9.63E-06	9.44E-10
40	-9.27E-07	0.000412	-2.174	0.000218	1.20E-05	1.88E-09
41	4.59E-06	0.000412	-1.838	0.000287	-2.25E-05	-3.34E-09
42	3.66E-06	0.000410	-1.814	0.000299	-1.82E-05	-1.01E-09
43	-1.21E-09	0.000413	-1.800	0.000308	-7.49E-15	-2.99E-13
44	-3.66E-06	0.000410	-1.814	0.000299	1.82E-05	1.01E-09
45	-4.60E-06	0.000412	-1.838	0.000287	2.25E-05	3.34E-09
46	9.78E-05	0.000407	-1.476	0.000254	-5.00E-05	-2.83E-09
47	7.69E-06	0.000410	-1.424	0.000282	-4.07E-05	-9.61E-10
48	-6.93E-10	0.000419	-1.391	0.000304	-1.01E-14	-2.60E-13
49	-7.69E-06	0.000410	-1.424	0.000282	4.07E-05	-9.61E-10
50	-9.78E-06	0.000407	-1.476	0.000254	5.00E-05	2.83E-09
51	1.13E-05	0.000395	-1.239	0.000101	-9.86E-05	4.16E-09
52	1.04E-05	0.000408	-1.133	0.000139	-8.54E-05	8.99E-09
53	-3.11E-10	0.000434	-1.056	0.000185	-1.23E-14	-1.16E-13
54	-1.04E-05	0.000408	-1.133	0.000139	8.54E-05	-8.99E-09
55	-1.13E-05	0.000395	-1.239	0.000101	9.86E-05	-4.16E-09
56	1.53E-06	0.000368	-1.266	-0.000143	-0.000131	1.42E-08
57	-5.75E-07	0.000400	-1.120	-0.000141	-0.000128	3.73E-08
58	-2.45E-10	0.000472	-0.989274	-0.000133	-1.40E-14	9.96E-14
59	5.75E-07	0.000400	-1.120	-0.000141	0.000128	-3.73E-08
60	-1.53E-06	0.000368	-1.266	-0.000143	0.000131	-1.42E-08
61	-7.13E-06	0.000408	-1.771	-0.000448	8.54E-05	6.55E-09
62	-7.14E-06	0.000325	-1.681	-0.000481	-7.24E-05	9.59E-09
63	-7.16E-10	0.000345	-1.617	-0.000521	-1.31E-14	2.85E-13
64	7.14E-06	0.000328	-1.681	-0.000481	7.24E-05	-9.59E-09
65	7.30E-06	0.000316	-1.771	-0.000448	8.44E-05	-6.54E-09
66	-6.66E-06	0.000245	-2.656	-0.000568	-3.23E-05	-6.78E-11
67	-4.92E-06	0.000246	-2.622	-0.000585	-2.61E-05	1.51E-09
68	-1.66E-09	0.000250	-2.601	-0.000598	-1.08E-14	4.03E-13
69	4.91E-06	0.000244	-2.622	-0.000585	2.61E-05	-1.51E-09
70	6.65E-06	0.000245	-2.656	-0.000568	3.23E-05	6.91E-11
71	-3.62E-06	0.000165	-3.577	-0.000491	-1.32E-05	-1.03E-09
72	-2.44E-06	0.000164	-3.563	-0.000495	-1.06E-05	-2.20E-10
73	-2.64E-09	0.000165	-3.555	-0.000498	-8.52E-15	3.65E-13
74	2.44E-06	0.000164	-3.563	-0.000495	1.06E-05	2.20E-10
75	3.61E-06	0.000165	-3.577	-0.000491	1.32E-05	1.03E-09
76	-1.86E-06	8.22E-05	-4.214	-0.000276	-8.80E-06	-5.18E-10
77	-1.17E-06	8.22E-05	-4.235	-0.000279	-6.94E-06	-2.58E-10
78	-3.32E-09	8.22E-05	-4.229	-0.000280	-6.96E-15	2.05E-13
79	1.16E-06	8.22E-05	-4.235	-0.000279	6.94E-06	2.59E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	1.86E-06	8.26E-05	-4.244	-0.000278	8.80E-06	5.20E-10
81	-1.39E-06	-1.18E-13	-4.485	5.44E-17	-8.14E-06	1.40E-16
82	-8.29E-07	3.80E-14	-4.477	4.93E-17	-6.38E-06	1.39E-16
83	-3.56E-09	2.47E-13	-4.471	4.10E-17	-6.42E-15	1.39E-16
84	8.22E-07	4.56E-13	-4.477	3.56E-17	6.38E-06	1.39E-16
85	1.38E-06	6.12E-13	-4.485	3.61E-17	8.14E-06	1.39E-16
86	-1.86E-06	-8.26E-05	-4.244	0.000278	-8.80E-06	5.19E-10
87	-1.17E-06	-8.22E-05	-4.235	0.000279	-6.94E-06	2.58E-10
88	-3.32E-09	-8.22E-05	-4.229	0.000280	-6.94E-15	-2.08E-13
89	1.16E-06	-8.22E-05	-4.235	0.000279	6.94E-06	-2.59E-10
90	1.86E-06	-8.26E-05	-4.244	0.000278	8.80E-06	-5.20E-10
91	-3.62E-06	-0.000165	-3.577	0.000491	-1.32E-05	1.03E-09
92	-2.44E-06	-0.000164	-3.563	0.000495	-1.06E-05	2.20E-10
93	-2.64E-09	-0.000165	-3.555	0.000498	-8.49E-15	-3.65E-13
94	2.44E-06	-0.000164	-3.563	0.000495	1.06E-05	-2.20E-10
95	3.61E-06	-0.000165	-3.577	0.000491	1.32E-05	-1.03E-09
96	-6.66E-06	-0.000245	-2.656	0.000568	-3.23E-05	6.78E-11
97	-4.92E-06	-0.000246	-2.622	0.000585	-2.61E-05	-1.51E-09
98	-1.66E-09	-0.000250	-2.601	0.000598	-1.08E-14	-4.03E-13
99	4.91E-06	-0.000244	-2.622	0.000585	2.61E-05	1.51E-09
100	6.65E-06	-0.000245	-2.656	0.000568	3.23E-05	-6.91E-11
101	-7.30E-06	-0.000316	-1.771	0.000448	-8.44E-05	-6.55E-09
102	-7.14E-06	-0.000328	-1.681	0.000481	-7.24E-05	-9.59E-09
103	-7.18E-10	-0.000345	-1.617	0.000521	-1.30E-14	-2.85E-13
104	7.14E-06	-0.000328	-1.681	0.000481	7.24E-05	9.59E-09
105	7.30E-06	-0.000316	-1.771	0.000448	8.44E-05	6.54E-09
106	1.53E-06	-0.000368	-1.266	0.000143	-0.000131	-1.42E-08
107	-5.75E-07	-0.000400	-1.120	0.000141	-0.000128	-3.73E-08
108	-2.48E-10	-0.000472	-0.989274	0.000133	-1.40E-14	-9.93E-14
109	5.75E-07	-0.000400	-1.120	0.000141	0.000128	3.73E-08
110	-1.53E-06	-0.000368	-1.266	0.000143	0.000131	1.42E-08
111	1.13E-05	-0.000395	-1.239	-0.000101	-9.86E-05	-4.16E-09
112	1.04E-05	-0.000408	-1.133	-0.000139	-8.54E-05	-8.99E-09
113	-3.14E-10	-0.000434	-1.056	-0.000185	-1.23E-14	1.16E-13
114	-1.04E-05	-0.000408	-1.133	-0.000139	8.54E-05	8.99E-09
115	-1.13E-05	-0.000395	-1.239	-0.000101	9.86E-05	4.16E-09
116	9.78E-06	-0.000407	-1.476	-0.000254	-5.00E-05	2.83E-09
117	7.69E-06	-0.000410	-1.424	-0.000282	-4.07E-05	-9.61E-10
118	-6.96E-10	-0.000419	-1.391	-0.000304	-1.00E-14	2.60E-13
119	-7.69E-06	-0.000410	-1.424	-0.000282	4.07E-05	9.61E-10
120	-9.78E-06	-0.000407	-1.476	-0.000254	5.00E-05	-2.83E-09
121	4.59E-06	-0.000412	-1.838	-0.000287	-2.25E-05	3.34E-09
122	3.66E-06	-0.000410	-1.814	-0.000299	-1.82E-05	1.01E-09
123	-1.22E-09	-0.000413	-1.800	-0.000308	-7.41E-15	2.99E-13
124	-3.66E-06	-0.000410	-1.814	-0.000299	1.82E-05	-1.01E-09
125	-4.60E-06	-0.000412	-1.838	-0.000287	2.25E-05	-3.34E-09
126	9.23E-07	-0.000412	-2.174	-0.000218	-1.20E-05	1.88E-09
127	9.68E-07	-0.000411	-2.162	-0.000222	-9.63E-06	9.44E-10
128	-1.70E-09	-0.000412	-2.154	-0.000225	-4.86E-15	2.38E-13
129	-9.72E-07	-0.000411	-2.162	-0.000222	9.63E-06	-9.44E-10
130	-9.27E-07	-0.000412	-2.174	-0.000218	1.20E-05	-1.88E-09
131	-7.38E-07	-0.000412	-2.373	-7.86E-05	-8.57E-06	7.52E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-2.95E-07	-0.000411	-2.364	-8.02E-05	-6.74E-06	5.00E-10
133	-2.01E-09	-0.000411	-2.359	-8.12E-05	-2.66E-15	1.12E-13
134	2.91E-07	-0.000411	-2.364	-8.02E-05	6.74E-06	-5.00E-10
135	7.34E-07	-0.000412	-2.373	-7.86E-05	8.57E-06	-7.51E-10
136	-1.31E-06	-0.000412	-2.361	0.000101	-6.04E-06	2.91E-10
137	-7.58E-07	-0.000412	-2.354	9.89E-05	-4.60E-06	2.06E-10
138	-2.09E-05	-0.000411	-2.351	9.71E-05	-9.83E-16	-4.68E-14
139	7.54E-07	-0.000412	-2.354	9.89E-05	4.60E-06	-2.06E-10
140	1.30E-06	-0.000412	-2.361	0.000101	6.04E-06	-2.91E-10
141	-1.54E-06	-0.000412	-2.103	0.000295	7.15E-07	2.33E-10
142	-9.27E-07	-0.000412	-2.103	0.000287	1.06E-06	1.58E-11
143	-1.92E-09	-0.000412	-2.104	0.000281	1.02E-16	-2.20E-13
144	9.23E-07	-0.000412	-2.103	0.000287	-1.06E-06	-1.62E-11
145	1.54E-06	-0.000412	-2.103	0.000295	-7.15E-07	-2.33E-10
146	-1.57E-06	-0.000411	-1.596	0.000477	2.02E-05	3.78E-11
147	-8.41E-07	-0.000412	-1.618	0.000456	1.73E-05	3.54E-10
148	-1.49E-09	-0.000412	-1.631	0.000440	5.70E-16	-3.84E-13
149	8.38E-07	-0.000412	-1.618	0.000456	-1.73E-05	-3.54E-10
150	1.57E-06	-0.000411	-1.596	0.000477	-2.02E-05	-3.85E-11
151	-3.13E-07	-0.000411	-0.869963	0.000623	6.78E-05	-1.35E-09
152	1.76E-05	-0.000412	-0.940651	0.000577	5.45E-05	-9.42E-10
153	-8.24E-10	-0.000412	-0.984826	0.000546	4.92E-16	-4.77E-13
154	-1.92E-08	-0.000412	-0.940651	0.000577	-5.45E-05	9.41E-10
155	3.11E-07	-0.000411	-0.869963	0.000623	-6.78E-05	1.34E-09
156	3.81E-06	-0.000410	-2.07E-96	0.000675	0.000150	-1.68E-09
157	1.95E-06	-0.000412	-0.154471	0.000622	0.000111	-1.25E-09
158	-8.65E-11	-0.000412	-0.244623	0.000586	1.22E-16	-4.69E-13
159	-1.95E-06	-0.000412	-0.154471	0.000622	-0.000111	1.25E-09
160	-3.81E-06	-0.000410	-3.07E-96	0.000675	-0.000150	1.68E-09
161	4.63E-06	-0.000410	0.337475	0.000675	0.000150	-1.63E-05
162	2.58E-06	-0.000412	0.156680	0.000622	0.000111	-1.25E-09
163	1.48E-10	-0.000412	0.048380	0.000586	1.22E-16	-4.69E-13
164	-2.58E-06	-0.000412	0.156680	0.000622	-0.000111	1.25E-09
165	-4.63E-06	-0.000410	0.337475	0.000675	-0.000150	1.63E-09
166	-0	-7.40E-98	-1.94E-95	+0	-0	+0
167	-0	7.40E-98	-1.94E-95	-0	+0	-0
min:	-1.13E-05	-0.000472	-4.485	-0.000675	-0.000150	-3.73E-08
max:	1.13E-05	0.000472	0.337475	0.000675	0.000150	3.73E-08

Loadcase	Factor	Stage	Init.def	Title
2	1.0000			PESO PAVIMENTO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-4.17E-08	-4.50E-06	1.462			
10	4.17E-08	-4.50E-06	1.462			
156	-4.17E-08	4.50E-06	1.462			
160	4.17E-08	4.50E-06	1.462			
166	6.23E-12	0.035307	9.219	-0.155311	4.94E-11	-4.84E-11
167	6.34E-12	-0.035307	9.219	0.155311	5.01E-11	4.83E-11
Sums :	2.03E-13	-5.34E-16	24.288			
min:	-4.17E-08	-0.035307	1.462	-0.155311	4.94E-11	-4.84E-11
max:	4.17E-08	0.035307	9.219	0.155311	5.01E-11	4.83E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	2.20E-07	1.96E-05	0.016063	-3.22E-05	6.83E-06	7.68E-11
2	1.23E-07	1.97E-05	0.007812	-2.97E-05	5.05E-06	5.96E-11
3	7.54E-12	1.97E-05	0.002860	-2.79E-05	5.51E-16	2.24E-14
4	-1.23E-07	1.97E-05	0.007812	-2.97E-05	-5.05E-06	-5.96E-11
5	-2.20E-07	1.96E-05	0.016083	-3.22E-05	-6.83E-06	-7.68E-11
6	1.81E-07	1.96E-05	-1.46E-97	-3.22E-05	6.83E-06	8.01E-11
7	9.29E-08	1.97E-05	-0.007019	-2.97E-05	5.05E-06	5.96E-11
8	3.64E-12	1.97E-05	-0.011107	-2.79E-05	5.51E-16	2.24E-14
9	-9.29E-08	1.97E-05	-0.007019	-2.97E-05	-5.05E-06	-5.96E-11
10	-1.81E-07	1.96E-05	-1.46E-97	-3.22E-05	-6.83E-06	-8.00E-11
11	-1.45E-08	1.96E-05	-0.041463	-2.97E-05	2.90E-06	6.40E-11
12	8.30E-10	1.97E-05	-0.044494	-2.75E-05	2.34E-06	4.48E-11
13	-3.68E-11	1.97E-05	-0.046393	-2.60E-05	2.19E-17	2.25E-14
14	-9.10E-10	1.97E-05	-0.044494	-2.75E-05	-2.34E-06	-4.48E-11
15	1.48E-08	1.96E-05	-0.041463	-2.97E-05	-2.90E-06	-6.40E-11
16	-7.48E-08	1.96E-05	-0.076084	-2.28E-05	6.40E-07	-1.80E-12
17	-4.00E-08	1.96E-05	-0.076767	-2.17E-05	5.72E-07	1.69E-11
18	-7.03E-11	1.97E-05	-0.077219	-2.10E-05	2.41E-17	1.83E-14
19	3.99E-08	1.96E-05	-0.076767	-2.17E-05	-5.72E-07	-1.68E-11
20	7.47E-08	1.96E-05	-0.076084	-2.28E-05	-6.40E-07	1.84E-12
21	-7.34E-08	1.97E-05	-0.100242	-1.41E-05	2.87E-07	-1.11E-11
22	-4.41E-08	1.96E-05	-0.099950	-1.37E-05	2.00E-07	-7.80E-13
23	-9.11E-11	1.97E-05	-0.099770	-1.34E-05	1.74E-16	1.05E-14
24	4.39E-08	1.96E-05	-0.099950	-1.37E-05	2.00E-07	7.80E-13
25	7.32E-08	1.97E-05	-0.100242	-1.41E-05	2.87E-07	1.11E-11
26	-6.22E-08	1.97E-05	-0.112589	-4.87E-06	-4.68E-07	-1.39E-11
27	-3.61E-08	1.96E-05	-0.111958	-4.75E-06	-4.69E-07	-9.82E-12

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-9.93E-11	1.96E-05	-0.111569	-4.67E-06	-5.28E-17	2.27E-15
29	3.59E-08	1.96E-05	-0.111958	-4.75E-06	4.69E-07	9.82E-12
30	6.20E-08	1.97E-05	-0.112589	-4.87E-06	6.05E-07	1.39E-11
31	-3.50E-08	1.97E-05	-0.113230	3.70E-06	-7.28E-07	-3.59E-11
32	-1.40E-08	1.96E-05	-0.112473	3.77E-06	5.71E-07	2.39E-11
33	-9.54E-11	1.96E-05	-0.112011	3.82E-06	-1.34E-16	-5.28E-15
34	1.38E-08	1.96E-05	-0.112473	3.77E-06	5.71E-07	2.39E-11
35	3.48E-08	1.97E-05	-0.113230	3.70E-06	7.28E-07	3.59E-11
36	4.43E-08	1.97E-05	-0.103835	1.03E-05	-8.93E-07	-5.97E-11
37	4.63E-08	1.96E-05	-0.102906	1.05E-05	-7.08E-07	-4.50E-11
38	-8.65E-11	1.97E-05	-0.102342	1.07E-05	-2.40E-16	-1.13E-14
39	-4.65E-08	1.96E-05	-0.102906	1.05E-05	7.08E-07	4.50E-11
40	-4.45E-08	1.97E-05	-0.103835	1.03E-05	8.93E-07	8.97E-11
41	2.19E-07	1.97E-05	-0.087853	1.36E-05	-1.39E-06	-1.55E-10
42	1.75E-07	1.96E-05	-0.086403	1.42E-05	-1.11E-06	-4.79E-11
43	-5.79E-11	1.97E-05	-0.085524	1.46E-05	-3.62E-16	-1.42E-14
44	-1.75E-07	1.96E-05	-0.086403	1.42E-05	1.11E-06	4.79E-11
45	-2.20E-07	1.97E-05	-0.087853	1.36E-05	1.39E-06	1.53E-10
46	4.67E-07	1.95E-05	-0.070693	1.21E-05	2.70E-06	-1.35E-10
47	3.67E-07	1.96E-05	-0.067867	1.34E-05	-2.15E-06	4.60E-11
48	-3.31E-11	2.00E-05	-0.066108	1.44E-05	-4.86E-16	-1.23E-14
49	-3.67E-07	1.96E-05	-0.067867	1.34E-05	2.19E-06	-4.60E-11
50	-4.67E-07	1.95E-05	-0.070693	1.21E-05	2.70E-06	1.35E-10
51	5.41E-07	1.89E-05	-0.058433	4.76E-06	-5.01E-06	1.99E-10
52	4.98E-07	1.95E-05	-0.054079	6.60E-06	-4.31E-06	4.29E-10
53	-1.49E-11	2.00E-05	-0.050235	8.77E-06	-5.94E-16	-5.50E-15
54	-4.98E-07	1.95E-05	-0.054079	6.60E-06	4.31E-06	-4.29E-10
55	-5.41E-07	1.89E-05	-0.059433	4.76E-06	5.01E-06	-1.99E-10
56	7.25E-08	1.76E-05	-0.060797	-6.82E-06	-6.58E-06	6.81E-10
57	-2.77E-08	1.91E-05	-0.053507	-6.74E-06	-6.32E-06	1.78E-09
58	-1.13E-11	2.26E-05	-0.047073	-6.35E-06	-6.75E-16	4.75E-15
59	2.77E-08	1.91E-05	-0.053507	-6.74E-06	6.32E-06	-1.78E-09
60	-7.25E-08	1.76E-05	-0.060797	-6.82E-06	6.58E-06	-6.81E-10
61	-3.49E-07	1.51E-05	-0.084864	-2.13E-05	-4.34E-06	2.12E-10
62	-3.41E-07	1.57E-05	-0.080242	-2.29E-05	-3.70E-06	4.58E-10
63	-3.42E-11	1.65E-05	-0.076999	-2.48E-05	-6.29E-16	1.36E-14
64	3.41E-07	1.57E-05	-0.080242	-2.29E-05	3.70E-06	-4.58E-10
65	3.49E-07	1.51E-05	-0.084864	-2.13E-05	4.34E-06	-2.12E-10
66	-3.18E-07	1.17E-05	-0.126965	-2.71E-05	-1.86E-06	-3.44E-12
67	-2.35E-07	1.18E-05	-0.125025	-2.79E-05	1.43E-06	7.20E-11
68	-7.90E-11	1.20E-05	-0.123845	-2.85E-05	-5.24E-16	1.92E-14
69	2.35E-07	1.18E-05	-0.125025	-2.79E-05	1.43E-06	-7.19E-11
70	3.18E-07	1.17E-05	-0.126965	-2.71E-05	1.86E-06	3.50E-12
71	-1.72E-07	7.87E-06	-0.170824	-2.34E-05	-9.48E-07	-4.94E-11
72	-1.16E-07	7.85E-06	-0.169837	-2.36E-05	-7.54E-07	-1.05E-11
73	-1.26E-10	7.88E-06	-0.169238	-2.37E-05	-4.13E-16	1.74E-14
74	1.16E-07	7.85E-06	-0.169837	-2.36E-05	7.54E-07	1.06E-11
75	1.72E-07	7.87E-06	-0.170824	-2.34E-05	9.48E-07	4.94E-11
76	-8.88E-08	3.94E-06	-0.202580	-1.32E-05	-7.39E-07	-2.48E-11
77	-5.57E-08	3.93E-06	-0.201812	-1.33E-05	-5.80E-07	-1.23E-11
78	-1.56E-10	3.92E-06	-0.201345	-1.33E-05	-1.39E-16	9.94E-15
79	5.54E-08	3.93E-06	-0.201812	-1.33E-05	5.80E-07	1.24E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	8.84E-08	3.94E-06	-0.202580	-1.32E-05	7.39E-07	2.48E-11
81	-6.60E-08	-5.64E-15	-0.214053	2.62E-18	-7.08E-07	6.66E-18
82	-3.54E-08	1.81E-15	-0.213318	2.35E-18	-5.54E-07	6.65E-18
83	-1.70E-10	1.18E-14	-0.212870	1.92E-18	-3.13E-16	6.65E-18
84	3.91E-08	2.18E-14	-0.213318	1.66E-18	5.54E-07	6.65E-18
85	6.56E-08	2.92E-14	-0.214053	1.72E-18	7.08E-07	6.64E-18
86	-8.88E-08	-3.94E-06	-0.202580	1.32E-05	-7.39E-07	2.48E-11
87	-5.57E-08	-3.93E-06	-0.201812	1.33E-05	-5.80E-07	1.23E-11
88	-1.58E-10	-3.92E-06	-0.201345	1.33E-05	-3.28E-16	-9.92E-15
89	5.54E-08	-3.93E-06	-0.201812	1.33E-05	5.80E-07	-1.24E-11
90	8.84E-08	-3.94E-06	-0.202580	1.32E-05	7.39E-07	-2.48E-11
91	-1.72E-07	-7.87E-06	-0.170824	2.34E-05	-9.48E-07	4.94E-11
92	-1.16E-07	-7.85E-06	-0.169837	2.36E-05	-7.54E-07	1.05E-11
93	-1.26E-10	-7.86E-06	-0.169238	2.37E-05	-4.11E-16	-1.74E-14
94	1.16E-07	-7.85E-06	-0.169837	2.36E-05	7.54E-07	-1.06E-11
95	1.72E-07	-7.87E-06	-0.170824	2.34E-05	9.48E-07	-4.94E-11
96	-3.18E-07	-1.17E-05	-0.125965	2.71E-05	-1.86E-06	3.44E-12
97	-2.35E-07	-1.18E-05	-0.125025	2.79E-05	-1.49E-06	-7.20E-11
98	-7.91E-11	-1.20E-05	-0.123845	2.85E-05	-5.21E-16	-1.92E-14
99	2.35E-07	-1.18E-05	-0.125025	2.79E-05	1.49E-06	7.19E-11
100	3.18E-07	-1.17E-05	-0.126965	2.71E-05	1.86E-06	-3.50E-12
101	-3.45E-07	-1.51E-05	-0.084864	2.13E-05	-4.34E-06	-3.12E-10
102	-3.41E-07	-1.57E-05	-0.080242	2.29E-05	-3.70E-06	-4.58E-10
103	-3.42E-11	-1.65E-05	-0.076998	2.42E-05	-6.26E-16	-1.36E-14
104	3.41E-07	-1.57E-05	-0.080242	2.29E-05	3.70E-06	4.58E-10
105	3.45E-07	-1.51E-05	-0.084864	2.13E-05	4.34E-06	3.12E-10
106	7.25E-08	-1.76E-05	-0.060797	6.62E-06	-6.58E-06	-6.81E-10
107	-2.77E-08	-1.91E-05	-0.053507	6.74E-06	-6.32E-06	-1.78E-09
108	-1.19E-11	-2.26E-05	-0.047073	6.35E-06	-6.72E-16	-4.74E-15
109	2.77E-08	-1.91E-05	-0.053507	6.74E-06	6.32E-06	1.75E-09
110	-7.25E-08	-1.76E-05	-0.060797	6.62E-06	6.58E-06	6.81E-10
111	5.41E-07	-1.89E-05	-0.059433	-4.76E-06	-5.01E-06	-1.99E-10
112	4.98E-07	-1.95E-05	-0.054079	-6.60E-06	-4.31E-06	-4.29E-10
113	-1.51E-11	-2.07E-05	-0.050235	-6.77E-06	-5.91E-16	5.52E-15
114	-4.98E-07	-1.95E-05	-0.054079	-6.60E-06	4.31E-06	4.29E-10
115	-5.41E-07	-1.89E-05	-0.059433	-4.76E-06	5.01E-06	1.99E-10
116	4.67E-07	-1.95E-05	-0.070693	-1.21E-05	-2.70E-06	1.35E-10
117	3.67E-07	-1.96E-05	-0.067867	-1.34E-05	-2.19E-06	-4.60E-11
118	-3.32E-11	-2.00E-05	-0.066108	-1.44E-05	-4.82E-16	1.24E-14
119	-3.67E-07	-1.96E-05	-0.067867	-1.34E-05	2.19E-06	4.60E-11
120	-4.67E-07	-1.95E-05	-0.070693	-1.21E-05	2.70E-06	-1.35E-10
121	2.19E-07	-1.97E-05	-0.087853	-1.36E-05	-1.39E-06	1.59E-10
122	1.75E-07	-1.96E-05	-0.086403	-1.42E-05	-1.11E-06	4.79E-11
123	-5.80E-11	-1.97E-05	-0.085524	-1.46E-05	-3.58E-16	1.42E-14
124	-1.75E-07	-1.96E-05	-0.086403	-1.42E-05	1.11E-06	-4.79E-11
125	-2.20E-07	-1.97E-05	-0.087853	-1.36E-05	1.39E-06	-1.59E-10
126	4.43E-08	-1.97E-05	-0.103835	-1.03E-05	-8.93E-07	8.97E-11
127	4.61E-08	-1.96E-05	-0.102906	-1.05E-05	-7.08E-07	4.50E-11
128	-8.08E-11	-1.97E-05	-0.102342	-1.07E-05	-2.36E-16	1.13E-14
129	-4.65E-08	-1.96E-05	-0.102906	-1.05E-05	7.08E-07	-4.50E-11
130	-4.45E-08	-1.97E-05	-0.103835	-1.03E-05	8.93E-07	-8.97E-11
131	-3.50E-08	-1.97E-05	-0.113230	-3.70E-06	-7.28E-07	3.59E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-1.40E-08	-1.96E-05	-0.112473	-3.77E-06	-5.71E-07	2.39E-11
133	-9.56E-11	-1.96E-05	-0.112011	-3.82E-06	-1.30E-16	5.29E-15
134	1.38E-08	-1.96E-05	-0.112473	-3.77E-06	5.71E-07	-2.39E-11
135	3.48E-08	-1.97E-05	-0.113230	-3.70E-06	7.28E-07	-3.59E-11
136	-6.22E-08	-1.97E-05	-0.112589	4.87E-06	-6.08E-07	1.39E-11
137	-3.61E-08	-1.96E-05	-0.111958	4.75E-06	-4.69E-07	9.82E-12
138	-9.96E-11	-1.96E-05	-0.111569	4.67E-06	-4.98E-17	-2.26E-15
139	3.59E-08	-1.96E-05	-0.111958	4.75E-06	4.69E-07	-9.82E-12
140	6.20E-08	-1.97E-05	-0.112589	4.87E-06	6.08E-07	-1.39E-11
141	-7.34E-08	-1.97E-05	-0.100242	1.41E-05	-2.87E-07	1.11E-11
142	-4.41E-08	-1.96E-05	-0.099950	1.37E-05	-2.00E-07	7.60E-13
143	-9.14E-11	-1.97E-05	-0.099770	1.34E-05	2.60E-18	-1.05E-14
144	4.39E-08	-1.96E-05	-0.099950	1.37E-05	2.00E-07	-7.60E-13
145	7.32E-08	-1.97E-05	-0.100242	1.41E-05	2.87E-07	-1.11E-11
146	-7.48E-08	-1.96E-05	-0.076084	2.28E-05	6.40E-07	1.80E-12
147	-4.00E-08	-1.96E-05	-0.076767	2.17E-05	5.72E-07	-1.69E-11
148	-7.06E-11	-1.97E-05	-0.077219	2.10E-05	2.56E-17	-1.83E-14
149	3.99E-08	-1.96E-05	-0.076767	2.17E-05	-5.72E-07	1.68E-11
150	7.47E-08	-1.96E-05	-0.076084	2.28E-05	-6.40E-07	-1.84E-12
151	-1.49E-08	-1.96E-05	-0.041463	2.97E-05	2.90E-06	-6.40E-11
152	8.30E-10	-1.97E-05	-0.044494	2.75E-05	2.34E-06	-4.48E-11
153	-3.51E-11	-1.97E-05	-0.046393	2.60E-05	2.26E-17	-2.28E-14
154	-8.10E-10	-1.97E-05	-0.044494	2.75E-05	-2.34E-06	4.48E-11
155	1.48E-08	-1.96E-05	-0.041463	2.97E-05	-2.90E-06	6.40E-11
156	1.81E-07	-1.96E-05	-1.46E-97	3.22E-05	6.83E-06	-8.01E-11
157	9.29E-08	-1.97E-05	-0.007019	2.97E-05	5.05E-06	-5.96E-11
158	-3.93E-12	-1.97E-05	-0.011107	2.79E-05	5.72E-18	-2.23E-14
159	-9.29E-08	-1.97E-05	-0.007019	2.97E-05	-5.05E-06	5.96E-11
160	-1.81E-07	-1.96E-05	-1.46E-97	3.22E-05	-6.83E-06	8.00E-11
161	2.20E-07	-1.96E-05	0.016083	3.22E-05	6.83E-06	-7.68E-11
162	1.23E-07	-1.97E-05	0.007812	2.97E-05	5.05E-06	-5.96E-11
163	7.25E-12	-1.97E-05	0.002860	2.79E-05	5.71E-18	-2.23E-14
164	-1.23E-07	-1.97E-05	0.007812	2.97E-05	-5.05E-06	5.96E-11
165	-2.20E-07	-1.96E-05	0.016083	3.22E-05	-6.83E-06	7.68E-11
166	-0	-3.53E-99	-9.22E-97	+0	-0	+0
167	-0	3.53E-99	-9.22E-97	-0	-0	-0
min:	-5.41E-07	-2.26E-05	-0.214053	-3.22E-05	-6.83E-06	-1.78E-09
max:	5.41E-07	2.26E-05	0.016083	3.22E-05	6.83E-06	1.78E-09

Loadcase 3 — Factor 1.0000 — Stage — Init.def — Title: PESO BARRERAS

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-1.52E-07	-1.72E-05	5.307			
10	1.52E-07	-1.72E-05	5.307			
156	-1.52E-07	1.72E-05	5.307			
160	1.52E-07	1.72E-05	5.307			
166	2.78E-11	0.134950	33.386	-0.593620	2.19E-10	-1.83E-10
167	2.82E-11	-0.134950	33.386	0.593620	2.21E-10	1.83E-10
Sums :	7.93E-13	-6.38E-16	88.000			
min:	-1.52E-07	-0.134950	5.307	-0.593620	2.19E-10	-1.83E-10
max:	1.52E-07	0.134950	33.386	0.593620	2.21E-10	1.83E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	7.94E-07	7.49E-05	0.059667	-0.000119	-7.99E-06	2.63E-10
2	4.46E-07	7.51E-05	0.049601	-0.000110	4.58E-06	2.17E-10
3	3.94E-11	7.53E-05	0.042284	-0.000104	1.41E-17	8.28E-14
4	-4.46E-07	7.51E-05	0.049601	-0.000110	-4.58E-06	-2.17E-10
5	-7.94E-07	7.49E-05	0.059667	-0.000119	7.99E-06	-2.63E-10
6	6.59E-07	7.49E-05	-5.31E-97	-0.000120	3.64E-06	2.94E-10
7	3.38E-07	7.51E-05	-0.005565	-0.000110	4.58E-06	2.17E-10
8	-2.04E-12	7.51E-05	-0.009738	-0.000104	1.42E-17	8.28E-14
9	-3.38E-07	7.51E-05	-0.005565	-0.000110	-4.58E-06	-2.17E-10
10	-6.59E-07	7.49E-05	-5.31E-97	-0.000120	-3.64E-06	-2.93E-10
11	-5.45E-06	7.49E-05	-0.153959	-0.000111	-1.07E-05	2.32E-10
12	2.86E-05	7.51E-05	-0.145023	-0.000102	-5.29E-06	1.63E-10
13	-1.32E-10	7.52E-05	-0.141238	-9.71E-05	3.55E-17	8.44E-14
14	-3.13E-05	7.51E-05	-0.145023	-0.000102	5.29E-06	-1.63E-10
15	5.42E-06	7.49E-05	-0.153959	-0.000111	1.07E-05	-2.32E-10
16	-2.72E-07	7.50E-05	-0.283052	-8.52E-05	-1.89E-05	-6.52E-12
17	-1.45E-07	7.51E-05	-0.265596	-8.15E-05	-1.17E-05	6.11E-11
18	-2.49E-10	7.52E-05	-0.256559	-7.88E-05	2.67E-19	6.83E-14
19	1.45E-07	7.51E-05	-0.265596	-8.15E-05	1.17E-05	-6.10E-11
20	2.71E-07	7.50E-05	-0.283052	-8.52E-05	1.89E-05	6.64E-12
21	-2.66E-07	7.51E-05	-0.374148	-5.37E-05	-2.22E-05	-4.05E-11
22	-1.60E-07	7.51E-05	-0.353156	-5.23E-05	-1.45E-05	-3.23E-12
23	-3.26E-10	7.51E-05	-0.341828	-5.11E-05	-1.31E-16	3.95E-14
24	1.60E-07	7.51E-05	-0.353156	-5.23E-05	1.45E-05	3.31E-12
25	2.66E-07	7.51E-05	-0.374148	-5.37E-05	2.22E-05	4.06E-11
26	-2.25E-07	7.51E-05	-0.422331	-2.03E-05	-2.34E-05	-5.24E-11
27	-1.30E-07	7.51E-05	-0.400115	-1.98E-05	-1.55E-05	-3.73E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-3.58E-10	7.51E-05	-0.388029	-1.95E-05	-3.69E-16	9.96E-15
29	1.29E-07	7.51E-05	-0.400115	-1.98E-05	1.55E-05	3.73E-11
30	2.24E-07	7.51E-05	-0.422331	-2.03E-05	2.34E-05	5.24E-11
31	-1.21E-07	7.52E-05	-0.427948	1.09E-05	-2.38E-05	-1.37E-10
32	-4.57E-08	7.51E-05	-0.405277	1.12E-05	-1.55E-05	-9.05E-11
33	-3.46E-10	7.51E-05	-0.392927	1.14E-05	-7.08E-16	-1.75E-14
34	4.50E-08	7.51E-05	-0.405277	1.12E-05	1.55E-05	9.05E-11
35	1.20E-07	7.52E-05	-0.427948	1.09E-05	2.38E-05	1.37E-10
36	1.81E-07	7.50E-05	-0.397006	3.52E-05	-2.44E-05	-3.40E-10
37	1.84E-07	7.50E-05	-0.373715	3.59E-05	-1.63E-05	-1.70E-10
38	-2.95E-10	7.51E-05	-0.361000	3.63E-05	-1.14E-15	-3.93E-14
39	-1.84E-07	7.50E-05	-0.373715	3.59E-05	1.63E-05	1.70E-10
40	-1.62E-07	7.52E-05	-0.397006	3.52E-05	2.44E-05	3.40E-10
41	8.44E-07	7.51E-05	-0.341958	4.73E-05	-2.62E-05	-6.00E-10
42	6.71E-07	7.49E-05	-0.316793	4.94E-05	-1.78E-05	-1.79E-10
43	-2.14E-10	7.54E-05	-0.302947	5.08E-05	-1.62E-15	-5.00E-14
44	-6.71E-07	7.49E-05	-0.316793	4.94E-05	1.78E-05	1.79E-10
45	-8.45E-07	7.51E-05	-0.341958	4.73E-05	2.62E-05	6.00E-10
46	1.78E-06	7.43E-05	-0.282356	4.18E-05	-3.09E-05	-4.98E-10
47	1.40E-06	7.47E-05	-0.252236	4.67E-05	-2.17E-05	1.61E-10
48	-1.26E-10	7.65E-05	-0.235219	5.04E-05	-2.11E-15	-4.35E-14
49	-1.40E-06	7.47E-05	-0.252236	4.67E-05	2.17E-05	-1.61E-10
50	-1.78E-06	7.43E-05	-0.282356	4.18E-05	3.09E-05	4.98E-10
51	2.05E-06	7.21E-05	-0.243820	1.56E-05	-3.93E-05	7.74E-10
52	1.89E-06	7.44E-05	-0.204574	2.23E-05	-2.93E-05	1.65E-09
53	-6.20E-11	7.93E-05	-0.180024	3.02E-05	-2.55E-15	-1.89E-14
54	-1.89E-06	7.44E-05	-0.204574	2.23E-05	2.93E-05	-1.65E-09
55	-2.05E-06	7.21E-05	-0.243620	1.56E-05	3.93E-05	-7.74E-10
56	2.49E-07	6.72E-05	-0.250783	-2.62E-05	-4.50E-05	2.61E-09
57	-1.22E-07	7.30E-05	-0.204451	-2.58E-05	-3.67E-05	6.80E-09
58	-2.49E-07	8.62E-05	-0.170475	-2.43E-05	-2.89E-15	1.80E-14
59	1.22E-07	7.30E-05	-0.204451	-2.58E-05	3.67E-05	-6.80E-09
60	2.49E-07	6.72E-05	-0.250783	-2.62E-05	4.50E-05	-2.61E-09
61	-1.35E-06	5.77E-05	-0.340131	-7.84E-05	-3.70E-06	1.17E-09
62	-1.31E-06	5.98E-05	-0.303392	-8.40E-05	-2.72E-05	1.75E-09
63	-1.34E-10	6.29E-05	-0.280925	-9.11E-05	-2.72E-15	4.99E-14
64	1.31E-06	5.98E-05	-0.303392	-8.40E-05	2.72E-05	-1.75E-09
65	1.35E-06	5.77E-05	-0.340131	-7.84E-05	3.70E-05	-1.17E-09
66	-1.21E-06	4.46E-05	-0.494245	-9.88E-05	-2.79E-05	-2.60E-11
67	-8.97E-07	4.50E-05	-0.467265	-0.000102	-1.92E-05	2.70E-10
68	-2.98E-10	4.57E-05	-0.452296	-0.000104	-2.34E-15	7.00E-14
69	8.96E-07	4.50E-05	-0.467265	-0.000102	1.92E-05	-2.70E-10
70	1.21E-06	4.46E-05	-0.494245	-9.88E-05	2.79E-05	2.62E-11
71	-6.47E-07	3.01E-05	-0.654286	-8.52E-05	-2.46E-05	-1.93E-10
72	-4.39E-07	3.00E-05	-0.630777	-8.60E-05	-1.65E-05	-4.27E-11
73	-4.67E-10	3.01E-05	-0.617931	-8.65E-05	-1.94E-15	6.33E-14
74	4.38E-07	3.00E-05	-0.630777	-8.60E-05	1.65E-05	4.29E-11
75	6.46E-07	3.01E-05	-0.654286	-8.52E-05	2.46E-05	1.93E-10
76	-3.26E-07	1.51E-05	-0.770030	-4.83E-05	-2.39E-05	-9.51E-11
77	-2.05E-07	1.50E-05	-0.747321	-4.84E-05	-1.59E-05	-4.78E-11
78	-5.86E-10	1.50E-05	-0.734954	-4.85E-05	-1.67E-15	3.62E-14
79	2.04E-07	1.50E-05	-0.747321	-4.84E-05	1.59E-05	4.79E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	3.25E-07	1.51E-05	-0.770030	-4.83E-05	2.39E-05	9.52E-11
81	-2.39E-07	-2.19E-14	-0.811829	9.93E-18	-2.37E-05	2.51E-17
82	-1.43E-07	6.18E-15	-0.789241	8.99E-18	-1.58E-05	2.50E-17
83	-6.28E-10	4.37E-14	-0.776945	7.09E-18	-1.58E-15	2.50E-17
84	1.42E-07	8.13E-14	-0.789241	6.29E-18	1.58E-05	2.50E-17
85	2.38E-07	1.09E-13	-0.811829	6.44E-18	2.37E-05	2.50E-17
86	-3.26E-07	-1.51E-05	-0.770030	4.83E-05	-2.39E-05	9.51E-11
87	-2.05E-07	-1.50E-05	-0.747321	4.84E-05	-1.59E-05	4.78E-11
88	-5.86E-10	-1.50E-05	-0.734954	4.85E-05	-1.67E-15	-3.61E-14
89	2.04E-07	-1.50E-05	-0.747321	4.84E-05	1.59E-05	-4.79E-11
90	3.25E-07	-1.51E-05	-0.770030	4.83E-05	2.39E-05	-9.52E-11
91	-6.47E-07	-3.01E-05	-0.654286	8.52E-05	-2.46E-05	1.93E-10
92	-4.39E-07	-3.00E-05	-0.630777	8.60E-05	-1.65E-05	4.27E-11
93	-4.67E-10	-3.01E-05	-0.617931	8.65E-05	-1.93E-15	-6.33E-14
94	4.38E-07	-3.00E-05	-0.630777	8.60E-05	1.65E-05	-4.29E-11
95	6.46E-07	-3.01E-05	-0.654286	8.52E-05	2.46E-05	-1.93E-10
96	-1.21E-06	-4.46E-05	-0.494245	9.88E-05	-2.79E-05	2.60E-11
97	-8.97E-07	-4.50E-05	-0.467265	0.000102	-1.92E-05	-2.70E-10
98	-2.98E-10	-4.57E-05	-0.452296	0.000104	-2.33E-15	-7.00E-14
99	8.96E-07	-4.50E-05	-0.467265	0.000102	1.92E-05	2.70E-10
100	1.21E-06	-4.46E-05	-0.494245	9.88E-05	2.79E-05	-2.62E-11
101	-1.35E-06	-5.77E-05	-0.340131	7.84E-05	-3.70E-05	-1.17E-09
102	-1.31E-06	-5.98E-05	-0.303392	8.40E-05	-2.72E-05	-1.75E-09
103	-1.35E-10	-6.29E-05	-0.280925	9.11E-05	-2.71E-15	-4.99E-14
104	1.31E-06	-5.98E-05	-0.303392	8.40E-05	2.72E-05	1.75E-09
105	1.35E-06	-5.77E-05	-0.340131	7.84E-05	3.70E-05	1.17E-09
106	2.49E-07	-6.72E-05	-0.250783	2.62E-05	-4.50E-05	-2.61E-09
107	-1.22E-07	-7.30E-05	-0.204451	2.58E-05	-3.67E-05	-6.80E-09
108	-5.24E-11	-6.62E-05	-0.170475	2.43E-05	-2.88E-15	-1.79E-14
109	1.22E-07	-7.30E-05	-0.204451	2.58E-05	3.67E-05	6.80E-09
110	-2.49E-07	-6.72E-05	-0.250783	2.62E-05	4.50E-05	2.61E-09
111	2.05E-06	-7.21E-05	-0.243820	-1.56E-05	-3.93E-05	-7.74E-10
112	1.89E-06	-7.44E-05	-0.204574	-2.23E-05	-2.93E-05	-1.65E-09
113	-6.25E-11	-7.93E-05	-0.180024	-3.02E-05	-2.54E-15	1.89E-14
114	-1.89E-06	-7.44E-05	-0.204574	-2.23E-05	2.93E-05	1.65E-09
115	-2.05E-06	-7.21E-05	-0.243820	-1.56E-05	3.93E-05	7.74E-10
116	1.78E-06	-7.43E-05	-0.282256	-4.18E-05	-3.09E-05	4.98E-10
117	1.40E-06	-7.47E-05	-0.252236	-4.67E-05	-2.17E-05	1.61E-10
118	-1.27E-10	-7.65E-05	-0.235219	-5.04E-05	-2.10E-15	4.36E-14
119	-1.40E-06	-7.47E-05	-0.252236	-4.67E-05	2.17E-05	-1.61E-10
120	-1.78E-06	-7.43E-05	-0.282356	-4.18E-05	3.09E-05	-4.98E-10
121	8.44E-07	-7.51E-05	-0.341958	-4.73E-05	-2.62E-05	6.00E-10
122	6.71E-07	-7.49E-05	-0.316793	-4.94E-05	-1.78E-05	1.79E-10
123	-2.15E-10	-7.54E-05	-0.302947	-5.08E-05	-1.61E-15	5.01E-14
124	-6.71E-07	-7.49E-05	-0.316793	-4.94E-05	1.78E-05	-1.79E-10
125	-8.45E-07	-7.51E-05	-0.341958	-4.73E-05	2.62E-05	-6.00E-10
126	1.81E-07	-7.52E-05	-0.397006	-3.52E-05	-2.44E-05	3.40E-10
127	1.84E-07	-7.50E-05	-0.373715	-3.59E-05	-1.63E-05	1.70E-10
128	-2.96E-10	-7.51E-05	-0.361000	-3.63E-05	-1.12E-15	3.93E-14
129	-1.84E-07	-7.50E-05	-0.373715	-3.59E-05	1.63E-05	-1.70E-10
130	-1.62E-07	-7.52E-05	-0.397006	-3.52E-05	2.44E-05	-3.40E-10
131	-1.21E-07	-7.52E-05	-0.427948	-1.09E-05	-2.38E-05	1.37E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-4.57E-08	-7.51E-05	-0.405277	-1.12E-05	-1.58E-05	9.05E-11
133	-3.47E-10	-7.51E-05	-0.392927	-1.14E-05	-6.95E-16	1.75E-14
134	4.50E-08	-7.51E-05	-0.405277	-1.12E-05	1.58E-05	-9.05E-11
135	1.20E-07	-7.52E-05	-0.427948	-1.09E-05	2.38E-05	-1.37E-10
136	-2.25E-07	-7.51E-05	-0.422331	2.03E-05	-2.34E-05	5.24E-11
137	-1.30E-07	-7.51E-05	-0.400115	1.98E-05	-1.55E-05	3.73E-11
138	-3.59E-10	-7.51E-05	-0.388029	1.95E-05	-3.58E-16	-9.91E-15
139	1.29E-07	-7.51E-05	-0.400115	1.98E-05	1.55E-05	-3.73E-11
140	2.24E-07	-7.51E-05	-0.422331	2.03E-05	2.34E-05	-5.24E-11
141	-2.66E-07	-7.51E-05	-0.374148	5.37E-05	-2.22E-05	4.05E-11
142	-1.60E-07	-7.51E-05	-0.353156	5.23E-05	-1.45E-05	3.23E-12
143	-3.27E-10	-7.51E-05	-0.341828	5.11E-05	-1.22E-16	-3.99E-14
144	1.60E-07	-7.51E-05	-0.353156	5.23E-05	1.45E-05	-3.31E-12
145	2.66E-07	-7.51E-05	-0.374148	5.37E-05	2.22E-05	-4.06E-11
146	-2.72E-07	-7.50E-05	-0.283052	8.52E-05	-1.89E-05	6.52E-12
147	-1.45E-07	-7.51E-05	-0.265596	8.15E-05	-1.17E-05	-6.11E-11
148	-2.50E-10	-7.52E-05	-0.256559	7.88E-05	5.72E-18	-6.82E-14
149	1.45E-07	-7.51E-05	-0.265596	8.15E-05	1.17E-05	6.10E-11
150	2.71E-07	-7.50E-05	-0.283052	8.52E-05	1.89E-05	-6.64E-12
151	-5.45E-06	-7.49E-05	-0.153959	0.000111	-1.07E-05	-2.32E-10
152	2.86E-05	-7.51E-05	-0.145023	0.000102	-5.29E-06	-1.63E-10
153	-1.33E-10	-7.52E-05	-0.141238	9.71E-05	3.81E-17	-8.43E-14
154	-3.13E-05	-7.51E-05	-0.145023	0.000102	5.29E-06	1.63E-10
155	5.42E-06	-7.49E-05	-0.153959	0.000111	1.07E-05	2.32E-10
156	6.59E-07	-7.49E-05	-5.31E-97	0.000120	3.64E-06	-2.94E-10
157	3.38E-07	-7.51E-05	-0.005565	0.000110	4.58E-06	-2.17E-10
158	-3.12E-12	-7.53E-05	-0.009738	0.000104	1.52E-17	-8.28E-14
159	-3.38E-07	-7.51E-05	-0.005565	0.000110	-4.58E-06	2.17E-10
160	-6.59E-07	-7.49E-05	-5.31E-97	0.000120	-3.64E-06	2.93E-10
161	7.94E-07	-7.49E-05	0.059667	0.000119	-7.99E-06	-2.63E-10
162	4.46E-07	-7.51E-05	0.049601	0.000110	4.58E-06	-2.17E-10
163	3.63E-11

Loadcase Factor Stage Init.def Title
5 1.0000 RETRACCION

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-5.69E-05	-1.441	-0.295944			
10	5.69E-05	-1.441	-0.295944			
156	-5.69E-05	1.441	-0.295944			
160	5.69E-05	1.441	-0.295944			
166	1.22E-12	-1.846	0.591887	12.714	-2.36E-11	-2.24E-10
167	4.16E-12	1.846	0.591887	-12.714	-1.70E-11	2.22E-10
Sums :	-1.12E-12	1.41E-11	-1.20E-12			
min:	-5.69E-05	-1.846	-0.295944	-12.714	-2.36E-11	-2.24E-10
max:	5.69E-05	1.846	0.591887	12.714	-1.70E-11	2.22E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000436	6.411	-0.009271	1.85E-05	-1.53E-06	3.76E-07
2	0.000365	6.412	-0.007449	1.80E-05	-1.13E-06	3.64E-07
3	9.19E-12	6.412	-0.006357	1.77E-05	6.53E-17	-1.27E-14
4	-0.000369	6.412	-0.007449	1.80E-05	1.13E-06	-3.64E-07
5	-0.000436	6.411	-0.009271	1.85E-05	1.53E-06	-3.76E-07
6	0.000247	6.266	2.96E-98	1.85E-05	-1.53E-06	3.76E-07
7	0.000187	6.266	0.001568	1.80E-05	-1.13E-06	3.64E-07
8	1.55E-11	6.266	0.002486	1.77E-05	6.53E-17	-1.27E-14
9	-0.000187	6.266	0.001568	1.80E-05	1.13E-06	-3.64E-07
10	-0.000247	6.265	2.96E-98	1.85E-05	1.53E-06	-3.76E-07
11	-4.00E-05	5.887	0.023979	1.79E-05	-7.30E-07	1.30E-07
12	-3.41E-05	5.887	0.024740	1.75E-05	-5.85E-07	1.29E-07
13	3.37E-11	5.887	0.025214	1.72E-05	-1.63E-15	-1.30E-14
14	3.41E-05	5.887	0.024740	1.75E-05	5.85E-07	-1.29E-07
15	4.00E-05	5.887	0.023979	1.79E-05	7.30E-07	-1.30E-07
16	-5.92E-05	5.508	0.046209	1.60E-05	-2.70E-07	3.20E-09
17	-6.46E-05	5.508	0.046493	1.58E-05	-2.26E-07	2.74E-08
18	5.18E-11	5.508	0.046674	1.57E-05	-1.52E-16	-1.21E-14
19	6.46E-05	5.508	0.046493	1.58E-05	2.26E-07	-2.74E-08
20	8.92E-05	5.508	0.046209	1.60E-05	2.70E-07	-3.20E-09
21	-5.77E-05	5.129	0.065289	1.31E-05	-8.34E-08	-2.38E-08
22	-4.20E-05	5.129	0.065377	1.31E-05	-7.01E-08	-4.01E-09
23	6.79E-11	5.129	0.065430	1.30E-05	2.53E-15	-1.02E-14
24	4.20E-05	5.129	0.065377	1.31E-05	7.01E-08	4.01E-09
25	5.77E-05	5.129	0.065289	1.31E-05	8.34E-08	2.38E-08
26	-2.53E-05	4.750	0.079923	9.20E-06	-3.10E-08	-1.71E-08
27	-1.90E-05	4.750	0.079955	9.19E-06	-2.65E-08	-7.69E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
26	8.11E-11	4.750	0.079973	9.19E-06	4.30E-15	-7.61E-15
29	1.90E-05	4.750	0.079955	9.19E-06	2.65E-08	7.69E-09
30	2.53E-05	4.750	0.079923	9.20E-06	3.10E-08	1.71E-08
31	-9.08E-06	4.371	0.088724	4.16E-06	-6.89E-08	-6.42E-09
32	-7.15E-06	4.371	0.088796	4.22E-06	-5.83E-08	-3.95E-09
33	9.05E-11	4.371	0.088838	4.27E-06	4.95E-15	-4.27E-15
34	7.15E-06	4.371	0.088796	4.22E-06	5.83E-08	3.95E-09
35	9.08E-06	4.371	0.088724	4.16E-06	6.89E-08	6.42E-09
36	-6.35E-06	3.992	0.090196	-2.07E-06	-2.58E-07	1.31E-09
37	-5.03E-06	3.992	0.090466	-1.85E-06	-2.13E-07	-2.58E-10
38	9.50E-11	3.992	0.090628	-1.70E-06	4.92E-15	2.66E-16
39	5.03E-06	3.992	0.090466	-1.85E-06	2.13E-07	2.58E-10
40	6.35E-06	3.992	0.090196	-2.07E-06	2.58E-07	-1.31E-09
41	-1.24E-06	3.613	0.082702	-9.59E-06	-7.92E-07	5.57E-09
42	-9.51E-06	3.613	0.083528	-9.03E-06	-6.39E-07	8.06E-10
43	9.23E-11	3.613	0.084029	-8.64E-06	4.54E-15	6.49E-15
44	9.51E-06	3.613	0.083528	-9.03E-06	6.39E-07	-8.06E-10
45	1.24E-05	3.613	0.082702	-9.59E-06	7.92E-07	-5.57E-09
46	-2.19E-05	3.234	0.064570	-1.83E-05	-1.81E-06	2.93E-09
47	-1.76E-05	3.234	0.066492	-1.74E-05	-1.53E-06	-3.91E-09
48	7.52E-11	3.234	0.067823	-1.65E-05	4.03E-15	1.40E-14
49	1.76E-05	3.234	0.066492	-1.74E-05	1.53E-06	3.91E-09
50	2.19E-05	3.234	0.064570	-1.83E-05	1.81E-06	-2.93E-09
51	-2.19E-05	2.856	0.035029	-2.67E-05	-2.29E-06	-1.42E-08
52	-2.25E-05	2.855	0.037677	-2.71E-05	-2.47E-06	-2.33E-08
53	5.39E-11	2.855	0.040520	-2.60E-05	3.71E-15	2.05E-14
54	2.25E-05	2.855	0.037677	-2.71E-05	2.47E-06	2.33E-08
55	2.19E-05	2.856	0.035029	-2.67E-05	2.29E-06	1.42E-08
56	3.43E-06	2.477	-0.001933	-3.24E-05	-4.21E-07	-3.53E-08
57	5.66E-06	2.477	-0.003204	-3.47E-05	-2.97E-07	-9.29E-08
58	2.04E-11	2.476	-0.003022	-4.32E-05	3.66E-15	2.20E-14
59	-5.66E-06	2.477	-0.003204	-3.47E-05	2.97E-07	9.29E-08
60	-3.43E-06	2.477	-0.003629	-3.24E-05	4.21E-07	3.53E-08
61	2.34E-05	1.981	-0.057496	-3.01E-05	2.00E-06	-1.12E-08
62	2.07E-05	1.981	-0.059751	-3.02E-05	2.01E-06	-2.26E-08
63	-3.06E-11	1.981	-0.061933	-2.85E-05	3.66E-15	2.15E-14
64	-2.07E-05	1.981	-0.059751	-3.02E-05	-2.01E-06	2.26E-08
65	-2.34E-05	1.981	-0.057496	-3.01E-05	-2.00E-06	1.12E-08
66	1.63E-05	1.486	-0.103145	-2.29E-05	1.03E-06	3.66E-09
67	1.22E-05	1.486	-0.104227	-2.23E-05	8.35E-07	-2.35E-09
68	-6.95E-11	1.486	-0.104501	-2.18E-05	3.17E-15	1.69E-14
69	-1.22E-05	1.486	-0.104227	-2.23E-05	-8.35E-07	2.35E-09
70	-1.63E-05	1.486	-0.103145	-2.29E-05	-1.03E-06	-3.66E-09
71	5.94E-06	0.990624	-0.135527	-1.51E-05	2.69E-07	3.65E-09
72	4.36E-06	0.990626	-0.135808	-1.49E-05	2.20E-07	1.23E-09
73	-9.34E-11	0.990625	-0.135977	-1.47E-05	2.75E-15	1.06E-14
74	-4.36E-06	0.990626	-0.135808	-1.49E-05	-2.20E-07	-1.23E-09
75	-5.94E-06	0.990624	-0.135527	-1.51E-05	-2.69E-07	-3.65E-09
76	1.11E-06	0.495312	-0.154698	-7.48E-06	4.94E-08	1.42E-09
77	8.57E-07	0.495313	-0.154750	-7.43E-06	4.20E-08	8.18E-10
78	-1.06E-10	0.495313	-0.154781	-7.40E-06	2.60E-15	5.02E-15
79	-8.58E-07	0.495313	-0.154750	-7.43E-06	-4.20E-08	-8.18E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-1.11E-06	0.495312	-0.154698	-7.48E-06	-4.94E-08	-1.42E-09
81	-3.47E-08	-5.90E-12	-0.161052	-2.98E-17	1.10E-08	7.78E-17
82	1.91E-08	-5.81E-12	-0.161064	-2.81E-17	9.65E-09	7.79E-17
83	-1.10E-10	-5.69E-12	-0.161070	-2.54E-17	2.57E-15	7.78E-17
84	-1.94E-08	-5.58E-12	-0.161064	-2.24E-17	-9.65E-09	7.77E-17
85	3.45E-08	-5.49E-12	-0.161052	-2.04E-17	-1.10E-08	7.74E-17
86	1.11E-06	0.495312	-0.154698	7.48E-06	4.94E-08	-1.42E-09
87	6.57E-07	-0.495313	-0.154750	7.43E-06	4.20E-08	-8.18E-10
88	-1.06E-10	-0.495313	-0.154781	7.40E-06	2.59E-15	-4.86E-15
89	-8.58E-07	-0.495313	-0.154750	7.43E-06	-4.20E-08	8.18E-10
90	-1.11E-06	-0.495312	-0.154698	7.48E-06	-4.94E-08	1.42E-09
91	5.94E-06	-0.990624	-0.135527	1.51E-05	2.69E-07	-3.65E-09
92	4.36E-06	-0.990626	-0.135808	1.49E-05	2.20E-07	-1.23E-09
93	-9.35E-11	-0.990625	-0.135977	1.47E-05	2.74E-15	-1.04E-14
94	-4.36E-06	-0.990626	-0.135808	1.49E-05	-2.20E-07	1.23E-09
95	-5.94E-06	-0.990624	-0.135527	1.51E-05	-2.69E-07	3.65E-09
96	1.63E-05	-1.486	-0.103145	2.29E-05	1.03E-06	-3.66E-09
97	1.22E-05	-1.486	-0.104227	2.23E-05	8.35E-07	2.35E-09
98	-7.03E-11	-1.486	-0.104901	2.18E-05	3.15E-15	-1.67E-14
99	-1.22E-05	-1.486	-0.104227	2.23E-05	-8.35E-07	-2.35E-09
100	-1.63E-05	-1.486	-0.103145	2.29E-05	-1.03E-06	3.66E-09
101	2.34E-05	-1.981	-0.057496	3.01E-05	2.00E-06	1.12E-08
102	2.07E-05	-1.981	-0.059751	3.02E-05	2.01E-06	2.26E-08
103	-3.15E-11	-1.981	-0.061933	2.85E-05	3.63E-15	-2.13E-14
104	-2.07E-05	-1.981	-0.059751	3.02E-05	-2.01E-06	-2.26E-08
105	-2.34E-05	-1.981	-0.057496	3.01E-05	-2.00E-06	-1.12E-08
106	3.43E-06	-2.477	-0.003629	3.24E-05	-4.21E-07	3.53E-08
107	5.55E-06	-2.477	-0.003204	3.47E-05	2.97E-07	9.29E-08
108	1.90E-11	-2.476	-0.003022	4.32E-05	3.63E-15	-2.18E-14
109	-5.56E-06	-2.477	-0.003204	3.47E-05	-2.97E-07	-9.29E-08
110	-3.43E-06	-2.477	-0.003629	3.47E-05	2.97E-07	-9.29E-08
111	-2.19E-05	-2.856	0.035029	2.67E-05	-2.29E-06	1.42E-08
112	-2.25E-05	-2.855	0.037677	2.71E-05	-2.47E-06	2.33E-08
113	5.23E-11	-2.855	0.040520	2.60E-05	3.68E-15	-2.04E-14
114	2.25E-05	-2.855	0.037677	2.71E-05	2.47E-06	-2.33E-08
115	2.19E-05	-2.856	0.035029	2.67E-05	2.29E-06	-1.42E-08
116	-2.19E-05	-3.234	0.064570	1.63E-05	-1.81E-06	-2.93E-09
117	-1.76E-05	-3.234	0.066492	1.74E-05	-1.53E-06	3.91E-09
118	7.74E-11	-3.234	0.067823	1.65E-05	4.00E-15	-1.38E-14
119	1.76E-05	-3.234	0.066492	1.74E-05	1.53E-06	-3.91E-09
120	2.19E-05	-3.234	0.064570	1.83E-05	1.81E-06	2.93E-09
121	-1.24E-05	-3.613	0.082702	9.59E-06	-7.92E-07	-5.57E-09
122	-9.51E-06	-3.613	0.083528	9.03E-06	-6.39E-07	-8.06E-10
123	9.03E-11	-3.613	0.084029	8.64E-06	4.52E-15	-6.33E-15
124	9.51E-06	-3.613	0.083528	9.03E-06	6.39E-07	8.06E-10
125	1.24E-05	-3.613	0.082702	9.59E-06	7.92E-07	5.57E-09
126	-6.35E-06	-3.992	0.090196	2.07E-06	-2.58E-07	-1.31E-09
127	-5.03E-06	-3.992	0.090466	1.85E-06	-2.13E-07	2.58E-10
128	9.28E-11	-3.992	0.090628	1.70E-06	4.90E-15	-9.90E-17
129	5.03E-06	-3.992	0.090466	1.85E-06	2.13E-07	-2.58E-10
130	6.35E-06	-3.992	0.090196	2.07E-06	2.58E-07	1.31E-09
131	-9.08E-06	-4.371	0.088724	-4.16E-06	-6.89E-08	6.42E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-7.15E-06	-4.371	0.088796	-4.22E-06	-5.83E-08	3.95E-09
133	6.81E-11	-4.371	0.088838	-4.27E-06	4.93E-15	4.43E-15
134	7.15E-06	-4.371	0.088796	-4.22E-06	5.83E-08	-3.95E-09
135	9.08E-06	-4.371	0.088724	-4.16E-06	6.89E-08	-6.42E-09
136	-2.53E-05	-4.750	0.079923	-9.20E-06	-3.10E-08	1.71E-08
137	-1.90E-05	-4.750	0.079955	-9.19E-06	-2.65E-08	7.69E-09
138	7.84E-11	-4.750	0.079973	-9.19E-06	4.29E-15	7.78E-15
139	1.90E-05	-4.750	0.079955	-9.19E-06	2.65E-08	-7.69E-09
140	2.53E-05	-4.750	0.079923	-9.20E-06	3.10E-08	-1.71E-08
141	-5.77E-05	-5.129	0.065289	-1.31E-05	-8.34E-08	2.38E-08
142	-4.20E-05	-5.129	0.065377	-1.31E-05	-7.01E-08	4.01E-09
143	6.51E-11	-5.129	0.065430	-1.30E-05	2.52E-15	1.04E-14
144	4.20E-05	-5.129	0.065377	-1.31E-05	7.01E-08	-4.01E-09
145	5.77E-05	-5.129	0.065289	-1.31E-05	8.34E-08	-2.38E-08
146	-8.92E-05	-5.508	0.046209	-1.60E-05	-2.70E-07	-3.20E-09
147	-6.46E-05	-5.508	0.046493	-1.58E-05	-2.26E-07	-2.74E-08
148	4.87E-11	-5.508	0.046674	-1.57E-05	-1.66E-16	1.23E-14
149	6.46E-05	-5.508	0.046493	-1.58E-05	2.26E-07	2.74E-08
150	8.92E-05	-5.508	0.046209	-1.60E-05	2.70E-07	3.20E-09
151	-4.00E-05	-5.887	0.023979	-1.79E-05	-7.30E-07	-1.30E-07
152	-3.41E-05	-5.887	0.024740	-1.75E-05	-5.85E-07	-1.29E-07
153	3.04E-11	-5.887	0.025214	-1.72E-05	-1.63E-15	1.31E-14
154	3.41E-05	-5.887	0.024740	-1.75E-05	5.85E-07	1.29E-07
155	4.00E-05	-5.887	0.023979	-1.79E-05	7.30E-07	1.30E-07
156	0.000247	-6.265	2.96E-98	-1.85E-05	-1.53E-06	-3.76E-07
157	0.000187	-6.266	0.001568	-1.80E-05	-1.13E-06	-3.64E-07
158	1.20E-11	-6.266	0.002486	-1.77E-05	6.47E-17	1.28E-14
159	-0.000187	-6.266	0.001568	-1.80E-05	1.13E-06	3.64E-07
160	-0.000247	-6.265	2.96E-98	-1.85E-05	1.53E-06	3.76E-07
161	0.000436	-6.411	-0.009271	-1.85E-05	-1.53E-06	-3.76E-07
162	0.000369	-6.412	-0.007449	-1.80E-05	-1.13E-06	-3.64E-07
163	5.59E-12	-6.412	-0.006357	-1.77E-05	6.47E-17	1.28E-14
164	-0.000369	-6.412	-0.007449	-1.80E-05	1.13E-06	3.64E-07
165	-0.000436	-6.411	-0.009271	-1.85E-05	1.53E-06	3.76E-07
166	-0	1.85E-97	-5.92E-98	-1.27E-99	+0	+0
167	-0	-1.85E-97	-5.92E-98	1.27E-99	+0	-0
min:	-0.000436	-6.412	-0.161070	-4.32E-05	-2.47E-06	-3.76E-07
max:	0.000436	6.412	0.090628	4.32E-05	2.47E-06	3.76E-07

Loadcase Factor Stage Init.def Title
60 1.0000 FRENADO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-4.14E-05	-1.116	-0.371460			
10	4.14E-05	-1.116	-0.371460			
156	4.14E-05	-1.116	0.371460			
160	-4.14E-05	-1.116	0.371460			
166	1.47E-11	-3.763	-0.958693	25.552	7.27E-11	-2.38E-10
167	-1.57E-11	-3.763	0.958693	25.552	-8.03E-11	-2.38E-10
Sums :	-1.83E-12	-11.990	6.52E-13			
min:	-4.14E-05	-3.763	-0.958693	25.552	-8.03E-11	-2.38E-10
max:	4.14E-05	-1.116	0.958693	25.552	7.27E-11	-2.38E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000321	4.852	-0.012012	2.40E-05	-1.91E-06	2.82E-07
2	0.000270	4.852	-0.009726	2.34E-05	-1.42E-06	2.70E-07
3	-1.99E-11	4.852	-0.008355	2.29E-05	4.72E-17	-1.70E-14
4	-0.000270	4.852	-0.009726	2.34E-05	1.42E-06	2.70E-07
5	-0.000321	4.852	-0.012012	2.40E-05	1.91E-06	2.82E-07
6	0.000180	4.852	3.71E-98	2.40E-05	-1.91E-06	2.82E-07
7	0.000135	4.852	0.001968	2.34E-05	-1.42E-06	2.70E-07
8	-1.14E-11	4.852	0.003119	2.29E-05	4.72E-17	-1.70E-14
9	-0.000135	4.852	0.001968	2.34E-05	1.42E-06	-2.70E-07
10	-0.000180	4.852	3.71E-98	2.40E-05	1.91E-06	-2.82E-07
11	-3.40E-05	4.852	0.031075	2.33E-05	-9.15E-07	9.45E-08
12	-2.86E-05	4.852	0.032029	2.27E-05	-7.33E-07	9.21E-08
13	1.29E-11	4.852	0.032624	2.23E-05	-1.17E-15	-1.74E-14
14	2.86E-05	4.852	0.032029	2.27E-05	7.33E-07	-9.21E-08
15	3.40E-05	4.852	0.031075	2.33E-05	9.15E-07	-9.45E-08
16	-6.87E-05	4.852	0.059953	2.09E-05	-3.38E-07	-4.56E-10
17	-4.97E-05	4.852	0.060309	2.06E-05	-2.83E-07	1.54E-08
18	3.70E-11	4.852	0.060535	2.04E-05	-2.51E-15	-1.63E-14
19	4.97E-05	4.852	0.060309	2.06E-05	2.83E-07	-1.54E-08
20	6.87E-05	4.852	0.059953	2.09E-05	3.38E-07	4.55E-10
21	-4.37E-05	4.853	0.084878	1.72E-05	-1.05E-07	-1.99E-08
22	-3.18E-05	4.853	0.084988	1.71E-05	-8.84E-08	-7.87E-09
23	5.86E-11	4.853	0.085054	1.71E-05	2.07E-15	-1.39E-14
24	3.18E-05	4.853	0.084988	1.71E-05	8.84E-08	7.87E-09
25	4.37E-05	4.853	0.084878	1.72E-05	1.05E-07	1.99E-08
26	-1.93E-05	4.853	0.104212	1.23E-05	-4.81E-08	-1.38E-08
27	-1.45E-05	4.853	0.104263	1.23E-05	-4.11E-08	-1.00E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
26	7.66E-11	4.853	0.104290	1.23E-05	3.45E-15	-1.07E-14
29	1.45E-05	4.853	0.104263	1.23E-05	4.11E-08	1.00E-08
30	1.93E-05	4.853	0.104212	1.23E-05	4.81E-08	1.38E-08
31	-8.82E-06	4.852	0.116197	5.92E-06	-1.32E-07	-4.10E-09
32	-6.97E-06	4.853	0.116336	6.05E-06	-1.12E-07	-6.24E-09
33	9.01E-11	4.853	0.116417	6.14E-06	3.94E-15	-6.43E-15
34	6.97E-06	4.853	0.116336	6.05E-06	1.12E-07	6.24E-09
35	8.82E-06	4.853	0.116197	5.92E-06	1.32E-07	4.10E-09
36	-1.18E-05	4.853	0.118895	-1.59E-06	-4.90E-07	4.58E-09
37	-9.14E-06	4.853	0.119407	-1.57E-06	-4.03E-07	-2.45E-09
38	9.70E-11	4.853	0.119714	-1.29E-06	3.81E-15	-3.40E-16
39	9.14E-06	4.853	0.119407	-1.57E-06	4.03E-07	2.45E-09
40	1.18E-05	4.853	0.118895	-1.99E-06	4.90E-07	-4.58E-09
41	-2.63E-05	4.853	0.110135	-1.16E-06	-1.47E-06	1.04E-08
42	-1.99E-05	4.853	0.111672	-1.06E-05	-1.19E-06	-2.20E-09
43	9.38E-11	4.853	0.112604	-9.88E-06	3.23E-15	8.41E-15
44	1.99E-05	4.853	0.111672	-1.06E-05	1.19E-06	2.20E-09
45	2.63E-05	4.853	0.110135	-1.16E-05	1.47E-06	-1.04E-08
46	-4.55E-05	4.853	0.087747	-2.26E-05	-3.26E-06	4.31E-09
47	-3.64E-05	4.853	0.091215	-2.12E-05	-2.77E-06	-1.25E-08
48	7.52E-11	4.853	0.093654	-1.96E-05	2.42E-15	1.85E-14
49	3.64E-05	4.853	0.091219	-2.12E-05	2.77E-06	1.25E-08
50	4.55E-05	4.853	0.087747	-2.26E-05	3.26E-06	-4.31E-09
51	-4.52E-05	4.853	0.051406	-3.24E-05	-3.71E-06	-3.07E-08
52	-4.62E-05	4.853	0.055775	-3.35E-05	-4.21E-06	-5.22E-08
53	3.94E-11	4.852	0.060838	-3.18E-05	1.96E-15	2.62E-14
54	4.62E-05	4.853	0.055775	-3.35E-05	4.21E-06	5.22E-08
55	4.52E-05	4.853	0.051406	-3.24E-05	3.71E-06	3.07E-08
56	7.24E-06	4.853	0.006608	-3.61E-05	5.20E-07	-7.44E-08
57	1.18E-05	4.852	0.005935	-4.07E-05	7.52E-07	-1.95E-07
58	-4.26E-12	4.852	0.004855	-5.85E-05	2.00E-15	2.33E-14
59	-1.18E-05	4.852	0.005935	-4.07E-05	-7.52E-07	1.95E-07
60	-7.24E-06	4.853	0.006608	-3.61E-05	-5.20E-07	7.44E-08
61	4.75E-05	4.853	-0.044517	-2.27E-05	4.98E-06	-2.59E-08
62	4.21E-05	4.853	-0.050088	-2.25E-05	4.89E-06	-5.26E-08
63	-6.12E-11	4.853	-0.055250	-2.07E-05	1.77E-15	1.69E-14
64	-4.21E-05	4.853	-0.050088	-2.25E-05	-4.89E-06	5.26E-08
65	-4.75E-05	4.853	-0.044517	-2.27E-05	-4.98E-06	2.59E-08
66	3.32E-05	4.853	-0.067773	-3.97E-06	2.40E-06	4.42E-09
67	2.49E-05	4.853	-0.070291	-2.60E-06	1.95E-06	-1.12E-08
68	-8.27E-11	4.853	-0.071855	-1.45E-06	1.12E-15	4.11E-15
69	-2.49E-05	4.853	-0.070291	-2.60E-06	-1.95E-06	1.12E-08
70	-3.32E-05	4.853	-0.067773	-3.97E-06	-2.40E-06	-4.42E-09
71	1.24E-05	4.853	-0.061603	1.06E-05	6.11E-07	4.38E-09
72	9.08E-06	4.853	-0.062244	1.11E-05	5.04E-07	-3.92E-09
73	-6.95E-11	4.853	-0.062629	1.14E-05	2.87E-16	-8.37E-15
74	-9.08E-06	4.853	-0.062244	1.11E-05	-5.04E-07	3.92E-09
75	-1.24E-05	4.853	-0.061603	1.06E-05	-6.13E-07	-4.38E-09
76	2.83E-06	4.853	-0.035615	1.91E-05	1.13E-07	-2.00E-11
77	2.13E-06	4.853	-0.035733	1.92E-05	9.54E-08	-4.52E-09
78	-3.77E-11	4.853	-0.035803	1.93E-05	2.29E-17	-1.52E-14
79	-2.13E-06	4.853	-0.035733	1.92E-05	-9.54E-08	4.52E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-2.83E-06	4.853	-0.035615	1.91E-05	-1.13E-07	2.00E-11
81	8.84E-13	4.853	1.17E-13	2.19E-05	4.32E-17	-1.65E-09
82	8.84E-13	4.853	6.91E-14	2.19E-05	4.32E-17	-5.19E-09
83	8.85E-13	4.853	4.31E-15	2.19E-05	4.32E-17	-1.72E-14
84	8.85E-13	4.853	-6.05E-14	2.19E-05	4.33E-17	5.19E-09
85	8.85E-13	4.853	-1.09E-13	2.19E-05	4.33E-17	1.65E-09
86	-2.83E-06	4.853	0.035615	1.91E-05	-1.13E-07	-2.00E-11
87	-2.13E-06	4.853	0.035733	1.92E-05	-9.54E-08	-4.52E-09
88	3.95E-11	4.853	0.035803	1.93E-05	6.34E-17	-1.52E-14
89	2.13E-06	4.853	0.035733	1.92E-05	9.54E-08	4.52E-09
90	2.83E-06	4.853	0.035615	1.91E-05	1.13E-07	2.00E-11
91	-1.24E-05	4.853	0.061603	1.06E-05	-6.13E-07	4.38E-09
92	-9.08E-06	4.853	0.062244	1.11E-05	-5.04E-07	-3.92E-09
93	7.12E-11	4.853	0.062629	1.14E-05	-2.00E-16	-8.36E-15
94	9.08E-06	4.853	0.062244	1.11E-05	5.04E-07	3.92E-09
95	1.24E-05	4.853	0.061603	1.06E-05	6.13E-07	-4.38E-09
96	-3.32E-05	4.853	0.067773	-3.97E-06	-2.40E-06	4.42E-09
97	-2.49E-05	4.853	0.070291	-2.60E-06	-1.95E-06	-1.12E-08
98	6.45E-11	4.853	0.071855	-1.45E-06	-1.03E-15	4.12E-15
99	2.49E-05	4.853	0.070291	-2.60E-06	1.95E-06	1.12E-08
100	3.32E-05	4.853	0.067773	-3.97E-06	2.40E-06	-4.42E-09
101	-4.75E-05	4.853	0.044517	-2.27E-05	-4.98E-06	-2.59E-08
102	-4.21E-05	4.853	0.050088	-2.25E-05	-4.89E-06	-5.26E-08
103	6.29E-11	4.853	0.055250	-1.94E-05	-1.98E-15	1.69E-14
104	4.21E-05	4.853	0.050088	-2.25E-05	4.89E-06	5.26E-08
105	4.75E-05	4.853	0.044517	-2.27E-05	4.98E-06	2.59E-08
106	-7.24E-06	4.853	-0.006608	-3.61E-05	-5.20E-07	-7.44E-08
107	-1.18E-05	4.852	-0.005935	-4.07E-05	-7.52E-07	-1.95E-07
108	6.01E-12	4.852	-0.004895	-5.85E-05	-1.91E-15	2.33E-14
109	1.18E-05	4.852	-0.005935	-4.07E-05	7.52E-07	1.95E-07
110	7.24E-06	4.853	-0.006608	-3.61E-05	5.20E-07	7.44E-08
111	4.52E-05	4.853	-0.051406	-3.24E-05	3.71E-06	-3.07E-08
112	4.62E-05	4.853	-0.055775	-3.35E-05	4.21E-06	-5.22E-08
113	-3.76E-11	4.852	-0.060838	-3.18E-05	-1.88E-15	2.62E-14
114	-4.62E-05	4.853	-0.055775	-3.35E-05	-4.21E-06	5.22E-08
115	-4.52E-05	4.853	-0.051406	-3.24E-05	-3.71E-06	3.07E-08
116	4.55E-05	4.853	-0.087747	-2.26E-05	3.26E-06	4.31E-09
117	3.64E-05	4.853	-0.091219	-2.12E-05	2.77E-06	-1.25E-08
118	-7.35E-11	4.853	-0.093654	-1.96E-05	-2.35E-15	1.88E-14
119	-3.64E-05	4.853	-0.091219	-2.12E-05	-2.77E-06	1.25E-08
120	-4.55E-05	4.853	-0.087747	-2.26E-05	-3.26E-06	-4.31E-09
121	2.63E-05	4.853	-0.110135	-1.16E-05	1.47E-06	1.04E-08
122	1.99E-05	4.853	-0.111672	-1.06E-05	1.19E-06	-2.20E-09
123	-9.20E-11	4.853	-0.112604	-9.88E-06	-3.17E-15	8.40E-15
124	-1.99E-05	4.853	-0.111672	-1.06E-05	-1.19E-06	2.20E-09
125	-2.63E-05	4.853	-0.110135	-1.16E-05	-1.47E-06	-1.04E-08
126	1.18E-05	4.853	-0.118895	-1.99E-06	4.90E-07	4.58E-09
127	9.14E-06	4.853	-0.119407	-1.57E-06	4.03E-07	-2.45E-09
128	-9.52E-11	4.853	-0.119714	-1.29E-06	-3.76E-15	-3.47E-16
129	-9.14E-06	4.853	-0.119407	-1.57E-06	-4.03E-07	2.45E-09
130	-1.18E-05	4.853	-0.118895	-1.99E-06	-4.90E-07	-4.58E-09
131	8.82E-06	4.853	-0.116197	5.92E-06	1.32E-07	-4.10E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	6.97E-06	4.853	-0.116336	6.05E-06	1.12E-07	-6.24E-09
133	-8.83E-11	4.853	-0.116417	6.14E-06	-3.89E-15	-6.44E-15
134	-6.97E-06	4.853	-0.116336	6.05E-06	-1.12E-07	6.24E-09
135	-8.82E-06	4.853	-0.116197	5.92E-06	-1.32E-07	4.10E-09
136	1.93E-05	4.853	-0.104212	1.23E-05	4.81E-08	-1.38E-08
137	1.45E-05	4.853	-0.104263	1.23E-05	4.11E-08	-1.00E-08
138	-7.49E-11	4.853	-0.104290	1.23E-05	-3.41E-15	-1.07E-14
139	-1.45E-05	4.853	-0.104263	1.23E-05	-4.11E-08	1.00E-08
140	-1.93E-05	4.853	-0.104212	1.23E-05	-4.81E-08	1.38E-08
141	4.37E-05	4.853	-0.084878	1.72E-05	1.05E-07	-1.99E-08
142	3.18E-05	4.853	-0.084988	1.71E-05	8.84E-08	-7.87E-09
143	-5.68E-11	4.853	-0.085054	1.71E-05	-2.05E-15	-1.39E-14
144	-3.18E-05	4.853	-0.084988	1.71E-05	-8.84E-08	7.87E-09
145	-4.37E-05	4.853	-0.084878	1.72E-05	-1.05E-07	1.99E-08
146	6.87E-05	4.852	-0.059953	2.09E-05	3.38E-07	-4.56E-10
147	4.97E-05	4.852	-0.060309	2.06E-05	2.83E-07	1.54E-08
148	-3.52E-11	4.852	-0.060535	2.04E-05	2.05E-17	-1.63E-14
149	-4.97E-05	4.852	-0.060309	2.06E-05	-2.83E-07	-1.54E-08
150	-6.87E-05	4.852	-0.059953	2.09E-05	-3.38E-07	4.55E-10
151	3.40E-05	4.852	-0.031075	2.33E-05	9.15E-07	9.45E-08
152	2.86E-05	4.852	-0.032029	2.27E-05	7.33E-07	9.21E-08
153	-1.10E-11	4.852	-0.032624	2.23E-05	1.18E-15	-1.74E-14
154	-2.86E-05	4.852	-0.032029	2.27E-05	-7.33E-07	-9.21E-08
155	-3.40E-05	4.852	-0.031075	2.33E-05	-9.15E-07	-9.45E-08
156	-0.000180	4.852	-3.71E-98	2.40E-05	1.91E-06	2.82E-07
157	-0.000135	4.852	-0.001968	2.34E-05	1.42E-06	2.70E-07
158	1.33E-11	4.852	-0.003119	2.29E-05	-4.59E-17	-1.70E-14
159	0.000135	4.852	-0.001966	2.34E-05	-1.42E-06	-2.70E-07
160	0.000180	4.852	-3.71E-98	2.40E-05	-1.91E-06	-2.82E-07
161	-0.000321	4.852	0.012012	2.40E-05	1.91E-06	2.82E-07
162	-0.000270	4.852	0.009726	2.34E-05	1.42E-06	2.70E-07
163	2.18E-11	4.852	0.008355	2.29E-05	-4.59E-17	-1.70E-14
164	0.000270	4.852	0.009726	2.34E-05	-1.42E-06	-2.70E-07
165	0.000321	4.852	0.012012	2.40E-05	-1.91E-06	-2.82E-07
166	-0	3.76E-97	9.59E-98	-2.56E-99	-0	+0
167	+0	3.76E-97	-9.59E-98	-2.56E-99	+0	+0
min:	-0.000321	3.76E-97	-0.119714	-5.85E-05	-4.98E-06	-2.82E-07
max:	0.000321	4.853	0.119714	2.40E-05	4.98E-06	2.82E-07

Loadcase Factor Stage Init.def Title
62 1.0000 VIENTO TRANSV SIN SOE.

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	1.531	0.004263	3.948			
10	1.531	-0.004262	-4.140			
156	1.531	-0.004263	3.948			
160	1.531	0.004262	-4.140			
166	5.242	-0.002368	-0.604205	0.010415	32.670	-0.040211
167	5.242	0.002368	-0.604205	-0.010415	32.670	0.040211
Sums :	16.609	2.71E-12	-1.592			
min:	1.531	-0.004263	-4.140	-0.010415	32.670	-0.040211
max:	5.242	0.004263	3.948	0.010415	32.670	0.040211

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-6.653	-0.018533	0.026975	-5.39E-05	1.91E-06	7.49E-06
2	-6.653	-0.018396	0.014646	-3.21E-05	-7.19E-07	7.16E-06
3	-6.654	-1.59E-06	-0.000444	1.85E-06	-4.09E-06	7.06E-06
4	-6.653	0.010395	-0.016000	3.60E-05	-2.85E-07	7.16E-06
5	-6.653	0.018532	-0.029105	5.82E-05	2.51E-06	7.49E-06
6	-6.657	-0.018533	-3.95E-97	-5.39E-05	1.91E-06	7.49E-06
7	-6.657	-0.010398	-0.001395	-3.21E-05	-7.19E-07	7.16E-06
8	-6.657	-1.59E-06	0.000483	1.85E-06	-4.09E-06	7.06E-06
9	-6.657	0.010395	0.002008	3.60E-05	-2.85E-07	7.16E-06
10	-6.657	0.018532	4.14E-97	5.82E-05	2.51E-06	7.50E-06
11	-6.666	-0.018397	-0.078384	-5.90E-05	-3.02E-05	7.40E-06
12	-6.666	-0.010341	-0.044333	-3.40E-05	-3.09E-05	7.15E-06
13	-6.666	-1.49E-06	0.002825	1.73E-06	-3.20E-05	7.11E-06
14	-6.667	0.010338	0.049918	3.76E-05	-3.08E-05	7.15E-06
15	-6.667	0.018396	0.083881	6.29E-05	-3.01E-05	7.40E-06
16	-6.676	-0.018020	-0.160357	-6.04E-05	-6.30E-05	7.14E-06
17	-6.676	-0.010174	-0.089611	-3.56E-05	-6.30E-05	7.01E-06
18	-6.676	-1.38E-06	0.004875	1.40E-06	-6.33E-05	7.02E-06
19	-6.676	0.010171	0.099686	3.85E-05	-6.32E-05	7.01E-06
20	-6.676	0.018017	0.170451	6.35E-05	-6.32E-05	7.14E-06
21	-6.685	-0.017445	-0.243800	-6.13E-05	-9.55E-05	6.86E-06
22	-6.685	-0.009877	-0.136877	-3.64E-05	-9.55E-05	6.77E-06
23	-6.685	-1.32E-06	0.006382	9.02E-07	-9.56E-05	6.79E-06
24	-6.685	0.009874	0.149845	3.83E-05	-9.57E-05	6.77E-06
25	-6.685	0.017442	0.257119	6.32E-05	-9.58E-05	6.86E-06
26	-6.694	-0.016699	-0.328103	-6.18E-05	-0.000128	6.54E-06
27	-6.694	-0.009471	-0.184819	-3.69E-05	-0.000128	6.46E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-6.694	-1.30E-06	0.007183	3.27E-07	-0.000128	6.48E-06
29	-6.694	0.009468	0.199421	3.76E-05	-0.000128	6.46E-06
30	-6.694	0.016696	0.343096	6.24E-05	-0.000128	6.54E-06
31	-6.702	-0.015809	-0.412739	-6.18E-05	-0.000160	6.17E-06
32	-6.702	-0.008981	-0.233267	-3.72E-05	-0.000160	6.10E-06
33	-6.702	-1.29E-06	0.007238	-2.31E-07	-0.000160	6.12E-06
34	-6.702	0.008978	0.247989	3.67E-05	-0.000161	6.10E-06
35	-6.702	0.015806	0.427869	6.14E-05	-0.000161	6.17E-06
36	-6.710	-0.014805	-0.497063	-6.13E-05	-0.000192	5.75E-06
37	-6.710	-0.008425	-0.281822	-3.71E-05	-0.000192	5.70E-06
38	-6.710	-1.27E-06	0.006630	-6.81E-07	-0.000192	5.71E-06
39	-6.710	0.008422	0.295340	3.57E-05	-0.000193	5.70E-06
40	-6.710	0.014803	0.511011	6.00E-05	-0.000193	5.75E-06
41	-6.717	-0.013719	-0.579960	-5.96E-05	-0.000223	5.30E-06
42	-6.717	-0.007819	-0.329813	-3.63E-05	-0.000223	5.27E-06
43	-6.717	-1.26E-06	0.005550	-9.40E-07	-0.000224	5.28E-06
44	-6.717	0.007817	0.341213	3.44E-05	-0.000224	5.27E-06
45	-6.717	0.013716	0.591859	5.79E-05	-0.000224	5.30E-06
46	-6.724	-0.012582	-0.659056	-5.54E-05	-0.000253	4.84E-06
47	-6.724	-0.007176	-0.376080	-3.43E-05	-0.000253	4.82E-06
48	-6.724	-1.35E-06	0.004299	-9.30E-07	-0.000254	4.81E-06
49	-6.724	0.007174	0.385093	3.26E-05	-0.000253	4.82E-06
50	-6.724	0.012580	0.668746	5.39E-05	-0.000253	4.84E-06
51	-6.730	-0.011431	-0.729023	-4.58E-05	-0.000277	4.41E-06
52	-6.730	-0.006504	-0.418531	-2.99E-05	-0.000278	4.39E-06
53	-6.730	-1.64E-06	0.003277	-5.62E-07	-0.000283	4.29E-06
54	-6.730	0.006502	0.425773	2.91E-05	-0.000279	4.39E-06
55	-6.730	0.011429	0.737272	4.52E-05	-0.000278	4.41E-06
56	-6.735	-0.010273	-0.780684	-2.93E-05	-0.000293	4.02E-06
57	-6.735	-0.005832	-0.451527	-1.80E-05	-0.000295	3.96E-06
58	-6.735	-2.01E-06	0.003085	4.26E-07	-0.000316	3.95E-06
59	-6.735	0.005828	0.458725	1.89E-05	-0.000296	3.96E-06
60	-6.735	0.010273	0.789146	3.02E-05	-0.000294	4.03E-06
61	-6.742	-0.008625	-0.817406	-1.08E-05	-0.000312	3.42E-06
62	-6.742	-0.004886	-0.467607	-4.42E-06	-0.000313	3.32E-06
63	-6.742	-1.23E-06	0.005063	1.64E-06	-0.000316	3.39E-06
64	-6.742	0.004884	0.478344	7.44E-06	-0.000314	3.32E-06
65	-6.742	0.008623	0.829060	1.36E-05	-0.000313	3.42E-06
66	-6.747	-0.006714	-0.829054	-2.74E-06	-0.000319	2.68E-06
67	-6.747	-0.003788	-0.471430	-7.32E-07	-0.000319	2.59E-06
68	-6.747	-7.29E-07	0.008147	1.87E-06	-0.000320	2.60E-06
69	-6.747	0.003787	0.488065	4.40E-06	-0.000320	2.59E-06
70	-6.747	0.006712	0.846252	6.30E-06	-0.000320	2.68E-06
71	-6.751	-0.004590	-0.831749	-3.45E-07	-0.000322	1.83E-06
72	-6.751	-0.002588	-0.471515	4.06E-07	-0.000322	1.77E-06
73	-6.751	-4.71E-07	0.011133	1.56E-06	-0.000322	1.78E-06
74	-6.751	0.002587	0.494044	2.69E-06	-0.000322	1.77E-06
75	-6.751	0.004589	0.854715	3.42E-06	-0.000322	1.83E-06
76	-6.753	-0.002329	-0.831989	1.35E-07	-0.000323	9.30E-07
77	-6.753	-0.001313	-0.470729	4.22E-07	-0.000323	9.00E-07
78	-6.753	-2.43E-07	0.013243	8.75E-07	-0.000323	9.02E-07
79	-6.753	0.001313	0.497461	1.32E-06	-0.000323	8.99E-07

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-6.753	0.002328	0.859129	1.61E-06	-0.000323	9.30E-07
81	-6.754	-2.46E-11	-0.831895	-5.18E-16	-0.000323	9.00E-15
82	-6.754	-1.45E-11	-0.470347	-3.19E-16	-0.000323	9.00E-15
83	-6.754	-9.92E-13	0.014000	7.67E-18	-0.000323	9.00E-15
84	-6.754	1.25E-11	0.498591	3.34E-16	-0.000323	9.00E-15
85	-6.754	2.26E-11	0.860544	5.31E-16	-0.000323	9.00E-15
86	-6.753	0.002329	-0.831989	-1.35E-07	-0.000323	-9.30E-07
87	-6.753	0.001313	-0.470729	-4.22E-07	-0.000323	-9.00E-07
88	-6.753	2.43E-07	0.013243	-8.75E-07	-0.000323	-9.02E-07
89	-6.753	-0.001313	0.497461	-1.32E-06	-0.000323	-8.99E-07
90	-6.753	-0.002328	0.859129	-1.61E-06	-0.000323	-9.30E-07
91	-6.751	0.004590	-0.831749	3.45E-07	-0.000322	-1.83E-06
92	-6.751	0.002588	-0.471515	4.06E-07	-0.000322	-1.77E-06
93	-6.751	4.71E-07	0.011133	-1.56E-06	-0.000322	-1.78E-06
94	-6.751	-0.002587	0.494044	-2.69E-06	-0.000322	-1.77E-06
95	-6.751	-0.004589	0.854715	-3.42E-06	-0.000322	-1.83E-06
96	-6.747	0.006714	-0.829054	2.74E-06	-0.000319	-2.68E-06
97	-6.747	0.003788	-0.471430	7.32E-07	-0.000319	-2.59E-06
98	-6.747	7.29E-07	0.008147	-1.87E-06	-0.000320	-2.60E-06
99	-6.747	-0.003787	0.488065	-4.40E-06	-0.000320	-2.59E-06
100	-6.747	-0.006712	0.846252	-6.30E-06	-0.000320	-2.68E-06
101	-6.742	0.008625	-0.817406	1.08E-05	-0.000312	-3.42E-06
102	-6.742	0.004886	-0.467607	4.42E-06	-0.000313	-3.32E-06
103	-6.742	1.23E-06	0.005063	-1.64E-06	-0.000316	-3.39E-06
104	-6.742	-0.004884	0.478344	-7.44E-06	-0.000314	-3.32E-06
105	-6.742	-0.008623	0.829060	-1.36E-05	-0.000313	-3.42E-06
106	-6.735	0.010273	-0.780684	2.93E-05	-0.000293	-4.02E-06
107	-6.735	0.005832	-0.451527	1.80E-05	-0.000295	-3.96E-06
108	-6.735	2.01E-06	0.003085	-4.26E-07	-0.000316	-3.95E-06
109	-6.735	-0.005828	0.458725	-1.89E-05	-0.000296	-3.96E-06
110	-6.735	-0.010273	0.789146	-3.02E-05	-0.000294	-4.03E-06
111	-6.730	0.011431	-0.729023	4.58E-05	-0.000277	-4.41E-06
112	-6.730	0.006504	-0.418531	2.99E-05	-0.000278	-4.39E-06
113	-6.730	1.64E-06	0.003277	5.62E-07	-0.000283	-4.29E-06
114	-6.730	-0.006502	0.425773	-2.91E-05	-0.000279	-4.39E-06
115	-6.730	-0.011429	0.737272	-4.52E-05	-0.000278	-4.41E-06
116	-6.724	0.012582	-0.659056	5.54E-05	-0.000253	-4.84E-06
117	-6.724	0.007176	-0.376080	3.43E-05	-0.000253	-4.82E-06
118	-6.724	1.35E-06	0.004299	9.30E-07	-0.000254	-4.81E-06
119	-6.724	-0.007174	0.385093	-3.26E-05	-0.000253	-4.82E-06
120	-6.724	-0.012580	0.668746	-5.39E-05	-0.000253	-4.84E-06
121	-6.717	0.013719	-0.579960	5.96E-05	-0.000223	-5.30E-06
122	-6.717	0.007819	-0.329813	3.63E-05	-0.000223	-5.27E-06
123	-6.717	1.26E-06	0.005550	9.40E-07	-0.000224	-5.28E-06
124	-6.717	-0.007817	0.341213	-3.44E-05	-0.000224	-5.27E-06
125	-6.717	-0.013716	0.591859	-5.79E-05	-0.000224	-5.30E-06
126	-6.710	0.014805	-0.497063	6.13E-05	-0.000192	-5.75E-06
127	-6.710	0.008425	-0.281822	3.71E-05	-0.000192	-5.70E-06
128	-6.710	1.27E-06	0.006630	6.81E-07	-0.000192	-5.71E-06
129	-6.710	-0.008422	0.295340	-3.57E-05	-0.000193	-5.70E-06
130	-6.710	-0.014803	0.511011	-6.00E-05	-0.000193	-5.75E-06
131	-6.702	0.015809	-0.412739	6.18E-05	-0.000160	-6.17E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-6.702	0.008981	-0.233267	3.72E-05	-0.000160	-6.10E-06
133	-6.702	1.29E-06	0.007238	2.31E-07	-0.000160	-6.12E-06
134	-6.702	-0.008978	0.247989	-3.67E-05	-0.000161	-6.10E-06
135	-6.702	-0.015806	0.427869	-6.14E-05	-0.000161	-6.17E-06
136	-6.694	0.016699	-0.328103	6.18E-05	-0.000128	-6.54E-06
137	-6.694	0.009471	-0.184819	3.69E-05	-0.000128	-6.46E-06
138	-6.694	1.30E-06	0.007183	-3.27E-07	-0.000128	-6.48E-06
139	-6.694	-0.009468	0.199421	-3.76E-05	-0.000128	-6.46E-06
140	-6.694	-0.016696	0.343096	-6.24E-05	-0.000128	-6.54E-06
141	-6.685	0.017445	-0.243800	6.13E-05	-9.55E-05	-6.86E-06
142	-6.685	0.009877	-0.136877	3.64E-05	-9.55E-05	-6.77E-06
143	-6.685	1.32E-06	0.006382	-9.02E-07	-9.56E-05	-6.79E-06
144	-6.685	-0.009874	0.149849	-3.83E-05	-9.57E-05	-6.77E-06
145	-6.685	-0.017442	0.257119	-6.32E-05	-9.58E-05	-6.86E-06
146	-6.676	0.018020	-0.160357	6.04E-05	-6.30E-05	-7.14E-06
147	-6.676	0.010174	-0.089811	3.56E-05	-6.30E-05	-7.01E-06
148	-6.676	1.38E-06	0.004875	-1.40E-06	-6.33E-05	-7.02E-06
149	-6.676	-0.010171	0.099686	-3.85E-05	-6.32E-05	-7.01E-06
150	-6.676	-0.018017	0.170451	-6.35E-05	-6.32E-05	-7.14E-06
151	-6.666	0.018397	-0.078384	5.90E-05	-3.02E-05	-7.40E-06
152	-6.666	0.010341	-0.044333	3.40E-05	-3.09E-05	-7.15E-06
153	-6.666	1.49E-06	0.002825	-1.73E-06	-3.20E-05	-7.11E-06
154	-6.667	-0.010338	0.049918	-3.76E-05	-3.08E-05	-7.15E-06
155	-6.667	-0.018394	0.083881	-6.29E-05	-3.01E-05	-7.40E-06
156	-6.657	0.018533	-3.95E-97	5.39E-05	1.91E-06	-7.49E-06
157	-6.657	0.010398	-0.001395	3.21E-05	-7.19E-07	-7.16E-06
158	-6.657	1.59E-06	0.000483	-1.85E-06	-4.09E-06	-7.06E-06
159	-6.657	-0.010395	0.002008	-3.60E-05	-2.85E-07	-7.16E-06
160	-6.657	-0.018532	4.14E-97	-5.82E-05	2.51E-06	-7.50E-06
161	-6.653	0.018533	0.026975	5.39E-05	1.91E-06	-7.49E-06
162	-6.653	0.010398	0.014646	3.21E-05	-7.19E-07	-7.16E-06
163	-6.654	1.59E-06	-0.000444	-1.85E-06	-4.09E-06	-7.06E-06
164	-6.653	-0.010395	-0.016000	-3.60E-05	-2.85E-07	-7.16E-06
165	-6.653	-0.018532	-0.029105	-5.82E-05	2.51E-06	-7.49E-06
166	-5.24E-97	+0	6.04E-98	-0	-3.27E-99	+0
167	-5.24E-97	-0	6.04E-98	+0	-3.27E-99	-0
min:	-6.754	-0.018533	-0.831989	-6.35E-05	-0.000323	-7.50E-06
max:	-5.24E-97	0.018533	0.860544	6.35E-05	2.51E-06	7.50E-06

Loadcase Factor Stage Init.def Title
63 1.0000 VIENTO TRANSV CON SOE

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	3.976	0.010057	10.805			
10	3.976	-0.010056	-11.366			
156	3.976	-0.010057	10.805			
160	3.976	0.010056	-11.366			
166	11.245	-0.006921	-1.766	0.030443	79.020	-0.094356
167	11.245	0.006921	-1.766	-0.030443	79.020	0.094356
Sums :	38.395	7.08E-12	-4.654			
min:	3.976	-0.010057	-11.366	-0.030443	79.020	-0.094356
max:	11.245	0.010057	10.805	0.030443	79.020	0.094356

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-17.278	-0.043724	0.073702	-0.000147	5.17E-06	1.78E-05
2	-17.280	-0.024489	0.039996	-8.75E-05	-2.01E-06	1.69E-05
3	-17.280	-4.64E-06	-0.001299	5.42E-06	-1.12E-05	1.67E-05
4	-17.280	0.024480	-0.043955	9.90E-05	-7.41E-07	1.69E-05
5	-17.279	0.043720	-0.079930	0.000160	6.93E-06	1.78E-05
6	-17.287	-0.043724	-1.08E-96	-0.000147	5.17E-06	1.78E-05
7	-17.288	-0.024489	-0.003766	-8.75E-05	-2.01E-06	1.69E-05
8	-17.289	-4.64E-06	0.001411	5.42E-06	-1.12E-05	1.67E-05
9	-17.288	0.024480	0.005559	9.90E-05	-7.41E-07	1.69E-05
10	-17.288	0.043720	1.14E-96	0.000160	6.93E-06	1.78E-05
11	-17.310	-0.043373	-0.214224	-0.000161	-8.27E-05	1.75E-05
12	-17.311	-0.024344	-0.120932	-9.27E-05	-8.46E-05	1.69E-05
13	-17.311	-4.36E-06	0.008257	5.05E-06	-8.76E-05	1.68E-05
14	-17.311	0.024336	0.137259	0.000103	-8.43E-05	1.69E-05
15	-17.311	0.043367	0.230291	0.000173	-8.24E-05	1.75E-05
16	-17.333	-0.042412	-0.438312	-0.000165	-0.000172	1.68E-05
17	-17.333	-0.023925	-0.245094	-9.71E-05	-0.000173	1.65E-05
18	-17.333	-4.02E-06	0.014249	4.09E-06	-0.000173	1.65E-05
19	-17.333	0.023918	0.273960	0.000106	-0.000173	1.65E-05
20	-17.333	0.042404	0.467818	0.000174	-0.000173	1.68E-05
21	-17.354	-0.040957	-0.666482	-0.000168	-0.000261	1.61E-05
22	-17.354	-0.023182	-0.373674	-9.95E-05	-0.000261	1.59E-05
23	-17.354	-3.86E-06	0.018654	2.64E-06	-0.000262	1.59E-05
24	-17.355	0.023175	0.411593	0.000105	-0.000262	1.59E-05
25	-17.355	0.040950	0.705414	0.000173	-0.000262	1.61E-05
26	-17.375	-0.039093	-0.697068	-0.000169	-0.000350	1.53E-05
27	-17.375	-0.022177	-0.504742	-0.000101	-0.000350	1.51E-05

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-17.375	-3.80E-06	0.020996	9.56E-07	-0.000351	1.52E-05
29	-17.375	0.022170	0.547425	0.000103	-0.000351	1.51E-05
30	-17.376	0.039086	0.940894	0.000171	-0.000351	1.53E-05
31	-17.394	-0.036900	-1.129	-0.000169	-0.000439	1.44E-05
32	-17.394	-0.020977	-0.637285	-0.000102	-0.000439	1.42E-05
33	-17.394	-3.76E-06	0.021159	-6.74E-07	-0.000439	1.43E-05
34	-17.395	0.020969	0.680320	0.000100	-0.000440	1.42E-05
35	-17.395	0.036892	1.173	0.000168	-0.000440	1.44E-05
36	-17.412	-0.034463	-1.359	-0.000168	-0.000526	1.33E-05
37	-17.412	-0.019617	-0.770197	-0.000102	-0.000526	1.32E-05
38	-17.412	-3.70E-06	0.019379	-1.99E-06	-0.000527	1.33E-05
39	-17.413	0.019629	0.809712	9.76E-05	-0.000527	1.32E-05
40	-17.413	0.034455	1.400	0.000164	-0.000527	1.33E-05
41	-17.429	-0.031875	-1.586	-0.000163	-0.000611	1.22E-05
42	-17.429	-0.018202	-0.901608	-9.93E-05	-0.000611	1.22E-05
43	-17.429	-3.68E-06	0.016225	-2.75E-06	-0.000612	1.22E-05
44	-17.429	0.018195	0.934933	9.40E-05	-0.000612	1.22E-05
45	-17.430	0.031867	1.621	0.000158	-0.000613	1.22E-05
46	-17.444	-0.029234	-1.803	-0.000152	-0.000691	1.12E-05
47	-17.444	-0.016707	-1.028	-9.39E-05	-0.000692	1.12E-05
48	-17.444	-3.94E-06	0.012566	-2.72E-06	-0.000695	1.11E-05
49	-17.445	0.016699	1.055	8.89E-05	-0.000693	1.12E-05
50	-17.445	0.029226	1.831	0.000147	-0.000693	1.12E-05
51	-17.458	-0.026642	-1.994	-0.000125	-0.000757	1.02E-05
52	-17.458	-0.015173	-1.144	-8.19E-05	-0.000762	1.02E-05
53	-17.458	-4.78E-06	0.009580	-1.64E-06	-0.000775	9.87E-06
54	-17.458	0.015165	1.166	7.94E-05	-0.000764	1.02E-05
55	-17.459	0.026636	2.018	0.000124	-0.000760	1.02E-05
56	-17.471	-0.024118	-2.135	-8.01E-05	-0.000802	9.45E-06
57	-17.471	-0.013684	-1.235	-4.91E-05	-0.000807	9.29E-06
58	-17.470	-5.87E-06	0.009018	1.25E-06	-0.000866	9.26E-06
59	-17.471	0.013674	1.256	5.18E-05	-0.000810	9.29E-06
60	-17.472	0.024118	2.160	8.28E-05	-0.000806	9.47E-06
61	-17.486	-0.020482	-2.236	-2.95E-05	-0.000853	8.17E-06
62	-17.486	-0.011586	-1.279	-1.20E-05	-0.000857	7.89E-06
63	-17.486	-3.58E-06	0.014799	4.78E-06	-0.000866	8.12E-06
64	-17.487	0.011580	1.310	2.08E-05	-0.000859	7.89E-06
65	-17.487	0.020476	2.270	1.77E-05	-0.000856	8.17E-06
66	-17.499	-0.016081	-2.267	-7.37E-06	-0.000874	6.48E-06
67	-17.499	-0.009046	-1.289	-1.79E-06	-0.000874	6.23E-06
68	-17.499	-2.13E-06	0.023815	5.47E-06	-0.000875	6.26E-06
69	-17.499	0.009041	1.337	1.25E-05	-0.000875	6.23E-06
70	-17.500	0.016075	2.318	1.78E-05	-0.000875	6.48E-06
71	-17.508	-0.011055	-2.275	-8.06E-07	-0.000880	4.46E-06
72	-17.508	-0.006213	-1.289	1.31E-06	-0.000880	4.28E-06
73	-17.509	-1.38E-06	0.032541	4.56E-06	-0.000881	4.29E-06
74	-17.509	0.006210	1.354	7.75E-06	-0.000881	4.28E-06
75	-17.509	0.011052	2.342	9.79E-06	-0.000882	4.46E-06
76	-17.514	-0.005627	-2.275	4.56E-07	-0.000883	2.27E-06
77	-17.514	-0.003163	-1.286	1.27E-06	-0.000883	2.18E-06
78	-17.514	-7.10E-07	0.038710	2.56E-06	-0.000883	2.18E-06
79	-17.515	0.003162	1.364	3.83E-06	-0.000884	2.18E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-17.515	0.005625	2.354	4.63E-06	-0.000884	2.27E-06
81	-17.516	-6.38E-11	-2.275	-1.34E-15	-0.000884	2.34E-14
82	-17.516	-3.77E-11	-1.285	-8.28E-16	-0.000884	2.34E-14
83	-17.516	-2.59E-12	0.040924	2.00E-17	-0.000884	2.34E-14
84	-17.517	3.25E-11	1.368	8.66E-16	-0.000885	2.34E-14
85	-17.517	5.87E-11	2.358	1.38E-15	-0.000885	2.34E-14
86	-17.514	0.005627	-2.275	-4.56E-07	-0.000883	-2.27E-06
87	-17.514	0.003163	-1.286	-1.27E-06	-0.000883	-2.18E-06
88	-17.514	7.10E-07	0.038710	-2.56E-06	-0.000883	-2.18E-06
89	-17.515	-0.003162	1.364	-3.83E-06	-0.000884	-2.18E-06
90	-17.515	-0.005625	2.354	-4.63E-06	-0.000884	-2.27E-06
91	-17.508	0.011055	-2.275	8.06E-07	-0.000880	-4.46E-06
92	-17.508	0.006213	-1.289	-1.31E-06	-0.000880	-4.28E-06
93	-17.509	1.38E-06	0.032541	-4.56E-06	-0.000881	-4.29E-06
94	-17.509	-0.006210	1.354	-7.75E-06	-0.000881	-4.28E-06
95	-17.509	-0.011052	2.342	-9.79E-06	-0.000882	-4.46E-06
96	-17.499	0.016081	-2.267	7.37E-06	-0.000874	-6.48E-06
97	-17.499	0.009046	-1.289	1.79E-06	-0.000874	-6.23E-06
98	-17.499	2.13E-06	0.023815	-5.47E-06	-0.000875	-6.26E-06
99	-17.499	-0.009041	1.337	-1.25E-05	-0.000875	-6.23E-06
100	-17.500	-0.016075	2.318	-1.78E-05	-0.000875	-6.48E-06
101	-17.486	0.020482	-2.236	2.95E-05	-0.000853	-8.17E-06
102	-17.486	0.011586	-1.279	1.20E-05	-0.000857	-7.89E-06
103	-17.486	3.58E-06	0.014799	-4.78E-06	-0.000866	-8.12E-06
104	-17.487	-0.011580	1.310	-2.08E-05	-0.000859	-7.89E-06
105	-17.487	-0.020476	2.270	-3.77E-05	-0.000856	-8.17E-06
106	-17.471	0.024118	-2.135	8.01E-05	-0.000802	-9.45E-06
107	-17.471	0.013684	-1.235	4.91E-05	-0.000807	-9.29E-06
108	-17.470	5.87E-06	0.009018	-1.25E-06	-0.000866	-9.26E-06
109	-17.471	-0.013674	1.256	-5.18E-05	-0.000810	-9.29E-06
110	-17.472	-0.024118	2.160	-8.28E-05	-0.000806	-9.47E-06
111	-17.458	0.020642	-1.994	0.000125	-0.000757	-1.02E-05
112	-17.458	0.015173	-1.144	8.19E-05	-0.000762	-1.02E-05
113	-17.458	4.78E-06	0.009580	1.64E-06	-0.000775	-9.87E-06
114	-17.458	-0.015165	1.166	-7.94E-05	-0.000764	-1.02E-05
115	-17.459	-0.026636	2.018	-0.000124	-0.000760	-1.02E-05
116	-17.444	0.029234	-1.803	0.000152	-0.000691	-1.12E-05
117	-17.444	0.016707	-1.028	9.39E-05	-0.000692	-1.12E-05
118	-17.444	3.94E-06	0.012566	2.72E-06	-0.000695	-1.11E-05
119	-17.445	-0.016699	1.055	-8.89E-05	-0.000693	-1.12E-05
120	-17.445	-0.029226	1.831	-0.000147	-0.000693	-1.12E-05
121	-17.429	0.031875	-1.586	0.000163	-0.000611	-1.22E-05
122	-17.429	0.018202	-0.901608	9.93E-05	-0.000611	-1.22E-05
123	-17.429	3.68E-06	0.016225	2.75E-06	-0.000612	-1.22E-05
124	-17.429	-0.018195	0.934933	-9.40E-05	-0.000612	-1.22E-05
125	-17.430	-0.031867	1.621	-0.000158	-0.000613	-1.22E-05
126	-17.412	0.034463	-1.359	0.000168	-0.000526	-1.33E-05
127	-17.412	0.019637	-0.770197	0.000102	-0.000526	-1.32E-05
128	-17.412	3.70E-06	0.019379	1.99E-06	-0.000527	-1.33E-05
129	-17.413	-0.019629	0.809712	-9.76E-05	-0.000527	-1.32E-05
130	-17.413	-0.034455	1.400	-0.000164	-0.000527	-1.33E-05
131	-17.394	0.036900	-1.129	0.000169	-0.000439	-1.44E-05

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-17.394	0.020977	-0.637285	0.000102	-0.000439	-1.42E-05
133	-17.394	3.76E-06	0.021159	6.74E-07	-0.000439	-1.43E-05
134	-17.395	-0.020969	0.680320	-0.000100	-0.000440	-1.42E-05
135	-17.395	-0.036892	1.173	-0.000168	-0.000440	-1.44E-05
136	-17.375	0.039093	-0.897068	0.000169	-0.000350	-1.53E-05
137	-17.375	0.022177	-0.504742	0.000101	-0.000350	-1.51E-05
138	-17.375	3.80E-06	0.020996	-9.56E-07	-0.000351	-1.52E-05
139	-17.375	-0.022170	0.547425	-0.000103	-0.000351	-1.51E-05
140	-17.376	-0.039086	0.940894	-0.000171	-0.000351	-1.53E-05
141	-17.354	0.040957	-0.666482	0.000168	-0.000261	-1.61E-05
142	-17.354	0.023182	-0.373674	9.95E-05	-0.000261	-1.59E-05
143	-17.354	3.86E-06	0.018654	-2.64E-06	-0.000262	-1.59E-05
144	-17.355	-0.023175	0.411593	-0.000105	-0.000262	-1.59E-05
145	-17.355	-0.040950	0.705414	-0.000173	-0.000262	-1.61E-05
146	-17.333	0.042412	-0.438312	0.000165	-0.000172	-1.68E-05
147	-17.333	0.023925	-0.245094	9.71E-05	-0.000173	-1.65E-05
148	-17.333	4.02E-06	0.014249	-4.09E-06	-0.000173	-1.65E-05
149	-17.333	-0.023918	0.273960	-0.000106	-0.000173	-1.65E-05
150	-17.333	-0.042404	0.467818	-0.000174	-0.000173	-1.68E-05
151	-17.310	0.043373	-0.214224	0.000161	-8.27E-05	-1.75E-05
152	-17.311	0.024344	-0.120932	9.27E-05	-8.46E-05	-1.69E-05
153	-17.311	4.36E-06	0.008257	-5.05E-06	-8.76E-05	-1.68E-05
154	-17.311	-0.024336	0.137259	-0.000103	-8.43E-05	-1.69E-05
155	-17.311	-0.043367	0.230291	-0.000173	-8.24E-05	-1.75E-05
156	-17.287	0.043724	-1.08E-96	0.000147	5.17E-06	-1.78E-05
157	-17.288	0.024489	-0.003766	8.75E-05	-2.01E-06	-1.69E-05
158	-17.289	4.64E-06	0.001411	-5.42E-06	-1.12E-05	-1.67E-05
159	-17.288	-0.024480	0.005559	-9.90E-05	-7.41E-07	-1.69E-05
160	-17.288	-0.043720	1.14E-96	-0.000160	6.93E-06	-1.78E-05
161	-17.278	0.043724	0.073702	0.000147	5.17E-06	-1.78E-05
162	-17.280	0.024489	0.039996	8.75E-05	-2.01E-06	-1.69E-05
163	-17.280	4.64E-06	-0.001299	-5.42E-06	-1.12E-05	-1.67E-05
164	-17.280	-0.024480	-0.043955	-9.90E-05	-7.41E-07	-1.69E-05
165	-17.279	-0.043720	-0.079930	-0.000160	6.93E-06	-1.78E-05
166	-1.12E-96	+0	1.77E-97	-0	-7.90E-99	+0
167	-1.12E-96	-0	1.77E-97	+0	-7.90E-99	-0
min:	-17.517	-0.043724	-2.275	-0.000174	-0.000885	-1.78E-05
max:	-1.12E-96	0.043724	2.358	0.000174	6.93E-06	1.78E-05

Loadcase Factor Stage Init.def Title
64 1.0000 TEMPERATURA (-)

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-7.09E-05	-1.795	-0.368725			
10	7.09E-05	-1.795	-0.368725			
156	-7.09E-05	1.795	-0.368725			
160	7.09E-05	1.795	-0.368725			
166	3.69E-12	-2.300	0.737449	15.841	-3.18E-11	-2.79E-10
167	5.11E-12	2.300	0.737449	-15.841	-2.18E-11	2.76E-10
Sums :	-2.06E-12	1.30E-11	-1.43E-12			
min:	-7.09E-05	-2.300	-0.368725	-15.841	-3.18E-11	-2.79E-10
max:	7.09E-05	2.300	0.737449	15.841	-2.18E-11	2.76E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000543	7.988	-0.011551	2.31E-05	-1.90E-06	4.69E-07
2	0.000455	7.989	-0.009281	2.25E-05	-1.41E-06	4.53E-07
3	1.22E-11	7.989	-0.007920	2.20E-05	8.16E-17	-1.57E-14
4	-0.000455	7.988	-0.009281	2.25E-05	1.41E-06	-4.53E-07
5	-0.000543	7.988	-0.011551	2.31E-05	1.90E-06	-4.69E-07
6	0.000306	7.806	3.69E-98	2.31E-05	-1.90E-06	4.69E-07
7	0.000233	7.807	0.001954	2.25E-05	-1.41E-06	4.53E-07
8	2.01E-11	7.807	0.003097	2.20E-05	8.16E-17	-1.57E-14
9	-0.000233	7.807	0.001954	2.25E-05	1.41E-06	-4.53E-07
10	-0.000306	7.806	3.69E-98	2.31E-05	1.90E-06	-4.69E-07
11	-4.98E-05	7.334	0.029677	2.23E-05	-9.09E-07	1.62E-07
12	-4.25E-05	7.335	0.030824	2.18E-05	-7.26E-07	1.61E-07
13	4.28E-11	7.335	0.031415	2.14E-05	-2.02E-15	-1.61E-14
14	4.25E-05	7.335	0.030824	2.18E-05	7.28E-07	-1.61E-07
15	4.98E-05	7.334	0.029677	2.23E-05	9.09E-07	-1.62E-07
16	-0.000111	6.862	0.057573	2.00E-05	-3.37E-07	3.98E-09
17	-8.04E-05	6.863	0.057927	1.97E-05	-2.81E-07	3.42E-08
18	6.53E-11	6.863	0.058152	1.95E-05	-1.93E-16	-1.51E-14
19	8.04E-05	6.863	0.057927	1.97E-05	2.81E-07	-3.42E-08
20	0.000111	6.862	0.057573	2.00E-05	3.37E-07	-3.98E-09
21	-7.19E-05	6.390	0.081346	1.64E-05	-1.04E-07	-2.97E-08
22	-5.23E-05	6.390	0.081455	1.63E-05	-8.74E-08	-4.99E-09
23	8.53E-11	6.390	0.081521	1.62E-05	3.16E-15	-1.27E-14
24	5.23E-05	6.390	0.081455	1.63E-05	8.74E-08	4.99E-09
25	7.19E-05	6.390	0.081346	1.64E-05	1.04E-07	2.97E-08
26	-3.15E-05	5.918	0.099578	1.15E-05	-3.87E-08	-2.13E-08
27	-2.36E-05	5.918	0.099619	1.15E-05	-3.30E-08	-9.58E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	1.02E-10	5.918	0.099641	1.14E-05	5.37E-15	-9.46E-15
29	2.36E-05	5.918	0.099619	1.15E-05	3.30E-08	9.58E-09
30	3.15E-05	5.918	0.099578	1.15E-05	3.87E-08	2.13E-08
31	-1.13E-05	5.446	0.110544	5.18E-06	-8.58E-08	-8.00E-09
32	-8.90E-06	5.446	0.110634	5.26E-06	-7.26E-08	-4.92E-09
33	1.13E-10	5.446	0.110686	5.32E-06	6.18E-15	-5.30E-15
34	8.90E-06	5.446	0.110634	5.26E-06	7.26E-08	4.92E-09
35	1.13E-05	5.446	0.110544	5.18E-06	8.58E-08	8.00E-09
36	-7.91E-06	4.974	0.112378	-2.58E-06	-3.21E-07	1.63E-09
37	-6.27E-06	4.974	0.112714	-2.30E-06	-2.65E-07	3.22E-10
38	1.19E-10	4.974	0.112916	-2.11E-06	6.15E-15	1.49E-16
39	6.27E-06	4.974	0.112714	-2.30E-06	2.65E-07	3.22E-10
40	7.91E-06	4.974	0.112378	-2.58E-06	3.21E-07	-1.63E-09
41	-1.55E-05	4.502	0.103041	-1.20E-05	-9.86E-07	6.95E-09
42	-1.18E-05	4.502	0.104070	-1.13E-05	-7.96E-07	1.00E-09
43	1.16E-10	4.502	0.104694	-1.08E-05	5.67E-15	8.11E-15
44	1.18E-05	4.502	0.104070	-1.13E-05	7.96E-07	-1.00E-09
45	1.55E-05	4.502	0.103041	-1.20E-05	9.86E-07	-6.95E-09
46	-2.73E-05	4.030	0.080449	-2.27E-05	-2.25E-06	3.65E-09
47	-2.19E-05	4.030	0.082845	-2.17E-05	-1.90E-06	-4.88E-09
48	9.92E-11	4.030	0.084503	-2.06E-05	5.04E-15	1.75E-14
49	2.19E-05	4.030	0.082845	-2.17E-05	1.90E-06	4.88E-09
50	2.73E-05	4.030	0.080449	-2.27E-05	2.25E-06	-3.65E-09
51	-2.73E-05	3.558	0.043644	-3.33E-05	-2.85E-06	-1.77E-08
52	-2.80E-05	3.558	0.046942	-3.38E-05	-3.08E-06	-2.91E-08
53	6.77E-11	3.558	0.050485	-3.24E-05	4.65E-15	2.56E-14
54	2.80E-05	3.558	0.046942	-3.38E-05	3.08E-06	2.91E-08
55	2.73E-05	3.558	0.043644	-3.33E-05	2.85E-06	1.77E-08
56	4.27E-06	3.086	-0.004522	-4.04E-05	-5.24E-07	-4.40E-08
57	6.92E-06	3.086	-0.003992	-4.32E-05	-3.70E-07	-1.16E-07
58	2.59E-11	3.085	-0.003765	-5.38E-05	4.58E-15	2.74E-14
59	-6.92E-06	3.086	-0.003992	-4.32E-05	3.70E-07	1.16E-07
60	-4.27E-06	3.086	-0.004522	-4.04E-05	5.24E-07	4.40E-08
61	2.91E-05	2.469	-0.071635	-3.75E-05	2.49E-06	-1.40E-08
62	2.58E-05	2.469	-0.074445	-3.76E-05	2.51E-06	-2.82E-08
63	-3.74E-11	2.468	-0.077164	-3.60E-05	4.57E-15	2.68E-14
64	-2.58E-05	2.469	-0.074445	-3.76E-05	-2.51E-06	2.82E-08
65	-2.91E-05	2.469	-0.071635	-3.75E-05	-2.49E-06	1.40E-08
66	2.03E-05	1.851	-0.128511	-2.85E-05	1.29E-06	4.56E-09
67	1.52E-05	1.851	-0.129860	-2.78E-05	1.04E-06	-2.92E-09
68	-8.62E-11	1.851	-0.130700	-2.72E-05	3.97E-15	2.11E-14
69	-1.52E-05	1.851	-0.129860	-2.78E-05	-1.04E-06	2.92E-09
70	-2.03E-05	1.851	-0.128511	-2.85E-05	-1.29E-06	-4.56E-09
71	7.40E-06	1.234	-0.168857	-1.88E-05	3.35E-07	4.55E-09
72	5.43E-06	1.234	-0.169207	-1.85E-05	2.74E-07	1.53E-09
73	-1.16E-10	1.234	-0.169417	-1.83E-05	3.44E-15	1.32E-14
74	-5.43E-06	1.234	-0.169207	-1.85E-05	-2.74E-07	-1.53E-09
75	-7.40E-06	1.234	-0.168857	-1.88E-05	-3.35E-07	-4.55E-09
76	1.38E-06	0.617123	-0.192743	-9.31E-06	6.16E-08	1.77E-09
77	1.07E-06	0.617124	-0.192807	-9.26E-06	5.23E-08	1.02E-09
78	-1.32E-10	0.617125	-0.192845	-9.22E-06	3.25E-15	6.28E-15
79	-1.07E-06	0.617124	-0.192807	-9.26E-06	-5.23E-08	-1.02E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-1.38E-06	0.617123	-0.192743	-9.31E-06	-6.16E-08	-1.77E-09
81	-4.32E-08	-5.58E-12	-0.200660	-3.02E-17	1.37E-08	1.18E-16
82	2.38E-08	-5.45E-12	-0.200674	-2.76E-17	1.20E-08	1.18E-16
83	-1.37E-10	-5.27E-12	-0.200681	-2.33E-17	3.22E-15	1.18E-16
84	-2.41E-08	-5.09E-12	-0.200674	-1.88E-17	-1.20E-08	1.18E-16
85	4.30E-08	-4.96E-12	-0.200660	-1.59E-17	-1.37E-08	1.18E-16
86	1.38E-06	-0.617123	-0.192743	9.31E-06	6.16E-08	-1.77E-09
87	1.07E-06	-0.617124	-0.192807	9.26E-06	5.23E-08	-1.02E-09
88	-1.32E-10	-0.617125	-0.192845	9.22E-06	3.24E-15	-6.04E-15
89	-1.07E-06	-0.617124	-0.192807	9.26E-06	-5.23E-08	1.02E-09
90	-1.38E-06	-0.617123	-0.192743	9.31E-06	-6.16E-08	1.77E-09
91	7.40E-06	-1.234	-0.168857	1.88E-05	3.35E-07	-4.55E-09
92	5.43E-06	-1.234	-0.169207	1.85E-05	2.74E-07	-1.53E-09
93	-1.17E-10	-1.234	-0.169417	1.83E-05	3.44E-15	-1.29E-14
94	-5.43E-06	-1.234	-0.169207	1.85E-05	-2.74E-07	1.53E-09
95	-7.40E-06	-1.234	-0.168857	1.88E-05	-3.35E-07	4.55E-09
96	2.03E-05	-1.851	-0.128511	2.85E-05	1.29E-06	-4.56E-09
97	1.52E-05	-1.851	-0.129860	2.78E-05	1.04E-06	2.92E-09
98	-8.74E-11	-1.851	-0.130700	2.72E-05	3.94E-15	-2.08E-14
99	-1.52E-05	-1.851	-0.129860	2.78E-05	-1.04E-06	-2.92E-09
100	-2.03E-05	-1.851	-0.128511	2.85E-05	-1.29E-06	4.56E-09
101	2.91E-05	-2.469	-0.071635	3.75E-05	2.49E-06	1.40E-08
102	2.58E-05	-2.469	-0.074445	3.76E-05	2.51E-06	2.82E-08
103	-3.90E-11	-2.468	-0.077164	3.60E-05	4.53E-15	-2.66E-14
104	-2.58E-05	-2.469	-0.074445	3.76E-05	-2.51E-06	-2.82E-08
105	-2.91E-05	-2.469	-0.071635	3.75E-05	-2.49E-06	-1.40E-08
106	4.27E-06	-3.086	-0.004522	4.04E-05	-5.24E-07	4.40E-08
107	6.92E-06	-3.086	-0.003765	4.32E-05	-3.70E-07	1.16E-07
108	2.39E-11	-3.085	-0.003765	5.38E-05	4.53E-15	-2.71E-14
109	-6.92E-06	-3.086	-0.003992	4.32E-05	3.70E-07	-1.16E-07
110	-4.27E-06	-3.086	-0.004522	4.04E-05	5.24E-07	-4.40E-08
111	-2.73E-05	-3.558	0.043644	3.33E-05	-2.65E-06	1.77E-08
112	-2.80E-05	-3.558	0.046942	3.38E-05	-3.08E-06	2.91E-08
113	6.53E-11	-3.558	0.050485	3.24E-05	4.60E-15	-2.53E-14
114	2.80E-05	-3.558	0.046942	3.38E-05	3.08E-06	-2.91E-08
115	2.73E-05	-3.558	0.043644	3.33E-05	2.85E-06	-1.77E-08
116	-2.73E-05	-4.030	0.080449	2.27E-05	-2.25E-06	-3.65E-09
117	-2.19E-05	-4.030	0.082845	2.17E-05	-1.90E-06	4.88E-09
118	9.66E-11	-4.030	0.084503	2.06E-05	5.00E-15	-1.72E-14
119	2.19E-05	-4.030	0.082845	2.17E-05	1.90E-06	-4.88E-09
120	2.73E-05	-4.030	0.080449	2.27E-05	2.25E-06	3.65E-09
121	-1.55E-05	-4.502	0.103041	1.20E-05	9.86E-07	-6.95E-09
122	-1.18E-05	-4.502	0.104070	1.13E-05	-7.96E-07	-1.00E-09
123	1.13E-10	-4.502	0.104694	1.08E-05	5.64E-15	-7.86E-15
124	1.18E-05	-4.502	0.104070	1.13E-05	7.96E-07	1.00E-09
125	1.55E-05	-4.502	0.103041	1.20E-05	9.86E-07	6.95E-09
126	-7.91E-06	-4.974	0.112378	2.58E-06	-3.21E-07	-1.63E-09
127	-6.27E-06	-4.974	0.112714	2.30E-06	-2.65E-07	3.22E-10
128	1.16E-10	-4.974	0.112916	2.11E-06	6.11E-15	-9.80E-17
129	6.27E-06	-4.974	0.112714	2.30E-06	2.65E-07	-3.22E-10
130	7.91E-06	-4.974	0.112378	2.58E-06	3.21E-07	1.63E-09
131	-1.13E-05	-5.446	0.110544	-5.18E-06	-8.58E-08	8.00E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-8.90E-06	-5.446	0.110634	-5.26E-06	-7.26E-08	4.92E-09
133	1.10E-10	-5.446	0.110686	-5.32E-06	6.15E-15	5.55E-15
134	8.90E-06	-5.446	0.110634	-5.26E-06	7.26E-08	-4.92E-09
135	1.13E-05	-5.446	0.110544	-5.18E-06	8.58E-08	-8.00E-09
136	-3.15E-05	-5.918	0.099578	-1.15E-05	-3.87E-08	2.13E-08
137	-2.36E-05	-5.918	0.099619	-1.15E-05	-3.30E-08	9.58E-09
138	9.77E-11	-5.918	0.099641	-1.14E-05	5.35E-15	9.71E-15
139	2.36E-05	-5.918	0.099619	-1.15E-05	3.30E-08	-9.58E-09
140	3.15E-05	-5.918	0.099578	-1.15E-05	3.87E-08	-2.13E-08
141	-7.19E-05	-6.390	0.081346	-1.64E-05	-1.04E-07	2.97E-08
142	-5.23E-05	-6.390	0.081455	-1.63E-05	-8.74E-08	4.99E-09
143	8.10E-11	-6.390	0.081521	-1.62E-05	3.14E-15	1.29E-14
144	5.23E-05	-6.390	0.081455	-1.63E-05	8.74E-08	-4.99E-09
145	7.19E-05	-6.390	0.081346	-1.64E-05	1.04E-07	-2.97E-08
146	-0.000111	-6.862	0.057573	-2.00E-05	-3.37E-07	-3.98E-09
147	-8.04E-05	-6.863	0.057927	-1.97E-05	-2.81E-07	3.42E-08
148	6.06E-11	-6.863	0.058152	-1.95E-05	-2.04E-16	1.54E-14
149	8.04E-05	-6.863	0.057927	-1.97E-05	2.81E-07	3.42E-08
150	0.000111	-6.862	0.057573	-2.00E-05	3.37E-07	3.98E-09
151	-4.98E-05	-7.334	0.029877	-2.23E-05	-9.09E-07	-1.62E-07
152	-4.25E-05	-7.335	0.030824	-2.18E-05	-7.28E-07	-1.61E-07
153	3.78E-11	-7.335	0.031415	-2.14E-05	-2.03E-15	1.64E-14
154	4.25E-05	-7.335	0.030824	-2.18E-05	7.28E-07	1.61E-07
155	4.98E-05	-7.334	0.029877	-2.23E-05	9.09E-07	1.62E-07
156	0.000308	-7.806	3.69E-98	-2.31E-05	-1.90E-06	-4.69E-07
157	0.000233	-7.807	0.001954	-2.25E-05	-1.41E-06	-4.53E-07
158	1.48E-11	-7.807	0.003097	-2.20E-05	8.08E-17	1.60E-14
159	-0.000233	-7.807	0.001954	-2.25E-05	1.41E-06	4.53E-07
160	-0.000308	-7.806	3.69E-98	-2.31E-05	1.90E-06	4.69E-07
161	0.000545	-7.988	-0.011551	-2.31E-05	-1.90E-06	-4.69E-07
162	0.000459	-7.989	-0.009281	-2.25E-05	-1.41E-06	-4.53E-07
163	6.80E-12	-7.989	-0.007920	-2.20E-05	8.08E-17	1.60E-14
164	-0.000459	-7.989	-0.009281	-2.25E-05	1.41E-06	4.53E-07
165	-0.000543	-7.988	-0.011551	-2.31E-05	1.90E-06	4.69E-07
166	-0	2.30E-97	-7.37E-98	-1.58E-99	+0	+0
167	-0	-2.30E-97	-7.37E-98	1.58E-99	+0	-0
min:	-0.000543	-7.989	-0.200681	-5.38E-05	-3.08E-06	-4.69E-07
max:	0.000543	7.989	0.112916	5.38E-05	3.08E-06	4.69E-07

Loadcase 65 — Factor 1.0000 — Stage — Init.def — Title: TEMPERATURA (+)

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	7.09E-05	1.795	0.368725			
10	-7.09E-05	1.795	0.368725			
156	7.09E-05	-1.795	0.368725			
160	-7.09E-05	-1.795	0.368725			
166	-3.69E-12	2.300	-0.737449	-15.841	3.18E-11	2.79E-10
167	-5.11E-12	-2.300	-0.737449	15.841	2.18E-11	-2.76E-10
Sums :	2.06E-12	-1.30E-11	1.43E-12			
min:	-7.09E-05	-2.300	-0.737449	-15.841	2.18E-11	-2.76E-10
max:	7.09E-05	2.300	0.368725	15.841	3.18E-11	2.79E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-0.000542	-7.988	0.011551	-2.31E-05	1.90E-06	-4.69E-07
2	-0.000459	-7.989	0.009281	-2.25E-05	1.41E-06	-4.53E-07
3	-1.22E-11	-7.989	0.007920	-2.20E-05	-8.16E-17	1.57E-14
4	0.000459	-7.989	0.009281	-2.25E-05	-1.41E-06	4.53E-07
5	0.000543	-7.988	0.011551	-2.31E-05	-1.90E-06	4.69E-07
6	-0.00030E	-7.806	-3.69E-98	-2.31E-05	1.90E-06	-4.69E-07
7	-0.000233	-7.807	-0.001954	-2.25E-05	1.41E-06	-4.53E-07
8	-2.01E-11	-7.807	-0.003097	-2.20E-05	-8.16E-17	1.57E-14
9	0.000233	-7.807	-0.001954	-2.25E-05	-1.41E-06	4.53E-07
10	0.000308	-7.806	-3.69E-98	-2.31E-05	-1.90E-06	4.69E-07
11	4.98E-05	-7.334	-0.029877	-2.23E-05	9.09E-07	-1.62E-07
12	4.25E-05	-7.335	-0.030824	-2.18E-05	7.28E-07	-1.61E-07
13	-4.28E-11	-7.335	-0.031415	-2.14E-05	2.02E-15	1.61E-14
14	-4.25E-05	-7.335	-0.030824	-2.18E-05	-7.28E-07	1.61E-07
15	-4.98E-05	-7.334	-0.029877	-2.23E-05	-9.09E-07	1.62E-07
16	0.000111	-6.862	-0.057573	-2.00E-05	3.37E-07	-3.98E-09
17	8.04E-05	-6.863	-0.057927	-1.97E-05	2.81E-07	-3.42E-08
18	-6.53E-11	-6.863	-0.058152	-1.95E-05	1.93E-16	1.51E-14
19	-8.04E-05	-6.863	-0.057927	-1.97E-05	-2.81E-07	3.42E-08
20	-0.000111	-6.862	-0.057573	-2.00E-05	-3.37E-07	3.98E-09
21	7.19E-05	-6.390	-0.081346	-1.64E-05	1.04E-07	2.97E-08
22	5.23E-05	-6.390	-0.081455	-1.63E-05	8.74E-08	4.99E-09
23	-8.53E-11	-6.390	-0.081521	-1.62E-05	-3.16E-15	1.27E-14
24	-5.23E-05	-6.390	-0.081455	-1.63E-05	-8.74E-08	-4.99E-09
25	-7.19E-05	-6.390	-0.081346	-1.64E-05	-1.04E-07	-2.97E-08
26	3.15E-05	-5.918	-0.099578	-1.15E-05	3.87E-08	2.13E-08
27	2.36E-05	-5.918	-0.099619	-1.15E-05	3.30E-08	9.58E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-1.02E-10	-5.918	-0.099641	-1.14E-05	-5.37E-15	9.46E-15
29	-2.36E-05	-5.918	-0.099619	-1.15E-05	-3.30E-08	-9.58E-09
30	-3.15E-05	-5.918	-0.099578	-1.15E-05	-3.87E-08	-2.13E-08
31	1.13E-05	-5.446	-0.110544	-5.18E-06	8.58E-08	8.00E-09
32	8.90E-06	-5.446	-0.110634	-5.26E-06	7.26E-08	4.92E-09
33	-1.13E-10	-5.446	-0.110686	-5.32E-06	-6.18E-15	-5.55E-15
34	-8.90E-06	-5.446	-0.110634	-5.26E-06	-7.26E-08	-4.92E-09
35	-1.13E-05	-5.446	-0.110544	-5.18E-06	-8.58E-08	-8.00E-09
36	7.91E-06	-4.974	-0.112378	2.58E-06	3.21E-07	-1.63E-09
37	6.27E-06	-4.974	-0.112714	2.30E-06	2.65E-07	3.22E-10
38	-1.19E-10	-4.974	-0.112916	2.11E-06	-6.15E-15	-3.49E-16
39	-6.27E-06	-4.974	-0.112714	2.30E-06	-2.65E-07	-3.22E-10
40	-7.91E-06	-4.974	-0.112378	2.58E-06	-3.21E-07	1.63E-09
41	1.55E-05	-4.502	-0.103041	1.20E-05	9.86E-07	-6.95E-09
42	1.18E-05	-4.502	-0.104070	1.13E-05	7.96E-07	-1.00E-09
43	-1.16E-10	-4.502	-0.104694	1.08E-05	-5.67E-15	-8.11E-15
44	-1.18E-05	-4.502	-0.104070	1.13E-05	-7.96E-07	1.00E-09
45	-1.55E-05	-4.502	-0.103041	1.20E-05	-9.86E-07	6.95E-09
46	2.73E-05	-4.030	-0.080449	2.27E-05	2.25E-06	-3.65E-09
47	2.19E-05	-4.030	-0.082845	2.17E-05	1.90E-06	4.88E-09
48	-9.92E-11	-4.030	-0.084503	2.06E-05	-5.04E-15	-1.75E-14
49	-2.19E-05	-4.030	-0.082845	2.17E-05	-1.90E-06	-4.88E-09
50	-2.73E-05	-4.030	-0.080449	2.27E-05	-2.25E-06	3.65E-09
51	2.73E-05	-3.558	-0.043644	3.33E-05	2.85E-06	1.77E-08
52	2.80E-05	-3.558	-0.046942	3.38E-05	3.08E-06	2.91E-08
53	-6.77E-11	-3.558	-0.050485	3.24E-05	-4.65E-15	-2.56E-14
54	-2.80E-05	-3.558	-0.046942	3.38E-05	-3.08E-06	-2.91E-08
55	-2.73E-05	-3.558	-0.043644	3.33E-05	-2.85E-06	-1.77E-08
56	-4.27E-06	-3.086	0.004522	4.04E-05	5.24E-07	4.40E-08
57	-6.92E-06	-3.086	0.003992	4.32E-05	3.70E-07	1.16E-07
58	-2.59E-11	-3.085	0.003765	5.38E-05	-4.58E-15	-2.74E-14
59	6.92E-06	-3.086	0.003992	4.32E-05	-3.70E-07	-1.16E-07
60	4.27E-06	-3.086	0.004522	4.04E-05	-5.24E-07	-4.40E-08
61	-2.91E-05	-2.469	0.071635	3.75E-05	-2.49E-06	1.40E-08
62	-2.58E-05	-2.469	0.074445	3.76E-05	-2.51E-06	2.82E-08
63	3.74E-11	-2.468	0.077164	3.60E-05	-4.57E-15	-2.68E-14
64	2.58E-05	-2.469	0.074445	3.76E-05	2.51E-06	-2.82E-08
65	2.91E-05	-2.469	0.071635	3.75E-05	2.49E-06	-1.40E-08
66	-2.03E-05	-1.851	0.128511	2.85E-05	-1.29E-06	-4.56E-09
67	-1.52E-05	-1.851	0.129860	2.78E-05	-1.04E-06	2.92E-09
68	8.62E-11	-1.851	0.130700	2.72E-05	-3.97E-15	-2.11E-14
69	1.52E-05	-1.851	0.129860	2.78E-05	1.04E-06	-2.92E-09
70	2.03E-05	-1.851	0.128511	2.85E-05	1.29E-06	4.56E-09
71	-7.40E-06	-1.234	0.168857	1.88E-05	-3.35E-07	-4.55E-09
72	-5.43E-06	-1.234	0.169207	1.85E-05	-2.74E-07	-1.53E-09
73	1.16E-10	-1.234	0.169417	1.83E-05	-3.44E-15	-1.32E-14
74	5.43E-06	-1.234	0.169207	1.85E-05	2.74E-07	1.53E-09
75	7.40E-06	-1.234	0.168857	1.88E-05	3.35E-07	4.55E-09
76	-1.38E-06	-0.617123	0.192743	9.31E-06	-6.16E-08	-1.77E-09
77	-1.07E-06	-0.617124	0.192807	9.26E-06	-5.23E-08	-1.02E-09
78	1.32E-10	-0.617125	0.192845	9.22E-06	-3.25E-15	-6.28E-15
79	1.07E-06	-0.617124	0.192807	9.26E-06	5.23E-08	1.02E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	1.38E-06	-0.617123	0.192743	9.31E-06	6.16E-08	1.77E-09
81	4.32E-08	5.58E-12	0.200660	3.02E-17	-1.37E-08	-1.18E-16
82	-2.38E-08	5.45E-12	0.200674	2.76E-17	-1.20E-08	-1.18E-16
83	1.37E-10	5.27E-12	0.200681	2.33E-17	-3.22E-15	-1.18E-16
84	2.41E-08	5.09E-12	0.200674	1.88E-17	1.20E-08	-1.18E-16
85	-4.30E-08	4.96E-12	0.200660	1.59E-17	1.37E-08	-1.18E-16
86	-1.38E-06	0.617123	0.192743	-9.31E-06	-6.16E-08	1.77E-09
87	-1.07E-06	0.617124	0.192807	-9.26E-06	-5.23E-08	1.02E-09
88	1.32E-10	0.617125	0.192845	-9.22E-06	-3.24E-15	6.04E-15
89	1.07E-06	0.617124	0.192807	-9.26E-06	5.23E-08	-1.02E-09
90	1.38E-06	0.617123	0.192743	-9.31E-06	6.16E-08	-1.77E-09
91	-7.40E-06	1.234	0.168857	-1.88E-05	-3.35E-07	4.55E-09
92	-5.43E-06	1.234	0.169207	-1.85E-05	-2.74E-07	1.53E-09
93	1.17E-10	1.234	0.169417	-1.83E-05	-3.42E-15	1.29E-14
94	5.43E-06	1.234	0.169207	-1.85E-05	2.74E-07	-1.53E-09
95	7.40E-06	1.234	0.168857	-1.88E-05	3.35E-07	-4.55E-09
96	-2.03E-05	1.851	0.128511	-2.85E-05	-1.29E-06	4.56E-09
97	-1.52E-05	1.851	0.129860	-2.78E-05	-1.04E-06	2.92E-09
98	8.74E-11	1.851	0.130700	-2.72E-05	-3.94E-15	2.08E-14
99	1.52E-05	1.851	0.129860	-2.78E-05	1.04E-06	-2.92E-09
100	2.03E-05	1.851	0.128511	-2.85E-05	1.29E-06	-4.56E-09
101	-2.91E-05	2.469	0.071635	-3.75E-05	-2.49E-06	-1.40E-08
102	-2.58E-05	2.469	0.074445	-3.76E-05	-2.51E-06	-2.82E-08
103	3.90E-11	2.468	0.077164	-3.60E-05	-4.53E-15	2.66E-14
104	2.58E-05	2.469	0.074445	-3.76E-05	2.51E-06	2.82E-08
105	2.91E-05	2.469	0.071635	-3.75E-05	2.49E-06	1.40E-08
106	-4.27E-06	3.086	0.004522	-4.04E-05	5.24E-07	-4.40E-08
107	-6.92E-06	3.086	0.003992	-4.32E-05	3.70E-07	-1.16E-07
108	-2.39E-11	3.085	0.003765	-5.38E-05	-4.53E-15	2.71E-14
109	6.92E-06	3.086	0.003992	-4.32E-05	-3.70E-07	1.16E-07
110	4.27E-06	3.086	0.004522	-4.04E-05	-5.24E-07	4.40E-08
111	2.73E-05	3.558	-0.043644	-3.33E-05	2.85E-06	-1.77E-08
112	2.80E-05	3.558	-0.046942	-3.38E-05	3.08E-06	-2.91E-08
113	-6.53E-11	3.558	-0.050485	-3.24E-05	4.60E-15	2.53E-14
114	-2.80E-05	3.558	-0.046942	-3.38E-05	-3.08E-06	2.91E-08
115	-2.73E-05	3.558	-0.043644	-3.33E-05	-2.85E-06	1.77E-08
116	2.73E-05	4.030	-0.080449	-2.27E-05	2.25E-06	3.65E-09
117	2.19E-05	4.030	-0.082845	-2.17E-05	1.90E-06	-4.88E-09
118	-9.66E-11	4.030	-0.084503	-2.06E-05	-5.00E-15	1.72E-14
119	-2.19E-05	4.030	-0.082845	-2.17E-05	-1.90E-06	4.88E-09
120	-2.73E-05	4.030	-0.080449	-2.27E-05	-2.25E-06	-3.65E-09
121	1.55E-05	4.502	-0.103041	-1.20E-05	9.86E-07	6.95E-09
122	1.18E-05	4.502	-0.104070	-1.13E-05	7.96E-07	1.00E-09
123	-1.13E-10	4.502	-0.104694	-1.08E-05	-5.64E-15	7.86E-15
124	-1.18E-05	4.502	-0.104070	-1.13E-05	-7.96E-07	-1.00E-09
125	-1.55E-05	4.502	-0.103041	-1.20E-05	-9.86E-07	-6.95E-09
126	7.91E-06	4.974	-0.112378	-2.58E-06	3.21E-07	1.63E-09
127	6.27E-06	4.974	-0.112714	-2.30E-06	2.65E-07	-3.22E-10
128	-1.16E-10	4.974	-0.112916	-2.11E-06	-6.11E-15	9.80E-17
129	-6.27E-06	4.974	-0.112714	-2.30E-06	-2.65E-07	3.22E-10
130	-7.91E-06	4.974	-0.112378	-2.58E-06	-3.21E-07	1.63E-09
131	1.13E-05	5.446	-0.110544	5.18E-06	8.58E-08	-8.00E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	8.90E-06	5.446	-0.110634	5.26E-06	7.26E-08	-4.92E-09
133	-1.10E-10	5.446	-0.110686	5.32E-06	-6.15E-15	-5.55E-15
134	-8.90E-06	5.446	-0.110634	5.26E-06	-7.26E-08	4.92E-09
135	-1.13E-05	5.446	-0.110544	5.18E-06	-8.58E-08	8.00E-09
136	3.15E-05	5.918	-0.099578	1.15E-05	3.87E-08	-2.13E-08
137	2.36E-05	5.918	-0.099619	1.15E-05	3.30E-08	-9.58E-09
138	-9.77E-11	5.918	-0.099641	1.14E-05	-5.35E-15	-9.71E-15
139	-2.36E-05	5.918	-0.099619	1.15E-05	-3.30E-08	9.58E-09
140	-3.15E-05	5.918	-0.099578	1.15E-05	-3.87E-08	2.13E-08
141	7.19E-05	6.390	-0.081346	1.64E-05	1.04E-07	-2.97E-08
142	5.23E-05	6.390	-0.081455	1.63E-05	8.74E-08	-4.99E-09
143	-8.10E-11	6.390	-0.081521	1.62E-05	-3.14E-15	-1.29E-14
144	-5.23E-05	6.390	-0.081455	1.63E-05	-8.74E-08	4.99E-09
145	-7.19E-05	6.390	-0.081346	1.64E-05	-1.04E-07	2.97E-08
146	0.000111	6.862	-0.057573	2.00E-05	3.37E-07	3.98E-09
147	8.04E-05	6.863	-0.057927	1.97E-05	2.81E-07	3.42E-08
148	-6.06E-11	6.863	-0.058152	1.95E-05	2.04E-16	-1.54E-14
149	-8.04E-05	6.863	-0.057927	1.97E-05	-2.81E-07	-3.42E-08
150	-0.000111	6.862	-0.057573	2.00E-05	-3.37E-07	-3.98E-09
151	4.98E-05	7.334	-0.029877	2.23E-05	9.09E-07	1.62E-07
152	4.25E-05	7.335	-0.030824	2.18E-05	7.28E-07	1.61E-07
153	-3.78E-11	7.335	-0.031415	2.14E-05	2.03E-15	-1.64E-14
154	-4.25E-05	7.335	-0.030824	2.18E-05	-7.28E-07	-1.61E-07
155	-4.98E-05	7.334	-0.029877	2.23E-05	-9.09E-07	-1.62E-07
156	-0.000308	7.806	-3.69E-98	2.31E-05	1.90E-06	4.69E-07
157	-0.000233	7.807	-0.001954	2.25E-05	1.41E-06	4.53E-07
158	-1.48E-11	7.807	-0.003097	2.20E-05	-8.08E-17	-1.60E-14
159	0.000233	7.807	-0.001954	2.25E-05	-1.41E-06	-4.53E-07
160	0.000308	7.806	-3.69E-98	2.31E-05	-1.90E-06	-4.69E-07
161	-0.000545	7.988	0.011551	2.31E-05	1.90E-06	4.69E-07
162	-0.000459	7.989	0.009281	2.25E-05	1.41E-06	4.53E-07
163	-6.80E-12	7.989	0.007920	2.20E-05	-8.08E-17	-1.60E-14
164	0.000459	7.989	0.009281	2.25E-05	-1.41E-06	-4.53E-07
165	0.000543	7.988	0.011551	2.31E-05	-1.90E-06	-4.69E-07
166	+0	-2.30E-97	7.37E-98	1.58E-99	-0	-0
167	+0	2.30E-97	7.37E-98	-1.58E-99	-0	+0
min:	-0.000543	-7.989	-0.112916	-5.38E-05	-3.08E-06	-4.69E-07
max:	0.000543	7.989	0.200681	5.38E-05	3.08E-06	4.69E-07

Loadcase Factor Stage Init.def Title
66 1.0000 GRADIENTE

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-0.001262	0.001005	7.143			
10	0.001262	0.001005	7.143			
156	-0.001262	-0.001005	7.143			
160	0.001262	-0.001005	7.143			
166	8.72E-09	1.119	-14.286	-4.921	4.38E-08	-1.08E-08
167	8.72E-09	-1.119	-14.286	4.921	4.38E-08	1.08E-08
Sums :	-2.51E-12	1.24E-14	-8.01E-12			
min:	-0.001262	-1.119	-14.286	-4.921	4.38E-08	-1.08E-08
max:	0.001262	1.119	7.143	4.921	4.38E-08	1.08E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.014881	-0.004368	-0.348553	0.000739	3.71E-05	2.47E-05
2	0.003935	0.002525	-0.393333	0.000753	2.76E-05	2.25E-06
3	1.98E-08	0.003102	-0.419966	0.000762	1.63E-13	1.92E-12
4	-0.003935	0.002525	-0.393333	0.000753	-2.76E-05	-2.25E-06
5	-0.014881	-0.004368	-0.348553	0.000739	-3.71E-05	-2.47E-05
6	0.005487	-0.004368	-7.14E-97	0.000655	3.71E-05	1.29E-05
7	0.002811	0.002525	-0.038120	0.000668	2.76E-05	2.25E-06
8	1.88E-08	0.003102	-0.060421	0.000677	1.63E-13	1.92E-12
9	-0.002811	0.002525	-0.038120	0.000668	-2.76E-05	-2.25E-06
10	-0.005487	-0.004368	-7.14E-97	0.000655	-3.71E-05	-1.29E-05
11	-0.001962	-0.001357	0.711610	0.000450	1.75E-05	1.42E-06
12	-0.000546	0.000966	0.693319	0.000461	1.41E-05	1.79E-06
13	1.63E-08	0.002190	0.681895	0.000468	9.18E-13	1.93E-12
14	0.000546	0.000966	0.693319	0.000461	-1.41E-05	-1.79E-06
15	0.001962	-0.001357	0.711610	0.000450	-1.75E-05	-1.42E-06
16	-0.001782	0.000280	1.179	0.000275	6.49E-06	-5.63E-07
17	-0.001114	0.000509	1.172	0.000280	5.42E-06	1.80E-07
18	1.38E-08	0.001145	1.168	0.000284	1.44E-12	1.91E-12
19	0.001114	0.000509	1.172	0.000280	-5.42E-06	-1.80E-07
20	0.001782	0.000280	1.179	0.000275	-6.49E-06	5.63E-07
21	-0.000845	0.000754	1.436	0.000124	1.99E-06	-5.39E-07
22	-0.000613	0.000502	1.434	0.000126	1.67E-06	-2.16E-07
23	1.13E-08	0.000666	1.432	0.000128	1.65E-12	1.86E-12
24	0.000613	0.000502	1.434	0.000126	-1.67E-06	2.16E-07
25	0.000845	0.000754	1.436	0.000124	-1.99E-06	5.39E-07
26	-0.000276	0.000777	1.513	-1.54E-06	4.76E-07	-2.75E-07
27	-0.000212	0.000565	1.512	-1.02E-06	4.03E-07	-1.65E-07

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	8.87E-09	0.000553	1.512	-6.65E-07	1.68E-12	1.80E-12
29	0.000212	0.000565	1.512	-1.02E-06	-4.03E-07	1.65E-07
30	0.000276	0.000777	1.513	-1.54E-06	-4.76E-07	2.75E-07
31	-4.29E-05	0.000709	1.443	-0.000102	1.61E-07	-9.84E-08
32	-3.75E-05	0.000606	1.443	-0.000102	1.39E-07	-7.46E-08
33	6.54E-09	0.000566	1.443	-0.000102	1.63E-12	1.73E-12
34	3.75E-05	0.000606	1.443	-0.000102	-1.39E-07	7.46E-08
35	4.29E-05	0.000709	1.443	-0.000102	-1.61E-07	9.84E-08
36	2.15E-05	0.000657	1.260	-0.000175	4.79E-07	-2.19E-08
37	1.33E-05	0.000622	1.259	-0.000176	4.00E-07	-2.38E-08
38	4.31E-09	0.000596	1.259	-0.000176	1.54E-12	1.63E-12
39	-1.33E-05	0.000622	1.259	-0.000176	-4.00E-07	2.38E-08
40	-2.15E-05	0.000657	1.260	-0.000175	-4.79E-07	2.19E-08
41	2.84E-05	0.000631	0.998538	-0.000222	1.70E-06	3.12E-11
42	2.03E-05	0.000625	0.996761	-0.000223	1.39E-06	-3.68E-09
43	2.22E-09	0.000618	0.995693	-0.000224	1.44E-12	1.52E-12
44	-2.03E-05	0.000625	0.996761	-0.000223	-1.39E-06	3.68E-09
45	-2.84E-05	0.000631	0.998538	-0.000222	-1.70E-06	-2.81E-11
46	2.46E-05	0.000616	0.694735	-0.000241	4.56E-06	4.42E-09
47	1.89E-05	0.000623	0.689920	-0.000244	3.78E-06	4.38E-09
48	2.99E-10	0.000634	0.686792	-0.000246	1.34E-12	1.39E-12
49	-1.89E-05	0.000623	0.689920	-0.000244	-3.78E-06	-4.38E-09
50	-2.46E-05	0.000616	0.694735	-0.000241	-4.56E-06	-4.42E-09
51	1.73E-05	0.000596	0.383001	-0.000235	8.45E-06	1.24E-08
52	1.67E-05	0.000619	0.373760	-0.000238	7.80E-06	1.61E-08
53	-1.43E-09	0.000660	0.366175	-0.000242	1.24E-12	1.23E-12
54	-1.67E-05	0.000619	0.373760	-0.000238	-7.80E-06	-1.61E-08
55	-1.73E-05	0.000596	0.383001	-0.000235	-8.45E-06	-1.24E-08
56	-1.39E-06	0.000557	0.092200	-0.000210	9.13E-06	2.28E-08
57	-2.74E-06	0.000607	0.082040	-0.000208	8.88E-06	5.72E-08
58	-2.95E-09	0.000717	0.072945	-0.000201	1.12E-12	1.06E-12
59	2.74E-06	0.000607	0.082040	-0.000208	-8.88E-06	-5.72E-08
60	1.38E-06	0.000557	0.092200	-0.000210	-9.13E-06	-2.28E-08
61	-1.45E-05	0.000481	-0.230820	-0.000168	3.65E-06	6.91E-09
62	-1.27E-05	0.000496	-0.234622	-0.000165	2.91E-06	1.39E-08
63	-4.59E-09	0.000522	-0.236859	-0.000163	1.12E-12	8.51E-13
64	1.27E-05	0.000496	-0.234622	-0.000165	-2.91E-06	-1.39E-08
65	1.45E-05	0.000481	-0.230820	-0.000168	-3.65E-06	-6.91E-09
66	-1.01E-05	0.000372	-0.479242	-0.000124	8.04E-07	-2.33E-09
67	-7.54E-06	0.000373	-0.480081	-0.000124	6.63E-07	1.42E-09
68	-5.85E-09	0.000379	-0.480575	-0.000123	1.12E-12	6.34E-13
69	7.53E-06	0.000373	-0.480081	-0.000124	-6.63E-07	-1.42E-09
70	1.01E-05	0.000372	-0.479242	-0.000124	-8.04E-07	2.33E-09
71	-3.66E-06	0.000250	-0.655278	-8.26E-05	1.22E-07	-2.27E-09
72	-2.69E-06	0.000249	-0.655407	-8.25E-05	1.05E-07	-7.75E-10
73	-6.75E-09	0.000250	-0.655481	-8.24E-05	1.11E-12	4.21E-13
74	2.68E-06	0.000249	-0.655407	-8.25E-05	-1.05E-07	7.76E-10
75	3.65E-06	0.000250	-0.655278	-8.26E-05	-1.22E-07	2.28E-09
76	-6.79E-07	0.000125	-0.760597	-4.13E-05	4.15E-09	-8.77E-10
77	-5.28E-07	0.000125	-0.760601	-4.13E-05	4.35E-09	-5.08E-10
78	-7.28E-09	0.000124	-0.760602	-4.12E-05	1.11E-12	2.10E-13
79	5.13E-07	0.000125	-0.760601	-4.13E-05	-4.34E-09	5.09E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	6.65E-07	0.000125	-0.760597	-4.13E-05	-4.15E-09	8.78E-10
81	2.49E-08	4.31E-14	-0.795675	-3.82E-18	-8.51E-09	-6.74E-17
82	-1.19E-08	-3.24E-14	-0.795666	-4.69E-18	-6.71E-09	-6.74E-17
83	-7.46E-09	-1.33E-13	-0.795659	-6.19E-18	1.11E-12	-6.74E-17
84	-3.05E-09	-2.35E-13	-0.795666	-7.21E-18	6.71E-09	-6.74E-17
85	-3.98E-08	-3.10E-13	-0.795675	-6.76E-18	8.51E-09	-6.74E-17
86	-6.79E-07	-0.000125	-0.760597	4.13E-05	4.15E-09	8.77E-10
87	-5.28E-07	-0.000125	-0.760601	4.13E-05	4.35E-09	5.08E-10
88	-7.28E-09	-0.000124	-0.760602	4.12E-05	1.11E-12	-2.11E-13
89	5.13E-07	-0.000125	-0.760601	4.13E-05	-4.34E-09	-5.09E-10
90	6.65E-07	-0.000125	-0.760597	4.13E-05	-4.15E-09	-8.78E-10
91	-3.66E-06	-0.000250	-0.655278	8.26E-05	1.22E-07	2.27E-09
92	-2.69E-06	-0.000249	-0.655407	8.25E-05	1.05E-07	7.75E-10
93	-6.75E-09	-0.000250	-0.655481	8.24E-05	1.11E-12	-4.21E-13
94	2.68E-06	-0.000249	-0.655407	8.25E-05	-1.05E-07	-7.76E-10
95	3.65E-06	-0.000250	-0.655278	8.26E-05	-1.22E-07	-2.28E-09
96	-1.01E-05	-0.000372	-0.479242	0.000124	8.04E-07	2.33E-09
97	-7.54E-06	-0.000373	-0.480081	0.000124	6.63E-07	-1.42E-09
98	-5.85E-09	-0.000379	-0.480575	0.000123	1.12E-12	-6.34E-13
99	7.53E-06	-0.000373	-0.480081	0.000124	-6.63E-07	1.42E-09
100	1.01E-05	-0.000372	-0.479242	0.000124	-8.04E-07	-2.33E-09
101	-1.45E-05	-0.000481	-0.230820	0.000168	3.65E-06	-6.91E-09
102	-1.27E-05	-0.000496	-0.234622	0.000165	2.91E-06	-1.39E-08
103	-4.59E-09	-0.000522	-0.236859	0.000163	1.12E-12	-8.51E-13
104	1.27E-05	-0.000496	-0.234622	0.000165	-2.91E-06	1.39E-08
105	1.45E-05	-0.000481	-0.230820	0.000168	-3.65E-06	6.91E-09
106	-1.39E-06	-0.000557	0.092200	0.000210	9.13E-06	2.28E-08
107	-2.74E-06	-0.000607	0.082040	0.000208	8.88E-06	-5.72E-08
108	-2.95E-09	-0.000717	0.072945	0.000201	1.12E-12	-1.06E-12
109	2.74E-06	-0.000607	0.082040	0.000208	-8.88E-06	5.72E-08
110	1.38E-06	-0.000557	0.092200	0.000210	-9.13E-06	2.28E-08
111	1.73E-05	-0.000596	0.383001	0.000235	8.45E-06	-1.24E-08
112	1.67E-05	-0.000619	0.373760	0.000238	7.80E-06	-1.61E-08
113	-1.43E-09	-0.000660	0.366175	0.000242	1.24E-12	-1.23E-12
114	-1.67E-05	-0.000619	0.373760	0.000238	-7.80E-06	1.61E-08
115	-1.73E-05	-0.000596	0.383001	0.000235	-8.45E-06	1.24E-08
116	2.46E-05	-0.000616	0.694735	0.000241	4.56E-06	-4.42E-09
117	1.89E-05	-0.000623	0.689920	0.000244	3.78E-06	-4.38E-09
118	3.01E-10	-0.000634	0.686792	0.000246	1.34E-12	-1.39E-12
119	-1.89E-05	-0.000623	0.689920	0.000244	-3.78E-06	4.38E-09
120	-2.46E-05	-0.000616	0.694735	0.000241	-4.56E-06	4.42E-09
121	2.84E-05	-0.000631	0.998538	0.000222	1.70E-06	-3.12E-11
122	2.03E-05	-0.000625	0.996761	0.000223	1.39E-06	3.68E-09
123	2.23E-09	-0.000618	0.995693	0.000224	1.44E-12	-1.52E-12
124	-2.03E-05	-0.000625	0.996761	0.000223	-1.39E-06	-3.68E-09
125	-2.84E-05	-0.000631	0.998538	0.000222	-1.70E-06	2.81E-11
126	2.15E-05	-0.000657	1.260	0.000175	4.79E-07	2.19E-08
127	1.33E-05	-0.000622	1.259	0.000176	4.00E-07	2.38E-08
128	4.32E-09	-0.000596	1.259	0.000176	1.54E-12	-1.63E-12
129	-1.33E-05	-0.000622	1.259	0.000176	-4.00E-07	-2.38E-08
130	-2.15E-05	-0.000657	1.260	0.000175	-4.79E-07	-2.19E-08
131	-4.29E-05	-0.000709	1.443	0.000102	1.61E-07	9.84E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-3.75E-05	-0.000606	1.443	0.000102	1.39E-07	7.46E-08
133	6.54E-09	-0.000566	1.443	0.000102	1.63E-12	-1.73E-12
134	3.75E-05	-0.000606	1.443	0.000102	-1.39E-07	-7.46E-08
135	4.29E-05	-0.000709	1.443	0.000102	-1.61E-07	-9.84E-08
136	-0.000276	-0.000777	1.513	1.54E-06	4.76E-07	2.75E-07
137	-0.000212	-0.000565	1.512	1.02E-06	4.03E-07	1.65E-07
138	8.87E-09	-0.000553	1.512	6.65E-07	1.68E-12	-1.80E-12
139	0.000212	-0.000565	1.512	1.02E-06	-4.03E-07	-1.65E-07
140	0.000276	-0.000777	1.513	1.54E-06	-4.76E-07	-2.75E-07
141	-0.000845	-0.000754	1.436	-0.000124	1.99E-06	5.39E-07
142	-0.000613	-0.000502	1.434	-0.000126	1.67E-06	2.16E-07
143	1.13E-08	-0.000666	1.432	-0.000128	1.65E-12	-1.86E-12
144	0.000613	-0.000502	1.434	-0.000126	-1.67E-06	-2.16E-07
145	0.000845	-0.000754	1.436	-0.000124	-1.99E-06	-5.39E-07
146	-0.001782	-0.000280	1.179	-0.000275	6.49E-06	5.63E-07
147	-0.001114	-0.000509	1.172	-0.000280	5.42E-06	-1.80E-07
148	1.38E-08	-0.001145	1.168	-0.000284	1.44E-12	-1.91E-12
149	0.001114	-0.000509	1.172	-0.000280	-5.42E-06	1.80E-07
150	0.001782	-0.000280	1.179	-0.000275	-6.49E-06	-5.63E-07
151	-0.001962	0.001357	0.711610	-0.000450	1.75E-05	-1.42E-06
152	-0.000546	-0.000966	0.693319	-0.000461	1.41E-05	-1.79E-06
153	1.63E-08	-0.002190	0.681895	-0.000468	9.18E-13	-1.93E-12
154	0.000546	-0.000966	0.693319	-0.000461	-1.41E-05	1.79E-06
155	0.001962	0.001357	0.711610	-0.000450	-1.75E-05	1.42E-06
156	0.005487	0.004368	-7.14E-97	-0.000655	3.71E-05	-1.29E-05
157	0.002811	-0.002525	-0.038120	-0.000668	2.76E-05	-2.25E-06
158	1.89E-08	-0.003102	-0.060421	-0.000677	1.63E-13	-1.92E-12
159	-0.002811	-0.002525	-0.038120	-0.000668	-2.76E-05	2.25E-06
160	-0.005487	0.004368	-7.14E-97	-0.000655	-3.71E-05	1.29E-05
161	0.014881	0.004368	-0.348553	-0.000739	3.71E-05	-2.47E-05
162	0.003935	-0.002525	-0.393333	-0.000753	2.76E-05	-2.25E-06
163	1.98E-08	-0.003102	-0.419966	-0.000762	1.63E-13	-1.92E-12
164	-0.003935	-0.002525	-0.393333	-0.000753	-2.76E-05	2.25E-06
165	-0.014881	0.004368	-0.348553	-0.000739	-3.71E-05	2.47E-05
166	-0	-1.12E-97	1.43E-96	+0	-0	+0
167	-0	1.12E-97	1.43E-96	-0	-0	-0
min:	-0.014881	-0.004368	-0.795675	-0.000762	-3.71E-05	-2.47E-05
max:	0.014881	0.004368	1.513	0.000762	3.71E-05	2.47E-05

3.2. Combinación de acciones

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOE
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000		SOB UNIF 5
AZ	PLUS	11	1.000		VEHICULO HIPOTESIS 11
BA	OR	12	1.000		VEHICULO HIPOTESIS 12
BB	OR	13	1.000		VEHICULO HIPOTESIS 13
BC	OR	14	1.000		VEHICULO HIPOTESIS 14
BD	OR	15	1.000		VEHICULO HIPOTESIS 15
BE	OR	16	1.000		VEHICULO HIPOTESIS 16
BF	OR	17	1.000		VEHICULO HIPOTESIS 17
BG	OR	18	1.000		VEHICULO HIPOTESIS 18
BH	OR	19	1.000		VEHICULO HIPOTESIS 19
BI	OR	20	1.000		VEHICULO HIPOTESIS 20
BJ	OR	21	1.000		VEHICULO HIPOTESIS 21
BK	OR	22	1.000		VEHICULO HIPOTESIS 22
BL	OR	23	1.000		VEHICULO HIPOTESIS 23
BM	OR	24	1.000		VEHICULO HIPOTESIS 24
BN	OR	25	1.000		VEHICULO POSICION 25
BO	OR	26	1.000		VEHICULO POSICION 26
BP	OR	27	1.000		VEHICULO POSICION 27
BQ	OR	28	1.000		VEHICULO POSICION 28
BR	OR	29	1.000		VEHICULO POSICION 29
BS	OR	30	1.000		VEHICULO POSICION 30
BT	OR	31	1.000		VEHICULO POSICION 31
BU	OR	32	1.000		VEHICULO POSICION 32
BV	OR	33	1.000		VEHICULO POSICION 33
BW	OR	34	1.000		VEHICULO POSICION 34
BX	OR	35	1.000		VEHICULO POSICION 35
BY	OR	36	1.000		VEHICULO POSICION 36
BZ	OR	37	1.000		VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000		FRENADO
CB	PLUS	63	0.300000		VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000		TEMPERATURA (-)
CD	OR	65	0.600000		TEMPERATURA (+)
CE	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
CF	PERM.	1	1.000		PESO PROPIO
CG	PL.PERM	2	1.500		PESO PAVIMENTO
CH	OR	2	1.000		PESO PAVIMENTO
CI	PL.PERM	3	1.000		PESO BARRERAS
CJ	PLUS	46	1.000		SOB UNIF VANO 1
CK	PLUS	47	1.000		SOB UNIF VANO 2
CL	PLUS	48	1.000		SOB UNIF VANO 3
CM	PLUS	11	1.000		VEHICULO HIPOTESIS 11
CN	OR	12	1.000		VEHICULO HIPOTESIS 12
CO	OR	13	1.000		VEHICULO HIPOTESIS 13
CP	OR	14	1.000		VEHICULO HIPOTESIS 14
CQ	OR	15	1.000		VEHICULO HIPOTESIS 15
CR	OR	16	1.000		VEHICULO HIPOTESIS 16
CS	OR	17	1.000		VEHICULO HIPOTESIS 17
CT	OR	18	1.000		VEHICULO HIPOTESIS 18
CU	OR	19	1.000		VEHICULO HIPOTESIS 19
CV	OR	20	1.000		VEHICULO HIPOTESIS 20
CW	OR	21	1.000		VEHICULO HIPOTESIS 21
CX	OR	22	1.000		VEHICULO HIPOTESIS 22
CY	OR	23	1.000		VEHICULO HIPOTESIS 23
CZ	OR	24	1.000		VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOE
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE
ALTERNATIVE ENVELOPE :				
DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FE	PLUS	60	1.000	FRENADO

FG	PLUS	63	0.300000	VIENTO TRANSV CON SOE
FH	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	20.036			
	1.761	1.141	100.469			
	Min: AP AR AS AT AX AY BU...			Max: A B D E F G J AL AN AO		
10	2.283	-3.686	16.626			
	-0.568555	1.138	97.227			
	Min: AP AR AS AT AU AV BC...			Max: A E D G H I AB AN AO		
156	-1.091	2.568	20.407			
	1.761	-2.257	100.840			
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.		
160	2.283	2.571	16.997			
	-0.568596	-2.254	97.599			
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...		
166	3.374	-1.935	218.118	15.604	23.708	-0.028301
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09
	Min: CF CH CI CL DC DN DO...			Max: DS DT DV DW DX DY EM...		
167	3.374	-1.829	219.077	9.951	23.708	0.028301
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...		

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	26.641			
	2.283	1.009	60.785			
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F M AL AN		
10	-1.090	1.006	57.547			
	2.284	-3.686	23.231			
	Min: A C D H I AE AN			Max: AP AQ AS AT AU AV AW...		
156	-1.091	2.567	27.013			
	2.283	-2.125	61.160			
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F O AK AL AN		
160	-1.091	-2.122	57.919			
	2.284	2.570	23.603			
	Min: A C D H I AG AK AN			Max: AP AQ AS AT AU AV AW...		
166	-2.615	3.395	313.122	-17.884	-3.159	0.221212
	5.989	-4.252	319.171	36.214	26.867	-0.249513
	Min: A C D E F M AN			Max: AP AQ AS AT AW AX AY...		
167	-2.615	-7.158	314.081	43.438	-3.159	-0.221212

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
	5.989	0.488287	320.130	-10.660	26.867	0.249513
	Min: A C D E F O AK AN			Max: AP AQ AS AT AW AX AY...		

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-0.167731	-3.836	34.498			
	0.835704	1.280	53.022			
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DQ DQ...		
10	1.360	-3.835	31.088			
	0.356995	1.277	49.781			
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR		
156	0.835745	-2.396	53.394			
	-0.167690	2.720	34.870			
	Min: CF CH CI CL DL DN DO...			Max: DS DT DV DW DX DY ET...		
160	0.356954	-2.393	50.152			
	1.360	2.723	31.460			
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EE...		
166	3.374	-8.324	297.858	52.598	23.708	-0.028301
	5.36E-09	6.034	296.749	-29.975	2.74E-08	-1.18E-08
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
167	5.35E-09	-9.797	297.708	55.530	2.73E-08	1.16E-08
	3.374	4.560	298.816	-27.044	23.708	0.028301
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

DEFORMATIONS: ""
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-9.927	-4.388	-1.45E-08	-0.001116	0.000178	-1.26E-05
		4.745	16.012	-2.36E-09	-0.000181	0.000186	2.63E-05
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...		
2	1.300	-9.912	15.434	-1.030	-0.000782	-7.75E-05	-1.13E-05
		4.718	-4.186	-0.728517	-0.000510	0.000188	1.76E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
31	0	-9.912	-10.583	-1.061	0.000805	-7.66E-05	1.14E-05
		4.718	9.037	-0.759594	0.000534	0.000189	-1.75E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		
31	1.300	-9.927	9.239	-1.74E-08	0.001141	0.000180	1.29E-05
		4.745	-11.161	-3.23E-09	0.000205	0.000188	-2.61E-05
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...		

DEFORMATIONS: ""
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
75	0	-9.759	-1.872	-1.33E-05	-2.92E-05	-0.001310	-1.79E-05
		4.522	10.104	-1.31E-05	5.37E-06	0.001078	2.05E-05
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...		
75	1.300	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...		
76	0	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...		
76	1.700	-9.702	8.576	-3.304	-0.001163	-0.001535	-2.04E-05
		4.457	-1.219	-2.834	-0.000935	0.001276	2.28E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
85	0	-9.702	-3.725	-3.248	0.001143	-0.001535	2.04E-05
		4.457	6.071	-2.779	0.000916	0.001276	-2.28E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		
85	1.700	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05
		Min: A B D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...		
86	0	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05
		Min: A B D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...		
86	1.300	-9.759	6.724	-1.391	-2.60E-06	-0.001310	1.79E-05
		4.522	-5.252	-1.371	-3.72E-05	0.001078	-2.09E-05
		Min: A B D E F G O AK AL AN.			Max: AP AR AS AT AX AY BW...		
130	0	-9.931	16.026	-1.74E-09	-0.000134	-0.000184	-2.10E-05
		4.741	-4.375	-1.39E-08	-0.001072	-0.000176	1.79E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
130	1.300	-9.911	-4.173	-0.659427	-0.000459	-0.000213	-1.24E-05
		4.719	15.447	-0.965400	-0.000733	5.27E-05	1.65E-05
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...		
159	0	-9.911	9.024	-0.690504	0.000482	-0.000214	1.23E-05
		4.719	-10.596	-0.996477	0.000756	5.17E-05	-1.66E-05
		Min: A C D E F G AK AL AN			Max: AP AQ AS AT AW AX AY...		
159	1.300	-9.931	-11.174	-2.41E-09	0.000158	-0.000186	2.07E-05
		4.741	9.226	-1.66E-08	0.001096	-0.000178	-1.82E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-3.633	-5.566	-1.43E-08	-0.001098	0.000283	2.93E-05
		0.729265	16.677	-9.22E-09	-0.000709	0.000154	-2.00E-05
	Min:	CF CH CI CJ DF DO DQ...	Max:	DS DT DV DW DY DZ EZ...			
2	1.300	-3.666	-5.281	-1.474	-0.001105	0.000194	2.26E-05
		0.755751	16.016	-0.908772	-0.000646	7.11E-05	-2.06E-05
	Min:	CF CH CI CJ DF DO DQ...	Max:	DS DT DV DW DY DZ EZ...			
31	0	0.755785	-11.165	-0.939849	0.000669	7.20E-05	2.07E-05
		-3.666	10.132	-1.505	0.001128	0.000195	-2.25E-05
	Min:	DS DT DV DW DX DY ET...	Max:	CF CH CI CL DL DN DO...			
31	1.300	0.729085	-11.826	-1.07E-08	0.000733	0.000156	2.02E-05
		-3.634	10.417	-1.63E-08	0.001122	0.000285	-2.91E-05
	Min:	DS DT DV DW DX DY ET...	Max:	CF CH CI CL DL DN DO...			
75	0	-5.237	-2.959	-2.341	0.000825	-0.000232	2.96E-06
		-1.03E-09	10.666	-0.931812	-8.42E-05	7.32E-13	7.37E-13
	Min:	CF CH CI CJ CW DO DQ	Max:	DS DT DV DW DY DZ EQ...			
75	1.300	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
	Min:	CF CH CI CJ CW DO DQ	Max:	DS DT DV DW DY DZ EQ...			
76	0	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
	Min:	CF CH CI CJ CW DO DQ	Max:	DS DT DV DW DY DZ EQ...			
76	1.700	-5.245	-2.305	-1.599	-0.000298	-0.000260	2.44E-06
		-4.04E-09	9.138	-2.679	-0.000971	6.64E-13	1.02E-12
	Min:	CF CH CI CJ CW DO DQ	Max:	DS DT DV DW DY DZ EQ...			
85	0	-3.98E-09	-4.286	-2.623	0.000951	6.61E-13	-1.01E-12
		-5.245	7.157	-1.544	0.000279	-0.000260	-2.44E-06
	Min:	DS DT DV DW DX DY EK...	Max:	CF CH CI CL DC DN DO...			
85	1.700	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000352	-0.000260	-2.78E-06
	Min:	DS DT DV DW DX DY EK...	Max:	CF CH CI CL DC DN DO...			
86	0	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
	Min:	DS DT DV DW DX DY EK...	Max:	CF CH CI CL DC DN DO...			
86	1.300	-1.08E-09	-5.814	-0.992653	5.24E-05	7.30E-13	-7.10E-13
		-5.237	7.810	-2.402	-0.000856	-0.000232	-2.96E-06
	Min:	DS DT DV DW DX DY EK...	Max:	CF CH CI CL DC DN DO...			
130	0	-1.552	-5.553	-1.37E-08	-0.001054	-0.000282	-2.40E-05
		-5.915	16.691	-8.59E-09	-0.000661	-0.000152	2.53E-05
	Min:	CF CH CI CJ CN DQ DR	Max:	DS DT DV DW DY DZ EH...			
130	1.300	-1.526	-5.268	-1.409	-0.001057	-0.000219	-1.74E-05
		-5.949	16.029	-0.839682	-0.000594	-9.58E-05	2.59E-05
	Min:	CF CH CI CJ CN DQ DR	Max:	DS DT DV DW DY DZ EH...			

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
159	0	-5.949	-11.178	-0.870759	0.000617	-9.68E-05	-2.60E-05
		-1.526	10.119	-1.440	0.001080	-0.000220	1.73E-05
	Min:	DS DT DV DW DX DY EE...	Max:	CF CH CI CL CT DN DQ...			
159	1.300	-5.915	-11.839	-9.85E-09	0.000685	-0.000154	-2.56E-05
		-1.552	10.404	-1.55E-08	0.001078	-0.000284	2.37E-05
	Min:	DS DT DV DW DX DY EE...	Max:	CF CH CI CL CT DN DQ...			

ENVELOPE for < N > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-352.379	-0.710816	-2.90E-10	3.88E-09	2.13E-09	11.174
		-218.118	-1.935	-3.374	0.028301	23.708	15.604
	Min:	DS DT DV DW DX DY EM...	Max:	CF CH CI CL DC DN DO...			
290	13.200	-352.379	-0.710816	-2.90E-10	3.88E-09	-1.70E-09	1.791
		-218.118	-1.935	-2.582	0.028301	-15.598	-9.938
	Min:	DS DT DV DW DX DY EM...	Max:	CF CH CI CL DC DN DO...			
291	0	-353.338	-3.053	-2.78E-10	-3.63E-09	2.08E-09	14.381
		-219.077	-1.829	-3.374	-0.028301	23.708	9.951
	Min:	DS DT DV DW DY DZ EO...	Max:	CF CH CI CJ CW DO DQ...			
291	13.200	-353.338	-3.053	-2.78E-10	-3.63E-09	-1.59E-09	-25.914
		-219.077	-1.829	-2.582	-0.028301	-15.598	-14.186
	Min:	DS DT DV DW DY DZ EO...	Max:	CF CH CI CJ CW DO DQ...			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-313.535	-3.098	2.525	-0.264263	-3.487	20.929
		-316.630	-1.529	-5.898	0.292564	27.196	11.566
	Min:	AP AR AS AT AU AV BB...	Max:	A B D G H I AD AK AL...			
290	13.200	-319.171	-4.252	-5.197	0.249513	-46.963	-19.909
		-313.122	3.395	2.615	-0.221212	31.365	26.929
	Min:	AP AQ AS AT AW AX AY...	Max:	A C D E F M AN			
291	0	-314.494	-0.665613	2.525	0.264263	-3.487	4.626
		-317.589	-2.234	-5.898	-0.292564	27.196	13.988
	Min:	AP AR AS AT AU AV BF...	Max:	A B D G H I AH AL AN...			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
291	13.200	-320.130	0.488287	-5.197	-0.249513	-46.963	-4.214
		-314.081	-7.156	2.615	0.221212	31.365	-51.052
	Min:	AP AQ AS AT AW AX AY...	Max:	A C D E F O AK AN			

ENVELOPE for < Mz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.749	6.034	-5.36E-09	1.18E-08	2.74E-08	-29.975
		-297.856	-8.324	-3.374	0.028301	23.708	52.598
	Min:	CF CG CI CK CZ DQ DR	Max:	DS DU DV DW DX DZ EK...			
290	13.200	-297.856	-8.324	-2.582	0.028301	-15.598	-57.273
		-296.749	6.034	-5.36E-09	1.18E-08	-4.34E-08	49.670
	Min:	DS DU DV DW DX DZ EK...	Max:	CF CG CI CK CZ DQ DR			
291	0	-298.816	4.560	-3.374	-0.028301	23.708	-27.044
		-297.708	-9.797	-5.35E-09	-1.16E-08	2.73E-08	55.530
	Min:	DS DU DV DW DX DZ EQ...	Max:	CF CG CI CK CZ DN DQ...			
291	13.200	-297.708	-9.797	-5.35E-09	-1.16E-08	-4.33E-08	-73.793
		-298.816	4.560	-2.582	-0.028301	-15.598	33.150
	Min:	CF CG CI CK CZ DN DQ...	Max:	DS DU DV DW DX DZ EQ...			

PILAS

Introducción

Del cálculo del tablero como emparrillado espacial se han obtenido para las distintas hipótesis los valores de las reacciones del tablero, tanto verticales como horizontales.

Con dichos valores se han obtenido las reacciones para las distintas hipótesis de carga, que responden a lo dispuesto por la "Instrucción sobre a las acciones a considerar en el proyecto de puentes de carretera" (IAP).

La pila se ha calculado en segundo orden, considerando la longitud de pandeo real de las mismas, que se obtiene del cálculo de los autovalores estáticos del modelo con sus rigideces resultantes mediante el programa STATIK·3. Con estos valores se ha utilizado la fórmula de la EHE para esbelteces medias.

ENVELOPE SPECIFIC.: CZ 'COMBINACION ELU'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	PL.PERM	2	2.025		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.350		PESO BARRERAS
E	PLUS	6	1.500		SOB UNIF 1
F	PLUS	7	1.500		SOB UNIF 2
G	PLUS	8	1.500		SOB UNIF 3
H	PLUS	9	1.500		SOB UNIF 4
I	PLUS	10	1.500		SOB UNIF 5
J	PLUS	11	1.500		VEHICULO HIPOTESIS 11
K	OR	12	1.500		VEHICULO HIPOTESIS 12
L	OR	13	1.500		VEHICULO HIPOTESIS 13
M	OR	14	1.500		VEHICULO HIPOTESIS 14
N	OR	15	1.500		VEHICULO HIPOTESIS 15
O	OR	16	1.500		VEHICULO HIPOTESIS 16
P	OR	17	1.500		VEHICULO HIPOTESIS 17
Q	OR	18	1.500		VEHICULO HIPOTESIS 18
R	OR	19	1.500		VEHICULO HIPOTESIS 19
S	OR	20	1.500		VEHICULO HIPOTESIS 20
T	OR	21	1.500		VEHICULO HIPOTESIS 21
U	OR	22	1.500		VEHICULO HIPOTESIS 22
V	OR	23	1.500		VEHICULO HIPOTESIS 23
W	OR	24	1.500		VEHICULO HIPOTESIS 24
X	OR	25	1.500		VEHICULO POSICION 25
Y	OR	26	1.500		VEHICULO POSICION 26
Z	OR	27	1.500		VEHICULO POSICION 27
AA	OR	28	1.500		VEHICULO POSICION 28
AB	OR	29	1.500		VEHICULO POSICION 29
AC	OR	30	1.500		VEHICULO POSICION 30
AD	OR	31	1.500		VEHICULO POSICION 31
	OR	32	1.500		VEHICULO POSICION 32
AF	OR	33	1.500		VEHICULO POSICION 33
AG	OR	34	1.500		VEHICULO POSICION 34
AH	OR	35	1.500		VEHICULO POSICION 35
AI	OR	36	1.500		VEHICULO POSICION 36
AJ	OR	37	1.500		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.500		FRENADO
AL	PLUS	63	0.750000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.900000		TEMPERATURA (-)
AN	OR	65	0.900000		TEMPERATURA (+)
AO	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.500		SOB UNIF 1
AV	PLUS	7	1.500		SOB UNIF 2
AW	PLUS	8	1.500		SOB UNIF 3
AX	PLUS	9	1.500		SOB UNIF 4

AY	PLUS	10	1.500	SOB UNIF 5
AZ	PLUS	11	1.500	VEHICULO HIPOTESIS 11
BA	OR	12	1.500	VEHICULO HIPOTESIS 12
BB	OR	13	1.500	VEHICULO HIPOTESIS 13
BC	OR	14	1.500	VEHICULO HIPOTESIS 14
BD	OR	15	1.500	VEHICULO HIPOTESIS 15
BE	OR	16	1.500	VEHICULO HIPOTESIS 16
BF	OR	17	1.500	VEHICULO HIPOTESIS 17
BG	OR	18	1.500	VEHICULO HIPOTESIS 18
BH	OR	19	1.500	VEHICULO HIPOTESIS 19
BI	OR	20	1.500	VEHICULO HIPOTESIS 20
BJ	OR	21	1.500	VEHICULO HIPOTESIS 21
BK	OR	22	1.500	VEHICULO HIPOTESIS 22
BL	OR	23	1.500	VEHICULO HIPOTESIS 23
BM	OR	24	1.500	VEHICULO HIPOTESIS 24
BN	OR	25	1.500	VEHICULO POSICION 25
BO	OR	26	1.500	VEHICULO POSICION 26
BP	OR	27	1.500	VEHICULO POSICION 27
BQ	OR	28	1.500	VEHICULO POSICION 28
BR	OR	29	1.500	VEHICULO POSICION 29
BS	OR	30	1.500	VEHICULO POSICION 30
BT	OR	31	1.500	VEHICULO POSICION 31
BU	OR	32	1.500	VEHICULO POSICION 32
BV	OR	33	1.500	VEHICULO POSICION 33
BW	OR	34	1.500	VEHICULO POSICION 34
BX	OR	35	1.500	VEHICULO POSICION 35
BY	OR	36	1.500	VEHICULO POSICION 36
BZ	OR	37	1.500	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.500	FRENADO
CB	PLUS	63	0.750000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.900000	TEMPERATURA (-)
CD	OR	65	0.900000	TEMPERATURA (+)
CE	PLUS	66	0.900000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.350	PESO PROPIO
CG	PL.PERM	2	2.025	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.350	PESO BARRERAS
CJ	PLUS	46	1.500	SOB UNIF VANO 1
CK	PLUS	47	1.500	SOB UNIF VANO 2
CL	PLUS	48	1.500	SOB UNIF VANO 3
CM	PLUS	11	1.500	VEHICULO HIPOTESIS 11
CN	OR	12	1.500	VEHICULO HIPOTESIS 12
CO	OR	13	1.500	VEHICULO HIPOTESIS 13
CP	OR	14	1.500	VEHICULO HIPOTESIS 14
CQ	OR	15	1.500	VEHICULO HIPOTESIS 15
CR	OR	16	1.500	VEHICULO HIPOTESIS 16
CS	OR	17	1.500	VEHICULO HIPOTESIS 17
CT	OR	18	1.500	VEHICULO HIPOTESIS 18
CU	OR	19	1.500	VEHICULO HIPOTESIS 19
CV	OR	20	1.500	VEHICULO HIPOTESIS 20
CW	OR	21	1.500	VEHICULO HIPOTESIS 21
CX	OR	22	1.500	VEHICULO HIPOTESIS 22
CY	OR	23	1.500	VEHICULO HIPOTESIS 23
CZ	OR	24	1.500	VEHICULO HIPOTESIS 24

DA	OR	25	1.500	VEHICULO POSICION 25
DB	OR	26	1.500	VEHICULO POSICION 26
DC	OR	27	1.500	VEHICULO POSICION 27
DD	OR	28	1.500	VEHICULO POSICION 28
DE	OR	29	1.500	VEHICULO POSICION 29
DF	OR	30	1.500	VEHICULO POSICION 30
DG	OR	31	1.500	VEHICULO POSICION 31
DH	OR	32	1.500	VEHICULO POSICION 32
DI	OR	33	1.500	VEHICULO POSICION 33
DJ	OR	34	1.500	VEHICULO POSICION 34
DK	OR	35	1.500	VEHICULO POSICION 35
DL	OR	36	1.500	VEHICULO POSICION 36
DM	OR	37	1.500	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.500	FRENADO
DO	PLUS	63	0.750000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.900000	TEMPERATURA (-)
DQ	OR	65	0.900000	TEMPERATURA (+)
DR	PLUS	66	0.900000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.500	SOB UNIF VANO 1
DY	PLUS	47	1.500	SOB UNIF VANO 2
DZ	PLUS	48	1.500	SOB UNIF VANO 3
EA	PLUS	11	1.500	VEHICULO HIPOTESIS 11
EB	OR	12	1.500	VEHICULO HIPOTESIS 12
EC	OR	13	1.500	VEHICULO HIPOTESIS 13
ED	OR	14	1.500	VEHICULO HIPOTESIS 14
EE	OR	15	1.500	VEHICULO HIPOTESIS 15
	OR	16	1.500	VEHICULO HIPOTESIS 16
EG	OR	17	1.500	VEHICULO HIPOTESIS 17
EH	OR	18	1.500	VEHICULO HIPOTESIS 18
EI	OR	19	1.500	VEHICULO HIPOTESIS 19
EJ	OR	20	1.500	VEHICULO HIPOTESIS 20
EK	OR	21	1.500	VEHICULO HIPOTESIS 21
EL	OR	22	1.500	VEHICULO HIPOTESIS 22
EM	OR	23	1.500	VEHICULO HIPOTESIS 23
EN	OR	24	1.500	VEHICULO HIPOTESIS 24
EO	OR	25	1.500	VEHICULO POSICION 25
EP	OR	26	1.500	VEHICULO POSICION 26
EQ	OR	27	1.500	VEHICULO POSICION 27
ER	OR	28	1.500	VEHICULO POSICION 28
ES	OR	29	1.500	VEHICULO POSICION 29
ET	OR	30	1.500	VEHICULO POSICION 30
EU	OR	31	1.500	VEHICULO POSICION 31
EV	OR	32	1.500	VEHICULO POSICION 32
EW	OR	33	1.500	VEHICULO POSICION 33
EX	OR	34	1.500	VEHICULO POSICION 34
EY	OR	35	1.500	VEHICULO POSICION 35
EZ	OR	36	1.500	VEHICULO POSICION 36
FA	OR	37	1.500	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.500	FRENADO

FC	PLUS	63	0.750000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.900000	TEMPERATURA (-)
FE	OR	65	0.900000	TEMPERATURA (+)
FF	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-491.897	1.493	-4.19E-10	6.10E-09	2.71E-09	1.461
		[-208.997]	-6.154	-9.523	0.045376	[59.749]	[39.020]
		Min: CF CG CI CJ CK CY DP			Max: DS DU DV DW DZ EQ FB...		
290	11.300	-491.897	1.493	-4.19E-10	6.10E-09	-2.02E-09	18.332
		[-208.997]	-6.154	-7.828	0.045376	[-38.279]	[-30.525]
		Min: CF CG CI CJ CK CY DP			Max: DS DU DV DW DZ EQ FB...		
291	0	[-493.319]	-8.024	-3.99E-10	-5.68E-09	[2.64E-09]	[36.674]
		-210.420	-0.376457	-9.523	-0.045376	59.749	-0.885525
		Min: CF CG CI CK CL DA DN...			Max: DS DU DV DW DX EK FC...		
291	11.300	[-493.319]	-8.024	-3.99E-10	-5.68E-09	[-1.86E-09]	[-53.996]
		-210.420	-0.376457	-7.828	-0.045376	-38.279	-5.139
		Min: CF CG CI CK CL DA DN...			Max: DS DU DV DW DX EK FC...		

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-264.115	-5.924	-1.134	-0.701718	-8.941	37.051
		-349.885	-1.245	-8.388	0.747094	68.689	12.659
		Min: AP AR AS AT AX AY BX...			Max: A B D E F G P AK AL AN.		
290	11.300	-441.481	-4.651	-11.904	0.520733	-85.960	-13.484
		-352.179	3.629	4.077	-0.475357	47.681	27.574
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
291	0	-265.537	-0.606722	-1.134	0.701718	-8.941	1.083
		[-351.308]	-5.286	-8.388	-0.747094	[68.689]	[25.476]
		Min: AP AR AS AT AX AY BT...			Max: A B D E F G L AL AN AO		
291	11.300	[-442.904]	-1.880	-11.904	-0.520733	[-85.960]	[-22.181]
		-353.601	-10.160	4.077	0.475357	47.681	-63.239
		Min: A B D G H I AG AL AM...			Max: AP AR AS AT AU AV BE...		

ΔG pile = 1.35 × 22.2 = 30 t

N = 209.00
M = 49.00

N = 239.00
M = 71.36

N = 493.30
M = 54.00

N = 523.30
M = 36.67

N = 442.904
M = 88.77

N = 472.904
M = 73.28

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-408.499	12.240	-8.85E-09	2.01E-08	3.58E-08	-53.110
		-260.485	-15.098	-9.523	0.045376	59.749	85.777
		Min: CF CG CI CK CZ DQ DR			Max: DS DU DV DW DX DZ EQ...		
290	11.300	-328.577	-15.859	-7.828	0.045376	-38.279	-94.753
		-408.499	12.240	-8.85E-09	2.01E-08	-6.43E-08	85.198
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
291	0	-261.908	8.567	-9.523	-0.045376	59.749	-47.643
		-409.922	-18.771	-8.83E-09	-1.97E-08	3.57E-08	91.245
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DN DQ...		
291	11.300	-409.922	-18.771	-8.83E-09	-1.97E-08	-6.41E-08	-120.863
		-330.000	9.328	-7.828	-0.045376	-38.279	59.088
		Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

ENVELOPE for < Vz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-439.715	1.829	-13.599	0.520733	58.134	0.618926
		-353.945	-2.850	4.077	-0.475357	1.615	25.011
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
290	11.300	-439.715	1.829	-11.904	0.520733	-85.960	21.284
		-353.945	-2.850	4.077	-0.475357	47.681	-7.194
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
291	0	-441.138	-8.360	-13.599	-0.520733	58.134	37.516
		-355.367	-3.681	4.077	0.475357	1.615	13.123
		Min: A B D G H I AG AL AN...			Max: AP AR AS AT AU AV BE...		
291	11.300	-441.138	-8.360	-11.904	-0.520733	-85.960	-56.949
		-355.367	-3.681	4.077	0.475357	47.681	-28.471
		Min: A B D G H I AG AL AN...			Max: AP AR AS AT AU AV BE...		

N = 328.60
M = 102.19

N = 358.60
M = 104.53

N = 409.92
M = 120.86

N = 439.92
M = 91.24

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 1 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **49.0** Md (KNm) = 480.2
Nd (T) = **-209.0** Nd (KN) = -2048.2

Pie de pórtico

Md (Tm) = **71.4** Md (KNm) = 699.3
Nd (T) = **-239.0** Nd (KN) = -2342.2

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A *\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

e_e = 0.299 Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

β = 1.50

e_a = 0.139

e_{tot} (m) = 0.437

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 91.35
Nd (t) = -209.00

Md (KNm) = 895.3
Nd (KN) = -2048.2

Pie de pórtico

Md (tm) = 104.47
Nd (t) = -239.00

Md (KNm) = 1023.8
Nd (KN) = -2342.2

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 2 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **54.0** Md (KNm) = 529.2
Nd (T) = **-493.3** Nd (KN) = -4834.3

Pie de pórtico

Md (Tm) = **36.7** Md (KNm) = 359.4
Nd (T) = **-523.3** Nd (KN) = -5128.3

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A * \Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.109 Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$$is^2 = \frac{1}{6}(d - d')^2$$

β = 1.50

e_a = 0.121

e_{tot} (m) = 0.230

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 113.49
Nd (t) = -493.30

Md (KNm) = 1112.2
Nd (KN) = -4834.3

Pie de pórtico

Md (tm) = 120.39
Nd (t) = -523.30

Md (KNm) = 1179.8
Nd (KN) = -5128.3

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 3 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **88.8** Md (KNm) = 869.9
Nd (T) = **-442.9** Nd (KN) = -4340.4

Pie de pórtico

Md (Tm) = **73.3** Md (KNm) = 718.1
Nd (T) = **-472.9** Nd (KN) = -4634.4

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L dintel = 0.0000

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : $\lambda = 45.20$

$35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

$e_e = 0.200$ Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

$\varepsilon y = fyd / Es = 0.002070$

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$$is^2 = \frac{1}{6}(d - d')^2$$

$\beta = 1.50$

$e_a = 0.132$

e_{tot} (m) = 0.332

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 147.25
Nd (t) = -442.90

Md (KNm) = 1443.0
Nd (KN) = -4340.4

Pie de pórtico

Md (tm) = 157.22
Nd (t) = -472.90

Md (KNm) = 1540.8
Nd (KN) = -4634.4

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 4 :

Solicitaciones :

Cabeza de pórtico

Md (Tm) = **102.2** Md (KNm) = 1001.6
Nd (T) = **-328.6** Nd (KN) = -3220.3

Pie de pórtico

Md (Tm) = **104.5** Md (KNm) = 1024.4
Nd (T) = **-358.6** Nd (KN) = -3514.3

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L dintel = 0.0000

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A * \Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : $\lambda =$ **45.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

$e_e = 0.311$ Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

$\varepsilon y =$ fyd / Es = 0.002070

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

$\beta = 1.50$

$e_a = 0.139$

e_{tot} (m) = 0.450

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 147.92
Nd (t) = -328.60

Md (KNm) = 1449.6
Nd (KN) = -3220.3

Pie de pórtico

Md (tm) = 161.42
Nd (t) = -358.60

Md (KNm) = 1581.9
Nd (KN) = -3514.3

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 5 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **120.9** Md (KNm) = 1184.4
Nd (T) = **-409.9** Nd (KN) = -4017.2

Pie de pórtico

Md (Tm) = **91.2** Md (KNm) = 894.2
Nd (T) = **-439.9** Nd (KN) = -4311.2

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A*\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0.5}$

α = 1.000

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_a)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.295 Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$$is^2 = \frac{1}{6}(d - d')^2$$

β = 1.50

e_a = 0.138

e_{tot} (m) = 0.433

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 177.57
Nd (t) = -409.92

Md (KNm) = 1740.2
Nd (KN) = -4017.2

Pie de pórtico

Md (tm) = 190.56
Nd (t) = -439.92

Md (KNm) = 1867.5
Nd (KN) = -4311.2

Características mecánicas Sección "PILAS" (sin coef. homogeneiz.)

Area	Ax = 7.858E3 cm2		
Momento de inercia	Iy = 4.918E6 cm4	Iz = 4.909E6 cm4	Ip = 9.827E6 cm4
Const. de torsión			Ix = 9.817E6 cm4
Momento estático	Zy =166.73E3 cm3	Zz = 166.73E3 cm3	
Baricentro	ys = -0.0000 m	zs = 0.0000 m	Angulo= 0.0 Grad
Dist. al borde	yl = -0.5000 m	yr = 0.5000 m	
	zo = 0.5000 m	zu = -0.5000 m	

S-N-Punto de aplic. de fuerzas en el baricentro de la sección
S-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.0000 m z = 0.0000 m

Sección parcial circular:

Figure	Material	w	ym[m]	zm[m]	r[m]	ix[cm4]
1	H300	1.0	0.0000	0.0000	0.5000	9.82E+06

Armadura "B1" As-tot =74.3302 cm2 (0.95 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
STR 6 / C1	AEH500	1.0	1	5.3093	-0.1001	0.4387
STR 5 / C1	AEH500	1.0	1	5.3093	0.1001	0.4387
STR 7 / C1	AEH500	1.0	1	5.3093	-0.2806	0.3518
STR 4 / C1	AEH500	1.0	1	5.3093	0.2806	0.3518
STR 8 / C1	AEH500	1.0	1	5.3093	-0.4054	0.1952
STR 3 / C1	AEH500	1.0	1	5.3093	0.4054	0.1952
STR 9 / C1	AEH500	1.0	1	5.3093	-0.4500	0.0000
STR 2 / C1	AEH500	1.0	1	5.3093	0.4500	0.0000
STR 15 / C1	AEH500	1.0	1	5.3093	0.4054	-0.1952
STR 10 / C1	AEH500	1.0	1	5.3093	-0.4054	-0.1952
STR 14 / C1	AEH500	1.0	1	5.3093	0.2806	-0.3518
STR / C1	AEH500	1.0	1	5.3093	-0.2806	-0.3518
STR 13 / C1	AEH500	1.0	1	5.3093	0.1001	-0.4387
STR 12 / C1	AEH500	1.0	1	5.3093	-0.1001	-0.4387

Dimensionamiento a flexión: Viga Sección "PILAS"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-239.0000	104.4700	0.0000	
2	2	-523.3000	120.3900	0.0000	
3	2	-472.9000	157.2200	0.0000	
4	2	-358.6000	161.4200	0.0000	
5	2	-439.9200	190.5600	0.0000	

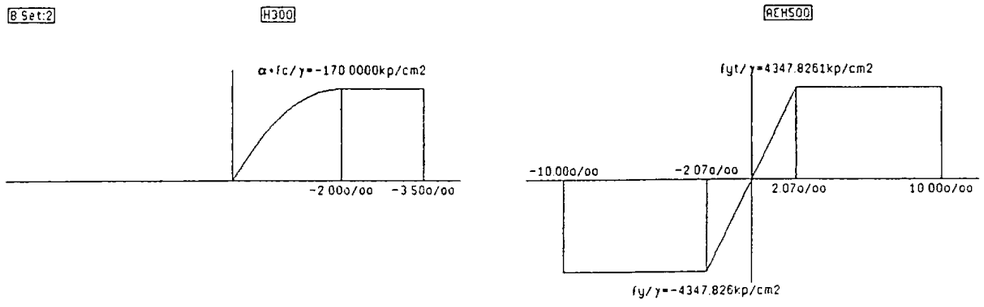
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
5 AEH500	-0.1001	0.4387			0.5000	4.0981	4.0981
5 AEH500	0.1001	0.4387			0.5000	4.0981	4.0981
5 AEH500	-0.2806	0.3518			0.5000	4.0981	4.0981
5 AEH500	0.2806	0.3518			0.5000	4.0981	4.0981
5 AEH500	-0.4054	0.1952			0.5000	4.0981	4.0981
5 AEH500	0.4054	0.1952			0.5000	4.0981	4.0981
5 AEH500	-0.4500	0.0000			0.5000	4.0981	4.0981
5 AEH500	0.4500	0.0000			0.5000	4.0981	4.0981
5 AEH500	0.4054	-0.1952			0.5000	4.0981	4.0981
5 AEH500	-0.4054	-0.1952			0.5000	4.0981	4.0981
5 AEH500	0.2806	-0.3518			0.5000	4.0981	4.0981
5 AEH500	-0.2806	-0.3518			0.5000	4.0981	4.0981
5 AEH500	0.1001	-0.4387			0.5000	4.0981	4.0981
5 AEH500	-0.1001	-0.4387			0.5000	4.0981	4.0981

Max.x/h = 0.67 As-top/bot = 24.5884/32.7845 As = 0.73 % = 57.3729

14 ϕ 25

Nota: Es necesaria armadura de compresión
Material acorde a la sección: "PILAS"



'NVELOPE SPECIFIC.: DA 'COMBINACION FRECUENTE'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	0.500000		SOB UNIF 1
F	PLUS	7	0.500000		SOB UNIF 2
G	PLUS	8	0.500000		SOB UNIF 3
H	PLUS	9	0.500000		SOB UNIF 4
I	PLUS	10	0.500000		SOB UNIF 5
(-	PLUS	11	0.500000		VEHICULO HIPOTESIS 11
..	OR	12	0.500000		VEHICULO HIPOTESIS 12
L	OR	13	0.500000		VEHICULO HIPOTESIS 13
M	OR	14	0.500000		VEHICULO HIPOTESIS 14
N	OR	15	0.500000		VEHICULO HIPOTESIS 15
O	OR	16	0.500000		VEHICULO HIPOTESIS 16
P	OR	17	0.500000		VEHICULO HIPOTESIS 17
Q	OR	18	0.500000		VEHICULO HIPOTESIS 18
R	OR	19	0.500000		VEHICULO HIPOTESIS 19
S	OR	20	0.500000		VEHICULO HIPOTESIS 20
T	OR	21	0.500000		VEHICULO HIPOTESIS 21
U	OR	22	0.500000		VEHICULO HIPOTESIS 22
V	OR	23	0.500000		VEHICULO HIPOTESIS 23
W	OR	24	0.500000		VEHICULO HIPOTESIS 24
X	OR	25	0.500000		VEHICULO POSICION 25
Y	OR	26	0.500000		VEHICULO POSICION 26
Z	OR	27	0.500000		VEHICULO POSICION 27
AA	OR	28	0.500000		VEHICULO POSICION 28
AB	OR	29	0.500000		VEHICULO POSICION 29
·(	OR	30	0.500000		VEHICULO POSICION 30
⌄	OR	31	0.500000		VEHICULO POSICION 31
AE	OR	32	0.500000		VEHICULO POSICION 32
AF	OR	33	0.500000		VEHICULO POSICION 33
AG	OR	34	0.500000		VEHICULO POSICION 34
AH	OR	35	0.500000		VEHICULO POSICION 35
AI	OR	36	0.500000		VEHICULO POSICION 36
AJ	OR	37	0.500000		VEHICULO HIPOTESIS 37
AK	PLUS	60	0.500000		FRENADO
AL	PLUS	63	0.100000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.200000		TEMPERATURA (-)
AN	OR	65	0.200000		TEMPERATURA (+)
AO	PLUS	66	0.200000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
\(	PLUS	46	0.500000	SOB UNIF VANO 1
AU	PLUS	47	0.500000	SOB UNIF VANO 2
AV	PLUS	48	0.500000	SOB UNIF VANO 3
AW	PLUS	11	0.500000	VEHICULO HIPOTESIS 11
AX	OR	12	0.500000	VEHICULO HIPOTESIS 12

AY	OR	13	0.500000	VEHICULO HIPOTESIS 13
AZ	OR	14	0.500000	VEHICULO HIPOTESIS 14
BA	OR	15	0.500000	VEHICULO HIPOTESIS 15
BB	OR	16	0.500000	VEHICULO HIPOTESIS 16
BC	OR	17	0.500000	VEHICULO HIPOTESIS 17
BD	OR	18	0.500000	VEHICULO HIPOTESIS 18
BE	OR	19	0.500000	VEHICULO HIPOTESIS 19
BF	OR	20	0.500000	VEHICULO HIPOTESIS 20
BG	OR	21	0.500000	VEHICULO HIPOTESIS 21
BH	OR	22	0.500000	VEHICULO HIPOTESIS 22
BI	OR	23	0.500000	VEHICULO HIPOTESIS 23
BJ	OR	24	0.500000	VEHICULO HIPOTESIS 24
BK	OR	25	0.500000	VEHICULO POSICION 25
BL	OR	26	0.500000	VEHICULO POSICION 26
BM	OR	27	0.500000	VEHICULO POSICION 27
BN	OR	28	0.500000	VEHICULO POSICION 28
BO	OR	29	0.500000	VEHICULO POSICION 29
BP	OR	30	0.500000	VEHICULO POSICION 30
BQ	OR	31	0.500000	VEHICULO POSICION 31
BR	OR	32	0.500000	VEHICULO POSICION 32
BS	OR	33	0.500000	VEHICULO POSICION 33
BT	OR	34	0.500000	VEHICULO POSICION 34
BU	OR	35	0.500000	VEHICULO POSICION 35
BV	OR	36	0.500000	VEHICULO POSICION 36
BW	OR	37	0.500000	VEHICULO HIPOTESIS 37
BX	PLUS	60	0.500000	FRENADO
BY	PLUS	63	0.100000	VIENTO TRANSV CON SOB
BZ	PLUS	64	0.200000	TEMPERATURA (-)
CA	OR	65	0.200000	TEMPERATURA (+)
CB	PLUS	66	0.200000	GRADIENTE

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.416	1.505	-2.29E-10	2.76E-09	1.53E-09	-4.087
		-228.793	-0.826379	-1.270	0.006050	7.966	7.086
		Min: AP AQ AS AT AU BI BZ			Max: AP AR AS AV BM BX BY...		
290	11.300	-296.416	1.505	-2.29E-10	2.76E-09	-1.05E-09	12.920
		-228.793	-0.826379	-1.044	0.006050	-5.104	-2.252
		Min: AP AQ AS AT AU BI BZ			Max: AP AR AS AV BM BX BY...		
291	0	-296.890	-3.682	-2.23E-10	-2.62E-09	1.52E-09	16.798
		-229.267	-1.351	-1.270	-0.006050	7.966	5.626
		Min: AP AQ AS AU AV BK BX...			Max: AP AR AS AT BG BY CA...		
291	11.300	-296.890	-3.682	-2.23E-10	-2.62E-09	-1.01E-09	-24.809
		-229.267	-1.351	-1.044	-0.006050	-5.104	-9.636
		Min: AP AQ AS AU AV BK BX...			Max: AP AR AS AT BG BY CA...		

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-245.268	0.118116	-0.378103	-0.233906	-2.980	1.601
		-250.976	-0.275479	-0.891571	0.239956	10.947	4.475
		Min: A C D H I AH AM			Max: A B D E F G P AK AL AN.		
290	11.300	-281.311	-0.690654	-2.403	0.164502	-20.997	1.202
		-274.819	2.583	1.359	-0.158452	15.894	18.228
		Min: A B D G H I AE AK AL...			Max: A C D E F M AN		
	0	-245.742	-2.295	-0.378103	0.233906	-2.980	11.111
		-251.450	-1.901	-0.891571	-0.239956	10.947	8.237
		Min: A C D H I AD AK AM			Max: A B D E F G L AL AN AO		
291	11.300	-281.785	-1.486	-2.403	-0.164502	-20.997	-13.090
		-275.293	-4.760	1.359	0.158452	15.894	-30.116
		Min: A B D G H I AG AL AM...			Max: A C D E F O AK AN		

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-270.249	4.218	-2.07E-09	6.24E-09	8.69E-09	-17.443
		-244.324	-2.938	-1.270	0.006050	7.966	17.838
		Min: AP AQ AS AU BJ CA CB			Max: AP AR AS AT AV BM BX...		
2	11.300	-267.021	-3.192	-1.044	0.006050	-5.104	-18.675
		-270.249	4.218	-2.07E-09	6.24E-09	-1.47E-08	30.222
		Min: AP AR AS AT AV BG BX...			Max: AP AQ AS AU BJ CA CB		
291	0	-244.798	0.761432	-1.270	-0.006050	7.966	-5.127
		-270.723	-6.395	-2.07E-09	-6.10E-09	8.66E-09	30.155
		Min: AP AR AS AT AV BG BY...			Max: AP AQ AS AU BJ BX CA...		
291	11.300	-270.723	-6.395	-2.07E-09	-6.10E-09	-1.47E-08	-42.111
		-267.495	1.015	-1.044	-0.006050	-5.104	6.786
		Min: AP AQ AS AU BJ BX CA...			Max: AP AR AS AT AV BM BY...		

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: Verificación fisuracion pila PS 313+500
Fecha: 7/5/01 10.18.11

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 88.6 cm Alto = 88.6 cm Canto útil = 83.85 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 24.54 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 42.11 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0033037
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 17.72 cm
Area de hormigón eficaz, Ac,eficaz = 1962.49 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 32.90 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 1708.9 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2187.0 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 20.54 cm
Alargamiento medio de las fisuras, Esm = 0.000759679
Apertura de fisura, Wk = 0.265 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.265 mm
Apertura de fisura máxima, Wmax = 0.300 mm

4.2. Cálculo de la cimentación

ENVELOPE SPECIFIC.: DE 'COMBINACION CARACTERISTICA' ELS

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DP	PLUS	63	0.300000	VIENTO TRANSV CON SOB
	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

$\Delta G = 22,20$ t

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy (LONG) [t]	Vz (TRANSV.) [t]	T [tm]	My (TRANSV) [tm]	Mz (LONG) [tm]
290	0	-352.818	-1.776	-2.94E-10	4.55E-09	1.87E-09	17.676
		-217.955	-1.790	-3.809	0.018150	23.899	13.128
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...			
290	11.300	-352.818	-1.776	-2.94E-10	4.55E-09	-1.46E-09	-2.395
		-217.955	-1.790	-3.131	0.018150	-15.312	-7.101
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...			
291	0	-351.767	-2.578	-2.83E-10	-4.27E-09	1.83E-09	7.747
		-218.904	-2.564	-3.809	-0.018150	23.899	12.295
		Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...			
291	11.300	-351.767	-2.578	-2.83E-10	-4.27E-09	-1.36E-09	-21.382
		-218.904	-2.564	-3.131	-0.018150	-15.312	-16.675
		Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...			

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-255.134	-4.528	-0.756206	-0.467812	-5.960	28.967
		-257.710	-0.710774	-3.053	0.485962	29.860	7.989
		Min: AP AR AS AT AX AY BX...		Max: A B D E F G P AK AL AN.			
290	11.300	-319.561	-5.870	-5.849	0.335055	-47.099	-23.592
		-313.056	4.731	2.718	-0.316905	31.787	31.618
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F M AN			
291	0	-256.082	0.173680	-0.756206	0.467812	-5.960	-3.544
		-258.658	-3.643	-3.053	-0.485962	29.860	17.434
		Min: AP AR AS AT AX AY BT...		Max: A B D E F G L AL AN AO			
291	11.300	-320.509	1.516	-5.849	-0.335055	-47.099	-0.184579
		-314.004	-9.085	2.718	0.316905	31.787	-55.395
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F O AK AN			

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.433	8.278	-5.92E-09	1.35E-08	2.40E-08	-35.850
		-253.068	-10.642	-3.809	0.018150	23.899	61.444
		Min: CF CG CI CK CZ DQ DR			Max: DS DU DV DW DX DZ EQ...		
290	11.300	-298.463	-11.149	-3.131	0.018150	-15.312	-65.423
		-296.433	8.278	-5.92E-09	1.35E-08	-4.29E-08	57.686
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
291	0	-254.016	6.288	-3.809	-0.018150	23.899	-36.021
		-297.381	-12.631	-5.90E-09	-1.33E-08	2.39E-08	61.273
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DN DQ...		
291	11.300	-297.381	-12.631	-5.90E-09	-1.33E-08	-4.28E-08	-81.462
		-299.411	6.795	-3.131	-0.018150	-15.312	41.646
		Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

ENVELOPE SPECIFIC.: DE 'COMBINACION CARACTERISTICA' REACCIONES

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
	OR	12	1.000		VEHICULO HIPOTESIS 12
	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
	OR	31	1.000		VEHICULO POSICION 31
	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE
ALTERNATIVE ENVELOPE :				
CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.098	-3.385	19.890				
	1.484	1.137	100.455				
	Min: AP AR AS AT AX AY BU...						Max: A B D E F G J AL AN AO
10	2.016	-3.387	16.535				
	-0.565750	1.136	97.268				
	Min: AP AR AS AT AU AV BC...						Max: A B D G H I AB AN AO
156	-1.098	2.564	20.256				
	1.484	-1.958	100.821				
	Min: AP AR AS AT AX AY BW...						Max: A B D E F G R AK AL AN.
160	2.016	2.566	16.901				
	-0.565780	-1.956	97.634				
	Min: AP AR AS AT AU AV BE...						Max: A B D G H I AJ AK AN...
166	3.809	-1.790	217.955	13.128	23.899	-0.018150	
	2.94E-10	-1.776	352.818	17.676	1.87E-09	-4.55E-09	
	Min: CF CH CI CL DC DN DO...						Max: DS DT DV DW DX DY EM...
167	3.809	-2.564	218.904	12.295	23.899	0.018150	
	2.83E-10	-2.578	353.767	7.747	1.83E-09	4.27E-09	
	Min: CF CH CI CJ CW DO DQ...						Max: DS DT DV DW DY DZ EO...

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.099	-3.384	26.517				
	2.016	1.005	60.759				
	Min: AP AQ AS AT AW AX AY...						Max: A C D E F M AL AN
10	-1.098	1.003	57.572				
	2.017	-3.386	23.162				
	Min: A C D H I AE AN						Max: AP AQ AS AT AU AV AW...
156	-1.099	2.564	26.883				
	2.016	-1.825	61.124				
	Min: AP AQ AS AT AW AX AY...						Max: A C D E F O AK AL AN
160	-1.098	-1.824	57.937				
	2.017	2.565	23.527				
	Min: A C D H I AG AK AN						Max: AP AQ AS AT AU AV AW...
166	-2.718	-2.478	315.021	20.940	1.077	0.316905	
	6.527	1.339	317.596	-0.037189	22.823	-0.335055	
	Min: AP AR AS AT AU AV BC...						Max: A B D G H I AE AK AL...
167	-2.718	-4.765	315.182	21.628	1.077	-0.316905	

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
	6.527	-2.803	319.332	8.315	22.823	0.335055	
	Min: A C D E F O AK AM			Max: AP AQ AS AT AW AX AY...			

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-0.145770	-3.539	34.296				
	0.547958	1.277	52.991				
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DO DQ...			
10	1.064	-3.540	30.941				
	0.370101	1.275	49.804				
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR			
156	0.547988	-2.098	53.357				
	-0.145741	2.718	34.661				
	Min: CF CH CI CL DL DN DO...			Max: DS DT DV DW DX DY ET...			
160	0.370071	-2.096	50.170				
	1.064	2.720	31.306				
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EB...			
166	3.809	-11.149	298.463	60.563	23.899	-0.018150	
	5.92E-09	8.278	296.433	-35.850	2.40E-08	-1.35E-08	
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR			
167	5.90E-09	-12.631	297.381	61.273	2.39E-08	1.33E-08	
	3.809	6.795	299.411	-35.140	23.899	0.018150	
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...			

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 1 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **15.3** Mk (KNm) = 150.0
Nk (t) = **-218.0** Nk (KN) = -2136.4

Pie de pórtico

Mk (tm) = **23.9** Mk (KNm) = 234.2
Nk (t) = **-240.2** Nk (KN) = -2354.0

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **7.1** Mk (KNm) = 69.6
Nk (t) = **-218.0** Nk (KN) = -2136.4

Pie de pórtico

Mk (tm) = **13.1** Mk (KNm) = 128.6
Nk (t) = **-240.2** Nk (KN) = -2354.0

Hormigón : **HA - 30** Acero pasivo : **B 500 S**

fck (N/mm²)= **30** fyk (N/mm²)= **500**
γ c = **1.50** γ s = **1.15**
fcd (N/mm²)= 20.0 fyd (N/mm²)= 434.8
Ec (KN/mm²) = 28.6 Es (KN/mm²) = 210

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m⁴) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m⁴) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20** $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

$e_e = 0.100$ Máxima excentricidad de cálculo de 1er orden transversal
$e_e = 0.055$ Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 11.30

$\varepsilon y = fyd / Es =$ 0.002070

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ $\beta = 1.50$

Solicitaciones de cálculo transversales :

$e_a = 0.119$

e_{tot} (m) = 0.218

Pie de pórtico

Mk (tm) = 52.41
Nk (t) = -240.20

Mk (KNm) = 513.6
Nk (KN) = -2354.0

Solicitaciones de cálculo longitudinales :

$e_a = 0.107$

e_{tot} (m) = 0.162

Pie de pórtico

Mk (tm) = 38.86
Nk (t) = -240.20

Mk (KNm) = 380.9
Nk (KN) = -2354.0

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 3 :

Dirección transversal

Solicitaciones :

Cabeza de pórtico

Mk (tm) = **31.8** Mk (KNm) = 311.6
Nk (t) = **-314.1** Nk (KN) = -3078.0

Pie de pórtico

Mk (tm) = **29.9** Mk (KNm) = 293.0
Nk (t) = **-336.3** Nk (KN) = -3295.7

Dirección longitudinal

Solicitaciones :

Cabeza de pórtico

Mk (tm) = **55.4** Mk (KNm) = 542.9
Nk (t) = **-314.1** Nk (KN) = -3078.2

Pie de pórtico

Mk (tm) = **17.4** Mk (KNm) = 170.8
Nk (t) = **-336.3** Nk (KN) = -3295.7

Hormigón : HA - 30

f_{ck} (N/mm²)= **30**
γ_c = **1.50**
f_{cd} (N/mm²)= 20.0
E_c (KN/mm²) = 28.6

Acero pasivo : B 500 S

f_{yk} (N/mm²)= **500**
γ_s = **1.15**
f_{yd} (N/mm²)= 434.8
E_s (KN/mm²) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m⁴) : 0.0000

$\Sigma E * I / L$ dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m⁴) : 0.0491

$\Sigma E * I / L$ soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A * \Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0.5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20** $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.101 Máxima excentricidad de cálculo de 1ºr orden transversal
e_e = 0.176 Máxima excentricidad de cálculo de 1ºr orden longitudinal

Lo = 11.30

$\varepsilon y = f_{yd} / E_s$ = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :

e_a = 0.119

e_{tot} (m) = 0.220

Pie de pórtico

Mk (tm) = 74.08
Nk (t) = -336.30

Mk (KNm) = 726.0
Nk (KN) = -3295.7

Solicitaciones de cálculo longitudinales :

e_a = 0.130

e_{tot} (m) = 0.306

Pie de pórtico

Mk (tm) = 102.95
Nk (t) = -336.30

Mk (KNm) = 1008.9
Nk (KN) = -3295.7

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 4 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-297.4** Nk (KN) = -2914.5

Pie de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-319.6** Nk (KN) = -3132.1

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **81.5** Mk (KNm) = 798.3
Nk (t) = **-297.4** Nk (KN) = -2914.5

Pie de pórtico

Mk (tm) = **61.3** Mk (KNm) = 600.7
Nk (t) = **-319.6** Nk (KN) = -3132.1

Hormigón : **HA - 30** Acero pasivo : **B 500 S**

fck (N/mm²)= **30** fyk (N/mm²)= **500**
γ c = **1.50** γ s = **1.15**
fcd (N/mm²)= 20.0 fyd (N/mm²)= 434.8
Ec (KN/mm²) = 28.6 Es (KN/mm²) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m⁴) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m⁴) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A * \Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ **= 45.20** $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

$e_e = 0.000$ Máxima excentricidad de cálculo de 1er orden transversal
$e_e = 0.274$ Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 11.30

$\varepsilon y = fyd / Es =$ 0.002070

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ $\beta = 1.50$

Solicitaciones de cálculo transversales :

$e_a = 0.079$

e_{tot} (m) = 0.079

Pie de pórtico

Mk (tm) = 25.31 **Mk (KNm) = 248.1**
Nk (t) = -319.60 **Nk (KN) = -3132.1**

Solicitaciones de cálculo longitudinales :

$e_a = 0.137$

e_{tot} (m) = 0.411

Pie de pórtico

Mk (tm) = 131.40 **Mk (KNm) = 1287.7**
Nk (t) = -319.60 **Nk (KN) = -3132.1**

Comprobación de punzonamiento
Articulo 46 EHE

Dimensiones del soporte

Ancho (m)	0.89
Canto (m)	1.20
Canto útil (m)	1.15

u1 (m)	18.64

Losa sin armadura de punzonamiento

Nd (t)	523.30
β	1.15
Fsd,ef	601.80
τsd (t/m2)	*28.07*

ξ	1.417
ϕ (pm)	25
nº (pm)	5.71428
As (cm2)	28.05
ρ	2.439E-03
fck (Mpa)	25
τrd (MPa)	0.311
τrd (t/m2)	*31.07*

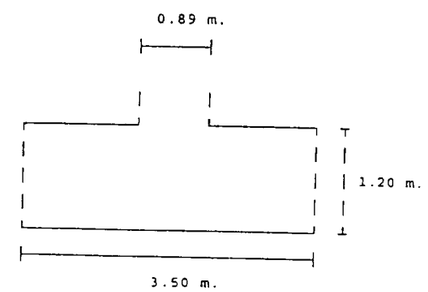
τsd (t/m2)	*< τrd (t/m2)*

'ctura .....:Cami de les Codines

Pila Nº : 1

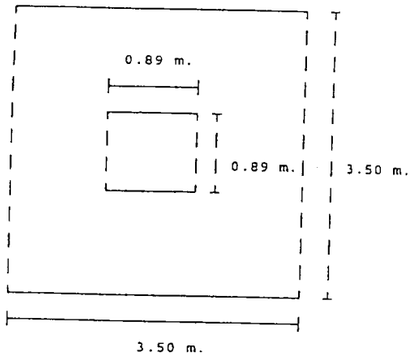
©DIBUJO

* dibujo sin escala



ALZADO

Dirección del eje del tablero



PLANTA

CARACTERISTICAS DE LOS MATERIALES Y CIMENTACION

Fck (Kg/cm²) ..... 250 γcd ... 1.50

Fyk (Kg/cm²) ..... 5100 γyd ... 1.15

Recubrimiento de armaduras ..... 4.0 cms

Tensión admisible del terreno ..... 5.00 Kg/cm²

Coeficiente de rozamiento en cimentación ... 0.55

Coeficiente de seguridad al deslizamiento... 1.50

Coeficiente de seguridad al vuelco 1.50

©ESFUERZOS CONSIDERADOS

* Longitudinal y transversal según la dirección del eje del tablero
* Esfuerzos en t y m.t

Hipótesis	Axil	F.Long	F.Trans	M.Long	M.Trans	γf
1	240.20	1.80	3.81	38.86	52.41	1.50
2	379.30	2.60	0.00	64.35	29.78	1.50
3	336.30	3.64	3.05	102.95	74.08	1.50
4	319.60	12.63	0.00	131.40	25.31	1.50

RESULTADOS DE CALCULO

©Tensiones sobre el Terreno en Kg/cm² y coeficientes de seguridad

Hipótesis	σ1	σ2	σ3	σ4	σcob	Cd	Cv
1	3.63	2.04	2.48	0.89	2.80	39.98	8.51
2	4.76	3.92	2.87	2.04	3.90	88.01	10.79
3	5.64	3.46	2.63	0.46	4.14	56.37	6.08
4	5.31	4.61	1.21	0.50	3.96	15.52	4.26

Tensión cobaricéntrica Máxima 4.14 Kg/cm² para la Hipótesis 3

©Esfuerzos de cálculo

* Esfuerzos en m.t/m y t/m Armaduras en cm²/m

Recubrimiento de armaduras= 4.0 cms

Uc= 1933 t/m

Vcu long..= 149.76 t/m
Vcu trans.= 149.76 t/m

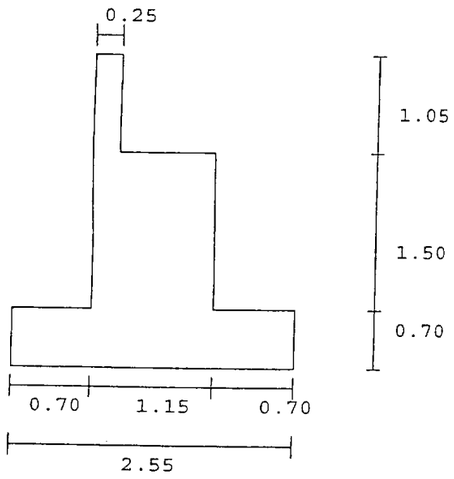
Hipótesis	M.long	M.trans	Ar.long	Ar.trans	Vd long.	Vd Trans.
1	49.37	48.42	9.70	9.52	1.72	1.72
2	65.28	67.53	12.88	13.33	2.43	2.42
3	76.55	78.32	15.14	15.50	2.97	2.96
4	69.22	76.46	13.67	15.12	2.79	2.74

Estructura ....: Reposicion 13 E-10

Estribo .....:E-1

DATOS GEOMETRICOS (sin escala)

* Cotas en mtrs.



Area de la sección 3.77 m²

MATERIALES

Hormigón en zapata y alzado ..... 250 Kg/cm²

Coeficiente de seguridad del hormigón 1.50

Acero en armaduras, zapata y alzado ..... 5100 Kg/cm²

Coeficiente de seguridad del acero 1.15

CARACTERISTICAS DEL TERRENO

Densidad de las tierras (t/m3) 2.00

Coeficiente de empuje activo horizontal 0.33

Tensión admisible del terreno en cimentación (Kg/cm²) 3.0

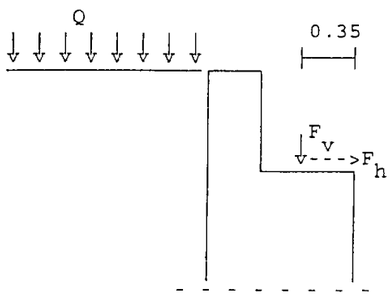
Coeficiente de rozamiento en cota de cimentación 0.55

Coeficiente de seguridad al deslizamiento (Cd) 1.50

Coeficiente de seguridad al vuelco (Cv) 1.80

Altura considerada de empuje de tierras (mtrs.) 3.25

CARGAS ACTUANTES



Reacciones Verticales (Fv t/m)

Cargas Permanentes :	9.95
Sobrecargas Máximas:	12.55
Sobrecargas Mínimas:	0.00
Sobrecarga q (t/m²):	1.00

Reacciones Horizontales (Fh t/m)

Reológicas :	0.38
Temperatura :	0.47
Frenado :	0.40

COMBINACIONES

A) 1.35*(Peso Propio)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

B) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)

C) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Máximas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

D) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Mínimas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

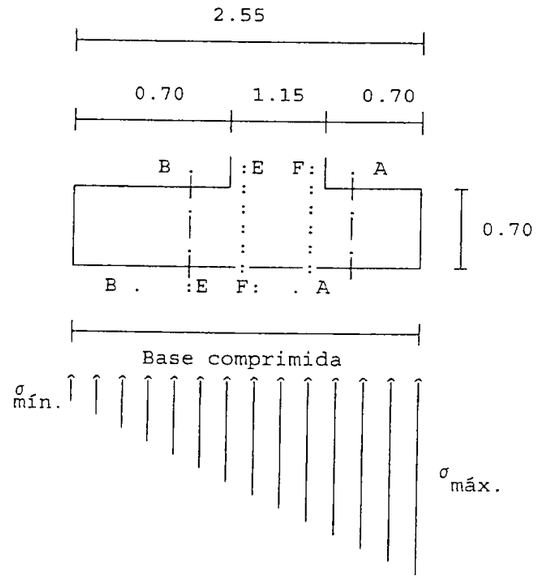
ESFUERZOS DE COMBINACIONES

Combinación	Fv(t/m)	Fh(t/m)	Q(t/m²)
A	0.00 0.00	0.00 0.00	1.00 1.25
B	9.95 13.43	0.85 1.22	1.00 1.50
C	22.50 32.26	1.25 1.31	1.00 1.50
D	9.95 13.43	1.25 1.82	1.00 1.50

COMPROBACION DE ESTABILIDAD:

Hipótesis	ΣFv(t/m)	ΣFh(t/m)	Cd	ΣMe(mt/m)	ΣMv(mt/m)	Cv
A	13.70	4.56	1.65	21.71	5.52	3.93
B	23.65	5.41	2.41	32.16	7.39	4.35
C	36.20	5.81	3.43	45.34	8.27	5.48
D	23.65	5.81	2.24	32.16	8.27	3.89

TENSIONES EN CIMIENTOS



COMPROBACION DE TENSIONES:

Hipótesis	σmáx. (t/m²)	σmín. (t/m²)	σcob. (t/m²)	Base comprimida
A	6.55	4.20	5.80	2.55
B	14.24	4.31	11.29	2.55
C	22.58	5.81	17.68	2.55
D	15.05	3.50	11.71	2.55

ARMADURAS:

ZAPATA

CORTANTE: fcv= 64.55 t/m² (EH-91)

Sección A-A | d = 0.56 m.
Vcu= 72.62 t/m (EH-91)

Sección B-B | d = 0.56 m.
Vcu= 72.62 t/m (EH-91)

FLEXION: | d = 0.65 m.
Uc = 921 t/m

ZAPATA DELANTERA:

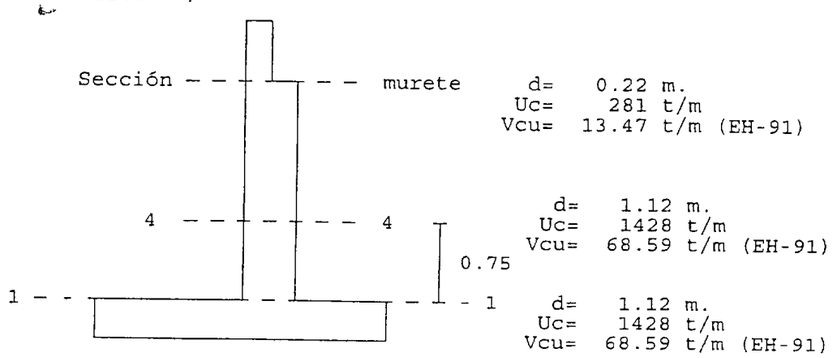
Hipót.	Vd(A-A) (t/m)	Vcu t/m (EHE)	Md(F-F) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	2.64	17.63	2.60	4.01	8.31	2.53
B	6.32	17.63	6.17	9.55	8.31	2.53
C	10.39	17.63	10.18	15.80	8.31	2.53
D	6.71	17.63	6.53	10.10	8.31	2.53

ZAPATA TRASERA:

Hipót.	Vd(B-B) (t/m)	Vcu t/m (EHE)	Md(E-E) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	-2.33	17.63	-2.15	3.32	8.31	2.53
B	-2.10	17.63	-1.76	2.70	8.31	2.53
C	-0.64	17.63	-0.15	0.22	8.31	2.53
D	-2.49	17.63	-2.11	3.26	8.31	2.53

ALZADO

fcv= 61.24 t/m²



SECCION 1-1:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	4.27	28.06	6.71	3.68	3.29	12.88	18.40
B	5.70	30.02	20.14	8.80	7.88	12.88	18.40
C	5.79	32.77	38.97	13.16	11.80	12.88	18.40
D	6.30	30.02	20.14	9.70	8.68	12.88	18.40

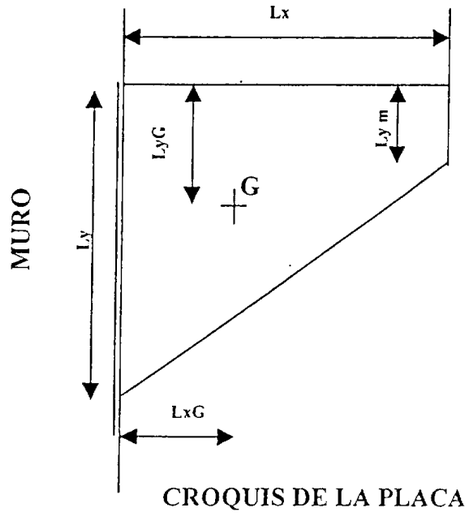
SECCION 4-4:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	2.35	27.64	3.80	1.23	1.10	12.88	18.40
B	3.71	29.60	17.23	5.30	4.74	12.88	18.40
C	3.80	32.35	36.05	9.60	8.60	12.88	18.40
D	4.31	29.60	17.23	5.75	5.14	12.88	18.40

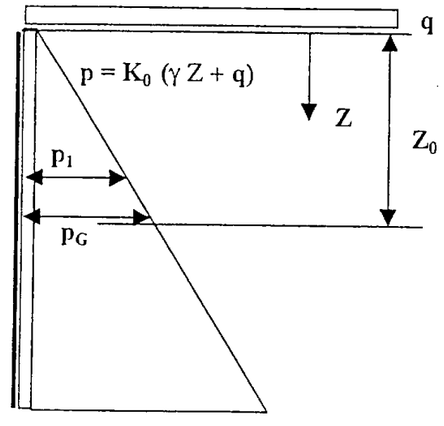
SECCION MURETE:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	0.98	7.23	0.89	0.42	1.91	2.53	4.00
B	1.07	7.23	0.89	0.46	2.12	2.53	4.00
C	1.07	7.23	0.89	0.46	2.12	2.53	4.00
D	1.07	7.23	0.89	0.46	2.12	2.53	4.00

ALETAS MURO DE ESTRIBOS



CROQUIS DE LA PLACA



PRESIONES SOBRE LA PLACA

1, DATOS

GEOMETRIA

Ly_m =	0.500 m
L_Y =	2.600 m
L_X =	2.100 m
L_{YG} =	0.894 m
L_{XG} =	0.813 m
h =	0.300 m
r =	0.035 m
d_x =	0.265 m
d_y =	0.245 m
b = b_w =	1.000 m

EMPUJES

q =	1.80 tm^{-2}
γ =	2.00 tm^{-3}
Φ =	33 º
K_0 =	0.5
$p_1 = K_0 ((L_{y\,m}) \gamma + q)$ =	1.4 tm^{-2}
$p_G = K_0 ((L_{yG})^* \gamma + q)$ =	1.8 tm^{-2}
γ_f =	1.5

MATERIALES

H-30

f_{ck} =	3000 tm^{-2}
γ_c =	1.5
f_{cd} =	2000 tm^{-2}
f_{cv} =	70.7 tm^{-2}

BS500

f_{yk} =	51000 tm^{-2}
γ_y =	1.15
f_{yd} =	44348 tm^{-2}
$f_{y\alpha d}$ =	42000 tm^{-2}

2. DETERMINACIÓN DE LAS SOLICITACIO!

$M_{xGd} = \gamma_f \times A \times p_G \times L_{xG} / L_y$ = 2.7

$M_{x1d} = \gamma_f \times p_1 \times L_x^{\,2} / 2$ = 4.6

$V_{xd} = \gamma_f \times A \times p_G / L_y$ = 3.4

3. DIMENSIONAMIENTO

3,1, FLEXIÓN

ARMADURAS MÍNIMAS :

DIRECCIÓN X : $A_{s\,total} = 1{,}6 / 1000 \times h \times b$ =
$A_{s\,min\,c/cara} = 0{,}53 / 1000 \times h$ ›

DIRECCIÓN Y : $A_{s\,total} = 0{,}9 / 1000 \times h \times b$ =
$A_{s\,min\,c/cara} = 0{,}3 / 1000 \times h$ x

DIRECCIÓN X $U_{cx} = 0.85 \times f_{cd} \times d_x \times b$ =
CARA INTERIOR (TIERRAS)

M_d = 4.6
$U_{s1} = U_c \times (1 - (1 - 2 \times M_d /$
$A_{s1} = U_{s1} / f_{yd}$ =

3.2. CORTANTE

DIRECCIÓN X :

$V_{u1x} = 0{,}30 \times b_w \times d_x f_{cd}$ = 159 t

$Vcu = (0.12\ \xi\ (100\ \rho l\ fck)^{1/3})\ bo\ d$ = 12.4

Vd_x = 3.4 t

$Vd_x < V_{u1x}$
$Vd_x < V_{cux}$ No requiere armaduras de cortante

Prueba de carga de la Estructura E-10

OBJETO DE LA PRUEBA

El objeto de esta prueba consiste en comprobar que la estructura en estudio presenta un comportamiento satisfactorio frente a las sobrecargas de cálculo. Dichas sobrecargas son las definidas en la "Instrucción sobre las acciones a considerar en el Proyecto de Puentes de Carreteras: I.A.P.", dada por Orden Ministerial del 12 de Febrero de 1998.

El tren tipo, definido en dicha Instrucción, ha sido sustituido por camiones, cuyas características se indican mas adelante, que, de acuerdo con las "Recomendaciones para el Proyecto y Ejecución de Pruebas de Carga en Puentes de Carretera" del M.O.P.U., originen esfuerzos **"no mas desfavorables que los del tren de cargas de la Instrucción, estimándose como suficientes si tales esfuerzos oscilan en torno al 60 % de los valores teóricos producidos por el tren de carga de la IAP" (Artículo 6.1 de las Recomendaciones).**

DESCRIPCIÓN DEL ENSAYO Y PLAN DE CARGAS

La estructura a ensayar consiste en un tablero continuo tipo losa maciza, con tres vanos de 13.00m – 17.00 m – 13.00 m , con un ancho total de 7.70 m, y un ancho de plataforma de 6.00 m.

El tablero está formado por una losa maciza de hormigón armado de canto constante 0.90 m y un ancho total de 7.70 m, medidos perpendiculares al eje de replanteo de la estructura. El apoyo de la losa sobre los estribos, se realiza mediante dos aparatos de neopreno, y sobre las pilas se empotra el tablero.

El estudio de los momentos máximos flectores positivos se va a realizar en las situaciones siguientes:

El estudio de los momentos flectores positivos vano 1 en el estado de carga 1.

El estudio de los momentos flectores positivos vano 2 en el estado de carga 2.

Los camiones adoptados corresponden a un vehículo con una carga total de 25.0 toneladas, correspondiendo 7.0 t. al eje delantero y 9 t. a cada uno de los dos ejes traseros, siendo las dimensiones del vehículo:

Ancho total . . . . . 2,50 m.

Ancho de la vía anterior. . . . . .2.00 m.

Ancho de las vías posteriores . . . . 2.00 m.

Longitud total. . . . . 8.40 m.

Voladizo posterior. . . . . 1.85 m.

Distancia eje 1º al 2º. . . . . 3,80 m.

Distancia eje 2º al 3º. . . . . 1,35 m.

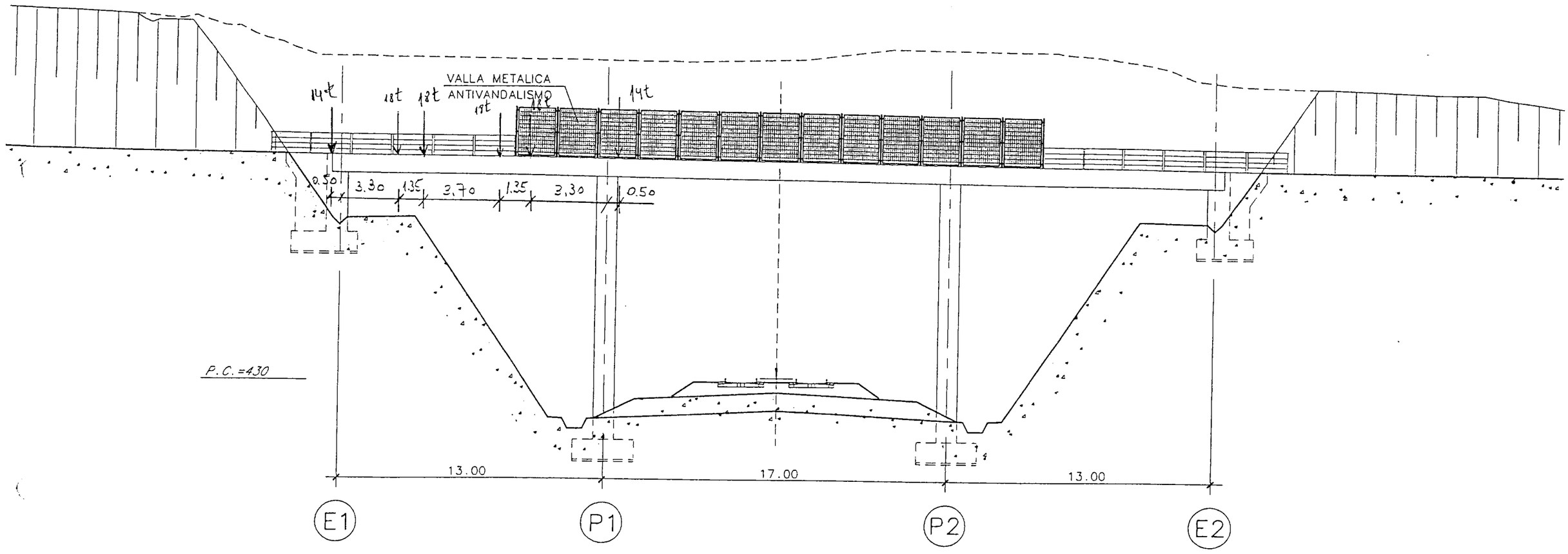
La disposición de los vehículos durante la realización de la prueba de carga será la siguiente:

Para obtener el máximo momento flector positivo en el vano 1 se colocarán 2 filas de dos camiones en paralelo (cuatro camiones en total situados en el centro del vano 1.

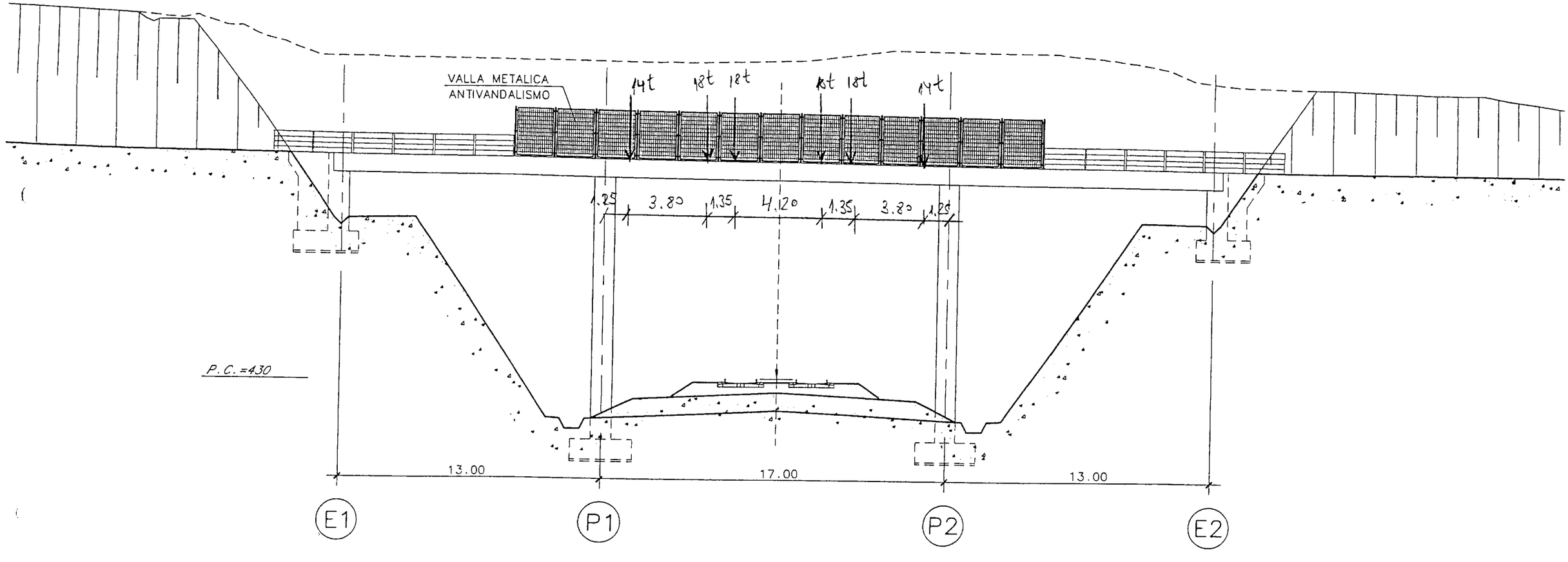
Para obtener el máximo momento flector positivo en el vano 2 se colocarán 2 filas de dos camiones en paralelo (cuatro camiones en total), situados en el centro del vano 2.

Esquemas

ESTADO DE CARGA 1



ESTADO DE CARGA 2



ALZADO

Listados de ordenador

LOADING: 'Y'

Loadcase	Factor	Stage	Init.def	Title
70	1.0000			prueba de carga 1

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-1.08E-12	0	-14.000	0	-7.00E-08	0
	0.500	-1.08E-12	0	-14.000	0	-7.000	0
66	0	-0.221654	0	30.917	0	-7.000	0
	1.300	-0.221654	0	30.917	0	33.192	0
67	0	-0.221654	0	30.917	0	33.192	0
	1.300	-0.221654	0	30.917	0	73.383	0
68	0	-0.221654	0	30.917	0	73.383	0
	0.700	-0.221654	0	30.917	0	95.021	0
	0.700	-0.221654	0	12.917	0	95.027	0
	1.300	-0.221654	0	12.917	0	102.775	0
69	0	-0.221654	0	12.917	0	102.775	0
	0.750	-0.221654	0	12.917	0	112.461	0
	0.750	-0.221654	0	-5.083	0	112.462	0
	1.300	-0.221654	0	-5.083	0	109.667	0
70	0	-0.221654	0	-5.083	0	109.667	0
	1.300	-0.221654	0	-5.083	0	103.058	0
71	0	-0.221654	0	-5.083	0	103.058	0
	1.300	-0.221654	0	-5.083	0	96.450	0
72	0	-0.221654	0	-5.083	0	96.450	0
	0.550	-0.221654	0	-5.083	0	93.655	0
	0.550	-0.221654	0	-23.083	0	93.651	0
	1.300	-0.221654	0	-23.083	0	76.341	0
73	0	-0.221654	0	-23.083	0	76.341	0
	0.600	-0.221654	0	-23.083	0	62.494	0
	0.600	-0.221654	0	-41.083	0	62.486	0
	1.300	-0.221654	0	-41.083	0	33.733	0
74	0	-0.221654	0	-41.083	0	33.733	0
	1.300	-0.221654	0	-41.083	0	-19.675	0
75	0	-0.221654	0	-41.083	0	-19.675	0
	1.300	-0.221654	0	-41.083	0	-73.084	0
76	0	0.974456	0	18.139	0	-61.502	0
	0.500	0.974456	0	18.139	0	-52.435	0
	0.500	0.974456	0	4.139	0	-52.432	0
	1.700	0.974456	0	4.139	0	-47.465	0

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
77	0	0.974456	0	4.139	0	-47.465	0
	1.700	0.974456	0	4.139	0	-40.429	0
78	0	0.974456	0	4.139	0	-40.429	0
	1.700	0.974456	0	4.139	0	-33.392	0
79	0	0.974456	0	4.139	0	-33.392	0
	1.700	0.974456	0	4.139	0	-26.356	0
80	0	0.974456	0	4.139	0	-26.356	0
	1.700	0.974456	0	4.139	0	-19.319	0
81	0	0.974456	0	4.139	0	-19.319	0
	1.700	0.974456	0	4.139	0	-12.283	0
82	0	0.974456	0	4.139	0	-12.283	0
	1.700	0.974456	0	4.139	0	-5.247	0
83	0	0.974456	0	4.139	0	-5.247	0
	1.700	0.974456	0	4.139	0	1.790	0
84	0	0.974456	0	4.139	0	1.790	0
	1.700	0.974456	0	4.139	0	8.826	0
85	0	0.974456	0	4.139	0	8.826	0
	1.700	0.974456	0	4.139	0	15.863	0
86	0	0.221233	0	-0.791433	0	10.289	0
	1.300	0.221233	0	-0.791433	0	9.260	0
87	0	0.221233	0	-0.791433	0	9.260	0
	1.300	0.221233	0	-0.791433	0	8.231	0
88	0	0.221233	0	-0.791433	0	8.231	0
	1.300	0.221233	0	-0.791433	0	7.202	0
89	0	0.221233	0	-0.791433	0	7.202	0
	1.300	0.221233	0	-0.791433	0	6.173	0
90	0	0.221233	0	-0.791433	0	6.173	0
	1.300	0.221233	0	-0.791433	0	5.144	0
91	0	0.221233	0	-0.791433	0	5.144	0
	1.300	0.221233	0	-0.791433	0	4.115	0
92	0	0.221233	0	-0.791433	0	4.115	0
	1.300	0.221233	0	-0.791433	0	3.087	0
93	0	0.221233	0	-0.791433	0	3.087	0
	1.300	0.221233	0	-0.791433	0	2.058	0

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
94	0	0.221233	0	-0.791433	0	2.058	0
	1.300	0.221233	0	-0.791433	0	1.029	0
95	0	0.221233	0	-0.791433	0	1.029	0
	1.300	0.221233	0	-0.791433	0	1.03E-08	0
96	0	1.20E-12	0	3.24E-14	0	-4.26E-14	0
	0.500	1.20E-12	0	3.24E-14	0	-2.64E-14	0
290	0	-59.222	-1.196	0	0	0	4.207
	13.200	-59.222	-1.196	0	0	0	-11.582
291	0	4.931	0.753222	0	0	0	-4.368
	13.200	4.931	0.753222	0	0	0	5.574
	min:	-59.222	-1.196	-41.083	0	-73.084	-11.582
	max:	4.931	0.753222	30.917	0	112.462	5.574

Loadcase	Factor	Stage	Init.def	Title
71	1.0000			prueba de carga 2

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-5.76E-16	0	2.08E-13	0	-6.69E-14	0
	0.500	-5.76E-16	0	2.08E-13	0	3.70E-14	0
66	0	-0.000904	0	-6.559	0	-8.53E-08	0
	1.300	-0.000904	0	-6.559	0	-8.527	0
67	0	-0.000904	0	-6.559	0	-8.527	0
	1.300	-0.000904	0	-6.559	0	-17.053	0
68	0	-0.000904	0	-6.559	0	-17.053	0
	1.300	-0.000904	0	-6.559	0	-25.580	0
69	0	-0.000904	0	-6.559	0	-25.580	0
	1.300	-0.000904	0	-6.559	0	-34.106	0
70	0	-0.000904	0	-6.559	0	-34.106	0
	1.300	-0.000904	0	-6.559	0	-42.633	0
71	0	-0.000904	0	-6.559	0	-42.633	0
	1.300	-0.000904	0	-6.559	0	-51.160	0

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
72	0	-0.000904	0	-6.559	0	-51.160	0
	1.300	-0.000904	0	-6.559	0	-59.686	0
73	0	-0.000904	0	-6.559	0	-59.686	0
	1.300	-0.000904	0	-6.559	0	-68.213	0
74	0	-0.000904	0	-6.559	0	-68.213	0
	1.300	-0.000904	0	-6.559	0	-76.740	0
75	0	-0.000904	0	-6.559	0	-76.740	0
	1.300	-0.000904	0	-6.559	0	-85.266	0
76	0	-2.308	0	49.820	0	-105.568	0
	1.250	-2.308	0	49.820	0	-43.301	0
	1.250	-2.308	0	35.820	0	-43.286	0
	1.700	-2.308	0	35.820	0	-27.173	0
77	0	-2.308	0	35.820	0	-27.173	0
	1.700	-2.308	0	35.820	0	33.722	0
78	0	-2.308	0	35.820	0	33.722	0
	1.650	-2.308	0	35.820	0	92.819	0
	1.650	-2.308	0	17.820	0	92.828	0
	1.700	-2.308	0	17.820	0	93.716	0
79	0	-2.308	0	17.820	0	93.716	0
	1.350	-2.308	0	17.820	0	117.771	0
	1.350	-2.308	0	-0.179549	0	117.774	0
	1.700	-2.308	0	-0.179549	0	117.711	0
80	0	-2.308	0	-0.179549	0	117.711	0
	1.700	-2.308	0	-0.179549	0	117.406	0
81	0	-2.308	0	-0.179549	0	117.406	0
	1.700	-2.308	0	-0.179549	0	117.101	0
82	0	-2.308	0	-0.179549	0	117.101	0
	0.450	-2.308	0	-0.179549	0	117.020	0
	0.450	-2.308	0	-18.180	0	117.017	0
	1.700	-2.308	0	-18.180	0	94.295	0
83	0	-2.308	0	-18.180	0	94.295	0
	0.0998	-2.308	0	-18.180	0	92.480	0
	0.100	-2.308	0	-36.180	0	92.471	0
	1.700	-2.308	0	-36.180	0	34.590	0
84	0	-2.308	0	-36.180	0	34.590	0
	1.700	-2.308	0	-36.180	0	-26.915	0
85	0	-2.308	0	-36.180	0	-26.915	0
	0.450	-2.308	0	-36.180	0	-43.196	0

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
85	0.450	-2.308	0	-50.180	0	-43.204	0
	1.700	-2.308	0	-50.180	0	-105.920	0
86	0	0.001901	0	6.583	0	-85.581	0
	1.300	0.001901	0	6.583	0	-77.022	0
87	0	0.001901	0	6.583	0	-77.022	0
	1.300	0.001901	0	6.583	0	-68.464	0
88	0	0.001901	0	6.583	0	-68.464	0
	1.300	0.001901	0	6.583	0	-59.906	0
89	0	0.001901	0	6.583	0	-59.906	0
	1.300	0.001901	0	6.583	0	-51.348	0
90	0	0.001901	0	6.583	0	-51.348	0
	1.300	0.001901	0	6.583	0	-42.790	0
91	0	0.001901	0	6.583	0	-42.790	0
	1.300	0.001901	0	6.583	0	-34.232	0
92	0	0.001901	0	6.583	0	-34.232	0
	1.300	0.001901	0	6.583	0	-25.674	0
93	0	0.001901	0	6.583	0	-25.674	0
	1.300	0.001901	0	6.583	0	-17.116	0
94	0	0.001901	0	6.583	0	-17.116	0
	1.300	0.001901	0	6.583	0	-8.558	0
95	0	0.001901	0	6.583	0	-8.558	0
	1.300	0.001901	0	6.583	0	-8.56E-08	0
96	0	1.33E-14	0	1.27E-13	0	2.77E-13	0
	0.500	1.33E-14	0	1.27E-13	0	3.40E-13	0
290	0	-56.379	2.308	0	0	0	-10.157
	13.200	-56.379	2.308	0	0	0	20.302
291	0	-56.763	-2.310	0	0	0	10.156
	13.200	-56.763	-2.310	0	0	0	-20.340
	min:	-56.763	-2.310	-50.180	0	-105.920	-20.340
	max:	0.001901	2.308	49.820	0	117.774	20.302

ENVELOPE SPECIFIC.: EU 'COMBINACION SOBRECARGAS'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	0		PESO PROPIC
B	PLUS	6	1.000		SOB UNIF 1
C	PLUS	7	1.000		SOBRECARGA UNIF 2
D	PLUS	8	1.000		SOB UNIF 3
E	PLUS	11	1.000		VEHICULO HIPOTESIS 11
F	OR	12	1.000		VEHICULO HIPOTESIS 12
G	OR	13	1.000		VEHICULO HIPOTESIS 13
H	OR	14	1.000		VEHICULO HIPOTESIS 14
I	OR	15	1.000		VEHICULO HIPOTESIS 15
J	OR	16	1.000		VEHICULO HIPOTESIS 16
K	OR	17	1.000		VEHICULO HIPOTESIS 17
L	OR	18	1.000		VEHICULO HIPOTESIS 18
M	OR	19	1.000		VEHICULO HIPOTESIS 19
N	OR	20	1.000		VEHICULO HIPOTESIS 20
O	OR	21	1.000		VEHICULO HIPOTESIS 21
P	OR	22	1.000		VEHICULO HIPOTESIS 22
Q	OR	23	1.000		VEHICULO HIPOTESIS 23
R	OR	24	1.000		VEHICULO HIPOTESIS 24
S	OR	25	1.000		VEHICULO POSICION 25
T	OR	26	1.000		VEHICULO POSICION 26
U	OR	27	1.000		VEHICULO POSICION 27
V	OR	28	1.000		VEHICULO POSICION 28
W	OR	29	1.000		VEHICULO POSICION 29
X	OR	30	1.000		VEHICULO POSICION 30
Y	OR	31	1.000		VEHICULO POSICION 31
Z	OR	32	1.000		VEHICULO POSICION 32
AA	OR	33	1.000		VEHICULO POSICION 33
AB	OR	34	1.000		VEHICULO POSICION 34
AC	OR	35	1.000		VEHICULO POSICION 35
AD	OR	36	1.000		VEHICULO POSICION 36
AE	OR	37	1.000		VEHICULO HIPOTESIS 37

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-2.54E-15	-1.18E-10	6.15E-14	1.18E-13	-4.34E-14	6.30E-10
		1.15E-12	4.13E-09	-1.60E-08	-2.26E-13	6.50E-13	-5.95E-10
	Min: A C I				Max: A B D F		
65	0.500	-2.78E-13	4.08E-09	-1.600	2.11E-13	-0.400000	1.45E-09
		1.54E-12	4.13E-09	-5.15E-13	-2.26E-13	6.97E-14	1.47E-09
	Min: A E C E				Max: A D F		
66	0	-0.107566	-3.294	9.523	4.15E-14	-0.400000	-4.52E-08
		0.003163	-3.875	47.002	-3.19E-14	6.11E-07	-5.28E-08
	Min: A B C I				Max: A D E		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
66	1.300	0.000661	-3.294	-8.769	4.15E-14	-11.400	-4.282
		-0.105066	-3.875	41.135	30.000	72.779	-5.037
		Min: A C I			Max: A B D E		
67	0	0.000661	-3.294	-8.769	4.15E-14	-11.400	-4.282
		-0.105066	-3.875	41.135	30.000	72.779	-5.037
		Min: A C I			Max: A B D E		
67	1.300	0.000661	-3.294	-8.769	4.15E-14	-22.800	-8.565
		-0.105066	-3.875	16.975	60.000	118.550	-10.074
		Min: A C I			Max: A B D E		
68	0	0.000661	-3.294	-8.769	4.15E-14	-22.800	-8.565
		-0.105066	-3.875	16.975	60.000	118.550	-10.074
		Min: A C I			Max: A B D E		
68	1.300	0.000661	-3.294	-8.769	4.15E-14	-34.199	-12.847
		-0.224418	-3.875	30.822	4.82E-14	144.142	-15.112
		Min: A C I			Max: A B D F		
69	0	0.000661	-3.294	-8.769	2.80E-13	-34.199	-12.847
		-0.224418	-3.875	30.822	3.79E-13	144.142	-15.112
		Min: A C I			Max: A B D F		
69	1.300	0.000661	-3.294	-8.769	2.80E-13	-45.599	-17.129
		-0.224418	-3.875	6.662	30.000	177.506	-20.149
		Min: A C I			Max: A B D F		
70	0	0.000661	-3.294	-8.769	2.85E-13	-45.599	-17.129
		-0.224418	-3.875	6.662	30.000	177.506	-20.149
		Min: A C I			Max: A B D F		
70	1.300	0.000661	-3.294	-8.769	2.85E-13	-56.999	-21.411
		-0.224418	-3.875	2.502	30.000	183.463	-25.186
		Min: A C I			Max: A B D F		
71	0	0.000661	-3.294	-8.769	3.84E-14	-56.999	-21.411
		-0.224418	-3.875	-17.498	60.000	183.463	-25.186
		Min: A C I			Max: A B D F		
71	1.300	0.000661	-3.294	-8.769	3.84E-14	-68.399	-25.694
		-0.224418	-3.875	-21.658	60.000	158.011	-30.223
		Min: A C I			Max: A B D F		
72	0	0.000661	-3.294	-8.769	-2.62E-13	-68.399	-25.694
		-0.224418	-3.875	-21.658	60.000	158.011	-30.223
		Min: A C I			Max: A B D F		
72	1.300	0.000661	-3.294	-8.769	-2.62E-13	-79.798	-29.976
		-0.224418	-3.875	-45.818	90.000	105.152	-35.260
		Min: A C I			Max: A B D F		
73	0	0.000661	-3.294	-8.769	-4.31E-13	-79.798	-29.976
		-0.224418	-3.875	-45.818	90.000	105.152	-35.260
		Min: A C I			Max: A B D F		
73	1.300	0.000661	-3.294	-8.769	-4.31E-13	-91.198	-34.258

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.158576	-3.875	-27.252	30.000	72.235	-40.298
		Min: A C I			Max: A E D G		
74	0	0.000661	-3.294	-8.769	-7.42E-13	-91.198	-34.258
		-0.158576	-3.875	-27.252	30.000	72.235	-40.298
		Min: A C I			Max: A E D G		
74	1.300	-0.107568	-3.294	-27.917	-7.42E-13	-108.002	-38.540
		-0.050347	-3.875	-32.264	60.000	18.507	-45.335
		Min: A E C I			Max: A D G		
75	0	-0.107568	-3.294	-27.917	-9.21E-13	-108.002	-38.540
		-0.050347	-3.875	-32.264	60.000	18.507	-45.335
		Min: A E C I			Max: A D G		
75	1.300	-0.107568	-3.294	-32.077	-9.21E-13	-146.998	-42.823
		0.331790	-2.713	1.301	-7.30E-13	16.919	-35.273
		Min: A E C I			Max: A D L		
76	0	-2.577	1.37E-09	59.279	-45.000	-168.219	-42.740
		1.500	-0.971664	-6.533	-30.231	25.623	-34.481
		Min: A E C I			Max: A D L		
76	1.700	0.325916	0.971664	28.293	30.231	-86.370	-49.348
		-0.415103	0.703027	31.139	-25.686	24.920	-47.521
		Min: A E C F			Max: A D H		
77	0	0.325916	0.971664	28.293	30.231	-86.370	-49.348
		-0.415103	0.703027	31.139	-25.686	24.920	-47.521
		Min: A E C F			Max: A D H		
77	1.700	1.500	0.971664	6.533	30.231	-63.225	-47.696
		-1.590	0.703027	27.459	4.314	77.185	-46.326
		Min: A E F			Max: A C D H		
78	0	1.500	0.971664	6.533	30.231	-63.225	-47.696
		-1.590	0.703027	27.459	4.314	77.185	-46.326
		Min: A E F			Max: A C D H		
78	1.700	1.983	0.971664	4.454	30.231	-54.666	-46.044
		-3.060	1.10E-09	40.880	-45.000	109.171	-42.740
		Min: A E D F			Max: A C I		
79	0	1.983	0.971664	4.454	30.231	-54.666	-46.044
		-3.060	9.75E-10	40.880	-45.000	109.171	-42.740
		Min: A E D F			Max: A C I		
79	1.700	1.983	0.971664	4.454	30.231	-47.094	-44.392
		-3.060	9.75E-10	35.440	-45.000	174.043	-42.740
		Min: A E D F			Max: A C I		
80	0	1.983	0.971664	4.454	30.231	-47.094	-44.392
		-3.060	9.34E-10	35.440	-45.000	174.043	-42.740
		Min: A E D F			Max: A C I		
80	1.700	1.983	0.971664	4.454	30.231	-39.522	-42.740
		-3.060	9.34E-10	10.000	-15.000	199.667	-42.740

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A E D F			Max: A C I		
81	0	1.983	-0.971664	-4.454	-30.231	-39.522	-42.740
		-3.060	8.59E-10	-10.000	15.000	199.667	-42.740
		Min: A E D L			Max: A C I		
81	1.700	1.983	-0.971664	-4.454	-30.231	-47.094	-44.392
		-3.060	8.59E-10	-35.440	45.000	174.043	-42.740
		Min: A E D L			Max: A C I		
82	0	1.983	-0.971664	-4.454	-30.231	-47.094	-44.392
		-3.060	8.59E-10	-35.440	45.000	174.043	-42.740
		Min: A E D L			Max: A C I		
82	1.700	1.983	-0.971664	-4.454	-30.231	-54.666	-46.044
		-3.060	8.28E-10	-40.880	45.000	109.171	-42.740
		Min: A E D L			Max: A C I		
83	0	1.983	-0.971664	-4.454	-30.231	-54.666	-46.044
		-3.060	8.43E-10	-40.880	45.000	109.171	-42.740
		Min: A E D L			Max: A C I		
83	1.700	1.500	-0.971664	-6.533	-30.231	-63.225	-47.696
		-1.590	-0.703027	-27.459	-4.314	77.185	-46.326
		Min: A D L			Max: A B C J		
84	0	1.500	-0.971664	-6.533	-30.231	-63.225	-47.696
		-1.590	-0.703027	-27.459	-4.314	77.185	-46.326
		Min: A D L			Max: A B C J		
84	1.700	0.325916	-0.971664	-28.293	-30.231	-86.370	-49.348
		-0.415103	-0.703027	-31.139	25.686	24.920	-47.521
		Min: A C D L			Max: A E J		
85	0	0.325916	-0.971664	-28.293	-30.231	-86.370	-49.348
		-0.415103	-0.703027	-31.139	25.686	24.920	-47.521
		Min: A C D L			Max: A E J		
85	1.700	-2.577	7.33E-10	-59.279	45.000	-168.219	-42.740
		1.500	0.971664	6.533	30.231	25.623	-34.481
		Min: A C D I			Max: A E F		
86	0	-0.107568	3.294	32.077	-3.27E-13	-146.998	-42.823
		0.331790	2.713	-1.301	-2.40E-13	16.919	-35.273
		Min: A C D I			Max: A E F		
86	1.300	-0.107568	3.294	27.917	-3.27E-13	-108.002	-38.540
		-0.050347	3.875	32.264	-60.000	18.507	-45.335
		Min: A C D I			Max: A E K		
87	0	-0.107568	3.294	27.917	-1.02E-13	-108.002	-38.540
		-0.050347	3.875	32.264	-60.000	18.507	-45.335
		Min: A C D I			Max: A E K		
87	1.300	0.000661	3.294	8.769	-1.02E-13	-91.198	-34.258
		-0.158576	3.875	27.252	-30.000	72.235	-40.298
		Min: A C I			Max: A E D K		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
88	0	0.000661	3.294	8.769	9.81E-14	-91.198	-34.258
		-0.158576	3.875	27.252	-30.000	72.235	-40.298
		Min: A C I			Max: A E D K		
88	1.300	0.000661	3.294	8.769	9.81E-14	-79.798	-29.976
		-0.224418	3.875	45.818	-90.000	105.152	-35.260
		Min: A C I			Max: A B D L		
89	0	0.000661	3.294	8.769	3.92E-13	-79.798	-29.976
		-0.224418	3.875	45.818	-90.000	105.152	-35.260
		Min: A C I			Max: A B D L		
89	1.300	0.000661	3.294	8.769	3.92E-13	-68.399	-25.694
		-0.224418	3.875	21.658	-60.000	158.011	-30.223
		Min: A C I			Max: A B D L		
90	0	0.000661	3.294	8.769	2.24E-13	-68.399	-25.694
		-0.224418	3.875	21.658	-60.000	158.011	-30.223
		Min: A C I			Max: A B D L		
90	1.300	0.000661	3.294	8.769	2.24E-13	-56.999	-21.411
		-0.224418	3.875	17.498	-60.000	183.463	-25.186
		Min: A C I			Max: A B D L		
91	0	0.000661	3.294	8.769	-3.16E-15	-56.999	-21.411
		-0.224418	3.875	-2.502	-30.000	183.463	-25.186
		Min: A C I			Max: A B D L		
91	1.300	0.000661	3.294	8.769	-3.16E-15	-45.599	-17.129
		-0.224418	3.875	-6.662	-30.000	177.506	-20.149
		Min: A C I			Max: A B D L		
92	0	0.000661	3.294	8.769	1.72E-13	-45.599	-17.129
		-0.224418	3.875	-6.662	-30.000	177.506	-20.149
		Min: A C I			Max: A B D L		
92	1.300	0.000661	3.294	8.769	1.72E-13	-34.199	-12.847
		-0.224418	3.875	-30.822	1.07E-14	144.142	-15.112
		Min: A C I			Max: A B D L		
93	0	0.000661	3.294	8.769	1.16E-13	-34.199	-12.847
		-0.224418	3.875	-30.822	1.64E-13	144.142	-15.112
		Min: A C I			Max: A B D L		
93	1.300	0.000661	3.294	8.769	1.16E-13	-22.800	-8.565
		-0.105066	3.875	-16.975	-60.000	118.550	-10.074
		Min: A C I			Max: A B D M		
94	0	0.000661	3.294	8.769	1.80E-13	-22.800	-8.565
		-0.105066	3.875	-16.975	-60.000	118.550	-10.074
		Min: A C I			Max: A B D M		
94	1.300	0.000661	3.294	8.769	1.80E-13	-11.400	-4.282
		-0.105066	3.875	-41.135	-30.000	72.779	-5.037
		Min: A C I			Max: A B D M		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
95	0	0.000661	3.294	8.769	3.55E-13	-11.400	-4.282
		-0.105066	3.875	-41.135	-30.000	72.779	-5.037
		Min: A C I			Max: A B D M		
95	1.300	-0.107568	3.294	-9.523	3.55E-13	-0.400000	-4.48E-08
		0.003163	3.875	-47.002	6.86E-13	6.11E-07	-5.25E-08
		Min: A C D I			Max: A B M		
96	0	3.03E-12	4.65E-09	1.600	7.37E-13	-0.400000	1.27E-11
		9.19E-16	4.71E-09	2.08E-13	-1.61E-13	2.07E-13	-3.66E-10
		Min: A B D L			Max: A C I		
96	0.500	1.22E-12	4.76E-09	1.60E-08	5.56E-13	-1.64E-12	2.37E-09
		9.19E-16	4.71E-09	2.08E-13	-1.61E-13	3.11E-13	1.99E-09
		Min: A B D M			Max: A C I		
290	0	3.345	-0.520912	-1.742	-0.791553	-7.242	3.045
		3.345	-0.520912	1.742	0.791553	7.242	3.045
		Min: A AC			Max: A K		
290	13.200	-15.522	-0.585552	-4.846	0.627517	-59.769	-5.652
		-15.522	-0.585552	4.846	-0.627517	59.769	-5.652
		Min: A W			Max: A E		
291	0	3.345	0.520912	-1.742	0.791553	-7.242	-3.045
		3.345	0.520912	1.742	-0.791553	7.242	-3.045
		Min: A Y			Max: A G		
291	13.200	-55.500	0.837354	-4.846	-0.627517	-59.769	8.123
		-55.500	0.837354	4.846	0.627517	59.769	8.123
		Min: A AC			Max: A K		

LOADING: 'Y'

Loadcase	Factor	Stage	Init.def	Title
70	1.0000			prueba de carga 1

Displacements (in global coordinate directions): *ALL*

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
65	0	0	-5.70E-4	2.49E-4	-4.98E-4	0	0
65	0.500	0	-5.70E-4	2.5E-12	-5.00E-4	0	0
66	0	0	-5.70E-4	-6.5E-12	-5.00E-4	0	0
66	1.300	0	-5.70E-4	-6.44E-4	-4.82E-4	0	0
67	0	0	-5.70E-4	-6.44E-4	-4.82E-4	0	0
67	1.300	0	-5.70E-4	-0.00123	-4.08E-4	0	0
68	0	0	-5.70E-4	-0.00123	-4.08E-4	0	0
68	1.300	0	-5.70E-4	-0.00168	-2.83E-4	0	0
69	0	0	-5.70E-4	-0.00168	-2.83E-4	0	0
69	1.300	0	-5.70E-4	-0.00195	-1.32E-4	0	0
70	0	0	-5.70E-4	-0.00195	-1.32E-4	0	0
70	1.300	0	-5.70E-4	-0.00203	1.48E-5	0	0
71	0	0	-5.70E-4	-0.00203	1.48E-5	0	0
71	1.300	0	-5.70E-4	-0.00192	1.52E-4	0	0
72	0	0	-5.70E-4	-0.00192	1.52E-4	0	0
72	1.300	0	-5.70E-4	-0.00164	2.76E-4	0	0
73	0	0	-5.70E-4	-0.00164	2.76E-4	0	0
73	1.300	0	-5.70E-4	-0.00122	3.56E-4	0	0
74	0	0	-5.70E-4	-0.00122	3.56E-4	0	0
74	1.300	0	-5.70E-4	-7.44E-4	3.65E-4	0	0
75	0	0	-5.70E-4	-7.44E-4	3.65E-4	0	0
75	1.300	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
76	0	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
76	1.700	0	-5.70E-4	1.27E-4	2.07E-4	0	0
77	0	0	-5.70E-4	1.27E-4	2.07E-4	0	0
77	1.700	0	-5.69E-4	4.11E-4	1.28E-4	0	0
78	0	0	-5.69E-4	4.11E-4	1.28E-4	0	0
78	1.700	0	-5.69E-4	5.70E-4	6.15E-5	0	0
79	0	0	-5.69E-4	5.70E-4	6.15E-5	0	0
79	1.700	0	-5.69E-4	6.27E-4	7.55E-6	0	0

Displacements (in global coordinate directions): *ALL*

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
80	0	0	-5.69E-4	6.27E-4	7.55E-6	0	0
80	1.700	0	-5.69E-4	6.03E-4	-3.37E-5	0	0
81	0	0	-5.69E-4	6.03E-4	-3.37E-5	0	0
81	1.700	0	-5.69E-4	5.19E-4	-6.22E-5	0	0
82	0	0	-5.69E-4	5.19E-4	-6.22E-5	0	0
82	1.700	0	-5.69E-4	3.98E-4	-7.80E-5	0	0
83	0	0	-5.69E-4	3.98E-4	-7.80E-5	0	0
83	1.700	0	-5.69E-4	2.61E-4	-8.12E-5	0	0
84	0	0	-5.69E-4	2.61E-4	-8.12E-5	0	0
84	1.700	0	-5.69E-4	1.30E-4	-7.16E-5	0	0
85	0	0	-5.69E-4	1.30E-4	-7.16E-5	0	0
85	1.700	0	-5.69E-4	2.52E-5	-4.93E-6	0	0
86	0	0	-5.69E-4	2.52E-5	-4.93E-6	0	0
86	1.300	0	-5.69E-4	-3.00E-5	-3.58E-5	0	0
87	0	0	-5.69E-4	-3.00E-5	-3.58E-5	0	0
87	1.300	0	-5.69E-4	-6.85E-5	-2.37E-5	0	0
88	0	0	-5.69E-4	-6.85E-5	-2.37E-5	0	0
88	1.300	0	-5.69E-4	-9.23E-5	-1.31E-5	0	0
89	0	0	-5.69E-4	-9.23E-5	-1.31E-5	0	0
89	1.300	0	-5.69E-4	-1.03E-4	-3.83E-6	0	0
90	0	0	-5.69E-4	-1.03E-4	-3.83E-6	0	0
90	1.300	0	-5.69E-4	-1.03E-4	3.95E-6	0	0
91	0	0	-5.69E-4	-1.03E-4	3.95E-6	0	0
91	1.300	0	-5.69E-4	-9.34E-5	1.04E-5	0	0
92	0	0	-5.69E-4	-9.34E-5	1.04E-5	0	0
92	1.300	0	-5.68E-4	-7.65E-5	1.53E-5	0	0
93	0	0	-5.68E-4	-7.65E-5	1.53E-5	0	0
93	1.300	0	-5.68E-4	-5.41E-5	1.89E-5	0	0
94	0	0	-5.68E-4	-5.41E-5	1.89E-5	0	0
94	1.300	0	-5.68E-4	-2.80E-5	2.10E-5	0	0
95	0	0	-5.68E-4	-2.80E-5	2.10E-5	0	0
95	1.300	0	-5.68E-4	-2.9E-13	2.17E-5	0	0
96	0	0	-5.68E-4	1.1E-13	2.17E-5	0	0
96	0.500	0	-5.68E-4	1.09E-5	2.17E-5	0	0

Displacements (in global coordinate directions): *ALL*

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
290	0	0	2.3E-19	-3.0E-12	-3.4E-12	0	0
290	13.200	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
291	0	0	-2.4E-19	2.9E-13	3.6E-12	0	0
291	13.200	0	-5.69E-4	2.52E-5	-4.93E-5	0	0
	min:	0	-0.000570	-0.002029	-0.000500	0	0
	max:	0	2.27E-19	0.000627	0.000365	0	0

Loadcase	Factor	Stage	Init.def	Title
71	1.0000			prueba de carga 2

Displacements (in global coordinate directions): *ALL*

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
65	0	0	-2.32E-6	-8.70E-5	1.74E-4	0	0
65	0.500	0	-2.32E-6	-8.7E-13	1.74E-4	0	0
66	0	0	-2.32E-6	2.3E-12	1.74E-4	0	0
66	1.300	0	-2.32E-6	2.24E-4	1.68E-4	0	0
67	0	0	-2.32E-6	2.24E-4	1.68E-4	0	0
67	1.300	0	-2.32E-6	4.32E-4	1.51E-4	0	0
68	0	0	-2.32E-6	4.32E-4	1.51E-4	0	0
68	1.300	0	-2.32E-6	6.10E-4	1.21E-4	0	0
69	0	0	-2.32E-6	6.10E-4	1.21E-4	0	0
69	1.300	0	-2.32E-6	7.42E-4	7.99E-5	0	0
70	0	0	-2.32E-6	7.42E-4	7.99E-5	0	0
70	1.300	0	-2.32E-6	8.13E-4	2.69E-5	0	0
71	0	0	-2.32E-6	8.13E-4	2.69E-5	0	0
71	1.300	0	-2.32E-6	8.07E-4	-3.78E-5	0	0
72	0	0	-2.32E-6	8.07E-4	-3.78E-5	0	0
72	1.300	0	-2.32E-6	7.09E-4	-1.14E-4	0	0
73	0	0	-2.32E-6	7.09E-4	-1.14E-4	0	0
73	1.300	0	-2.32E-6	5.04E-4	-2.03E-4	0	0
74	0	0	-2.32E-6	5.04E-4	-2.03E-4	0	0
74	1.300	0	-2.32E-6	1.77E-4	-3.03E-4	0	0

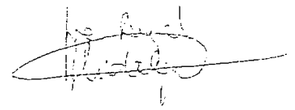
Displacements (in global coordinate directions): *ALL*

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
75	0	0	-2.32E-6	1.77E-4	-3.03E-4	0	0
75	1.300	0	-2.32E-6	-2.88E-4	-4.15E-4	0	0
76	0	0	-2.32E-6	-2.88E-4	-4.15E-4	0	0
76	1.700	0	-2.58E-6	-0.00111	-5.30E-4	0	0
77	0	0	-2.58E-6	-0.00111	-5.30E-4	0	0
77	1.700	0	-2.84E-6	-0.00202	-5.24E-4	0	0
78	0	0	-2.84E-6	-0.00202	-5.24E-4	0	0
78	1.700	0	-3.09E-6	-0.00283	-4.08E-4	0	0
79	0	0	-3.09E-6	-0.00283	-4.08E-4	0	0
79	1.700	0	-3.35E-6	-0.00337	-2.13E-4	0	0
80	0	0	-3.35E-6	-0.00337	-2.13E-4	0	0
80	1.700	0	-3.61E-6	-0.00355	-8.32E-7	0	0
81	0	0	-3.61E-6	-0.00355	-8.32E-7	0	0
81	1.700	0	-3.86E-6	-0.00337	2.11E-4	0	0
82	0	0	-3.86E-6	-0.00337	2.11E-4	0	0
82	1.700	0	-4.12E-6	-0.00284	4.07E-4	0	0
83	0	0	-4.12E-6	-0.00284	4.07E-4	0	0
83	1.700	0	-4.37E-6	-0.00203	5.25E-4	0	0
84	0	0	-4.37E-6	-0.00203	5.25E-4	0	0
84	1.700	0	-4.63E-6	-0.00112	5.32E-4	0	0
85	0	0	-4.63E-6	-0.00112	5.32E-4	0	0
85	1.700	0	-4.89E-6	-2.90E-4	4.16E-4	0	0
86	0	0	-4.89E-6	-2.90E-4	4.16E-4	0	0
86	1.300	0	-4.89E-6	1.77E-4	3.04E-4	0	0
87	0	0	-4.89E-6	1.77E-4	3.04E-4	0	0
87	1.300	0	-4.89E-6	5.05E-4	2.03E-4	0	0
88	0	0	-4.89E-6	5.05E-4	2.03E-4	0	0
88	1.300	0	-4.89E-6	7.11E-4	1.15E-4	0	0
89	0	0	-4.89E-6	7.11E-4	1.15E-4	0	0
89	1.300	0	-4.89E-6	8.09E-4	3.81E-5	0	0
90	0	0	-4.89E-6	8.09E-4	3.81E-5	0	0
90	1.300	0	-4.89E-6	8.15E-4	-2.69E-5	0	0
91	0	0	-4.89E-6	8.15E-4	-2.69E-5	0	0
91	1.300	0	-4.89E-6	7.44E-4	-8.01E-5	0	0

Displacements (in global coordinate directions): *ALL*

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
92	0	0	-4.89E-6	7.44E-4	-8.01E-5	0	0
92	1.300	0	-4.89E-6	6.12E-4	-1.21E-4	0	0
93	0	0	-4.89E-6	6.12E-4	-1.21E-4	0	0
93	1.300	0	-4.89E-6	4.34E-4	-1.51E-4	0	0
94	0	0	-4.89E-6	4.34E-4	-1.51E-4	0	0
94	1.300	0	-4.89E-6	2.24E-4	-1.69E-4	0	0
95	0	0	-4.89E-6	2.24E-4	-1.69E-4	0	0
95	1.300	0	-4.89E-6	2.3E-12	-1.75E-4	0	0
96	0	0	-4.89E-6	-8.7E-13	-1.75E-4	0	0
96	0.500	0	-4.89E-6	-8.73E-5	-1.75E-4	0	0
290	0	0	-5.5E-19	-2.9E-12	8.3E-12	0	0
290	13.200	0	-2.32E-6	-2.88E-4	-4.15E-4	0	0
291	0	0	5.5E-19	-2.9E-12	-8.3E-12	0	0
291	13.200	0	-4.89E-6	-2.90E-4	4.16E-4	0	0
	min:	0	-4.89E-06	-0.003549	-0.000530	0	0
	max:	0	5.48E-19	0.000815	0.000532	0	0

CÁLCULOS ESTRUCTURALES



FDO JOSÉ ANGEL HIDALGO GONZÁLEZ
COL Nº 9.859

El Plan de Carga constará de dos estados de carga, compuestos de los siguientes escalones de carga:

Estado de carga nº 1:

Escalón - 0 : Puente descargado

Escalón - 1 : Carga de la primera fila de camiones en vano 1

Escalón - 2 : Carga de la segunda fila de camiones (máxima flexión positiva en centro de vano)

Estado de carga nº 2:

Escalón - 3 : Paso del primer escalón a la posición sobre el vano 2.

Escalón - 4 : Paso del segundo escalón a la posición sobre el vano 2.(máxima flexión positiva)

Estado de carga nº 3:

Escalón - 7 : Descarga del primer escalón

Escalón - 8 : Descarga del segundo escalón

Escalón - 9 : Puente descargado

Cumpliendo este plan de carga, no se pasará al escalón siguiente hasta que los aparatos de medida no acusen la estabilización de las lecturas, lo que se supondrá ha ocurrido cuando la diferencia entre dos lecturas efectuadas en un intervalo no inferior a 10 minutos, sea inferior al 5% de la flecha correspondiente a la última lectura.

MEDIDAS A REALIZAR

Se determinarán, mediante el uso de flexímetros si el tráfico inferior lo permite, o bien nivelación de alta precisión en caso contrario, los descensos producidos en los apoyos de la losa sobre estribos, pilas y en la sección central de cada vano. El número de unidades de medida será catorce (14), cuatro (4) para los apoyos de los estribos, cuatro (4) para los apoyos en las pilas y seis (6) en el centro de vano

La media de los valores medidos en los apoyos se restará al valor obtenido en las secciones centrales, para determinar la flecha de la losa. Se registrarán en cada escalón todos los valores obtenidos.

Durante la ejecución de las pruebas se medirá la temperatura ambiente en la zona del puente. Deberán elegirse las horas adecuadas para que las condiciones climatológicas perturben lo menos posible el comportamiento de la estructura.

CONCLUSIONES

Estado de carga nº 1:

Máxima flexión positiva en el centro del vano 1 :

Los máximos momentos flectores positivos de sobrecargas, en mT, previstos en el cálculo del tablero, para las secciones más cargadas del centro de vano 1 son:

Barras	S.Unif.+ Carro	Prueba de carga	Porcentaje
70	183.46	109.67	60 %

Las flechas que se esperan para este estado de carga son las siguientes:

Punto de la sección central vano 1 2.03 mm.

Punto de la sección central vano 2 -0.63 mm.

Punto de la sección central vano 3 0.10 mm.

Estado de carga nº 2

Máxima flexión positiva en el centro del vano 2 :

Los máximos momentos flectores positivos de sobrecargas, en mT, previstos en el cálculo del tablero, para las secciones más cargadas del vano 2 son:

Barras	S.Unif.+ Carro	Prueba de carga	Porcentaje
80	199.67	117.406	59 %

Las flechas que se esperan para este estado de carga son las siguientes:

Punto de la sección central vano 1 -0.81 mm.

Punto de la sección central vano 2 3.60 mm.

Punto de la sección central vano 3 -0.81 mm.

En todas ellas, se considera positivo el movimiento descendente y negativo el ascendente. Estas flechas corresponden a la deformación de la estructura sin incluir la correspondiente al descenso de apoyos, por lo que, en el ensayo, se obtendrán deduciendo del valor medido en la sección central el correspondiente a la media de registros efectuados en las proximidades de los apoyos, y que representa el descenso de los mismos.

El módulo de elasticidad supuesto para el cálculo de las flechas ha sido: $\mathbf{E = 3{,}55 \cdot 10^6\ T/m^2}$. por lo que las flechas indicadas deberán modificarse con la relación entre este módulo supuesto y el correspondiente al hormigón realmente colocado en obra, el cual, podrá evaluarse a partir de las indicaciones dadas en el art 39.6 dela EH

Estructura E-11. (PK 315+500)

ESTRUCTURA E-11 (PK 315+500)

ÍNDICE

TABLERO. INTRODUCCIÓN

ESTRIBOS

CÁLCULO TABLERO:

1. INTRODUCCIÓN
2. NORMATIVA DE CÁLCULO
3. SOLUCIÓN ESTRUCTRURAL ADOPTADA
4. MATERIALES

CÁLCULO DEL TABLERO

La O.D.T.E. 315+500 es la misma que la del Proyecto Vigente, con la salvedad de que se produce un aumento en la altura de los muros cajero con un espesor variable de 0.30 a 0.20 m, lo cual implica una variación del peso propio de la sección del 3.50% respecto del peso de la sección original de proyecto, no siendo necesario según el Artículo 3.2.1 de la "Instrucción sobre las acciones a considerar en el proyecto de Puentes de Carretera" un nuevo cálculo. Se adjunta a continuación el Anejo de cálculo de la estructura del Proyecto Vigente y copia de la nota emitida por AEPO justificando la variación de la sección del tablero.

TABLERO

GIF SUBTRAMO III - L=23.10 M. A=11.20 M
==========

SECCION LONGITUDINAL
==========

LUZ DE LA VIGA = 23.100 M.
LUZ DE CALCULO = 22.400 M.
ESVIAJE = 90.000 GR

SECCION TRANSVERSAL
==========

ANCHO TOTAL DE LA PLATAFORMA = 11.200 M.
ANCHO TOTAL DE LA LOSA = 11.200 M.
ANCHO ACERA IZQUIERDA SOBRE LOSA = 0.000 M.
ANCHO ACERA DERECHA SOBRE LOSA = 0.000 M.
ANCHO TOTAL ACERA IZQUIERDA = 0.000 M.
ANCHO TOTAL ACERA DERECHA = 0.000 M.
VUELO DE LOSA SOBRE EXT. VIGA IZQ. = 0.000 M.
VUELO DE LOSA SOBRE EXT. VIGA DER. = 0.000 M.

SOLUCION ADOPTADA
==========

NUMERO DE VIGAS = 6
CANTO DE LA VIGA = 1.200 M.
CANTO DE LA LOSA = 0.200 M.
CANTO DE LA LOSA DE ENCOFRADO = 0.050 M.
INTEREJE DE VIGAS = 2.000 M.
ANCHO DE LOSA VIGA CENTRAL = 2.000 M.
ANCHO DE LOSA VIGA BORDE IZQ. = 1.600 M.
ANCHO DE LOSA VIGA BORDE DER. = 1.600 M.

GIF SUBTRAMO III - L=23.10 M. A=11.20 M
==========

COEFICIENTES DE SEGURIDAD DE MATERIALES
==========

COEF. SEGURIDAD DEL ACERO = 1.100

COEFICIENTES DE SEGURIDAD DE ACCIONES
==========

COEF. MAYORACION CARGAS PERMANENTES = 1.350
COEF. MAYORACION DE SOBRECARGAS = 1.500

CARACTERISTICAS DE LOS MATERIALES
==========

RESISTENCIA DEL HORMIGON DE LA VIGA = 450.000 KG/CM2
RESISTENCIA DEL HORMIGON DE LA LOSA = 250.000 KG/CM2
LIMITE ELASTICO DEL ACERO = 5100.000 KG/CM2

GIF SUBTRAMO III - L=23.10 M. A=11.20 M

ACCIONES A CONSIDERAR

PESO PROPIO DE LA VIGA = 0.882 T/ML
PESO PROPIO DE LA LOSA = 0.625 T/M2

CARGAS PERMANENTES

PAVIMENTO = 0.000 T/M2
ACERA IZQUIERDA = 0.000 T/M2
ACERA DERECHA = 0.000 T/M2
IMPOSTA + BARAND. ACERA IZQ. = 1.000 T/M
IMPOSTA + BARAND. ACERA DER. = 1.000 T/M

SOBRECARGAS - NORMA M.O.P.U. (CARRETERAS)

SOBRECARGA UNIF. ZONA N. 1 = 0.400 T/M2 (2)
SOBRECARGA UNIF. ZONA N. 2 = 0.400 T/M2 (2)
SOBRECARGA UNIF. ZONA N. 3 = 0.400 T/M2 (2)

CAMION EJE N. 1 = 20.000 T
CAMION EJE N. 2 = 20.000 T
CAMION EJE N. 3 = 20.000 T

DEFINICION GEOMETRICA

NUDO	X	Y	NUDO	X	Y
1	0.0000	0.6000	2	0.0000	2.6000
3	0.0000	4.6000	4	0.0000	6.6000
5	0.0000	8.6000	6	0.0000	10.6000
7	2.8000	0.6000	8	2.8000	2.6000
9	2.8000	4.6000	10	2.8000	6.6000
11	2.8000	8.6000	12	2.8000	10.6000
13	5.6000	0.6000	14	5.6000	2.6000
15	5.6000	4.6000	16	5.6000	6.6000
17	5.6000	8.6000	18	5.6000	10.6000
19	8.4000	0.6000	20	8.4000	2.6000
21	8.4000	4.6000	22	8.4000	6.6000
23	8.4000	8.6000	24	8.4000	10.6000
25	11.2000	0.6000	26	11.2000	2.6000
27	11.2000	4.6000	28	11.2000	6.6000
29	11.2000	8.6000	30	11.2000	10.6000
31	14.0000	0.6000	32	14.0000	2.6000
33	14.0000	4.6000	34	14.0000	6.6000
35	14.0000	8.6000	36	14.0000	10.6000
37	16.8000	0.6000	38	16.8000	2.6000
39	16.8000	4.6000	40	16.8000	6.6000
41	16.8000	8.6000	42	16.8000	10.6000
43	19.6000	0.6000	44	19.6000	2.6000
45	19.6000	4.6000	46	19.6000	6.6000
47	19.6000	8.6000	48	19.6000	10.6000
49	22.4000	0.6000	50	22.4000	2.6000
51	22.4000	4.6000	52	22.4000	6.6000
53	22.4000	8.6000	54	22.4000	10.6000

DEFINICION DE BARRAS TRANSVERSALES

BARRA	N.IN.	N.FI.	MAT	SEC.	BARRA	N.IN.	N.FI.	MAT	SEC.
1	1	2	1	1	2	2	3	1	1
3	3	4	1	1	4	4	5	1	1
5	5	6	1	1	6	7	8	1	2
7	8	9	1	2	8	9	10	1	2
9	10	11	1	2	10	11	12	1	2
11	13	14	1	3	12	14	15	1	3
13	15	16	1	3	14	16	17	1	3
15	17	18	1	3	16	19	20	1	4
17	20	21	1	4	18	21	22	1	4
19	22	23	1	4	20	23	24	1	4
21	25	26	1	5	22	26	27	1	5
23	27	28	1	5	24	28	29	1	5
25	29	30	1	5	26	31	32	1	6
27	32	33	1	6	28	33	34	1	6
29	34	35	1	6	30	35	36	1	6
31	37	38	1	7	32	38	39	1	7
33	39	40	1	7	34	40	41	1	7
35	41	42	1	7	36	43	44	1	8
37	44	45	1	8	38	45	46	1	8
39	46	47	1	8	40	47	48	1	8
41	49	50	1	9	42	50	51	1	9
43	51	52	1	9	44	52	53	1	9
45	53	54	1	9					

DEFINICION DE BARRAS LONGITUDINALES

BARRA	N.IN.	N.FI.	MAT	SEC.	BARRA	N.IN.	N.FI.	MAT	SEC.
46	1	7	2	10	47	7	13	2	10
48	13	19	2	10	49	19	25	2	10
50	25	31	2	10	51	31	37	2	10
52	37	43	2	10	53	43	49	2	10
54	2	8	2	11	55	8	14	2	11
56	14	20	2	11	57	20	26	2	11
58	26	32	2	11	59	32	38	2	11
60	38	44	2	11	61	44	50	2	11
62	3	9	2	12	63	9	15	2	12
64	15	21	2	12	65	21	27	2	12
66	27	33	2	12	67	33	39	2	12
68	39	45	2	12	69	45	51	2	12
70	4	10	2	13	71	10	16	2	13
72	16	22	2	13	73	22	28	2	13
74	28	34	2	13	75	34	40	2	13
76	40	46	2	13	77	46	52	2	13
78	5	11	2	14	79	11	17	2	14
80	17	23	2	14	81	23	29	2	14
82	29	35	2	14	83	35	41	2	14
84	41	47	2	14	85	47	53	2	14
86	6	12	2	15	87	12	18	2	15
88	18	24	2	15	89	24	30	2	15
90	30	36	2	15	91	36	42	2	15
92	42	48	2	15	93	48	54	2	15

CARACTERISTICAS DE LOS MATERIALES

TIPO		MOD. ELASTICIDAD (TN/M2)	POISSON
1	LOSA	3320391.50	0.15
2	VIGA	4454772.50	0.15

CARACTERISTICAS GEOMETRICAS DE SECCIONES TIPO BARRAS TRANSVERSALES

SECC.	AREA	M. TORSION	M. INERCIA
1	0.28000000	0.00186667	0.00093333
2	0.56000000	0.00373333	0.00186667
3	0.56000000	0.00373333	0.00186667
4	0.56000000	0.00373333	0.00186667
5	0.56000000	0.00373333	0.00186667
6	0.56000000	0.00373333	0.00186667
7	0.56000000	0.00373333	0.00186667
8	0.56000000	0.00373333	0.00186667
9	0.28000000	0.00186667	0.00093333

CARACTERISTICAS GEOMETRICAS DE SECCIONES TIPO BARRAS LONGITUDINALES

SECC.	AREA	M. TORSION	M. INERCIA
10	0.63319016	0.00530278	0.15526842
11	0.69002354	0.00609550	0.16523470
12	0.69002354	0.00609550	0.16523470
13	0.69002354	0.00609550	0.16523470
14	0.69002354	0.00609550	0.16523470
15	0.63319016	0.00530278	0.15526842

HIPOTESIS CARGA PERMANENTE (HIP = 1)

46	A	53	FZ -1.000	T/M
46	A	53	MX 0.600	TXM/M
54	A	61	FZ 0.000	T/M
62	A	69	FZ 0.000	T/M
70	A	77	FZ 0.000	T/M
78	A	85	FZ 0.000	T/M
86	A	93	FZ -1.000	T/M
86	A	93	MX -0.600	TXM/M

HIPOTESIS SC. UNIF. ZONA 1 (HIP = 2)

46	A	53	FZ -0.640	T/M
46	A	53	MX -0.061	TXM/M
54	A	61	FZ -0.700	T/M
62	A	69	FZ -0.100	T/M

HIPOTESIS SC. UNIF. ZONA 2 (HIP = 3)

62	A	69	FZ -0.700	T/M
54	A	61	FZ -0.100	T/M
70	A	77	FZ -0.700	T/M
78	A	85	FZ -0.100	T/M

HIPOTESIS SC. UNIF. ZONA 3 (HIP = 4)

78	A	85	FZ -0.700	T/M
70	A	77	FZ -0.100	T/M
86	A	93	FZ -0.640	T/M
86	A	93	MX 0.061	TXM/M

HIPOTESIS TANQUE POSICION = 1 (HIP = 9)

NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)
5	6.5313	6	0.3437	11	17.6005	12	0.9263
17	4.3683	18	0.2299				

HIPOTESIS TANQUE POSICION = 2 (HIP = 10)

NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)
5	6.8750	6	6.8750	11	18.5268	12	18.5268
17	4.5982	18	4.5982				

HIPOTESIS TANQUE POSICIÓN = 3 (HIP = 11)

NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)
23	5.0893	24	0.2679	29	18.3214	30	0.9643
35	5.0893	36	0.2679				

HIPOTESIS TANQUE POSICION = 4 (HIP = 12)

NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)
23	5.3571	24	5.3571	29	19.2857	30	19.2857
35	5.3571	36	5.3571				

HIPOTESIS TANQUE POSICION = 5 (HIP = 13)

NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)
23	5.3571	24	5.3571	29	19.2857	30	19.2857
35	5.3571	36	5.3571				

HIPOTESIS TANQUE POSICIÓN = 6 (HIP = 14)

NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)	NUDO	CARGA (T)
22	5.3571	23	5.3571	28	19.2857	29	19.2857
34	5.3571	35	5.3571				

REACCIONES EN APOYOS

HIP(IDENTIF)			N 1 REACCION	N 2 REACCION	N 3 REACCION	N 4 REACCION	N 5 REACCION	N 6 REACCION
1	C.PE	1	11.770	-0.009	-0.560	-0.560	-0.009	11.770
2	SU	1	7.539	6.016	2.459	0.569	-0.058	-0.397
3	SU	2	-0.014	2.985	5.989	5.989	2.985	-0.014
4	SU	3	-0.397	-0.058	0.569	2.459	6.016	7.539
5	SU	1+2	7.525	9.001	8.448	6.558	2.927	-0.411
6	SU	1+3	7.142	5.958	3.028	3.028	5.958	7.142
7	SU	2+3	-0.411	2.927	6.558	8.448	9.001	7.525
8	SU	1+2+3	7.128	8.943	9.017	9.017	8.943	7.128
9	T	9	-0.251	0.003	0.205	2.906	20.018	3.653
10	T	10	-0.361	-0.210	-0.031	3.008	23.273	27.391
11	T	11	-0.718	0.093	1.490	4.086	4.828	5.221
12	T	12	-1.038	-0.513	0.956	5.137	9.101	16.357
13	T	13	-1.038	-0.513	0.956	5.137	9.101	16.357
14	T	14	-1.648	2.015	6.020	8.758	9.603	5.251
RMA	SU+T		7.288	11.016	15.037	17.775	32.274	34.930
RMI	SU+T		-2.060	-0.571	0.538	3.475	4.770	3.242

REACCIONES EN APOYOS

HIP(IDENTIF)			N 49 REACCION	N 50 REACCION	N 51 REACCION	N 52 REACCION	N 53 REACCION	N 54 REACCION
1	C.PE	1	11.770	-0.009	-0.560	-0.560	-0.009	11.770
2	SU	1	7.539	6.016	2.459	0.569	-0.058	-0.397
3	SU	2	-0.014	2.985	5.989	5.989	2.985	-0.014
4	SU	3	-0.397	-0.058	0.569	2.459	6.016	7.539
5	SU	1+2	7.525	9.001	8.448	6.558	2.927	-0.411
6	SU	1+3	7.142	5.958	3.028	3.028	5.958	7.142
7	SU	2+3	-0.411	2.927	6.558	8.448	9.001	7.525
8	SU	1+2+3	7.128	8.943	9.017	9.017	8.943	7.128
9	T	9	-0.261	0.098	0.567	0.835	0.842	1.385
10	T	10	-0.377	-0.120	0.435	1.287	1.935	3.770
11	T	11	-0.718	0.093	1.490	4.086	4.828	5.221
12	T	12	-1.038	-0.513	0.956	5.137	9.101	16.357
13	T	13	-1.038	-0.513	0.956	5.137	9.101	16.357
14	T	14	-1.648	2.015	6.020	8.758	9.603	5.251
RMA	SU+T		7.278	11.016	15.037	17.775	18.604	23.896
RMI	SU+T		-2.060	-0.571	1.004	1.404	0.784	0.974

RESUMEN DE ESFUERZOS VÍGA DE BORDE DERECHA

SECCION APOYOS BARRA = 46

C. PERMANENTE	CORTANTE =	11.770 TN	M. FLECTOR =	0.000 M X TN
SOBRECARGA	CORTANTE =	7.288 TN	M. FLECTOR =	0.000 M X TN

SECCION CENTRAL BARRA = 50

C. PERMANENTE	CORTANTE =	0.457 TN	M. FLECTOR =	47.504 M X TN
SOBRECARGA	CORTANTE =	0.081 TN	M. FLECTOR =	42.813 M X TN

RESUMEN DE ESFUERZOS VIGA CENTRAL

SECCION APOYOS BARRA = 78

C. PERMANENTE	CORTANTE =	0.009 TN	M. FLECTOR =	0.000 M X TN
SOBRECARGA	CORTANTE =	32.274 TN	M. FLECTOR =	0.000 M X TN

SECCION CENTRAL BARRA = 82

C. PERMANENTE	CORTANTE =	0.527 TN	M. FLECTOR =	16.772 M X TN
SOBRECARGA	CORTANTE =	8.250 TN	M. FLECTOR =	158.516 M X TN

RESUMEN DE ESFUERZOS VIGA DE BORDE IZQUIERDA

SECCION APOYOS BARRA = 86

C. PERMANENTE	CORTANTE =	11.770 TN	M. FLECTOR =	0.000 M X TN
SOBRECARGA	CORTANTE =	34.930 TN	M. FLECTOR =	0.000 M X TN

SECCION CENTRAL BARRA = 90

C. PERMANENTE	CORTANTE =	0.457 TN	M. FLECTOR =	47.504 M X TN
SOBRECARGA	CORTANTE =	9.740 TN	M. FLECTOR =	193.081 M X TN

RESUMEN DE ESFUERZOS PARA CALCULO DE LA LOSA

ZONA (1) LINEAS TRANSVERSALES 1 A 9

BARRA = 45 M. FLECTOR POSITIVO = 1.953 M X TN / M

BARRA = 45 M. FLECTOR NEGATIVO = -2.898 M X TN / M

CALCULO DE ESFUERZOS LOCALES - WESTERGAARD

MOMENTO LONGITUDINAL = 1.413 M X TN

MOMENTO TRANSVERSAL EN CENTRO DE VANO = 2.341 M X TN / M
MOMENTO TRANSVERSAL SOBRE APOYO = -0.967 M X TN / M

ARMADURA DE LOSA ZONA = 1
==========
(*) ESFUERZOS MAYORADOS

CARA INFERIOR

MOMENTO TRANSVERSAL	P.P. PERM. SOB.	=	0.20 M X TN
	FLEXION GENERAL	=	2.93 M X TN
	CARGA PUNTUAL	=	3.51 M X TN
			6.64 M X TN

MOMENTO LONGITUDINAL CARGA PUNTUAL = 2.12 M X TN

ARMADURA TRANSVERSAL (H-D = 3.0 CM) = 9.11 CM2/M

ARMADURA LONGITUDINAL (H-D = 4.5 CM) = 3.03 CM2/M

CARA SUPERIOR

MOMENTO TRANSVERSAL C. VANO	P.P. PERM. SOB.	=	0.20 M X TN
	FLEXION GENERAL	=	-4.35 M X TN
			-4.15 M X TN

MOMENTO TRANSVERSAL APOYO	P.P. PERM. SOB.	=	-0.41 M X TN
	FLEXION GENERAL	=	-4.35 M X TN
			-4.75 M X TN

ARMADURA TRANSVERSAL (H-D = 3.0 CM) = 5.51 CM2/M

ARMADURA LONGITUDINAL (H-D = 4.5 CM) = 1.84 CM2/M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.
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COMPROBACION DE VIGAS PRETENSADAS
==========

DATOS GENERALES
==========

LONGITUD TOTAL	= 23.10 M.
LUZ DE CALCULO	= 22.40 M.
ANCHURA DE LOSA	= 1.60 M.
ESPESOR DE LOSA	= 0.25 M.

DEFINICION DE LA SECCION DE VIGAS
==========

ALTURA (M)	ANCHO (M)
0.000	0.600
0.170	0.600
0.240	0.150
1.020	0.150
1.100	0.250
1.160	1.200
1.200	1.200

CARACTERISTICAS DE LOS MATERIALES
==========

RESISTENCIA DEL HORMIGON INICIAL DE LA VIGA	350. KG/CM2
RESISTENCIA DEL HORMIGON FINAL DE LA VIGA	450. KG/CM2
RESISTENCIA DEL HORMIGON DE LA LOSA	250. KG/CM2
LIMITE DE ELASTICIDAD DEL ACERO PASIVO	5100. KG/CM2

COMPORTAMIENTO DIFERIDO DE LOS MATERIALES
==========

	RETRACCION	FLUENCIA	RELAJACION
AL HORMIGONAR LA LOSA	0.00010	1.00000	0.00000
VALOR FINAL	0.00025	2.50000	0.04000

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

DEFINICION DE ARMADURAS PRETESAS

CARGA DE ROTURA DE LOS CORDONES	26.581 TN.
SECCION DE LOS CORDONES	1.393 CM2

DISPOSICION DE LOS CORDONES PRETESOS

SEPARACION MINIMA DE CAPA INFERIOR A BORDE	0.050 M.
SEPARACION VERTICAL MINIMA ENTRE CAPAS	0.060 M.
NUMERO DE CORDONES EN LA ARMADURA SUPERIOR	0
ALTURA C.D.G. DE LA ARMADURA SUPERIOR	1.150 M.

NUMERO DE CORDONES POR CAPA

8 6 6 0 0 0 0 0 0 0

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

ESFUERZOS CARGAS EXTERIORES(SIN PESO PROPIO)

	DISTANCIA	AXIL	MOMENTO	CORTANTE
CARGAS PERMANENTES	0.000	0.000	47.500	0.000
SOBRECARGAS	0.000	0.000	193.080	9.740
CARGAS PERMANENTES	11.200	0.000	0.000	11.770
SOBRECARGAS	11.200	0.000	0.000	34.930

FRAC. PESO LOSA RESISTIDO POR LA VIGA	1.000
MAXIMA FISURA CON CARGA TOTAL	0.100 MM.

COEFICIENTES DE SEGURIDAD DE MATERIALES

COEF. MINORACION DEL HORMIGON EN ROTURA	= 1.500
COEF. MINORACION DEL ACERO	= 1.100

COEFICIENTES DE SEGURIDAD DE ACCIONES EXTERIORES

COEF. MAYORACION DE CARGAS PERMANENTES	= 1.350
COEF. MAYORACION DE SOBRECARGAS	= 1.500

COEFICIENTES DE SEGURIDAD PARA EL PRETENSADO

COEF. MINORACION DE LA FUERZA DE PRET. INICIAL	= 0.950
COEF. MINORACION/MAYORACION DE LAS PERDIDAS	= 0.900

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

RESULTADOS DE CALCULO

CARACTERISTICAS DE LA SECCION

	AREA(M2)	AL.C.D.G.(M.)	INERCIA(M4)
SECCION BRUTA DE LA VIGA	0.3527501	0.5972244	0.0697157
SECCION COMPUESTA	0.6508925	0.9305832	0.1568494
SECCION NETA DE LA VIGA	0.3499641	0.6011509	0.0690326
SECCION NETA COMPUESTA	0.6481065	0.9341364	0.1549377

DEFINICION DEL PRETENSADO

		PRETENSADO INFERIOR	PRETENSADO SUPERIOR	PRETENSADO TOTAL
NUMERO DE CORDONES		20	0	20
SECCION DE ACERO	(CM2)	27.860	0.000	27.860
TENSION EN BANCADA POR CORDON	(TN)	19.936	0.000	
TENSION TOTAL EN BANCADA	(TN)	398.720	0.000	398.720
ALTURA DEL C.D.G.	(M.)	0.104	1.150	0.104

DISTANCIA DEL LIMITE DE ENVAINADO AL APOYO	NUMERO DE CORDONES ENVAINADOS
8.600	2
2.600	8

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

CLASE DE COMPROBACION	2
COEF. ESTADO LIM. DECOMPRESION	0.783
COEF. ESTADO LIM. FORM. FISURAS	1.000

NOTA.-DEFINICION DE FASES

FASE 1 : AL DESTESAR

FASE 2 : POSTESADO 1 FASE

FASE 3 : A PIE DE OBRA

FASE 4 : AL HORMIGONAR LA LOSA (*)

FASE 5 : POSTESADO 2 FASE

FASE 6 : BAJO CARGAS PERMANENTES

FASE 7 : TRAS PERDIDAS FINALES

FASE 8 : CON CARGA TOTAL Y PRETENSADO TEORICO

FASE 9 : CON CARGA TOTAL Y PRETENSADO MINORADO

NOTA.-(*)
SE CONSIDERA SOLO LA FRACCION DE PESO PROPIO DE LA LOSA RESISTIDO POR LA VIGA. EL RESTO SE SUMA A LA CARGA PERMANENTE

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

SECCION = 1 DISTANCIA AL CENTRO = 0.000 M.

COEF. GLOBAL DE MINORACION DEL PRETENSADO = 0.965

VARIACION DE LA FUERZA DE PRETENSADO(TN.)

		FASE 1	FASE 2	FASE 3	FASE 4	FASE 5	FASE 6	FASE 7	FASE 8
PRE	I	369.5	369.5	340.9	346.3	346.3	349.4	308.4	321.0

TENSIONES EN EL HORMIGON EN LAS DISTINTAS FASES (TN/M2)

	VIGA		LOSA	
	FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
FASE 1	-2174.00	57.94		
FASE 2	-2174.00	57.94		
FASE 3	-1968.04	16.24		
FASE 4	-1460.89	-519.95		
FASE 5	-1460.89	-519.95	0.00	0.00
FASE 6	-1194.67	-601.82	-81.78	-155.35
FASE 7	-926.59	-596.97	-78.16	-192.61
FASE 8	155.55	-929.76	-410.58	-824.07
FASE 9	234.79	-947.75	-410.70	-822.86

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

SECCION = 2 DISTANCIA AL CENTRO = 1.800 M.

COEF. GLOBAL DE MINORACION DEL PRETENSADO = 0.965

VARIACION DE LA FUERZA DE PRETENSADO(TN.)

		FASE 1	FASE 2	FASE 3	FASE 4	FASE 5	FASE 6	FASE 7	FASE 8
PRE	I	369.4	369.4	340.6	345.9	345.9	348.9	307.5	319.7

TENSIONES EN EL HORMIGON EN LAS DISTINTAS FASES (TN/M2)

	VIGA		LOSA	
	FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
FASE 1	-2185.44	70.13		
FASE 2	-2185.44	70.13		
FASE 3	-1978.68	28.26		
FASE 4	-1484.62	-494.07		
FASE 5	-1484.62	-494.07	0.00	0.00
FASE 6	-1225.28	-573.83	-79.67	-151.34
FASE 7	-954.28	-568.92	-76.01	-189.00
FASE 8	99.91	-893.12	-399.84	-804.16
FASE 9	178.50	-910.99	-399.96	-802.93

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

SECCION = 3 DISTANCIA AL CENTRO = 2.600 M.

COEF. GLOBAL DE MINORACION DEL PRETENSADO = 0.970

VARIACION DE LA FUERZA DE PRETENSADO(TN.)

		FASE 1	FASE 2	FASE 3	FASE 4	FASE 5	FASE 6	FASE 7	FASE 8
PRE	I	335.3	335.3	311.6	316.3	316.3	318.9	284.1	294.8

TENSIONES EN EL HORMIGON EN LAS DISTINTAS FASES (TN/M2)

		VIGA		LOSA	
		FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
FASE	1	-1936.83	16.61		
FASE	2	-1936.83	16.61		
FASE	3	-1767.62	-16.67		
FASE	4	-1284.19	-524.88		
FASE	5	-1284.19	-524.88	0.00	0.00
FASE	6	-1030.46	-602.34	-77.37	-147.26
FASE	7	-803.37	-597.85	-74.02	-178.48
FASE	8	227.97	-912.69	-388.51	-777.07
FASE	9	289.00	-926.05	-388.60	-776.20

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

SECCION = 4 DISTANCIA AL CENTRO = 7.800 M.

COEF. GLOBAL DE MINORACION DEL PRETENSADO = 0.974

VARIACION DE LA FUERZA DE PRETENSADO(TN.)

		FASE 1	FASE 2	FASE 3	FASE 4	FASE 5	FASE 6	FASE 7	FASE 8
PRE	I	333.2	333.2	307.8	310.3	310.3	311.8	270.1	275.9

TENSIONES EN EL HORMIGON EN LAS DISTINTAS FASES (TN/M2)

		VIGA		LOSA	
		FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
FASE	1	-2129.47	220.52		
FASE	2	-2129.47	220.52		
FASE	3	-1947.92	184.81		
FASE	4	-1684.78	-91.82		
FASE	5	-1684.78	-91.82	0.00	0.00
FASE	6	-1546.67	-133.98	-42.11	-80.16
FASE	7	-1275.07	-128.61	-38.11	-117.49
FASE	8	-713.69	-299.99	-209.29	-443.32
FASE	9	-662.59	-311.52	-209.39	-442.37

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

SECCION = 5 DISTANCIA AL CENTRO = 8.600 M.

COEF. GLOBAL DE MINORACION DEL PRETENSADO = 0.953

VARIACION DE LA FUERZA DE PRETENSADO(TN.)

		FASE 1	FASE 2	FASE 3	FASE 4	FASE 5	FASE 6	FASE 7	FASE 8
PRE	I	191.8	191.8	182.9	184.1	184.1	184.7	167.4	170.0

TENSIONES EN EL HORMIGON EN LAS DISTINTAS FASES (TN/M2)

		VIGA		LOSA	
		FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
FASE	1	-1110.80	12.36		
FASE	2	-1110.80	12.36		
FASE	3	-1049.91	2.62		
FASE	4	-833.73	-219.40		
FASE	5	-833.73	-219.40	0.00	0.00
FASE	6	-720.35	-252.97	-33.54	-64.37
FASE	7	-611.00	-249.66	-31.08	-78.37
FASE	8	-150.14	-386.14	-167.43	-340.04
FASE	9	-96.03	-395.74	-167.54	-339.40

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

SECCION = 6 DISTANCIA AL CENTRO = 11.200 M.

COEF. GLOBAL DE MINORACION DEL PRETENSADO = 1.000

VARIACION DE LA FUERZA DE PRETENSADO(TN.)

		FASE 1	FASE 2	FASE 3	FASE 4	FASE 5	FASE 6	FASE 7	FASE 8
PRE	I	190.7	190.7	180.8	180.8	180.8	180.8	159.5	159.5

TENSIONES EN EL HORMIGON EN LAS DISTINTAS FASES (TN/M2)

		VIGA		LOSA	
		FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
FASE	1	-1300.55	208.01		
FASE	2	-1300.55	208.01		
FASE	3	-1232.94	197.19		
FASE	4	-1232.94	197.19		
FASE	5	-1232.94	197.19	0.00	0.00
FASE	6	-1232.94	197.19	0.00	0.00
FASE	7	-1098.95	201.25	3.02	-17.15
FASE	8	-1098.95	201.25	3.02	-17.15
FASE	9	-1099.06	201.27	3.02	-17.15

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

FISURACION

SECCION = 1 DISTANCIA AL CENTRO = 0.000 M.

CABEZA SUPERIOR

BRAZO MECANICO	0.964	M
MODULO RESISTENTE	0.115	M3
SECCION PRETENSADO	0.000	CM2
CAPACIDAD MECANICA DEL PRETENSADO	0.000	TN
CAPACIDAD MECANICA REQUERIDA	23.922	TN
ARMADURA PASIVA REQUERIDA	5.160	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.031	M
AREA TRACCIONADA	0.035	M2
AREA TOTAL DE ACERO	1.730	CM2
AREA DE ACERO PASIVO	1.730	CM2

CABEZA INFERIOR

BRAZO MECANICO	1.109	M
MODULO RESISTENTE	0.166	M3
SECCION PRETENSADO	27.860	CM2
CAPACIDAD MECANICA DEL PRETENSADO	430.612	TN
CAPACIDAD MECANICA REQUERIDA	29.923	TN
ARMADURA PASIVA REQUERIDA	0.000	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.238	M
AREA TRACCIONADA	0.128	M2
AREA TOTAL DE ACERO	6.399	CM2
AREA DE ACERO PASIVO	0.000	CM2

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

FISURACION

SECCION = 2 DISTANCIA AL CENTRO = 1.800 M.

CABEZA SUPERIOR

BRAZO MECANICO	0.964	M
MODULO RESISTENTE	0.115	M3
SECCION PRETENSADO	0.000	CM2
CAPACIDAD MECANICA DEL PRETENSADO	0.000	TN
CAPACIDAD MECANICA REQUERIDA	23.922	TN
ARMADURA PASIVA REQUERIDA	5.160	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.037	M
AREA TRACCIONADA	0.042	M2
AREA TOTAL DE ACERO	2.099	CM2
AREA DE ACERO PASIVO	2.099	CM2

CABEZA INFERIOR

BRAZO MECANICO	1.109	M
MODULO RESISTENTE	0.166	M3
SECCION PRETENSADO	27.860	CM2
CAPACIDAD MECANICA DEL PRETENSADO	430.612	TN
CAPACIDAD MECANICA REQUERIDA	29.923	TN
ARMADURA PASIVA REQUERIDA	0.000	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.197	M
AREA TRACCIONADA	0.116	M2
AREA TOTAL DE ACERO	5.784	CM2
AREA DE ACERO PASIVO	0.000	CM2

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

FISURACION

SECCION = 3 DISTANCIA AL CENTRO = 2.600 M.

CABEZA SUPERIOR

BRAZO MECANICO	0.964	M
MODULO RESISTENTE	0.115	M3
SECCION PRETENSADO	0.000	CM2
CAPACIDAD MECANICA DEL PRETENSADO	0.000	TN
CAPACIDAD MECANICA REQUERIDA	23.922	TN
ARMADURA PASIVA REQUERIDA	5.160	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.010	M
AREA TRACCIONADA	0.009	M2
AREA TOTAL DE ACERO	0.473	CM2
AREA DE ACERO PASIVO	0.473	CM2

CABEZA INFERIOR

BRAZO MECANICO	1.109	M
MODULO RESISTENTE	0.166	M3
SECCION PRETENSADO	25.074	CM2
CAPACIDAD MECANICA DEL PRETENSADO	387.551	TN
CAPACIDAD MECANICA REQUERIDA	29.923	TN
ARMADURA PASIVA REQUERIDA	0.000	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.285	M
AREA TRACCIONADA	0.135	M2
AREA TOTAL DE ACERO	6.753	CM2
AREA DE ACERO PASIVO	0.000	CM2

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION EN CLASE 3

ESFUERZOS SOBRE ESTADO DE NEUTRALIZACION

AXIL	-423.539	TN
MOMENTO REF. ARMADURA	507.725	M*TN
SECCION ARMADURA PASIVA	0.000	CM2
DIST. FIBRA NEUTRA-ARMADURA INF.	0.565	M
SECCION COMPRIMIDA	0.457	M2
MOM. ESTATICO ARMADURA INF.	0.504	M3
MOM. INERCIA ARMADURA INF.	0.581	M4
INCREMENTO TENSION ARMADURA	397.364	KG/CM2
ANCHO MAXIMO DE FISURA	0.000	MM

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

FISURACION

SECCION = 4 DISTANCIA AL CENTRO = 7.800 M.

CABEZA SUPERIOR

BRAZO MECANICO	0.964	M
MODULO RESISTENTE	0.115	M3
SECCION PRETENSADO	0.000	CM2
CAPACIDAD MECANICA DEL PRETENSADO	0.000	TN
CAPACIDAD MECANICA REQUERIDA	23.922	TN
ARMADURA PASIVA REQUERIDA	5.160	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.113	M
AREA TRACCIONADA	0.092	M2
AREA TOTAL DE ACERO	4.588	CM2
AREA DE ACERO PASIVO	4.588	CM2

CABEZA INFERIOR

- NO HAY TRACCIONES -

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

FISURACION

SECCION = 5 DISTANCIA AL CENTRO = 8.600 M.

CABEZA SUPERIOR

BRAZO MECANICO	0.964	M
MODULO RESISTENTE	0.115	M3
SECCION PRETENSADO	0.000	CM2
CAPACIDAD MECANICA DEL PRETENSADO	0.000	TN
CAPACIDAD MECANICA REQUERIDA	23.922	TN
ARMADURA PASIVA REQUERIDA	5.160	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.013	M
AREA TRACCIONADA	0.013	M2
AREA TOTAL DE ACERO	0.653	CM2
AREA DE ACERO PASIVO	0.653	CM2

CABEZA INFERIOR

- NO HAY TRACCIONES -

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

FISURACION

SECCION = 6 DISTANCIA AL CENTRO = 11.200 M.

CABEZA SUPERIOR

BRAZO MECANICO	0.964	M
MODULO RESISTENTE	0.115	M3
SECCION PRETENSADO	0.000	CM2
CAPACIDAD MECANICA DEL PRETENSADO	0.000	TN
CAPACIDAD MECANICA REQUERIDA	23.922	TN
ARMADURA PASIVA REQUERIDA	5.160	CM2

CALCULO BASADO EN EL AREA TRACCIONADA

PROF.ZONA TRACCIONADA	0.165	M
AREA TRACCIONADA	0.102	M2
AREA TOTAL DE ACERO	5.120	CM2
AREA DE ACERO PASIVO	5.120	CM2

CABEZA INFERIOR

- NO HAY TRACCIONES -

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A ROTURA POR FLEXION

SECCION = 1 DISTANCIA AL CENTRO = 0.000 M.

MOMENTO MAYORADO REF. ARMADURA	513.087	M*TN
ARMADURA PASIVA MINIMA	0.000	CM2

DEFORMACION EN ROTURA

VIGA		LOSA	
FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
0.010000	-0.000302	-0.000180	-0.002381

ESFUERZOS EN EL PRETENSADO

PRE I 434.962 TN

RESULTANTE DE LAS TENSIONES EN EL HORMIGON

AXIL	448.192	TN
MOMENTO REF. ARMADURA	556.129	M*TN

RESULTANTE ESFUERZOS DE PRETENSADO

AXIL	434.962	TN
MOMENTO REF. ARMADURA	0.000	M*TN
AREA ACERO PASIVO	0.000	CM2
MOMENTO DE AGOTAMIENTO	556.129	M*TN

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A ROTURA POR FLEXION

SECCION = 2 DISTANCIA AL CENTRO = 1.800 M.

MOMENTO MAYORADO REF. ARMADURA 499.835 M*TN
ARMADURA PASIVA MINIMA 0.000 CM2

DEFORMACION EN ROTURA

VIGA		LOSA	
FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
0.010000	-0.000300	-0.000184	-0.002387

ESFUERZOS EN EL PRETENSADO

PRE I 434.962 TN

RESULTANTE DE LAS TENSIONES EN EL HORMIGON

AXIL 449.008 TN

MOMENTO REF. ARMADURA 557.095 M*TN

RESULTANTE ESFUERZOS DE PRETENSADO

AXIL 434.962 TN

MOMENTO REF. ARMADURA 0.000 M*TN

AREA ACERO PASIVO 0.000 CM2

MOMENTO DE AGOTAMIENTO 557.095 M*TN

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A ROTURA POR FLEXION

SECCION = 3 DISTANCIA AL CENTRO = 2.600 M.

MOMENTO MAYORADO REF. ARMADURA 485.437 M*TN
ARMADURA PASIVA MINIMA 0.000 CM2

DEFORMACION EN ROTURA

VIGA		LOSA	
FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
0.010000	-0.000150	-0.000027	-0.002187

ESFUERZOS EN EL PRETENSADO

PRE I 391.466 TN

RESULTANTE DE LAS TENSIONES EN EL HORMIGON

AXIL 399.588 TN

MOMENTO REF. ARMADURA 497.683 M*TN

RESULTANTE ESFUERZOS DE PRETENSADO

AXIL 391.466 TN

MOMENTO REF. ARMADURA 0.000 M*TN

AREA ACERO PASIVO 0.000 CM2

MOMENTO DE AGOTAMIENTO 497.683 M*TN

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A ROTURA POR FLEXION

SECCION = 4 DISTANCIA AL CENTRO = 7.800 M.

MOMENTO MAYORADO REF. ARMADURA 264.233 M*TN
ARMADURA PASIVA MINIMA 0.000 CM2

DEFORMACION EN ROTURA

VIGA		LOSA	
FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
0.010000	-0.000002	0.000017	-0.002153

ESFUERZOS EN EL PRETENSADO

PRE I 391.466 TN

RESULTANTE DE LAS TENSIONES EN EL HORMIGON

AXIL	385.951	TN
MOMENTO REF. ARMADURA	482.031	M*TN

RESULTANTE ESFUERZOS DE PRETENSADO

AXIL	391.466	TN
MOMENTO REF. ARMADURA	0.000	M*TN
AREA ACERO PASIVO	0.000	CM2
MOMENTO DE AGOTAMIENTO	482.031	M*TN

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A ROTURA POR FLEXION

SECCION = 5 DISTANCIA AL CENTRO = 8.600 M.

MOMENTO MAYORADO REF. ARMADURA 210.569 M*TN
ARMADURA PASIVA MINIMA 0.000 CM2

DEFORMACION EN ROTURA

VIGA		LOSA	
FIB. INF.	FIB. SUP.	FIB. INF.	FIB. SUP.
0.010000	0.000516	0.000568	-0.001443

ESFUERZOS EN EL PRETENSADO

PRE I 217.481 TN

RESULTANTE DE LAS TENSIONES EN EL HORMIGON

AXIL	216.404	TN
MOMENTO REF. ARMADURA	269.198	M*TN

RESULTANTE ESFUERZOS DE PRETENSADO

AXIL	217.481	TN
MOMENTO REF. ARMADURA	0.000	M*TN
AREA ACERO PASIVO	0.000	CM2
MOMENTO DE AGOTAMIENTO	269.198	M*TN

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A CORTANTE

SECCION = 1 DISTANCIA AL CENTRO = 0.000 M.

CANTO UTIL = 1.346 M
ANCHO ALMA = 0.150 M

SECCION DE CERCOS MINIMA 3.214 CM2/M (CERCOS -O- 6 A 0.175 M.)

(ZONA C)

CORTANTE MAYORADO	14.610	TN
CORTANTE C.PERM. SIN MAY.	0.000	TN
CORTANTE DEBIDO PRETENSADO	0.000	TN
MOMENTO COMPATIBLE	513.087	M*TN
TENSION AXIL EN EL C.D.G	-388.149	TN/M2
COTANGENTE -O-	1.571	
LIM. COMPRESION ALMA	164.615	TN
COLABORACION CERCOS	0.000	TN
SECCION DE ACERO	3.214	CM2/M
DIAMETRO CERCOS	6.000	MM
SEPARACION CERCOS	0.175	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

ARMADURA DE CONEXION

SECCION = 1 DISTANCIA AL CENTRO = 0.000 M.

RASANTE MAYORADO	10.989	TN/M
SECCION TOTAL ACERO	2.616	CM2/M
SECCION DE ACERO EN CERCOS	3.214	CM2/M
SECCION ADICIONAL	0.000	CM2/M
DIAMETRO CERCOS ADICIONAL	0.000	MM
SEPARAC. CERCOS ADICIONAL	0.000	M

CORTANTES DE ALA EN CABEZA SUPERIOR

RASANTE MAYORADO	0.848	TN/M
SECCION NECESARIA	0.202	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.350	M

CORTANTES DE ALA EN CABEZA INFERIOR

RASANTE MAYORADO	3.553	TN/M
SECCION NECESARIA	0.846	CM2/M
DIAMETRO DE LAS BARRAS	6.000	MM
SEPARAC. DE LAS BARRAS	0.350	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A CORTANTE

SECCION = 2 DISTANCIA AL CENTRO = 1.800 M.

CANTO UTIL = 1.346 M
ANCHO ALMA = 0.150 M

SECCION DE CERCOS MINIMA 3.214 CM2/M (CERCOS -O- 6 A 0.175 M.)

(ZONA C)

CORTANTE MAYORADO	27.499	TN
CORTANTE C.PERM. SIN MAY.	5.049	TN
CORTANTE DEBIDO PRETENSADO	0.000	TN
MOMENTO COMPATIBLE	499.835	M*TN
TENSION AXIL EN EL C.D.G	-397.560	TN/M2
COTANGENTE -O-	1.583	
LIM. COMPRESION ALMA	164.113	TN
COLABORACION CERCOS	11.979	TN
SECCION DE ACERO	3.214	CM2/M
DIAMETRO CERCOS	6.000	MM
SEPARACION CERCOS	0.175	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

ARMADURA DE CONEXION

SECCION = 2 DISTANCIA AL CENTRO = 1.800 M.

RASANTE MAYORADO	18.308	TN/M
SECCION TOTAL ACERO	4.359	CM2/M
SECCION DE ACERO EN CERCOS	3.214	CM2/M
SECCION ADICIONAL	1.145	CM2/M
DIAMETRO CERCOS ADICIONAL	6.000	MM
SEPARAC. CERCOS ADICIONAL	0.350	M

CORTANTES DE ALA EN CABEZA SUPERIOR

RASANTE MAYORADO	2.726	TN/M
SECCION NECESARIA	0.649	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.350	M

CORTANTES DE ALA EN CABEZA INFERIOR

RASANTE MAYORADO	7.044	TN/M
SECCION NECESARIA	1.677	CM2/M
DIAMETRO DE LAS BARRAS	6.000	MM
SEPARAC. DE LAS BARRAS	0.175	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A CORTANTE

SECCION = 3 DISTANCIA AL CENTRO = 2.600 M.

CANTO UTIL = 1.340 M
ANCHO ALMA = 0.150 M

SECCION DE CERCOS MINIMA 3.214 CM2/M (CERCOS -O- 6 A 0.175 M.)

(ZONA C)

CORTANTE MAYORADO	33.228	TN
CORTANTE C.PERM. SIN MAY.	7.293	TN
CORTANTE DEBIDO PRETENSADO	0.000	TN
MOMENTO COMPATIBLE	485.437	M*TN
TENSION AXIL EN EL C.D.G	-343.457	TN/M2
COTANGENTE -O-	1.517	
LIM. COMPRESION ALMA	166.275	TN
COLABORACION CERCOS	18.032	TN
SECCION DE ACERO	3.214	CM2/M
DIAMETRO CERCOS	6.000	MM
SEPARACION CERCOS	0.175	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

ARMADURA DE CONEXION

SECCION = 3 DISTANCIA AL CENTRO = 2.600 M.

RASANTE MAYORADO	21.561	TN/M
SECCION TOTAL ACERO	5.134	CM2/M
SECCION DE ACERO EN CERCOS	3.214	CM2/M
SECCION ADICIONAL	1.919	CM2/M
DIAMETRO CERCOS ADICIONAL	6.000	MM
SEPARAC. CERCOS ADICIONAL	0.175	M

CORTANTES DE ALA EN CABEZA SUPERIOR

RASANTE MAYORADO	3.561	TN/M
SECCION NECESARIA	0.848	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.350	M

CORTANTES DE ALA EN CABEZA INFERIOR

RASANTE MAYORADO	8.595	TN/M
SECCION NECESARIA	2.047	CM2/M
DIAMETRO DE LAS BARRAS	6.000	MM
SEPARAC. DE LAS BARRAS	0.175	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.
==========

COMPROBACION A CORTANTE
==========

SECCION = 4 DISTANCIA AL CENTRO = 7.800 M.
==========

CANTO UTIL = 1.340 M
ANCHO ALMA = 0.150 M

SECCION DE CERCOS MINIMA 3.214 CM2/M (CERCOS -O- 6 A 0.175 M.)

(ZONA AB)

CORTANTE MAYORADO	70.463	TN
CORTANTE C.PERM. SIN MAY.	21.880	TN
CORTANTE DEBIDO PRETENSADO	0.000	TN
MOMENTO COMPATIBLE	264.233	M*TN
TENSION AXIL EN EL C.D.G	-506.443	TN/M2
COTANGENTE -O-	1.708	
LIM. COMPRESION ALMA	157.761	TN
COLABORACION CERCOS	53.056	TN
SECCION DE ACERO	6.699	CM2/M
DIAMETRO CERCOS	8.000	MM
SEPARACION CERCOS	0.150	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.
==========

ARMADURA DE CONEXION
==========

SECCION = 4 DISTANCIA AL CENTRO = 7.800 M.
==========

RASANTE MAYORADO	42.706	TN/M
SECCION TOTAL ACERO	10.168	CM2/M
SECCION DE ACERO EN CERCOS	6.699	CM2/M
SECCION ADICIONAL	3.469	CM2/M
DIAMETRO CERCOS ADICIONAL	6.000	MM
SEPARAC. CERCOS ADICIONAL	0.150	M

CORTANTES DE ALA EN CABEZA SUPERIOR
==========

RASANTE MAYORADO	8.986	TN/M
SECCION NECESARIA	2.140	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.150	M

CORTANTES DE ALA EN CABEZA INFERIOR
==========

RASANTE MAYORADO	18.679	TN/M
SECCION NECESARIA	4.447	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.150	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A CORTANTE

SECCION = 5 DISTANCIA AL CENTRO = 8.600 M.

CANTO UTIL = 1.304 M
ANCHO ALMA = 0.150 M

SECCION DE CERCOS MINIMA 3.214 CM2/M (CERCOS -O- 6 A 0.150 M.)

(ZONA C)

CORTANTE MAYORADO	76.191	TN
CORTANTE C.PERM. SIN MAY.	24.124	TN
CORTANTE DEBIDO PRETENSADO	0.000	TN
MOMENTO COMPATIBLE	210.569	M*TN
TENSION AXIL EN EL C.D.G	-268.368	TN/M2
COTANGENTE -O-	1.420	
LIM. COMPRESION ALMA	165.756	TN
COLABORACION CERCOS	66.934	TN
SECCION DE ACERO	10.467	CM2/M
DIAMETRO CERCOS	10.000	MM
SEPARACION CERCOS	0.150	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

ARMADURA DE CONEXION

SECCION = 5 DISTANCIA AL CENTRO = 8.600 M.

RASANTE MAYORADO	45.959	TN/M
SECCION TOTAL ACERO	10.943	CM2/M
SECCION DE ACERO EN CERCOS	10.467	CM2/M
SECCION ADICIONAL	0.476	CM2/M
DIAMETRO CERCOS ADICIONAL	6.000	MM
SEPARAC. CERCOS ADICIONAL	0.300	M

CORTANTES DE ALA EN CABEZA SUPERIOR

RASANTE MAYORADO	9.821	TN/M
SECCION NECESARIA	2.338	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.150	M

CORTANTES DE ALA EN CABEZA INFERIOR

RASANTE MAYORADO	20.231	TN/M
SECCION NECESARIA	4.817	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.150	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

COMPROBACION A CORTANTE

SECCION = 6 DISTANCIA AL CENTRO = 11.200 M.

CANTO UTIL = 1.304 M
ANCHO ALMA = 0.150 M

SECCION DE CERCOS MINIMA 3.214 CM2/M (CERCOS -O- 6 A 0.150 M.)

(ZONA AB)

CORTANTE MAYORADO	94.809	TN
CORTANTE C.PERM. SIN MAY.	31.418	TN
CORTANTE DEBIDO PRETENSADO	0.000	TN
MOMENTO COMPATIBLE	123.631	M*TN
TENSION AXIL EN EL C.D.G	-447.601	TN/M2
COTANGENTE -O-	1.641	
LIM. COMPRESION ALMA	156.440	TN
COLABORACION CERCOS	77.870	TN
SECCION DE ACERO	10.467	CM2/M
DIAMETRO CERCOS	10.000	MM
SEPARACION CERCOS	0.150	M

GIF SUBTRAMO III - L=23.10 M. A=11.20 M.

ARMADURA DE CONEXION

SECCION = 6 DISTANCIA AL CENTRO = 11.200 M.

RASANTE MAYORADO	56.531	TN/M
SECCION TOTAL ACERO	13.460	CM2/M
SECCION DE ACERO EN CERCOS	10.467	CM2/M
SECCION ADICIONAL	2.993	CM2/M
DIAMETRO CERCOS ADICIONAL	6.000	MM
SEPARAC. CERCOS ADICIONAL	0.150	M

CORTANTES DE ALA EN CABEZA SUPERIOR

RASANTE MAYORADO	12.534	TN/M
SECCION NECESARIA	2.984	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.150	M

CORTANTES DE ALA EN CABEZA INFERIOR

RASANTE MAYORADO	25.273	TN/M
SECCION NECESARIA	6.017	CM2/M
DIAMETRO DE LAS BARRAS	8.000	MM
SEPARAC. DE LAS BARRAS	0.150	M

ESTRIBOS

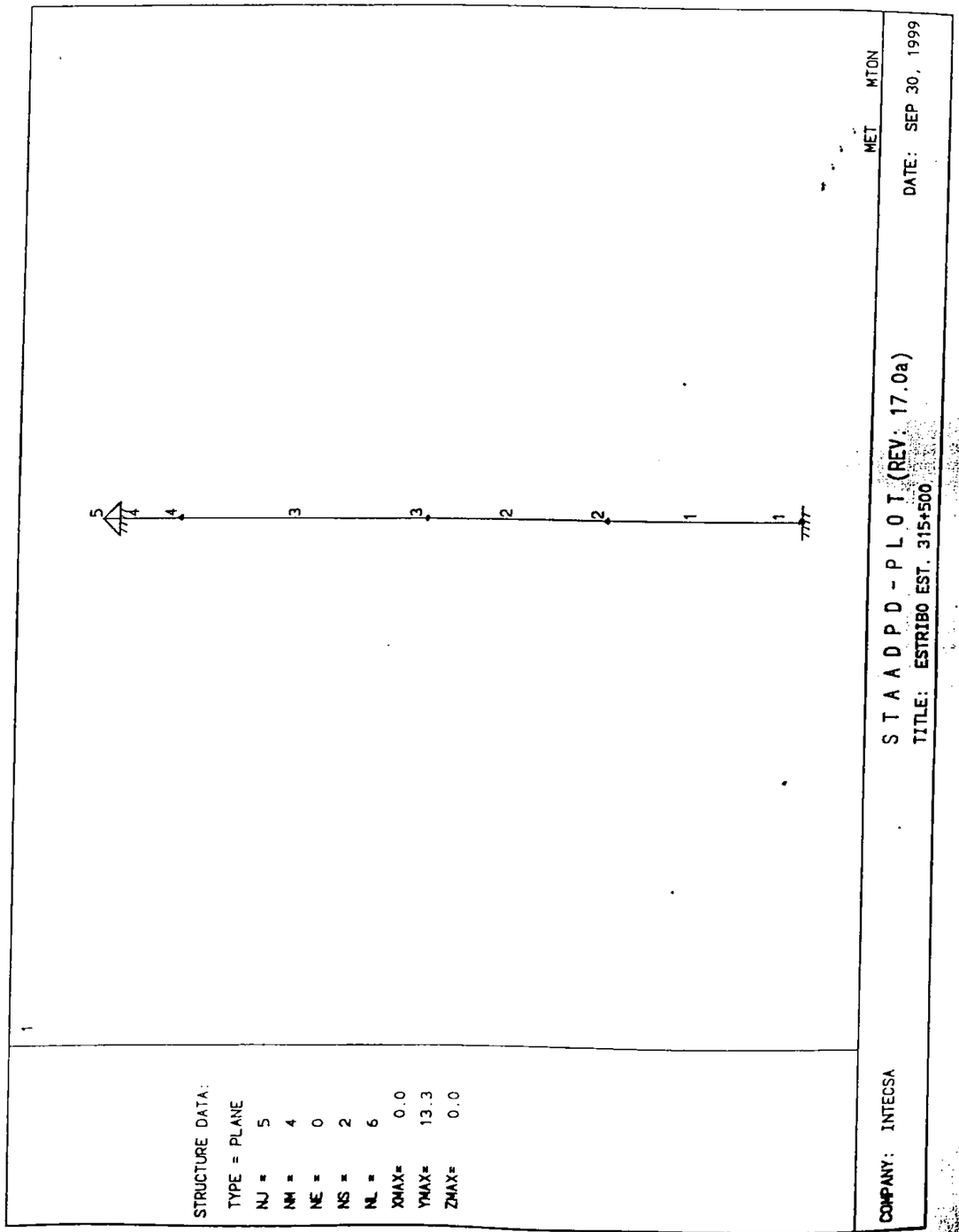
ESTRIBO 1

Se analizan el alzado y la zapata por separado.

Para el cálculo del primero se aplica el programa STAAD articulando empotramiento en la unión con la zapata y articulación en la unión con la losa de tablero

Y integrato a la zapata se aplica el programa general de estribos en el que se hace caso omiso de los resultados pertenecientes al cuerpo del estribo.

A continuación se incluyen los listados de ordenador y dimensionamiento



```
 *****************************************************
 *                                                   *
 *           S T A A D - III                         *
 *           Revision 17.0a                          *
 *           Proprietary Program of                  *
 *           RESEARCH ENGINEERS, Inc.                *
 *           Date=    SEP 30, 1999                   *
 *           Time=    16: 7:33                       *
 *                                                   *
 *****************************************************
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 1. STAAD PLANE ESTRIB0 EST. 315+500
 2. UNIT MET MTONS DEG
 3. JOINT COORDINATES
 4.     1    0.    -13.30    0.       2    0.     -9.80    0.
        3    0.     -6.30    0.       4    0.     -1.50    0.
 6.     5    0.      0.      0.
 7. MEMBER INCIDENCES
 8.   1    1    2 ;  2    2    3 ;  3    3    4 ;  4    4    5
 9. MEMBER PROPERTIES
10. 1 TO 3                PRIS AX  1.100  IZ 0.1109
11. 4                     PRIS AX  0.300  IZ 0.0023
12. CONSTANTS
13. E    3000000.   ALL
14. POISSON  0.15   ALL
15. SUPPORTS
16. 1          FIXED
17. 5          FIXED BUT FY MZ
18. LOADING 1 PESO PROPIO + CARGA PERMANENTE
19. MEMB LOAD
20. 1 TO 3        UNI GY    -2.75
21. 4             UNI GY    -0.75
22. JOINT LOAD
23. 4                FY   -14.78
24. 4                FX    -1.24
25. LOADING 2 SOBRECARGA
26. JOINT LOAD
27. 4                FY    -9.85
28. 4                FX    -0.36
29. LOADING 3 EMPUJE DE TIERRAS
30. MEMB LOAD
31. 1            TRAP GX    -7.98   -5.88   0.00   3.50
32. 2            TRAP GX    -5.88   -3.78   0.00   3.50
33. 3            TRAP GX    -3.78   -0.90   0.00   4.80
34. 4            TRAP GX    -0.90    0.00   0.00   1.50
35. LOADING 4 EMPUJE DE SOBRECARGAS
36. MEMB LOAD
37. 1 TO 4         UNI GX    -0.33
38. LOAD COMB 5 HIP.1 + HIP.3 + HIP.4
39. 1 1.35 3 1.35 4 1.5
40. LOAD COMB 6 HIP.1 + HIP.2 + HIP.3 + HIP.4
41. 1 1.35 2 1.5 3 1.35 4 1.5
42. PERFORM ANALYSIS
```


P R O B L E M S T A T I S T I C S

```
 NUMBER OF JOINTS/MEMBER+ELEMENTS/SUPPORTS =      5/     4/     2
 ORIGINAL/FINAL BAND-WIDTH =     1/     1
 TOTAL PRIMARY LOAD CASES  =     4, TOTAL DEGREES OF FREEDOM =     11
 SIZE OF STIFFNESS MATRIX =      66 DOUBLE PREC. WORDS
 TOTAL REQUIRED DISK SPACE =   12.01 MEGA-BYTES

++ PROCESSING ELEMENT STIFFNESS MATRIX.          16: 7:34
++ PROCESSING GLOBAL STIFFNESS MATRIX.           16: 7:34
++ PROCESSING TRIANGULAR FACTORIZATION.          16: 7:34
++ CALCULATING JOINT DISPLACEMENTS.              16: 7:34
++ CALCULATING MEMBER  FORCES.                   16: 7:34
```

```
43. LOAD LIST 1 TO 4
44. PRINT SUPPORTS REACTIONS
```

REACTIONS -UNIT MTON MET STRUCTURE TYPE = PLANE

JOINT	LOAD	FORCE-X	FORCE-Y	FORCE-Z	MOM-X	MOM-Y	MOM Z
	1	0.27	48.35	0.00	0.00	0.00	-1.79
	2	0.08	9.85	0.00	0.00	0.00	-0.52
	3	43.12	0.00	0.00	0.00	0.00	-102.96
	4	2.84	0.00	0.00	0.00	0.00	-8.53
	1	0.97	0.00	0.00	0.00	0.00	0.00
	2	0.28	0.00	0.00	0.00	0.00	0.00
	3	9.95	0.00	0.00	0.00	0.00	0.00
	4	1.55	0.00	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

LOAD LIST 5 6
PRINT MEMB FORC

MEMBER END FORCES STRUCTURE TYPE = PLANE

ALL UNITS ARE -- MTON MET

MEMB	LOAD	JT	AXIAL	SHEAR-Y	SHEAR-Z	TORSION	MOM-Y	MOM-Z
1	5	1	65.28	-62.84	0.00	0.00	0.00	-154.21
		2	-52.29	28.36	0.00	0.00	0.00	-2.49
	6	1	80.05	-62.96	0.00	0.00	0.00	-154.99
		2	-67.06	28.48	0.00	0.00	0.00	2.13
2	5	2	52.29	-28.36	0.00	0.00	0.00	2.49
		3	-39.29	3.81	0.00	0.00	0.00	-55.88
	6	2	67.06	-28.48	0.00	0.00	0.00	2.13
		3	-54.07	3.92	0.00	0.00	0.00	-55.94
3	5	3	39.29	-3.81	0.00	0.00	0.00	55.88
		4	-21.47	-13.73	0.00	0.00	0.00	-24.58
	6	3	54.07	-3.92	0.00	0.00	0.00	55.94
		4	-36.25	-13.61	0.00	0.00	0.00	-25.21
4	5	4	1.52	15.41	0.00	0.00	0.00	24.58
		5	0.00	-17.06	0.00	0.00	0.00	0.00
	6	4	1.52	15.83	0.00	0.00	0.00	25.21
		5	0.00	-17.48	0.00	0.00	0.00	0.00

********** END OF LATEST ANALYSIS RESULT **********

47. PLOT BENDING
48. PLOT DISP
49. PLOT MODE FILE
50. FINISH

********** END OF STAAD-III **********

**** DATE= SEP 30,1999 TIME= 16: 7:34 ****

****
* FOR QUESTIONS REGARDING THIS VERSION OF PROGRAM *
* TEL:(0454) 281-080, FAX:(0454)-415-866 THORNBURY UK *
* 10, St.MARY ST, St.MARY CENTRE,THORNBURY,BRISTOL,UK *
****

- Empuje del viento

$U_c = \frac{2500}{1.5} \times 1.00 \times 1.07 = 1782.3$ t/m

$0.04\ U_c = 71.3$ t/m

$M_d = 155.0$ mt/m

$U = 151.3$ t/m > 71.3

$A = \frac{151.3 \times 1.15}{5.1} = 34.1$ cm²/m $\phi 25/12.5$

$M'_d = 55.9$ mt/m

$U = 53.0$ t/m < 71.3

$A_{min} = 71.3 - \frac{1.15}{5.1} = 16.1$ cm²/m $\phi 20/15$

$V_d = 55.1$ t/m

El valor V_{cu} es superior a V_d, luego no es preciso armadura a cortante.

- Trasdós

$U_c = \frac{2500}{1.5} \times 1.00 \times 0.27 = 450.0$ t/m

$0.04\ U_c = 18.0$ t/m

$M'_d = 25.2$ mt/m

$U = 105.8$ t/m > 18.0

$A = \frac{105.8 \times 1.15}{5.1} = 23.8$ cm²/m $\phi 20/12.5$

CALCULO DE ESTRIBOS. VERSION 09-01-1996

PROGRAMA PROPIEDAD DE INTECSA

ZAPATA ESTRUCTURA 315+500

CARACTERISTICAS DEL RELLENO

PESO ESPECIFICO (TN/M3)	= 2.00
ANGULO DE ROZAMIENTO FI	= 30.00
ANGULO ROZAMIENTO TERRENO-MURO	= .00
SOBRECARGA (TN/M2)	= 1.00
COEFICIENTE DE EMPUJE ACTIVO	= .333

CARACTERISTICAS DE LOS MATERIALES

RESISTENCIA CARACTERISTICA DEL HORMIGON	= 250. KG/CM2
LIMITE ELASTICO DEL ACERO	= 5100. KG/CM2
RECUBRIMIENTO DE LAS ARMADURAS	= .040 M

CARGAS SOBRE EL ESTRIBO

CARGA VERTICAL DE TABLERO PESO PROPIO Y CARGA PERMANENTE	14.8 TN
CARGA VERTICAL DE SOBRECARGAS	9.9 TN
FUERZA LONGITUDINAL DE FRENADO RETRACCION Y TEMPERATURA	1.6 TN
FUERZA TRANSVERSAL DE VIENTO	1.0 TN
MOMENTO TRANSVERSAL DE SOBRECARGAS	26.2 MT
FUERZA LONGITUDINAL DE SISMO	.0 TN
FUERZA TRANSVERSAL DE SISMO	.0 TN

GEOMETRIA DEL ESTRIBO

ANCHURA DEL ESTRIBO	B	= 1.00
ESVIAJE (GRADOS SEXAGESIMALES)	BETA	= .00

ALZADO DEL ESTRIBO

ESPESOR DEL FALDON	A3	= .30
ALTURA DEL FALDON	A6	= 1.60
DISTANCIA DE APOYO A BORDE ESTRIBO	A5	= .45
ESPESOR DEL ESTRIBO	A2	= 1.10
ESPESOR DE LAS ALETAS	A7	= .50
ALTURA TOTAL DEL ESTRIBO	H + C	= 15.10
ALTURA DE TIERRAS	H	= 13.30

ZAPATA

VUELO DELANTERO	A1	= 3.35
VUELO TRASERO	A4	= 4.85
LONGITUD TOTAL	L	= 9.30
CANTO	C	= 1.80
RESGUARDO SOBRE ZAPATA		= 0.30
TENSION MEDIA PEDIDA SOBRE TERRENO		= 50.00 TN/M2

ARMADURAS DEL ALZADO

ALETAS	TRASDOS	AV.= 36.2 CM2/M (FI 25 A .125 M) AH.= 48.2 CM2/M (FI 25 A .100 M)
	INTRADOS	AV.= 18.1 CM2/M (FI 20 A .150 M) AH.= 24.1 CM2/M (FI 20 A .125 M)

ARMADURA DE ZAPATA

SE PRECISA ARMADURA A CORTANTE EN VUELO DELANTERO A = 4.20 CM2/M

CARA INFERIOR.	A. PRINCIPAL = 33.3 CM2/M	(FI 25 A .125 M)
	A. DE REPARTO = 10.0 CM2/M	(FI 16 A .200 M)
CARA SUPERIOR.	A. PRINCIPAL = 36.1 CM2/M	(FI 25 A .125 M)
	A. DE REPARTO = 10.8 CM2/M	(FI 16 A .175 M)

ESTRIBO CON RELLENO DE TIERRAS Y SIN TABLERO

TENSIONES EN EL TERRENO (TN/M2) SIN SISMO.

TENSION MEDIA EXIGIBLE EN EL TERRENO = 24.5

TENSIONES MEDIAS EN EL EJE DEL ESTRIBO

S1 = 30.6 SA = 23.8 SB = 21.5 S2 = 11.5

ESTRIBO CON PUENTE EN SERVICIO

TENSIONES EN EL TERRENO (TN/M2) SIN SISMO.

TENSION MEDIA EXIGIBLE EN EL TERRENO = 49.8

TENSIONES MEDIAS EN EL EJE DEL ESTRIBO

SS1 = 36.2 SSA = 27.2 SSB = 24.3 SS2 = 11.2

TENSIONES PUNTA MAXIMA Y MINIMA

SMAX = 62.3 SMIN = -14.8

CALCULO DE MUROS. VERSION 09-01-1996

PROGRAMA PROPIEDAD DE INTECSA

CARACTERISTICAS DEL RELLENO

PESO ESPECIFICO (TN/M3)	= 2.00
ANGULO DE ROZAMIENTO FI	= 30.00
ANGULO ROZAMIENTO TERRENO-MURO	= .00
ANGULO DE TALUD DEL TERRENO	= .00
SOBRECARGA (TN/M2)	= .00
PENDIENTE DE INCLINACION DEL TRASDOS	= .0900
COEFICIENTE DE EMPUJE ACTIVO	= .368
COEFICIENTE DE EMPUJE ACTIVO VERTICAL	= .033

CARACTERISTICAS DE LOS MATERIALES

RESISTENCIA CARACTERISTICA DEL HORMIGON	= 250. KG/CM2
LIMITE ELASTICO DEL ACERO	= 5100. KG/CM2
RECUBRIMIENTO DE LAS ARMADURAS	= .030 M

GEOMETRIA DEL MURO
==========

ALZADO DEL MURO

ANCHO EN CORONACION	A3	=	.20
ANCHO EN LA BASE	A2	=	.74
INCLINACION DEL TRASDOS	CTG(ALFA)	=	.09000
ALTURA TOTAL	H1	=	6.30
ALTURA DE TIERRAS	H	=	6.00

ZAPATA

VUELO DELANTERO	A1	=	.60
VUELO TRASERO	A4	=	2.50
LONGITUD TOTAL	L	=	3.84
CANTO	C	=	.70
RESGUARDO SOBRE ZAPATA		=	0.30
TENSION MEDIA PEDIDA SOBRE TERRENO		=	LIBRE

ARMADURAS DEL ALZADO

TRASDOS.	ZONA INFERIOR	AV.= 13.2 CM2/M	(FI 20 A	.225 M)
		AH.= 5.9 CM2/M	(FI 12 A	.175 M)
	2.7 M. SUPERIORES	AV.= 6.6 CM2/M	(FI 20 A	.450 M)
		AH.= 4.5 CM2/M	(FI 12 A	.250 M)
INTRADOS		AV.= 2.4 CM2/M	(FI 8 A	.200 M)
		AH.= 5.9 CM2/M	(FI 12 A	.175 M)

ARMADURA DE ZAPATA

CARA INFERIOR.	A. PRINCIPAL =	2.7 CM2/M	(FI 12 A	.250 M)
	A. DE REPARTO =	.8 CM2/M	(FI 12 A	.250 M)
CARA SUPERIOR.	A. PRINCIPAL =	13.3 CM2/M	(FI 20 A	.225 M)
	A. DE REPARTO =	4.0 CM2/M	(FI 12 A	.250 M)

TENSIONES EN EL TERRENO (TN/M2) SIN SISMO. (S. ADM.= 18.71)

S1 = 23.39 SA = 19.93 SB = 15.67 S2 = 1.28

COEFICIENTE DE SEGURIDAD AL DESLIZAMIENTO = 1.66
COEFICIENTE DE SEGURIDAD AL VUELCO = 2.73

VOLUMEN DE HORMIGON = 5.65 M3. PESO DE ACERO = 236.6 KG

GEOMETRIA DEL MURO
==========

ALZADO DEL MURO

ANCHO EN CORONACION	A3	=	.20
ANCHO EN LA BASE	A2	=	1.10
INCLINACION DEL TRASDOS	CTG(ALFA)	=	.09000
ALTURA TOTAL	H1	=	10.30
ALTURA DE TIERRAS	H	=	10.00

ZAPATA

VUELO DELANTERO	A1	=	1.10
VUELO TRASERO	A4	=	4.00
LONGITUD TOTAL	L	=	6.20
CANTO	C	=	1.10
RESGUARDO SOBRE ZAPATA		=	0.30
TENSION MEDIA PEDIDA SOBRE TERRENO		=	LIBRE

ARMADURAS DEL ALZADO

TRASDOS.	ZONA INFERIOR	AV.= 42.4 CM2/M	(FI 25 A	.100 M)
		AH.= 10.6 CM2/M	(FI 16 A	.175 M)
	5.5 M. SUPERIORES	AV.= 21.2 CM2/M	(FI 25 A	.200 M)
		AH.= 6.7 CM2/M	(FI 12 A	.150 M)
INTRADOS		AV.= 3.5 CM2/M	(FI 12 A	.250 M)
		AH.= 7.1 CM2/M	(FI 12 A	.150 M)

ARMADURA DE ZAPATA

CARA INFERIOR.	A. PRINCIPAL =	8.7 CM2/M	(FI 16 A	.225 M)
	A. DE REPARTO =	2.6 CM2/M	(FI 12 A	.250 M)
CARA SUPERIOR.	A. PRINCIPAL =	38.0 CM2/M	(FI 25 A	.125 M)
	A. DE REPARTO =	11.4 CM2/M	(FI 16 A	.175 M)

TENSIONES EN EL TERRENO (TN/M2) SIN SISMO. (S. ADM.= 30.56)

S1 = 38.20 SA = 31.67 SB = 25.14 S2 = 1.41

COEFICIENTE DE SEGURIDAD AL DESLIZAMIENTO = 1.56
COEFICIENTE DE SEGURIDAD AL VUELCO = 2.57

VOLUMEN DE HORMIGON = 13.52 M3. PESO DE ACERO = 899.6 KG

AEPO

Empresa / *Company:* SACYR- GIF SUBTRAMO IIIB

Fecha / *Date:* 25/03/02

Madrid, 25 de Marzo de 2002

Asunto: O.D.T.E 315+500.

El aumento de la altura de los muros cajeros de la estructura O.D.T.E 315+500 de 1.00 m a 2.00 m, con un espesor variable de 0.30 m a 0.20 m, implica un aumento del peso propio de la sección del 3.50 %, respecto del peso de la sección original de proyecto, que fue calculada con un peso propio de 14.30 t/m.

Conforme con el Artículo 3.2.1 de la "Instrucción sobre las acciones a considerar en el proyecto de Puentes de Carretera" IAP si el incremento del peso no sobrepasa el 5 % no deberá efectuarse un nuevo cálculo.

AEPO, S.A. INGENIEROS CONSULTORES C/. Bascones, 22 - 28029 MADRID

Departamento de Estructuras

AEPO

AEPO, S.A.
Ingenieros Consultores

c/ Bascones nº 22 - 28029 MADRID
Teléfono 91-378-9660 Fax 91-323-2644
C.I.F A-28117992. Inscrita en el Registro Mercantil de Madrid Tomo 1.630 General, 1.052 de la Sección 3 del Libro de Sociedades, Folio 1, hoja nº 7.541, Inscripción 1.

E11 ODTE 13 P.K. 313+500

CÁLCULO DEL TABLERO

prefabricados CASTELO

-MEMORIA DESCRIPTIVA-

prefabricados CASTELO

INDICE

1. Introducción
2. Normativa de cálculo
3. Solución estructural adoptada
4. Materiales

prefabricados CASTELO

1.INTRODUCCIÓN

La presente memoria se refiere al proyecto de ejecución de la estructura de paso superior E-11 perteneciente situado en el P.K.315+500 de la línea de alta velocidad Madrid-Barcelona / tramo Lleida-Martorell, cuya finalidad corresponde a un paso de aguas.

2.NORMATIVA DE CALCULO

A efectos de la determinación de las cargas de dimensionamiento de los elementos prefabricados así como de aquellos realizados "in situ" se consideró la "Instrucción de acciones a considerar en el proyecto de puentes de carretera (IAP-98)" aprobada por orden ministerial 250 de 4 de Marzo de 1.998.

El dimensionamiento de dichos elementos se realizó conforme la "Instrucción de Hormigón Estructural (EHE)", aprobada por Real Decreto 2661/1998 del 11 de Diciembre de 1998.

Ambas normativas se encuentran en estado vigente a la fecha de redacción del presente documento.

Para la realización de los cálculos precisos de los elementos prefabricados se han utilizado programas de cálculo de elaboración propia, suficientemente sancionados por la experiencia.

3. SOLUCION ADOPTADA

El paso superior consta de un vano isostático de luz 22.40 m.

La sección transversal de tablero consta de 6 vigas pretensadas tipo doble T de 1.20 m de canto y 1.20 m de ancho. Sobre estas se disponen prelosas pretensadas de encofrado perdido para el hormigonado posterior de la losa de compresión de espesor 25 cm. El tablero descansa mediante apoyos armados convencionales sobre estribos in situ.

4. MATERIALES

Los materiales previstos para la obra son los siguientes:

- Hormigón de vigas prefabricadas: HP-42.5/B/17/IIb
- Hormigón en losa de compresión: HA-25/F/20/IIb
- Acero pasivo en barras corrugadas: B 500 S
- Acero activo en torones de 0.6" : Y 1860 S7

prefabricados CASTELO

-ANEJO DE CALCULO-

prefabricados CASTELO

ANEJO DE CÁLCULO DEL TABLERO

1. Descripción del software empleado. Bases de cálculo.

El puente, cuyo anejo de ordenador se adjunta ha sido calculado empleando un conjunto de programas que forman una compleja aplicación informática para diseño, cálculo, comprobación y dibujo de puentes de carretera y ferrocarril, tanto de vigas como del tipo llamado tablero-losa, incluyendo comprobación y/o dimensionamiento de todos los elementos que lo forman como vigas, losa, neoprenos, placas de encofrado perdido o continuidad de losa.

Se ha procurado buscar salidas auto-explicativas de modo que no existan siglas o claves, pudiendo el técnico comprobar datos y resultados finales e intermedios con sólo consultar el listado. No figuran aquí por tanto los datos de materiales o coeficientes de seguridad, que han de ser consultados en los listados de cada caso concreto. El objeto de esta nota es definir los criterios de cálculo adoptados por los programas en cada fase de modo que el técnico pueda conocer lo que ha hecho el ordenador en cada momento.

El proceso de cálculo es siempre el mismo: a partir de los datos geométricos y de armado de las vigas y de las calidades de los materiales se obtienen las características brutas y homogeneizadas de las secciones simples y compuestas de las vigas con distintas fórmulas según que la viga esté bajo la losa o embebida en ella (tablero losa).

De los datos de sección compuesta se obtienen los de la losa ortótropa equivalente y se calculan los esfuerzos en cada viga empleando las aproximaciones por desarrollos en serie publicados por Guyon Massonet y Rowe entre otros: este cálculo se repite para las distintas soluciones hasta obtener un número de vigas definitivo y los esfuerzos en una viga pésima, cuya comprobación se desarrolla a continuación, tanto para los estados límites de servicio (tensiones y fisuración), como para los últimos (rotura y corte). Además se comprueban otros elementos como neoprenos, losa en tablero y zonas de continuidad, y se dan los datos precisos de reacciones para cálculo de pilas y estribos, y los de flechas previsibles.

En todas estas comprobaciones se han seguido las normas vigentes entre las que figuran la instruccion de cargas IAP para puentes de carretera y FF.CC respectivamente y la norma EHE para comprobaciones en elementos de hormigón pretensado y armado. Para los neoprenos se siguen las "Recomendaciones para el cálculo de apoyos elastoméricos del MOPT".

A continuación se describen detalles del proceso de cálculo en cada una de las tipologías observadas.

2. Tableros de vigas I para carretera.

2.1. Resolución de la losa ortótropa.- Esfuerzos.

Como cargas en el tablero, además del peso propio de viga y losa, que se supone resistido por la viga en sección simple, se considera una carga muerta de pavimento que ocupa toda la superficie y dos cargas lineales iguales paralelas a los bordes, que representan el exceso que las aceras suponen respecto a la carga muerta. Como sobrecargas se admite una carga repartida que puede ocupar cualquier zona y un vehículo formado par cualquier número de filas de ruedas cada una de ellas formada por cargas puntuales de número, valor y posición dados por el usuario. El tres de 60 T de la IAP entra dentro e este esquema, pero también los camiones que realizan una prueba de carga, que se puede calcular de este modo.

Una vez obtenidos los datos de la sección con losa los parámetros de inercia a flexión y torsión de la losa ortotropa, así como su ancho ficticio, si la viga de borde no está distribuida como las anteriores, se procede a calcular los esfuerzos flectores y cortantes en las distintas vigas del tablero.

Esto se realiza para varias vigas, hasta que no es previsible encontrar otra peor, o con todas las del tablero, según los casos; para cada viga se comprueban varias posiciones del vehículo hasta encontrar la pésima.

En cada cálculo se toman los coeficientes de reparto correspondientes a la estación exacta del vehículo y cargas, tomando un término de desarrollo en serie, y mayorando por 1.1.

Los cortantes se obtienen de los mismos coeficientes que para flector, mayorados en un 15% para vehículo y en un 5% para sobrecarga. Aunque esto es formalmente incorrecto los errores se concentran en el extremo de las piezas donde están cubiertos por otras razones, según se verá.

2.2. Cálculos tensionales.

A continuación se explica la historia tensional de la viga pésima y se dan tensiones parciales y acumuladas con pretensado inicial y final, peso propio de viga y losa, carga muerta y sobrecargas, así como pérdidas de pretensado. Estas se calculan según fórmulas de la instrucción supuesto un módulo de elasticidad del hormigón de 17000*SQR(375) para pérdidas iniciales, despreciando penetración de cuñas por la gran longitud del banco y adoptando la fórmula de la EP para las pérdidas por fluencia y relajación, excesiva la primera frente a otras como la de Leonhardt. Lo que no se hace es aplicar el coeficiente de 0.9 a la tensión final, por razones que han sido recogidas en la norma EF-88 entre otras.

Las tensiones se calculan sobre secciones homogeneizadas, simples o compuestas adecuadas, según se comentó antes. En cuanto al valor del límite de corte por hormigón se obtiene para la sección de apoyo teniendo en cuenta la presencia de pretensado, pues esto queda del lado de la seguridad mientras que cuando se calculan armaduras no se considera más hormigón armado en el extremo.

Las longitudes de las fundas reductoras de pretensado se calculan con el máximo avance compatible con las cargas totales con la condición de que el pretensado extremo, correspondiente a la zona 1 pueda ser resistido sin

prefabricados CASTELO

sumar ninguna tensión de peso propio. En los extremos de fundas y con carga solo de peso propio de viga es donde se alcanza la máxima compresión de pretensado, valores que se incluyen en el mismo bloque de resultados tensionales.

También se realizan las comprobaciones definidas en la norma para fisuración.

2.3. Cálculo transversal. Armado de losa.

El programa obtiene los flectores de ambos signos de la losa como suma los debidos a efecto local de cargas permanentes incluido peso propio de losa, sobrecarga y carga puntual de ruedas, y los efectos generales de reparto transversal.

Como luz de cálculo para locales se toma la distancia entre ejes de vigas (lo que puede ser excesivo) con fórmulas del tipo viga continua P*L*L/K para cargas repartidas.

En cuanto a las cargas puntuales la carga máxima se considera repartida en una huella resultante de abrir las dimensiones originales de la misma a 45° en el canto del pavimento mas la mitad de la losa. Luego la dimensión longitudinal a las vigas se reparte según las fórmulas de la EH para cargas puntuales, y se toma para M- el correspondiente a viga biempotrada y para M+ el isostático menos el 60% del anterior.

El momento transversal de los ortótropa se calcula para la estación central, aplicando las fórmulas de Guyón y tomando los tres primeros términos no nulos de la serie Fourier. Para positivos se colocan filas del vehículo en el eje del tablero para positivos y lo mas orillados posible para negativos.

Como momento para armar se toma a positivos la suma total, pero a negativos se escoge entre el local de carro y el general de losa, lo que es lógico en un tablero de varias vigas, pues el vehículo orillado, que causa negativos generales en el centro del tablero, está creando negativos locales en el borde por lo que no hay posible concomitancia.

Con estos momentos y los recubrimientos dato se arma transversalmente la losa. El recubrimiento inferior permite tener en cuenta la placa, sin que sea preciso en este caso ninguna otra precaución de cálculo, pues la losa del tablero se parece mas en su comportamiento al canto total, los esfuerzos en losa son mayores para mayor espesor y los efectos de la junta entre placas son totalmente despreciables en la comprobación tensional y a rotura de la placa.

Como armadura longitudinal se dispone el 25% de la transversal con una cuantía geométrica mínima del 0.1%. El armado se realiza con al menos 3 hierros por metro, de diámetro mínimo 6 mm. También se realiza una comprobación de voladizo que puede originar la modificación de la armadura superior.

2.4. Neoprenos.

Los neoprenos se pueden calcular para un tablero con juntas en ambos extremos, esto es punto de movimiento nulo en sección centro-luz y deformaciones en apoyos correspondientes a la semiluz, o bien se pueden comprobar tableros unidos por continuidad de losa u otra unión longitudinal a otros, si bien en este caso la deformación por fluencia se divide por dos para tener en cuenta que la unión entre tableros se realiza transcurrido un tiempo prudente desde el hormigonado de losa, precisamente para evitar la acumulación de deformaciones.

Se comprueban las compresiones máxima y mínima, variando las dimensiones en planta para adaptarse, salvo que sean límites incompatibles en cuyo caso se define el apoyo como gofrado y se adapta a carga máximas; Se limita la distorsión relativa horizontal a 0.7 aumentando el número de capas si fuera preciso, lo que también se hace si no se cumplen giros bajo cargas permanentes o sobrecargas.

También se comprueba el posible aplastamiento, las tensiones axiales y rasantes, y el coeficiente de rozamiento apoyo suelo que, caso de ser insuficiente, motiva un aviso para pegar el neopreno a estribo y viga o disponerlo gofrado.

Tanto en el caso de tableros aislados como unidos el programa de las fuerzas horizontales generadas en apoyos por las deformaciones debidas a temperatura, retracción, fluencia y cargas horizontales, según la rigidez del neopreno. Estos valores, aceptables para el caso de puentes de un solo vano con estribos muy rígidos, son excesivos para pilas altas y flexibles, por lo que se recomienda en este caso hacer un cálculo matricial de la estructura completa contemplando en lo posible el comportamiento de los neoprenos. En todo caso los neoprenos aquí calculados están del lado de la seguridad.

2.5. Comprobación a rotura.

Se realiza obteniendo puntos del diagrama de interacción de la sección compuesta e interpolando para obtener el valor de M correspondiente a N=0. Las deformaciones siguen el diagrama de pivotes de la instrucción EHE limitando la del hormigón a 0.0030.

Como diagramas tensión deformación se toma el parábola-rectángulo para el hormigón, el birrectilíneo para armaduras pasivas de dureza natural y la parábola de 5° grado para el acero activo. A la deformación de esta armadura se le añade la predeformación de pretensado, descontadas las pérdidas iniciales por acortamiento elástico.

El valor del momento hallado se compara con el que resiste la sección central como suma mayorada de todas las acciones y si no fuera suficiente se procede a calcular aproximadamente un refuerzo en base a una armadura pasiva que, trabajando a límite elástico y con un brazo de 0.8 el canto total, cubra la diferencia de momentos.

2.6. Cálculo a cortante.

Las vigas se comprueban y arman a corte para dos cargas repartidas permanentes actuando sobre sección simple y compuesta, una sobrecarga y un tren móvil de 3 cargas, que provoquen en el extremo de la pieza los mismos cortantes respectivamente que los pesos propios de la viga + losa, la carga muerta + las aceras, la sobrecarga y el carro en el tablero.

prefabricados CASTELO

Las cargas se colocan de modo que provoquen en la sección el máximo corte y no el peor flector.

Para las secciones escogidas se comprueba el límite por compresión de biela en el hormigón, la tensión rasante, y las armaduras precisas en alma, ala superior, e inferior.

Como armadura de alma se toma el peor valor de los obtenidos, armando a cortante el alma con Cot0, calculada a partir de la compresión a nivel del c. de g. de la sección compuesta, la comprobación a rasante, calculando como hormigón armado, con las cargas de la sección compuesta y espesor de alma igual a la zona de contacto, y la armadura a rasante, calculada según la norma ACI como proporcional a la sección de contacto con coeficientes variables según el valor de la tensión.

El ala superior se puede armar, según desee el usuario, para todas las cargas o sólo para las que actúan sobre la sección simple si se piensa que la armadura de losa puede cubrir los rasantes de sección compuesta; las fórmulas son las de la EP considerando pretensado a nivel del centro de ala. En cuanto al ala inferior se arma según la EHE, sin considerar pretensado ni resistencia del hormigón.

En todo caso en la sección de apoyo no se considera pretensado lo que motiva grandes diferencias entre X=0 y X=1, lo que queda hasta ciento punto del lado de la seguridad pues algún pretensado existirá.

2.7. Otros cálculos. Deformaciones, continuidad de losa.

Opcionalmente también se incluyen las flechas instantáneas y diferidas previsibles en función de los módulos de elasticidad del hormigón en cada momento y con esto se crea una historia deformacional de la pieza, útil para tratar de prever contraflechas.

Si se desea, también se calcula la zona de continuidad de losa, como viga biempotrada que sufre como giro impuesto los giros del tablero con 3 hipótesis: Giros máximos en ambos tableros, giro mínimo en uno y máximo en otro y esfuerzos locales al paso del carro. También está disponible u resumen de reacciones.

3. Tableros de vigas I para ferrocarril.

En caso de cargas de ferrocarril sólo difieren los aspectos que aquí se relacionan.

Se admiten hasta 3 vías. En estas vías se suponen actuando las cargas IAPF76 para vía RENFE, métrica e internacional, así como alta velocidad. Se admiten varias hipótesis de ripado que siempre respetan la distancia mínima entre ejes de vías.

La fuerza centrífuga se tiene en cuenta como carga de un carril y descarga de otro, si da peores resultados.

La armadura de losa se calcula de modo similar, aunque como aquí no es seguro que los mayores momentos generales se obtengan en la estación central, se hace un rastreo cuidadosó en este punto y bajo todos los carriles para todas las posibles posiciones de vías. En cuanto a la carga puntual se reparte la rueda a 0.7 en el balasto y a 1 en la losa. Como luz

de viga se toma entre ejes de vigas menos 0.6 de ancho de ala superior y se suman todos los momentos para el negativo.

4. Puentes con viga embebida en la losa.

Dado que la losa y vigas están embebidas, se hace preciso manejar como losa a efectos del reparto por Guyon, la que realmente realiza ese papel en función de la posición de la armadura inferior transversal que se enhebra, independientemente del espesor de hormigón que se sitúe sobre viga, que habrá que tener en cuenta en el cálculo de las secciones compuestas de viga.

Un tablero no se considera admisible sólo por la tracción en fibra inferior sino que también se comprueban las compresiones en viga y losa que en estos tableros pueden fácilmente marcar límite.

La armadura inferior transversal de losa se ajusta en su número a la distancia entre orificios de vigas, dato dado por el usuario; la armadura inferior longitudinal entre senos no se dispone, salvo que el usuario lo desee o que sea precisa a rotura.

Como son frecuentes en esta tipología las secciones limitadas a rotura por falta de cabeza de compresión, la rutina de comprobación actúa del siguiente modo: una vez calculado el refuerzo preciso aproximado recalcula la sección con este armado como inferior; si aún no basta emite un mensaje y considera el refuerzo como superior e inferior modificando cubicación de losa en ese sentido. Las armaduras dadas por el usuario al principio del programa son tenidas en cuenta desde el primer momento.

El armado a corte del alma se obtiene de un doble cálculo: la viga resistiendo en sección simple con su alma todo el peso del hormigón y la sección compuesta como una losa pretensada (armada en su primer metro); además se tiene en cuenta la comprobación a rasante. El ala inferior se obtiene del cálculo en sección simple y no se considera la superior mas que por razones de montaje del resto de la armadura. Los cercos se disponen obligatoriamente a ambos lados del hueco.

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DATOS DE CÁLCULO DEL TABLERO

1. DATOS GENERALES

1.1. **Sección Transversal**

Ancho total de plataforma	=	11.20	m
Ancho de las aceras	=	0.50	m

1.2. **Sección Longitudinal**

Luz de Cálculo	=	22.40	m
Longitud de Viga	=	22.90	m

1.3. **Planta**

Esviaje	=	90	°

2. DATOS GENERALES

El tablero está formado por vigas prefabricadas pretensadas sobre las que se vierte hormigón in situ para dar forma a la losa de compresión

Tipo de viga	=	ZEUS-120	
Canto de Viga	=	1.20	m
Canto de losa	=	0.25	m
Número de Vigas	=	6	
Separación entre Vigas	=	2.00	m

Las características de las vigas figuran en el listado de resultados anexo

3. ACCIONES DE CÁLCULO

Peso propio de viga	=	939	Kg/m
Peso propio de Losa	=	625	Kg/m^2
Carga Muerta	=	0	Kg/m^2
Carga de Aceras	=	950	Kg/m
Sobrecarga	=	1000	Kg/m^2 (1.00 m.c.a.)

4. CARACTERÍSTICAS DE LOS MATERIALES. COEFICIENTES DE SEGURIDAD SEGÚN EHE

4.1. **Hormigón de la viga prefabricada**

Resistencia Característica	=	425	Kg/cm^2
γ_c	=	1.5	

4.2. **Hormigón de la losa in situ**

Resistencia Característica	=	250	Kg/cm^2
γ_c	=	1.5	

4.3. **Acero Activo en viga prefabricada**

Tensión de Rotura	=	19000	Kg/cm^2
Limite Elástico al 0.2	=	17100	Kg/cm^2
γ_s	=	1.15	

4.4. **Acero Pasivo en viga prefabricada**

Limite Elástico	=	5100	Kg/cm^2
γ_s	=	1.15	

4.5. **Acero Pasivo en losa in situ**

Limite Elástico	=	5100	Kg/cm^2
γ_s	=	1.15	

4.6. **Acciones**

Cargas permanentes	$\gamma_{f,cp}$	=	1.35
Sobrecargas	$\gamma_{f,sc}$	=	1.50

prefabricados CASTELO

Pretensados del Louro, S.A.

CLIENTE : SACYR Ref.:4522
OBRA : E-11
CALCULO DEL TABLERO

DEFINICION DEL PERFIL: ZEUS

TRAPECIOS (En Cm)

INFERIOR	SUPERIOR	ALTURA
60.0	60.0	12.0
60.0	24.0	6.0
24.0	12.0	5.0
12.0	12.0	81.0
12.0	24.0	5.0
24.0	120.0	6.0
120.0	120.0	5.0

Canto (Cm).....	120.00	C.d.g. (a fibra sup.) (Cm).	56.53
Inercia flexion (Cm4).....	6658326	Inercia torsion (Cm4).....	147032
Area (Cm2).....	3156.00	Coef. Corte ala superior...	.45
Espesor ala sup. medio(cm).	8.61	Idem Inferior.....	16.38
Espesor ala sup. maximo(cm)	11.00	Idem Inferior.....	18.00
Area volada ala sup. (cm2).	384.00		
Area pret inf en extremo...	15.40	Recubrimiento a eje (cm)...	5.00
Area pret.inf.zona interm..	18.20	Recubrimiento a eje (cm)...	5.77
Area pret.inf.centro viga..	18.20	Recubrimiento a eje (cm)...	5.77
Area pret.sup.(cm2).....	2.80	Recubrimiento a eje (cm)...	5.00
Coef. Corte ala inferior...	.31		

DATOS PARA CALCULO DE MATERIALES SEGUN EHE (Kg.y Cm.)

Resist. carac.hormigon viga	425.00	Resist.carac. hormigon losa	250.00
Resist. calc. acero viga...	4434.78	Resist. calc. acero losa...	4434.78
Lim. elast. min. acero pret	14782.60	Tension inicial tesado pret	14250.00
Coeficiente retraccion.....	.037	Coeficiente fluencia.....	2.500
Coef. relajacion a T= inf..	.006	Coef.Sobrecarga Frecuente..	.500
Coef. mayoracion carga perm	1.350	Coef. mayoracion sobrecarga	1.500

Las secciones se homogeneizan con la relacion de modulos de elasticidad acero/hormigon este ultimo distinto para cargas instantaneas o permanentes

DATOS DEL PUENTE

Ancho de tablero(m.).....	11.20	Luz de calculo(m.).....	22.40
Espesor de losa(m.).....	.250	Ancho de la acera(m.).....	.600
Numero vigas(inicio tanteo)	6.000	Dist.eje viga ext. a borde.	.600
Longitud total viga(m.)....	22.900	Carga muerta (Kg./m2).....	0.000
Carga linea acera (Kg/m.)..	950.000	Distancia carga a borde(m.)	.200
Recub. arm. sup. losa (cm).	3.000	Recub. arm. inf. losa (cm).	6.000
Culata minima viga (cm)....	25.00	Diametro toron inferior.cm.	1.52
Ancho del neopreno (cm.)...	30.00	Long. neopreno(paral.viga).	15.00
Espesor total neopreno(cm.)	3.00	Espesor chapas metalicas...	.30
Numero capas de goma.....	2.00	Espesor de cada capa (cm.).	.80
Modulo deform.transv.Kg/cm2	10.00	Incremento temperatura (oC)	30.00

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CARGAS DE USUARIO: CARRO Y SOBRECARGA

Sobrecarga (kg/m2)..... 1000.00

CALCULOS CON 6 VIGAS EN EL TABLERO

CARACTERISTICAS RESISTENTES VIGA EXTREMA + LOSA (Cm.)

C.d Grav-borde sup. S.bruta	45.97	Inercia seccion bruta.....	14578429
C.d G. Sec.homg.carg.perm.	48.81	Inercia sec.homg.carg.perm.	16363400
C.d G. Sec.homg.sobrecarg.	46.94	Inercia sec.homg.sobrecarg.	15185507

CARACTERISTICAS RESISTENTES VIGA CENTRAL + LOSA (Cm.)

C.d Grav-borde sup. S.bruta	42.16	Inercia seccion bruta.....	15453986
C.d G. Sec.homg.carg.perm.	44.80	Inercia sec.homg.carg.perm.	17389675
C.d G. Sec.homg.sobrecarg.	43.06	Inercia sec.homg.sobrecarg.	16111075

DEFINICION LOSA ORTOTROPA: CARGAS: DEF. USUARIO

Inercia flexion long. (cm3)	77270	Inercia torsion long. (Cm3)	1091
Inercia flexion trans.(cm3)	2685	Inercia torsion trans.(Cm3)	1950
Parametro de flexion..(cm3)	.762	Parametro de torsion.....	.110
Momento medio carro(Kg.m)..	0.00	Cortante medio carro(Kg)...	0.00
Mom.medio sobrecarga(Kg.m).	14634.67	Cortante medio sobrecarga..	2613.33

ESFUERZOS (Ton.y m.) EN VIGA 1 CON CARRO A 0.00m DE LA ACERA

Momento p.propio viga+losa.	112.21	Cortante p.propio viga+losa	20.04
Momento c.muerta+aceras....	37.48	Cortante c.muerta+aceras...	7.20
Momento sobrecarga rep.....	121.46	Cortante sobrecarga rep....	23.34
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	71.78	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	8.42	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 1 CON CARRO A .50m DE LA ACERA

Momento p.propio viga+losa.	112.21	Cortante p.propio viga+losa	20.04
Momento c.muerta+aceras....	37.48	Cortante c.muerta+aceras...	7.20
Momento sobrecarga rep.....	121.46	Cortante sobrecarga rep....	23.34
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	71.78	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	8.42	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 2 CON CARRO A 0.00m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	17.66	Cortante c.muerta+aceras...	3.39
Momento sobrecarga rep.....	122.41	Cortante sobrecarga rep....	23.53
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	70.70	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	8.05	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 2 CON CARRO A .50m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84

Momento c.muerta+aceras....	17.66	Cortante c.muerta+aceras...	3.39
Momento sobrecarga rep.....	122.41	Cortante sobrecarga rep....	23.53
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	70.70	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	8.05	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 2 CON CARRO A 1.00m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	17.66	Cortante c.muerta+aceras...	3.39
Momento sobrecarga rep.....	122.41	Cortante sobrecarga rep....	23.53
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	70.70	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	8.05	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 2 CON CARRO A 1.50m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	17.66	Cortante c.muerta+aceras...	3.39
Momento sobrecarga rep.....	122.41	Cortante sobrecarga rep....	23.53
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	70.70	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	8.05	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 1.00m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 1.50m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 2.00m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 2.50m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01

prefabricados CASTELO

Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 3.00m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 3.50m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 4.00m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

ESFUERZOS (Ton.y m.) EN VIGA 3 CON CARRO A 4.50m DE LA ACERA

Momento p.propio viga+losa.	127.89	Cortante p.propio viga+losa	22.84
Momento c.muerta+aceras....	5.65	Cortante c.muerta+aceras...	1.08
Momento sobrecarga rep.....	119.85	Cortante sobrecarga rep....	23.03
Momento carro.....	0.00	Cortante carro.....	0.00
Cortante total mayorado....	66.85	Limite corte por hormigon..	142.01
Tension carga frec.viga inf	14.73	(Tensiones en Kg/Cm2).....	

SE ADOPTA COMO SOLUCION LA DE 6 VIGAS
VIGA PESIMA LA 2 DESDE EL BORDE
POSICION PESIMA CARRO A 1.0 m. DE LA ACERA

PERDIDAS PRETENSADO (Kg/Cm2)

Penetracion cu·as.....	60.80	Proceso termico.....	0.00
Acortamiento elastico.....	1274.29	Total diferida(Ret+Flu+Rel)	2034.90
Tension inicial armadura...	12914.91	Tension final armadura.....	10880.01

HISTORIA TENSIONAL VIGA PESIMA (Kg/Cm2)

Tension pret. final sup....	-11.95	Tension pret. final inf....	169.61
Tension p.propio viga sup..	39.79	Tension p.propio viga inf..	-40.31
Tension p.propio losa sup..	63.05	Tension p.propio losa inf..	-63.87
Tension carga perm. sup....	2.01	Tension carga perm. inf....	-10.17
Tension sobrecarga sup.....	13.72	Tension sobrecarga inff....	-77.46
Tens.carga frecuen.losa sup	20.90	Tens.carga frecuen.losa inf	8.87
Tens.carga frecuen.viga sup	100.36	Tens.carga frecuen.viga inf	8.05

COMPROBACION ESTADO LIMITE ROTURA FLEXION Y ENFUNDADOS

Momento rotura seccion Kg.m	397026.62	Momento necesario (m.Kg)...	380096.81
Momento rotura enfundado 1	341246.55	% Respecto M. neces centro.	89.78
Longitud zona 1 enfundados.	3.02	Longitud zona 2 enfundados.	0.00
Tens.sup.pret.ini+pp.zona 1	0.00	Tens.inf.pret.ini+pp.zona 1	0.00
Tens.sup.pret.ini+pp.zona 2	-4.14	Tens.inf.pret.ini+pp.zona 2	189.92

CALCULO TRANSVERSAL. MOMENTOS MAYORADOS Y ARMADURA LOSA

Momento general Sobrecarga+	3916.86	Momento general Sobrecarga-	-5647.48
Momento general Carro pos..	0.00	Momento general Carro neg..	-0.00
Momento local+ carro.....	0.00	Momento local- carro.....	-0.00
Momento local+ c. per.+sob.	836.25	Momento local-c. perm+sob..	-1087.50
Momento total + (Kg.m/m)...	4753.11	Momento total - (Kg.m/m)...	-6734.98
Area teor.trans.sup.(Cm2/m)	7.25	Area teor.long.sup.(Cm2/m).	2.35
Area teor.trans.inf.(Cm2/m)	5.90	Area teor.long.inf.(Cm2/m).	2.35
Arm.real trans.sup.-No.00pm	10.10	Arm.real long.sup.-No.00pm.	5.08
Arm.real trans.inf.-No.00pm	8.10	Arm.real long.inf.-No.00pm.	5.08
Cubicacion losa (Kg/m2)....	15.04		

COMPROBACION NEOPRENO (Deform. acortamiento +)

El neopreno se comprueba a tension maxima y minima, rozamiento, distorsion, aplastamiento, tensiones tangenciales y giro maximo bajo cargas totales y permanentes.

Longitud (Segun eje viga)Cm	15.00	Ancho (Perp.viga).(Cm).....	30.00
Espesor total (Cm).....	3.00	Espesor chapa.(Cm).....	.30
No capas de goma.....	2.00	Espesor de cada capa.....	.80
Modulo deform.transv.Kg/cm2	10.00	Incremento temperatura (oC)	30.00
Dist.NEOP-Eje movimientos m	11.20		
Deform. por retraccion(+)..	.168	Deformacion por fluencia(+)	.329
Deform. por temperatura(+-)	.336	Deform. por giro preten.(+)	.427
Deform.por giro p.prop (-).	-.767	Deform.por giro c.perm-	-.089
Deform.por giro sobrec.(-).	-.177	Deform.por giro carro(-)...	-0.000
Deform.por frenado (+-)....	.296	Fuerza de frenado (Kg) (+-)	1666.667
Defor.pesima suma (+)).....	.700	Fuerza por maxima def +(Kg)	2803.36
Defor.pesima suma (-).....	-.741	Fuerza por maxima def -(Kg)	-3416.26

prefabricados CASTELO

Reaccion vertical maxima Kg 50863.90 Reaccion vertical minima Kg 26811.41

NOTA.- Deformaciones obtenidas despreciando flexibilidad de pilas y estribos

CALCULO A CORTE VIGAS PRETENSADAS SEGUN EHE

COMPROBACIONES PREVIAS EN PLASTICIDAD

Fuerza en ala inf.(Kg).....	90574	Idem ala sup.seccion simple	78529
Fuerza a rasante.....	294359	Idem ala sup.seccion comp..	138349
Tension en ala inf.(Kg/cm2)	4.49	Idem ala sup.seccion simple	6.37
Tension rasante media.....	2.50	Idem ala sup.seccion comp..	3.43
Armado medio ala inf(cm2/m)	1.93	Idem ala sup.seccion simple	1.67
Armado medio a rasante.....	0.00	Idem ala sup.seccion comp..	2.94
Refuerzo pasivo inf.extremo (Valor por armadura de corte teorica)	6.42	(Cm2). REAL (N.DD)=.....	2.25
Refuerzo pasivo inf.extremo (Valor por armadura de difusion)	0.00	(Cm2). REAL (N.DD)=.....	0.00

COMPROBACION CORTANTE SEGUN EHE EN X= 0.00
(Esfuerzos mayorados)

Momento seccion simple(T.m)	23.07	Cortante seccion simple(T).	28.70
Momento seccion compuesta..	28.91	Cortante seccion compuesta.	37.15
Cortante total para VU1....	70.22	Limite corte por hormigon..	114.24
Cortante total para VU2....	61.54	Armado corte en losa(cm2/m)	0.00
Arm.corte alma(Cm2/m).....	5.81	Arm.rasante alma union losa	0.00
Arm.corte ala sup (Sec.Simp	3.19	Arm.corte ala inf.(Cm2/m)..	3.68

COMPROBACION CORTANTE SEGUN EHE EN X= 1.00
(Esfuerzos mayorados)

Momento seccion simple(T.m)	29.45	Cortante seccion simple(T).	28.08
Momento seccion compuesta..	36.58	Cortante seccion compuesta.	36.38
Cortante total para VU1....	64.45	Limite corte por hormigon..	114.24
Cortante total para VU2....	61.54	Armado corte en losa(cm2/m)	0.00
Arm.corte alma(Cm2/m).....	5.81	Arm.rasante alma union losa	0.00
Arm.corte ala sup (Sec.Simp	2.89	Arm.corte ala inf.(Cm2/m)..	3.34

COMPROBACION CORTANTE SEGUN EHE EN X= 4.00
(Esfuerzos mayorados)

Momento seccion simple(T.m)	101.30	Cortante seccion simple(T).	19.82
Momento seccion compuesta..	110.28	Cortante seccion compuesta.	26.75
Cortante total para VU1....	46.57	Limite corte por hormigon..	123.41
Cortante total para VU2....	46.57	Armado corte en losa(cm2/m)	0.00
Arm.corte alma(Cm2/m).....	3.29	Arm.rasante alma union losa	0.00
Arm.corte ala sup (Sec.Simp	2.00	Arm.corte ala inf.(Cm2/m)..	2.30

COMPROBACION CORTANTE SEGUN EHE EN X= 7.00
(Esfuerzos mayorados)

Momento seccion simple(T.m)	148.37	Cortante seccion simple(T).	11.56
Momento seccion compuesta..	138.78	Cortante seccion compuesta.	18.40
Cortante total para VU1....	29.96	Limite corte por hormigon..	115.46
Cortante total para VU2....	29.96	Armado corte en losa(cm2/m)	0.00

prefabricados CASTELO

Arm.corte alma(Cm2/m).....	1.25	Arm.rasante alma union losa	0.00
Arm.corte ala sup (Sec.Simp	1.10	Arm.corte ala inf.(Cm2/m)..	1.80

COMPROBACION CORTANTE SEGUN EHE EN X= 4.44
(Esfuerzos mayorados)

Momento seccion simple(T.m)	109.82	Cortante seccion simple(T).	18.60
Momento seccion compuesta..	117.07	Cortante seccion compuesta.	25.44
Cortante total para VU1....	44.04	Limite corte por hormigon..	122.01
Cortante total para VU2....	44.04	Armado corte en losa(cm2/m)	0.00
Arm.corte alma(Cm2/m).....	2.95	Arm.rasante alma union losa	0.00
Arm.corte ala sup (Sec.Simp	1.87	Arm.corte ala inf.(Cm2/m)..	2.15

COMPROBACION CORTANTE SEGUN EHE EN X= 1.43
(Esfuerzos mayorados)

Momento seccion simple(T.m)	41.19	Cortante seccion simple(T).	26.90
Momento seccion compuesta..	50.26	Cortante seccion compuesta.	34.93
Cortante total para VU1....	61.83	Limite corte por hormigon..	114.24
Cortante total para VU2....	61.54	Armado corte en losa(cm2/m)	0.00
Arm.corte alma(Cm2/m).....	5.81	Arm.rasante alma union losa	0.00
Arm.corte ala sup (Sec.Simp	2.76	Arm.corte ala inf.(Cm2/m)..	3.19
CERCOS MINIMOS ALMA	1.62		

SE AÑADE EN CADA ZONA PARA CUMPLIR MINIMO DE RASANTE: 5.52 cm2/m

ANALISIS DE DEFORMACIONES PREVISIBLES

Flechas (+) y contraflechas (-) en mm.

(1)- Instantanea pretensado +p.propio (seccion simple)	-22.4
(2)- Diferida pretensado +p.propio (seccion simple)	-41.4
(3)- Diferida pretensado +p.propio (seccion compuesta)	-17.8
(4)- Instantanea peso propio losa (seccion simple)	16.6
(5)- Diferida peso propio losa (seccion compuesta)	11.6
(6)- Instantanea carga permanente (seccion compuesta)	1.5
(7)- Diferida carga permanente (seccion compuesta)	2.7
(8)- Instantanea sobrecarga (seccion compuesta)	10.3

NOTA: Modulos de elasticidad: (1).-0.74*100000*((.1*FCK+8)^(1/3))
(4).-100000*((.1*FCK+8)^(1/3))
(6).-107000*((.1*FCK+8)^(1/3))
(8).-109000*((.1*FCK+8)^(1/3))
Fluencia: 2.5 para (2) y (3); 1.9 para (5) y 1.7 para (7)

La deformacion final del puente depende de la edad de la viga al llegar al tablero. Supuesto que se ha producido el 40% de (2) al llegar a obra la contraflecha sera: -38.9
Al hormigonar la losa.....: -22.3
Al echar la carga permanente.....: -20.8
A tiempo infinito sin sobrecarga.....: -17.1
A tiempo infinito con sobrecarga.....: -6.9

Estos valores solo pueden ser considerados como estimativos pues dependen de factores variables no conocidos por el programa

GIRO C.MUERTA:.000248 GIRO S.UNIFORME.001722 GIRO VEHICULO.000000

prefabricados CASTELO

Ref: 4522 E-11

DESGLOSE DE REACCIONES PARA CARGAS VERTICALES

Peso propio viga exterior..	20.574	Idem viga interior.....	23.449
Carga muerta viga exterior.	0.000	Idem viga interior.....	0.000
Incr. aceras viga exterior.	7.388	Idem viga interior.....	3.480
Total permanente v.exterior	27.962	Idem viga interior.....	26.928
Sobrec.repartida v.exterior	23.970	Idem viga interior.....	24.158
Sobrecarga carro v.exterior	0.000	Idem viga interior.....	0.000
Total sobrecarga.v.exterior	23.970	Idem viga interior.....	24.158
Total todas cargas v.ext...	51.931	Idem viga interior.....	51.086

NOTA: Valores en Tn. sin mayorar y por apoyo. Para horizontales ver neoprenos

Estructura E-13. (PK 312+491)

ESTRUCTURA E-13 (PK 312+491)

ÍNDICE

CÁLCULOS ESTRUCTURALES

1. INTRODUCCIÓN
   - 1.1 DESCRIPCIÓN DE LA SOLUCIÓN ADOPTADA
   - 1.2 INSTRUCCIONES Y NORMAS EMPLEADAS
   - 1.3 CARACTERÍSTICAS DE LOS MATERIALES
   - 1.4 NIVELES DE CONTROL Y COEFICIENTES DE SEGURIDAD
   - 1.5 CARACTERÍSTICAS DE LA CIMENTACIÓN
   - 1.6 PROCEDIMIENTO DE CÁLCULO Y DESCRIPCIÓN DE LOS PROGRAMAS UTILIZADOS
2. TABLERO
   - 2.1 DEFINICIÓN GEOMÉTRICA DEL TABLERO
   - 2.2 CÁLCULO DE LAS ACCIONES
     - 2.2.1. ACCIONES PERMANENTES
       - 2.2.1.1 PESO PROPIO
       - 2.2.1.2 CARGA MUERTA
     - 2.2.2. ACCIONES PERMANENTES DE VALOR NO CONSTANTE
       - 2.2.2.1 REOLÓGICAS: RETRACCIÓN
       - 2.2.2.2 SOBRECARGAS DEL TERRENO
     - 2.2.3. ACCIONES VARIABLES
       - 2.2.3.1. SOBRECARGAS DE USO
       - 2.2.3.2. ACCIONES CLIMÁTICAS
     - 2.2.4. ACCIONES ACCIDENTALES
       - 2.2.4.1. ACCIONES SÍSMICAS
   - 2.3. CÁLCULO COMO EMPARRILLADO
     - 2.3.1. MODELO DE CÁLCULO
     - 2.3.2. CÁLCULO DE LOS COEFICIENTES DE REPARTO
     - 2.3.3. CÁLCULO DE LAS ARMADURAS PASIVAS TRANSVERSALES. MÉTODO DE WOOD
     - 2.3.4. RIOSTRAS SOBRE PILAS Y ESTRIBOS
     - 2.3.5. REACCIONES Y CÁLCULO DE NEOPRENOS EN PLANTA
   - 2.4. COMPROBACIÓN LONGITUDINAL DEL TABLERO
     - 2.4.1. VERIFICACIÓN DE LAS SECCIONES
       - 2.4.1.1. COMPROBACIÓN DE ESTADO LÍMITES FISURACIÓN
       - 2.4.1.2. COMPROBACIÓN DE ESTADOS LÍMITES ÚLTIMOS POR FLEXIÓN LONGITUDINAL
       - 2.4.1.3. VERIFICACIÓN DE LAS SECCIONES A ESFUERZOS DE CORTANTE (E.L.U.)
     - 2.4.2. COMPROBACIÓN DEL PUNZONAMIENTO DEL TABLERO
     - 2.4.3. REFUERZO DE ARMADURAS BAJO APOYOS
     - 2.4.4. VERIFICACIÓN DE LAS ARMADURAS DEL VOLADIZO
3. CÁLCULO DE LA SUBESTRUCTURA
   - 3.1. ACCIONES
   - 3.2. COMBINACIÓN DE ACCIONES
4. PILAS
   - 4.1. CÁLCULO DEL FUSTE
   - 4.2. CÁLCULO DE LA CIMENTACIÓN
5. ESTRIBOS
   - 5.1. CÁLCULO Y DIMENSIONAMIENTO

- PROYECTO DE PRUEBA DE CARGA

Cálculos Estructurales

1.1. Descripción de la solución adoptada

La Reposición del Camino 13 C, ubicada en el P.K. 312+491, de la obra "Línea de Alta Velocidad Madrid-Barcelona-Frontera Francesa. Tramo: Lleida-Martorell. Subtramo III-B " consta de tres vanos, con luces de 13.00 m, 17.00 m y 13.00 m, con una longitud total de 43.80 m. Está apoyada en los extremos en estribos del tipo cerrado y en los puntos intermedios en pilas con un único fuste de sección circular con diámetro de 1.00 m, la cimentación es del tipo superficial.

El tablero es una sección maciza de hormigón de 7.70 m de ancho con un canto de 0.90m y con voladizos laterales de 1.50 m de longitud con 0.30 m de canto en el arranque y 0.20m en el extremo. La sección tiene bombeo del 2%. El ancho inferior del núcleo es de 3.70 m.

Ambos estribos son cerrados y están cimentados mediante zapatas directamente en el terreno.

Las pilas tienen un único fuste circular de 1.00 m de diámetro, y están empotradas en el tablero.La cimentación es superficial mediante zapatas.

La ejecución del tablero se realizará en una sola fase, con hormigonado completo de la losa sobre cimbra.

1.2. Instrucciones y normas empleadas

Para el cálculo de las acciones que actúan sobre los diversos elementos de la estructura, se ha utilizado la "Instrucción sobre las acciones a considerar en el proyecto de puentes de carreteras (IAP)", aprobada el 12 de febrero de 1998.

Se ha tenido en cuenta la "Norma de Construcción Sismorresistente (Parte General y Edificación) NCS-94", aprobada por Real Decreto 2543/1994 de 29 de Diciembre.

Para el dimensionamiento y comprobación de los elementos de hormigón armado y de hormigón pretensado se ha seguido la "Instrucción de Hormigón Estructural" EHE, aprobada por Real Decreto 2661/1998 de 11 de Diciembre.

- Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.
La aceleración sísmica básica de la zona es a_b =0.04 g y el coeficiente de contribución K=1.0.

La aceleración sísmica de cálculo será entonces:

$\alpha_\chi = \rho\ \alpha_\beta$

$\rho = (\tau/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04$ g

$a_c = 0.052$ g < 0.06 g

Conforme con lo prescrito en la NCS-94, como la aceleración de cálculo es $a_c = 0.052$ g < 0.06 g no se deberán tener en cuenta las acciones sísmicas.

1.3. Características de los materiales

Hormigones - Resistencia Característica

Hormigón en capas de regularización	$\phi_{\chi K} \geq 150$ kp/cm²
Hormigón en zapatas	$\phi_{\chi K} \geq 250$ kp/cm²
Hormigón en alzados estribos	$\phi_{\chi K} \geq 300$ kp/cm²
Hormigón en pilas	$\phi_{\chi K} \geq 300$ kp/cm²
Hormigón en tablero	$\phi_{\chi K} \geq 300$ kp/cm²

Aceros

Armaduras pasivas B-500-S (límite elástico f yk ≥5100 kp/cm²

1.4. Niveles de control y coeficientes de seguridad

Hormigones	:	Nivel de control normal	$\gamma_\chi = 1.50$
Aceros :		Nivel de control normal	$\gamma_\psi = 1.15$
Acciones	:		
		Nivel de control intenso	$\gamma_F = 1.50$ (acciones variables)
		Conforme a la IAP	$\gamma_{G^*} = 1.50$ (acción del terreno)
			$\gamma_G = 1.35$ (acciones permanentes y reológicas

1.5. Características de la cimentación

Se han considerado las siguientes tensiones admisibles en la cimentación:

Estructura	Profundidad de cimentación	Tensión admisible del terreno	Observaciones
Estribo 1	7.00 m	4.00 kp/cm²	
Pila 1	1.50 m	5.00 kp/cm²	
Pila 2	1.50 m	5.00 kp/cm²	
Estribo 2	7.00 m	4.00 kp/cm²	

1.6. Procedimiento de cálculo y descripción de los programas utilizados

El cálculo del tablero se realiza mediante programas de ordenador en modelos estructurales de emparrillado plano y reticulado plano, basados en la matriz de rigidez y equilibrio de los nudos, donde se suponen las hipótesis básicas de la Resistencia de Materiales es decir, de linealidad geométrica y del material, despreciando la deformación por esfuerzo cortante.

Se ejecuta el cálculo con un modelo de emparrillado espacial mediante el programa STATIK·3, del que se obtienen los esfuerzos transversales y los esfuerzos longitudinales incluyendo el efecto del reparto transversal de las cargas y del empotramiento de la pila en el tablero.

Considerando los esfuerzos obtenidos se realizan las comprobaciones de fisuración y el cálculo a rotura del tablero mediante el postprocesador FAGUS·3.

Se completa el cálculo con el dimensionamiento de la armadura de la losa en sentido transversal mediante la aplicación de la regla de WOOD-ARMER y los cálculos de esfuerzos locales, como por ejemplo los de apoyo.

Los estribos y las pilas, tanto en alzado como en fundaciones, se calcularon y dimensionaron en hormigón armado.

Para el desarrollo de los cálculos resueltos por ordenador se han utilizado los siguientes programas:

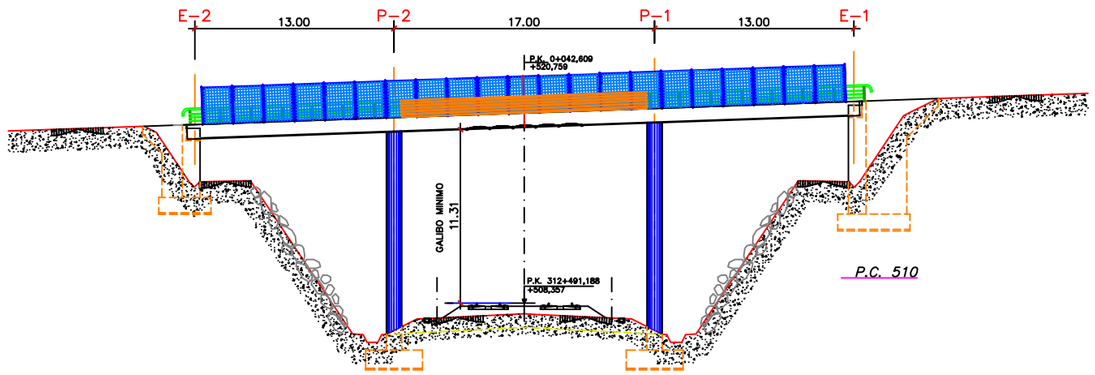
- STATIK-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10, 1997) .

- FAGUS-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10 1997) .

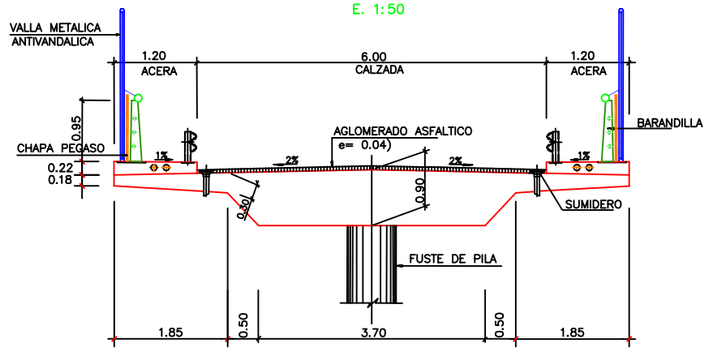
TABLERO

2.1. Geometría (ver planos)

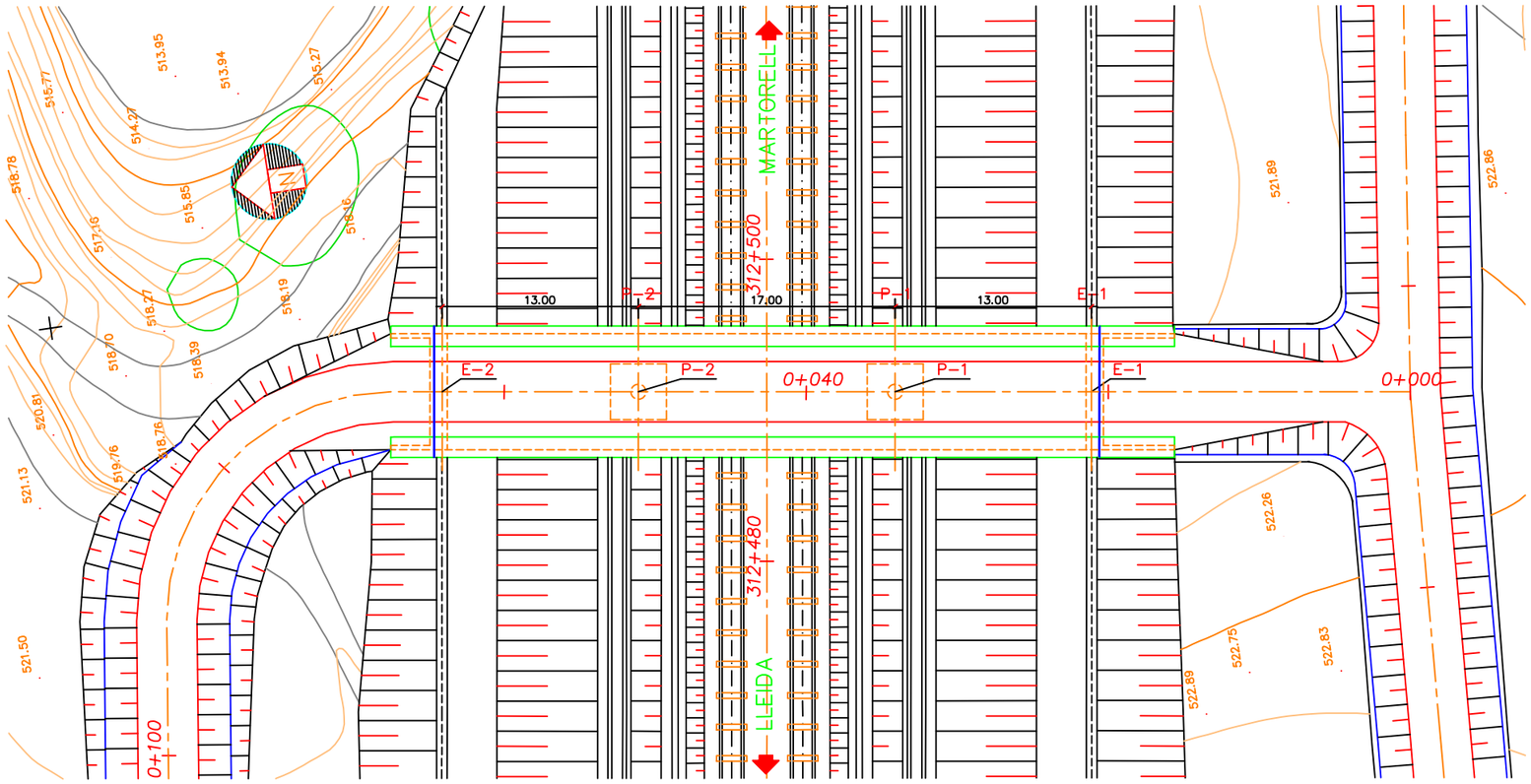
ALZADO
E. 1:200



SECCION TRANSVERSAL
E. 1:50



PLANTA
E. 1:200



CUADRO DE REPLANTEO

ESTRIBOS Y PILAS	P.K. EJE DE REPLANTEO	X	Y	Az	COTA RASANTE
E–1	0+021,109	336.935,356	4.585.932,522	9,6830	521,511
P–1	0+034,109	336.937,329	4.585.945,372	9,6830	521,056
P–2	0+051,109	336.939,916	4.585.962,174	9,6830	520,461
E–2	0+064,109	336.941,896	4.585.975,022	9,6830	520,006

GIF Gestor de Infraestructuras Ferroviarias

TITULO:
LIQUIDACION DE LA MODIFICACION Nº1 DEL PROYECTO CONSTRUCTIVO
L.A.V. MADRID–ZARAGOZA–BARCELONA–FRONTERA FRANCESA
TRAMO: LLEIDA–MARTORELL, SUBTRAMO III–B
PLATAFORMA

EL INGENIERO DE C.C. Y P.
AUTOR DE LA LIQUIDACION:

FDO:
D.JAIME GARCIA–GERMAN LOPEZ–BELMONTE

CONFORME:
Sacyr
EL CONTRATISTA

ESCALA:
1:50
1:100
(en A–1)
Numérica
0 1 2m.
0 2 4m.
Gráfica

FECHA:
ABRIL 2.003

TITULO DEL PLANO:
PASO SUPERIOR
E–13 P.K. 312+500 CAMINO DE VIMBODI
PLANO GENERAL

Nº DEL PLANO:
2.9–10.1
Hoja 1 de 1

2.9–10.1.DWG/REF:MOD.DWG

2.2. Cálculo de las acciones

2.2.1. Acciones permanentes

2.2.1.1. Peso propio

El peso propio de la estructura de hormigón se calcula con un peso específico

$$\gamma = 2.50 Mp/m^3.$$

2.2.1.2. Carga muerta

Cm = 1.00 t/m cada acera

pav = 0.04 m x 2.30 t/m 3 = 0.092 t/m2

2.2.2. Acciones permanentes de valor no constante

2.2.2.1. Reológicas: Retracción

Se han calculado considerando una humedad relativa del 60%, y un espesor medio de 337 mm. La edad del hormigón al entrar en carga es de 28 días, y el mismo es de endurecimiento normal. Los valores utilizados son:

ε retracción =-0.00029167

Cálculo de la retracción del hormigón

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\, \beta_s (t - t_s)$

Edad del hormigón al comienzo de la retracción (días)	ts = **28.0**
Edad del hormigón en el instante de evaluación (días)	t = **10000.0**
Coeficiente básico de retracción	$\varepsilon_{cso} = \varepsilon_s\, \beta_{HR}$
Resistencia característica del hormigón	f ck (N / mm2) = **30**
	ε_s = 0.00042
Humedad relativa en tanto por ciento	HR = **70**
	β_{HR} = -1.0184
	ε_{cso} = -0.0004277
Area de la seccion transversal (m^2)	Ac = **4.653**
Perímetro en contacto con la atmósfera (m)	u = **16.255**
Espesor medio (mm)	e = 572
Coeficiente de evolución temporal de la retracción	$\beta_s (t - ts)$ = 0.6819

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\, \beta_s (t - t_s)$ = -0.00029167

2.2.2.3. Sobrecargas del terreno

El relleno de tierras en el trasdós de los estribos se realiza con material del terraplén, que tiene las siguientes características:

Peso específico	:	$\gamma_T = 2.0\ Mp/m^3$
Ángulo de fricción interna	:	$\phi = 30°$
Coeficiente de empuje activo	:	$\lambda_\alpha = 0.33$

2.2.3. Acciones variables

2.2.3.1. Sobrecargas de uso

2.2.3.1.1. Tren de cargas

a) Componentes verticales

Como el ancho de plataforma es inferior a 12.0 m, conforme a la IAP se ha utilizado el siguiente tren de cargas:

- Sobrecarga uniforme: 0.40 Mp/m²
- Vehículo de 60 Mp

b) Componentes horizontales

b.1) Frenado y arranque

Se considerará la actuación de esta fuerza sobre la estructura.

$$F_F = \frac{6.00 \text{ x } 43.80 \text{ m x } 0.4 \text{ Mp m}^{-2} + 60 \text{ Mp}}{20}$$

$F_F = 8.28$ Mp

Valor mínimo: $F_F = 12.00$ Mp

b.2) Fuerza centrífuga

La estructura está ubicada en un tramo de radio infinito, por lo tanto esta fuerza no actúa.

2.2.3.2. Acciones climáticas

a.) Viento

CALCULO DE LAS ACCIONES DEBIDAS AL VIENTO CONFORME A LA I.A.P

Proyecto : GIF SUBTRAMO IIIB
Estructura : PS 315+880

Velocidad de referencia : V_{REF} (m/seg) = **28.00**

Velocidad de cálculo : V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

Factor de topografía : C_T = **1.10**

Período de retorno (años) T = **100**

Factor de riesgo : $C_R = (0.562x\{1-0.2x \ln [- \ln (1- 1/T)]\}) 1/2$
$C_R = 1.04$

Factor de altura : $C_Z = K_Z \times LN (Z/ Zo)$ si $Z > Z_{MIN}$
$C_Z = K_Z \times LN (Z_{MIN}/ Zo)$ si $Z < Z_{MIN}$

Los valores de K_Z , Zo y Z_{MIN} se obtendrán de la tabla adjunta .

Tipo de Entorno	K_Z	Zo (m)	Z_{MIN} (m)
I	0.17	0.01	2.00
II	0.19	0.05	4.00
III	0.22	0.30	8.00
IV	0.24	1.00	16.00

K_Z = **0.22**

Zo = **0.3**

Z_{MIN} = **8.00**

OBTENCIÓN DE LA VELOCIDAD DE CÁLCULO PARA EL TABLERO :

En función de la altura Z considerada se obtendrán los valores de C_Z y C_G y en consecuencia de V_C

V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

V_{REF} (m/seg) = 28.00

Para el tablero la altura considerada será : Z (m) = **13.00**

$C_Z = 0.829$

Factor de ráfaga : $C_G = (1 + 7 \times K_Z / C_Z / C_T)^{1/2}$

$C_G = 1.640$

TABLERO :	V_C (m/seg) = 43.50

ACCIÓN DEL VIENTO SOBRE EL TABLERO

El empuje producido sobre cualquier elemento del puente se calculará con la siguiente fórmula :

$$F\ (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde :

C_D : Coeficiente de arrastre

A : Área expuesta

$1/2\ \rho\ V_C^2$: Presión básica de cálculo (N/m^2)

ρ : masa específica del aire 1.25 kg/m^3

V_C : Velocidad de cálculo (m/seg)

EMPUJE TRANSVERSAL DE VIENTO

Empuje del Viento : $F\ (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$

TABLERO DE ALMA LLENA

Altura Z del tablero : Z (m) = **13.00**
Ancho del tablero : B (m) = **7.70**
Longitud del tramo : L (m) = **44.00**
Altura de barrera : $h_{BARRERA}$ (m) = **0.20** De tabla se obtiene : η = **2.00**
Altura equivalente : $h_{TABLERO}$ (m) = **1.10**
$h_{BAR.\ OPAC}$(m) = $h_{BARRERA} + \Sigma\ \eta\ h_{BARRERA}$
$h_{BAR.\ OPAC}$(m) = 0.60
$h_{SOBREC.}$ (m) = **2.00**

Sin sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{BARRERA\ OPACA}$
h_{eq} (m) = 1.70

Con sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{SOBRECARGA} + h_{BARRERA}$
h_{eq} (m) = 3.50

Área expuesta : A (m^2) = L x h_{eq}

Sin sobrecarga : A (m^2) = 74.8
Con sobrecarga : A (m^2) = 154.0
Coeficiente de arrastre : $C_D = 2.50 - 0.3 \times (B / h_{eq})$
$1.30 < C_D < 2.40$
Sin sobrecarga : C_D = 1.30
Con sobrecarga : C_D = 1.84

Cálculo del empuje transversal del viento sobre el tablero :

$$F\ (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde : V_C (m/seg) = 43.50
ρ (kg/m^3) = 1.25

Empuje sin la sobrecarga en el tablero : **F (Mp) = 11.50**

Longitud tramo L_T (m) = 44.00 **F (Mp/m) = 0.26**

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : **d (m) = 0.78**

Empuje con la sobrecarga en el tablero : **F (Mp) = 33.51**

Longitud tramo L_T (m) = 44.00 **F (Mp/m) = 0.76**

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : **d (m) = 1.86**

2.2.3.2.b) Nieve

La estructura está en Zona II.

$$q = 0.80 \times S_K$$

$$q = 0.80 \times 40\ Kp/m^2 = 0.032\ Mp/m^2$$

Es despreciable.

2.2.3.2.c) Térmicas

De acuerdo con la I.A.P. se ha considerado un incremento uniforme de temperatura que es función de los siguientes parámetros:

- La estructura está ubicada en la región climática denominada zona IV (Z = 4) .
- La sección del tablero está formada por una losa maciza de hormigón (S = 1), con un canto total de 0.90 m (h = 0.90).

$$\Delta T = K\, z^a\, h^b\, s^c = 23.89 \times 4^{-292} \times 0.90^{-0.139}$$

Sobre la base de estos datos se obtiene que el rango anual de la temperatura media es de 36.34 °C, y por lo tanto consideraremos un incremento uniforme de temperatura de

$$\Delta T = \pm 36.34\ °C$$

$$\varepsilon_t = \pm 36.34 \times 10^{-5}$$

El incremento de temperatura entre caras superior e inferior del tablero, gradiente térmico vertical, será:

- Gradiente térmico vertical positivo °C/m

Losa maciza de hormigón:

$\Delta T_{SI} = K\ \Delta T_{SI}$, ref.

$K = K_1 \cdot K_2$. $K_1 = 0.85$

$K_2 = 1.56$

ΔT_{SI}, ref = 11.50°C

$\Delta T_{SI} = 1.33 \times 11.50°C/m$

$\Delta T_{SI} = 15.30\ °C/m$

- Gradiente térmico vertical inverso

Tableros de hormigón: con pavimento bituminoso 0.0 °C

2.2.4. Acciones accidentales

2.2.4.1. Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.

La aceleración sísmica básica de la zona es ab≤ 0.04 g.

$a_c = \rho\ a_b$

$\rho = (t/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04\ g = 0.052\ g \leq 0.06\ g$ No se consideran las acciones sísmicas.

2.3. Cálculo como emparrillado

2.3. Cálculo como emparrillado

Se ha generado el modelo de emparrillado mediante el programa STATIK3, y se han introducido todas las cargas, lo que nos permitirá obtener los esfuerzos transversales con la influencia de la posición de las cargas, el ancho del tablero, y el apoyo puntual en las pilas, consideradas empotradas y con su correspondiente altura.

Se han introducido las acciones individuales, correspondientes a cada hipótesis básica de cálculo.

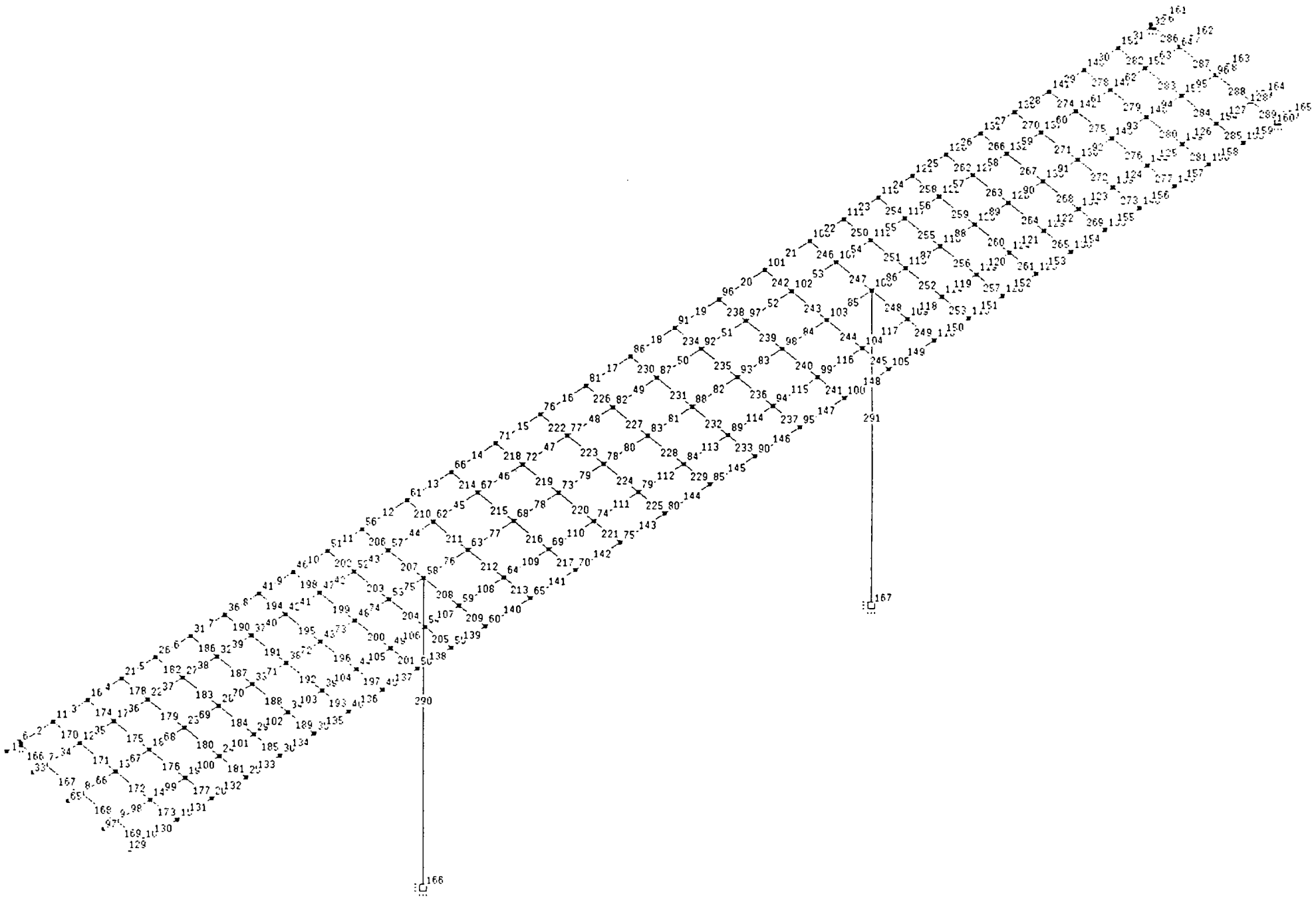
Posteriormente se ha calculado la envolvente pésima de esfuerzos para cada acción, con los diferentes coeficientes de ponderación de la Instrucción.

Por aplicación de la regla de WOOD-ARMER a dichos esfuerzos de cálculo se obtienen las armaduras transversales necesarias.

Finalmente se calculan los coeficientes de reparto transversal.

2.3.1. Modelo de cálculo

Scale 1 : 142.9
Structure - GEOMETRIA



****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (167 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	R XYZ	Specialities
1	0.00000	0.00000	0.00000			
2	1.12000	0.00000	0.00000			
3	2.62000	0.00000	0.00000			
4	4.12000	0.00000	0.00000			
5	5.24000	0.00000	0.00000			
6	0.00000	0.50000	0.00000	SSE	FFF	
7	1.12000	0.50000	0.00000			
8	2.62000	0.50000	0.00000			
9	4.12000	0.50000	0.00000			
10	5.24000	0.50000	0.00000	SSE	FFF	
11	0.00000	1.80000	0.00000			
12	1.12000	1.80000	0.00000			
13	2.62000	1.80000	0.00000			
14	4.12000	1.80000	0.00000			
15	5.24000	1.80000	0.00000			
16	0.00000	3.10000	0.00000			
17	1.12000	3.10000	0.00000			
18	2.62000	3.10000	0.00000			
19	4.12000	3.10000	0.00000			
20	5.24000	3.10000	0.00000			
21	0.00000	4.40000	0.00000			
22	1.12000	4.40000	0.00000			
23	2.62000	4.40000	0.00000			
24	4.12000	4.40000	0.00000			
25	5.24000	4.40000	0.00000			
26	0.00000	5.70000	0.00000			
27	1.12000	5.70000	0.00000			
28	2.62000	5.70000	0.00000			
29	4.12000	5.70000	0.00000			
30	5.24000	5.70000	0.00000			
31	0.00000	7.00000	0.00000			
32	1.12000	7.00000	0.00000			
33	2.62000	7.00000	0.00000			
34	4.12000	7.00000	0.00000			
35	5.24000	7.00000	0.00000			
36	0.00000	8.30000	0.00000			
37	1.12000	8.30000	0.00000			
38	2.62000	8.30000	0.00000			
39	4.12000	8.30000	0.00000			
40	5.24000	8.30000	0.00000			
41	0.00000	9.60000	0.00000			
42	1.12000	9.60000	0.00000			

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
43	2.62000	9.60000	0.00000		
44	4.12000	9.60000	0.00000		
45	5.24000	9.60000	0.00000		
46	0.00000	10.90000	0.00000		
47	1.12000	10.90000	0.00000		
48	2.62000	10.90000	0.00000		
49	4.12000	10.90000	0.00000		
50	5.24000	10.90000	0.00000		
51	0.00000	12.20000	0.00000		
52	1.12000	12.20000	0.00000		
53	2.62000	12.20000	0.00000		
54	4.12000	12.20000	0.00000		
55	5.24000	12.20000	0.00000		
56	0.00000	13.50000	0.00000		
57	1.12000	13.50000	0.00000		
58	2.62000	13.50000	0.00000		
59	4.12000	13.50000	0.00000		
60	5.24000	13.50000	0.00000		
61	0.00000	15.20000	0.00000		
62	1.12000	15.20000	0.00000		
63	2.62000	15.20000	0.00000		
64	4.12000	15.20000	0.00000		
65	5.24000	15.20000	0.00000		
66	0.00000	16.90000	0.00000		
67	1.12000	16.90000	0.00000		
68	2.62000	16.90000	0.00000		
69	4.12000	16.90000	0.00000		
70	5.24000	16.90000	0.00000		
71	0.00000	18.60000	0.00000		
72	1.12000	18.60000	0.00000		
73	2.62000	18.60000	0.00000		
74	4.12000	18.60000	0.00000		
75	5.24000	18.60000	0.00000		
76	0.00000	20.30000	0.00000		
77	1.12000	20.30000	0.00000		
78	2.62000	20.30000	0.00000		
79	4.12000	20.30000	0.00000		
80	5.24000	20.30000	0.00000		
81	0.00000	22.00000	0.00000		
82	1.12000	22.00000	0.00000		
83	2.62000	22.00000	0.00000		
84	4.12000	22.00000	0.00000		
85	5.24000	22.00000	0.00000		
86	0.00000	23.70000	0.00000		
87	1.12000	23.70000	0.00000		
88	2.62000	23.70000	0.00000		
89	4.12000	23.70000	0.00000		
90	5.24000	23.70000	0.00000		
91	0.00000	25.40000	0.00000		
92	1.12000	25.40000	0.00000		
93	2.62000	25.40000	0.00000		
94	4.12000	25.40000	0.00000		
95	5.24000	25.40000	0.00000		

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
96	0.00000	27.10000	0.00000		
97	1.12000	27.10000	0.00000		
98	2.62000	27.10000	0.00000		
99	4.12000	27.10000	0.00000		
100	5.24000	27.10000	0.00000		
101	0.00000	28.80000	0.00000		
102	1.12000	28.80000	0.00000		
103	2.62000	28.80000	0.00000		
104	4.12000	28.80000	0.00000		
105	5.24000	28.80000	0.00000		
106	0.00000	30.50000	0.00000		
107	1.12000	30.50000	0.00000		
108	2.62000	30.50000	0.00000		
109	4.12000	30.50000	0.00000		
110	5.24000	30.50000	0.00000		
111	0.00000	31.80000	0.00000		
112	1.12000	31.80000	0.00000		
113	2.62000	31.80000	0.00000		
114	4.12000	31.80000	0.00000		
115	5.24000	31.80000	0.00000		
116	0.00000	33.10000	0.00000		
117	1.12000	33.10000	0.00000		
118	2.62000	33.10000	0.00000		
119	4.12000	33.10000	0.00000		
120	5.24000	33.10000	0.00000		
121	0.00000	34.40000	0.00000		
122	1.12000	34.40000	0.00000		
123	2.62000	34.40000	0.00000		
124	4.12000	34.40000	0.00000		
125	5.24000	34.40000	0.00000		
126	0.00000	35.70000	0.00000		
127	1.12000	35.70000	0.00000		
128	2.62000	35.70000	0.00000		
129	4.12000	35.70000	0.00000		
130	5.24000	35.70000	0.00000		
131	0.00000	37.00000	0.00000		
132	1.12000	37.00000	0.00000		
133	2.62000	37.00000	0.00000		
134	4.12000	37.00000	0.00000		
135	5.24000	37.00000	0.00000		
136	0.00000	38.30000	0.00000		
137	1.12000	38.30000	0.00000		
138	2.62000	38.30000	0.00000		
139	4.12000	38.30000	0.00000		
140	5.24000	38.30000	0.00000		
141	0.00000	39.60000	0.00000		
142	1.12000	39.60000	0.00000		
143	2.62000	39.60000	0.00000		
144	4.12000	39.60000	0.00000		
145	5.24000	39.60000	0.00000		
146	0.00000	40.90000	0.00000		
147	1.12000	40.90000	0.00000		
148	2.62000	40.90000	0.00000		

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
149	4.12000	40.90000	0.00000		
150	5.24000	40.90000	0.00000		
151	0.00000	42.20000	0.00000		
152	1.12000	42.20000	0.00000		
153	2.62000	42.20000	0.00000		
154	4.12000	42.20000	0.00000		
155	5.24000	42.20000	0.00000		
156	0.00000	43.50000	0.00000	SSE	FFF
157	1.12000	43.50000	0.00000		
158	2.62000	43.50000	0.00000		
159	4.12000	43.50000	0.00000		
160	5.24000	43.50000	0.00000	SSE	FFF
161	0.00000	44.00000	0.00000		
162	1.12000	44.00000	0.00000		
163	2.62000	44.00000	0.00000		
164	4.12000	44.00000	0.00000		
165	5.24000	44.00000	0.00000		
166	2.62000	13.50000	-13.20000	BBE	BBE
167	2.62000	30.50000	-13.20000	BBE	BBE

ELASTICALLY SUPPORTED JOINTS: ("B"=Fixed "F"=Free)

Joint	V-X [T/M]	V-Y [T/M]	V-Z [T/M]	R-X [TM/ARC]	R-Y [TM/ARC]	R-Z [TM/ARC]
6	2.300E+02	2.300E+02	E	F	F	F
10	2.300E+02	2.300E+02	E	F	F	F
156	2.300E+02	2.300E+02	E	F	F	F
160	2.300E+02	2.300E+02	E	F	F	F

B A R D A T A : (286 bars)

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
1	1	6	0.50000	%Q0001			O oS
2	6	11	1.30000	%Q0001			O oS
3	11	16	1.30000	%Q0001			O oS
4	16	21	1.30000	%Q0001			O oS
5	21	26	1.30000	%Q0001			O oS
6	26	31	1.30000	%Q0001			O oS
7	31	36	1.30000	%Q0001			O oS
8	36	41	1.30000	%Q0001			O oS
9	41	46	1.30000	%Q0001			O oS
10	46	51	1.30000	%Q0001			O oS
11	51	56	1.30000	%Q0001			O oS
12	56	61	1.70000	%Q0001			O oS
13	61	66	1.70000	%Q0001			O oS
14	66	71	1.70000	%Q0001			O oS
15	71	76	1.70000	%Q0001			O oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
16	76	81	1.70000	%Q0001			O oS
17	81	86	1.70000	%Q0001			O oS
18	86	91	1.70000	%Q0001			O oS
19	91	96	1.70000	%Q0001			O oS
20	96	101	1.70000	%Q0001			O oS
21	101	106	1.70000	%Q0001			O oS
22	106	111	1.30000	%Q0001			O oS
23	111	116	1.30000	%Q0001			O oS
24	116	121	1.30000	%Q0001			O oS
25	121	126	1.30000	%Q0001			O oS
26	126	131	1.30000	%Q0001			O oS
27	131	136	1.30000	%Q0001			O oS
28	136	141	1.30000	%Q0001			O oS
29	141	146	1.30000	%Q0001			O oS
30	146	151	1.30000	%Q0001			O oS
31	151	156	1.30000	%Q0001			O oS
32	156	161	0.50000	%Q0001			O oS
33	2	7	0.50000	%Q0002			oS
34	7	12	1.30000	%Q0002			oS
35	12	17	1.30000	%Q0002			oS
36	17	22	1.30000	%Q0002			oS
37	22	27	1.30000	%Q0002			oS
38	27	32	1.30000	%Q0002			oS
39	32	37	1.30000	%Q0002			oS
40	37	42	1.30000	%Q0002			oS
41	42	47	1.30000	%Q0002			oS
42	47	52	1.30000	%Q0002			oS
43	52	57	1.30000	%Q0002			oS
44	57	62	1.70000	%Q0002			oS
45	62	67	1.70000	%Q0002			oS
46	67	72	1.70000	%Q0002			oS
47	72	77	1.70000	%Q0002			oS
48	77	82	1.70000	%Q0002			oS
49	82	87	1.70000	%Q0002			oS
50	87	92	1.70000	%Q0002			oS
51	92	97	1.70000	%Q0002			oS
52	97	102	1.70000	%Q0002			oS
53	102	107	1.70000	%Q0002			oS
54	107	112	1.30000	%Q0002			oS
55	112	117	1.30000	%Q0002			oS
56	117	122	1.30000	%Q0002			oS
57	122	127	1.30000	%Q0002			oS
58	127	132	1.30000	%Q0002			oS
59	132	137	1.30000	%Q0002			oS
60	137	142	1.30000	%Q0002			oS
61	142	147	1.30000	%Q0002			oS
62	147	152	1.30000	%Q0002			oS
63	152	157	1.30000	%Q0002			oS
64	157	162	0.50000	%Q0002			oS
65	3	8	0.50000	%Q0003			oS
66	8	13	1.30000	%Q0003			oS
67	13	18	1.30000	%Q0003			oS
68	18	23	1.30000	%Q0003			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
69	23	28	1.30000	%Q0003			oS
70	28	33	1.30000	%Q0003			oS
71	33	38	1.30000	%Q0003			oS
72	38	43	1.30000	%Q0003			oS
73	43	48	1.30000	%Q0003			oS
74	48	53	1.30000	%Q0003			oS
75	53	58	1.30000	%Q0003			oS
76	58	63	1.70000	%Q0003			oS
77	63	68	1.70000	%Q0003			oS
78	68	73	1.70000	%Q0003			oS
79	73	78	1.70000	%Q0003			oS
80	78	83	1.70000	%Q0003			oS
81	83	88	1.70000	%Q0003			oS
82	88	93	1.70000	%Q0003			oS
83	93	98	1.70000	%Q0003			oS
84	98	103	1.70000	%Q0003			oS
85	103	108	1.70000	%Q0003			oS
86	108	113	1.30000	%Q0003			oS
87	113	118	1.30000	%Q0003			oS
88	118	123	1.30000	%Q0003			oS
89	123	128	1.30000	%Q0003			oS
90	128	133	1.30000	%Q0003			oS
91	133	138	1.30000	%Q0003			oS
92	138	143	1.30000	%Q0003			oS
93	143	148	1.30000	%Q0003			oS
94	148	153	1.30000	%Q0003			oS
95	153	158	1.30000	%Q0003			oS
96	158	163	0.50000	%Q0003			oS
97	4	9	0.50000	%Q0004			oS
98	9	14	1.30000	%Q0004			oS
99	14	19	1.30000	%Q0004			oS
100	19	24	1.30000	%Q0004			oS
101	24	29	1.30000	%Q0004			oS
102	29	34	1.30000	%Q0004			oS
103	34	39	1.30000	%Q0004			oS
104	39	44	1.30000	%Q0004			oS
105	44	49	1.30000	%Q0004			oS
106	49	54	1.30000	%Q0004			oS
107	54	59	1.30000	%Q0004			oS
108	59	64	1.70000	%Q0004			oS
109	64	69	1.70000	%Q0004			oS
110	69	74	1.70000	%Q0004			oS
111	74	79	1.70000	%Q0004			oS
112	79	84	1.70000	%Q0004			oS
113	84	89	1.70000	%Q0004			oS
114	89	94	1.70000	%Q0004			oS
115	94	99	1.70000	%Q0004			oS
116	99	104	1.70000	%Q0004			oS
117	104	109	1.70000	%Q0004			oS
118	109	114	1.30000	%Q0004			oS
119	114	119	1.30000	%Q0004			oS
120	119	124	1.30000	%Q0004			oS
121	124	129	1.30000	%Q0004			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
122	129	134	1.30000	%Q0004			oS
123	134	139	1.30000	%Q0004			oS
124	139	144	1.30000	%Q0004			oS
125	144	149	1.30000	%Q0004			oS
126	149	154	1.30000	%Q0004			oS
127	154	159	1.30000	%Q0004			oS
128	159	164	0.50000	%Q0004			oS
129	5	10	0.50000	%Q0005			O oS
130	10	15	1.30000	%Q0005			O oS
131	15	20	1.30000	%Q0005			O oS
132	20	25	1.30000	%Q0005			O oS
133	25	30	1.30000	%Q0005			O oS
134	30	35	1.30000	%Q0005			O oS
135	35	40	1.30000	%Q0005			O oS
136	40	45	1.30000	%Q0005			O oS
137	45	50	1.30000	%Q0005			O oS
138	50	55	1.30000	%Q0005			O oS
139	55	60	1.30000	%Q0005			O oS
140	60	65	1.70000	%Q0005			O oS
141	65	70	1.70000	%Q0005			O oS
142	70	75	1.70000	%Q0005			O oS
143	75	80	1.70000	%Q0005			O oS
144	80	85	1.70000	%Q0005			O oS
145	85	90	1.70000	%Q0005			O oS
146	90	95	1.70000	%Q0005			O oS
147	95	100	1.70000	%Q0005			O oS
148	100	105	1.70000	%Q0005			O oS
149	105	110	1.70000	%Q0005			O oS
150	110	115	1.30000	%Q0005			O oS
151	115	120	1.30000	%Q0005			O oS
152	120	125	1.30000	%Q0005			O oS
153	125	130	1.30000	%Q0005			O oS
154	130	135	1.30000	%Q0005			O oS
155	135	140	1.30000	%Q0005			O oS
156	140	145	1.30000	%Q0005			O oS
157	145	150	1.30000	%Q0005			O oS
158	150	155	1.30000	%Q0005			O oS
159	155	160	1.30000	%Q0005			O oS
160	160	165	0.50000	%Q0005			O oS
166	6	7	1.12000	%Q0006			oS
167	7	8	1.50000	%Q0006			oS
168	8	9	1.50000	%Q0006			oS
169	9	10	1.12000	%Q0006			oS
170	11	12	1.12000	%Q0007			oS
171	12	13	1.50000	%Q0007			oS
172	13	14	1.50000	%Q0007			oS
173	14	15	1.12000	%Q0007			oS
174	16	17	1.12000	%Q0007			oS
175	17	18	1.50000	%Q0007			oS
176	18	19	1.50000	%Q0007			oS
177	19	20	1.12000	%Q0007			oS
178	21	22	1.12000	%Q0007			oS
179	22	23	1.50000	%Q0007			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
180	23	24	1.50000	%Q0007			oS
181	24	25	1.12000	%Q0007			oS
182	26	27	1.12000	%Q0007			oS
183	27	28	1.50000	%Q0007			oS
184	28	29	1.50000	%Q0007			oS
185	29	30	1.12000	%Q0007			oS
186	31	32	1.12000	%Q0007			oS
187	32	33	1.50000	%Q0007			oS
188	33	34	1.50000	%Q0007			oS
189	34	35	1.12000	%Q0007			oS
190	36	37	1.12000	%Q0007			oS
191	37	38	1.50000	%Q0007			oS
192	38	39	1.50000	%Q0007			oS
193	39	40	1.12000	%Q0007			oS
194	41	42	1.12000	%Q0007			oS
195	42	43	1.50000	%Q0007			oS
196	43	44	1.50000	%Q0007			oS
197	44	45	1.12000	%Q0007			oS
198	46	47	1.12000	%Q0007			oS
199	47	48	1.50000	%Q0007			oS
200	48	49	1.50000	%Q0007			oS
201	49	50	1.12000	%Q0007			oS
202	51	52	1.12000	%Q0007			oS
203	52	53	1.50000	%Q0007			oS
204	53	54	1.50000	%Q0007			oS
205	54	55	1.12000	%Q0007			oS
206	56	57	1.12000	%Q0008			oS
207	57	58	1.50000	%Q0008			oS
208	58	59	1.50000	%Q0008			oS
209	59	60	1.12000	%Q0008			oS
210	61	62	1.12000	%Q0009			oS
211	62	63	1.50000	%Q0009			oS
212	63	64	1.50000	%Q0009			oS
213	64	65	1.12000	%Q0009			oS
214	66	67	1.12000	%Q0009			oS
215	67	68	1.50000	%Q0009			oS
216	68	69	1.50000	%Q0009			oS
217	69	70	1.12000	%Q0009			oS
218	71	72	1.12000	%Q0009			oS
219	72	73	1.50000	%Q0009			oS
220	73	74	1.50000	%Q0009			oS
221	74	75	1.12000	%Q0009			oS
222	76	77	1.12000	%Q0009			oS
223	77	78	1.50000	%Q0009			oS
224	78	79	1.50000	%Q0009			oS
225	79	80	1.12000	%Q0009			oS
226	81	82	1.12000	%Q0009			oS
227	82	83	1.50000	%Q0009			oS
228	83	84	1.50000	%Q0009			oS
229	84	85	1.12000	%Q0009			oS
230	86	87	1.12000	%Q0009			oS
231	87	88	1.50000	%Q0009			oS
232	88	89	1.50000	%Q0009			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
233	89	90	1.12000	%Q0009			oS
234	91	92	1.12000	%Q0009			oS
235	92	93	1.50000	%Q0009			oS
236	93	94	1.50000	%Q0009			oS
237	94	95	1.12000	%Q0009			oS
238	96	97	1.12000	%Q0009			oS
239	97	98	1.50000	%Q0009			oS
240	98	99	1.50000	%Q0009			oS
241	99	100	1.12000	%Q0009			oS
242	101	102	1.12000	%Q0009			oS
243	102	103	1.50000	%Q0009			oS
244	103	104	1.50000	%Q0009			oS
245	104	105	1.12000	%Q0009			oS
246	106	107	1.12000	%Q0010			oS
247	107	108	1.50000	%Q0010			oS
248	108	109	1.50000	%Q0010			oS
249	109	110	1.12000	%Q0010			oS
250	111	112	1.12000	%Q0011			oS
251	112	113	1.50000	%Q0011			oS
252	113	114	1.50000	%Q0011			oS
253	114	115	1.12000	%Q0011			oS
254	116	117	1.12000	%Q0011			oS
255	117	118	1.50000	%Q0011			oS
256	118	119	1.50000	%Q0011			oS
257	119	120	1.12000	%Q0011			oS
258	121	122	1.12000	%Q0011			oS
259	122	123	1.50000	%Q0011			oS
260	123	124	1.50000	%Q0011			oS
261	124	125	1.12000	%Q0011			oS
262	126	127	1.12000	%Q0011			oS
263	127	128	1.50000	%Q0011			oS
264	128	129	1.50000	%Q0011			oS
265	129	130	1.12000	%Q0011			oS
266	131	132	1.12000	%Q0011			oS
267	132	133	1.50000	%Q0011			oS
268	133	134	1.50000	%Q0011			oS
269	134	135	1.12000	%Q0011			oS
270	136	137	1.12000	%Q0011			oS
271	137	138	1.50000	%Q0011			oS
272	138	139	1.50000	%Q0011			oS
273	139	140	1.12000	%Q0011			oS
274	141	142	1.12000	%Q0011			oS
275	142	143	1.50000	%Q0011			oS
276	143	144	1.50000	%Q0011			oS
277	144	145	1.12000	%Q0011			oS
278	146	147	1.12000	%Q0011			oS
279	147	148	1.50000	%Q0011			oS
280	148	149	1.50000	%Q0011			oS
281	149	150	1.12000	%Q0011			oS
282	151	152	1.12000	%Q0011			oS
283	152	153	1.50000	%Q0011			oS
284	153	154	1.50000	%Q0011			oS
285	154	155	1.12000	%Q0011			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
286	156	157	1.12000	%Q0012			oS
287	157	158	1.50000	%Q0012			oS
288	158	159	1.50000	%Q0012			oS
289	159	160	1.12000	%Q0012			oS
290*	166	58	13.20000	PILAS			oS
291*	167	108	13.20000	PILAS			oS

Bars marked with "*" are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

Cross sections marked with "*" (i.e *HEB200) are rotated 90 degr.
about the local x-axis.

O = Rotated bars (bar orientations)
oS = Bars without shear deformation

HAUNCHED AND NON DEFAULT ORIENTED MEMBERS:

Bar	haunched bars CS-Start	CS-End	Bar orientation x/kl/angle Beta	y/k2	z
1			-8.0000		
2			-8.0000		
3			-8.0000		
4			-8.0000		
5			-8.0000		
6			-8.0000		
7			-8.0000		
8			-8.0000		
9			-8.0000		
10			-8.0000		
11			-8.0000		
12			-8.0000		
13			-8.0000		
14			-8.0000		
15			-8.0000		
16			-8.0000		
17			-8.0000		
18			-8.0000		
19			-8.0000		
20			-8.0000		
21			-8.0000		
22			-8.0000		
23			-8.0000		
24			-8.0000		
25			-8.0000		
26			-8.0000		
27			-8.0000		
28			-8.0000		
29			-8.0000		

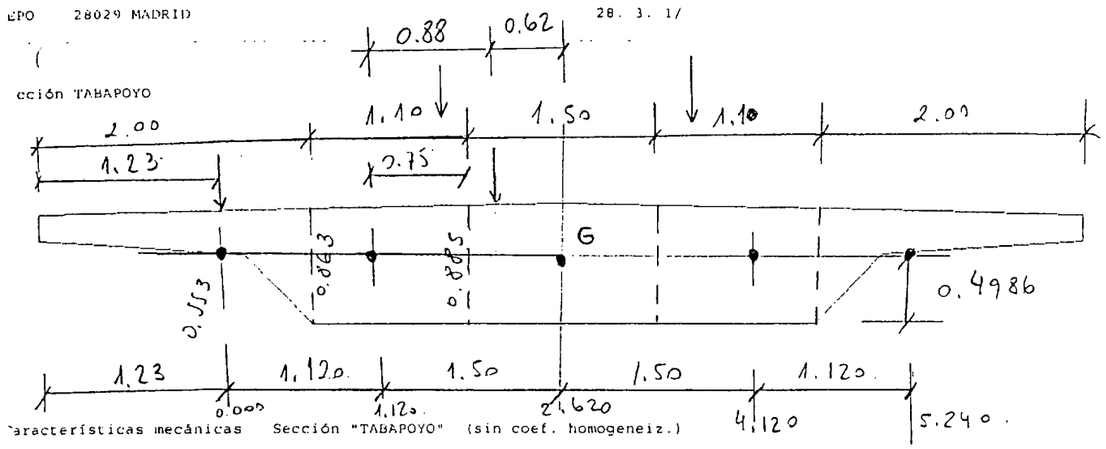
Bar	haunched bars CS-Start	CS-End	Bar orientation x/kl/angle Beta	y/k2	z
30			-8.0000		
31			-8.0000		
32			-8.0000		
129			8.0000		
130			8.0000		
131			8.0000		
132			8.0000		
133			8.0000		
134			8.0000		
135			8.0000		
136			8.0000		
137			8.0000		
138			8.0000		
139			8.0000		
140			8.0000		
141			8.0000		
142			8.0000		
143			8.0000		
144			8.0000		
145			8.0000		
146			8.0000		
147			8.0000		
148			8.0000		
149			8.0000		
150			8.0000		
151			8.0000		
152			8.0000		
153			8.0000		
154			8.0000		
155			8.0000		
156			8.0000		
157			8.0000		
158			8.0000		
159			8.0000		
160			8.0000		

CROSS SECTION VALUES:

CS-Name	Ax [M2] Ix [M4] zl [M1]	Iy [M4] Fy [M2] zu [M1]	Iz [M4] Fz [M2] yl [M1]	Phi [Degr] yr [M1]
%Q0001	6.9575E-01	2.7466E-02	2.4561E-01	8.01
(L1)	8.0250E-03	6.9575E-01	6.9575E-01	
	-0.4986	0.3644	-0.7703	1.2297
%Q0002	9.4930E-01	6.3194E-02	1.3370E-01	0.00
(L2B)	6.1400E-02	9.4930E-01	9.4930E-01	
	-0.4986	0.3644	-0.7500	0.3500

CROSS SECTION VALUES:

CS-Name	Ax [M2] Ix [M4] zl [M1]	Iy [M4] Fy [M2] zu [M1]	Iz [M4] Fz [M2] yl [M1]	Phi [Degr] yr [M1]
%Q0003	1.3500E+00	9.4309E-02	2.5312E-01	0.00
(L2)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.7500	0.7500
%Q0004	9.4930E-01	6.3194E-02	1.3370E-01	0.00
(L2A)	6.1400E-02	9.4930E-01	9.4930E-01	
	-0.4986	0.3644	-0.3500	0.7500
%Q0005	6.9575E-01	2.7466E-02	2.4561E-01	-8.01
(L3)	8.0250E-03	6.9575E-01	6.9575E-01	
	-0.4986	0.3644	-1.2297	0.7703
%Q0006	1.0350E+00	7.2304E-02	1.1990E-01	0.00
(TRANS0)	7.2950E-02	1.0350E+00	1.0350E+00	
	-0.4986	0.4014	-0.5000	0.6500
%Q0007	1.1700E+00	8.1733E-02	1.6478E-01	0.00
(TRANS1)	9.0350E-02	1.1700E+00	1.1700E+00	
	-0.4986	0.4014	-0.6500	0.6500
%Q0008	1.3500E+00	9.4309E-02	2.6660E-01	0.00
(TRANS5)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.6500	0.8500
%Q0009	1.5300E+00	1.0691E-01	3.6847E-01	0.00
(TRANS2)	1.3810E-01	1.5300E+00	1.5300E+00	
	-0.4986	0.4014	-0.8500	0.8500
%Q0010	1.3500E+00	9.4309E-02	2.6660E-01	0.00
(TRANS6)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.8500	0.6500
%Q0011	1.1700E+00	8.1733E-02	1.6478E-01	0.00
(TRANS3)	9.0350E-02	1.1700E+00	1.1700E+00	
	-0.4986	0.4014	-0.6500	0.6500
%Q0012	1.0350E+00	7.2304E-02	1.1990E-01	0.00
(TRANS4)	7.2950E-02	1.0350E+00	1.0350E+00	
	-0.4986	0.4014	-0.6500	0.5000
PILAS	7.8576E-01	4.9180E-02	4.9086E-02	0.00
	9.8175E-02	7.8576E-01	7.8576E-01	
	-0.5000	0.5000	-0.5000	0.5000



ección TABAPOYO

Características mecánicas Sección "TABAPOYO" (sin coef. homogeneiz.)

Area	Ax = 46.53E3 cm2 = 4.653 m²			
Momento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4	
Const. de torsión			Ix = 50.83E6 cm4	
Momento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3		
Baricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad	
Dist. al borde	yl = -3.8500 m	yr = 3.8500 m		
	zo = 0.4014 m	zu = -0.4986 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TABAPOYO" (sin coef. homogeneiz.)

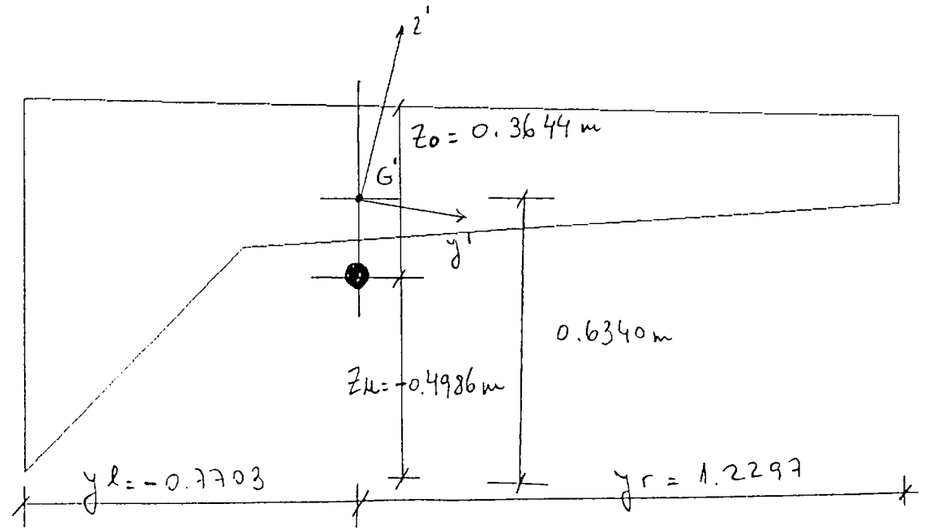
Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	1.8500	0.0000						

No se ha entrado ninguna armadura!

Sección L1



Características mecánicas Sección "L1" (sin coef. homogeneiz.)

Area	Ax = 6.958E3 cm2			
Momento de inercia	Iy = 1.471E6 cm4	Iz = 24.56E6 cm4	Ip = 26.03E6 cm4	
rel. a ejes dados	Iye= 1.919E6 cm4	Ize= 24.11E6 cm4	Iyz= -3.2E00 cm4	
Const. de torsión			Ix = 1.605E6 cm4	$\times 0.5 = 0.008025\ m^4$
Momento estático	Zy = 87.62E3 cm3	Zz = 356.13E3 cm3		
Baricentro	ys = 0.7703 m	zs = 0.6340 m	Angulo= 8.0 Grad	
Dist. al borde	yl = -0.7703 m	yr = 1.2297 m		
	zo = 0.2290 m	zu = -0.6340 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L1" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	6957.500	529.028	1.60E+06	3)

Puntos de contorno [m]:

1	0.0000	0.0000	2	0.5000	0.5230	3	2.0000	0.5230
4	2.0000	0.8230	5	0.0000	0.8630	6	0.0000	0.0000

No se ha entrado ninguna armadura!

$$I_y = 1{,}471\ 10^{6}\ cm^4 + 6.758\ 10^{3}\ cm^2 \left(6340\ cm - 49.86 cm\right)^2$$

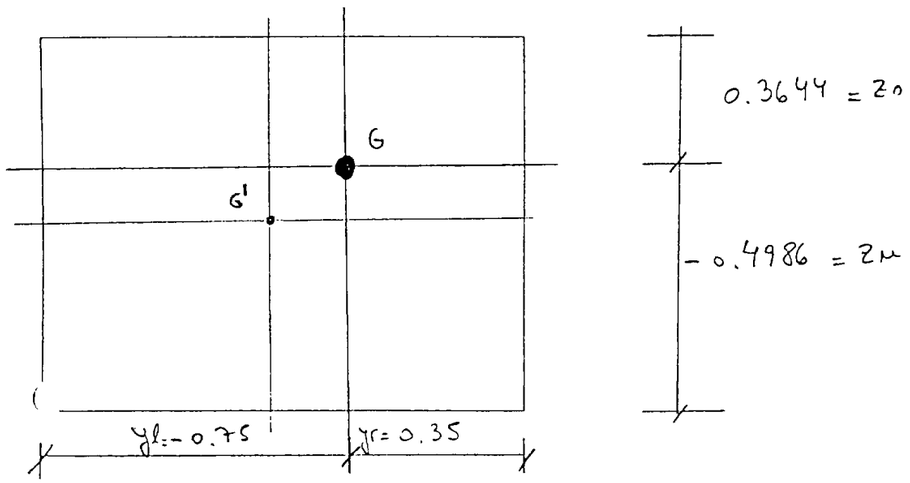
$$I_y = 0.027466\ m^4$$

$$I_x = 0.008025\ m^4$$

$$z_u = -0.4986\ m \qquad z_o = 0.3644\ m$$

$$BETA = -8.00^{\circ}$$

Sección L2B



Características mecánicas Sección "L2B" (sin coef. homogeneiz.)

Area Ax = 9.493E3 cm2
Momento de inercia Iy = 5.892E6 cm4 Iz = 9.572E6 cm4 Ip = 15.46E6 cm4
Const. de torsión Ix = 12.28E6 cm4
Momento estático Zy =204.81E3 cm3 Zz = 261.06E3 cm3
Baricentro ys = 0.5500 m zs = 0.4315 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5500 m yr = 0.5500 m
zo = 0.4315 m zu = -0.4315 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2B" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	9493.000	392.600	1.23E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.1000	0.0000	3	1.1000	0.8630
4	0.0000	0.8630	5	0.0000	0.0000		

No se ha entrado ninguna armadura!

$I_x = 12.28\ 10^6\ cm^4 \times 0.50 = 0.0614\ m^4$

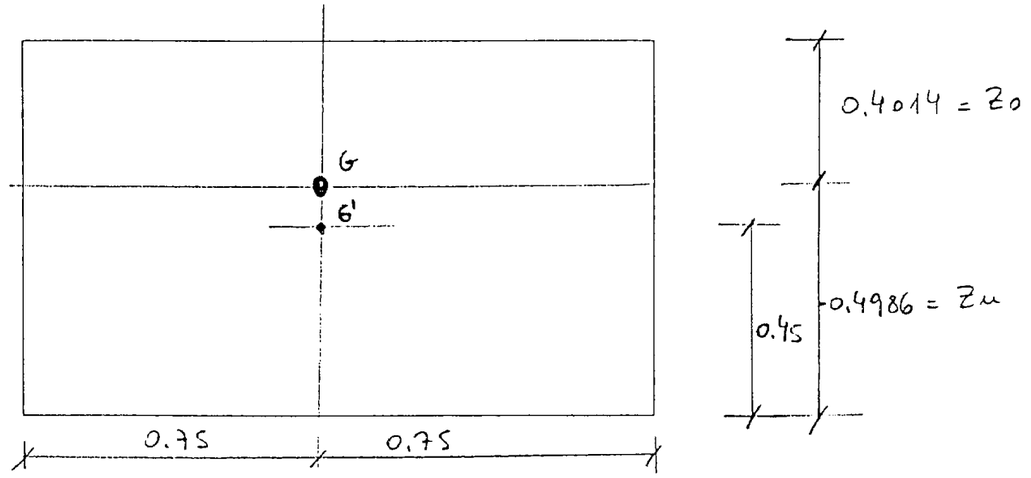
$I_y = 5.892\ 10^6 + 9.493\ 10^3 \times (49.86\ cm - 43.15\ cm)^2$

$I_y = 0.063194.0\ m^4$

$I_z = 9.572\ 10^6 + 9.493\ 10^3 \times (75 - 55)^2$

$I_z = 0.133692\ m^4$

Sección L2



Características mecánicas Sección "L2" (sin coef. homogeneiz.)

Area Ax = 13.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.7500 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.5000	0.0000	3	1.5000	0.9000
4	0.0000	0.9000	5	0.0000	0.0000		

No se ha entrado ninguna armadura!

$I_x = 22.82\ 10^6\ cm^4 \times 0.50 = 0.1141\ m^4$

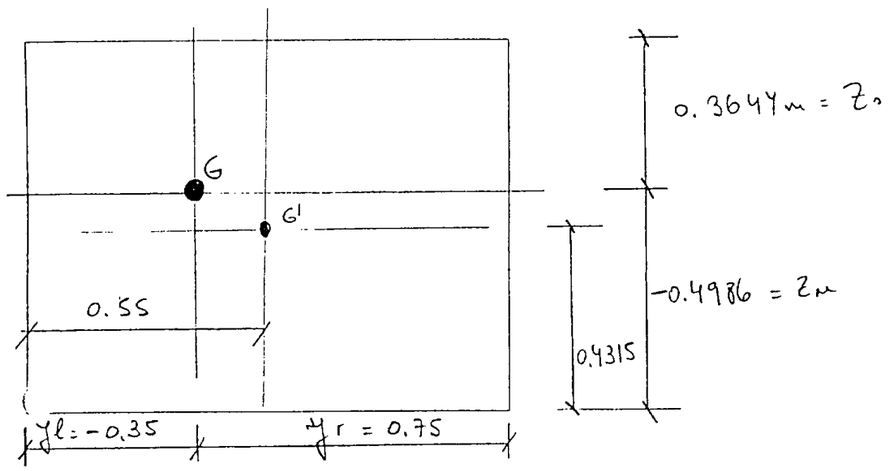
$I_y = 9.112\ 10^6\ cm^4 + 13.50\ 10^3\ cm^2 \times (49.86\ cm - 45.0\ cm)^2$

$I_y = 0.094306\ m^4$

$Z_u = -0.4986\ m$

$Z_o = 0.4014\ m$

Sección L2A



Características mecánicas Sección "L2A" (sin coef. homogeneiz.)

Area	Ax = 9.493E3 cm2				
Momento de inercia	Iy = 5.892E6 cm4	Iz = 9.572E6 cm4	Ip = 15.46E6 cm4		
Const. de torsión			Ix = 12.28E6 cm4		
Momento estático	Zy = 204.81E3 cm3	Zz = 261.06E3 cm3			
Baricentro	ys = 0.5500 m	zs = 0.4315 m	Angulo= 0.0 Grad		
Dist. al borde	yl = -0.5500 m	yr = 0.5500 m			
	zo = 0.4315 m	zu = -0.4315 m			

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2A" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	9493.000	392.600	1.23E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.1000	0.0000	3	1.1000	0.8630
4	0.0000	0.8630	5	0.0000	0.0000		

No se ha entrado ninguna armadura!

$I_x = 12.28\,10^6\,cm^4 \times 0.50 = 0.0614\,m^4$

$I_y = 5.892\,10^6\,cm^4 + 9.493 \times 10^3\,cm^2 \times (49.86\,cm - 43.15\,cm)^2$

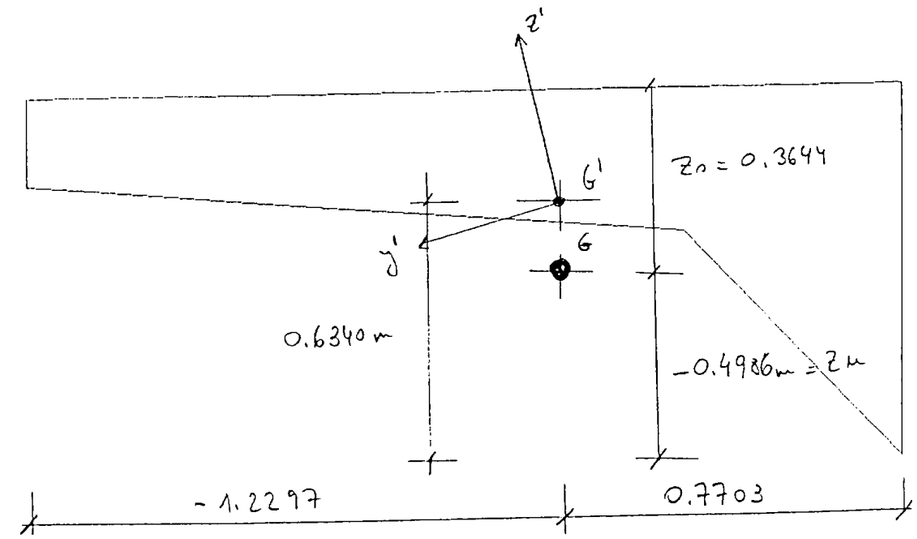
$I_y = 0.063194\,m^4$

$I_z = 9.572\,10^6\,cm^4 + 9.493 \times 10^3\,cm^2 \times (55.0\,cm - 35.0\,cm)^2$

$I_z = 0.1337\,m^4$

$Z_u = -0.4986\,m \qquad Z_o = 0.3644$

Sección L3



Características mecánicas Sección "L3" (sin coef. homogeneiz.)

Area	Ax = 6.957E3 cm2				
Momento de inercia	Iy = 1.471E6 cm4	Iz = 24.56E6 cm4	Ip = 26.03E6 cm4		
rel. a ejes dados	Iye= 1.919E6 cm4	Ize= 24.11E6 cm4	Iyz= 3.186E6 cm4		
Const. de torsión			Ix = 1.605E6 cm4		
Momento estático	Zy = 87.62E3 cm3	Zz = 356.13E3 cm3			
Baricentro	ys = 1.2297 m	zs = 0.6340 m	Angulo= -8.0 Grad		
Dist. al borde	yl = -1.2297 m	yr = 0.7703 m			
	zo = 0.2290 m	zu = -0.6340 m			

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L3" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	6957.500	529.028	1.60E+06	3)

Puntos de contorno [m]:

1	0.0000	0.8230	2	0.0000	0.6230	3	1.5000	0.5230
4	2.0000	0.0000	5	2.0000	0.8630	6	0.0000	0.8230

No se ha entrado ninguna armadura!

$I_x = 1.605\,10^6\,cm^4 \times 0.50 = 0.008025\,m^4$

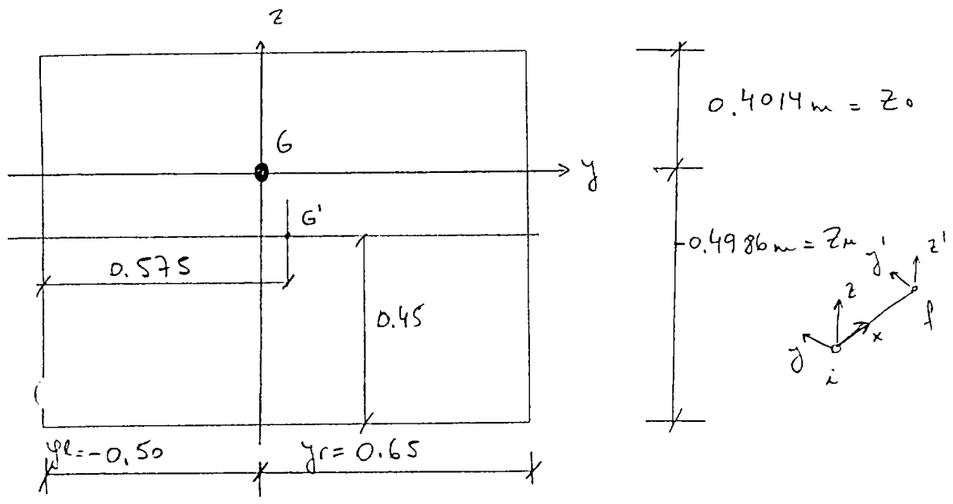
$I_y = 1.471\,10^6\,cm^4 + 6.957\,10^3\,cm^2\,(63.40\,cm - 49.86\,cm)^2$

$I_y = 0.027464\,m^4$

$Z_o = 0.3644\,m \qquad Z_u = -0.4986$

$BETA = 8.00^\circ$

Sección TRANS0



Características mecánicas Sección "TRANS0" (sin coef. homogeneiz.)

Area	Ax = 10.35E3 cm2				
Momento de inercia	Iy = 6.986E6 cm4	Iz = 11.41E6 cm4	Ip = 18.39E6 cm4		
Const. de torsión			Ix = 14.59E6 cm4		
Momento estático	Zy =232.88E3 cm3	Zz = 297.56E3 cm3			
Baricentro	ys = -0.0000 m	zs = 0.4500 m	Angulo= 0.0 Grad		
Dist. al borde	yl = -0.5750 m	yr = 0.5750 m			
	zo = 0.4500 m	zu = -0.4500 m			

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS0" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	10350.0	410.000	1.46E+07	1)

Puntos de contorno [m]:

1	-0.5750	0.0000	2	0.5750	0.0000	3	0.5750	0.9000
4	0.5750	0.9000	5	0.5750	0.0000			

No se ha entrado ninguna armadura!

$I_x = 14.59\,10^6\,cm^4 \times 0.50 = 0.07295\,m^4$

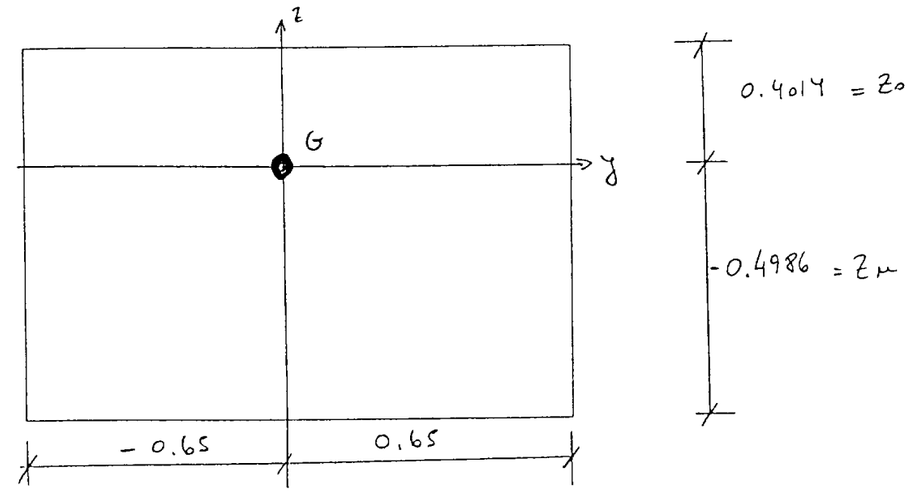
$I_y = 6.986\,10^6\,cm^4 + 10.35 \times 10^3\,cm^2 \times (49.86\,cm - 45.0\,cm)^2$

$I_y = 0.0723046\,m^4$

$I_z = 11.41\,10^6\,cm^4 + 10.35\,10^3\,cm^2 \times (57.5\,cm - 50\,cm)^2$

$I_z = 0.119921\,m^4$

Sección TRANS1



Características mecánicas Sección "TRANS1" (sin coef. homogeneiz.)

Area	Ax = 11.70E3 cm2				
Momento de inercia	Iy = 7.897E6 cm4	Iz = 16.48E6 cm4	Ip = 24.37E6 cm4		
Const. de torsión			Ix = 18.07E6 cm4		
Momento estático	Zy =263.25E3 cm3	Zz = 380.25E3 cm3			
Baricentro	ys = -0.0000 m	zs = 0.4500 m	Angulo= 0.0 Grad		
Dist. al borde	yl = -0.6500 m	yr = 0.6500 m			
	zo = 0.4500 m	zu = -0.4500 m			

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS1" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	11700.0	440.000	1.81E+07	1)

Puntos de contorno [m]

1	0.6500	0.0000	2	0.6500	0.0000	3	0.6500	0.9000
4	-0.6500	0.9000	5	0.6500	0.0000			

No se ha entrado ninguna armadura!

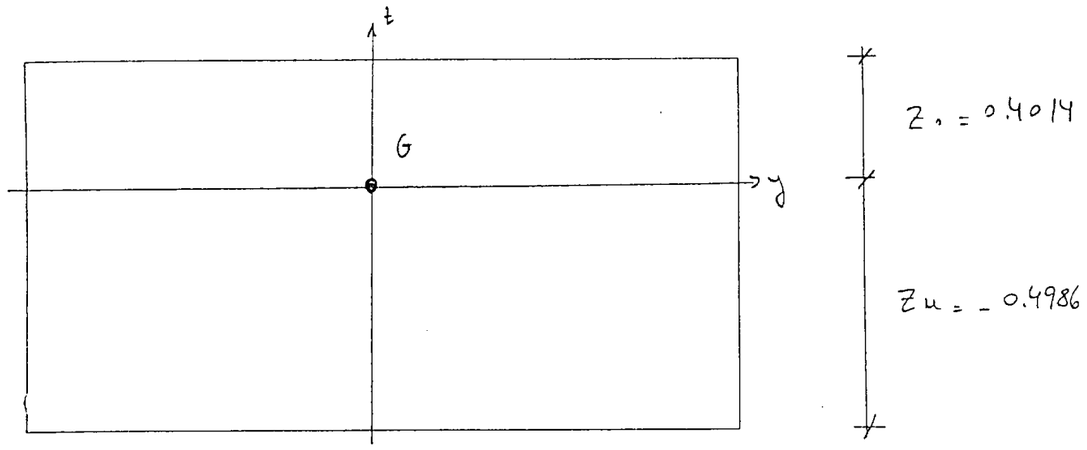
$I_x = 18.07\,10^6\,cm^4 \times 0.50 = 0.09035\,m^4$

$I_y = 7.897\,10^6\,cm^4 + 11.70\,10^3\,cm^2 \times (49.86\,cm - 45.0)^2$

$I_y = 0.0817334\,m^4$

$z_u = -0.4986\,m \qquad z_o = 0.4014\,m$

cción TRANS2



aracterísticas mecánicas Sección "TRANS2" (sin coef. homogeneiz.)

Area Ax = 15.30E3 cm2
Momento de inercia Iy = 10.33E6 cm4 Iz = 36.85E6 cm4 Ip = 47.17E6 cm4
Const. de torsión Ix = 27.62E6 cm4
Momento estático Zy =344.25E3 cm3 Zz = 650.25E3 cm3
Baricentro ys = 0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.8500 m yr = 0.8500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Con( )o de sección parcial, Sección "TRANS2" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	15300.0	520.000	2.76E+07	1)

Puntos de contorno [m]:
1 0.8500 0.0000 2 0.8500 0.0000 3 0.8500 0.9000
4 0.8500 0.9000 5 -0.8500 0.0000

No se ha entrado ninguna armadura!

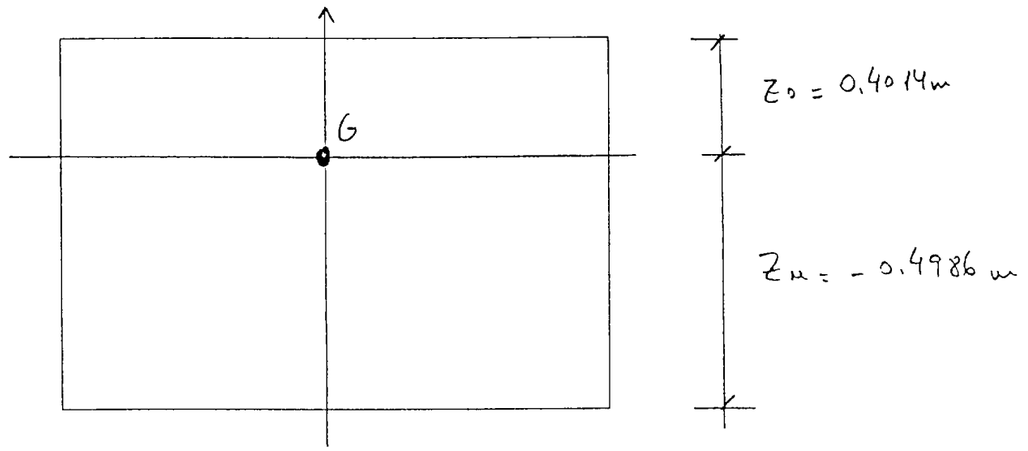
$I_x = 27.62\ 10^6\ cm^4 \times 0.50 = 0.1381\ m^4$

$I_y = 10.33\ 10^6\ cm^4 + 15.30\ 10^3\ cm^2 \times (49.86\ cm - 45.00)^2$

$I_y = 0.106913\ m^4$

$Z_u = -0.4986\ m \qquad Z_o = 0.4014\ m$

Sección TRANS3



Características mecánicas Sección "TRANS3" (sin coef. homogeneiz.)

Area Ax = 11.70E3 cm2
Momento de inercia Iy = 7.897E6 cm4 Iz = 16.48E6 cm4 Ip = 24.37E6 cm4
Const. de torsión Ix = 18.07E6 cm4
Momento estático Zy =263.25E3 cm3 Zz = 380.25E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.6500 m yr = 0.6500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS3" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	11700.0	440.000	1.81E+07	1)

Puntos de contorno [m]:
1 0.6500 0.0000 2 0.6500 0.0000 3 0.6500 0.9000
4 0.6500 0.9000 5 0.6500 0.0000

No se ha entrado ninguna armadura!

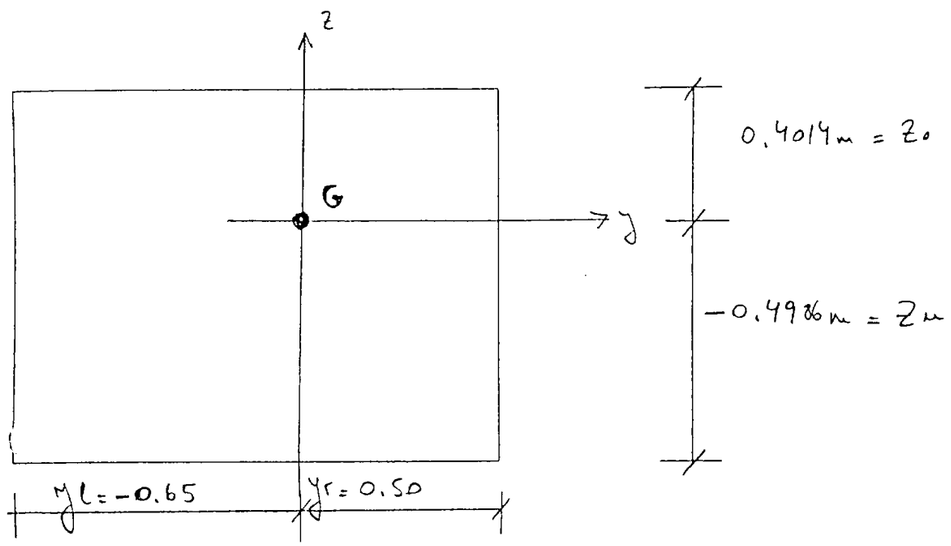
$I_x = 18.07\ 10^6\ cm^4 \times 0.50 = 0.09035\ m^4$

$I_y = 7.897\ 10^6\ cm^4 + 11.70 \times 10^3\ cm^2 \times (49.86\ cm - 45.00)^2$

$I_y = 0.0817335\ m^4$

$Z_u = -0.4986\ m \qquad Z_o = 0.4014\ m$

cción TRANS4



Características mecánicas Sección "TRANS4" (sin coef. homogeniz.)

Area Ax = 10.35E3 cm2
Momento de inercia Iy = 6.986E6 cm4 Iz = 11.41E6 cm4 Ip = 18.39E6 cm4
Const. de torsión Ix = 14.59E6 cm4
Momento estático Zy =232.88E3 cm3 Zz = 297.56E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5750 m yr = 0.5750 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS4" (sin coef. homogeniz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	10350.0	410.000	1.46E+07	1)

Puntos de contorno [m]:
1 -0.5750 0.0000 2 0.5750 0.0000 3 0.5750 0.9000
4 -0.5750 0.9000 5 -0.5750 0.0000

No se ha entrado ninguna armadura!

$I_x = 14.59\ 10^6\ cm^4 \times 0.50 = 0.07295\ m^4$

$I_y = 6.986\ 10^6\ cm^4 + 10.35\ 10^3\ cm^2 \times (49.86\ cm - 45.0\ cm)^2$

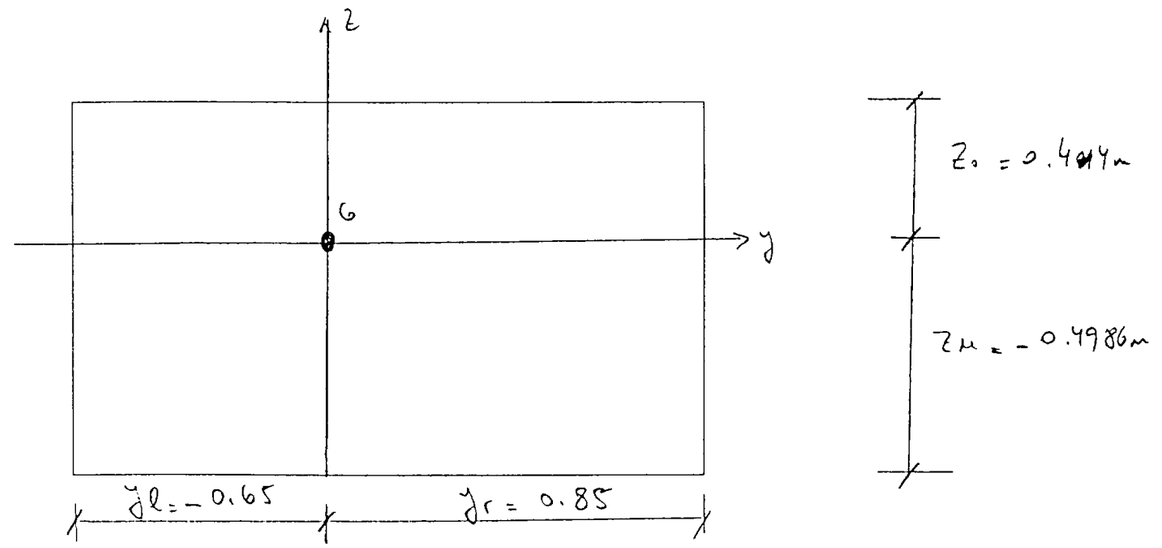
$I_y = 0.0723046\ m^4$

$I_z = 11.41\ 10^6\ cm^4 + 10.35\ 10^3\ cm^2 \times (65.0 - 57.50)^2$

$I_z = 0.11992\ m^4$

$z_\mu = -0.4986\ m \qquad z_0 = 0.4014\ m$

Sección TRANS5



Características mecánicas Sección "TRANS5" (sin coef. homogeniz.)

Area Ax = 11.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS5" (sin coef. homogeniz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	11500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:
1 -0.7500 0.0000 2 0.7500 0.0000 3 0.7500 0.9000
4 -0.7500 0.9000 5 0.7500 0.0000

No se ha entrado ninguna armadura!

$I_x = 22.82\ 10^6\ cm^4 \times 0.50 = 0.1141\ m^4$

$I_y = 9.112\ 10^6\ cm^4 + 13.50\ 10^3\ cm^2\ (49.8-45)^2$

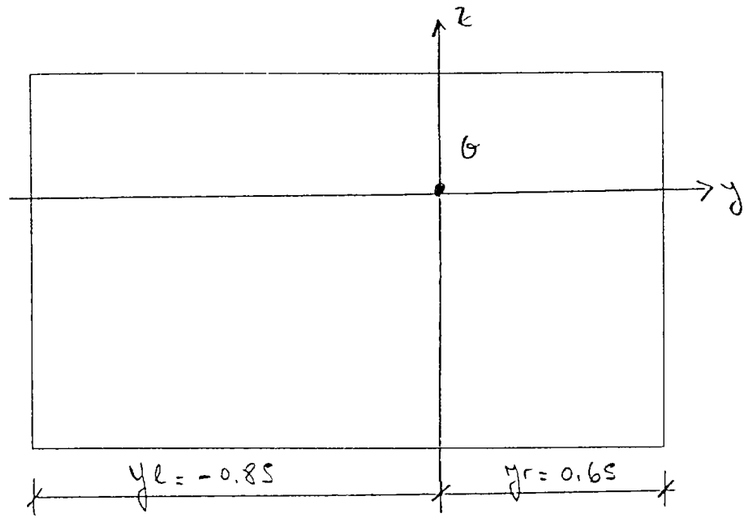
$I_y = 0.094309\ m^4$

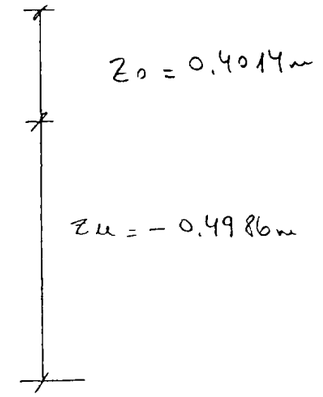
$I_z = 25.31\ 10^6\ cm^4 + 13.50\ 10^3\ cm^2\ (75-65)^2$

$I_z = 0.2666\ m^4$

$z_\mu = -0.4986\ m \qquad z_0 = 0.4014\ m$

Sección TRANS6





Características mecánicas Sección "TRANS6" (sin coef. homogeneiz.)

Area Ax = 13.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS6" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:

1	0.7500	0.0000	2	0.7500	0.0000	3	0.7500	0.9000
4	0.7500	0.9000	5	0.7500	0.0000			

No se ha entrado ninguna armadura!

$$I_x = 22.82\,10^6\ cm^4 \times 0.50 = 0.1141\ m^4$$

$$I_y = 9.112\,10^6\ cm^4 + 13.50\,10^3\ cm^2 (49.86 - 45)^2$$

$$I_y = 0.094309\ m^4$$

$$I_t = 25.31\,10^6\ cm^4 + 13.50\,10^3\ cm^2 (75 - 65)^2$$

$$I_t = 0.2666\ m^4$$

$$Z_u = -0.4986\ m \qquad Z_o = 0.4014$$

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 .. 291	3.2900E+06	1.3700E+06

STS-Run ok

Load case 1: PESO PROPIO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Mas.forcZ gl const.	-2.500		Stab 1 .. 160

Load case 2: PESO PAVIMENTO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.106000		Stab 1 .. 32
Force Z pj const.	-0.101000		Stab 33 .. 64
Force Z pj const.	-0.138000		Stab 65 .. 96
Force Z pj const.	-0.101000		Stab 97 .. 128
Force Z pj const.	-0.106000		Stab 129 .. 160

Load case 3: PESO BARRERAS

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-1.000		Stab 1
Moment X lo const.	-1.023		Stab 1
Force Z pj const.	-1.000		Stab 2
Moment X lo const.	-1.023		Stab 2
Force Z pj const.	-1.000		Stab 3
Moment X lo const.	-1.023		Stab 3
Force Z pj const.	-1.000		Stab 4
Moment X lo const.	-1.023		Stab 4
Force Z pj const.	-1.000		Stab 5
Moment X lo const.	-1.023		Stab 5
Force Z pj const.	-1.000		Stab 6
Moment X lo const.	-1.023		Stab 6
Force Z pj const.	-1.000		Stab 7
Moment X lo const.	-1.023		Stab 7
Force Z pj const.	-1.000		Stab 8
Moment X lo const.	-1.023		Stab 8
Force Z pj const.	-1.000		Stab 9
Moment X lo const.	-1.023		Stab 9
Force Z pj const.	-1.000		Stab 10
Moment X lo const.	-1.023		Stab 10
Force Z pj const.	-1.000		Stab 11
Moment X lo const.	-1.023		Stab 11
Force Z pj const.	-1.000		Stab 12
Moment X lo const.	-1.023		Stab 12
Force Z pj const.	-1.000		Stab 13
Moment X lo const.	-1.023		Stab 13
Force Z pj const.	-1.000		Stab 14
Moment X lo const.	-1.023		Stab 14
Force Z pj const.	-1.000		Stab 15
Moment X lo const.	-1.023		Stab 15
Force Z pj const.	-1.000		Stab 16
Moment X lo const.	-1.023		Stab 16
Force Z pj const.	-1.000		Stab 17
Moment X lo const.	-1.023		Stab 17
Force Z pj const.	-1.000		Stab 18
Moment X lo const.	-1.023		Stab 18
Force Z pj const.	-1.000		Stab 19
Moment X lo const.	-1.023		Stab 19
Force Z pj const.	-1.000		Stab 20
Moment X lo const.	-1.023		Stab 20
Force Z pj const.	-1.000		Stab 21
Moment X lo const.	-1.023		Stab 21
Force Z pj const.	-1.000		Stab 22
Moment X lo const.	-1.023		Stab 22
Force Z pj const.	-1.000		Stab 23
Moment X lo const.	-1.023		Stab 23
Force Z pj const.	-1.000		Stab 24
Moment X lo const.	-1.023		Stab 24
Force Z pj const.	-1.000		Stab 25

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Moment X lo const.	-1.023		Stab 25
Force Z pj const.	-1.000		Stab 26
Moment X lo const.	-1.023		Stab 26
Force Z pj const.	-1.000		Stab 27
Moment X lo const.	-1.023		Stab 27
Force Z pj const.	-1.000		Stab 28
Moment X lo const.	-1.023		Stab 28
Force Z pj const.	-1.000		Stab 29
Moment X lo const.	-1.023		Stab 29
Force Z pj const.	-1.000		Stab 30
Moment X lo const.	-1.023		Stab 30
Force Z pj const.	-1.000		Stab 31
Moment X lo const.	-1.023		Stab 31
Force Z pj const.	-1.000		Stab 32
Moment X lo const.	-1.023		Stab 32
Force Z pj const.	-1.000		Stab 129
Moment X lo const.	1.023		Stab 129
Force Z pj const.	-1.000		Stab 130
Moment X lo const.	1.023		Stab 130
Force Z pj const.	-1.000		Stab 131
Moment X lo const.	1.023		Stab 131
Force Z pj const.	-1.000		Stab 132
Moment X lo const.	1.023		Stab 132
Force Z pj const.	-1.000		Stab 133
Moment X lo const.	1.023		Stab 133
Force Z pj const.	-1.000		Stab 134
Moment X lo const.	1.023		Stab 134
Force Z pj const.	-1.000		Stab 135
Moment X lo const.	1.023		Stab 135
Force Z pj const.	-1.000		Stab 136
Moment X lo const.	1.023		Stab 136
Force Z pj const.	-1.000		Stab 137
Moment X lo const.	1.023		Stab 137
Force Z pj const.	-1.000		Stab 138
Moment X lo const.	1.023		Stab 138
Force Z pj const.	-1.000		Stab 139
Moment X lo const.	1.023		Stab 139
Force Z pj const.	-1.000		Stab 140
Moment X lo const.	1.023		Stab 140
Force Z pj const.	-1.000		Stab 141
Moment X lo const.	1.023		Stab 141
Force Z pj const.	-1.000		Stab 142
Moment X lo const.	1.023		Stab 142
Force Z pj const.	-1.000		Stab 143
Moment X lo const.	1.023		Stab 143
Force Z pj const.	-1.000		Stab 144
Moment X lo const.	1.023		Stab 144
Force Z pj const.	-1.000		Stab 145
Moment X lo const.	1.023		Stab 145
Force Z pj const.	-1.000		Stab 146
Moment X lo const.	1.023		Stab 146
Force Z pj const.	-1.000		Stab 147
Moment X lo const.	1.023		Stab 147

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-1.000		Stab 148
Moment X lo const.	1.023		Stab 148
Force Z pj const.	-1.000		Stab 149
Moment X lo const.	1.023		Stab 149
Force Z pj const.	-1.000		Stab 150
Moment X lo const.	1.023		Stab 150
Force Z pj const.	-1.000		Stab 151
Moment X lo const.	1.023		Stab 151
Force Z pj const.	-1.000		Stab 152
Moment X lo const.	1.023		Stab 152
Force Z pj const.	-1.000		Stab 153
Moment X lo const.	1.023		Stab 153
Force Z pj const.	-1.000		Stab 154
Moment X lo const.	1.023		Stab 154
Force Z pj const.	-1.000		Stab 155
Moment X lo const.	1.023		Stab 155
Force Z pj const.	-1.000		Stab 156
Moment X lo const.	1.023		Stab 156
Force Z pj const.	-1.000		Stab 157
Moment X lo const.	1.023		Stab 157
Force Z pj const.	-1.000		Stab 158
Moment X lo const.	1.023		Stab 158
Force Z pj const.	-1.000		Stab 159
Moment X lo const.	1.023		Stab 159
Force Z pj const.	-1.000		Stab 160
Moment X lo const.	1.023		Stab 160

Load case 5: RETRACCION

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000292		Stab 1 .. 160

Load case 6: SOB UNIF 1

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.800000		Stab 1 .. 32

Load case 7: SOB UNIF 2

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 33 .. 64

Load case 8: SOB UNIF 3

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.600000		Stab 65 .. 96

Load case 9: SOB UNIF 4

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 97 .. 128

Load case 10: SOB UNIF 5

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.800000		Stab 129 .. 160

Load case 11: VEHICULO HIPOTESIS 11

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-10.000	0.850000	Stab 2
Force Z gl conc.	-10.000	1.050	Stab 3
Force Z gl conc.	-10.000	1.250	Stab 4
Force Z gl conc.	-4.130	0.850000	Stab 34
Force Z gl conc.	-4.130	1.050	Stab 35
Force Z gl conc.	-4.130	1.250	Stab 36
Force Z gl conc.	-5.870	0.850000	Stab 66
Force Z gl conc.	-5.870	1.050	Stab 67
Force Z gl conc.	-5.870	1.250	Stab 68

Load case 12: VEHICULO HIPOTESIS 12

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	1.100	Stab	5
Force	Z	gl conc.	-10.000	1.300	Stab	6
Force	Z	gl conc.	-10.000	0.200000	Stab	8
Force	Z	gl conc.	-4.130	1.100	Stab	37
Force	Z	gl conc.	-4.130	1.300	Stab	38
Force	Z	gl conc.	-4.130	0.200000	Stab	40
Force	Z	gl conc.	-5.870	1.100	Stab	69
Force	Z	gl conc.	-5.870	1.300	Stab	70
Force	Z	gl conc.	-5.870	0.200000	Stab	72

Load case 13: VEHICULO HIPOTESIS 13

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.050000	Stab	9
Force	Z	gl conc.	-10.000	0.250000	Stab	10
Force	Z	gl conc.	-10.000	0.450000	Stab	11
Force	Z	gl conc.	-4.130	0.050000	Stab	41
Force	Z	gl conc.	-4.130	0.250000	Stab	42
Force	Z	gl conc.	-4.130	0.450000	Stab	43
Force	Z	gl conc.	-5.870	0.050000	Stab	73
Force	Z	gl conc.	-5.870	0.250000	Stab	74
Force	Z	gl conc.	-5.870	0.450000	Stab	75

Load case 14: VEHICULO HIPOTESIS 14

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.850000	Stab	12
Force	Z	gl conc.	-10.000	0.650000	Stab	13
Force	Z	gl conc.	-10.000	0.450000	Stab	14
Force	Z	gl conc.	-4.130	0.850000	Stab	44
Force	Z	gl conc.	-4.130	0.650000	Stab	45
Force	Z	gl conc.	-4.130	0.450000	Stab	46
Force	Z	gl conc.	-5.870	0.850000	Stab	76
Force	Z	gl conc.	-5.870	0.650000	Stab	77
Force	Z	gl conc.	-5.870	0.450000	Stab	78

Load case 15: VEHICULO HIPOTESIS 15

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.200000	Stab	16
Force	Z	gl conc.	-10.000	0	Stab	17
Force	Z	gl conc.	-10.000	1.500	Stab	17
Force	Z	gl conc.	-4.130	0.200000	Stab	48
Force	Z	gl conc.	-4.130	0	Stab	49
Force	Z	gl conc.	-4.130	1.500	Stab	49
Force	Z	gl conc.	-5.870	0.200000	Stab	80
Force	Z	gl conc.	-5.870	0	Stab	81
Force	Z	gl conc.	-5.870	1.500	Stab	81

Load case 16: VEHICULO HIPOTESIS 16

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	1.250	Stab	19
Force	Z	gl conc.	-10.000	1.050	Stab	20
Force	Z	gl conc.	-10.000	0.850000	Stab	21
Force	Z	gl conc.	-4.130	1.250	Stab	51
Force	Z	gl conc.	-4.130	1.050	Stab	52
Force	Z	gl conc.	-4.130	0.850000	Stab	53
Force	Z	gl conc.	-5.870	1.250	Stab	83
Force	Z	gl conc.	-5.870	1.050	Stab	84
Force	Z	gl conc.	-5.870	0.850000	Stab	85

Load case 17: VEHICULO HIPOTESIS 17

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.850000	Stab	22
Force	Z	gl conc.	-10.000	1.050	Stab	23
Force	Z	gl conc.	-10.000	1.250	Stab	24
Force	Z	gl conc.	-4.130	0.850000	Stab	54
Force	Z	gl conc.	-4.130	1.050	Stab	55
Force	Z	gl conc.	-4.130	1.250	Stab	56
Force	Z	gl conc.	-5.870	0.850000	Stab	86
Force	Z	gl conc.	-5.870	1.050	Stab	87
Force	Z	gl conc.	-5.870	1.250	Stab	88

Load case 18: VEHICULO HIPOTESIS 18

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	1.100	Stab	25
Force	Z	gl conc.	-10.000	1.300	Stab	26
Force	Z	gl conc.	-10.000	0.200000	Stab	28
Force	Z	gl conc.	-4.130	1.100	Stab	57
Force	Z	gl conc.	-4.130	1.300	Stab	58
Force	Z	gl conc.	-4.130	0.200000	Stab	60
Force	Z	gl conc.	-5.870	1.100	Stab	89
Force	Z	gl conc.	-5.870	1.300	Stab	90
Force	Z	gl conc.	-5.870	0.200000	Stab	92

Load case 19: VEHICULO HIPOTESIS 19

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.050000	Stab	29
Force	Z	gl conc.	-10.000	0.250000	Stab	30
Force	Z	gl conc.	-10.000	0.450000	Stab	31
Force	Z	gl conc.	-4.130	0.050000	Stab	61
Force	Z	gl conc.	-4.130	0.250000	Stab	62
Force	Z	gl conc.	-4.130	0.450000	Stab	63
Force	Z	gl conc.	-5.870	0.050000	Stab	93
Force	Z	gl conc.	-5.870	0.250000	Stab	94
Force	Z	gl conc.	-5.870	0.450000	Stab	95

Load case 20: VEHICULO HIPOTESIS 20

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	0.850000	Stab	34
Force	Z	gl conc.	-6.670	1.050	Stab	35
Force	Z	gl conc.	-6.670	1.250	Stab	36
Force	Z	gl conc.	-6.670	0.850000	Stab	66
Force	Z	gl conc.	-6.670	1.050	Stab	67
Force	Z	gl conc.	-6.670	1.250	Stab	68
Force	Z	gl conc.	-6.670	0.850000	Stab	98
Force	Z	gl conc.	-6.670	1.050	Stab	99
Force	Z	gl conc.	-6.670	1.250	Stab	100

Load case 21: VEHICULO HIPOTESIS 21

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	1.100	Stab	37
Force	Z	gl conc.	-6.670	1.300	Stab	38
Force	Z	gl conc.	-6.670	0.200000	Stab	40
Force	Z	gl conc.	-6.670	1.100	Stab	69
Force	Z	gl conc.	-6.670	1.300	Stab	70
Force	Z	gl conc.	-6.670	0.200000	Stab	72
Force	Z	gl conc.	-6.670	1.100	Stab	101
Force	Z	gl conc.	-6.670	1.300	Stab	102
Force	Z	gl conc.	-6.670	0.200000	Stab	104

Load case 22: VEHICULO HIPOTESIS 22

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	0.050000	Stab	41
Force	Z	gl conc.	-6.670	0.250000	Stab	42
Force	Z	gl conc.	-6.670	0.450000	Stab	43
Force	Z	gl conc.	-6.670	0.050000	Stab	73
Force	Z	gl conc.	-6.670	0.250000	Stab	74
Force	Z	gl conc.	-6.670	0.450000	Stab	75
Force	Z	gl conc.	-6.670	0.050000	Stab	105
Force	Z	gl conc.	-6.670	0.250000	Stab	106
Force	Z	gl conc.	-6.670	0.450000	Stab	107

Load case 23: VEHICULO HIPOTESIS 23

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	0.850000	Stab	44
Force	Z	gl conc.	-6.670	0.650000	Stab	45
Force	Z	gl conc.	-6.670	0.450000	Stab	46
Force	Z	gl conc.	-6.670	0.850000	Stab	76
Force	Z	gl conc.	-6.670	0.650000	Stab	77
Force	Z	gl conc.	-6.670	0.450000	Stab	78
Force	Z	gl conc.	-6.670	0.850000	Stab	108
Force	Z	gl conc.	-6.670	0.650000	Stab	109
Force	Z	gl conc.	-6.670	0.450000	Stab	110

Load case 24: VEHICULO HIPOTESIS 24

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.200000	Stab	48
Force	Z	gl conc.	-6.670	0	Stab	49
Force	Z	gl conc.	-6.670	1.500	Stab	49
Force	Z	gl conc.	-6.670	0.200000	Stab	80
Force	Z	gl conc.	-6.670	0	Stab	81
Force	Z	gl conc.	-6.670	1.500	Stab	81
Force	Z	gl conc.	-6.670	0.200000	Stab	112
Force	Z	gl conc.	-6.670	0	Stab	113
Force	Z	gl conc.	-6.670	1.500	Stab	113

Load case 25: VEHICULO POSICION 25

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	1.250	Stab	51
Force	Z	gl conc.	-6.670	1.050	Stab	52
Force	Z	gl conc.	-6.670	0.850000	Stab	53
Force	Z	gl conc.	-6.670	1.250	Stab	83
Force	Z	gl conc.	-6.670	1.050	Stab	84
Force	Z	gl conc.	-6.670	0.850000	Stab	85
Force	Z	gl conc.	-6.670	1.250	Stab	115
Force	Z	gl conc.	-6.670	1.050	Stab	116
Force	Z	gl conc.	-6.670	0.850000	Stab	117

Load case 26: VEHICULO POSICION 26

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.850000	Stab	54
Force	Z	gl conc.	-6.670	1.050	Stab	55
Force	Z	gl conc.	-6.670	1.250	Stab	56
Force	Z	gl conc.	-6.670	0.850000	Stab	86
Force	Z	gl conc.	-6.670	1.050	Stab	87
Force	Z	gl conc.	-6.670	1.250	Stab	88
Force	Z	gl conc.	-6.670	0.850000	Stab	118
Force	Z	gl conc.	-6.670	1.050	Stab	119
Force	Z	gl conc.	-6.670	1.250	Stab	120

Load case 27: VEHICULO POSICION 27

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	1.100	Stab	57
Force	Z	gl conc.	-6.670	1.300	Stab	58
Force	Z	gl conc.	-6.670	0.200000	Stab	60
Force	Z	gl conc.	-6.670	1.100	Stab	89
Force	Z	gl conc.	-6.670	1.300	Stab	90
Force	Z	gl conc.	-6.670	0.200000	Stab	92
Force	Z	gl conc.	-6.670	1.100	Stab	121
Force	Z	gl conc.	-6.670	1.300	Stab	122
Force	Z	gl conc.	-6.670	0.200000	Stab	124

Load case 28: VEHICULO POSICION 28

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.050000	Stab	61
Force	Z	gl conc.	-6.670	0.250000	Stab	62
Force	Z	gl conc.	-6.670	0.450000	Stab	63
Force	Z	gl conc.	-6.670	0.050000	Stab	93
Force	Z	gl conc.	-6.670	0.250000	Stab	94
Force	Z	gl conc.	-6.670	0.450000	Stab	95
Force	Z	gl conc.	-6.670	0.050000	Stab	125
Force	Z	gl conc.	-6.670	0.250000	Stab	126
Force	Z	gl conc.	-6.670	0.450000	Stab	127

Load case 29: VEHICULO POSICION 29

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	66
Force	Z	gl conc.	-5.870	1.050	Stab	67
Force	Z	gl conc.	-5.870	1.250	Stab	68
Force	Z	gl conc.	-4.130	0.850000	Stab	98
Force	Z	gl conc.	-4.130	1.050	Stab	99
Force	Z	gl conc.	-4.130	1.250	Stab	100
Force	Z	gl conc.	-10.000	0.850000	Stab	130
Force	Z	gl conc.	-10.000	1.050	Stab	131
Force	Z	gl conc.	-10.000	1.250	Stab	132

Load case 30: VEHICULO POSICION 30

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	1.100	Stab	69
Force	Z	gl conc.	-5.870	1.300	Stab	70
Force	Z	gl conc.	-5.870	0.200000	Stab	72
Force	Z	gl conc.	-4.130	1.100	Stab	101
Force	Z	gl conc.	-4.130	1.300	Stab	102
Force	Z	gl conc.	-4.130	0.200000	Stab	104
Force	Z	gl conc.	-10.000	1.100	Stab	133
Force	Z	gl conc.	-10.000	1.300	Stab	134
Force	Z	gl conc.	-10.000	0.200000	Stab	136

Load case 31: VEHICULO POSICION 31

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.050000	Stab	73
Force	Z	gl conc.	-5.870	0.250000	Stab	74
Force	Z	gl conc.	-5.870	0.450000	Stab	75
Force	Z	gl conc.	-4.130	0.050000	Stab	105
Force	Z	gl conc.	-4.130	0.250000	Stab	106
Force	Z	gl conc.	-4.130	0.450000	Stab	107
Force	Z	gl conc.	-10.000	0.050000	Stab	137
Force	Z	gl conc.	-10.000	0.250000	Stab	138
Force	Z	gl conc.	-10.000	0.450000	Stab	139

Load case 32: VEHICULO POSICION 32

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	76
Force	Z	gl conc.	-5.870	0.650000	Stab	77
Force	Z	gl conc.	-5.870	0.450000	Stab	78
Force	Z	gl conc.	-4.130	0.850000	Stab	108
Force	Z	gl conc.	-4.130	0.650000	Stab	109
Force	Z	gl conc.	-4.130	0.450000	Stab	110
Force	Z	gl conc.	-10.000	0.850000	Stab	140
Force	Z	gl conc.	-10.000	0.650000	Stab	141
Force	Z	gl conc.	-10.000	0.450000	Stab	142

Load case 33: VEHICULO POSICION 33

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.200000	Stab	80
Force	Z	gl conc.	-5.870	0	Stab	81
Force	Z	gl conc.	-5.870	1.500	Stab	81
Force	Z	gl conc.	-4.130	0.200000	Stab	112
Force	Z	gl conc.	-4.130	0	Stab	113
Force	Z	gl conc.	-4.130	1.500	Stab	113
Force	Z	gl conc.	-10.000	0.200000	Stab	144
Force	Z	gl conc.	-10.000	0	Stab	145
Force	Z	gl conc.	-10.000	1.500	Stab	145

Load case 34: VEHICULO POSICION 34

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	1.250	Stab	83
Force	Z	gl conc.	-5.870	1.050	Stab	84
Force	Z	gl conc.	-5.870	0.850000	Stab	85
Force	Z	gl conc.	-4.130	1.250	Stab	115
Force	Z	gl conc.	-4.130	1.050	Stab	116
Force	Z	gl conc.	-4.130	0.850000	Stab	117
Force	Z	gl conc.	-10.000	1.250	Stab	147
Force	Z	gl conc.	-10.000	1.050	Stab	148
Force	Z	gl conc.	-10.000	0.850000	Stab	149

Load case 35: VEHICULO POSICION 35

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	86
Force	Z	gl conc.	-5.870	1.050	Stab	87
Force	Z	gl conc.	-5.870	1.250	Stab	88
Force	Z	gl conc.	-4.130	0.850000	Stab	118
Force	Z	gl conc.	-4.130	1.050	Stab	119
Force	Z	gl conc.	-4.130	1.250	Stab	120
Force	Z	gl conc.	-10.000	0.850000	Stab	150
Force	Z	gl conc.	-10.000	1.050	Stab	151
Force	Z	gl conc.	-10.000	1.250	Stab	152

Load case 36: VEHICULO POSICION 36

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-5.870	1.100	Stab 89
Force Z gl conc.	-5.870	1.300	Stab 90
Force Z gl conc.	-5.870	0.200000	Stab 92
Force Z gl conc.	-4.130	1.100	Stab 121
Force Z gl conc.	-4.130	1.300	Stab 122
Force Z gl conc.	-4.130	0.200000	Stab 124
Force Z gl conc.	-10.000	1.100	Stab 153
Force Z gl conc.	-10.000	1.300	Stab 154
Force Z gl conc.	-10.000	0.200000	Stab 156

Load case 37: VEHICULO HIPOTESIS 37

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl conc.	-5.870	0.050000	Stab 93
Force Z gl conc.	-5.870	0.250000	Stab 94
Force Z gl conc.	-5.870	0.450000	Stab 95
Force Z gl conc.	-4.130	0.050000	Stab 125
Force Z gl conc.	-4.130	0.250000	Stab 126
Force Z gl conc.	-4.130	0.450000	Stab 127
Force Z gl conc.	-10.000	0.050000	Stab 157
Force Z gl conc.	-10.000	0.250000	Stab 158
Force Z gl conc.	-10.000	0.450000	Stab 159

Load case 46: SOB UNIF VANO 1

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.800000		Stab 1 .. 11 129 .. 139
Force Z pj const.	-0.440000		Stab 33 .. 43 97 .. 107
Force Z pj const.	-0.600000		Stab 65 .. 75

Load case 47: SOB UNIF VANO 2

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 44 .. 53 108 .. 117
Force Z pj const.	-0.600000		Stab 76 .. 85
Force Z pj const.	-0.800000		Stab 12 .. 21 140 .. 149

Load case 48: SOB UNIF VANO 3

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.440000		Stab 54 .. 64 118 .. 128
Force Z pj const.	-0.600000		Stab 86 .. 96
Force Z pj const.	-0.800000		Stab 22 .. 32 150 .. 160

Load case 60: FRENADO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force X lo const.	0.054500		Stab 1 .. 160

Load case 62: VIENTO TRANSV SIN SOB.

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Y lo const.	0.260000		Stab 129 .. 160
Force X pj const.	-0.200000		Stab 290 .. 291

Load case 63: VIENTO TRANSV CON SOB

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Y lo const.	0.760000		Stab 129 .. 160
Force X pj const.	-0.200000		Stab 290 .. 291

Load case 64: TEMPERATURA (-)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000363		Stab 1 .. 160

Load case 65: TEMPERATURA (+)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	0.000363		Stab 1 .. 160

Load case 66: GRADIENTE

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Curvat. Y lo const.	0.000170		Stab 1 .. 160

2.3.2. Cálculo de los coeficientes de reparto

Coeficientes de excentricidad a Flexión

Hipotesis	Barras	My (tm)	Iy (m^4)	Coef Flexion
H12	6	20.25	0.0275	1.51
	38	36.31	0.0632	
	70	43.67	0.0943	
	102	23.4	0.0632	
	134	10.87	0.0275	
H15	16	19.053	0.0275	1.38
	48	37.9	0.0632	
	80	46.53	0.0943	
	112	25.43	0.0632	
	144	9.63	0.0275	
H18	26	16.87	0.0275	1.29
	58	36.31	0.0632	
	90	43.722	0.0943	
	122	23.43	0.0632	
	154	10.873	0.0275	

Coeficiente Flexion =	1.39

Coeficiente Cortante =	2.81

Coeficientes de excentricidad cortante

Hipotesis	Barras	Vz (t)	Iy (m^4)	Coef Cortante
H11	2	22.89	0.0275	4.96
	34	10.48	0.0632	
	66	8.12	0.0943	
	98	4.06	0.0632	
	130	0.74	0.0275	
H13	11	8.08	0.0275	1.50
	43	13.22	0.0632	
	75	26.44	0.0943	
	107	4.72	0.0632	
	139	1.75	0.0275	
H14	12	11.55	0.0275	2.00
	44	14.05	0.0632	
	76	25.35	0.0943	
	108	4.55	0.0632	
	140	2.41	0.0275	
H16	21	11.55	0.0275	1.99
	53	14.05	0.0632	
	85	25.35	0.0943	
	117	4.94	0.0632	
	149	2.40	0.0275	
H17	22	8.08	0.0275	1.45
	54	13.22	0.0632	
	86	26.45	0.0943	
	118	6.29	0.0632	
	150	1.75	0.0275	
H19	31	22.90	0.0275	4.96
	63	10.48	0.0632	
	95	8.12	0.0943	
	127	4.06	0.0632	
	159	0.74	0.0275	

Loadcase Factor Stage Init.def Title
11 1.0000 VEHICULO HIPOTESIS 11

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.126491	0.057984	40.227			
10	0.126487	0.065156	6.303			
156	0.059326	0.056961	0.888022			
160	0.059331	0.065923	-0.448044			
166	-0.366341	-0.621683	15.628	2.239	-0.737014	0.065050
167	-0.005295	0.375660	-2.597	-2.148	0.634102	0.073680
Sums :	-3.53E-11	1.67E-11	60.000			
min:	-0.366341	-0.621683	-2.597	-2.148	-0.737014	0.065050
max:	0.126491	0.375660	40.227	2.239	0.634102	0.073680

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	7.18E-14	-1.05E-12	8.95E-14	7.74E-17	-1.07E-12	3.34E-13
1	0.500	7.18E-14	-1.05E-12	8.95E-14	7.74E-17	-1.03E-12	-1.90E-13
2	0	-0.014961	-3.261	22.896	-1.351	-9.755	1.406
2	0.850	-0.014961	-3.261	22.896	-1.351	9.704	-1.366
2	0.850	-0.014961	-1.869	12.993	-1.351	9.706	-1.366
2	1.300	-0.014961	-1.869	12.993	-1.351	15.554	-2.207
3	0	0.038421	-1.560	10.915	-0.881404	4.820	-0.657412
3	1.050	0.038421	-1.560	10.915	-0.881404	16.279	-2.295
3	1.050	0.038421	-0.168092	1.012	-0.881404	16.281	-2.295
3	1.300	0.038421	-0.168092	1.012	-0.881404	16.534	-2.327
4	0	0.083569	-0.533194	3.597	-0.399957	10.726	-1.488
4	1.250	0.083569	-0.533194	3.597	-0.399957	15.222	-2.155
4	1.250	0.083569	0.858537	-6.305	-0.399957	15.222	-2.155
4	1.300	0.083569	0.858537	-6.305	-0.399957	14.907	-2.112
5	0	0.125143	0.441007	-3.350	-0.049571	12.960	-1.809
5	1.300	0.125143	0.441007	-3.350	-0.049571	8.605	-1.235
6	0	0.165467	0.315521	-2.454	0.052411	8.781	-1.231
6	1.300	0.165467	0.315521	-2.454	0.052411	5.591	-0.820653
7	0	0.206219	0.288850	-2.263	0.080788	6.283	-0.888226
7	1.300	0.206219	0.288850	-2.263	0.080788	3.341	-0.512721

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
8	0	0.248424	0.276262	-2.185	0.086999	4.205	-0.603277
8	1.300	0.248424	0.276262	-2.185	0.086999	1.364	-0.244137
9	0	0.294783	0.255121	-2.074	0.076454	2.213	-0.329988
9	1.300	0.294783	0.255121	-2.074	0.076454	-0.482633	0.001670
10	0	0.349055	0.204178	-1.762	0.058909	0.207413	-0.057599
10	1.300	0.349055	0.204178	-1.762	0.058909	-2.083	0.207832
11	0	0.407944	0.141896	-1.257	0.067321	-1.515	0.166952
11	1.300	0.407944	0.141896	-1.257	0.067321	-3.150	0.351417
12	0	0.440530	0.116675	-0.868013	0.110335	-2.042	0.233020
12	1.700	0.440530	0.116675	-0.868013	0.110335	-3.518	0.431367
33	0	3.00E-14	-5.60E-12	-3.17E-12	-6.44E-16	-5.05E-15	2.54E-12
33	0.500	3.00E-14	-5.60E-12	-3.17E-12	-6.44E-16	-1.59E-12	-2.59E-13
34	0	-0.002518	-0.061418	10.482	-8.276	1.657	0.042887
34	0.850	-0.002518	-0.061418	10.482	-8.276	10.565	-0.009311
34	0.850	-0.002518	-0.061418	6.352	-8.276	10.567	-0.009327
34	1.300	-0.002518	-0.061418	6.352	-8.276	13.425	-0.036957
35	0	0.020486	-0.064843	7.246	-6.036	15.319	0.038953
35	1.050	0.020486	-0.064843	7.246	-6.036	22.926	-0.029124
35	1.050	0.020486	-0.064843	3.116	-6.036	22.928	-0.029141
35	1.300	0.020486	-0.064843	3.116	-6.036	23.706	-0.045344
36	0	0.054023	-0.059442	1.217	-2.968	23.903	0.031101
36	1.250	0.054023	-0.059442	1.217	-2.968	25.424	-0.043193
36	1.250	0.054023	-0.059442	-2.913	-2.968	25.423	-0.043209
36	1.300	0.054023	-0.059442	-2.913	-2.968	25.278	-0.046172
37	0	0.087182	-0.056054	-4.627	-0.626269	24.957	0.025834
37	1.300	0.087182	-0.056054	-4.627	-0.626269	18.942	-0.047036
38	0	0.119339	-0.055570	-4.120	0.313490	16.626	0.022660
38	1.300	0.119339	-0.055570	-4.120	0.313490	13.271	-0.049581
39	0	0.150994	-0.056243	-3.587	0.606696	13.269	0.020153
39	1.300	0.150994	-0.056243	-3.587	0.606696	8.606	-0.052963
40	0	0.182360	-0.058250	-3.399	0.675479	8.710	0.018308
40	1.300	0.182360	-0.058250	-3.399	0.675479	4.291	-0.057417
41	0	0.212062	-0.062978	-3.407	0.617467	4.473	0.017648
41	1.300	0.212062	-0.062978	-3.407	0.617467	0.043393	-0.064224
42	0	0.239784	-0.073328	-3.510	0.472629	0.300299	0.018724
42	1.300	0.239784	-0.073328	-3.510	0.472629	-4.262	-0.076602
43	0	0.278019	-0.084771	-2.711	0.481551	-4.089	0.015444

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
43	1.300	0.278019	-0.084771	-2.711	0.481551	-7.613	-0.094756
65	0	8.44E-15	-6.15E-12	-1.01E-12	2.26E-14	3.33E-13	-8.52E-13
65	0.500	8.44E-15	-6.15E-12	-1.01E-12	2.26E-14	-1.70E-13	-3.93E-12
66	0	-0.006242	-0.074536	8.121	-8.398	3.856	0.051352
66	0.850	-0.006242	-0.074536	8.121	-8.398	10.758	-0.011993
66	0.850	-0.006242	-0.074536	2.251	-8.398	10.759	-0.012013
66	1.300	-0.006242	-0.074536	2.251	-8.398	11.771	-0.045544
67	0	-0.020072	-0.094451	7.159	-7.273	15.752	0.056160
67	1.050	-0.020072	-0.094451	7.159	-7.273	23.268	-0.043001
67	1.050	-0.020072	-0.094451	1.289	-7.273	23.269	-0.043026
67	1.300	-0.020072	-0.094451	1.289	-7.273	23.591	-0.066626
68	0	-0.029126	-0.091885	2.540	-4.380	25.420	0.045753
68	1.250	-0.029126	-0.091885	2.540	-4.380	28.595	-0.069091
68	1.250	-0.029126	-0.091885	-3.330	-4.380	28.595	-0.069115
68	1.300	-0.029126	-0.091885	-3.330	-4.380	28.429	-0.073697
69	0	-0.033361	-0.088746	-3.341	-1.548	28.709	0.037421
69	1.300	-0.033361	-0.088746	-3.341	-1.548	24.366	-0.077949
70	0	-0.035127	-0.088221	-4.161	0.186281	24.094	0.031586
70	1.300	-0.035127	-0.088221	-4.161	0.186281	18.685	-0.083101
71	0	-0.036861	-0.088468	-4.537	0.974517	18.463	0.026181
71	1.300	-0.036861	-0.088468	-4.537	0.974517	12.564	-0.088826
72	0	-0.041141	-0.087893	-4.600	1.297	12.509	0.020137
72	1.300	-0.041141	-0.087893	-4.600	1.297	6.529	-0.094124
73	0	-0.052404	-0.084608	-4.643	1.417	6.639	0.013219
73	1.300	-0.052404	-0.084608	-4.643	1.417	0.602162	-0.096771
74	0	-0.079791	-0.080599	-5.102	1.451	0.960007	0.008685
74	1.300	-0.079791	-0.080599	-5.102	1.451	-5.673	-0.096094
75	0	-0.143874	-0.113126	-7.982	1.583	-4.982	0.012294
75	1.300	-0.143874	-0.113126	-7.982	1.583	-15.359	-0.134770
97	0	-9.97E-14	-2.53E-12	-6.99E-13	7.69E-15	2.82E-14	-4.00E-13
97	0.500	-9.97E-14	-2.53E-12	-6.99E-13	7.69E-15	-3.21E-13	-1.67E-12
98	0	-0.034843	-0.038694	4.058	-2.354	2.383	0.021519
98	1.300	-0.034843	-0.038694	4.058	-2.354	7.659	-0.026783
99	0	-0.068254	-0.050111	2.475	-2.380	9.790	0.026825
99	1.300	-0.068254	-0.050111	2.475	-2.380	13.007	-0.038319
100	0	-0.104570	-0.052587	0.666001	-1.764	14.151	0.025974
100	1.300	-0.104570	-0.052587	0.666001	-1.764	15.017	-0.042389

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
101	0	-0.137994	-0.053975	-1.060	-0.785441	15.373	0.024330
101	1.300	-0.137994	-0.053975	-1.060	-0.785441	13.995	-0.045838
102	0	-0.169481	-0.054662	-1.994	-0.022768	13.917	0.021938
102	1.300	-0.169481	-0.054662	-1.994	-0.022768	11.324	-0.049123
103	0	-0.200389	-0.054357	-2.514	0.445641	11.162	0.018790
103	1.300	-0.200389	-0.054357	-2.514	0.445641	7.895	-0.051874
104	0	-0.230761	-0.052335	-2.796	0.712264	7.756	0.014604
104	1.300	-0.230761	-0.052335	-2.796	0.712264	4.122	-0.053431
105	0	-0.259164	-0.047407	-2.971	0.885716	4.044	0.008747
105	1.300	-0.259164	-0.047407	-2.971	0.885716	0.180852	-0.052882
106	0	-0.282596	-0.037119	-3.016	0.990281	0.138719	-0.000368
106	1.300	-0.282596	-0.037119	-3.016	0.990281	-3.782	-0.048622
107	0	-0.297004	-0.008031	-1.700	0.755571	-4.017	-0.018612
107	1.300	-0.297004	-0.008031	-1.700	0.755571	-6.227	-0.029052
129	0	4.23E-13	-4.80E-11	6.62E-12	-1.07E-15	-9.45E-13	9.75E-12
129	0.500	4.23E-13	-4.80E-11	6.62E-12	-1.07E-15	2.37E-12	-1.43E-11
130	0	-0.064576	0.067689	0.739888	-0.218566	1.939	0.282258
130	1.300	-0.064576	0.067689	0.739888	-0.218566	2.901	0.370254
131	0	-0.093721	-0.209195	-1.360	-0.268788	5.707	0.791907
131	1.300	-0.093721	-0.209195	-1.360	-0.268788	3.940	0.519954
132	0	-0.127035	-0.234467	-1.512	-0.216189	6.611	0.920648
132	1.300	-0.127035	-0.234467	-1.512	-0.216189	4.645	0.615841
133	0	-0.164110	-0.172385	-1.049	-0.105575	6.281	0.872487
133	1.300	-0.164110	-0.172385	-1.049	-0.105575	4.917	0.648387
134	0	-0.203337	-0.125521	-0.710379	-0.007606	5.399	0.744504
134	1.300	-0.203337	-0.125521	-0.710379	-0.007606	4.476	0.581328
135	0	-0.243102	-0.101582	-0.542715	0.055568	4.166	0.566515
135	1.300	-0.243102	-0.101582	-0.542715	0.055568	3.460	0.434459
136	0	-0.282022	-0.089460	-0.464671	0.093340	2.685	0.353662
136	1.300	-0.282022	-0.089460	-0.464671	0.093340	2.081	0.237365
137	0	-0.318417	-0.071726	-0.352297	0.118634	1.021	0.114854
137	1.300	-0.318417	-0.071726	-0.352297	0.118634	0.562924	0.021610
138	0	-0.349592	-0.028507	-0.066596	0.127315	-0.692079	-0.132211
138	1.300	-0.349592	-0.028507	-0.066596	0.127315	-0.778654	-0.169270

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
135	0	-0.368224	0.013698	0.187710	0.093445	-1.965	-0.322821
135	1.300	-0.368224	0.013698	0.187710	0.093445	-1.721	-0.305014
min:		-0.368224	-3.261	-7.982	-8.398	-15.355	-2.337
max:		0.440530	0.858537	22.896	1.563	28.709	1.406

Loadcase Factor Stage Init.def Title
12 1.0000 VEHICULO HIPOTESIS 12

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.356267	0.119217	26.359			
10	0.356258	0.139359	-1.790			
156	0.167580	0.116425	2.334			
160	0.167591	0.141617	-1.442			
166	-1.031	-1.294	39.877	4.653	-2.071	0.182707
167	-0.016894	0.777781	-5.337	-4.462	1.781	0.207035
Sums :	-1.00E-10	3.49E-11	60.000			
min:	-1.031	-1.294	-5.337	-4.462	-2.071	0.182707
max:	0.356267	0.777781	39.877	4.653	1.781	0.207035

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	1.37E-13	2.94E-11	3.45E-12	7.81E-18	-2.18E-12	-3.73E-12
1	0.500	1.37E-13	2.94E-11	3.45E-12	7.81E-18	-4.58E-13	1.10E-11
2	0	-0.016069	-2.132	14.244	-1.218	-8.539	1.287
2	1.300	-0.016069	-2.132	14.244	-1.218	9.978	-1.485
3	0	0.122943	-1.604	10.871	-1.108	-1.467	0.232305
3	1.300	0.122943	-1.604	10.871	-1.108	12.665	-1.853
4	0	0.246818	-1.537	10.420	-0.978476	2.571	-0.343902
4	1.300	0.246818	-1.537	10.420	-0.978476	16.117	-2.342
5	0	0.365262	-1.696	11.557	-0.824340	7.100	-0.989046

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
5	1.100	0.365282	-1.696	11.557	-0.824340	19.811	-2.855
5	1.100	0.365282	-0.304692	1.654	-0.824340	19.813	-2.855
5	1.300	0.365282	-0.304692	1.654	-0.824340	20.144	-2.916
6	0	0.480783	-0.781442	5.032	-0.508455	13.706	-1.928
6	1.300	0.480783	-0.781442	5.032	-0.508455	20.247	-2.944
6	1.300	0.480783	-0.781442	5.032	-0.508455	20.248	-2.944
7	0	0.595501	0.065382	-1.020	-0.180607	16.870	-2.386
7	1.300	0.595501	0.065382	-1.020	-0.180607	15.544	-2.301
8	0	0.712738	-0.426990	2.430	0.106270	15.112	-2.155
8	0.200	0.712738	-0.426990	2.430	0.106270	15.598	-2.240
8	0.200	0.712738	0.964741	-7.473	0.106270	15.597	-2.240
8	1.300	0.712738	0.964741	-7.473	0.106270	7.378	-1.179
9	0	0.838741	0.739216	-5.963	0.179405	9.074	-1.327
9	1.300	0.838741	0.739216	-5.963	0.179405	1.322	-0.365602
10	0	0.982928	0.581839	-4.955	0.153659	3.033	-0.505554
10	1.300	0.982928	0.581839	-4.955	0.153659	-3.409	0.250837
11	0	1.134	0.409490	-3.559	0.178239	-1.899	0.138817
11	1.300	1.134	0.409490	-3.559	0.178239	-6.526	0.671154
12	0	1.212	0.347214	-2.510	0.293701	-3.617	0.347955
12	1.700	1.212	0.347214	-2.510	0.293701	-7.884	0.938219
33	0	-1.37E-13	-1.99E-11	-5.01E-12	-1.19E-15	-2.03E-13	7.82E-12
33	0.500	-1.37E-13	-1.99E-11	-5.01E-12	-1.19E-15	-2.71E-12	-2.15E-12
34	0	0.006287	-0.159494	4.670	-8.199	-0.093201	0.109912
34	1.300	0.006287	-0.159494	4.670	-8.199	5.978	-0.097430
35	0	0.074586	-0.175620	6.980	-8.036	6.502	0.105015
35	1.300	0.074586	-0.175620	6.980	-8.036	15.576	-0.123291
36	0	0.169190	-0.166604	7.656	-7.251	15.165	0.087503
36	1.300	0.169190	-0.166604	7.656	-7.251	25.119	-0.129083
37	0	0.262361	-0.161108	7.895	-6.009	24.773	0.074975
37	1.100	0.262361	-0.161108	7.895	-6.009	33.456	-0.102224
37	1.100	0.262361	-0.161108	3.765	-6.009	33.458	-0.102266
37	1.300	0.262361	-0.161108	3.765	-6.009	34.210	-0.134466
38	0	0.353211	-0.158138	2.044	-3.821	33.659	0.064575
38	1.300	0.353211	-0.158138	2.044	-3.821	36.317	-0.140983
38	1.300	0.353211	-0.158138	2.044	-3.821	36.317	-0.141004
39	0	0.443040	-0.158002	-3.952	-1.432	35.940	0.056159
39	1.300	0.443040	-0.158002	-3.952	-1.432	30.803	-0.149243

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
40	0	0.531310	-0.161114	-5.755	0.574990	30.658	0.049574
40	0.200	0.531310	-0.161114	-5.755	0.574990	29.507	0.017372
40	0.200	0.531310	-0.161114	-9.885	0.574990	29.505	0.017330
40	1.300	0.531310	-0.161114	-9.885	0.574990	18.634	-0.159875
41	0	0.614730	-0.171123	-9.876	1.323	18.515	0.046085
41	1.300	0.614730	-0.171123	-9.876	1.323	5.675	-0.176375
42	0	0.690970	-0.193078	-9.647	1.220	6.178	0.045663
42	1.300	0.690970	-0.193078	-9.647	1.220	-6.364	-0.205339
43	0	0.789748	-0.210549	-7.687	1.266	-5.899	0.031003
43	1.300	0.789748	-0.210549	-7.687	1.266	-15.892	-0.242710
65	0	-1.54E-12	1.40E-12	-4.09E-13	-3.67E-16	-2.89E-15	-6.26E-12
65	0.500	-1.54E-12	1.40E-12	-4.09E-13	-3.67E-16	-2.07E-13	-5.56E-12
66	0	-0.011795	-0.206237	4.765	-11.382	1.984	0.142276
66	1.300	-0.011795	-0.206237	4.765	-11.382	8.179	-0.125832
67	0	-0.039707	-0.263938	7.544	-12.477	10.322	0.157365
67	1.300	-0.039707	-0.263938	7.544	-12.477	20.128	-0.185754
68	0	-0.059366	-0.260113	8.073	-12.005	21.473	0.130407
68	1.300	-0.059366	-0.260113	8.073	-12.005	31.968	-0.207740
69	0	-0.069728	-0.253397	7.490	-10.057	32.817	0.107974
69	1.100	-0.069728	-0.253397	7.490	-10.057	41.055	-0.170730
69	1.100	-0.069728	-0.253397	1.620	-10.057	41.056	-0.170796
69	1.300	-0.069728	-0.253397	1.620	-10.057	41.380	-0.221442
70	0	-0.074454	-0.250968	1.377	-6.719	41.879	0.090490
70	1.300	-0.074454	-0.250968	1.377	-6.719	43.669	-0.235736
70	1.300	-0.074454	-0.250968	1.377	-6.719	43.669	-0.235769
71	0	-0.078136	-0.249879	-4.914	-2.850	43.722	0.073915
71	1.300	-0.078136	-0.249879	-4.914	-2.850	37.334	-0.250928
72	0	-0.086647	-0.247061	-5.106	0.509968	37.066	0.056181
72	0.200	-0.086647	-0.247061	-5.106	0.509968	36.046	0.006801
72	0.200	-0.086647	-0.247061	-10.976	0.509968	36.044	0.006737
72	1.300	-0.086647	-0.247061	-10.976	0.509968	23.972	-0.264998
73	0	-0.109680	-0.237656	-11.745	2.571	23.848	0.036716
73	1.300	-0.109680	-0.237656	-11.745	2.571	8.579	-0.272237
74	0	-0.166577	-0.226656	-13.243	3.488	9.166	0.024209
74	1.300	-0.166577	-0.226656	-13.243	3.488	-8.050	-0.270444
75	0	-0.200038	-0.318468	-20.229	4.207	-6.449	0.034514
75	1.300	-0.300036	-0.318468	-20.229	4.207	-32.746	-0.379494

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
97	0	4.84E-13	-8.34E-12	-1.10E-13	1.88E-14	-1.65E-13	-1.66E-12
97	0.500	4.84E-13	-8.34E-12	-1.10E-13	1.88E-14	-2.21E-13	-5.83E-12
98	0	-0.083706	-0.115716	3.876	-5.144	1.957	0.067294
98	1.300	-0.083706	-0.115716	3.876	-5.144	6.995	-0.083137
99	0	-0.173205	-0.145038	3.398	-5.849	8.703	0.079036
99	1.300	-0.173205	-0.145038	3.398	-5.849	13.121	-0.109513
100	0	-0.274573	-0.150725	3.019	-5.871	14.665	0.075246
100	1.300	-0.274573	-0.150725	3.019	-5.871	18.589	-0.120696
101	0	-0.369385	-0.154357	1.936	-5.060	19.962	0.070223
101	1.300	-0.369385	-0.154357	1.936	-5.060	22.479	-0.130441
102	0	-0.459224	-0.155746	-0.314943	-3.471	23.403	0.063020
102	1.300	-0.459224	-0.155746	-0.314943	-3.471	22.994	-0.139450
103	0	-0.547159	-0.154492	-2.869	-1.574	23.430	0.053831
103	1.300	-0.547159	-0.154492	-2.869	-1.574	19.700	-0.147008
104	0	-0.633166	-0.149624	-5.254	0.206062	19.707	0.042462
104	1.300	-0.633166	-0.149624	-5.254	0.206062	12.877	-0.152048
105	0	-0.713482	-0.139034	-6.734	1.506	12.633	0.027722
105	1.300	-0.713482	-0.139034	-6.734	1.506	3.878	-0.153022
106	0	-0.780879	-0.117645	-7.381	2.267	3.674	0.005820
106	1.300	-0.780879	-0.117645	-7.381	2.267	-5.922	-0.147119
107	0	-0.830107	-0.050671	-4.460	1.942	-6.584	-0.040001
107	1.300	-0.830107	-0.050671	-4.460	1.942	-12.381	-0.105873
129	0	1.33E-12	-9.62E-11	1.36E-11	1.11E-15	-1.33E-12	9.67E-12
129	0.500	1.33E-12	-9.62E-11	1.36E-11	1.11E-15	5.47E-12	-3.84E-11
130	0	-0.153293	-0.538540	-3.100	-0.643662	4.736	0.702451
130	1.300	-0.153293	-0.538540	-3.100	-0.643662	0.706078	0.002345
131	0	-0.243192	-0.656167	-4.292	-0.744803	7.823	1.084
131	1.300	-0.243192	-0.656167	-4.292	-0.744803	2.244	0.230891
132	0	-0.340646	-0.718644	-4.657	-0.750734	9.887	1.376
132	1.300	-0.340646	-0.718644	-4.657	-0.750734	3.833	0.444222
133	0	-0.447105	-0.688298	-4.379	-0.647593	10.992	1.527
133	1.300	-0.447105	-0.688298	-4.379	-0.647593	5.299	0.632380
134	0	-0.558892	-0.578505	-3.583	-0.449138	10.873	1.496
134	1.300	-0.558892	-0.578505	-3.583	-0.449138	6.215	0.744054
135	0	-0.671822	-0.444691	-2.640	-0.207333	9.481	1.284

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
135	1.300	-0.671822	-0.444691	-2.640	-0.207333	6.048	0.706363
136	0	-0.782810	-0.317506	-1.755	0.021533	6.882	0.903791
136	1.300	-0.782810	-0.317506	-1.755	0.021533	4.600	0.491033
137	0	-0.888886	-0.214773	-1.048	0.197358	3.388	0.397658
137	1.300	-0.888886	-0.214773	-1.048	0.197358	2.026	0.118453
138	0	-0.965018	-0.085070	-0.161729	0.287465	-0.556182	-0.175491
138	1.300	-0.965018	-0.085070	-0.161729	0.287465	-0.766430	-0.286083
139	0	-1.052	0.030547	0.526329	0.237943	-3.658	-0.645839
139	1.300	-1.052	0.030547	0.526329	0.237943	-2.974	-0.606127
	min:	-1.052	-2.132	-20.229	-12.477	-32.746	-2.944
	max:	1.212	0.964741	14.244	4.207	43.722	1.527

Loadcase Factor Stage Init.def Title
13 1.0000 VEHICULO HIPOTESIS 13

SUPPORT REACTIONS :

Nods	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.570715	0.074503	14.515			
10	0.570708	0.105636	-7.570			
156	0.275936	0.070252	3.378			
160	0.275944	0.105739	-2.878			
166	-1.639	-0.860769	55.444	3.060	-3.243	0.284786
167	-0.054322	0.500460	-3.285	-2.928	2.775	0.324107
Sums :	-1.65E-10	2.39E-11	60.000			
min:	-1.639	-0.860769	-7.570	-2.928	-3.243	0.284786
max:	0.570715	0.500460	55.444	3.060	2.775	0.324107

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	-8.05E-14	2.51E-11	2.02E-12	-3.16E-17	-4.81E-12	-1.87E-12
1	0.500	-8.05E-14	2.51E-11	2.02E-12	-3.16E-17	-3.79E-12	1.07E-11
2	0	0.050768	-1.403	8.571	-0.849102	-5.990	0.958860
2	1.300	0.050768	-1.403	8.571	-0.849102	5.151	-0.864901
3	0	0.250819	-1.098	7.003	-0.829354	-3.149	0.464081
3	1.300	0.250819	-1.098	7.003	-0.829354	5.955	-0.963913
4	0	0.437055	-1.065	6.758	-0.793100	-1.969	0.286992
4	1.300	0.437055	-1.065	6.758	-0.793100	6.617	-1.097
5	0	0.620303	-1.065	6.734	-0.777255	-0.916715	0.121705
5	1.300	0.620303	-1.065	6.734	-0.777255	7.837	-1.263
6	0	0.803102	-1.071	6.775	-0.764288	0.224092	-0.061093
6	1.300	0.803102	-1.071	6.775	-0.764288	9.031	-1.454
7	0	0.986173	-1.097	6.962	-0.746362	1.581	-0.274075
7	1.300	0.986173	-1.097	6.962	-0.746362	10.631	-1.701
8	0	1.172	-1.241	7.952	-0.688208	3.491	-0.562373
8	1.300	1.172	-1.241	7.952	-0.688208	13.629	-2.176
9	0	1.367	-1.748	11.446	-0.456609	8.157	-1.239
9	0.0499	1.367	-1.748	11.446	-0.456609	8.726	-1.326
9	0.0501	1.367	-0.356425	1.543	-0.456603	8.730	-1.326
9	1.300	1.367	-0.356425	1.543	-0.456609	10.658	-1.772
10	0	1.575	-1.042	6.289	-0.215304	7.273	-1.150
10	0.250	1.575	-1.042	6.289	-0.215304	8.845	-1.410
10	0.250	1.575	0.349613	-1.614	-0.215304	8.845	-1.410
10	1.300	1.575	0.349613	-3.614	-0.215304	5.051	-1.043
11	0	1.777	-0.381440	1.825	0.089659	4.101	-0.775083
11	0.450	1.777	-0.381440	1.825	0.089659	4.922	-0.946682
11	0.450	1.777	1.010	-8.078	0.089659	4.921	-0.946600
11	1.300	1.777	1.010	-8.078	0.089659	-1.944	-0.087984
12	0	1.863	0.677065	-4.715	0.399680	1.305	-0.459542
12	1.700	1.863	0.677065	-4.715	0.399680	-6.710	0.691469
33	0	-8.76E-13	-3.09E-11	-2.10E-12	1.88E-16	-2.81E-13	1.53E-11
33	0.500	-8.76E-13	-3.09E-11	-2.10E-12	1.88E-16	-1.33E-12	-1.34E-13
34	0	0.044586	-0.235035	1.385	-5.938	-0.579117	0.156382
34	1.300	0.044586	-0.235035	1.385	-5.938	1.221	-0.149162
35	0	0.163529	-0.266696	2.576	-6.147	1.046	0.155965
35	1.300	0.163529	-0.266696	2.576	-6.147	4.395	-0.190746
36	0	0.317521	-0.258547	2.593	-6.029	3.689	0.133935

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
36	1.300	0.317521	-0.258547	2.593	-6.029	7.059	-0.202172
37	0	0.467416	-0.253574	2.619	-5.936	6.189	0.117190
37	1.300	0.467416	-0.253574	2.619	-5.936	9.593	-0.212457
38	0	0.612289	-0.251950	2.814	-5.827	8.719	0.102883
38	1.300	0.612289	-0.251950	2.814	-5.827	12.378	-0.224652
39	0	0.755653	-0.252622	3.320	-5.599	11.618	0.088944
39	1.300	0.755653	-0.252622	3.320	-5.599	15.934	-0.238464
40	0	0.896483	-0.255395	3.722	-4.931	15.604	0.077897
40	1.300	0.896483	-0.255395	3.722	-4.931	20.442	-0.254116
41	0	1.029	-0.260636	1.746	-3.305	20.478	0.066064
41	0.0499	1.029	-0.260636	1.746	-3.305	20.565	0.053066
41	0.0501	1.029	-0.260636	-2.384	-3.305	20.565	0.052998
41	1.300	1.029	-0.260636	-2.384	-3.305	17.585	-0.272763
42	0	1.148	-0.274217	-4.755	-1.560	17.994	0.054476
42	0.250	1.148	-0.274217	-4.755	-1.560	16.806	-0.014042
42	0.250	1.148	-0.274217	-8.885	-1.560	16.804	-0.014113
42	1.300	1.148	-0.274217	-8.885	-1.560	7.476	-0.302005
43	0	1.283	-0.261753	-9.091	0.309191	7.877	0.016054
43	0.450	1.283	-0.261753	-9.091	0.309191	3.787	-0.101701
43	0.450	1.283	-0.261753	-13.221	0.309191	3.754	-0.101769
43	1.300	1.283	-0.261752	-13.221	0.309191	-7.452	-0.324224
65	0	-1.65E-13	-5.80E-12	-8.88E-16	3.76E-15	-4.30E-14	-1.16E-11
65	0.500	-1.65E-13	-5.80E-12	-8.88E-16	3.78E-15	-4.34E-14	-1.45E-11
66	0	-0.008166	-0.330042	1.409	-9.405	0.577546	0.227714
66	1.300	-0.008166	-0.330042	1.409	-9.405	2.409	-0.201340
67	0	-0.027603	-0.421901	2.268	-10.554	3.011	0.251526
67	1.300	-0.027603	-0.421901	2.268	-10.554	5.960	-0.296946
68	0	-0.041344	-0.415244	2.556	-10.886	6.275	0.206136
68	1.300	-0.041344	-0.415244	2.556	-10.886	9.601	-0.331681
69	0	-0.048428	-0.404476	2.601	-10.874	9.744	0.172383
69	1.300	-0.048428	-0.404478	2.601	-10.874	13.125	-0.353439
70	0	-0.051539	-0.401786	2.567	-10.570	13.269	0.145312
70	1.300	-0.051539	-0.401786	2.567	-10.570	16.606	-0.377010
71	0	-0.054067	-0.401716	2.285	-9.760	16.926	0.119785
71	1.300	-0.054067	-0.401716	2.285	-9.760	19.886	-0.402445
72	0	-0.060136	-0.398369	1.607	-7.945	20.509	0.091861
72	1.300	-0.060136	-0.398369	1.607	-7.945	22.598	-0.426018

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
73	0	-0.075849	-0.382716	1.356	-4.841	23.439	0.060015
73	0.0499	-0.075849	-0.382716	1.356	-4.841	23.506	0.040929
73	0.0501	-0.075849	-0.382716	-4.512	-4.841	23.506	0.040830
73	1.300	-0.075849	-0.382716	-4.512	-4.841	17.867	-0.437516
74	0	-0.113629	-0.364004	-6.199	-1.067	19.052	0.039011
74	0.250	-0.113629	-0.364004	-6.199	-1.067	17.504	-0.051943
74	0.250	-0.113629	-0.364004	-12.069	-1.067	17.501	-0.052037
74	1.300	-0.113629	-0.364004	-12.069	-1.067	4.830	-0.434195
75	0	-0.202043	-0.509851	-20.578	2.984	6.793	0.054486
75	0.450	-0.202043	-0.509851	-20.578	2.984	-2.465	-0.174880
75	0.450	-0.202043	-0.509851	-26.446	2.984	-2.471	-0.175013
75	1.300	-0.202043	-0.509851	-26.446	2.984	-24.948	-0.608320
97	0	-5.49E-13	-1.43E-11	-8.42E-14	2.92E-15	-7.38E-14	-1.35E-12
97	0.500	-5.49E-13	-1.43E-11	-8.42E-14	2.92E-15	-1.16E-13	-8.52E-12
98	0	-0.098550	-0.204806	1.189	-5.056	1.126	0.126835
98	1.300	-0.098550	-0.204806	1.189	-5.056	2.672	-0.139412
99	0	-0.232232	-0.245297	0.560083	-5.567	3.483	0.137777
99	1.300	-0.232232	-0.245297	0.560083	-5.567	4.212	-0.181110
100	0	-0.391149	-0.247514	0.634553	-5.755	5.184	0.125418
100	1.300	-0.391149	-0.247514	0.634553	-5.755	6.009	-0.196350
101	0	-0.541980	-0.249286	0.650567	-5.765	7.009	0.114120
101	1.300	-0.541980	-0.249286	0.650567	-5.765	7.855	-0.209951
102	0	-0.686097	-0.250469	0.416947	-5.550	8.858	0.101806
102	1.300	-0.686097	-0.250469	0.416947	-5.550	9.400	-0.223802
103	0	-0.828072	-0.250019	-0.159567	-4.993	10.432	0.088103
103	1.300	-0.828072	-0.250019	-0.159567	-4.993	10.224	-0.236921
104	0	-0.967622	-0.246724	-1.341	-3.887	11.292	0.072526
104	1.300	-0.967622	-0.246724	-1.341	-3.887	9.549	-0.248215
105	0	-1.098	-0.239105	-3.738	-2.065	10.498	0.053883
105	1.300	-1.098	-0.239105	-3.738	-2.065	5.638	-0.256954
106	0	-1.211	-0.224426	-6.282	0.012458	6.221	0.028350
106	1.300	-1.211	-0.224426	-6.282	0.012458	-1.943	-0.263406
107	0	-1.314	-0.156047	-4.721	1.037	-2.452	-0.030771
107	1.300	-1.314	-0.156047	-4.721	1.037	-8.589	-0.233632
129	0	3.24E-13	-1.64E-10	2.05E-11	2.39E-17	-1.66E-12	2.37E-11
129	0.500	3.24E-13	-1.64E-10	2.05E-11	2.39E-17	8.57E-12	-5.82E-11

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
130	0	-0.168976	-0.913872	-5.244	-0.682229	4.882	0.768486
130	1.300	-0.168976	-0.913872	-5.244	-0.682229	-1.936	-0.419548
131	0	-0.334850	-0.809962	-5.085	-0.732555	5.141	0.718032
131	1.300	-0.334850	-0.809962	-5.085	-0.732555	-1.469	-0.334919
132	0	-0.502422	-0.840058	-5.215	-0.750158	5.881	0.823364
132	1.300	-0.502422	-0.840058	-5.215	-0.750158	-0.899400	-0.268711
133	0	-0.677649	-0.858896	-5.274	-0.750603	6.565	0.906895
133	1.300	-0.677649	-0.858896	-5.274	-0.750603	-0.292107	-0.209669
134	0	-0.858094	-0.857467	-5.243	-0.721139	7.052	0.952411
134	1.300	-0.858094	-0.857467	-5.243	-0.721139	0.235686	-0.162296
135	0	-1.040	-0.834404	-5.081	-0.644189	7.100	0.933662
135	1.300	-1.040	-0.834404	-5.081	-0.644189	0.494846	-0.151063
136	0	-1.221	-0.770309	-4.629	-0.492431	6.298	0.795627
136	1.300	-1.221	-0.770309	-4.629	-0.492431	0.280471	-0.205775
137	0	-1.402	-0.620455	-3.547	-0.255388	4.146	0.467609
137	1.300	-1.402	-0.620455	-3.547	-0.255388	-0.464921	-0.338582
138	0	-1.579	-0.370223	-1.757	-0.005971	0.764744	-0.040931
138	1.300	-1.579	-0.370223	-1.757	-0.005971	-1.520	-0.522221
139	0	-1.725	-0.106651	-0.112078	0.106710	-2.402	-0.546416
139	1.300	-1.725	-0.106651	-0.112078	0.106710	-2.547	-0.685062
	min:	-1.725	-1.748	-26.448	-10.886	-24.948	-2.176
	max:	1.863	1.010	11.446	2.984	23.506	0.958860

Loadcase	Factor	Stage	Init.def	Title
14	1.0000			VEHICULO HIPOTESIS 14

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.647634	-0.073082	7.153			
10	0.647635	-0.047158	-10.476			
156	0.390235	-0.077848	1.601			
160	0.390230	-0.041928	-5.426			
166	-1.730	1.024	56.508	-4.021	-2.915	0.241741
167	-0.345961	-0.784014	8.439	3.932	2.340	0.269956
Sums :	-2.00E-10	-1.68E-11	60.000			
min:	-1.730	-0.784014	-10.476	-4.021	-2.915	0.241741
max:	0.647639	1.024	56.508	3.932	2.340	0.269956

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.981	-1.570	11.552	-0.405653	-5.099	0.365924
12	0.850	1.981	-1.570	11.552	-0.405653	4.718	-0.968178
12	0.850	1.981	-0.178115	1.649	-0.405653	4.720	-0.968475
12	1.700	1.981	-0.178115	1.649	-0.405653	6.122	-1.120
13	0	1.866	-1.163	8.877	-0.030892	3.364	-0.819953
13	0.650	1.866	-1.163	8.877	-0.030892	9.133	-1.576
13	0.650	1.866	0.228415	-1.026	-0.030892	9.134	-1.576
13	1.700	1.866	0.228415	-1.026	-0.030892	8.058	-1.336
14	0	1.751	-0.537146	4.276	0.263660	9.390	-1.622
14	0.450	1.751	-0.537146	4.276	0.263660	11.314	-1.863
14	0.450	1.751	0.854585	-5.626	0.263660	11.314	-1.863
14	1.700	1.751	0.854585	-5.626	0.263660	4.282	-0.795275
15	0	1.654	0.623125	-4.038	0.361146	8.899	-1.534
15	1.700	1.654	0.623125	-4.038	0.361146	2.035	-0.474533
16	0	1.562	0.596762	-3.855	0.375666	7.071	-1.266
16	1.700	1.562	0.596762	-3.855	0.375666	0.517135	-0.251964
17	0	1.472	0.592469	-3.822	0.383119	5.730	-1.068
17	1.700	1.472	0.592469	-3.822	0.383119	-0.767757	-0.060518
18	0	1.381	0.591353	-3.817	0.384672	4.511	-0.884986
18	1.700	1.381	0.591353	-3.817	0.384672	-1.978	0.120314

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
19	0	1.294	0.585144	-3.797	0.378401	3.284	-0.699281
19	1.700	1.294	0.585144	-3.797	0.378401	-3.171	0.295462
20	0	1.217	0.553102	-3.646	0.360113	1.936	-0.494719
20	1.700	1.217	0.553102	-3.646	0.360113	-4.261	0.445554
21	0	1.162	0.472947	-3.128	0.359144	0.586372	-0.296056
21	1.700	1.162	0.472947	-3.128	0.359144	-4.731	0.507953
44	0	1.427	0.083943	14.052	-2.795	-9.706	-0.233852
44	0.850	1.427	0.083943	14.052	-2.795	2.236	-0.162555
44	0.850	1.427	0.083943	9.922	-2.795	2.240	-0.162526
44	1.700	1.427	0.083943	9.922	-2.795	10.672	-0.091166
45	0	1.335	0.103071	8.200	-0.394724	9.354	-0.238700
45	0.650	1.335	0.103071	8.200	-0.394724	14.683	-0.171721
45	0.650	1.335	0.103071	4.070	-0.394724	14.685	-0.171686
45	1.700	1.335	0.103071	4.070	-0.394724	18.956	-0.063476
46	0	1.281	0.090739	0.982586	1.717	18.431	-0.216010
46	0.450	1.281	0.090739	0.982586	1.717	18.873	-0.175192
46	0.450	1.281	0.090739	-3.147	1.717	18.873	-0.175162
46	1.700	1.281	0.090739	-3.147	1.717	14.939	-0.061753
47	0	1.214	0.086715	-3.017	2.651	15.037	-0.204926
47	1.700	1.214	0.086715	-3.017	2.651	9.908	-0.057510
48	0	1.143	0.085532	-2.490	2.862	10.875	-0.197168
48	1.700	1.143	0.085532	-2.490	2.862	6.643	-0.051764
49	0	1.071	0.085307	-2.342	2.930	7.777	-0.190342
49	1.700	1.071	0.085307	-2.342	2.930	3.795	-0.045319
50	0	1.001	0.084562	-2.302	2.946	4.978	-0.183106
50	1.700	1.001	0.084562	-2.302	2.946	1.063	-0.039350
51	0	0.930042	0.081460	-2.315	2.909	2.276	-0.174283
51	1.700	0.930042	0.081460	-2.315	2.909	-1.660	-0.035767
52	0	0.856681	0.072190	-2.439	2.785	-0.377674	-0.161776
52	1.700	0.856681	0.072190	-2.439	2.785	-4.523	-0.039055
53	0	0.787361	0.043080	-2.218	2.718	-3.250	-0.140451
53	1.700	0.787361	0.043080	-2.218	2.718	-7.022	-0.067215
76	0	-0.426075	0.307467	25.351	-7.563	-27.563	-0.598204
76	0.850	-0.426075	0.307467	25.351	-7.563	-6.019	-0.336909
76	0.850	-0.426075	0.307467	19.481	-7.563	-6.011	-0.336804
76	1.700	-0.426075	0.307467	19.481	-7.563	10.544	-0.075509
77	0	-0.307777	0.130097	11.237	-2.412	7.583	-0.370463
77	0.650	-0.307777	0.130097	11.237	-2.412	14.895	-0.285922

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
77	0.650	-0.307777	0.130097	5.367	-2.412	14.698	-0.285878
77	1.700	-0.307777	0.130097	5.367	-2.412	20.533	-0.149298
78	0	-0.273298	0.146402	4.552	1.926	19.045	-0.364714
78	0.450	-0.273298	0.146402	4.552	1.926	21.093	-0.318856
78	0.450	-0.273298	0.146402	-1.318	1.926	21.094	-0.318808
78	1.700	-0.273298	0.146402	-1.318	1.926	19.446	-0.135830
79	0	-0.263858	0.152773	-2.096	4.317	18.526	-0.378718
79	1.700	-0.263858	0.152773	-2.096	4.317	14.964	-0.119003
80	0	-0.262181	0.152929	-2.366	5.155	14.581	-0.365950
80	1.700	-0.262181	0.152929	-2.366	5.155	10.559	-0.105970
81	0	-0.262265	0.152632	-2.352	5.415	10.470	-0.353015
81	1.700	-0.262265	0.152632	-2.352	5.415	6.472	-0.093540
82	0	-0.263634	0.152482	-2.329	5.494	6.468	-0.340338
82	1.700	-0.263634	0.152482	-2.329	5.494	2.510	-0.081119
83	0	-0.270618	0.152963	-2.325	5.510	2.563	-0.328325
83	1.700	-0.270618	0.152963	-2.325	5.510	-1.389	-0.068288
84	0	-0.296994	0.158339	-2.449	5.519	-1.180	-0.319230
84	1.700	-0.296994	0.158339	-2.449	5.519	-5.343	-0.050054
85	0	-0.389443	0.172823	-4.367	5.730	-4.711	-0.306163
85	1.700	-0.389443	0.172823	-4.367	5.730	-12.136	-0.012364
108	0	-1.747	-0.014709	4.551	-3.723	-9.503	-0.129879
108	1.700	-1.747	-0.014709	4.551	-3.723	-1.766	-0.154886
109	0	-1.700	0.067739	4.937	-1.899	-0.176822	-0.202757
109	1.700	-1.700	0.067739	4.937	-1.899	6.217	-0.087601
110	0	-1.649	0.079741	1.677	0.603659	7.750	-0.205561
110	1.700	-1.649	0.079741	1.677	0.603659	10.601	-0.070001
111	0	-1.562	0.084429	0.056140	2.079	9.400	-0.203109
111	1.700	-1.562	0.084429	0.056140	2.079	9.496	-0.059579
112	0	-1.512	0.085440	-0.545864	2.685	8.266	-0.197330
112	1.700	-1.512	0.085440	-0.545864	2.685	7.338	-0.052081
113	0	-1.441	0.085522	-0.763634	2.895	6.132	-0.190724
113	1.700	-1.441	0.085522	-0.763634	2.895	4.834	-0.045337
114	0	-1.370	0.086215	-0.831333	2.965	3.646	-0.184601
114	1.700	-1.370	0.086215	-0.831333	2.965	2.232	-0.038036
115	0	-1.298	0.089498	-0.868392	3.010	1.067	-0.180305
115	1.700	-1.298	0.089498	-0.868392	3.010	-0.409271	-0.028157

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
116	0	-1.222	0.099276	-0.925528	3.053	-1.545	-0.180346
116	1.700	-1.222	0.099276	-0.925528	3.053	-3.118	-0.011577
117	0	-1.120	0.118870	0.217933	2.845	-4.536	-0.189433
117	1.700	-1.120	0.118870	0.217933	2.845	-4.165	0.012647
140	0	-2.136	-0.333144	-2.404	-0.463896	-0.772527	-0.404796
140	1.700	-2.136	-0.333144	-2.404	-0.463896	-4.859	-0.971142
141	0	-2.097	0.029898	-0.147304	-0.251642	0.544233	-0.243504
141	1.700	-2.097	0.029898	-0.147304	-0.251642	0.293817	-0.192677
142	0	-2.014	0.285429	1.640	0.063354	1.435	-0.108824
142	1.700	-2.014	0.285429	1.640	0.063354	4.203	0.376404
143	0	-1.925	0.378782	2.296	0.263517	1.586	-0.072561
143	1.700	-1.925	0.378782	2.296	0.263517	5.492	0.571369
144	0	-1.835	0.401916	2.456	0.348183	1.096	-0.129464
144	1.700	-1.835	0.401916	2.456	0.348183	5.271	0.553794
145	0	-1.744	0.405193	2.479	0.377699	0.215903	-0.239822
145	1.700	-1.744	0.405193	2.479	0.377699	4.429	0.449006
146	0	-1.653	0.405690	2.478	0.387796	-0.640611	-0.375302
146	1.700	-1.653	0.405690	2.478	0.387796	3.372	0.314271
147	0	-1.559	0.411857	2.503	0.394728	-1.589	-0.524812
147	1.700	-1.559	0.411857	2.503	0.394728	2.265	0.175345
148	0	-1.458	0.437455	2.650	0.397111	-3.191	-0.682981
148	1.700	-1.458	0.437455	2.650	0.397111	1.315	0.060653
149	0	-1.344	0.444054	2.681	0.370244	-4.009	-0.791596
149	1.700	-1.344	0.444054	2.681	0.370244	0.547870	-0.036705
	min:	-2.136	-1.570	-5.626	-7.563	-27.563	-1.863
	max:	1.981	0.854585	25.351	5.730	21.094	0.571369

Loadcase	Factor	Stage	Init.def	Title
15	1.0000			VEHICULO HIPOTESIS 15

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.528423	0.002300	3.960			
10	0.528423	-0.002789	-9.374			
156	0.528423	-0.002300	3.960			
160	0.528423	0.002789	-9.374			
166	-1.057	1.910	35.414	-8.404	-0.292662	-0.024550
167	-1.057	-1.910	35.414	8.404	-0.292662	0.024550
Sums :	-1.87E-10	9.27E-13	60.000			
min:	-1.057	-1.910	-9.374	-8.404	-0.292662	-0.024550
max:	0.528423	1.910	35.414	8.404	-0.292662	0.024550

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.507	-0.771054	5.709	-0.513219	-10.488	1.184
12	1.700	1.507	-0.771054	5.709	-0.513219	-0.782081	-0.126378
13	0	1.439	-0.987060	7.301	-0.503702	-7.515	0.777587
13	1.700	1.439	-0.987060	7.301	-0.503702	4.897	-0.900416
14	0	1.405	-1.099	7.934	-0.545886	-2.450	0.106238
14	1.700	1.405	-1.099	7.934	-0.545886	11.038	-1.763
15	0	1.397	-1.209	8.649	-0.511940	3.562	-0.720506
15	1.700	1.397	-1.209	8.649	-0.511940	18.265	-2.776
16	0	1.397	-1.745	12.430	-0.202002	12.777	-2.005
16	0.200	1.397	-1.745	12.430	-0.202002	15.260	-2.354
16	0.200	1.397	-0.353230	2.527	-0.202002	15.263	-2.354
16	1.700	1.397	-0.353230	2.527	-0.202002	19.053	-2.884
17	0	1.397	0.353230	-2.527	0.202002	15.053	-2.884
17	1.7E-4	1.397	0.353230	-2.527	0.202002	15.053	-2.884
17	1.500	1.397	0.353230	-2.527	0.202002	15.263	-2.354
17	1.500	1.397	1.745	-12.430	0.202002	15.260	-2.354
17	1.700	1.397	1.745	-12.430	0.202002	12.777	-2.005
18	0	1.397	1.209	-8.649	0.511940	18.265	-2.776
18	1.700	1.397	1.209	-8.649	0.511940	3.562	-0.720506
19	0	1.405	1.099	-7.934	0.545886	11.038	-1.763

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
19	1.700	1.405	1.099	-7.934	0.545886	-2.450	0.106238
20	0	1.439	0.987060	-7.301	0.503702	4.897	-0.900416
20	1.700	1.439	0.987060	-7.301	0.503702	-7.515	0.777587
21	0	1.507	0.771054	-5.709	0.513219	-0.782081	-0.126378
21	1.700	1.507	0.771054	-5.709	0.513219	-10.488	1.184
44	0	0.948071	0.068811	7.346	-3.833	-20.421	-0.203802
44	1.700	0.948071	0.068811	7.346	-3.833	-7.932	-0.086823
45	0	0.915570	0.032415	8.681	-3.931	-9.890	-0.158320
45	1.700	0.915570	0.032415	8.681	-3.931	4.868	-0.103215
46	0	0.924465	0.008662	8.615	-4.181	2.822	-0.131977
46	1.700	0.924465	0.008662	8.615	-4.181	17.468	-0.117252
47	0	0.926294	0.000665	9.316	-3.687	16.055	-0.124002
47	1.700	0.926294	0.000665	9.316	-3.687	31.893	-0.122872
48	0	0.925801	-0.000307	7.400	-1.465	31.504	-0.123151
48	0.200	0.925801	-0.000307	7.400	-1.465	32.583	-0.123213
48	0.200	0.925801	-0.000307	3.270	-1.465	32.985	-0.123213
48	1.700	0.925801	-0.000307	3.270	-1.465	37.889	-0.123673
49	0	0.925801	0.000307	-3.270	1.465	37.885	-0.123673
49	1.7E-4	0.925801	0.000307	-3.270	1.465	37.888	-0.123673
49	1.500	0.925801	0.000307	-3.270	1.465	32.985	-0.123213
49	1.500	0.925801	0.000307	-7.400	1.465	32.983	-0.123213
49	1.700	0.925801	0.000307	-7.400	1.465	31.504	-0.123151
50	0	0.926294	-0.000665	-9.316	3.687	31.893	-0.122872
50	1.700	0.926294	-0.000665	-9.316	3.687	16.055	-0.124002
51	0	0.924465	-0.008662	-8.615	4.181	17.468	-0.117252
51	1.700	0.924465	-0.008662	-8.615	4.181	2.822	-0.131977
52	0	0.915570	-0.032415	-8.681	3.931	4.868	-0.103215
52	1.700	0.915570	-0.032415	-8.681	3.931	-9.890	-0.158320
53	0	0.948071	-0.068811	-7.346	3.833	-7.932	-0.086823
53	1.700	0.948071	-0.068811	-7.346	3.833	-20.421	-0.203802
76	0	-0.863785	0.068842	17.191	-8.896	-38.710	-0.310988
76	1.700	-0.863785	0.068842	17.191	-8.896	-9.486	-0.193956
77	0	-0.638549	-0.014736	10.671	-8.344	-11.790	-0.213656
77	1.700	-0.638549	-0.014736	10.671	-8.344	6.351	-0.238707
78	0	-0.574242	-0.004510	10.134	-7.808	5.803	-0.229596
78	1.700	-0.574242	-0.004510	10.134	-7.808	23.031	-0.237263

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
79	0	-0.557422	-0.001347	9.376	-6.137	23.424	-0.232973
79	1.700	-0.557422	-0.001347	9.376	-6.137	39.363	-0.235262
80	0	-0.554613	-0.000458	9.077	-2.392	39.911	-0.233680
80	0.200	-0.554613	-0.000458	9.077	-2.392	41.725	-0.233772
80	0.200	-0.554613	-0.000458	3.207	-2.392	41.727	-0.233772
80	1.700	-0.554613	-0.000458	3.207	-2.392	46.537	-0.234458
81	0	-0.554613	0.000458	-3.207	2.392	46.537	-0.234458
81	1.7E-4	-0.554613	0.000458	-3.207	2.392	46.537	-0.234458
81	1.500	-0.554613	0.000458	-3.207	2.392	41.727	-0.233772
81	1.500	-0.554613	0.000458	-9.077	2.392	41.725	-0.233772
81	1.700	-0.554613	0.000458	-9.077	2.392	39.911	-0.233680
82	0	-0.557422	0.001347	-9.376	6.137	39.363	-0.235262
82	1.700	-0.557422	0.001347	-9.376	6.137	23.424	-0.232973
83	0	-0.574242	0.004510	-10.134	7.808	23.031	-0.237263
83	1.700	-0.574242	0.004510	-10.134	7.808	5.803	-0.229596
84	0	-0.638549	0.014736	-10.671	8.344	6.351	-0.238707
84	1.700	-0.638549	0.014736	-10.671	8.344	-11.790	-0.213656
85	0	-0.863785	-0.068842	-17.191	8.896	-9.486	-0.193956
85	1.700	-0.863785	-0.068842	-17.191	8.896	-38.710	-0.310988
108	0	-1.638	-0.115891	2.988	-4.529	-15.244	-0.009203
108	1.700	-1.638	-0.115891	2.988	-4.529	-10.166	-0.206217
109	0	-1.687	-0.033618	5.897	-4.847	-7.848	-0.091358
109	1.700	-1.687	-0.033618	5.897	-4.847	2.177	-0.148509
110	0	-1.702	-0.010901	5.230	-4.228	3.817	-0.113453
110	1.700	-1.702	-0.010901	5.230	-4.228	12.708	-0.131985
111	0	-1.705	-0.002860	4.122	-3.131	14.444	-0.121213
111	1.700	-1.705	-0.002860	4.122	-3.131	21.451	-0.126075
112	0	-1.706	-0.000512	1.572	-1.183	22.755	-0.123330
112	1.700	-1.706	-0.000512	1.572	-1.183	25.427	-0.124200
113	0	-1.706	0.000512	-1.572	1.183	25.427	-0.124200
113	1.700	-1.706	0.000512	-1.572	1.183	22.755	-0.123330
114	0	-1.705	0.002860	-4.122	3.131	21.451	-0.126075
114	1.700	-1.705	0.002860	-4.122	3.131	14.444	-0.121213
115	0	-1.702	0.010901	-5.230	4.228	12.708	-0.131985
115	1.700	-1.702	0.010901	-5.230	4.228	3.817	-0.113453
116	0	-1.687	0.033618	-5.897	4.847	2.177	-0.148509
116	1.700	-1.687	0.033618	-5.897	4.847	-7.848	-0.091358

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
117	0	-1.638	0.115891	-2.988	4.529	-10.166	-0.206217
117	1.700	-1.638	0.115891	-2.988	4.529	-15.244	-0.009203
140	0	-1.864	-0.509523	-3.246	-0.582016	-2.228	-0.494184
140	1.700	-1.864	-0.509523	-3.246	-0.582016	-7.746	-1.360
141	0	-1.939	-0.386727	-2.588	-0.631405	0.896835	-0.081695
141	1.700	-1.939	-0.386727	-2.586	-0.631405	-3.503	-0.739130
142	0	-1.964	-0.285594	-1.969	-0.553202	4.783	0.446026
142	1.700	-1.964	-0.285594	-1.969	-0.553202	1.435	-0.039463
143	0	-1.971	-0.218098	-1.531	-0.401412	8.201	0.916682
143	1.700	-1.971	-0.218098	-1.531	-0.401412	5.598	0.545914
144	0	-1.972	-0.084172	-0.594388	-0.150588	9.636	1.114
144	1.700	-1.972	-0.084172	-0.594388	-0.150588	8.626	0.971106
145	0	-1.972	0.084172	0.594388	0.150588	8.626	0.971106
145	1.700	-1.972	0.084172	0.594388	0.150588	9.636	1.114
146	0	-1.971	0.218098	1.531	0.401412	5.598	0.545914
146	1.700	-1.971	0.218098	1.531	0.401412	8.201	0.916682
147	0	-1.964	0.285594	1.969	0.553202	1.435	-0.039463
147	1.700	-1.964	0.285594	1.969	0.553202	4.783	0.446026
148	0	-1.939	0.386727	2.588	0.631405	-1.503	-0.739130
148	1.700	-1.939	0.386727	2.588	0.631405	0.896835	-0.081695
149	0	-1.864	0.509523	3.246	0.582016	-7.746	-1.360
149	1.700	-1.864	0.509523	3.246	0.582016	-2.228	-0.494184
	min:	-1.972	-1.745	-17.191	-8.896	-38.710	-2.884
	max:	1.507	1.745	17.191	8.896	46.537	1.184

Loadcase	Factor	Stage	Init.def	Title
16	1.0000			VEHICULO HIPOTESIS 16

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.390235	0.077848	3.801			
10	0.390230	0.041525	-5.426			
156	0.647634	0.073082	7.153			
160	0.647639	0.047156	-10.476			
166	-0.345981	0.784014	8.439	-3.932	2.340	-0.289956
167	-1.730	-1.024	56.508	4.021	-2.915	-0.241741
Sums :	-1.62E-10	1.87E-11	60.000			
min:	-1.730	-1.024	-10.476	-3.932	-2.915	-0.289956
max:	0.647639	0.784014	56.508	4.021	2.340	-0.241741

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.162	-0.472947	3.128	-0.359144	-4.731	0.507955
12	1.700	1.162	-0.472947	3.128	-0.359144	0.586372	-0.296056
13	0	1.217	-0.553102	3.646	-0.360113	-4.261	0.445554
13	1.700	1.217	-0.553102	3.646	-0.360113	1.936	-0.494719
14	0	1.294	-0.585144	3.797	-0.378401	-3.171	0.295462
14	1.700	1.294	-0.585144	3.797	-0.378401	3.284	-0.699281
15	0	1.381	-0.591353	3.817	-0.384672	-1.978	0.120314
15	1.700	1.381	-0.591353	3.817	-0.384672	4.511	-0.884966
16	0	1.472	-0.592469	3.822	-0.383119	-0.767757	-0.060518
16	1.700	1.472	-0.592469	3.822	-0.383119	5.730	-1.068
17	0	1.562	-0.596762	3.855	-0.375666	0.517135	-0.251964
17	1.700	1.562	-0.596762	3.855	-0.375666	7.071	-1.266
18	0	1.654	-0.623125	4.038	-0.361146	2.035	-0.474533
18	1.700	1.654	-0.623125	4.038	-0.361146	8.899	-1.534
19	0	1.751	-0.854585	5.626	-0.263660	4.282	-0.795275
19	1.250	1.751	-0.854585	5.626	-0.263660	11.314	-1.863
19	1.250	1.751	0.537146	-4.276	-0.263660	11.314	-1.863
19	1.700	1.751	0.537146	-4.276	-0.263660	9.390	-1.622
20	0	1.866	-0.228415	1.026	0.030892	8.058	-1.336

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
20	1.050	1.866	-0.228415	1.026	0.030892	9.134	-1.576
20	1.050	1.866	1.163	-8.877	0.030892	9.133	-1.576
20	1.700	1.866	1.163	-8.877	0.030892	3.364	-0.819953
21	0	1.981	0.178115	-1.649	0.405653	6.122	-1.126
21	0.850	1.981	0.178115	-1.649	0.405653	4.720	-0.968475
21	0.850	1.981	1.570	-11.552	0.405653	4.718	-0.968178
21	1.700	1.981	1.570	-11.552	0.405653	-5.099	0.365924
44	0	0.787361	-0.043080	2.218	-2.718	-7.022	-0.067215
44	1.700	0.787361	-0.043080	2.218	-2.718	-3.250	-0.140451
45	0	0.856681	-0.072190	2.439	-2.785	-4.523	-0.039055
45	1.700	0.856681	-0.072190	2.439	-2.785	-0.377674	-0.161778
46	0	0.930042	-0.081480	2.315	-2.905	-1.660	-0.035767
46	1.700	0.930042	-0.081480	2.315	-2.909	2.276	-0.174282
47	0	1.001	-0.084562	2.302	-2.946	1.063	-0.039350
47	1.700	1.001	-0.084562	2.302	-2.946	4.978	-0.183106
48	0	1.071	-0.085307	2.342	-2.930	3.795	-0.045319
48	1.700	1.071	-0.085307	2.342	-2.930	7.777	-0.190342
49	0	1.143	-0.085532	2.490	-2.862	6.643	-0.051764
49	1.700	1.143	-0.085532	2.490	-2.862	10.875	-0.197169
50	0	1.214	-0.086715	3.017	-2.651	9.908	-0.057510
50	1.700	1.214	-0.086715	3.017	-2.651	15.037	-0.204926
51	0	1.281	-0.090739	3.147	-1.717	14.939	-0.061753
51	1.250	1.281	-0.090739	3.147	-1.717	18.873	-0.175162
51	1.250	1.281	-0.090739	-0.962586	-1.717	18.873	-0.175192
51	1.700	1.281	-0.090739	-0.962586	-1.717	18.431	-0.216010
52	0	1.335	-0.103071	-4.070	0.394724	18.556	-0.063478
52	1.050	1.335	-0.103071	-4.070	0.394724	14.685	-0.171686
52	1.050	1.335	-0.103071	-8.200	0.394724	14.683	-0.171721
52	1.700	1.335	-0.103071	-8.200	0.394724	9.354	-0.238700
53	0	1.427	-0.083943	-9.922	2.795	10.672	-0.091188
53	0.850	1.427	-0.083943	-9.922	2.795	2.240	-0.162526
53	0.850	1.427	-0.083943	-14.052	2.795	2.236	-0.162555
53	1.700	1.427	-0.083943	-14.052	2.795	-9.706	-0.233892
76	0	-0.389443	-0.172823	4.367	-5.730	-12.136	-0.012364
76	1.700	-0.389443	-0.172823	4.367	-5.730	-4.711	-0.306163
77	0	-0.296994	-0.158335	2.449	-5.519	-5.343	-0.050054
77	1.700	-0.296994	-0.158335	2.449	-5.519	-1.180	-0.319230
78	0	-0.270618	-0.152963	2.325	-5.510	-1.389	-0.068288

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
78	1.700	-0.270618	-0.152963	2.325	-5.510	2.563	-0.328325
79	0	-0.263634	-0.152482	2.329	-5.494	2.510	-0.081118
79	1.700	-0.263634	-0.152482	2.329	-5.494	6.468	-0.340338
80	0	-0.262265	-0.152632	2.352	-5.415	6.472	-0.093540
80	1.700	-0.262265	-0.152632	2.352	-5.415	10.470	-0.353015
81	0	-0.262181	-0.152929	2.366	-5.155	10.559	-0.105970
81	1.700	-0.262181	-0.152929	2.366	-5.155	14.581	-0.365950
82	0	-0.263858	-0.152773	2.096	-4.317	14.964	-0.119003
82	1.700	-0.263858	-0.152773	2.096	-4.317	18.526	-0.378716
83	0	-0.273298	-0.146402	1.318	-1.926	19.446	-0.135830
83	1.250	-0.273298	-0.146402	1.318	-1.926	21.094	-0.318808
83	1.250	-0.273298	-0.146402	-4.552	-1.926	21.093	-0.318858
83	1.700	-0.273298	-0.146402	-4.552	-1.926	19.045	-0.384714
84	0	-0.307777	-0.130097	-5.367	2.412	20.533	-0.149298
84	1.050	-0.307777	-0.130097	-5.367	2.412	14.898	-0.285878
84	1.050	-0.307777	-0.130097	-11.237	2.412	14.895	-0.285922
84	1.700	-0.307777	-0.130097	-11.237	2.412	7.593	-0.370463
85	0	-0.428075	-0.307467	-19.481	7.563	10.544	-0.075509
85	0.850	-0.428075	-0.307467	-19.481	7.563	-6.011	-0.336804
85	0.850	-0.428075	-0.307467	-25.351	7.563	-6.019	-0.336909
85	1.700	-0.428075	-0.307467	-25.351	7.563	-27.563	-0.598204
108	0	-1.120	-0.118870	-0.217933	-2.845	-4.165	0.012647
108	1.700	-1.120	-0.118870	-0.217933	-2.845	-4.536	-0.189433
109	0	-1.222	-0.099276	0.925526	-3.053	-3.118	-0.011577
109	1.700	-1.222	-0.099276	0.925528	-3.053	-1.545	-0.180346
110	0	-1.298	-0.089498	0.868392	-3.010	-0.409271	-0.028157
110	1.700	-1.298	-0.089498	0.868392	-3.010	1.067	-0.180305
111	0	-1.370	-0.086215	0.831333	-2.965	2.233	-0.038036
111	1.700	-1.370	-0.086215	0.831333	-2.965	3.646	-0.184601
112	0	-1.441	-0.085522	0.763634	-2.895	4.834	-0.045337
112	1.700	-1.441	-0.085522	0.763634	-2.895	6.132	-0.190724
113	0	-1.512	-0.085440	0.545864	-2.685	7.338	-0.052081
113	1.700	-1.512	-0.085440	0.545864	-2.685	8.266	-0.197330
114	0	-1.582	-0.084429	-0.056140	-2.079	9.496	-0.059579
114	1.700	-1.582	-0.084429	-0.056140	-2.079	9.400	-0.203109
115	0	-1.649	-0.079741	-1.677	-0.603659	10.601	-0.070001
115	1.700	-1.649	-0.079741	-1.677	-0.603659	7.750	-0.205561

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
116	0	-1.700	-0.067739	-4.937	1.899	8.217	-0.087601
116	1.700	-1.700	-0.067739	-4.937	1.899	-0.176822	-0.202757
117	0	-1.747	0.014709	-4.551	3.723	-1.766	-0.154886
117	1.700	-1.747	0.014709	-4.551	3.723	-9.503	-0.129879
140	0	-1.344	-0.444054	-2.681	-0.370244	0.547870	-0.036705
140	1.700	-1.344	-0.444054	-2.681	-0.370244	-4.009	-0.791596
141	0	-1.458	-0.437455	-2.650	-0.397111	1.315	0.060693
141	1.700	-1.458	-0.437455	-2.650	-0.397111	-3.191	-0.682981
142	0	-1.559	-0.411857	-2.503	-0.394728	2.265	0.175345
142	1.700	-1.559	-0.411857	-2.503	-0.394728	-1.989	-0.524612
143	0	-1.653	-0.405690	-2.478	-0.387796	3.372	0.314371
143	1.700	-1.653	-0.405690	-2.478	-0.387796	-0.840811	-0.375302
144	0	-1.744	-0.405193	-2.479	-0.377699	4.429	0.449006
144	1.700	-1.744	-0.405193	-2.479	-0.377699	0.215903	-0.239823
145	0	-1.835	-0.401916	-2.456	-0.348183	5.271	0.553794
145	1.700	-1.835	-0.401916	-2.456	-0.348183	1.096	-0.129464
146	0	-1.925	-0.378782	-2.296	-0.263517	5.492	0.571369
146	1.700	-1.925	-0.378782	-2.296	-0.263517	1.586	-0.072561
147	0	-2.014	-0.285429	-1.640	-0.063354	4.263	0.376404
147	1.700	-2.014	-0.285429	-1.640	-0.063354	1.415	-0.106824
148	0	-2.097	-0.029898	0.147304	0.251642	0.293817	-0.192677
148	1.700	-2.097	-0.029898	0.147304	0.251642	0.544233	-0.243504
149	0	-2.136	0.333144	2.404	0.463896	-4.859	-0.971142
149	1.700	-2.136	0.333144	2.404	0.463896	-0.772527	-0.404756
	min:	-2.136	-0.854585	-25.351	-5.730	-27.563	-1.863
	max:	1.981	1.570	5.626	7.563	21.094	0.571369

Loadcase	Factor	Stage	Init.def	Title
17	1.0000			VEHICULO HIPOTESIS 17

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.275936	-0.070252	3.376			
10	0.275944	-0.109739	-2.878			
156	0.570715	-0.074503	14.915			
160	0.570708	-0.105836	-7.570			
166	-0.054322	-0.500460	-3.289	2.928	2.775	-0.324107
167	-1.639	0.860789	55.444	-3.060	-3.243	-0.284786
Sums :	-1.22E-10	-2.24E-11	60.000			
min:	-1.639	-0.500460	-7.570	-3.060	-3.243	-0.324107
max:	0.570715	0.860789	55.444	2.928	2.775	-0.284786

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	1.777	-1.010	8.078	-0.089659	-1.944	-0.087986
22	0.850	1.777	-1.010	8.078	-0.089659	4.921	-0.946600
22	0.850	1.777	0.381440	-1.825	-0.089659	4.922	-0.946682
22	1.300	1.777	0.381440	-1.825	-0.089659	4.101	-0.775083
23	0	1.575	-0.349613	3.614	0.215304	5.051	-1.043
23	1.050	1.575	-0.349613	3.614	0.215304	8.845	-1.410
23	1.050	1.575	1.042	-6.289	0.215304	8.845	-1.410
23	1.300	1.575	1.042	-6.289	0.215304	7.273	-1.150
24	0	1.367	0.356429	-1.543	0.456609	10.658	-1.772
24	1.250	1.367	0.356429	-1.543	0.456609	8.730	-1.326
24	1.250	1.367	1.748	-11.446	0.456609	8.728	-1.326
24	1.300	1.367	1.748	-11.446	0.456609	8.157	-1.239
25	0	1.172	1.241	-7.952	0.688208	13.829	-2.176
25	1.300	1.172	1.241	-7.952	0.688208	3.491	-0.562373
26	0	0.986173	1.097	-6.962	0.746362	10.631	-1.701
26	1.300	0.986173	1.097	-6.962	0.746362	1.581	-0.274079
27	0	0.803102	1.071	-6.775	0.764288	9.031	-1.454
27	1.300	0.803102	1.071	-6.775	0.764288	0.224092	-0.061093
28	0	0.620303	1.065	-6.734	0.777255	7.837	-1.263
28	1.300	0.620303	1.065	-6.734	0.777255	-0.916715	0.121705

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
29	0	0.437055	1.065	-6.758	0.793100	6.817	-1.057
29	1.300	0.437055	1.065	-6.758	0.793100	-1.969	0.286992
30	0	0.250819	1.096	-7.003	0.829354	5.955	-0.963911
30	1.300	0.250819	1.096	-7.003	0.829354	-3.149	0.464081
31	0	0.050766	1.403	-8.571	0.849102	5.151	-0.864901
31	1.300	0.050766	1.403	-8.571	0.849102	-5.990	0.958860
32	0	-2.83E-13	6.20E-11	1.02E-11	1.28E-16	-4.55E-12	-2.95E-11
32	0.500	-2.83E-13	6.20E-11	1.02E-11	1.28E-16	5.71E-13	1.54E-12
54	0	1.283	0.261753	13.221	-0.309191	-7.452	-0.324224
54	0.850	1.283	0.261753	13.221	-0.309191	3.784	-0.101765
54	0.850	1.283	0.261753	9.091	-0.309191	3.767	-0.101701
54	1.300	1.283	0.261753	9.091	-0.309191	7.877	0.016054
55	0	1.148	0.274217	6.885	1.560	7.476	-0.302005
55	1.050	1.148	0.274217	6.885	1.560	16.604	-0.014113
55	1.050	1.148	0.274217	4.755	1.560	16.806	-0.014042
55	1.300	1.148	0.274217	4.755	1.560	17.994	0.054476
56	0	1.029	0.260636	2.384	3.305	17.585	-0.272763
56	1.250	1.029	0.260636	2.384	3.305	20.565	0.052998
56	1.250	1.029	0.260636	-1.746	3.305	20.565	0.053066
56	1.300	1.029	0.260636	-1.746	3.305	20.478	0.066064
57	0	0.896483	0.255395	-3.722	4.931	20.443	-0.254116
57	1.300	0.896483	0.255395	-3.722	4.931	15.604	0.077897
58	0	0.755653	0.252622	-3.320	5.599	15.934	-0.238464
58	1.300	0.755653	0.252622	-3.320	5.599	11.618	0.089944
59	0	0.612289	0.251950	-2.814	5.827	12.378	-0.224652
59	1.300	0.612289	0.251950	-2.814	5.827	8.719	0.102883
60	0	0.467416	0.253574	-2.619	5.936	9.593	-0.212457
60	1.300	0.467416	0.253574	-2.619	5.936	6.189	0.117190
61	0	0.317521	0.258547	-2.593	6.029	7.059	-0.202172
61	1.300	0.317521	0.258547	-2.593	6.029	3.689	0.133939
62	0	0.163529	0.266696	-2.576	6.147	4.395	-0.190740
62	1.300	0.163529	0.266696	-2.576	6.147	1.046	0.155965
63	0	0.044586	0.235035	-1.365	5.938	1.221	-0.149162
63	1.300	0.044586	0.235035	-1.365	5.938	-0.579117	0.156383
64	0	-6.38E-13	4.57E-11	-6.79E-13	-1.08E-16	4.94E-13	-2.09E-11
64	0.500	-6.38E-13	4.57E-11	-6.79E-13	-1.08E-16	5.41E-14	1.97E-12
86	0	-0.202043	0.509851	26.448	-2.984	-24.948	-0.608320

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
86	0.850	-0.202043	0.509851	26.448	-2.984	-2.471	-0.175013
86	0.850	-0.202043	0.509851	20.576	-2.984	-2.465	-0.174680
86	1.300	-0.202043	0.509851	20.576	-2.984	6.793	0.054486
87	0	-0.113629	0.364004	12.069	1.067	4.830	-0.434195
87	1.050	-0.113629	0.364004	12.069	1.067	17.501	-0.052037
87	1.050	-0.113629	0.364004	6.195	1.067	17.504	-0.051942
87	1.300	-0.113629	0.364004	6.199	1.067	19.052	0.039011
88	0	-0.075849	0.382716	4.512	4.841	17.667	-0.437516
88	1.250	-0.075849	0.382716	4.512	4.841	23.506	0.040830
88	1.250	-0.075849	0.382716	-1.356	4.841	23.506	0.040925
88	1.300	-0.075849	0.382716	-1.356	4.841	23.439	0.060015
89	0	-0.060136	0.398369	-1.607	7.945	22.598	-0.426016
89	1.300	-0.060136	0.398369	-1.607	7.945	20.509	0.091861
90	0	-0.054067	0.401716	-2.285	9.760	19.896	-0.402445
90	1.300	-0.054067	0.401716	-2.285	9.760	16.926	0.119785
91	0	-0.051539	0.401786	-2.567	10.570	16.606	-0.377010
91	1.300	-0.051539	0.401786	-2.567	10.570	13.269	0.145312
92	0	-0.048428	0.404478	-2.601	10.874	13.125	-0.353435
92	1.300	-0.048428	0.404478	-2.601	10.874	9.744	0.172383
93	0	-0.041344	0.415244	-2.558	10.888	9.601	-0.331681
93	1.300	-0.041344	0.415244	-2.558	10.888	6.275	0.208136
94	0	-0.027603	0.421901	-2.268	10.554	5.960	-0.296946
94	1.300	-0.027603	0.421901	-2.268	10.554	3.011	0.251526
95	0	-0.008166	0.330042	-1.405	9.405	2.409	-0.201340
95	1.300	-0.008166	0.330042	-1.405	9.405	0.577545	0.227714
96	0	-2.10E-12	1.99E-11	-1.62E-13	-1.46E-15	1.27E-13	1.05E-12
96	0.500	-2.10E-12	1.99E-11	-1.62E-13	-1.46E-15	4.61E-14	1.10E-11
118	0	-1.314	0.156047	4.721	-1.037	-8.589	-0.233632
118	1.300	-1.314	0.156047	4.721	-1.037	-2.452	-0.030771
119	0	-1.211	0.224428	6.282	-0.012458	-1.943	-0.263406
119	1.300	-1.211	0.224428	6.282	-0.012458	6.223	0.028350
120	0	-1.098	0.239105	3.738	2.065	5.638	-0.256954
120	1.300	-1.098	0.239105	3.738	2.065	10.498	0.053883
121	0	-0.967622	0.246724	1.341	3.887	9.549	-0.248215
121	1.300	-0.967622	0.246724	1.341	3.887	11.292	0.072526
122	0	-0.828072	0.250019	0.159567	4.993	10.224	-0.236921
122	1.300	-0.828072	0.250019	0.159567	4.993	10.432	0.088103

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
123	0	-0.686097	0.250469	-0.416947	5.550	9.400	-0.223802
123	1.300	-0.686097	0.250469	-0.416947	5.550	8.858	0.101806
124	0	-0.541980	0.249286	-0.650567	5.765	7.855	-0.209951
124	1.300	-0.541980	0.249286	-0.650567	5.765	7.009	0.114120
125	0	-0.391149	0.247514	-0.634553	5.755	6.009	-0.196350
125	1.300	-0.391149	0.247514	-0.634553	5.755	5.184	0.125418
126	0	-0.232232	0.245297	-0.560083	5.567	4.212	-0.181110
126	1.300	-0.232232	0.245297	-0.560083	5.567	3.483	0.137777
127	0	-0.098550	0.204806	-1.185	5.056	2.672	-0.139413
127	1.300	-0.098550	0.204806	-1.185	5.056	1.126	0.126835
128	0	7.18E-13	2.34E-11	-1.41E-13	9.31E-16	8.30E-14	-1.54E-12
128	0.500	7.18E-13	2.34E-11	-1.41E-13	9.31E-16	1.22E-14	1.02E-11
150	0	-1.725	0.106651	0.112078	-0.106710	-2.547	-0.685062
150	1.300	-1.725	0.106651	0.112078	-0.106710	-2.402	-0.546416
151	0	-1.579	0.370223	1.757	0.005971	-1.520	-0.522221
151	1.300	-1.579	0.370223	1.757	0.005971	0.764744	-0.040931
152	0	-1.402	0.620455	3.547	0.255388	-0.464921	-0.338985
152	1.300	-1.402	0.620455	3.547	0.255388	4.146	0.467605
153	0	-1.221	0.770305	4.629	0.492431	0.280471	-0.205775
153	1.300	-1.221	0.770305	4.629	0.492431	6.298	0.795627
154	0	-1.040	0.834404	5.081	0.644189	0.494848	-0.151063
154	1.300	-1.040	0.834404	5.081	0.644189	7.100	0.933662
155	0	-0.858094	0.857467	5.243	0.721139	0.235686	-0.162296
155	1.300	-0.858054	0.857467	5.243	0.721139	7.052	0.952411
156	0	-0.677649	0.858896	5.274	0.750603	-0.292107	-0.209669
156	1.300	-0.677649	0.858896	5.274	0.750603	6.565	0.906895
157	0	-0.502422	0.840058	5.215	0.750156	-0.899400	-0.268711
157	1.300	-0.502422	0.840058	5.215	0.750156	5.881	0.823364
158	0	-0.334850	0.809962	5.085	0.732555	-1.469	-0.334919
158	1.300	-0.334850	0.809962	5.085	0.732555	5.141	0.718032
159	0	-0.168976	0.913872	5.244	0.682229	-1.936	-0.419548
159	1.300	-0.168976	0.913872	5.244	0.682229	4.882	0.768486
160	0	-3.66E-14	-3.21E-11	9.65E-12	1.89E-17	-4.26E-12	1.13E-11
160	0.500	-3.66E-14	-3.21E-11	9.65E-12	1.89E-17	5.64E-13	-4.76E-12

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
min:		-1.725	-1.010	-11.446	-2.984	-24.948	-2.176
max:		1.777	1.748	26.448	10.888	23.506	0.958860

Loadcase	Factor	Stage	Init.def	Title
16	1.0000			VEHICULO HIPOTESIS 16

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.167580	-0.116429	2.334			
10	0.167591	-0.141617	-1.442			
156	0.356267	-0.119217	26.359			
160	0.356258	-0.139355	-1.790			
166	-0.016694	-0.777781	-5.337	4.462	1.781	-0.207035
167	-1.031	1.294	39.877	-4.653	-2.071	-0.182707
Sums :	-7.17E-11	-3.40E-11	60.000			
min:	-1.031	-0.777781	-5.337	-4.653	-2.071	-0.207035
max:	0.356267	1.294	39.877	4.462	1.781	-0.182707

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	1.134	-0.409490	3.559	-0.178239	-6.526	0.671154
22	1.300	1.134	-0.409490	3.559	-0.178239	-1.899	0.138817
23	0	0.982928	-0.581839	4.955	-0.153659	-3.409	0.250837
23	1.300	0.982928	-0.581839	4.955	-0.153659	3.033	-0.505554
24	0	0.838741	-0.739216	5.963	-0.179405	1.322	-0.365602
24	1.300	0.838741	-0.739216	5.963	-0.179405	9.074	-1.327
25	0	0.712738	-0.964741	7.473	-0.106270	7.376	-1.179
25	1.100	0.712738	-0.964741	7.473	-0.106270	15.597	-2.240
25	1.100	0.712738	0.426990	-2.430	-0.106270	15.598	-2.240
25	1.300	0.712738	0.426990	-2.430	-0.106270	15.112	-2.155
26	0	0.595501	-0.065382	1.020	0.180607	15.544	-2.301
26	1.300	0.595501	-0.065382	1.020	0.180607	16.870	-2.386

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
26	1.300	0.595501	-0.065382	1.020	0.180607	16.870	-2.386
27	0	0.480783	0.781442	-5.032	0.508455	20.248	-2.944
27	1.300	0.480783	0.781442	-5.032	0.508455	13.706	-1.928
28	0	0.365282	0.304692	-1.654	0.824340	20.144	-2.916
28	0.200	0.365282	0.304692	-1.654	0.824340	19.813	-2.855
28	0.200	0.365282	1.696	-11.557	0.824340	19.811	-2.855
28	1.300	0.365282	1.696	-11.557	0.824340	7.100	-0.989046
29	0	0.246818	1.537	-10.420	0.978476	16.117	-2.342
29	1.300	0.246818	1.537	-10.420	0.978476	2.571	-0.343902
30	0	0.122943	1.604	-10.871	1.108	12.665	-1.853
30	1.300	0.122943	1.604	-10.871	1.108	-1.467	0.232305
31	0	-0.016069	2.132	-14.244	1.218	9.978	-1.485
31	1.300	-0.016069	2.132	-14.244	1.218	-8.539	1.287
32	0	-3.83E-13	1.05E-11	2.13E-12	-4.06E-16	-2.48E-12	-1.21E-11
32	0.500	-3.83E-13	1.05E-11	2.13E-12	-4.06E-16	-1.41E-12	-6.88E-12
54	0	0.789746	0.210549	7.687	-1.268	-15.892	-0.242710
54	1.300	0.789746	0.210549	7.687	-1.268	-5.899	0.031003
55	0	0.690970	0.193078	9.647	-1.220	-6.364	-0.205339
55	1.300	0.690970	0.193078	9.647	-1.220	6.178	0.045663
56	0	0.614730	0.171123	9.876	-1.323	5.675	-0.176375
56	1.300	0.614730	0.171123	9.876	-1.323	18.515	0.046085
57	0	0.531310	0.161114	9.885	-0.574990	18.634	-0.159875
57	1.100	0.531310	0.161114	9.885	-0.574990	29.505	0.017330
57	1.100	0.531310	0.161114	5.755	-0.574990	29.507	0.017372
57	1.300	0.531310	0.161114	5.755	-0.574990	30.658	0.049574
58	0	0.443040	0.158002	3.952	1.432	30.803	-0.149243
58	1.300	0.443040	0.158002	3.952	1.432	35.939	0.056139
58	1.300	0.443040	0.158002	3.952	1.432	35.940	0.056159
59	0	0.353211	0.158138	-2.044	3.821	36.317	-0.141004
59	1.300	0.353211	0.158138	-2.044	3.821	33.659	0.064575
60	0	0.262361	0.161108	-3.765	6.009	34.210	-0.134466
60	0.200	0.262361	0.161108	-3.765	6.009	33.458	-0.102266
60	0.200	0.262361	0.161108	-7.895	6.009	33.456	-0.102224
60	1.300	0.262361	0.161108	-7.895	6.009	24.773	0.074975
61	0	0.169190	0.166604	-7.656	7.251	25.119	-0.129083
61	1.300	0.169190	0.166604	-7.656	7.251	15.165	0.087502
62	0	0.074586	0.175620	-6.980	8.036	15.576	-0.123291

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
62	1.300	0.074586	0.175620	-6.980	8.036	6.502	0.105015
63	0	0.006287	0.159494	-4.670	8.199	5.978	-0.097430
63	1.300	0.006287	0.159494	-4.670	8.199	-0.093201	0.109912
64	0	-6.94E-13	8.58E-12	-2.71E-12	2.70E-15	1.11E-12	-6.08E-12
64	0.500	-6.94E-13	8.58E-12	-2.71E-12	2.70E-15	-2.44E-13	-1.80E-12
86	0	-0.300038	0.318468	20.229	-4.207	-32.746	-0.379494
86	1.300	-0.300038	0.318468	20.229	-4.207	-6.449	0.034514
87	0	-0.166577	0.226656	13.243	-3.488	-8.050	-0.270444
87	1.300	-0.166577	0.226656	13.243	-3.488	9.166	0.024209
88	0	-0.109680	0.237656	11.745	-2.571	8.579	-0.272237
88	1.300	-0.109680	0.237656	11.745	-2.571	23.848	0.036716
89	0	-0.086647	0.247061	10.976	-0.509968	23.972	-0.264998
89	1.100	-0.086647	0.247061	10.976	-0.509968	36.044	0.006737
89	1.100	-0.086647	0.247061	5.106	-0.509968	36.046	0.006801
89	1.300	-0.086647	0.247061	5.106	-0.509968	37.066	0.056181
90	0	-0.078136	0.249879	4.914	2.850	37.334	-0.250928
90	1.300	-0.078136	0.249879	4.914	2.850	43.722	0.073882
90	1.300	-0.078136	0.249879	4.914	2.850	43.722	0.073915
91	0	-0.074454	0.250968	-1.377	6.719	43.669	-0.235769
91	1.300	-0.074454	0.250968	-1.377	6.719	41.879	0.090496
92	0	-0.069728	0.253397	-1.620	10.057	41.380	-0.221442
92	0.200	-0.069728	0.253397	-1.620	10.057	41.056	-0.170796
92	0.200	-0.069728	0.253397	-7.490	10.057	41.055	-0.170730
92	1.300	-0.069728	0.253397	-7.490	10.057	32.817	0.107974
93	0	-0.059366	0.260113	-6.073	12.005	31.968	-0.207740
93	1.300	-0.059366	0.260113	-8.073	12.005	21.473	0.130407
94	0	-0.039707	0.263938	-7.544	12.477	20.128	-0.185754
94	1.300	-0.039707	0.263938	-7.544	12.477	10.322	0.157365
95	0	-0.011795	0.206237	-4.765	11.382	8.179	-0.125832
95	1.300	-0.011795	0.206237	-4.765	11.382	1.984	0.142276
96	0	-2.24E-12	7.71E-12	-1.33E-13	-5.81E-15	2.83E-13	2.05E-12
96	0.500	-2.24E-12	7.71E-12	-1.33E-13	-5.81E-15	2.16E-13	5.91E-12
118	0	-0.830107	0.050671	4.460	-1.942	-12.381	-0.105673
118	1.300	-0.830107	0.050671	4.460	-1.942	-6.584	-0.040001
119	0	-0.780879	0.117645	7.381	-2.267	-5.922	-0.147119
119	1.300	-0.780879	0.117645	7.381	-2.267	3.674	0.005820

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
120	0	-0.713482	0.139034	6.734	-1.506	3.676	-0.153022
120	1.300	-0.713482	0.139034	6.734	-1.506	12.633	0.027722
121	0	-0.633166	0.149624	5.254	-0.206062	12.677	-0.152046
121	1.300	-0.633166	0.149624	5.254	-0.206062	19.707	0.042462
122	0	-0.547159	0.154492	2.865	1.574	19.700	-0.147008
122	1.300	-0.547159	0.154492	2.865	1.574	23.430	0.053831
123	0	-0.459224	0.155746	0.314943	3.471	22.994	-0.135450
123	1.300	-0.459224	0.155746	0.314943	3.471	23.403	0.063020
124	0	-0.369385	0.154357	-1.936	5.060	22.479	-0.130441
124	1.300	-0.369385	0.154357	-1.936	5.060	19.962	0.070223
125	0	-0.274573	0.150725	-3.019	5.871	18.589	-0.120696
125	1.300	-0.274573	0.150725	-3.019	5.871	14.665	0.075246
126	0	-0.173205	0.145038	-3.398	5.849	13.121	-0.109513
126	1.300	-0.173205	0.145038	-3.398	5.849	8.703	0.079038
127	0	-0.083706	0.115716	-3.876	5.144	6.995	-0.083137
127	1.300	-0.083706	0.115716	-3.876	5.144	1.957	0.067294
128	0	1.64E-13	5.97E-12	-4.49E-13	1.94E-16	2.40E-13	-1.38E-12
128	0.500	1.64E-13	5.97E-12	-4.49E-13	1.94E-16	1.53E-14	1.60E-12
150	0	-1.052	-0.030547	-0.526329	-0.237943	-2.974	-0.606127
150	1.300	-1.052	-0.030547	-0.526329	-0.237943	-3.658	-0.645835
151	0	-0.985018	0.085070	0.161729	-0.287465	-0.766430	-0.286083
151	1.300	-0.985018	0.085070	0.161729	-0.287465	-0.556182	-0.175491
152	0	-0.888886	0.214773	1.048	-0.197358	2.026	0.118453
152	1.300	-0.888886	0.214773	1.048	-0.197358	3.388	0.397658
153	0	-0.782810	0.317506	1.755	-0.021533	4.600	0.491033
153	1.300	-0.782810	0.317506	1.755	-0.021533	6.882	0.903791
154	0	-0.671622	0.444691	2.640	0.207333	6.048	0.706362
154	1.300	-0.671622	0.444691	2.640	0.207333	9.481	1.284
155	0	-0.558892	0.576505	3.583	0.449136	6.215	0.744054
155	1.300	-0.558892	0.576505	3.583	0.449136	10.873	1.496
156	0	-0.447105	0.688298	4.379	0.647593	5.299	0.632380
156	1.300	-0.447105	0.688298	4.379	0.647593	10.992	1.527
157	0	-0.340646	0.718644	4.657	0.750734	3.833	0.444222
157	1.300	-0.340646	0.718644	4.657	0.750734	9.887	1.378
158	0	-0.243192	0.656167	4.292	0.744803	2.244	0.230891

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
158	1.300	-0.243192	0.656167	4.292	0.744803	7.623	1.084
159	0	-0.153293	0.538540	3.100	0.643662	0.706078	0.002349
159	1.300	-0.153293	0.538540	3.100	0.643662	4.736	0.702451
160	0	-1.68E-12	-2.63E-13	3.41E-12	-7.26E-17	-2.32E-12	-5.16E-13
160	0.500	-1.68E-12	-2.63E-13	3.41E-12	-7.26E-17	-6.16E-13	-6.47E-13
	min:	-1.052	-0.964741	-14.244	-4.207	-32.746	-2.544
	max:	1.134	2.132	20.229	12.477	43.722	1.527

Loadcase Factor Stage Init.def Title
15 1.0000 VEHICULO HIPOTESIS 15

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.059326	-0.056961	0.888022			
10	0.059331	-0.065923	-0.448044			
156	0.126491	-0.057984	40.227			
160	0.126487	-0.065156	6.303			
166	-0.005295	-0.375660	-2.597	2.148	0.634102	-0.073680
167	-0.366341	0.621683	15.628	-2.239	-0.737014	-0.065050
Sums :	-2.44E-11	-1.63E-11	60.000			
min:	-0.366341	-0.375660	-2.597	-2.239	-0.737014	-0.073680
max:	0.126491	0.621683	40.227	2.148	0.634102	-0.065050

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	0.407944	-0.141896	1.257	-0.067321	-3.150	0.351417
22	1.300	0.407944	-0.141896	1.257	-0.067321	-1.515	0.166952
23	0	0.349055	-0.204178	1.762	-0.058909	-2.083	0.207832
23	1.300	0.349055	-0.204178	1.762	-0.058909	0.207413	-0.057599
24	0	0.294783	-0.255121	2.074	-0.076454	-0.482633	0.001670
24	1.300	0.294783	-0.255121	2.074	-0.076454	2.213	-0.329988
25	0	0.248424	-0.276262	2.185	-0.086999	1.364	-0.244137
25	1.300	0.248424	-0.276262	2.185	-0.086999	4.205	-0.603277
26	0	0.206219	-0.288850	2.263	-0.080788	3.341	-0.512721
26	1.300	0.206219	-0.288850	2.263	-0.080788	6.283	-0.888226
27	0	0.165467	-0.315521	2.454	-0.052411	5.591	-0.820693
27	1.300	0.165467	-0.315521	2.454	-0.052411	8.781	-1.231
28	0	0.125143	-0.441007	3.350	0.049571	8.605	-1.235
28	1.300	0.125143	-0.441007	3.350	0.049571	12.960	-1.809
29	0	0.083569	-0.858537	6.305	0.399957	14.907	-2.112
29	0.0499	0.083569	-0.858537	6.305	0.399957	15.222	-2.155
29	0.0501	0.083569	0.533194	-3.557	0.399957	15.222	-2.155
29	1.300	0.083569	0.533194	-3.557	0.399957	10.726	-1.488
30	0	0.038421	0.166092	-1.012	0.881404	16.534	-2.337
30	0.250	0.038421	0.166092	-1.012	0.881404	16.281	-2.295
30	0.250	0.038421	1.560	-10.915	0.881404	16.279	-2.295
30	1.300	0.038421	1.560	-10.915	0.881404	4.820	-0.657412
31	0	-0.014961	1.869	-12.993	1.351	15.554	-2.207
31	0.450	-0.014961	1.869	-12.993	1.351	9.706	-1.366
31	0.450	-0.014961	3.261	-22.896	1.351	9.704	-1.366
31	1.300	-0.014961	3.261	-22.896	1.351	-9.755	1.406
32	0	2.49E-13	2.46E-11	3.75E-12	-2.92E-16	-1.06E-12	-8.39E-12
32	0.500	2.49E-13	2.46E-11	3.75E-12	-2.92E-16	8.14E-13	3.92E-12
54	0	0.278019	0.084771	2.711	-0.481551	-7.613	-0.094756
54	1.300	0.278019	0.084771	2.711	-0.481551	-4.089	0.015444
55	0	0.239784	0.073328	3.510	-0.472629	-4.262	-0.076602
55	1.300	0.239784	0.073328	3.510	-0.472629	0.300299	0.018724
56	0	0.212062	0.062978	3.407	-0.617467	0.043393	-0.064224
56	1.300	0.212062	0.062978	3.407	-0.617467	4.473	0.017648
57	0	0.182360	0.058250	3.399	-0.675479	4.291	-0.057417
57	1.300	0.182360	0.058250	3.399	-0.675479	8.710	0.018308
58	0	0.150994	0.056243	3.587	-0.606696	8.606	-0.052963

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
58	1.300	0.150994	0.056243	3.587	-0.606696	13.269	0.020153
59	0	0.119339	0.055570	4.120	-0.313490	13.271	-0.049581
59	1.300	0.119339	0.055570	4.120	-0.313490	18.626	0.022660
60	0	0.087182	0.056054	4.627	0.626269	18.942	-0.047036
60	1.300	0.087182	0.056054	4.627	0.626269	24.957	0.025834
61	0	0.054023	0.059442	2.913	2.966	25.278	-0.046173
61	0.0499	0.054023	0.059442	2.913	2.966	25.423	-0.043209
61	0.0501	0.054023	0.059442	-1.217	2.966	25.424	-0.043193
61	1.300	0.054023	0.059442	-1.217	2.968	23.903	0.031101
62	0	0.020486	0.064843	-3.116	6.036	23.706	-0.045344
62	0.250	0.020486	0.064843	-3.116	6.036	22.928	-0.029141
62	0.250	0.020486	0.064843	-7.246	6.036	22.926	-0.029124
62	1.300	0.020486	0.064843	-7.246	6.036	15.319	0.038953
63	0	-0.002518	0.061418	-6.352	8.276	13.425	-0.036957
63	0.450	-0.002518	0.061418	-6.352	8.276	10.567	-0.009327
63	0.450	-0.002518	0.061418	-10.482	8.276	10.565	-0.009311
63	1.300	-0.002518	0.061418	-10.482	8.276	1.657	0.042887
64	0	-7.82E-13	9.33E-13	-9.61E-13	8.34E-16	4.85E-13	-2.30E-12
64	0.500	-7.82E-13	9.33E-13	-9.61E-13	8.34E-16	3.91E-15	-1.83E-12
86	0	-0.143874	0.113126	7.982	-1.583	-15.359	-0.134770
86	1.300	-0.143874	0.113126	7.982	-1.583	-4.982	0.012294
87	0	-0.079791	0.080599	5.102	-1.451	-5.673	-0.096094
87	1.300	-0.079791	0.080599	5.102	-1.451	0.960007	0.008685
88	0	-0.052404	0.084608	4.643	-1.417	0.602162	-0.096771
88	1.300	-0.052404	0.084608	4.643	-1.417	6.639	0.013219
89	0	-0.041141	0.087893	4.600	-1.297	6.529	-0.094124
89	1.300	-0.041141	0.087893	4.600	-1.297	12.509	0.020137
90	0	-0.036861	0.088468	4.537	-0.974517	12.564	-0.088828
90	1.300	-0.036861	0.088468	4.537	-0.974517	18.463	0.026181
91	0	-0.035127	0.088221	4.161	-0.186281	18.685	-0.083101
91	1.300	-0.035127	0.088221	4.161	-0.186281	24.094	0.031586
92	0	-0.033361	0.088746	3.341	1.548	24.366	-0.077949
92	1.300	-0.033361	0.088746	3.341	1.548	28.709	0.037421
93	0	-0.029126	0.091885	3.330	4.380	28.429	-0.073697
93	0.0499	-0.029126	0.091885	3.330	4.380	26.595	-0.069115
93	0.0501	-0.029126	0.091885	-2.540	4.380	26.595	-0.069091
93	1.300	-0.029126	0.091885	-2.540	4.380	25.420	0.045753

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
94	0	-0.020072	0.094451	-1.289	7.273	23.591	-0.066626
94	0.250	-0.020072	0.094451	-1.289	7.273	23.269	-0.043026
94	0.250	-0.020072	0.094451	-7.159	7.273	23.266	-0.043001
94	1.300	-0.020072	0.094451	-7.159	7.273	15.752	0.056160
95	0	-0.006242	0.074536	-2.251	8.398	11.771	-0.045544
95	0.450	-0.006242	0.074536	-2.251	8.398	10.759	-0.012013
95	0.450	-0.006242	0.074536	-8.121	8.398	10.758	-0.011993
95	1.300	-0.006242	0.074536	-8.121	8.398	3.656	0.051352
96	0	1.55E-14	1.35E-11	1.94E-13	-1.31E-14	8.62E-14	-1.67E-12
96	0.500	1.55E-14	1.35E-11	1.94E-13	-1.31E-14	1.83E-13	5.09E-12
118	0	-0.297004	0.008031	1.700	-0.755571	-6.227	-0.029052
118	1.300	-0.297004	0.008031	1.700	-0.755571	-4.017	-0.018612
119	0	-0.262596	0.037119	3.016	-0.990281	-3.762	-0.048622
119	1.300	-0.262596	0.037119	3.016	-0.990281	0.136719	-0.000368
120	0	-0.259164	0.047407	2.971	-0.885716	0.180852	-0.052862
120	1.300	-0.259164	0.047407	2.971	-0.885716	4.044	0.006747
121	0	-0.230761	0.052335	2.796	-0.712264	4.122	-0.053431
121	1.300	-0.230761	0.052335	2.796	-0.712264	7.756	0.014604
122	0	-0.200389	0.054357	2.514	-0.445641	7.895	-0.051874
122	1.300	-0.200389	0.054357	2.514	-0.445641	11.162	0.018790
123	0	-0.169481	0.054662	1.994	0.022768	11.334	-0.049123
123	1.300	-0.169481	0.054662	1.994	0.022768	13.917	0.021938
124	0	-0.137994	0.053975	1.060	0.785441	13.995	-0.045838
124	1.300	-0.137994	0.053975	1.060	0.785441	15.373	0.024330
125	0	-0.104570	0.052587	-0.666001	1.764	15.017	-0.042389
125	1.300	-0.104570	0.052587	-0.666001	1.764	14.151	0.025974
126	0	-0.068254	0.050111	-2.475	2.380	13.007	-0.038319
126	1.300	-0.068254	0.050111	-2.475	2.380	9.790	0.026825
127	0	-0.034843	0.038694	-4.058	2.354	7.659	-0.028783
127	1.300	-0.034843	0.038694	-4.058	2.354	2.383	0.021519
128	0	-8.05E-14	-5.35E-13	-2.36E-13	-6.82E-15	5.19E-14	6.56E-13
128	0.500	-8.05E-14	-5.35E-13	-2.36E-13	-6.82E-15	-6.61E-14	3.86E-13
150	0	-0.368224	-0.013698	-0.187710	-0.093445	-1.721	-0.305014
150	1.300	-0.368224	-0.013698	-0.187710	-0.093445	-1.965	-0.322621
151	0	-0.349592	0.028507	0.066596	-0.127315	-0.778654	-0.169270
151	1.300	-0.349592	0.028507	0.066596	-0.127315	-0.692079	-0.132211

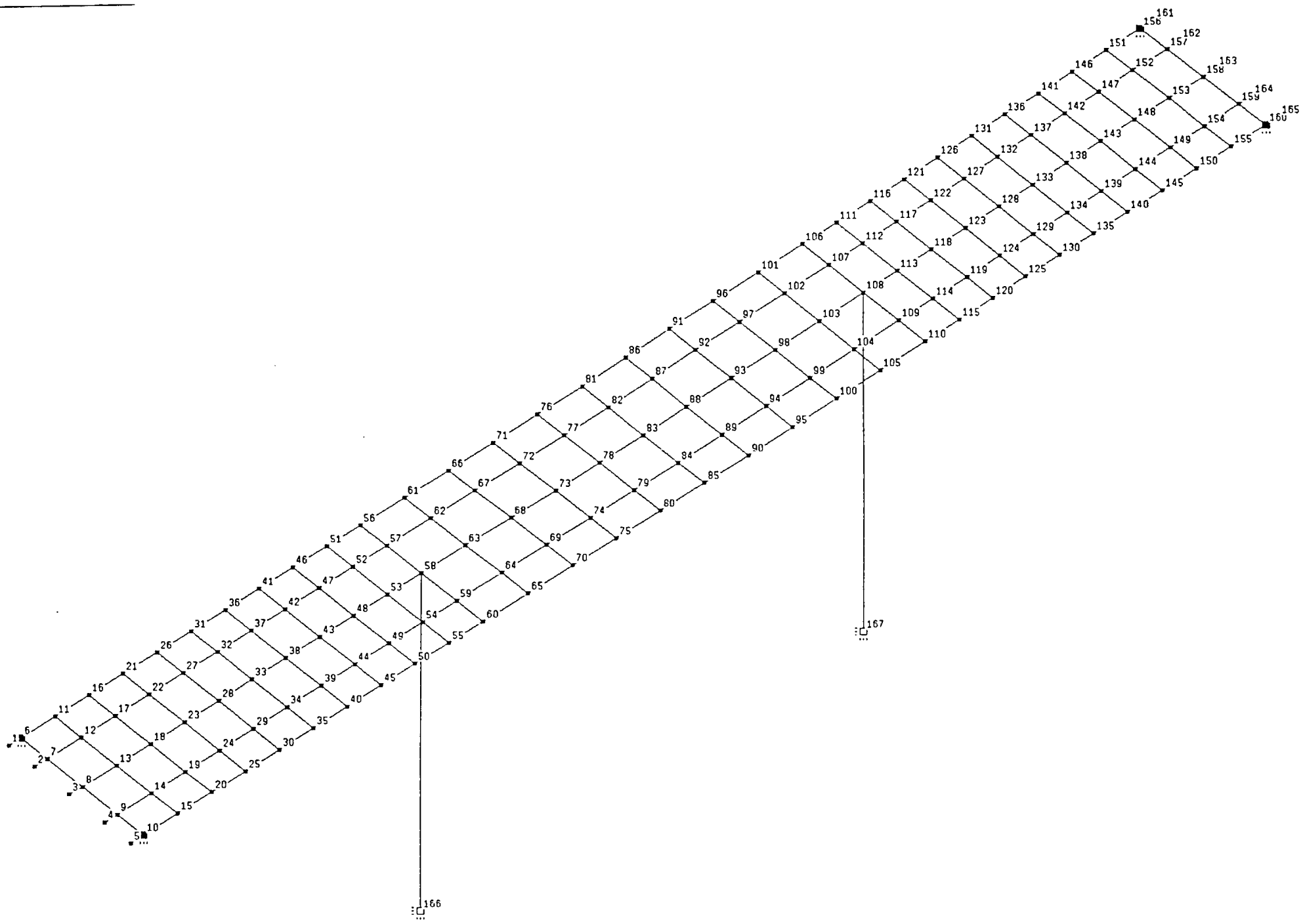
SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
152	0	-0.318417	0.071726	0.352297	-0.116634	0.562924	0.021610
152	1.300	-0.318417	0.071726	0.352297	-0.118634	1.021	0.114854
153	0	-0.282022	0.089460	0.464671	-0.093340	2.081	0.237365
153	1.300	-0.282022	0.089460	0.464671	-0.093340	2.685	0.353662
154	0	-0.243102	0.101582	0.542715	-0.055568	3.460	0.434459
154	1.300	-0.243102	0.101582	0.542715	-0.055568	4.166	0.566515
155	0	-0.203337	0.125521	0.710379	0.007606	4.476	0.581328
155	1.300	-0.203337	0.125521	0.710379	0.007606	5.399	0.744504
156	0	-0.164110	0.172385	1.049	0.105575	4.917	0.648387
156	1.300	-0.164110	0.172385	1.049	0.105575	6.281	0.872487
157	0	-0.127035	0.234467	1.512	0.216189	4.645	0.615841
157	1.300	-0.127035	0.234467	1.512	0.216189	6.611	0.920648
158	0	-0.093721	0.209195	1.360	0.268788	3.940	0.519954
158	1.300	-0.093721	0.209195	1.360	0.268788	5.707	0.791907
159	0	-0.064576	-0.067689	-0.739888	0.218566	2.901	0.370254
159	1.300	-0.064576	-0.067689	-0.739888	0.218566	1.939	0.282258
160	0	6.69E-14	-5.29E-12	2.62E-12	-1.08E-16	-1.03E-12	9.50E-13
160	0.500	6.69E-14	-5.29E-12	2.62E-12	-1.08E-16	2.79E-13	-1.69E-12
	min:	-0.368224	-0.858537	-22.896	-1.583	-15.359	-2.337
	max:	0.407944	3.261	7.982	8.398	28.709	1.406

2.3.3. Cálculo de las armaduras pasivas transversales. Método de Wood.

Scale 1 : 142.9
Structure - NUDOS

ARMADURAS



LOAD COMBINATION DY: 'COMB1'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION DZ: 'COMB2'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
12	1.5000			VEHICULO HIPOTESIS 12
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EA: 'COMB3'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
13	1.5000			VEHICULO HIPOTESIS 13
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EB: 'COMB4'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
14	1.5000			VEHICULO HIPOTESIS 14
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EC: 'COMB5'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
15	1.5000			VEHICULO HIPOTESIS 15
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION ED: 'COMB6'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
20	1.5000			VEHICULO HIPOTESIS 20
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EE: 'COME7'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOE UNIF 5
21	1.5000			VEHICULO HIPOTESIS 21
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EF: 'COMB8'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOE UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOE UNIF 4
10	1.5000			SOE UNIF 5
22	1.5000			VEHICULO HIPOTESIS 22
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EG: 'COMB9'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOE UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
23	1.5000			VEHICULO HIPOTESIS 23
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EH: 'COMB10'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOE UNIF 1
7	1.5000			SOE UNIF 2
8	1.5000			SOE UNIF 3
9	1.5000			SOE UNIF 4
10	1.5000			SOE UNIF 5
24	1.5000			VEHICULO HIPOTESIS 24
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EI: 'COMB11'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOE UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EJ: 'COMB12'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOE UNIF 1
7	1.5000			SOE UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOE
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EK: 'COMB13'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
12	1.5000			VEHICULO HIPOTESIS 12
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EL: 'COMB14'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
13	1.5000			VEHICULO HIPOTESIS 13
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EM: 'COMB15'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
14	1.5000			VEHICULO HIPOTESIS 14
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EN: 'COMB16'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
15	1.5000			VEHICULO HIPOTESIS 15
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

RESUMEN DE ARMADURAS DE WOOD-ARMER

NUDO	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
8	0 a 1.15	15.98	26.26	14.26	15.32
13	1.15 a 2.45	22.56	18.33	1.75	7.14
18	2.45 a 3.75	29.13	13.59	0.00	7.22
23	3.75 a 5.05	34.73	12.47	1.08	6.17
28	5.05 a 6.35	42.76	10.29	1.14	8.28
33	6.35 a 7.65	40.00	9.34	1.33	8.34
38	7.65 a 8.95	32.21	8.07	1.87	9.61
43	8.95 a 10.25	25.57	7.03	3.48	11.92
48	10.25 a 11.55	16.72	6.70	12.99	14.36
53	11.55 a 12.85	3.97	6.49	25.79	22.28

Nudo	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
58	12.85 a 14.55	2.90	3.97	49.40	33.91
63	14.55 a 16.25	9.00	5.74	15.98	17.16
68	16.25 a 17.95	22.18	4.64	1.40	6.18
73	17.95 a 19.65	35.80	3.61	0.00	3.20
78	19.65 a 21.35	44.43	2.03	0.00	2.56
83	21.35 a 23.05	47.04	2.02	0.00	2.47
88	23.05 a 24.75	43.86	2.62	0.00	2.57
93	24.75 a 26.45	34.69	3.55	0.00	3.30
98	26.45 a 28.15	20.59	4.66	1.96	7.14
103	28.15 a 29.85	4.93	6.41	18.54	18.49

Nudo	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
108	29.85 a 31.15	1.85	4.32	48.90	31.15
113	31.15 a 32.45	3.28	5.90	24.11	18.90
118	32.45 a 33.75	11.37	5.78	11.31	12.44
123	33.75 a 35.05	18.10	6.05	2.88	10.53
128	35.05 a 36.35	23.93	7.00	1.37	8.00
133	36.35 a 37.65	27.47	7.54	0.88	6.90
138	37.65 a 38.95	28.48	8.01	0.67	6.84
143	38.95 a 40.25	26.69	8.69	1.02	7.35
148	40.25 a 41.55	22.89	10.24	2.10	8.64
153	41.55 a 42.85	18.19	14.11	5.49	8.70
158	42.85 a 44	11.00	17.46	9.87	4.70

Armadura inferior longitudinal: $47.04 \frac{cm^2}{m} \times 3.70m = 174.05 cm^2$

centro Vano $\phi 25/0.10 \rightarrow 18\phi 25 + 18\phi 25$ $(176.76 cm^2)$

Armadura inferior longitudinal base: $22.56 \frac{cm^2}{m} \times 3.60m = 83.50 cm^2$

$\phi 25/0.20 \rightarrow 18\phi 25$

Armadura sup. longitudinal apoyo: $49.40 cm^2/m$

En el nucho central: $\phi 20/0.20 + \phi 25/0.20 + 14\phi 20$

(4.70m)

Verdejo

Armadura sup. longitudinal base: $15.70 cm^2/m$

269.14

2.3.4. Riostras sobre pilas y estribos

Plane (2-D) frame -analysis

STRUCTURAL - DATA RIOSTRA ESTRIBOS

Project title :

J O I N T D A T A : (9 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000			
2	0.850000	0.000000	0.000000	B	B F	
3	1.850000	0.000000	0.000000			
4	2.850000	0.000000	0.000000			
5	3.850000	0.000000	0.000000			
6	4.850000	0.000000	0.000000			
7	5.850000	0.000000	0.000000			
8	6.850000	0.000000	0.000000	F	B F	
9	7.700000	0.000000	0.000000			

B A R D A T A : (8 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	2	0.850000	RIOSTRAE			oS
2	2	3	1.000000	RIOSTRAE			oS
3	3	4	1.000000	RIOSTRAE			oS
	4	5	1.000000	RIOSTRAE			oS
5	5	6	1.000000	RIOSTRAE			oS
6	6	7	1.000000	RIOSTRAE			oS
7	7	8	1.000000	RIOSTRAE			oS
8	8	9	0.850000	RIOSTRAE			oS

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2] / zl [M1]	Iy [M4] / zu [M1]	Fz [M2]
RIOSTRAE	6.7500E-01 / -0.4500	4.5562E-02 / 0.4500	5.6250E-01

MATERIAL PROPERT. :

Bar	(to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 ..	8	3.5500E+06	1.3000E+06

STS-Run ok

Load case 1: carga permanente

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb		
Force Z gl const.	-9.950		Stab	1 .. 7	8 2

Load case 2: Sobrecarga maxima

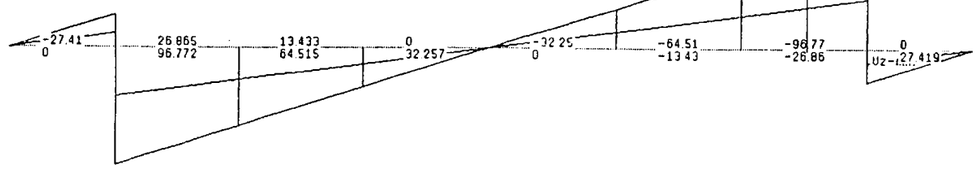
Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb		
Force Z gl const.	-12.550		Stab	1 .. 7	8 2

ENVELOPE SPECIFIC.: AB ''

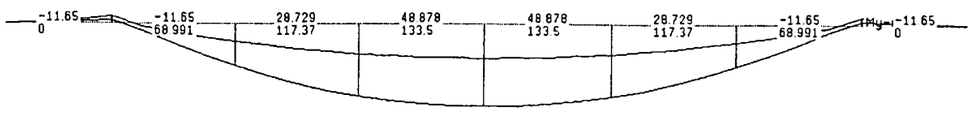
roup	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		carga permanente
B	PLUS	2	1.500		Sobrecarga maxima

cale 1 : 50.2
nt. Forces envelope Vz, GWSP AB, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 1.00E-02
min: -9.68E+01 max: 4.03E+01 [t]
Envelope Shear force Vz-max, Scale 1.00E-02
min: -4.03E+01 max: 9.68E+01 [t]
Text envelopes [t]

Vd = 83.64t



Scale 1 : 50.2
Int. Forces envelope My, GWSP AB, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
min: -1.17E+01 max: 5.56E+01 [tm]
- Envelope Moment My-max, Scale 5.00E-03
min: -4.85E+00 max: 1.34E+02 [tm]
- Text envelopes [tm]



Características mecánicas Sección "RIOSTRAE" (sin coef. homogeneiz.)

Area	Ax = 6.750E3 cm2		
Momento de inercia	Iy = 4.556E6 cm4	Iz = 3.164E6 cm4	Ip = 7.720E6 cm4
Const. de torsión			Ix = 6.276E6 cm4
Momento estático	Zy =151.88E3 cm3	Zz = 126.56E3 cm3	
Baricentro	ys = 0.00 cm	zs = 45.00 cm	Angulo= 0.0 Grad
Dist. al borde	yl = -37.50 cm	yr = 37.50 cm	
	zo = 45.00 cm	zu = -45.00 cm	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSTRAE" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	6750.000	330.000	6.28E+06	1)

Puntos de contorno [cm]:
1 37.50 0.00 2 37.50 90.00 3 -37.50 90.00
4 -37.50 0.00

Armadura "B1" As-tot =2.00 cm2 (0.03 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-33.50	86.00
					33.50	86.00
BOTTOM / RQS	AEH500	10.0	2	1.00	-33.50	4.00
					33.50	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	75.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	67.00	-33.50	45.00	33.50	45.00
SWT	Torsion	75.00	90.00	0.00	0.00	0.00	90.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "RIOSTRAE"/"B1"

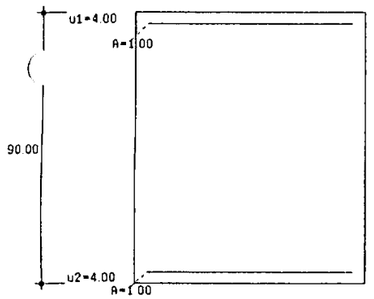
No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	1335.00	0.00	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

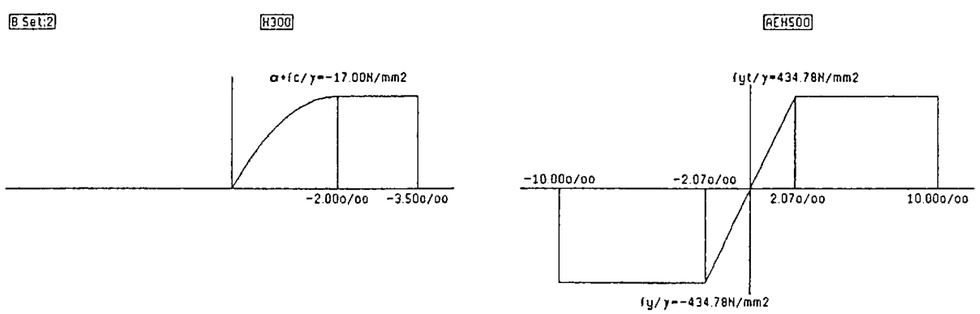
Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-33.50	86.00	33.50	86.00	1.00	----	1.00
1 AEH500	-33.50	4.00	33.50	4.00	1.00	38.77	38.77
ax.x/h = 0.20	As-top/bot = 1.00/38.77					As = 0.59 % =	39.77

←7φ32

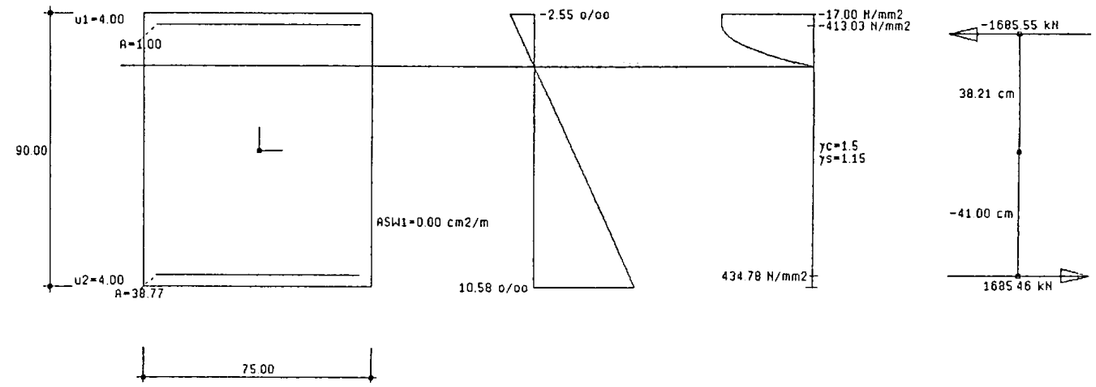
Sección RIOSTRAE



Material acorde a la sección: "RIOSTRAE"



Dimensionamiento, Sección "RIOSTRAE"



Características mecánicas Sección "RIOSTRAE" (sin coef. homogeneiz.)

Area	Ax = 6.750E3 cm2				
Momento de inercia	Iy = 4.556E6 cm4	Iz = 3.164E6 cm4	Ip = 7.720E6 cm4		
Const. de torsión			Ix = 6.276E6 cm4		
Momento estático	Zy =151.88E3 cm3	Zz = 126.56E3 cm3			
Baricentro	ys = 0.00 cm	zs = 45.00 cm	Angulo= 0.0 Grad		
Dist. al borde	yl = -37.50 cm	yr = 37.50 cm			
	zo = 45.00 cm	zu = -45.00 cm			

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSTRAE" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	6750.000	330.000	6.28E+06	1)

Puntos de contorno [cm]:
1 37.50 0.00 2 37.50 90.00 3 -37.50 90.00
4 -37.50 0.00

Armadura "B1" As-tot =39.77 cm2 (0.59 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-33.50	86.00
					33.50	86.00
BOTTOM / RQS	AEH500	10.0	2	38.77	-33.50	4.00
					33.50	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	75.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	67.00	-33.50	45.00	33.50	45.00
SWT	Torsion	75.00	90.00	0.00	0.00	0.00	90.00

nto de resultados:

mb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
SW1	Res.Kmb.			
Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)				

imensionamiento a flexión: Viga Sección "RIOSTRAE"/"B1"

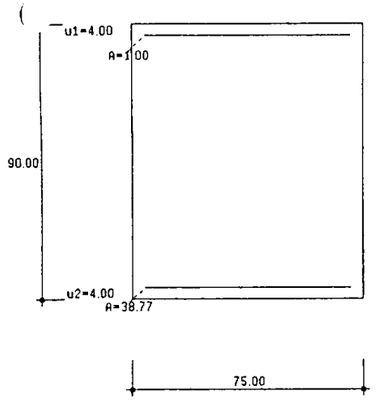
o	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-116.50	0.00	

Par(ros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
et 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

o	Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1	AEH500	-33.50	86.00	33.50	86.00	1.00	3.17	3.17
	AEH500	-33.50	4.00	33.50	4.00	1.00	----	1.00

ax.x/h = 0.05 As-top/bot = 3.17/1.00 As = 0.06 % = 4.17

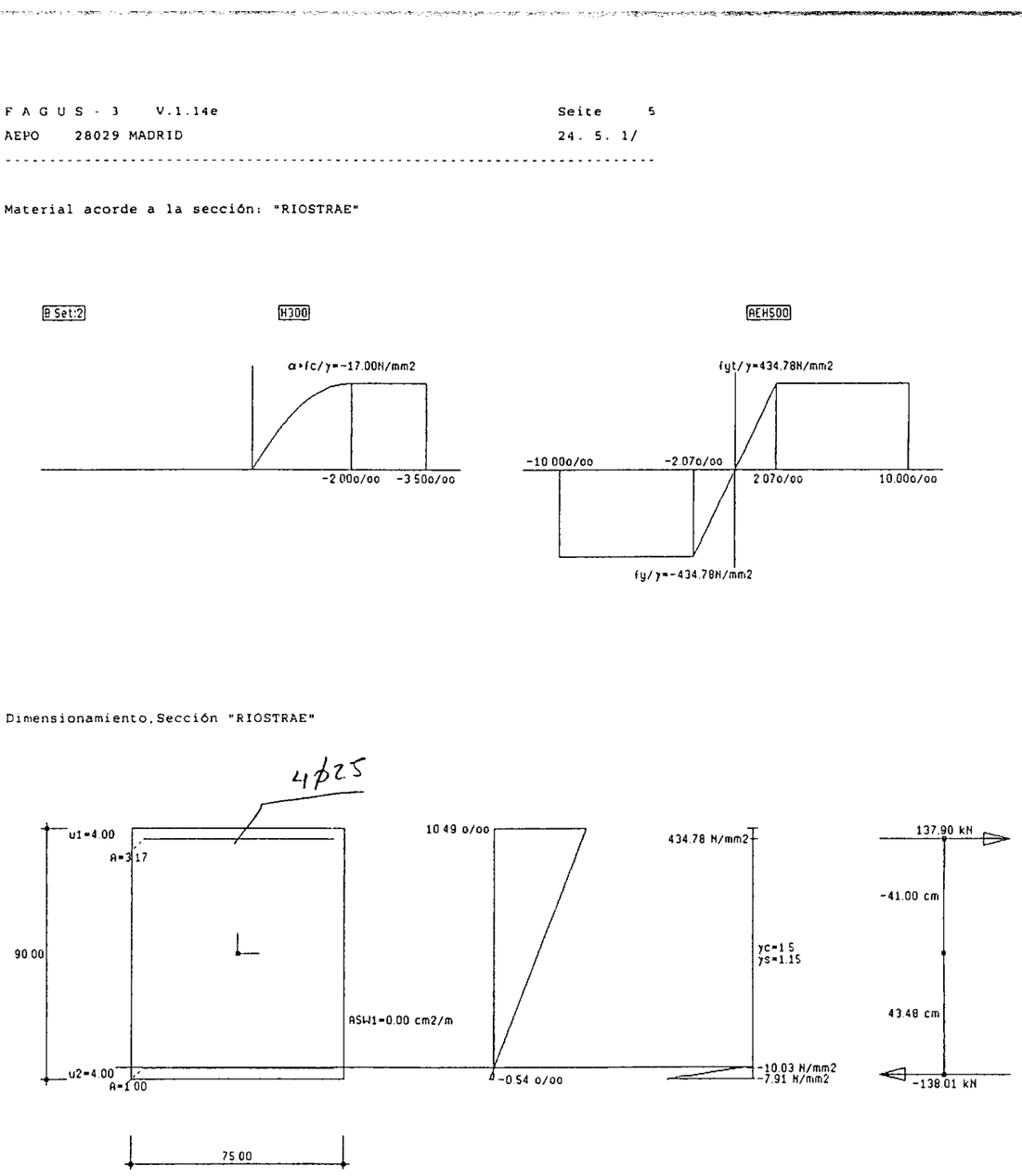
Sección RIOSTRAE



Material acorde a la sección: "RIOSTRAE"

Dimensionamiento, Sección "RIOSTRAE"

4 Ø 25



CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título: Riotra de estribos
Fecha: 24/5/01 13.46.18

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 75 cm, alto 90 cm y canto 86 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 96 T
Cortante reducido a un canto útil del borde del apoyo = 80 T
Axil de cálculo (Tracciones positivas) = -50 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 56 cm2 lo que implica una cuantía geométrica igual a 0.00868
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 96 T < Vu1 = 387.00 T
Es necesario disponer armadura a cortante al ser Vrd = 80.00 T > Vu2 = 42.01 T
Valores de las tensiones: Eje X = -7.41 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 41.80°
Vcu = 29.30 T. Vsu= 50.70 T.
As cálculo = 16.38 cm2/m. As mínima = 7.50 cm2/m
Mínimo de armadura a disponer = 16.38 cm2/m

$$A_{st} = \frac{0.865\,m}{0.15\,m} \times 2 \times 2 \times 0.78\,cm^2 = 18\,cm^2$$

2 cercos ϕ 10 a 0.15 m

Plane (2-D) frame -analysis

STRUCTURAL - DATA

RIOSTRA PILAS

Project title :

JOINT DATA : (7 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000	B B	B	
2	0.391667	0.000000	0.000000			
3	0.783333	0.000000	0.000000			
4	1.175000	0.000000	0.000000			
5	1.566667	0.000000	0.000000			
6	1.958333	0.000000	0.000000			
7	2.350000	0.000000	0.000000			

BAR DATA : (6 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	2	0.391667	RIOSPIL			oS
2	2	3	0.391667	RIOSPIL			oS
3	3	4	0.391667	RIOSPIL			oS
4	4	5	0.391667	RIOSPIL			oS
5	5	6	0.391667	RIOSPIL			oS
6	6	7	0.391667	RIOSPIL			oS

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2] / zl [M1]	Iy [M4] / zu [M1]	Fz [M2]
RIOSPIL	1.8000E+00 / -0.4500	1.2150E-01 / 0.4500	1.5000E+00

CS-Name	Ax [M2] / zl [M1]	Iy [M4] / zu [M1]	Fz [M2]

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 .. 6	3.5500E+06	1.3000E+06

STS-Run ok

Load case 1: cargas permanentes

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-50.280		Stab 1 .. 6

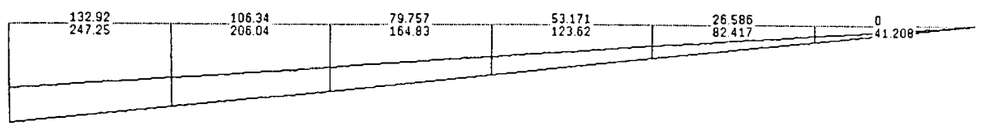
Load case 2: sobrecargas maximas

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-24.890		Stab 1 .. 6

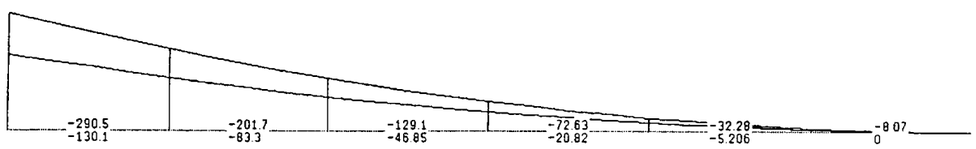
ENVELOPE SPECIFIC.: AA ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		cargas permanentes
B	PLUS	2	1.500		sobrecargas maximas

Scale 1 : 15.3
Int. Forces envelope Vz, GWSP AA, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 1.00E-03
  min: 2.66E-07 max: 1.60E+02 [t]
- Envelope Shear force Vz-max, Scale 1.00E-03
  min: 4.12E-07 max: 2.47E+02 [t]
- (: envelopes [t]



Scale 1 : 15.3
Int. Forces envelope My, GWSP AA, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 1.00E-03
  min: -2.91E+02 max: 2.65E-13 [tm]
- Envelope Moment My-max, Scale 1.00E-03
  min: -1.87E+02 max: 1.12E-12 [tm]
- (: envelopes [tm]



Características mecánicas Sección "RIOSPIL" (sin coef. homogeneiz.)

Area	Ax = 18.00E3 cm2		
Momento de inercia	Iy = 12.15E6 cm4	Iz = 60.00E6 cm4	Ip = 72.15E6 cm4
Const. de torsión			Ix = 34.87E6 cm4
Momento estático	Zy =405.00E3 cm3	Zz = 900.00E3 cm3	
Baricentro	ys = -0.00 cm	zs = 45.00 cm	Angulo= 0.0 Grad
Dist. al borde	yl = -100.00 cm	yr = 100.00 cm	
	zo = 45.00 cm	zu = -45.00 cm	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSPIL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	18000.0	580.000	3.49E+07	1)

Puntos de contorno [cm]:
1 100.00 0.00 2 100.00 90.00 3 -100.00 90.00
4 -100.00 0.00

Armadura "B1" As-tot =2.00 cm2 (0.01 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-96.00	86.00
					96.00	86.00
BOTTOM / RQS	AEH500	10.0	2	1.00	-96.00	4.00
					96.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	200.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	192.00	-96.00	45.00	96.00	45.00
SWT	Torsion	200.00	90.00	0.00	0.00	0.00	90.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "RIOSPIL"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-2905.00	0.00	

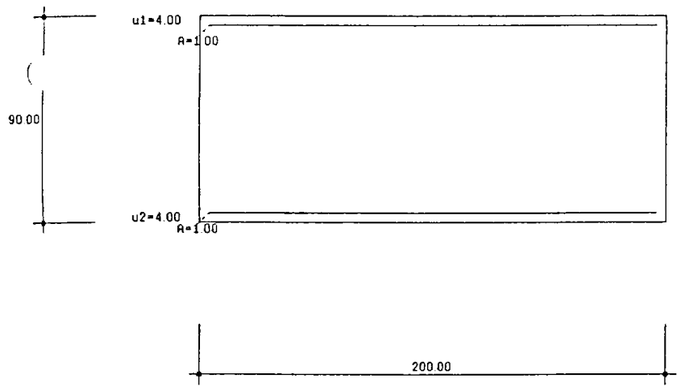
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-96.00	86.00	96.00	86.00	1.00	83.30	83.30
AEH500	-96.00	4.00	96.00	4.00	1.00	----	1.00

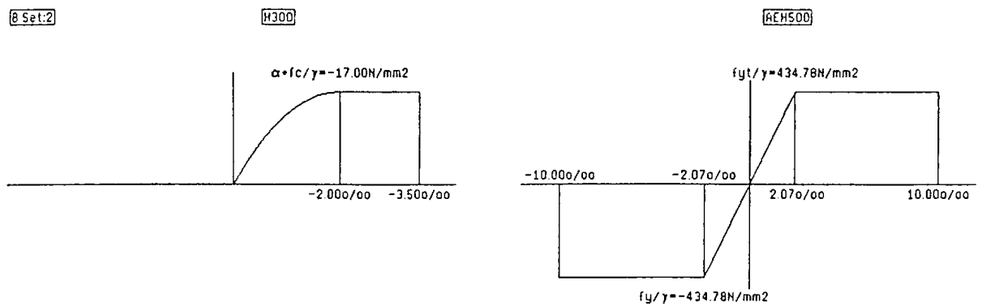
x.x/h = 0.18 As-top/bot = 83.30/1.00 As = 0.47 % = 84.30

$(10\phi25 + 10\phi25) = 98.20 cm^2$

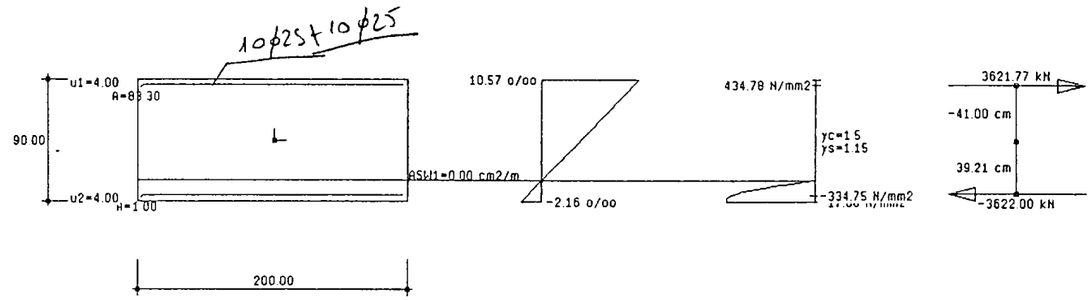
cción RIOSPIL



aterial acorde a la sección: "RIOSPIL"



Dimensionamiento, Sección "RIOSPIL"



CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título: Riotra de pilas
Fecha: 24/5/01 13.48.28

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 200 cm, alto 90 cm y canto 86 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 247 T
Cortante reducido a un canto útil del borde del apoyo = 247 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 98 cm2 lo que implica una cuantía geométrica igual a 0.00570
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 247 T < Vu1 = 1032.00 T
Es necesario disponer armadura a cortante al ser Vrd = 247.00 T > Vu2 = 80.42 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°
Vcu = 67.01 T. Vsu= 179.99 T.
As cálculo = 58.14 cm2/m. As mínima = 20.00 cm2/m
Mínimo de armadura a disponer = 58.14 cm2/m

$$A_{st} = \frac{0.865\,m}{0.10\,m} \cdot 4 \times 2 \times 1.13\,cm^2 = 78.19\,cm^2$$

4 c ϕ12 /0.10

2.3.5. Reacciones y cálculo de neoprenos en planta

PS 315+880

CARACTERÍSTICAS DE LOS NEOPRENOS

APOYOS	DIMENSIONES	δadm.	OBSERVACION
	mm	mm	
E-1	200 x 400 x 52 (37)	25.9	
E-2	200 x 400 x 52 (37)	25.9	

RESUMEN DE LOS DESPLAZAMIENTOS DE LOS APARATOS DE APOYO

APOYOS	DESPLAZAMIENTOS (mm)							
	Reológicos	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{H1}	δ_{H2}	δadm.
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\,C/SC}$	mm	mm	mm
E-1	6.42	8.00	6.65	0.00	21.00	18.95	25.93	25.90
E-2	6.42	8.00	6.65	0.00	21.00	18.95	25.93	25.90

$\delta_{H1} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (0{,}5 \times 0.6 \times \delta_{V\,C/SC})^2)^{0,5}$

$\delta_{H2} = ((\delta_R + 0.6 \times \delta_T + 0.6\ \delta_F)^2 + (\delta_{V\,C/SC})^2)^{0,5}$

RESUMEN DE LOS DESPLAZAMIENTOS DE LAS JUNTAS DE DILATACION

	DESPLAZAMIENTOS (mm)				
APOYOS	Reológicos	Térmicos	Frenado	δ_{MAX}	δ_{MIN}
	δ_R	δ_T	δ_F	mm	mm
E-1	6.42	8.00	6.65	21	15
E-2	6.42	8.00	6.65	21	15

J.D. ESTRIBOS DE 30 mm DE RECORRIDO, CON 15 mm DE APERTURA INICIAL

COMPROBACION DE TENSIONES DE LOS APARATOS DE APOYO

ESTRIBO 1 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) :	100.9	σ_{max} (tm^{-2}) =	1261	$< 1500\ tm^{-2}$
REACCION MINIMA (t):	16.00	σ_{min} (tm^{-2}) =	200	$> 200\ tm^{-2}$

ESTRIBO 2 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) :	101.12	σ_{max} (tm^{-2}) =	1264	$< 1500\ tm^{-2}$
REACCION MINIMA (t):	16.00	σ_{min} (tm^{-2}) =	200	$> 200\ tm^{-2}$

RESUMEN DE LAS FUERZAS HORIZONTALES

APOYOS	FUERZAS HORIZONTALES (t)					Resultante
	Reológicas	Térmicas	Frenado	Viento (s/S.C.)	Viento (c/S.C.)	
	F_R	F_T	F_F	$F_{V\ S/SC}$	$F_{V\ C/SC}$	F_{FT}
E-1	1.45	1.80	1.53	1.90	4.90	4.3
E-2	1.45	1.80	1.53	1.90	4.90	4.3

CALCULO DE LAS RIGIDECES PARA STATIK3

APOYOS	RIGIDECES HORIZONTALES (t/m)						
	ALTURA PILAR	I PILAR	E PILAR	F APOYO	T APOYO	K LONG	K TRANSV
E-1	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59
E-2	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59

RESUMEN DE LOS DESPLAZAMIENTOS TOTALES (APOYOS+PILARES)

APOYOS	DESPLAZAMIENTOS (mm)						
	Reológicos+Acort. Elas	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{H1}	δ_{H2}
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm
E-1	6.42	8.00	6.65	0.00	21.00	18.95	25.93
E-2	6.42	8.00	6.65	0.00	21.00	18.95	25.93

$\delta_{H1} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (0{,}5 \times 0.6 \times \delta_{V\ C/SC})^2)^{0,5}$

$\delta_{H2} = ((\delta_R + 0.6 \times \delta_T + 0.6\ \delta_F)^2 + (\delta_{V\ C/SC})^2)^{0,5}$

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000		SOB UNIF 5
AZ	PLUS	11	1.000		VEHICULO HIPOTESIS 11
BA	OR	12	1.000		VEHICULO HIPOTESIS 12
BB	OR	13	1.000		VEHICULO HIPOTESIS 13
BC	OR	14	1.000		VEHICULO HIPOTESIS 14
BD	OR	15	1.000		VEHICULO HIPOTESIS 15
BE	OR	16	1.000		VEHICULO HIPOTESIS 16
BF	OR	17	1.000		VEHICULO HIPOTESIS 17
BG	OR	18	1.000		VEHICULO HIPOTESIS 18
BH	OR	19	1.000		VEHICULO HIPOTESIS 19
BI	OR	20	1.000		VEHICULO HIPOTESIS 20
BJ	OR	21	1.000		VEHICULO HIPOTESIS 21
BK	OR	22	1.000		VEHICULO HIPOTESIS 22
BL	OR	23	1.000		VEHICULO HIPOTESIS 23
BM	OR	24	1.000		VEHICULO HIPOTESIS 24
BN	OR	25	1.000		VEHICULO POSICION 25
BO	OR	26	1.000		VEHICULO POSICION 26
BP	OR	27	1.000		VEHICULO POSICION 27
BQ	OR	28	1.000		VEHICULO POSICION 28
BR	OR	29	1.000		VEHICULO POSICION 29
BS	OR	30	1.000		VEHICULO POSICION 30
BT	OR	31	1.000		VEHICULO POSICION 31
BU	OR	32	1.000		VEHICULO POSICION 32
BV	OR	33	1.000		VEHICULO POSICION 33
BW	OR	34	1.000		VEHICULO POSICION 34
BX	OR	35	1.000		VEHICULO POSICION 35
BY	OR	36	1.000		VEHICULO POSICION 36
BZ	OR	37	1.000		VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000		FRENADO
CB	PLUS	63	0.300000		VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000		TEMPERATURA (-)
CD	OR	65	0.600000		TEMPERATURA (+)
CE	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
CF	PERM.	1	1.000		PESO PROPIO
CG	PL.PERM	2	1.500		PESO PAVIMENTO
CH	OR	2	1.000		PESO PAVIMENTO
CI	PL.PERM	3	1.000		PESO BARRERAS
CJ	PLUS	46	1.000		SOB UNIF VANO 1
CK	PLUS	47	1.000		SOB UNIF VANO 2
CL	PLUS	48	1.000		SOB UNIF VANO 3
CM	PLUS	11	1.000		VEHICULO HIPOTESIS 11
CN	OR	12	1.000		VEHICULO HIPOTESIS 12
CO	OR	13	1.000		VEHICULO HIPOTESIS 13
CP	OR	14	1.000		VEHICULO HIPOTESIS 14
CQ	OR	15	1.000		VEHICULO HIPOTESIS 15
CR	OR	16	1.000		VEHICULO HIPOTESIS 16
CS	OR	17	1.000		VEHICULO HIPOTESIS 17
CT	OR	18	1.000		VEHICULO HIPOTESIS 18
CU	OR	19	1.000		VEHICULO HIPOTESIS 19
CV	OR	20	1.000		VEHICULO HIPOTESIS 20
CW	OR	21	1.000		VEHICULO HIPOTESIS 21
CX	OR	22	1.000		VEHICULO HIPOTESIS 22
CY	OR	23	1.000		VEHICULO HIPOTESIS 23
CZ	OR	24	1.000		VEHICULO HIPOTESIS 24

DA	OR	25	1.000		VEHICULO POSICION 25
DB	OR	26	1.000		VEHICULO POSICION 26
DC	OR	27	1.000		VEHICULO POSICION 27
DD	OR	28	1.000		VEHICULO POSICION 28
DE	OR	29	1.000		VEHICULO POSICION 29
DF	OR	30	1.000		VEHICULO POSICION 30
DG	OR	31	1.000		VEHICULO POSICION 31
DH	OR	32	1.000		VEHICULO POSICION 32
DI	OR	33	1.000		VEHICULO POSICION 33
DJ	OR	34	1.000		VEHICULO POSICION 34
DK	OR	35	1.000		VEHICULO POSICION 35
DL	OR	36	1.000		VEHICULO POSICION 36
DM	OR	37	1.000		VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000		FRENADO
DO	PLUS	63	0.300000		VIENTO TRANSV CON SOB
DP	PLUS	64	0.600000		TEMPERATURA (-)
DQ	OR	65	0.600000		TEMPERATURA (+)
DR	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
DS	PERM.	1	1.000		PESO PROPIO
DT	PL.PERM	2	1.500		PESO PAVIMENTO
DU	OR	2	1.000		PESO PAVIMENTO
DV	PL.PERM	3	1.000		PESO BARRERAS
DW	PL.PERM	5	1.000		RETRACCION
DX	PLUS	46	1.000		SOB UNIF VANO 1
DY	PLUS	47	1.000		SOB UNIF VANO 2
DZ	PLUS	48	1.000		SOB UNIF VANO 3
EA	PLUS	11	1.000		VEHICULO HIPOTESIS 11
EB	OR	12	1.000		VEHICULO HIPOTESIS 12
EC	OR	13	1.000		VEHICULO HIPOTESIS 13
ED	OR	14	1.000		VEHICULO HIPOTESIS 14
EE	OR	15	1.000		VEHICULO HIPOTESIS 15
EF	OR	16	1.000		VEHICULO HIPOTESIS 16
EG	OR	17	1.000		VEHICULO HIPOTESIS 17
EH	OR	18	1.000		VEHICULO HIPOTESIS 18
EI	OR	19	1.000		VEHICULO HIPOTESIS 19
EJ	OR	20	1.000		VEHICULO HIPOTESIS 20
EK	OR	21	1.000		VEHICULO HIPOTESIS 21
EL	OR	22	1.000		VEHICULO HIPOTESIS 22
EM	OR	23	1.000		VEHICULO HIPOTESIS 23
EN	OR	24	1.000		VEHICULO HIPOTESIS 24
EO	OR	25	1.000		VEHICULO POSICION 25
EP	OR	26	1.000		VEHICULO POSICION 26
EQ	OR	27	1.000		VEHICULO POSICION 27
ER	OR	28	1.000		VEHICULO POSICION 28
ES	OR	29	1.000		VEHICULO POSICION 29
ET	OR	30	1.000		VEHICULO POSICION 30
EU	OR	31	1.000		VEHICULO POSICION 31
EV	OR	32	1.000		VEHICULO POSICION 32
EW	OR	33	1.000		VEHICULO POSICION 33
EX	OR	34	1.000		VEHICULO POSICION 34
EY	OR	35	1.000		VEHICULO POSICION 35
EZ	OR	36	1.000		VEHICULO POSICION 36
FA	OR	37	1.000		VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000		FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOE
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.091	-3.683	20.036				
	1.761	1.141	100.469				
	Min: AP AR AS AT AX AY BU...			Max: A E D E F G J AL AN AO			
10	2.283	-3.686	16.626				
	-0.568555	1.138	97.227				
	Min: AP AR AS AT AU AV BC...			Max: A E D G H I AB AN AO			
156	-1.091	2.568	20.407				
	1.761	-2.257	100.840				
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.			
160	2.283	2.571	16.997				
	-0.568596	-2.254	97.599				
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...			
166	3.374	-1.935	218.118	15.604	23.708	-0.028301	
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09	
	Min: CF CH CI CL DC DN DO...			Max: DS DT DV DW DX DY EM...			
167	3.374	-1.829	219.077	9.951	23.708	0.028301	
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09	
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EG...			

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.091	-3.683	26.641				
	2.283	1.009	60.789				
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F M AL AN			
10	-1.090	1.006	57.547				
	2.284	-3.686	23.231				
	Min: A C D H I AE AN			Max: AP AQ AS AT AU AV AW...			
156	-1.091	2.567	27.013				
	2.283	-2.125	61.160				
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F O AK AL AN			
160	-1.091	-2.122	57.919				
	2.284	2.570	23.603				
	Min: A C D H I AG AK AN			Max: AP AQ AS AT AU AV AW...			
166	-2.615	3.395	313.122	-17.884	-3.159	0.221212	
	5.989	-4.252	319.171	36.214	26.867	-0.249513	
	Min: A C D E F M AN			Max: AP AQ AS AT AW AX AY...			
167	-2.615	-7.158	314.081	43.438	-3.159	-0.221212	

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
	5.989	0.488287	320.130	-10.660	26.867	0.249513	
	Min: A C D E F O AK AN			Max: AP AQ AS AT AW AX AY...			

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-0.167731	-3.836	34.498				
	0.835704	1.280	53.022				
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DO DQ...			
10	1.360	-3.839	31.086				
	0.356995	1.277	49.781				
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR			
156	0.835745	-2.396	53.394				
	-0.167690	2.720	34.870				
	Min: CF CH CI CL DL DN DO...			Max: DS DT DV DW DX DY ET...			
160	0.356954	-2.393	50.152				
	1.360	2.723	31.460				
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EE...			
166	3.374	-8.324	297.858	52.598	23.708	-0.028301	
	5.36E-09	6.034	296.749	-29.975	2.74E-08	-1.18E-08	
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR			
167	5.35E-09	-9.797	297.708	55.530	2.73E-08	1.16E-08	
	3.374	4.560	298.816	-27.044	23.708	0.028301	
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...			

DEFORMATIONS: **
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]	
2	0	-9.927	-4.388	-1.45E-08	-0.001116	0.000178	-1.26E-05	
		4.745	16.012	-2.36E-09	-0.000181	0.000186	2.63E-05	
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...			
2	1.300	-9.912	15.434	-1.030	-0.000782	-7.75E-05	-1.13E-05	
		4.718	-4.186	-0.728517	-0.000510	0.000188	1.76E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN			
31	0	-9.912	-10.583	-1.061	0.000805	-7.66E-05	1.14E-05	
		4.718	9.037	-0.759594	0.000534	0.000189	-1.75E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN			
31	1.300	-9.927	9.239	-1.74E-08	0.001141	0.000180	1.29E-05	
		4.745	-11.161	-3.23E-09	0.000205	0.000188	-2.61E-05	
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...			

DEFORMATIONS: **
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]	
75	0	-9.759	-1.872	-1.330	-2.92E-05	-0.001310	-1.79E-05	
		4.522	10.104	-1.311	5.37E-06	0.001078	2.09E-05	
		Min: A E D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...			
75	1.300	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05	
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05	
		Min: A E D E F G M AL AN AO			Max: AP AR AS AT AX AY EU...			
76	0	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05	
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05	
		Min: A E D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...			
76	1.700	-9.702	8.576	-3.304	-0.001163	-0.001535	-2.04E-05	
		4.457	-1.219	-2.834	-0.000935	0.001276	2.28E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN			
85	0	-9.702	-3.725	-3.248	0.001143	-0.001535	2.04E-05	
		4.457	6.071	-2.779	0.000916	0.001276	-2.28E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN			
85	1.700	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05	
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05	
		Min: A E D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...			
86	0	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05	
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05	
		Min: A E D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...			
86	1.300	-9.759	6.724	-1.391	-2.60E-06	-0.001310	1.79E-05	
		4.522	-5.252	-1.371	-3.72E-05	0.001078	-2.09E-05	
		Min: A B D E F G O AK AL AN.			Max: AP AR AS AT AX AY BW...			
130	0	-9.931	16.026	-1.74E-09	-0.000134	-0.000184	-2.10E-05	
		4.741	-4.375	-1.39E-08	-0.001072	-0.000176	1.79E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN			
130	1.300	-9.911	-4.173	-0.659427	-0.000459	-0.000213	-1.24E-05	
		4.719	15.447	-0.965400	-0.000733	5.27E-05	1.65E-05	
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...			
159	0	-9.911	9.024	-0.690504	0.000482	-0.000214	1.23E-05	
		4.719	-10.596	-0.996477	0.000756	5.17E-05	-1.66E-05	
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...			
159	1.300	-9.931	-11.174	-2.41E-09	0.000158	-0.000186	2.07E-05	
		4.741	9.226	-1.66E-08	0.001096	-0.000178	-1.82E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN			

DEFORMATIONS: ""
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

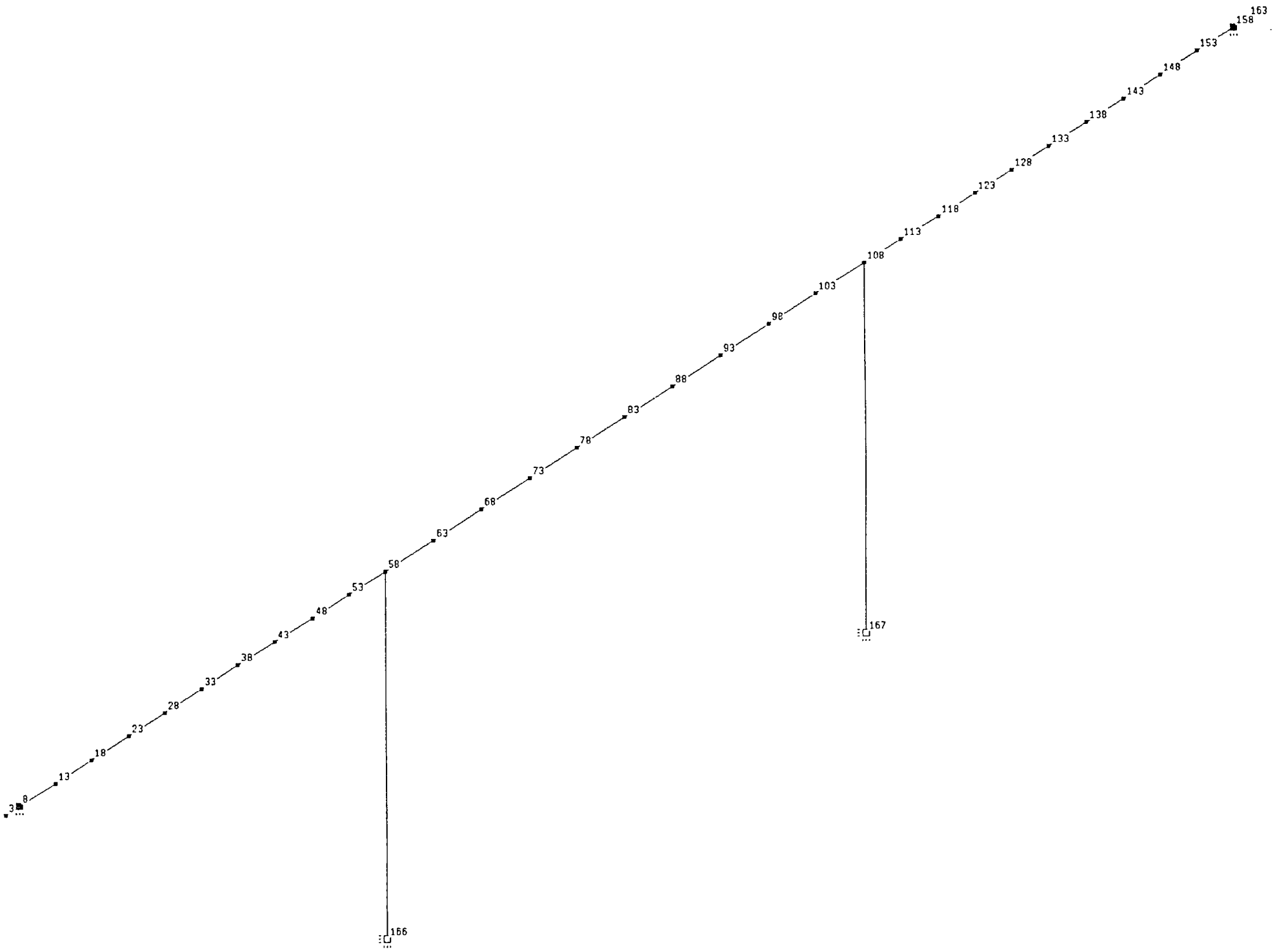
Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-3.633	-5.566	-1.43E-08	-0.001098	0.000283	2.93E-05
		0.729265	16.677	-9.22E-05	-0.000709	0.000154	-2.00E-05
	Min:	CF CH CI CJ DF DO DQ...		Max:	DS DT DV DW DY DZ EZ...		
2	1.300	-3.666	-5.281	-1.474	-0.001105	0.000194	2.26E-05
		0.755751	16.016	-0.908772	-0.000646	7.11E-05	-2.06E-05
	Min:	CF CH CI CJ DF DO DQ...		Max:	DS DT DV DW DY DZ EZ...		
31	0	0.755785	-11.165	-0.939849	0.000669	7.20E-05	2.07E-05
		-3.666	10.132	-1.505	0.001128	0.000195	-2.25E-05
	Min:	DS DT DV DW DX DY ET...		Max:	CF CH CI CL DL DN DO...		
31	1.300	0.729085	-11.826	-1.07E-08	0.000733	0.000156	2.02E-05
		-3.634	10.417	-1.63E-08	0.001122	0.000285	-2.91E-05
	Min:	DS DT DV DW DX DY ET...		Max:	CF CH CI CL DL DN DO...		
75	0	-5.237	-2.959	-2.341	0.000825	-0.000232	2.96E-06
		-1.03E-09	10.666	-0.931812	-8.42E-05	7.32E-13	7.37E-13
	Min:	CF CH CI CJ CW DO DQ		Max:	DS DT DV DW DY DZ EQ...		
75	1.300	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
	Min:	CF CH CI CJ CW DO DQ		Max:	DS DT DV DW DY DZ EQ...		
76	0	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
	Min:	CF CH CI CJ CW DO DQ		Max:	DS DT DV DW DY DZ EQ...		
76	1.700	-5.245	-2.305	-1.599	-0.000298	-0.000260	2.44E-06
		-4.04E-09	9.138	-2.679	-0.000971	6.64E-13	1.02E-12
	Min:	CF CH CI CJ CW DO DQ		Max:	DS DT DV DW DY DZ EQ...		
85	0	-3.98E-09	-4.286	-2.623	0.000951	6.61E-13	-1.01E-12
		-5.245	7.157	-1.544	0.000279	-0.000260	-2.44E-06
	Min:	DS DT DV DW DX DY EK...		Max:	CF CH CI CL DC DN DO...		
85	1.700	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
	Min:	DS DT DV DW DX DY EK...		Max:	CF CH CI CL DC DN DO...		
86	0	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
	Min:	DS DT DV DW DX DY EK...		Max:	CF CH CI CL DC DN DO...		
86	1.300	-1.08E-09	-5.814	-0.992653	5.24E-05	7.30E-13	-7.10E-13
		-5.237	7.810	-2.402	-0.000856	-0.000232	-2.96E-06
	Min:	DS DT DV DW DX DY EK...		Max:	CF CH CI CL DC DN DO...		
130	0	-1.552	-5.553	-1.37E-08	-0.001054	-0.000282	-2.40E-05
		-5.915	16.691	-8.59E-09	-0.000661	-0.000152	2.53E-05
	Min:	CF CH CI CJ CN DQ DR		Max:	DS DT DV DW DY DZ EH...		
130	1.300	-1.526	-5.268	-1.409	-0.001057	-0.000219	-1.74E-05
		-5.949	16.029	-0.839682	-0.000594	-9.58E-05	2.59E-05
	Min:	CF CH CI CJ CN DQ DR		Max:	DS DT DV DW DY DZ EH...		

DEFORMATIONS: ""
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

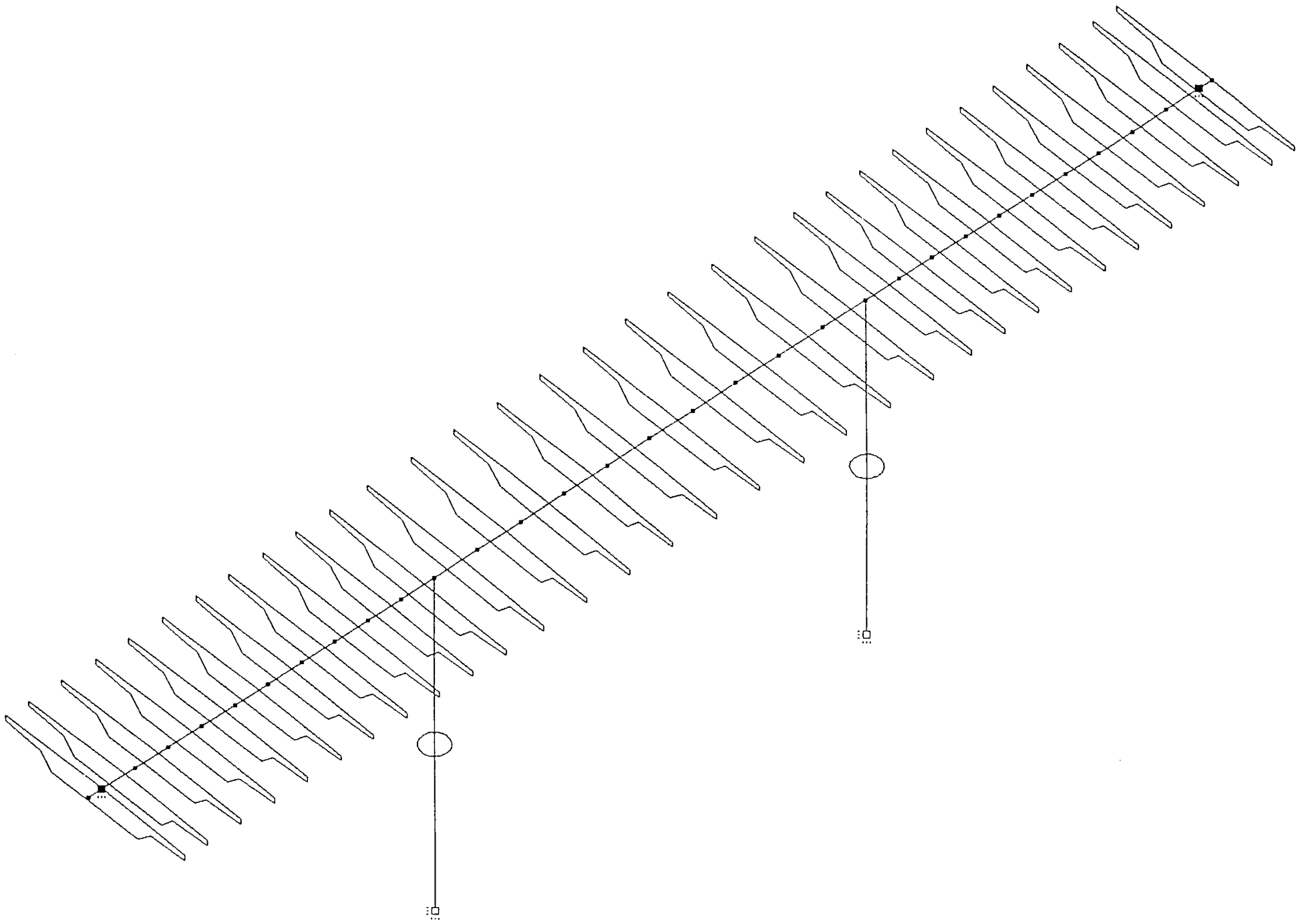
Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
159	0	-5.949	-11.178	-0.870759	0.000617	-9.68E-05	-2.60E-05
		-1.526	10.119	-1.440	0.001080	-0.000220	1.73E-05
	Min:	DS DT DV DW DX DY EE...		Max:	CF CH CI CL CT DN DQ...		
159	1.300	-5.915	-11.839	-9.85E-09	0.000685	-0.000154	-2.56E-05
		-1.552	10.404	-1.55E-08	0.001078	-0.000284	2.37E-05
	Min:	DS DT DV DW DX DY EE...		Max:	CF CH CI CL CT DN DQ...		

2.4. Comprobación Longitudinal del tablero

Scale 1 : 129.0
Structure - GEOMETRIA



Scale 1 : 147.9
Structure - SECCIONES



****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (35 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
3	2.62000	0.00000	0.00000			
8	2.62000	0.50000	0.00000	SSE	FFF	
13	2.62000	1.80000	0.00000			
18	2.62000	3.10000	0.00000			
23	2.62000	4.40000	0.00000			
28	2.62000	5.70000	0.00000			
33	2.62000	7.00000	0.00000			
38	2.62000	8.30000	0.00000			
43	2.62000	9.60000	0.00000			
48	2.62000	10.90000	0.00000			
53	2.62000	12.20000	0.00000			
58	2.62000	13.50000	0.00000			
63	2.62000	15.20000	0.00000			
68	2.62000	16.90000	0.00000			
73	2.62000	18.60000	0.00000			
78	2.62000	20.30000	0.00000			
83	2.62000	22.00000	0.00000			
88	2.62000	23.70000	0.00000			
93	2.62000	25.40000	0.00000			
98	2.62000	27.10000	0.00000			
103	2.62000	28.80000	0.00000			
108	2.62000	30.50000	0.00000			
113	2.62000	31.80000	0.00000			
118	2.62000	33.10000	0.00000			
123	2.62000	34.40000	0.00000			
128	2.62000	35.70000	0.00000			
133	2.62000	37.00000	0.00000			
138	2.62000	38.30000	0.00000			
143	2.62000	39.60000	0.00000			
148	2.62000	40.90000	0.00000			
153	2.62000	42.20000	0.00000			
158	2.62000	43.50000	0.00000	SSE	FFF	
163	2.62000	44.00000	0.00000			
166	2.62000	13.50000	-13.20000	BBE	BBE	
167	2.62000	30.50000	-13.20000	BBE	BBE	

ELASTICALLY SUPPORTED JOINTS: ('B'=Fixed 'F'=Free)

Joint	V-X [T/M]	V-Y [T/M]	V-Z [T/M]	R-X [TM/ARC]	R-Y [TM/ARC]	R-Z [TM/ARC]
8	3.892E+02	3.892E+02	E	F	F	F
158	3.892E+02	3.892E+02	E	F	F	F

B A R D A T A : (34 bars)

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
65	3	8	0.50000	TABAPOYO			oS
66	8	13	1.30000	TABAPOYO			oS
67	13	18	1.30000	TABAPOYO			oS
68	18	23	1.30000	TABAPOYO			oS
69	23	28	1.30000	TABAPOYO			oS
70	28	33	1.30000	TABAPOYO			oS
71	33	38	1.30000	TABAPOYO			oS
72	38	43	1.30000	TABAPOYO			oS
73	43	48	1.30000	TABAPOYO			oS
74	48	53	1.30000	TABAPOYO			oS
75	53	58	1.30000	TABAPOYO			oS
76	58	63	1.70000	TABAPOYO			oS
77	63	68	1.70000	TABAPOYO			oS
78	68	73	1.70000	TABAPOYO			oS
79	73	78	1.70000	TABAPOYO			oS
80	78	83	1.70000	TABAPOYO			oS
81	83	88	1.70000	TABAPOYO			oS
82	88	93	1.70000	TABAPOYO			oS
83	93	98	1.70000	TABAPOYO			oS
84	98	103	1.70000	TABAPOYO			oS
85	103	108	1.70000	TABAPOYO			oS
86	108	113	1.30000	TABAPOYO			oS
87	113	118	1.30000	TABAPOYO			oS
88	118	123	1.30000	TABAPOYO			oS
89	123	128	1.30000	TABAPOYO			oS
90	128	133	1.30000	TABAPOYO			oS
91	133	138	1.30000	TABAPOYO			oS
92	138	143	1.30000	TABAPOYO			oS
93	143	148	1.30000	TABAPOYO			oS
94	148	153	1.30000	TABAPOYO			oS
95	153	158	1.30000	TABAPOYO			oS
96	158	163	0.50000	TABAPOYO			oS
290*	166	58	13.20000	PILAS			oS
291*	167	108	13.20000	PILAS			oS

Bars marked with '*' are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2] / Ix [M4] / zl [M1]	Iy [M4] / Fy [M2] / zu [M1]	Iz [M4] / Fz [M2] / yl [M1]	Phi [Degr] / yr [M1]
PILAS	7.8576E-01 / 9.8175E-02 / -0.5000	4.9180E-02 / 7.8576E-01 / 0.5000	4.9086E-02 / 7.8576E-01 / -0.5000	0.00 / 0.5000
TABAPOYO	4.6531E+00 / 5.0835E-01 / -0.4986	2.8617E-01 / 4.6531E+00 / 0.4014	1.3718E+01 / 4.6531E+00 / -3.8500	0.00 / 3.8500

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
65 .. 291	3.2900E+06	1.3700E+06

STS-Run ok

****
Load case 1: PESO PROPIC
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Mas.forcZ gl const.	-2.500		Stab 65 .. 96

****
Load case 2: PESO PAVIMENTO
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.553006		Stab 65 .. 96

****
Load case 3: PESO BARRERAS
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-2.046		Stab 65 .. 96

****
Load case 5: RETRACCION
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000292		Stab 65 .. 96

****
Load case 6: SOE UNIF 1
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 65 .. 75

****
Load case 7: SOBRECARGA UNIF 2
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 76 .. 85

****
Load case 8: SOE UNIF 3
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 86 .. 96

****
Load case 9: SOB UNIF EXC
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-1.600		Stab 65
Moment X lo const.	-3.080		Stab 65
Force Z gl const.	-1.600		Stab 66
Moment X lo const.	-3.080		Stab 66
Force Z gl const.	-1.600		Stab 67
Moment X lo const.	-3.080		Stab 67
Force Z gl const.	-1.600		Stab 68
Moment X lo const.	-3.080		Stab 68
Force Z gl const.	-1.600		Stab 69
Moment X lo const.	-3.080		Stab 69
Force Z gl const.	-1.600		Stab 70
Moment X lo const.	-3.080		Stab 70
Force Z gl const.	-1.600		Stab 71
Moment X lo const.	-3.080		Stab 71
Force Z gl const.	-1.600		Stab 72
Moment X lo const.	-3.080		Stab 72
Force Z gl const.	-1.600		Stab 73
Moment X lo const.	-3.080		Stab 73
Force Z gl const.	-1.600		Stab 74
Moment X lo const.	-3.080		Stab 74
Force Z gl const.	-1.600		Stab 75
Moment X lo const.	-3.080		Stab 75
Force Z gl const.	-1.600		Stab 76
Moment X lo const.	-3.080		Stab 76
Force Z gl const.	-1.600		Stab 77
Moment X lo const.	-3.080		Stab 77
Force Z gl const.	-1.600		Stab 78
Moment X lo const.	-3.080		Stab 78
Force Z gl const.	-1.600		Stab 79
Moment X lo const.	-3.080		Stab 79
Force Z gl const.	-1.600		Stab 80
Moment X lo const.	-3.080		Stab 80
Force Z gl const.	-1.600		Stab 81
Moment X lo const.	-3.080		Stab 81
Force Z gl const.	-1.600		Stab 82
Moment X lo const.	-3.080		Stab 82
Force Z gl const.	-1.600		Stab 83
Moment X lo const.	-3.080		Stab 83
Force Z gl const.	-1.600		Stab 84
Moment X lo const.	-3.080		Stab 84
Force Z gl const.	-1.600		Stab 85
Moment X lo const.	-3.080		Stab 85
Force Z gl const.	-1.600		Stab 86
Moment X lo const.	-3.080		Stab 86
Force Z gl const.	-1.600		Stab 87
Moment X lo const.	-3.080		Stab 87
Force Z gl const.	-1.600		Stab 88
Moment X lo const.	-3.080		Stab 88
Force Z gl const.	-1.600		Stab 89

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Moment	X	lo const.	-3.080		Stab 89
Force	Z	gl const.	-1.600		Stab 90
Moment	X	lo const.	-3.080		Stab 90
Force	Z	gl const.	-1.600		Stab 91
Moment	X	lo const.	-3.080		Stab 91
Force	Z	gl const.	-1.600		Stab 92
Moment	X	lo const.	-3.080		Stab 92
Force	Z	gl const.	-1.600		Stab 93
Moment	X	lo const.	-3.080		Stab 93
Force	Z	gl const.	-1.600		Stab 94
Moment	X	lo const.	-3.080		Stab 94
Force	Z	gl const.	-1.600		Stab 95
Moment	X	lo const.	-3.080		Stab 95
Force	Z	gl const.	-1.600		Stab 96
Moment	X	lo const.	-3.080		Stab 96

Load case 10: SOB UNIF EXC

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Moment	X	lo const.	3.080		Stab 65
Force	Z	lo const.	-1.600		Stab 65
Moment	X	lo const.	3.080		Stab 66
Force	Z	lo const.	-1.600		Stab 66
Moment	X	lo const.	3.080		Stab 67
Force	Z	lo const.	-1.600		Stab 67
Moment	X	lo const.	3.080		Stab 68
Force	Z	lo const.	-1.600		Stab 68
Moment	X	lo const.	3.080		Stab 69
Force	Z	lo const.	-1.600		Stab 69
Moment	X	lo const.	3.080		Stab 70
Force	Z	lo const.	-1.600		Stab 70
Moment	X	lo const.	3.080		Stab 71
Force	Z	lo const.	-1.600		Stab 71
Moment	X	lo const.	3.080		Stab 72
Force	Z	lo const.	-1.600		Stab 72
Moment	X	lo const.	3.080		Stab 73
Force	Z	lo const.	-1.600		Stab 73
Moment	X	lo const.	3.080		Stab 74
Force	Z	lo const.	-1.600		Stab 74
Moment	X	lo const.	3.080		Stab 75
Force	Z	lo const.	-1.600		Stab 75
Moment	X	lo const.	3.080		Stab 76
Force	Z	lo const.	-1.600		Stab 76
Moment	X	lo const.	3.080		Stab 77

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	lo const.	-1.600		Stab 77
Moment	X	lo const.	3.080		Stab 78
Force	Z	lo const.	-1.600		Stab 78
Moment	X	lo const.	3.080		Stab 79
Force	Z	lo const.	-1.600		Stab 79
Moment	X	lo const.	3.080		Stab 80
Force	Z	lo const.	-1.600		Stab 80
Moment	X	lo const.	3.080		Stab 81
Force	Z	lo const.	-1.600		Stab 81
Moment	X	lo const.	3.080		Stab 82
Force	Z	lo const.	-1.600		Stab 82
Moment	X	lo const.	3.080		Stab 83
Force	Z	lo const.	-1.600		Stab 83
Moment	X	lo const.	3.080		Stab 84
Force	Z	lo const.	-1.600		Stab 84
Moment	X	lo const.	3.080		Stab 85
Force	Z	lo const.	-1.600		Stab 85
Moment	X	lo const.	3.080		Stab 86
Force	Z	lo const.	-1.600		Stab 86
Moment	X	lo const.	3.080		Stab 87
Force	Z	lo const.	-1.600		Stab 87
Moment	X	lo const.	3.080		Stab 88
Force	Z	lo const.	-1.600		Stab 88
Moment	X	lo const.	3.080		Stab 89
Force	Z	lo const.	-1.600		Stab 89
Moment	X	lo const.	3.080		Stab 90
Force	Z	lo const.	-1.600		Stab 90
Moment	X	lo const.	3.080		Stab 91
Force	Z	lo const.	-1.600		Stab 91
Moment	X	lo const.	3.080		Stab 92
Force	Z	lo const.	-1.600		Stab 92
Moment	X	lo const.	3.080		Stab 93
Force	Z	lo const.	-1.600		Stab 93
Moment	X	lo const.	3.080		Stab 94
Force	Z	lo const.	-1.600		Stab 94
Moment	X	lo const.	3.080		Stab 95
Force	Z	lo const.	-1.600		Stab 95
Moment	X	lo const.	3.080		Stab 96
Force	Z	lo const.	-1.600		Stab 96

Load case 11: VEHICULO HIPOTESIS 11

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.850000	Stab 66
Moment	X	lo conc.	-30.000	0.850000	Stab 66
Force	Z	gl conc.	-20.000	1.050	Stab 67
Moment	X	lo conc.	-30.000	1.050	Stab 67
Force	Z	gl conc.	-20.000	1.250	Stab 68
Moment	X	lo conc.	-30.000	1.250	Stab 68

Load case 12: VEHICULO HIPOTESIS 12

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	1.100	Stab 69
Force	Z	gl conc.	-20.000	1.300	Stab 70
Force	Z	gl conc.	-20.000	0.200000	Stab 72
Moment	X	lo conc.	-30.000	1.100	Stab 69
Moment	X	lo conc.	-30.000	1.300	Stab 70
Moment	X	lo conc.	-30.000	0.200000	Stab 72

Load case 13: VEHICULO HIPOTESIS 13

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.050000	Stab 73
Force	Z	gl conc.	-20.000	0.250000	Stab 74
Force	Z	gl conc.	-20.000	0.450000	Stab 75
Moment	X	lo conc.	-30.000	0.050000	Stab 73
Moment	X	lo conc.	-30.000	0.250000	Stab 74
Moment	X	lo conc.	-30.000	0.450000	Stab 75

Load case 14: VEHICULO HIPOTESIS 14

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.850000	Stab 76
Force	Z	gl conc.	-20.000	0.650000	Stab 77
Force	Z	gl conc.	-20.000	0.450000	Stab 78
Moment	X	lo conc.	-30.000	0.850000	Stab 76
Moment	X	lo conc.	-30.000	0.650000	Stab 77
Moment	X	lo conc.	-30.000	0.450000	Stab 78

Load case 15: VEHICULO HIPOTESIS 15

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.200000	Stab 80
Force	Z	gl conc.	-20.000	0	Stab 81
Force	Z	gl conc.	-20.000	1.500	Stab 81
Moment	X	lo conc.	-30.000	0.200000	Stab 80
Moment	X	lo conc.	-30.000	0	Stab 81
Moment	X	lo conc.	-30.000	1.500	Stab 81

Load case 16: VEHICULO HIPOTESIS 16

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	1.250	Stab 83
Force	Z	gl conc.	-20.000	1.050	Stab 84
Force	Z	gl conc.	-20.000	0.850000	Stab 85
Moment	X	lo conc.	-30.000	1.250	Stab 83
Moment	X	lo conc.	-30.000	1.050	Stab 84
Moment	X	lo conc.	-30.000	0.850000	Stab 85

Load case 17: VEHICULO HIPOTESIS 17

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.850000	Stab 86
Force	Z	gl conc.	-20.000	1.050	Stab 87
Force	Z	gl conc.	-20.000	1.250	Stab 88
Moment	X	lo conc.	-30.000	0.850000	Stab 86
Moment	X	lo conc.	-30.000	1.050	Stab 87
Moment	X	lo conc.	-30.000	1.250	Stab 88

Load case 18: VEHICULO HIPOTESIS 18

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	1.100	Stab 89
Force	Z	gl conc.	-20.000	1.300	Stab 90
Force	Z	gl conc.	-20.000	0.200000	Stab 92
Moment	X	lo conc.	-30.000	1.100	Stab 89
Moment	X	lo conc.	-30.000	1.300	Stab 90
Moment	X	lo conc.	-30.000	0.200000	Stab 92

Load case 19: VEHICULO HIPOTESIS 19

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.050000	Stab 93
Force	Z	gl conc.	-20.000	0.250000	Stab 94
Force	Z	gl conc.	-20.000	0.450000	Stab 95
Moment	X	lo conc.	-30.000	0.050000	Stab 93
Moment	X	lo conc.	-30.000	0.250000	Stab 94
Moment	X	lo conc.	-30.000	0.450000	Stab 95

Load case 20: VEHICULO HIPOTESIS 20

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.850000	Stab 66
Force	Z	gl conc.	-20.000	1.050	Stab 67
Force	Z	gl conc.	-20.000	1.250	Stab 68

Load case 21: VEHICULO HIPOTESIS 21

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	1.100	Stab 69
Force	Z	gl conc.	-20.000	1.300	Stab 70
Force	Z	gl conc.	-20.000	0.200000	Stab 72

Load case 22: VEHICULO HIPOTESIS 22

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb
Force	Z	gl conc.	-20.000	0.050000	Stab 73
Force	Z	gl conc.	-20.000	0.250000	Stab 74
Force	Z	gl conc.	-20.000	0.450000	Stab 75

Load case 23: VEHICULO HIPOTESIS 23

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	76
Force	Z	gl conc.	-20.000	0.650000	Stab	77
Force	Z	gl conc.	-20.000	0.450000	Stab	78

Load case 24: VEHICULO HIPOTESIS 24

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.200000	Stab	80
Force	Z	gl conc.	-20.000	0	Stab	81
Force	Z	gl conc.	-20.000	1.500	Stab	81

Load case 25: VEHICULO POSICION 25

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.250	Stab	83
Force	Z	gl conc.	-20.000	1.050	Stab	84
Force	Z	gl conc.	-20.000	0.850000	Stab	85

Load case 26: VEHICULO POSICION 26

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	86
Force	Z	gl conc.	-20.000	1.050	Stab	87
Force	Z	gl conc.	-20.000	1.250	Stab	88

Load case 27: VEHICULO POSICION 27

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	89
Force	Z	gl conc.	-20.000	1.300	Stab	90
Force	Z	gl conc.	-20.000	0.200000	Stab	92

Load case 28: VEHICULO POSICION 28

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	93
Force	Z	gl conc.	-20.000	0.250000	Stab	94
Force	Z	gl conc.	-20.000	0.450000	Stab	95

Load case 29: VEHICULO POSICION 29

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	66
Force	Z	gl conc.	-20.000	1.050	Stab	67
Force	Z	gl conc.	-20.000	1.250	Stab	68
Moment	X	lo conc.	30.000	0.850000	Stab	66
Moment	X	lo conc.	30.000	1.050	Stab	67
Moment	X	lo conc.	30.000	1.250	Stab	68

Load case 30: VEHICULO POSICION 30

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	69
Force	Z	gl conc.	-20.000	1.300	Stab	70
Force	Z	gl conc.	-20.000	0.200000	Stab	72
Moment	X	lo conc.	30.000	1.100	Stab	69
Moment	X	lo conc.	30.000	1.300	Stab	70
Moment	X	lo conc.	30.000	0.200000	Stab	72

Load case 31: VEHICULO POSICION 31

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	73
Force	Z	gl conc.	-20.000	0.250000	Stab	74
Force	Z	gl conc.	-20.000	0.450000	Stab	75
Moment	X	lo conc.	30.000	0.050000	Stab	73
Moment	X	lo conc.	30.000	0.250000	Stab	74
Moment	X	lo conc.	30.000	0.450000	Stab	75

Load case 32: VEHICULO POSICION 32

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	76
Force	Z	gl conc.	-20.000	0.650000	Stab	77
Force	Z	gl conc.	-20.000	0.450000	Stab	78
Moment	X	lo conc.	30.000	0.850000	Stab	76
Moment	X	lo conc.	30.000	0.650000	Stab	77
Moment	X	lo conc.	30.000	0.450000	Stab	78

Load case 33: VEHICULO POSICION 33

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.200000	Stab	80
Force	Z	gl conc.	-20.000	0	Stab	81
Force	Z	gl conc.	-20.000	1.500	Stab	81
Moment	X	lo conc.	30.000	0.200000	Stab	80
Moment	X	lo conc.	30.000	0	Stab	81
Moment	X	lo conc.	30.000	1.500	Stab	81

Load case 34: VEHICULO POSICION 34

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.250	Stab	83
Force	Z	gl conc.	-20.000	1.050	Stab	84
Force	Z	gl conc.	-20.000	0.850000	Stab	85
Moment	X	lo conc.	30.000	1.250	Stab	83
Moment	X	lo conc.	30.000	1.050	Stab	84
Moment	X	lo conc.	30.000	0.850000	Stab	85

Load case 35: VEHICULO POSICION 35

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	86
Force	Z	gl conc.	-20.000	1.050	Stab	87
Force	Z	gl conc.	-20.000	1.250	Stab	88
Moment	X	lo conc.	30.000	0.850000	Stab	86
Moment	X	lo conc.	30.000	1.050	Stab	87
Moment	X	lo conc.	30.000	1.250	Stab	88

Load case 36: VEHICULO POSICION 36

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	89
Force	Z	gl conc.	-20.000	1.300	Stab	90
Force	Z	gl conc.	-20.000	0.200000	Stab	92
Moment	X	lo conc.	30.000	1.100	Stab	89
Moment	X	lo conc.	30.000	1.300	Stab	90
Moment	X	lo conc.	30.000	0.200000	Stab	92

Load case 37: VEHICULO HIPOTESIS 37

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	93
Force	Z	gl conc.	-20.000	0.250000	Stab	94
Force	Z	gl conc.	-20.000	0.450000	Stab	95
Moment	X	lo conc.	30.000	0.050000	Stab	93
Moment	X	lo conc.	30.000	0.250000	Stab	94
Moment	X	lo conc.	30.000	0.450000	Stab	95

Load case 60: FRENADO

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	lo const.	0.272700		Stab	65 .. 96

Load case 62: VIENTO TRANSV SIN SOB.

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl const.	-0.260000		Stab	65 .. 96
Force	X	pj const.	-0.200000		Stab	290 .. 291

Load case 63: VIENTO TRANSV CON SOB

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl const.	-0.760000		Stab	65 .. 96
Force	X	pj const.	-0.200000		Stab	290 .. 291

Load case 64: TEMPERATURA (-)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000363		Stab 65 .. 96

Load case 65: TEMPERATURA (+)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	0.000363		Stab 65 .. 96

Load case 66: GRADIENTE

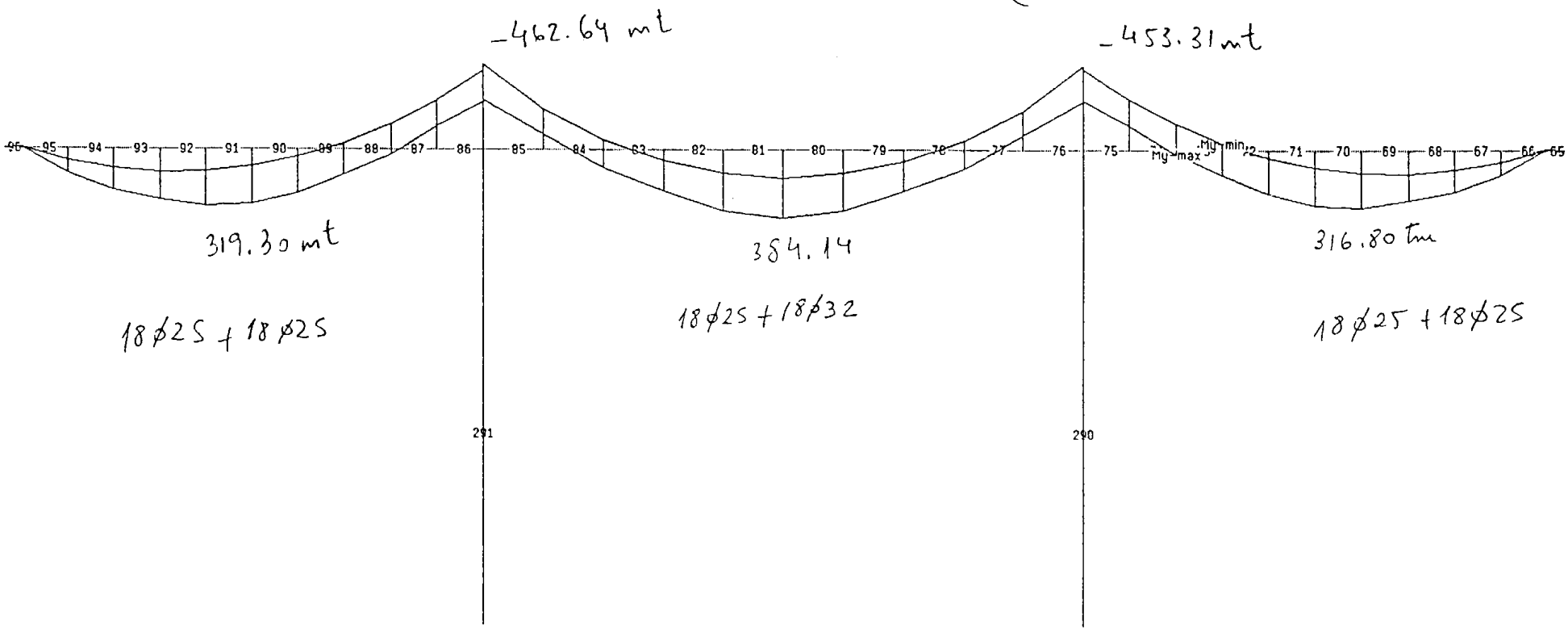
Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Curvat. Y lo const.	0.000170		Stab 65 .. 96

S T

2.4.1.1. Comprobación de estados límitesfisuración

Scale 1 : 173.7
Int. Forces envelope My, GWSP EO (COMBINACION FRECUENTE), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -4.63E+02 max: 1.60E+02 [tm]
- Envelope Moment My-max, Scale 5.00E-03
  min: -2.67E+02 max: 3.84E+02 [tm]

(23φ25+14φ20+φ20/20×7.60m)



ENVELOPE SPECIFIC.: EO 'COMBINACION FRECUENTE'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	0.600000		SOB UNIF 1
F	PLUS	7	0.600000		SOBRECARGA UNIF 2
G	PLUS	8	0.600000		SOB UNIF 3
H	PLUS	11	0.840000		VEHICULO HIPOTESIS 11
I	OR	12	0.840000		VEHICULO HIPOTESIS 12
J	OR	13	0.840000		VEHICULO HIPOTESIS 13
K	OR	14	0.840000		VEHICULO HIPOTESIS 14
L	OR	15	0.840000		VEHICULO HIPOTESIS 15
M	OR	16	0.840000		VEHICULO HIPOTESIS 16
N	OR	17	0.840000		VEHICULO HIPOTESIS 17
O	OR	18	0.840000		VEHICULO HIPOTESIS 18
P	OR	19	0.840000		VEHICULO HIPOTESIS 19
Q	OR	20	0.840000		VEHICULO HIPOTESIS 20
R	OR	21	0.840000		VEHICULO HIPOTESIS 21
S	OR	22	0.840000		VEHICULO HIPOTESIS 22
T	OR	23	0.840000		VEHICULO HIPOTESIS 23
U	OR	24	0.840000		VEHICULO HIPOTESIS 24
V	OR	25	0.840000		VEHICULO POSICION 25
W	OR	26	0.840000		VEHICULO POSICION 26
X	OR	27	0.840000		VEHICULO POSICION 27
Y	OR	28	0.840000		VEHICULO POSICION 28
Z	OR	29	0.840000		VEHICULO POSICION 29
AA	OR	30	0.840000		VEHICULO POSICION 30
AB	OR	31	0.840000		VEHICULO POSICION 31
AC	OR	32	0.840000		VEHICULO POSICION 32
AD	OR	33	0.840000		VEHICULO POSICION 33
AE	OR	34	0.840000		VEHICULO POSICION 34
AF	OR	35	0.840000		VEHICULO POSICION 35
AG	OR	36	0.840000		VEHICULO POSICION 36
AH	OR	37	0.840000		VEHICULO HIPOTESIS 37
AI	PLUS	60	0.600000		FRENADO
AJ	PLUS	63	0.100000		VIENTO TRANSV CON SOB
AK	PLUS	64	0.200000		TEMPERATURA (-)
AL	OR	65	0.200000		TEMPERATURA (+)
AM	PLUS	66	0.200000		GRADIENTE

ALTERNATIVE ENVELOPE :

Group	Spec.	Loadcase	Factor	Stage	Title
AN	PERM.	1	1.000		PESO PROPIO
AO	PL.PERM	2	1.500		PESO PAVIMENTO
AP	OR	2	1.000		PESO PAVIMENTO
AQ	PL.PERM	3	1.000		PESO BARRERAS
AR	PLUS	9	0.600000		SOB UNIF EXC
AS	PLUS	10	0.600000		SOB UNIF EXC
AT	PLUS	11	0.840000		VEHICULO HIPOTESIS 11
AU	OR	12	0.840000		VEHICULO HIPOTESIS 12
AV	OR	13	0.840000		VEHICULO HIPOTESIS 13
AW	OR	14	0.840000		VEHICULO HIPOTESIS 14
AX	OR	15	0.840000		VEHICULO HIPOTESIS 15

AY	OR	16	0.840000		VEHICULO HIPOTESIS 16
AZ	OR	17	0.840000		VEHICULO HIPOTESIS 17
BA	OR	18	0.840000		VEHICULO HIPOTESIS 18
BB	OR	19	0.840000		VEHICULO HIPOTESIS 19
BC	OR	20	0.840000		VEHICULO HIPOTESIS 20
BD	OR	21	0.840000		VEHICULO HIPOTESIS 21
BE	OR	22	0.840000		VEHICULO HIPOTESIS 22
BF	OR	23	0.840000		VEHICULO HIPOTESIS 23
BG	OR	24	0.840000		VEHICULO HIPOTESIS 24
BH	OR	25	0.840000		VEHICULO POSICION 25
BI	OR	26	0.840000		VEHICULO POSICION 26
BJ	OR	27	0.840000		VEHICULO POSICION 27
BK	OR	28	0.840000		VEHICULO POSICION 28
BL	OR	29	0.840000		VEHICULO POSICION 29
BM	OR	30	0.840000		VEHICULO POSICION 30
BN	OR	31	0.840000		VEHICULO POSICION 31
BO	OR	32	0.840000		VEHICULO POSICION 32
BP	OR	33	0.840000		VEHICULO POSICION 33
BQ	OR	34	0.840000		VEHICULO POSICION 34
BR	OR	35	0.840000		VEHICULO POSICION 35
BS	OR	36	0.840000		VEHICULO POSICION 36
BT	OR	37	0.840000		VEHICULO HIPOTESIS 37
BU	PLUS	60	0.600000		FRENADO
BV	PLUS	63	0.100000		VIENTO TRANSV CON SOB
BW	PLUS	64	0.200000		TEMPERATURA (-)
BX	OR	65	0.200000		TEMPERATURA (+)
BY	PLUS	66	0.200000		GRADIENTE

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-8.17E-10	-9.94E-11	-7.25E-08	9.92E-14	-8.29E-13	5.30E-10
		9.01E-13	3.47E-09	-8.08E-08	-1.90E-13	-2.20E-13	-5.00E-10
	Min:	A B D F L AI AK AM		Max:	A C D E G I AL		
65	0.500	-0.081810	3.43E-09	-8.213	1.77E-13	-2.053	1.22E-09
		1.08E-12	3.47E-09	-7.115	-1.90E-13	-1.779	1.23E-09
	Min:	AN AO AQ AR AS AT EU...		Max:	A C D G I AK		
66	0	1.649	-2.767	73.437	3.48E-14	-2.053	-3.80E-08
		-0.630755	-3.255	110.846	-2.68E-14	-1.779	-4.43E-08
	Min:	A B D E F L AI AK		Max:	A C D G H AL AM		
66	1.300	1.501	-2.767	42.637	3.48E-14	65.674	-3.597
		-0.695688	-3.255	84.993	25.200	136.597	-4.231
	Min:	A C D F L AI AK		Max:	A B D E G H AL AM		
67	0	1.501	-2.767	42.637	3.48E-14	65.674	-3.597
		-0.695688	-3.255	84.993	25.200	136.597	-4.231
	Min:	A C D F L AI AK		Max:	A B D E G H AL AM		
67	1.300	1.289	-2.767	24.137	3.48E-14	109.077	-7.194

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.695688	-3.255	46.838	50.400	229.007	-8.463
	Min:	A C D F L AI AK		Max:	A E D E G H AL AM		
68	0	1.289	-2.767	24.137	3.48E-14	109.077	-7.194
		-0.695688	-3.255	46.838	50.400	229.007	-8.463
	Min:	A C D F L AI AK		Max:	A E D E G H AL AM		
68	1.300	1.076	-2.767	5.637	3.48E-14	128.430	-10.791
		-0.795944	-3.255	40.609	4.05E-14	281.248	-12.694
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
69	0	1.076	-2.767	5.637	2.35E-13	128.430	-10.791
		-0.795944	-3.255	40.609	3.18E-13	281.248	-12.694
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
69	1.300	0.863157	-2.767	-12.863	2.35E-13	123.733	-14.388
		-0.795944	-3.255	2.455	25.200	316.800	-16.925
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
70	0	0.863157	-2.767	-12.863	2.40E-13	123.733	-14.388
		-0.795944	-3.255	2.455	25.200	316.800	-16.925
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
70	1.300	0.650451	-2.767	-31.363	2.40E-13	94.986	-17.985
		-0.795944	-3.255	-18.900	25.200	306.110	-21.156
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
71	0	0.650451	-2.767	-31.363	3.23E-14	94.986	-17.985
		-0.795944	-3.255	-35.700	50.400	306.110	-21.156
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
71	1.300	0.437745	-2.767	-49.862	3.23E-14	42.190	-21.583
		-0.795944	-3.255	-57.054	50.400	245.820	-25.388
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
72	0	0.437745	-2.767	-49.862	-2.20E-13	42.190	-21.583
		-0.795944	-3.255	-57.054	50.400	245.820	-25.388
	Min:	A C D F L AI AK		Max:	A E D E G I AL AM		
72	1.300	0.225039	-2.767	-68.362	-2.20E-13	-34.656	-25.180
		-0.795944	-3.255	-95.209	75.600	139.289	-29.619
	Min:	A C D F L AI AK		Max:	A B D E G I AL AM		
73	0	0.225039	-2.767	-68.362	-3.62E-13	-34.656	-25.180
		-0.795944	-3.255	-95.209	75.600	139.289	-29.619
	Min:	A C D F L AI AK		Max:	A B D E G I AL AM		
73	1.300	0.012337	-2.767	-88.407	-3.62E-13	-136.729	-28.777
		-0.740640	-3.255	-95.929	25.200	27.468	-33.850
	Min:	A B D F L AI AK		Max:	A C D E G J AL AM		
74	1.300	-0.265306	-2.767	-118.754	-6.23E-13	-267.158	-32.374
		-0.675703	-3.255	-122.236	50.400	-125.284	-38.081

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min:	A E D E F L AI AK		Max:	A C D G J AL AM		
75	0	-0.265306	-2.767	-118.754	-7.73E-13	-267.158	-32.374
		-0.675703	-3.255	-122.236	50.400	-125.284	-38.081
	Min:	A E D E F L AI AK		Max:	A C D G J AL AM		
75	1.300	-0.478012	-2.767	-140.105	-7.73E-13	-435.419	-35.971
		-0.354707	-2.279	-112.540	-6.13E-13	-262.317	-29.629
	Min:	A E D E F L AI AK		Max:	A C D G O AL AM		
76	0	-4.027	1.15E-09	166.074	-37.800	-453.307	-35.902
		2.447	-0.816198	114.873	-25.394	-257.553	-28.964
	Min:	A B D E F L AL		Max:	A C D G O AI AK AM		
76	1.700	-1.588	0.816198	116.690	25.394	-206.732	-41.452
		0.560163	0.590543	122.326	-21.576	-74.093	-39.918
	Min:	A B D E F I AL		Max:	A C D G K AI AK AM		
77	0	-1.588	0.816198	116.690	25.394	-206.732	-41.452
		0.560163	0.590543	122.326	-21.576	-74.093	-39.918
	Min:	A B D E F I AL		Max:	A C D G K AI AK AM		
77	1.700	-0.865035	0.816198	77.565	25.394	-44.387	-40.065
		-0.440823	0.590543	92.533	3.624	107.950	-38.914
	Min:	A C D E I AL		Max:	A B D F G K AI AK AM		
78	0	-0.865035	0.816198	77.565	25.394	-44.387	-40.065
		-0.440823	0.590543	92.533	3.624	107.950	-38.914
	Min:	A C D E I AL		Max:	A B D F G K AI AK AM		
78	1.700	-0.575585	0.816198	52.125	25.394	65.382	-38.677
		-1.838	9.21E-10	79.952	-37.800	232.449	-35.902
	Min:	A C D E G I AL		Max:	A E D F L AI AK AM		
79	0	-0.575585	0.816198	52.125	25.394	65.382	-38.677
		-1.838	8.19E-10	79.952	-37.800	232.449	-35.902
	Min:	A C D E G I AL		Max:	A B D F L AI AK AM		
79	1.700	-0.575585	0.816198	27.933	25.394	133.432	-37.290
		-2.116	8.19E-10	52.027	-37.800	344.631	-35.902
	Min:	A C D E G I AL		Max:	A B D F L AI AK AM		
80	0	-0.575585	0.816198	27.933	25.394	133.432	-37.290
		-2.116	7.85E-10	52.027	-37.800	344.631	-35.902
	Min:	A C D E G I AL		Max:	A B D F L AI AK AM		
80	1.700	-0.575585	0.816198	3.741	25.394	160.355	-35.902
		-2.394	7.85E-10	7.302	-12.600	384.141	-35.902
	Min:	A C D E G I AL		Max:	A B D F L AI AK AM		
81	0	-0.575585	-0.816198	-4.840	-25.394	160.355	-35.902
		-2.394	7.21E-10	-8.400	12.600	384.141	-35.902
	Min:	A C D E G O AI AL		Max:	A B D F L AK AM		
81	1.700	-0.853739	-0.816198	-29.032	-25.394	131.565	-37.290
		-2.394	7.21E-10	-53.125	37.800	342.764	-35.902
	Min:	A C D E G O AI AL		Max:	A B D F L AK AM		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
82	0	-0.853739	-0.816198	-29.032	-25.394	131.565	-37.290
		-2.394	6.96E-10	-53.125	37.800	342.764	-35.902
	Min:	A C D E G O AI AL		Max:	A B D F L AK AM		
82	1.700	-1.132	-0.816198	-53.224	-25.394	61.648	-38.677
		-2.394	6.96E-10	-81.051	37.800	228.715	-35.902
	Min:	A C D E G O AI AL		Max:	A B D F L AK AM		
83	0	-1.132	-0.816198	-53.224	-25.394	61.648	-38.677
		-2.394	7.08E-10	-81.051	37.800	228.715	-35.902
	Min:	A C D E G O AI AL		Max:	A B D F L AK AM		
83	1.700	-1.699	-0.816198	-78.663	-25.394	-49.988	-40.065
		-1.275	-0.590543	-93.632	-3.624	102.348	-38.914
	Min:	A C D G O AI AL		Max:	A B D E F M AK AM		
84	0	-1.699	-0.816198	-78.663	-25.394	-49.988	-40.065
		-1.275	-0.590543	-93.632	-3.624	102.348	-38.914
	Min:	A C D G O AI AL		Max:	A B D E F M AK AM		
84	1.700	-2.700	-0.816198	-117.788	-25.394	-214.200	-41.452
		-0.552453	-0.590543	-123.424	21.576	-81.561	-39.918
	Min:	A E D F G O AI AL		Max:	A C D E M AK AM		
85	0	-2.700	-0.816198	-117.788	-25.394	-214.200	-41.452
		-0.552453	-0.590543	-123.424	21.576	-81.561	-39.918
	Min:	A E D F G O AI AL		Max:	A C D E M AK AM		
85	1.700	-5.417	6.16E-10	-167.172	37.800	-462.643	-35.902
		1.057	0.816198	-115.972	25.394	-266.889	-28.964
	Min:	A E D F G L AI AL		Max:	A C D E I AK AM		
86	0	0.543500	2.767	139.625	-2.75E-13	-429.182	-35.971
		0.666805	2.279	112.061	-2.02E-13	-256.080	-29.629
	Min:	A E D F G L AK		Max:	A C D E I AI AL AM		
86	1.300	0.543500	2.767	118.274	-2.75E-13	-261.544	-32.374
		0.133104	3.255	121.756	-50.400	-119.671	-38.081
	Min:	A E D F G L AK		Max:	A C D E N AI AL AM		
87	0	0.543500	2.767	118.274	-8.58E-14	-261.544	-32.374
		0.133104	3.255	121.756	-50.400	-119.671	-38.081
	Min:	A B D F G L AK		Max:	A C D E N AI AL AM		
87	1.300	0.608436	2.767	87.927	-8.58E-14	-131.739	-28.777
		-0.144540	3.255	95.449	-25.200	32.458	-33.850
	Min:	A B D F L AK		Max:	A C D E G N AI AL AM		
88	0	0.608436	2.767	87.927	8.24E-14	-131.739	-28.777
		-0.144540	3.255	95.449	-25.200	32.458	-33.850
	Min:	A B D F L AK		Max:	A C D E G N AI AL AM		
88	1.300	0.608434	2.767	67.882	8.24E-14	-30.290	-25.180
		-0.412549	3.255	94.729	-75.600	143.655	-29.619
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
89	0	0.608434	2.767	67.882	3.29E-13	-30.290	-25.180
		-0.412549	3.255	94.729	-75.600	143.655	-29.619
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		
89	1.300	0.608434	2.767	49.383	3.29E-13	45.933	-21.583
		-0.625255	3.255	56.575	-50.400	249.562	-25.388
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		
90	0	0.608434	2.767	49.383	1.88E-13	45.933	-21.583
		-0.625255	3.255	56.575	-50.400	249.562	-25.388
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		
90	1.300	0.608434	2.767	30.883	1.88E-13	98.105	-17.985
		-0.837961	3.255	35.220	-50.400	309.229	-21.156
	Min:	A C D F L AK		Max:	A E D E G O AI AL AM		
91	0	0.608434	2.767	30.883	-2.66E-15	98.105	-17.985
		-0.837961	3.255	18.420	-25.200	309.229	-21.156
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		
91	1.300	0.608434	2.767	12.383	-2.66E-15	126.228	-14.388
		-1.051	3.255	-2.935	-25.200	319.294	-16.925
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		
92	0	0.608434	2.767	12.383	1.45E-13	126.228	-14.388
		-1.051	3.255	-2.935	-25.200	319.294	-16.925
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		
92	1.300	0.608434	2.767	-6.117	1.45E-13	130.301	-10.791
		-1.263	3.255	-41.089	1.07E-14	283.119	-12.694
	Min:	A C D F L AK		Max:	A B D E G O AI AL AM		
93	0	0.608434	2.767	-6.117	9.70E-14	130.301	-10.791
		-1.263	3.255	-41.089	1.37E-13	283.119	-12.694
	Min:	A C D F L AK		Max:	A E D E G O AI AL AM		
93	1.300	0.608434	2.767	-24.617	9.70E-14	110.324	-7.194
		-1.376	3.255	-47.318	-50.400	230.255	-8.463
	Min:	A C D F L AK		Max:	A B D E G P AI AL AM		
94	0	0.608434	2.767	-24.617	1.51E-13	110.324	-7.194
		-1.376	3.255	-47.318	-50.400	230.255	-8.463
	Min:	A C D F L AK		Max:	A B D E G P AI AL AM		
94	1.300	0.608434	2.767	-43.116	1.51E-13	66.297	-3.597
		-1.589	3.255	-85.472	-25.200	137.221	-4.231
	Min:	A C D F L AK		Max:	A B D E G P AI AL AM		
95	0	0.608434	2.767	-43.116	2.98E-13	66.297	-3.597
		-1.589	3.255	-85.472	-25.200	137.221	-4.231
	Min:	A C D F L AK		Max:	A B D E G P AI AL AM		
95	1.300	0.543500	2.767	-73.917	2.98E-13	-2.053	-3.76E-08
		-1.736	3.255	-111.326	5.76E-13	-1.779	-4.41E-08
	Min:	A B D F G L AK		Max:	A C D E P AI AL AM		
96	0	0.081810	3.91E-09	8.213	6.19E-13	-2.053	1.06E-11

ENVELOPE for < My > (and accomp. values) --
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		5.92E-14	3.96E-09	7.115	-1.35E-13	-1.779	-3.08E-10
		Min: A B D E G O AI AL			Max: A C D F L AK AM		
96	0.500	8.21E-10	4.00E-09	8.21E-08	4.67E-13	-1.52E-12	1.99E-09
		5.59E-14	3.96E-09	7.12E-08	-1.35E-13	3.88E-14	1.67E-09
		Min: A B D E G P AI AL AM			Max: A C D F L AK		
290	0	-255.453	0.576378	-4.439	-0.739005	-7.455	-1.902
		-255.453	0.576378	3.646	0.757716	16.175	-1.902
		Min: AN AO AQ AS BR			Max: AN AO AQ AR AZ BV		
290	13.200	-271.302	0.522081	-7.047	0.453014	-90.862	4.176
		-271.302	0.522081	6.518	-0.434303	90.862	4.176
		Min: AN AO AQ AS BL			Max: AN AO AQ AR AT BV		
291	0	-255.453	-0.576378	-4.439	0.739005	-7.455	1.902
		-255.453	-0.576378	3.646	-0.757716	16.175	1.902
		Min: AN AO AQ AS BN			Max: AN AO AQ AR AV BV		
291	13.200	-304.883	-0.310567	-7.047	-0.453014	-90.862	-2.100
		-304.883	-0.310567	6.518	0.434303	90.862	-2.100
		Min: AN AO AQ AS BR			Max: AN AO AQ AR AZ BV		

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
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Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL CENTRO DE VANO
Fecha: 23/5/01 18.28.28

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 420 cm Alto = 90 cm Canto útil = 84.90 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 233.23 cm2
Diámetro equivalente = 32.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 384.14 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0065408
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 14.48 cm
Area de hormigón eficaz, Ac,eficaz = 9450.00 cm2
Resistencia a tracción del hormigón, fct,m = .4 Kp/cm2
Momento de fisuración, Mfis = 160.95 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 890.0 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2124.2 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 16.38 cm
Alargamiento medio de las fisuras, Esm = 0.000968898
Apertura de fisura, Wk = 0.270 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.270 mm
Apertura de fisura máxima, Wmax = 0.300 mm

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****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL CENTRO DE VANO
Fecha: 23/5/01 18.31.17

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 420 cm Alto = 90 cm Canto útil = 85.25 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 176.71 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 319.3 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0049355
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 11.67 cm
Area de hormigón eficaz, Ac,eficaz = 9450.00 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 160.95 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 1157.3 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2295.9 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 16.02 cm
Alargamiento medio de las fisuras, Esm = 0.001002137
Apertura de fisura, Wk = 0.273 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.273 mm
Apertura de fisura máxima, Wmax = 0.300 mm

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL APOYO
Fecha: 23/5/01 18.36.07

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 460 cm Alto = 90 cm Canto útil = 85.25 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 276.12 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 462.64 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0070411
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 8.18 cm
Area de hormigón eficaz, Ac,eficaz = 10350.00 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 176.27 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 822.5 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2158.6 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 13.32 cm
Alargamiento medio de las fisuras, Esm = .001000968
Apertura de fisura, Wk = 0.227 mm

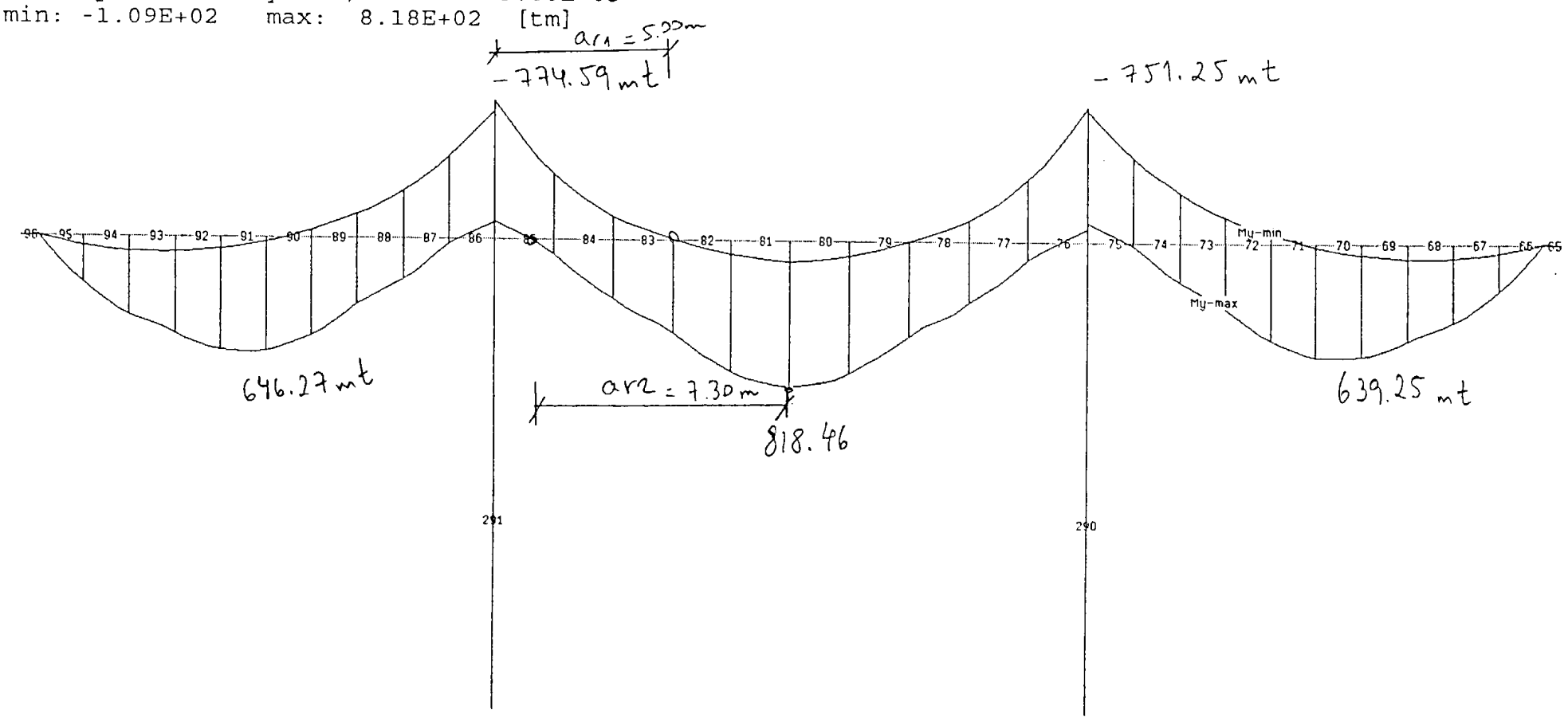
Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.227 mm
Apertura de fisura máxima, Wmax = 0.300 mm

2.4.1.2. Comprobación de estados límites últimos por flexión longitudinal

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Scale 1 : 173.7
Int. Forces envelope My, GWSP ER (COMBINACION FZAS EXTERIORES), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -7.75E+02 max: 1.18E+02 [tm]
- Envelope Moment My-max, Scale 5.00E-03
  min: -1.09E+02 max: 8.18E+02 [tm]



ENVELOPE SPECIFIC.: ER 'COMBINACION FZAS EXTERIORES'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	2	2.025		PESO PAVIMENTO
D	OR	2	1.000		PESO PAVIMENTO
E	PL.PERM	3	1.350		PESO BARRERAS
F	OR	3	1.000		PESO BARRERAS
G	PL.PERM	5	1.350		RETRACCION
H	OR	5	1.000		RETRACCION
I	PLUS	6	1.500		SOB UNIF 1
J	PLUS	7	1.500		SOBRECARGA UNIF 2
K	PLUS	8	1.500		SOB UNIF 3
L	PLUS	11	2.100		VEHICULO HIPOTESIS 11
M	OR	12	2.100		VEHICULO HIPOTESIS 12
N	OR	13	2.100		VEHICULO HIPOTESIS 13
O	OR	14	2.100		VEHICULO HIPOTESIS 14
P	OR	15	2.100		VEHICULO HIPOTESIS 15
Q	OR	16	2.100		VEHICULO HIPOTESIS 16
R	OR	17	2.100		VEHICULO HIPOTESIS 17
S	OR	18	2.100		VEHICULO HIPOTESIS 18
T	OR	19	2.100		VEHICULO HIPOTESIS 19
U	OR	20	2.100		VEHICULO HIPOTESIS 20
V	OR	21	2.100		VEHICULO HIPOTESIS 21
W	OR	22	2.100		VEHICULO HIPOTESIS 22
X	OR	23	2.100		VEHICULO HIPOTESIS 23
Y	OR	24	2.100		VEHICULO HIPOTESIS 24
Z	OR	25	2.100		VEHICULO POSICION 25
AA	OR	26	2.100		VEHICULO POSICION 26
AB	OR	27	2.100		VEHICULO POSICION 27
AC	OR	28	2.100		VEHICULO POSICION 28
AD	OR	29	2.100		VEHICULO POSICION 29
AE	OR	30	2.100		VEHICULO POSICION 30
AF	OR	31	2.100		VEHICULO POSICION 31
AG	OR	32	2.100		VEHICULO POSICION 32
AH	OR	33	2.100		VEHICULO POSICION 33
AI	OR	34	2.100		VEHICULO POSICION 34
AJ	OR	35	2.100		VEHICULO POSICION 35
AK	OR	36	2.100		VEHICULO POSICION 36
AL	OR	37	2.100		VEHICULO HIPOTESIS 37
AM	PLUS	60	1.500		FRENADO
AN	PLUS	63	0.450000		VIENTO TRANSV CON SOB
AO	PLUS	64	0.900000		TEMPERATURA (-)
AP	OR	65	0.900000		TEMPERATURA (+)
AQ	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AR	PERM.	1	1.350	PESO PROPIO
AS	OR	1	1.000	PESO PROPIO
AT	PL.PERM	2	2.025	PESO PAVIMENTO
AU	OR	2	1.000	PESO PAVIMENTO
AV	PL.PERM	3	1.350	PESO BARRERAS
AW	OR	3	1.000	PESO BARRERAS
AX	PL.PERM	5	1.350	RETRACCION

AY	OR	5	1.000	RETRACCION
AZ	PLUS	9	1.500	SOB UNIF EXC
BA	PLUS	10	1.500	SOB UNIF EXC
BE	PLUS	11	2.100	VEHICULO HIPOTESIS 11
BC	OR	12	2.100	VEHICULO HIPOTESIS 12
BD	OR	13	2.100	VEHICULO HIPOTESIS 13
BE	OR	14	2.100	VEHICULO HIPOTESIS 14
BF	OR	15	2.100	VEHICULO HIPOTESIS 15
BG	OR	16	2.100	VEHICULO HIPOTESIS 16
BH	OR	17	2.100	VEHICULO HIPOTESIS 17
BI	OR	18	2.100	VEHICULO HIPOTESIS 18
BJ	OR	19	2.100	VEHICULO HIPOTESIS 19
BK	OR	20	2.100	VEHICULO HIPOTESIS 20
BL	OR	21	2.100	VEHICULO HIPOTESIS 21
BM	OR	22	2.100	VEHICULO HIPOTESIS 22
BN	OR	23	2.100	VEHICULO HIPOTESIS 23
BO	OR	24	2.100	VEHICULO HIPOTESIS 24
BP	OR	25	2.100	VEHICULO POSICION 25
BQ	OR	26	2.100	VEHICULO POSICION 26
BR	OR	27	2.100	VEHICULO POSICION 27
BS	OR	28	2.100	VEHICULO POSICION 28
BT	OR	29	2.100	VEHICULO POSICION 29
BU	OR	30	2.100	VEHICULO POSICION 30
BV	OR	31	2.100	VEHICULO POSICION 31
BW	OR	32	2.100	VEHICULO POSICION 32
BX	OR	33	2.100	VEHICULO POSICION 33
BY	OR	34	2.100	VEHICULO POSICION 34
BZ	OR	35	2.100	VEHICULO POSICION 35
CA	OR	36	2.100	VEHICULO POSICION 36
CB	OR	37	2.100	VEHICULO HIPOTESIS 37
CC	PLUS	60	1.500	FRENADO
CD	PLUS	63	0.450000	VIENTO TRANSV CON SOB
CE	PLUS	64	0.900000	TEMPERATURA (-)
CF	OR	65	0.900000	TEMPERATURA (+)
CG	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65		0	-2.05E-09	-2.48E-10	-9.43E-08	2.48E-13	-1.50E-12
		-9.23E-12	8.66E-09	-9.87E-08	-4.75E-13	5.40E-13	-1.25E-09
		Min: A C F H J P AM AO AQ			Max: B D E G I K M AP		
65	0.125	-0.051131	-2.48E-10		-3.048	2.48E-13	-0.190500
		-8.65E-12	8.66E-09		-1.779	-4.75E-13	-0.111177
		Min: AR AT AV AY AZ BA BF...			Max: B D F G K M AP		
65	0.250	-0.102263	-2.48E-10		-6.096	2.48E-13	-0.761998
		-8.88E-12	8.66E-09		-3.558	-4.75E-13	-0.444707
		Min: AR AT AV AY AZ BA BF...			Max: B D F G K M AO		
65	0.375	-0.153394	8.57E-09		-9.144	4.43E-13	-1.714

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-8.88E-12	8.66E-09	-5.336	-4.75E-13	-1.001	2.00E-09
		Min: AR AT AV AY AZ BA BB...			Max: B D F G K M AO		
65	0.500	-0.204525	8.57E-09	-12.192	4.43E-13	-3.048	3.05E-09
		-8.88E-12	8.66E-09	-7.115	-4.75E-13	-1.779	3.08E-09
		Min: AR AT AV AY AZ BA EE...			Max: B D F G K M AO		
66		0	8.630	-6.917	102.359	8.71E-14	-3.048
		-0.353668	-8.137	180.260	-6.69E-14	-1.779	-1.11E-07
		Min: A C E G I J P AM AO			Max: B D F H K L AP AQ		
66	0.325	8.660	-6.917	44.589	8.71E-14	13.464	-2.248
		-0.515936	-8.137	225.480	-6.69E-14	71.521	-2.645
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.650	8.527	-6.917	39.964	8.71E-14	27.204	-4.496
		-0.515936	-8.137	217.556	-6.69E-14	143.514	-5.289
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.975	8.394	-6.917	35.339	8.71E-14	39.441	-6.745
		-0.515936	-8.137	167.631	63.000	207.682	-7.934
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	1.300	8.261	-6.917	30.714	8.71E-14	50.175	-8.993
		-0.515936	-8.137	159.706	63.000	260.874	-10.578
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67		0	8.261	-6.917	30.714	8.71E-14	50.175
		-0.515936	-8.137	159.706	63.000	260.874	-10.578
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.325	8.128	-6.917	26.089	8.71E-14	59.405	-11.241
		-0.515936	-8.137	151.781	63.000	311.491	-13.223
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.650	7.995	-6.917	21.464	8.71E-14	67.133	-13.489
		-0.515936	-8.137	143.856	63.000	359.532	-15.867
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.975	7.862	-6.917	16.839	8.71E-14	73.357	-15.737
		-0.515936	-8.137	135.932	63.000	404.986	-18.512
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	1.300	7.729	-6.917	12.214	8.71E-14	78.078	-17.985
		-0.515936	-8.137	86.007	126.000	437.388	-21.156
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68		0	7.729	-6.917	12.214	8.71E-14	78.078
		-0.515936	-8.137	86.007	126.000	437.388	-21.156
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68	0.325	7.596	-6.917	7.590	8.71E-14	81.296	-20.234
		-0.515936	-8.137	78.082	126.000	464.052	-23.801
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68	0.650	7.463	-6.917	2.965	8.71E-14	83.011	-22.482
		-0.515936	-8.137	70.157	126.000	488.141	-26.445
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
68	0.975	7.330	-6.917	-1.660	8.71E-14	83.223	-24.730
		-0.766575	-8.137	100.048	1.01E-13	510.444	-29.090
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
68	1.300	7.197	-6.917	-6.285	8.71E-14	81.932	-26.978
		-0.766575	-8.137	92.123	1.01E-13	541.671	-31.734
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69		0	7.197	-6.917	-6.285	5.88E-13	81.932
		-0.766575	-8.137	92.123	7.95E-13	541.671	-31.734
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	0.325	7.064	-6.917	-10.910	5.88E-13	79.138	-29.226
		-0.766575	-8.137	84.198	7.95E-13	570.324	-34.379
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	0.650	6.931	-6.917	-15.535	5.88E-13	74.840	-31.475
		-0.766575	-8.137	76.273	7.95E-13	596.400	-37.024
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	0.975	6.799	-6.917	-20.160	5.88E-13	69.040	-33.723
		-0.766575	-8.137	68.349	7.95E-13	619.901	-39.668
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
69	1.300	6.666	-6.917	-24.785	5.88E-13	61.736	-35.971
		-0.766575	-8.137	18.424	63.000	632.427	-42.313
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70		0	6.666	-6.917	-24.785	5.99E-13	61.736
		-0.766575	-8.137	18.424	63.000	632.427	-42.313
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	0.325	6.533	-6.917	-29.410	5.99E-13	52.930	-38.219
		-0.766575	-8.137	10.499	63.000	637.127	-44.957
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	0.650	6.400	-6.917	-34.035	5.99E-13	42.620	-40.467
		-0.766575	-8.137	2.574	63.000	639.251	-47.602
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	0.975	6.267	-6.917	-38.660	5.99E-13	30.807	-42.715
		-0.766575	-8.137	-5.351	63.000	638.800	-50.246
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
70	1.300	6.134	-6.917	-43.285	5.99E-13	17.491	-44.964
		-0.766575	-8.137	-13.275	63.000	635.773	-52.891
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71		0	6.134	-6.917	-43.285	8.07E-14	17.491
		-0.766575	-8.137	-55.275	126.000	635.773	-52.891
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	0.325	6.001	-6.917	-47.910	8.07E-14	2.672	-47.212
		-0.766575	-8.137	-63.200	126.000	616.521	-55.535
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	0.650	5.868	-6.917	-52.535	8.07E-14	-13.651	-49.460
		-0.766575	-8.137	-71.125	126.000	594.693	-58.180
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	0.975	5.735	-6.917	-57.160	8.07E-14	-31.476	-51.705
		-0.766575	-8.137	-79.050	126.000	570.290	-60.824
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
71	1.300	5.602	-6.917	-61.785	8.07E-14	-50.805	-53.956
		-0.766575	-8.137	-86.974	126.000	543.311	-63.469

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72		0	5.602	-6.917	-61.785	-5.51E-13	-50.805
		-0.766575	-8.137	-86.974	126.000	543.311	-63.469
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	0.325	5.469	-6.917	-66.410	-5.51E-13	-71.636	-56.205
		-0.766575	-8.137	-136.899	189.000	508.507	-66.113
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	0.650	5.336	-6.917	-71.035	-5.51E-13	-93.971	-58.453
		-0.766575	-8.137	-144.824	189.000	462.727	-68.758
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	0.975	5.203	-6.917	-75.660	-5.51E-13	-117.809	-60.701
		-0.766575	-8.137	-152.749	189.000	414.371	-71.402
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
72	1.300	5.070	-6.917	-80.285	-5.51E-13	-142.150	-62.949
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
73		0	5.070	-6.917	-80.285	-9.06E-13	-143.150
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
73	0.325	4.937	-6.917	-84.910	-9.06E-13	-165.994	-65.197
		-0.628383	-8.137	-120.874	63.000	325.036	-76.652
		Min: E D F G J P AM AO			Max: A C E H I K N AP AQ		
73	0.650	4.804	-6.917	-116.023	-9.06E-13	-202.824	-67.445
		-0.628383	-8.137	-102.310	63.000	268.950	-79.336
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
73	0.975	4.672	-6.917	-122.388	-9.06E-13	-241.566	-69.694
		-0.628383	-8.137	-108.495	63.000	254.694	-81.981
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
73	1.300	4.539	-6.917	-128.753	-9.06E-13	-282.376	-71.942
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74		0	4.539	-6.917	-128.753	-1.56E-12	-282.376
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	0.325	4.406	-6.917	-135.117	-1.56E-12	-325.255	-74.190
		-0.628383	-8.137	-162.865	126.000	177.002	-87.270
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	0.650	4.273	-6.917	-141.482	-1.56E-12	-370.203	-76.438
		-0.628383	-8.137	-169.050	126.000	123.066	-89.914
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	0.975	4.140	-6.917	-147.847	-1.56E-12	-417.219	-78.686
		-0.628383	-8.137	-175.235	126.000	67.120	-92.559
		Min: A C E G J P AM AO			Max: B D F H I K N AP AQ		
74	1.300	3.844	-6.917	-182.933	-1.56E-12	-474.409	-80.935
		-0.466039	-8.137	-152.698	126.000	17.269	-95.203
		Min: A C E G I J P AM AO			Max: B D F H K N AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
75		0	3.844	-6.917	-182.933	-1.93E-12	-474.409
		-0.466039	-8.137	-152.698	126.000	17.269	-95.203
		Min: A C E G I J P AM AO			Max: B D F H K N AP AQ		
75	0.325	3.712	-6.917	-190.858	-1.93E-12	-535.150	-83.183
		0.336450	-5.698	-86.835	-1.53E-12	-17.069	-68.518
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
75	0.650	3.579	-6.917	-198.783	-1.93E-12	-598.467	-85.431
		0.336450	-5.698	-91.460	-1.53E-12	-46.062	-70.369
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
75	0.975	3.446	-6.917	-206.708	-1.93E-12	-664.355	-87.679
		0.336450	-5.698	-96.085	-1.53E-12	-76.536	-72.221
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
75	1.300	3.313	-6.917	-214.632	-1.93E-12	-732.627	-89.927
		0.336450	-5.698	-100.710	-1.53E-12	-108.517	-74.073
		Min: A C E G I J P AM AO			Max: B D F H K S AP AQ		
76		0	-6.805	2.89E-09	273.382	-94.500	-751.251
			15.042	-2.040	105.743	-63.486	-76.899
		Min: A C E H I J P AP			Max: B D F G K S AM AO AQ		
76	0.425	-6.805	2.89E-09	263.019	-94.500	-637.266	-89.755
		14.868	-2.040	99.695	-63.486	-33.244	-73.278
		Min: A C E H I J P AP			Max: B D F G K S AM AO AQ		
76	0.850	-6.805	2.89E-09	252.656	-94.500	-527.685	-89.755
		14.694	-2.040	93.647	-63.486	7.841	-74.145
		Min: A C E H I J P AP			Max: B D F G K S AM AO AQ		
76	1.275	-0.708267	2.040	188.646	63.486	-429.741	-104.498
		14.520	-2.040	87.599	-63.486	46.356	-75.012
		Min: A C E H I J M AP			Max: B D F G K S AM AO AQ		
76	1.700	-0.708267	2.040	178.283	63.486	-351.769	-103.630
		10.323	1.476	160.662	-53.940	104.148	-99.794
		Min: A C E H I J M AP			Max: B D F G K O AM AO AQ		
77		0	-0.708267	2.040	178.283	63.486	-351.769
			10.323	1.476	160.662	-53.940	104.149
		Min: A C E H I J M AP			Max: B D F G K O AM AO AQ		
77	0.425	-0.708267	2.040	167.919	63.486	-278.201	-102.763
		10.150	1.476	154.614	-53.940	171.145	-99.167
		Min: A C E H I J M AP			Max: B D F G K O AM AO AQ		
77	0.850	1.054	2.040	128.996	63.486	-216.988	-101.896
		8.214	1.476	135.126	9.060	235.121	-98.539
		Min: A C E H I M AP			Max: B D F G J K O AM AO AQ		
77	1.275	1.054	2.040	120.673	63.486	-163.934	-101.029
		8.040	1.476	127.038	9.060	290.831	-97.912
		Min: A C E H I M AP			Max: B D F G J K O AM AO AQ		
77	1.700	1.404	2.040	85.048	63.486	-116.253	-100.162
		7.515	1.476	146.252	9.060	344.940	-97.284
		Min: B D F H I M AP			Max: A C E G J K O AM AO AQ		
78		0	1.404	2.040	85.048	63.486	-116.253
			7.515	1.476	146.252	9.060	344.940

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min:	B D F H I M AP		Max:	A C E G J K O AM AO AQ		
78	0.425	1.404	2.040	79.000	63.486	-81.392	-99.294
		7.342	1.476	135.889	9.060	404.894	-96.657
	Min:	B D F H I M AP		Max:	A C E G J K O AM AO AQ		
78	0.850	2.128	2.040	69.833	63.486	-50.272	-98.427
		6.444	1.476	86.644	72.060	444.815	-96.030
	Min:	B D F H I K M AP		Max:	A C E G J O AM AO AQ		
78	1.275	2.128	2.040	63.785	63.486	-21.878	-97.560
		6.270	1.476	76.281	72.060	479.436	-95.402
	Min:	B D F H I K M AP		Max:	A C E G J O AM AO AQ		
78	1.700	2.128	2.040	57.737	63.486	3.945	-96.693
		4.022	2.30E-09	143.160	-94.500	535.656	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
79	0	2.128	2.040	57.737	63.486	3.945	-96.693
		4.022	2.05E-09	143.160	-94.500	535.656	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
79	0.425	2.128	2.040	51.689	63.486	27.198	-95.825
		3.848	2.05E-09	132.797	-94.500	594.297	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
79	0.850	2.128	2.040	45.641	63.486	47.881	-94.958
		3.674	2.05E-09	122.433	-94.500	648.533	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
79	1.275	2.128	2.040	39.593	63.486	65.994	-94.091
		3.501	2.05E-09	112.070	-94.500	698.365	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
79	1.700	2.128	2.040	33.545	63.486	81.536	-93.224
		3.327	2.05E-09	101.707	-94.500	743.793	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
80	0	2.128	2.040	33.545	63.486	81.536	-93.224
		3.327	1.96E-09	101.707	-94.500	743.793	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
80	0.425	2.128	2.040	27.497	63.486	94.507	-92.357
		3.153	1.96E-09	49.344	-31.500	775.366	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
80	0.850	2.128	2.040	21.449	63.486	104.908	-91.489
		2.979	1.96E-09	38.981	-31.500	794.135	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
80	1.275	2.128	2.040	15.401	63.486	112.739	-90.622
		2.805	1.96E-09	28.617	-31.500	808.500	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
80	1.700	2.128	2.040	9.353	63.486	117.999	-89.755
		2.631	1.96E-09	18.254	-31.500	818.460	-89.755
	Min:	B D F H I K M AP		Max:	A C E G J P AM AO AQ		
81	0	2.128	2.040	-12.099	-63.486	117.999	-89.755
		2.631	1.80E-09	-21.000	31.500	818.460	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
81	0.425	1.954	-2.040	-18.147	-63.486	111.572	-90.622

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		2.631	1.80E-09	-31.363	31.500	807.333	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
81	0.850	1.780	-2.040	-24.195	-63.486	102.574	-91.489
		2.631	1.80E-09	-41.726	31.500	791.801	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
81	1.275	1.607	-2.040	-30.243	-63.486	91.006	-92.357
		2.631	1.80E-09	-52.090	31.500	771.866	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
81	1.700	1.433	-2.040	-36.291	-63.486	76.868	-93.224
		2.631	1.80E-09	-104.453	94.500	739.125	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
82	0	1.433	-2.040	-36.291	-63.486	76.868	-93.224
		2.631	1.74E-09	-104.453	94.500	739.125	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
82	0.425	1.259	-2.040	-42.339	-63.486	60.155	-94.091
		2.631	1.74E-09	-114.816	94.500	692.531	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
82	0.850	1.085	-2.040	-48.387	-63.486	40.880	-94.958
		2.631	1.74E-09	-125.179	94.500	641.532	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
82	1.275	0.911158	-2.040	-54.435	-63.486	19.030	-95.825
		2.631	1.74E-09	-135.542	94.500	586.129	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
82	1.700	0.737312	-2.040	-60.483	-63.486	-5.390	-96.693
		2.631	1.74E-09	-145.905	94.500	526.321	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
83	0	0.737312	-2.040	-60.483	-63.486	-5.390	-96.693
		2.631	1.77E-09	-145.905	94.500	526.321	-89.755
	Min:	B D F H I K S AM AP		Max:	A C E G J P AO AQ		
83	0.425	0.563466	-2.040	-66.531	-63.486	-32.381	-97.560
		4.706	-1.476	-79.026	-72.060	468.934	-95.402
	Min:	B D F H I K S AM AP		Max:	A C E G J Q AO AQ		
83	0.850	0.389619	-2.040	-72.579	-63.486	-61.942	-98.427
		4.706	-1.476	-89.390	-72.060	433.145	-96.030
	Min:	B D F H I K S AM AP		Max:	A C E G J Q AO AQ		
83	1.275	-0.507851	-2.040	-81.746	-63.486	-94.229	-99.294
		5.429	-1.476	-138.634	-9.060	392.058	-96.657
	Min:	B D F H K S AM AP		Max:	A C E G I J Q AO AQ		
83	1.700	-0.681697	-2.040	-87.794	-63.486	-130.256	-100.162
		5.429	-1.476	-148.998	-9.060	330.936	-97.284
	Min:	B D F H K S AM AP		Max:	A C E G I J Q AO AQ		
84	0	-0.681697	-2.040	-87.794	-63.486	-130.256	-100.162
		5.429	-1.476	-148.998	-9.060	330.936	-97.284
	Min:	B D F H K S AM AP		Max:	A C E G I J Q AO AQ		
84	0.425	-1.206	-2.040	-123.415	-63.486	-179.104	-101.029
		5.780	-1.476	-129.784	-9.060	275.661	-97.912
	Min:	A C E H K S AM AP		Max:	B D F G I J Q AO AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
84	0.850	-1.380	-2.040	-131.742	-63.486	-233.325	-101.896
		5.780	-1.476	-137.872	-9.060	218.784	-98.539
	Min:	A C E H K S AM AP		Max:	B D F G I J Q AO AQ		
84	1.275	-3.316	-2.040	-170.665	-63.486	-295.705	-102.763
		7.542	-1.476	-157.360	53.940	153.641	-99.167
	Min:	A C E H J K S AM AP		Max:	B D F G I Q AO AQ		
84	1.700	-3.490	-2.040	-181.028	-63.486	-370.440	-103.630
		7.542	-1.476	-163.408	53.940	85.478	-99.794
	Min:	A C E H J K S AM AP		Max:	B D F G I Q AO AQ		
85	0	-3.490	-2.040	-181.028	-63.486	-370.440	-103.630
		7.542	-1.476	-163.408	53.940	85.478	-99.794
	Min:	A C E H J K S AM AP		Max:	B D F G I Q AO AQ		
85	0.425	-3.664	-2.040	-191.391	-63.486	-449.579	-104.498
		11.565	2.040	-90.345	63.486	26.518	-75.012
	Min:	A C E H J K S AM AP		Max:	B D F G I M AO AQ		
85	0.850	-9.934	1.54E-09	-255.401	94.500	-548.690	-89.755
		11.565	2.040	-96.393	63.486	-13.163	-74.145
	Min:	A C E H J K P AM AP		Max:	B D F G I M AO AQ		
85	1.275	-10.108	1.54E-09	-265.764	94.500	-659.438	-89.755
		11.565	2.040	-102.441	63.486	-55.415	-73.276
	Min:	A C E H J K P AM AP		Max:	B D F G I M AO AQ		
85	1.700	-10.282	1.54E-09	-276.128	94.500	-774.590	-89.755
		11.565	2.040	-108.489	63.486	-100.238	-72.411
	Min:	A C E H J K P AM AP		Max:	B D F G I M AO AQ		
86	0	5.867	6.917	213.433	-6.87E-13	-717.233	-89.927
		7.890	5.698	99.510	-5.05E-13	-92.921	-74.075
	Min:	A C E G J K P AO		Max:	B D F H I M AM AP AQ		
86	0.325	5.867	6.917	205.508	-6.87E-13	-649.155	-87.679
		2.757	5.698	94.885	-5.05E-13	-61.334	-72.221
	Min:	A C E G J K P AO		Max:	B D F H I M AM AP AQ		
86	0.650	5.867	6.917	197.583	-6.87E-13	-583.653	-85.431
		2.624	5.698	90.260	-5.05E-13	-31.248	-70.369
	Min:	A C E G J K P AO		Max:	B D F H I M AM AP AQ		
86	0.975	5.867	6.917	189.659	-6.87E-13	-520.726	-83.183
		2.491	5.698	85.635	-5.05E-13	-2.665	-68.518
	Min:	A C E G J K P AO		Max:	B D F H I M AM AP AQ		
86	1.300	5.867	6.917	181.734	-6.87E-13	-460.375	-80.935
		1.556	8.137	151.499	-126.000	31.303	-95.203
	Min:	A C E G J K P AO		Max:	B D F H I R AM AP AQ		
87	0	5.867	6.917	181.734	-2.14E-13	-460.375	-80.935
		1.556	8.137	151.499	-126.000	31.303	-95.203
	Min:	A C E G J K P AO		Max:	B D F H I R AM AP AQ		
87	0.325	6.029	6.917	146.648	-2.14E-13	-403.574	-78.686
		1.261	8.137	174.035	-126.000	80.764	-92.559
	Min:	A C E G J P AO		Max:	B D F H I K R AM AP AQ		
87	0.650	6.029	6.917	140.283	-2.14E-13	-356.948	-76.438
		1.128	8.137	167.850	-126.000	136.321	-89.914

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min:	A C E G J P AO		Max:	B D F H I K R AM AP AQ		
87	0.975	6.029	6.917	133.918	-2.14E-13	-312.391	-74.190
		0.994816	8.137	161.665	-126.000	189.867	-87.270
	Min:	A C E G J P AC		Max:	B D F H I K R AM AP AQ		
87	1.300	6.029	6.917	127.553	-2.14E-13	-269.902	-71.942
		0.861869	8.137	113.480	-63.000	230.903	-84.625
	Min:	A C E G J P AC		Max:	B D F H I K R AM AP AQ		
88	0	6.029	6.917	127.553	2.06E-13	-269.902	-71.942
		0.894695	8.137	113.480	-63.000	230.903	-84.625
	Min:	A C E G J P AC		Max:	B D F H I K R AM AP AQ		
88	0.325	6.029	6.917	121.188	2.06E-13	-229.481	-69.694
		0.728928	8.137	107.295	-63.000	266.779	-81.981
	Min:	A C E G J P AO		Max:	B D F H I K R AM AP AQ		
88	0.650	6.029	6.917	114.824	2.06E-13	-191.129	-67.445
		0.595986	8.137	101.110	-63.000	300.645	-79.338
	Min:	A C E G J P AC		Max:	B D F H I K R AM AP AQ		
88	0.975	6.029	6.917	83.710	2.06E-13	-158.688	-65.197
		0.463121	8.137	119.674	-63.000	336.343	-76.692
	Min:	B D F G J P AO		Max:	A C E H I K R AM AP AQ		
88	1.300	6.029	6.917	79.085	2.06E-13	-132.234	-62.949
		0.191911	8.137	159.474	-189.000	374.355	-74.047
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
89	0	6.029	6.917	79.085	8.23E-13	-132.234	-62.949
		0.191911	8.137	159.474	-189.000	374.355	-74.047
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
89	0.325	6.029	6.917	74.460	8.23E-13	-107.283	-60.701
		0.058970	8.137	151.549	-189.000	424.897	-71.402
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
89	0.650	6.029	6.917	69.835	8.23E-13	-83.835	-58.453
		-0.073971	8.137	143.624	-189.000	472.862	-68.758
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
89	0.975	6.029	6.917	65.210	8.23E-13	-61.890	-56.205
		-0.206912	8.137	135.700	-189.000	518.253	-66.113
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
89	1.300	6.029	6.917	60.585	8.23E-13	-41.448	-53.956
		-0.339854	8.137	85.775	-126.000	552.667	-63.469
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
90	0	6.029	6.917	60.585	4.71E-13	-41.448	-53.956
		-0.339854	8.137	85.775	-126.000	552.667	-63.469
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
90	0.325	6.029	6.917	55.960	4.71E-13	-22.510	-51.708
		-0.472795	8.137	77.850	-126.000	579.256	-60.824
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
90	0.650	6.029	6.917	51.335	4.71E-13	-5.074	-49.460
		-0.605736	8.137	69.925	-126.000	603.270	-58.180
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
90	0.975	6.029	6.917	46.710	4.71E-13	10.858	-47.212

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.738677	8.137	62.001	-126.000	624.708	-55.535
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
90	1.300	6.029	6.917	42.085	4.71E-13	25.288	-44.964
		-0.871619	8.137	54.076	-126.000	643.570	-52.891
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
91	0	6.029	6.917	42.085	-6.64E-15	25.288	-44.964
		-0.871619	8.137	12.076	-63.000	643.570	-52.891
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
91	0.325	6.029	6.917	37.461	-6.64E-15	38.214	-42.715
		-1.005	8.137	4.151	-63.000	646.207	-50.246
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
91	0.650	6.029	6.917	32.836	-6.64E-15	49.637	-40.467
		-1.138	8.137	-3.774	-63.000	646.268	-47.602
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
91	0.975	6.029	6.917	28.211	-6.64E-15	59.557	-38.219
		-1.270	8.137	-11.699	-63.000	643.754	-44.957
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
91	1.300	6.029	6.917	23.586	-6.64E-15	67.974	-35.971
		-1.403	8.137	-19.623	-63.000	638.664	-42.313
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
92	0	6.029	6.917	23.586	3.61E-13	67.974	-35.971
		-1.403	8.137	-19.623	-63.000	638.664	-42.313
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
92	0.325	6.029	6.917	18.961	3.61E-13	74.888	-33.723
		-1.536	8.137	-69.548	2.13E-14	625.749	-39.668
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
92	0.650	6.029	6.917	14.336	3.61E-13	80.298	-31.475
		-1.669	8.137	-77.473	2.13E-14	601.858	-37.024
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
92	0.975	6.029	6.917	9.711	3.61E-13	84.206	-29.226
		-1.802	8.137	-85.398	2.13E-14	575.392	-34.379
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
92	1.300	6.029	6.917	5.086	3.61E-13	86.610	-26.978
		-1.935	8.137	-93.322	2.13E-14	546.350	-31.734
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
93	0	6.029	6.917	5.086	2.43E-13	86.610	-26.978
		-1.935	8.137	-93.322	3.44E-13	546.350	-31.734
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
93	0.325	6.029	6.917	0.460886	2.43E-13	87.512	-24.730
		-2.068	8.137	-101.247	3.44E-13	514.732	-29.090
	Min:	B D F G J P AO		Max:	A C E H I K S AM AP AQ		
93	0.650	6.029	6.917	-4.164	2.43E-13	86.910	-22.482
		-1.950	8.137	-71.357	-126.000	492.039	-26.445
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
93	0.975	6.029	6.917	-8.789	2.43E-13	84.805	-20.234
		-2.083	8.137	-79.282	-126.000	467.561	-23.801
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
93	1.300	6.029	6.917	-13.414	2.43E-13	81.197	-17.985
		-2.216	8.137	-87.206	-126.000	440.506	-21.156
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
94	0	6.029	6.917	-13.414	3.77E-13	81.197	-17.985
		-2.216	8.137	-87.206	-126.000	440.506	-21.156
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
94	0.325	6.029	6.917	-18.039	3.77E-13	76.086	-15.737
		-2.349	8.137	-137.131	-63.000	407.726	-18.512
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
94	0.650	6.029	6.917	-22.664	3.77E-13	69.472	-13.489
		-2.482	8.137	-145.056	-63.000	361.871	-15.867
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
94	0.975	6.029	6.917	-27.289	3.77E-13	61.354	-11.241
		-2.615	8.137	-152.981	-63.000	313.440	-13.223
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
94	1.300	6.029	6.917	-31.914	3.77E-13	51.734	-8.993
		-2.748	8.137	-160.906	-63.000	262.434	-10.578
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
95	0	6.029	6.917	-31.914	7.46E-13	51.734	-8.993
		-2.748	8.137	-160.906	-63.000	262.434	-10.578
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
95	0.325	6.029	6.917	-36.539	7.46E-13	40.610	-6.745
		-2.881	8.137	-168.830	-63.000	208.852	-7.934
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
95	0.650	6.029	6.917	-41.164	7.46E-13	27.984	-4.496
		-3.014	8.137	-218.755	1.44E-12	144.294	-5.289
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
95	0.975	6.029	6.917	-45.789	7.46E-13	13.854	-2.248
		-3.147	8.137	-226.680	1.44E-12	71.911	-2.645
	Min:	B D F G J P AO		Max:	A C E H I K T AM AP AQ		
95	1.300	5.867	6.917	-103.558	7.46E-13	-3.048	-9.41E-08
		-3.118	8.137	-181.460	1.44E-12	-1.779	-1.10E-07
	Min:	A C E G J K P AO		Max:	B D F H I T AM AP AQ		
96	0	0.204525	9.77E-09	12.192	1.55E-12	-3.048	2.66E-11
		-1.43E-11	9.89E-09	7.115	-3.37E-13	-1.779	-7.69E-10
	Min:	A C E H I K S AM AP		Max:	B D F G J P AO AQ		
96	0.125	0.153394	9.77E-09	9.144	1.55E-12	-1.714	1.25E-09
		-1.43E-11	9.89E-09	5.336	-3.37E-13	-1.001	4.68E-10
	Min:	A C E H I K S AM AP		Max:	B D F G J P AO AQ		
96	0.250	0.102262	9.99E-09	6.096	1.17E-12	-0.761998	2.48E-09
		-1.43E-11	9.89E-09	3.558	-3.37E-13	-0.444707	1.70E-09
	Min:	A C E H I K T AM AP		Max:	B D F G J P AO AQ		
96	0.375	0.051131	9.99E-09	3.048	1.17E-12	-0.190500	3.73E-09
		-1.43E-11	9.89E-09	1.779	-3.37E-13	-0.111177	2.94E-09
	Min:	A C E H I K T AM AP		Max:	B D F G J P AO AQ		
96	0.500	2.02E-09	9.99E-09	1.22E-07	1.17E-12	-3.54E-12	4.97E-09
		-1.43E-11	9.89E-09	7.12E-08	-3.37E-13	4.28E-13	4.18E-09

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min: A C E H I K T AM AP AQ				Max: B D F G J P AO		
290	0	-360.888	-2.195	-11.098	-1.848	-18.638	17.438
		-360.888	-2.195	7.531	1.932	57.877	17.438
	Min: AR AT AV AX BA BZ				Max: AR AT AV AX AZ BH CD		
290	3.300	-360.888	-2.195	-11.098	-1.848	-55.260	10.195
		-360.888	-2.195	7.828	1.932	83.219	10.195
	Min: AR AT AV AX BA BT				Max: AR AT AV AX AZ BE CD		
290	6.600	-484.462	-2.859	-17.618	1.133	-110.878	-1.675
		-484.462	-2.859	14.645	-1.048	128.537	-1.675
	Min: AR AT AV AX BA BV				Max: AR AT AV AX AZ BD CD		
290	9.900	-400.509	-2.330	-17.618	1.133	-169.016	-7.667
		-400.509	-2.330	14.942	-1.048	177.355	-7.667
	Min: AR AT AV AX BA BT				Max: AR AT AV AX AZ BE CD		
290	13.200	-400.509	-2.330	-17.618	1.133	-227.154	-15.358
		-400.509	-2.330	15.239	-1.048	227.154	-15.358
	Min: AR AT AV AX BA BT				Max: AR AT AV AX AZ BE CD		
291	0	-360.888	2.195	-11.098	1.848	-18.638	-17.438
		-360.888	2.195	7.531	-1.932	57.877	-17.438
	Min: AR AT AV AX BA BV				Max: AR AT AV AX AZ BD CD		
291	3.300	-360.888	2.195	-11.098	1.848	-55.260	-10.195
		-360.888	2.195	7.828	-1.932	83.219	-10.195
	Min: AR AT AV AX BA BV				Max: AR AT AV AX AZ BD CD		
291	6.600	-484.462	2.859	-17.618	-1.133	-110.878	1.675
		-484.462	2.859	14.645	1.048	128.537	1.675
	Min: AR AT AV AX BA BZ				Max: AR AT AV AX AZ BH CD		
291	9.900	-484.462	2.859	-17.618	-1.133	-169.016	11.111
		-484.462	2.859	14.942	1.048	177.355	11.111
	Min: AR AT AV AX BA BZ				Max: AR AT AV AX AZ BH CD		
291	13.200	-484.462	2.859	-17.618	-1.133	-227.154	20.546
		-484.462	2.859	15.239	1.048	227.154	20.546
	Min: AR AT AV AX BA BZ				Max: AR AT AV AX AZ BH CD		

racterísticas mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

ea	Ax = 46.53E3 cm2		
mento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4
nst. de torsión			Ix = 50.83E6 cm4
mento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3	
ricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad
st. al borde	yl = -3.8500 m	yr = 3.8500 m	
	zo = 0.4014 m	zu = -0.4986 m	

N-Punto de aplic. de fuerzas en el baricentro de la sección
T-Punto de aplic. de fuerzas en el baricentro de la sección
hubmittelpunkt y = 0.0000 m z = 0.4986 m

ntorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

cción parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
1	H300	1.00	46530.5	1625.531	5.08E+07	3)

ntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
0	-1.8500	0.0000						

madura "B1" As-tot =2.0000 cm2 (0.00 o/o)

mbre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
2 / CS 1	AEH500	1.0	2	1.0000	-3.7500	0.7800
					3.7500	0.7800
1 / CS 1	AEH500	1.0	2	1.0000	-1.8000	0.0600
					1.8000	0.0600

mensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
2	-0.0000	646.2700	0.0000	

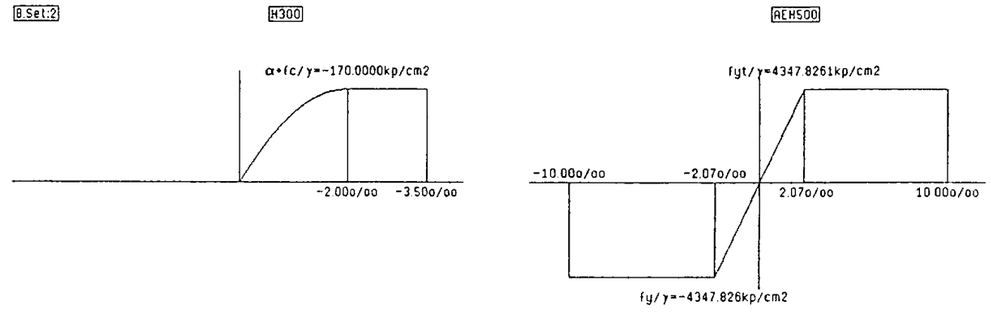
rámetros de cálculo empleados:
t:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
t 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	----	1.0000
AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	194.1145	194.1145

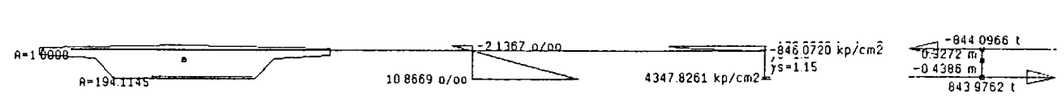
c.x/h = 0.18 As-top/bot = 1.0000/194.1145 As = 0.42 % = 195.1145

18 ϕ 25 + 18 ϕ 32 (233.10 cm²)

Material acorde a la sección: "TABVANOL"



Dimensionamiento, Sección "TABVANOL"



Características mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

Area	Ax = 46.53E3 cm2		
Momento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4
Const. de torsión			Ix = 50.83E6 cm4
Momento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3	
Baricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad
Dist. al borde	yl = -3.8500 m	yr = 3.8500 m	
	zo = 0.4014 m	zu = -0.4986 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = 0.0000 m z = 0.4986 m

Contorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

madura "B1" As-tot =195.1145 cm2 (0.42 o/o)

ombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
R 2 / CS 1	AEH500	1.0	2	1.0000	-3.7500	0.7800
					3.7500	0.7800
R 1 / CS 1	AEH500	1.0	2	194.1145	-1.8000	0.0600
					1.8000	0.0600

imensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

o	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	-774.5900	0.0000	

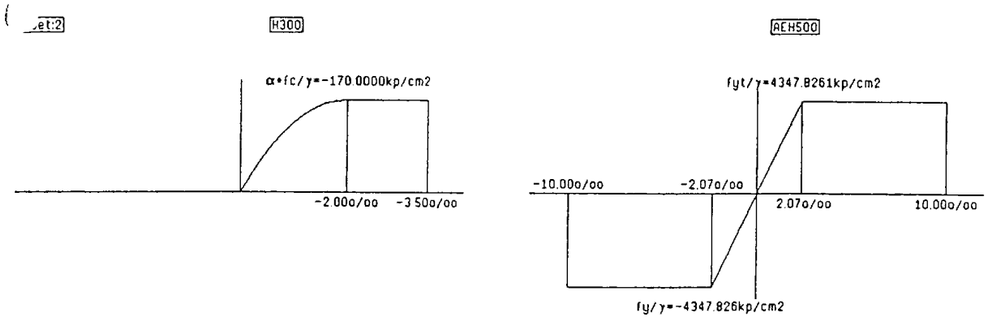
ar(ros de cálculo empleados:
et:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
et 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

o	Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
1	AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	257.6408	257.6408
	AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	----	1.0000

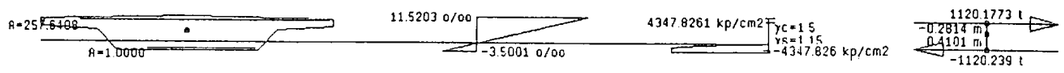
ax.x/h = 0.27 As-top/bot = 257.6408/1.0000 As = 0.56 % = 258.6408

$\phi 20/0.20 \times 7.60m +$
$23\phi 25 + 14\phi 20 \quad (276.21cm^2)$

aterial acorde a la sección: "TABVANOL"



Dimensionamiento,Sección "TABVANOL"



Características mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

Area	Ax = 46.53E3 cm2		
Momento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4
Const. de torsión			Ix = 50.83E6 cm4
Momento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3	
Baricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad
Dist. al borde	yl = -3.8500 m	yr = 3.8500 m	
	zo = 0.4014 m	zu = -0.4986 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = 0.0000 m z = 0.4986 m

Contorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

Armadura "B1" As-tot =258.6408 cm2 (0.56 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 2 / CS 1	AEH500	1.0	2	257.6408	-3.7500	0.7800
					3.7500	0.7800
LR 1 / CS 1	AEH500	1.0	2	1.0000	-1.8000	0.0600
					1.8000	0.0600

Dimensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	818.4600	0.0000	

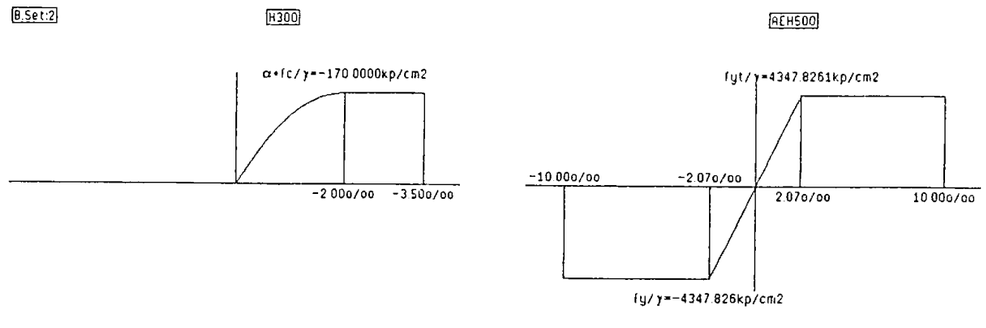
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	----	1.0000
1 AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	248.5995	248.5995

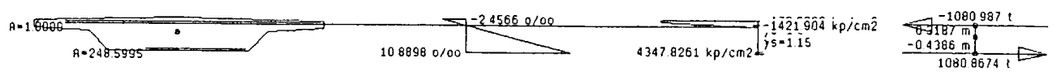
Max.x/h = 0.20 As-top/bot = 1.0000/248.5995 As = 0.54 % = 249.5995

18 ϕ25 + 18 ϕ32 + 4 ϕ25.
(252,74 cm²)

Material acorde a la sección: "TABVANOL"

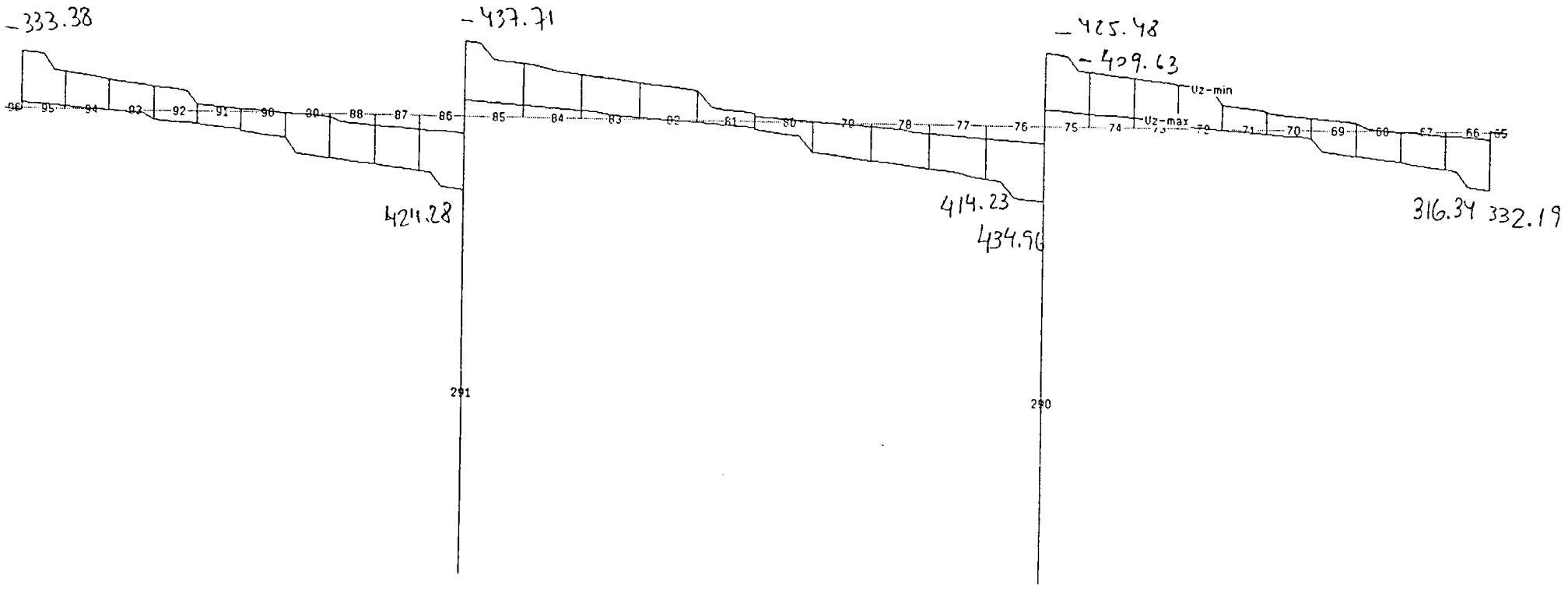


Dimensionamiento, Sección "TABVANOL"



2.4.1.3. Verificación de las secciones a esfuerzos de cortante (E.L.U.)

Scale 1 : 173.7
Int. Forces envelope Vz, GWSP ES (COMBINACION FZAS EXTERIORES), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 5.00E-03
  min: -4.38E+02 max: 9.76E+01 [t]
- Envelope Shear force Vz-max, Scale 5.00E-03
  min: -9.90E+01 max: 4.35E+02 [t]



ENVELOPE SPECIFIC.: ES 'COMBINACION FZAS EXTERIORES'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	2	2.025		PESO PAVIMENTO
D	OR	2	1.000		PESO PAVIMENTO
E	PL.PERM	3	1.350		PESO BARRERAS
F	OR	3	1.000		PESO BARRERAS
G	PL.PERM	5	1.350		RETRACCION
H	OR	5	1.000		RETRACCION
I	PLUS	6	1.500		SOB UNIF 1
J	PLUS	7	1.500		SOBRECARGA UNIF 2
K	PLUS	8	1.500		SOB UNIF 3
L	PLUS	11	4.220		VEHICULO HIPOTESIS 11
M	OR	12	4.220		VEHICULO HIPOTESIS 12
N	OR	13	4.220		VEHICULO HIPOTESIS 13
O	OR	14	4.220		VEHICULO HIPOTESIS 14
P	OR	15	4.220		VEHICULO HIPOTESIS 15
Q	OR	16	4.220		VEHICULO HIPOTESIS 16
R	OR	17	4.220		VEHICULO HIPOTESIS 17
S	OR	18	4.220		VEHICULO HIPOTESIS 18
T	OR	19	4.220		VEHICULO HIPOTESIS 19
U	OR	20	4.220		VEHICULO HIPOTESIS 20
V	OR	21	4.220		VEHICULO HIPOTESIS 21
W	OR	22	4.220		VEHICULO HIPOTESIS 22
X	OR	23	4.220		VEHICULO HIPOTESIS 23
Y	OR	24	4.220		VEHICULO HIPOTESIS 24
Z	OR	25	4.220		VEHICULO POSICION 25
AA	OR	26	4.220		VEHICULO POSICION 26
AB	OR	27	4.220		VEHICULO POSICION 27
AC	OR	28	4.220		VEHICULO POSICION 28
AD	OR	29	4.220		VEHICULO POSICION 29
AE	OR	30	4.220		VEHICULO POSICION 30
AF	OR	31	4.220		VEHICULO POSICION 31
AG	OR	32	4.220		VEHICULO POSICION 32
AH	OR	33	4.220		VEHICULO POSICION 33
AI	OR	34	4.220		VEHICULO POSICION 34
AJ	OR	35	4.220		VEHICULO POSICION 35
AK	OR	36	4.220		VEHICULO POSICION 36
AL	OR	37	4.220		VEHICULO HIPOTESIS 37
AM	PLUS	60	1.500		FRENADO
AN	PLUS	63	0.450000		VIENTO TRANSV CON SOB
AO	PLUS	64	0.900000		TEMPERATURA (-)
AP	OR	65	0.900000		TEMPERATURA (+)
AQ	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AR	PERM.	1	1.350	PESO PROPIO
AS	OR	1	1.000	PESO PROPIO
AT	PL.PERM	2	2.025	PESO PAVIMENTO
AU	OR	2	1.000	PESO PAVIMENTO
AV	PL.PERM	3	1.350	PESO BARRERAS
AW	OR	3	1.000	PESO BARRERAS
AX	PL.PERM	5	1.350	RETRACCION
AY	OR	5	1.000	RETRACCION
AZ	PLUS	9	1.500	SOB UNIF EXC
BA	PLUS	10	1.500	SOB UNIF EXC
BB	PLUS	11	4.220	VEHICULO HIPOTESIS 11
BC	OR	12	4.220	VEHICULO HIPOTESIS 12
BD	OR	13	4.220	VEHICULO HIPOTESIS 13
BE	OR	14	4.220	VEHICULO HIPOTESIS 14
BF	OR	15	4.220	VEHICULO HIPOTESIS 15
BG	OR	16	4.220	VEHICULO HIPOTESIS 16
BH	OR	17	4.220	VEHICULO HIPOTESIS 17
BI	OR	18	4.220	VEHICULO HIPOTESIS 18
BJ	OR	19	4.220	VEHICULO HIPOTESIS 19
BK	OR	20	4.220	VEHICULO HIPOTESIS 20
BL	OR	21	4.220	VEHICULO HIPOTESIS 21
BM	OR	22	4.220	VEHICULO HIPOTESIS 22
BN	OR	23	4.220	VEHICULO HIPOTESIS 23
BO	OR	24	4.220	VEHICULO HIPOTESIS 24
BP	OR	25	4.220	VEHICULO POSICION 25
BQ	OR	26	4.220	VEHICULO POSICION 26
BR	OR	27	4.220	VEHICULO POSICION 27
BS	OR	28	4.220	VEHICULO POSICION 28
BT	OR	29	4.220	VEHICULO POSICION 29
BU	OR	30	4.220	VEHICULO POSICION 30
BV	OR	31	4.220	VEHICULO POSICION 31
BW	OR	32	4.220	VEHICULO POSICION 32
BX	OR	33	4.220	VEHICULO POSICION 33
BY	OR	34	4.220	VEHICULO POSICION 34
BZ	OR	35	4.220	VEHICULO POSICION 35
CA	OR	36	4.220	VEHICULO POSICION 36
CB	OR	37	4.220	VEHICULO HIPOTESIS 37
CC	PLUS	60	1.500	FRENADO
CD	PLUS	63	0.450000	VIENTO TRANSV CON SOB
CE	PLUS	64	0.900000	TEMPERATURA (-)
CF	OR	65	0.900000	TEMPERATURA (+)
CG	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-8.21E-12	1.74E-08	-1.22E-07	-9.54E-13	6.01E-13	-2.51E-09
		-2.05E-09	-4.99E-10	-7.12E-08	4.98E-13	-1.24E-12	2.66E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.125	-8.21E-12	1.74E-08	-3.04E	-9.54E-13	-0.190500	-3.35E-10
		-0.051131	-4.99E-10	-1.779	4.98E-13	-0.111177	2.60E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.250	-8.21E-12	1.74E-08	-6.096	-9.54E-13	-0.761998	1.84E-09
		-0.102263	-4.99E-10	-3.558	4.98E-13	-0.444707	2.54E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.375	-8.21E-12	1.74E-08	-9.144	-9.54E-13	-1.714	4.02E-09

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.153394	-4.99E-10	-5.336	4.98E-13	-1.001	2.47E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
65	0.500	-8.21E-12	1.74E-08	-12.192	-9.54E-13	-3.048	6.19E-09
		-0.204525	-4.99E-10	-7.115	4.98E-13	-1.779	2.41E-09
		Min: AR AT AV AX AZ BA BC...			Max: B D F H P AM AO AQ		
66	0	8.794	-13.901	37.688	1.75E-13	-1.779	-1.91E-07
		-0.738234	-16.352	332.190	-1.34E-13	-3.048	-2.23E-07
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.325	8.661	-13.901	33.063	1.75E-13	9.718	-4.518
		-0.738234	-16.352	324.265	-1.34E-13	103.626	-5.314
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.650	8.528	-13.901	28.438	1.75E-13	19.712	-9.036
		-0.738234	-16.352	316.340	-1.34E-13	207.724	-10.629
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	0.975	8.395	-13.901	23.813	1.75E-13	28.203	-13.553
		-0.738234	-16.352	224.015	126.600	298.697	-15.943
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
66	1.300	8.262	-13.901	19.186	1.75E-13	35.190	-18.071
		-0.738234	-16.352	216.091	126.600	370.214	-21.257
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0	8.262	-13.901	19.186	1.75E-13	35.190	-18.071
		-0.736234	-16.352	216.091	126.600	370.214	-21.257
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.325	8.129	-13.901	14.563	1.75E-13	40.675	-22.589
		-0.738234	-16.352	208.166	126.600	439.156	-26.571
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.650	7.996	-13.901	9.938	1.75E-13	44.656	-27.107
		-0.738234	-16.352	200.241	126.600	505.522	-31.886
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	0.975	7.863	-13.901	5.313	1.75E-13	47.134	-31.624
		-0.738234	-16.352	192.316	126.600	569.313	-37.200
		Min: B D F G J P AM AO			Max: A C E H I K L AP AQ		
67	1.300	7.730	-13.901	0.687888	1.75E-13	48.109	-36.142
		-1.242	-16.352	175.982	2.03E-13	536.923	-42.514
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68	0	7.730	-13.901	0.687888	1.75E-13	48.109	-36.142
		-1.242	-16.352	175.982	2.03E-13	536.923	-42.514
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68	0.325	7.597	-13.901	-3.937	1.75E-13	47.581	-40.660
		-1.242	-16.352	168.057	2.03E-13	592.830	-47.828
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68	0.650	7.464	-13.901	-8.562	1.75E-13	45.550	-45.178
		-1.242	-16.352	160.133	2.03E-13	646.161	-53.143
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		
68	0.975	7.331	-13.901	-13.187	1.75E-13	42.016	-49.696
		-1.242	-16.352	152.208	2.03E-13	696.916	-58.457
		Min: B D F G J P AM AO			Max: A C E H I K M AP AQ		

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
68	1.300	6.754	-16.352	-51.430	379.800	500.888	-63.771
		-1.242	-16.352	144.283	2.03E-13	745.096	-63.771
		Min: B D F G J L AM AO			Max: A C E H I K M AP AQ		
69	0	6.754	-16.352	-51.430	379.800	500.888	-63.771
		-1.242	-16.352	144.283	1.60E-12	745.096	-63.771
		Min: B D F G J L AM AO			Max: A C E H I K M AP AQ		
69	0.325	6.621	-16.352	-56.055	379.800	483.422	-69.085
		-1.242	-16.352	136.358	1.60E-12	790.700	-69.085
		Min: B D F G J L AM AO			Max: A C E H I K M AP AQ		
69	0.650	6.488	-16.352	-60.680	379.800	464.452	-74.400
		-1.242	-16.352	128.433	1.60E-12	833.729	-74.400
		Min: B D F G J L AM AO			Max: A C E H I K M AP AQ		
69	0.975	6.355	-16.352	-65.696	379.800	505.016	-79.714
		-1.242	-16.352	120.900	1.60E-12	813.145	-79.714
		Min: A C E G J L AM AO			Max: B D F H I K M AP AQ		
69	1.300	6.222	-16.352	-72.061	379.800	482.630	-85.028
		-0.964122	-16.352	41.819	6.01E-13	472.373	-85.028
		Min: A C E G J L AM AO			Max: B D F H I K N AP AQ		
70	0	6.222	-16.352	-72.061	379.800	482.630	-85.028
		-0.964122	-16.352	41.819	6.22E-13	472.373	-85.028
		Min: A C E G J L AM AO			Max: B D F H I K N AP AQ		
70	0.325	6.089	-16.352	-78.426	379.800	458.176	-90.342
		-0.964122	-16.352	35.634	6.22E-13	484.959	-90.342
		Min: A C E G J L AM AO			Max: B D F H I K N AP AQ		
70	0.650	5.794	-16.352	-85.432	379.800	509.435	-95.657
		-0.801778	-16.352	30.090	6.22E-13	417.753	-95.657
		Min: A C E G I J L AM AO			Max: B D F H K N AP AQ		
70	0.975	5.661	-16.352	-93.357	379.800	480.382	-100.971
		-0.801778	-16.352	25.465	6.22E-13	426.781	-100.971
		Min: A C E G I J L AM AO			Max: B D F H K N AP AQ		
70	1.300	5.528	-16.352	-101.282	379.800	448.753	-106.285
		-0.801778	-16.352	20.840	6.22E-13	434.306	-106.285
		Min: A C E G I J L AM AO			Max: B D F H K N AP AQ		
71	0	5.025	-16.352	-109.691	253.200	769.672	-106.285
		-0.801778	-16.352	20.840	-3.88E-13	434.306	-106.285
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	0.325	4.892	-16.352	-117.616	253.200	732.734	-111.599
		-0.801778	-16.352	16.215	-3.88E-13	440.327	-111.599
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	0.650	4.759	-16.352	-125.541	253.200	693.221	-116.914
		-0.801778	-16.352	11.591	-3.88E-13	444.846	-116.914
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	0.975	4.626	-16.352	-133.465	253.200	651.133	-122.228
		-0.801778	-16.352	6.966	-3.88E-13	447.861	-122.228
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
71	1.300	4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-3.88E-13	449.374	-127.542

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0	4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-6.12E-13	449.374	-127.542
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.325	4.360	-16.352	-233.715	379.800	548.679	-132.856
		-0.801778	-16.352	-2.284	-6.12E-13	449.383	-132.856
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.650	4.227	-16.352	-241.640	379.800	471.434	-138.171
		-0.801778	-16.352	-6.909	-6.12E-13	447.885	-138.171
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.975	4.094	-16.352	-249.564	379.800	391.614	-143.485
		-0.801778	-16.352	-11.534	-6.12E-13	444.892	-143.485
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	1.300	3.961	-16.352	-257.489	379.800	309.218	-148.799
		-0.801778	-16.352	-16.159	-6.12E-13	440.392	-148.799
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
73	0	3.961	-16.352	-257.489	379.800	309.217	-148.799
		-0.801778	-16.352	-16.159	-2.89E-12	440.392	-148.799
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
73	0.325	3.828	-16.352	-265.414	379.800	224.246	-154.113
		0.810842	-11.450	-47.936	-1.53E-12	178.478	-107.917
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	0.650	3.695	-16.352	-273.339	379.800	126.698	-159.428
		0.810842	-11.450	-52.561	-1.53E-12	162.147	-111.639
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	0.975	3.562	-16.352	-281.264	379.800	46.576	-164.742
		0.810842	-11.450	-57.186	-1.53E-12	144.313	-115.360
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	1.300	3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-1.53E-12	124.976	-119.081
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0	3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-2.52E-12	124.976	-119.081
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.325	3.296	-16.352	-297.113	379.800	-141.397	-175.371
		0.810842	-11.450	-66.436	-2.52E-12	104.135	-122.803
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.650	3.163	-16.352	-305.038	379.800	-239.246	-180.685
		0.810842	-11.450	-71.061	-2.52E-12	81.792	-126.524
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.975	3.030	-16.352	-312.963	379.800	-339.671	-185.999
		0.810842	-11.450	-75.686	-2.52E-12	57.945	-130.245
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	1.300	2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-2.52E-12	32.596	-133.966
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0	4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-6.12E-13	449.374	-127.542
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.325	4.360	-16.352	-233.715	379.800	548.679	-132.856
		-0.801778	-16.352	-2.284	-6.12E-13	449.383	-132.856
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.650	4.227	-16.352	-241.640	379.800	471.434	-138.171
		-0.801778	-16.352	-6.909	-6.12E-13	447.885	-138.171
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	0.975	4.094	-16.352	-249.564	379.800	391.614	-143.485
		-0.801778	-16.352	-11.534	-6.12E-13	444.892	-143.485
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
72	1.300	3.961	-16.352	-257.489	379.800	309.218	-148.799
		-0.801778	-16.352	-16.159	-6.12E-13	440.392	-148.799
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
73	0	3.961	-16.352	-257.489	379.800	309.217	-148.799
		-0.801778	-16.352	-16.159	-2.89E-12	440.392	-148.799
		Min: A C E G I J M AM AO			Max: B D F H K N AP AQ		
73	0.325	3.828	-16.352	-265.414	379.800	224.246	-154.113
		0.810842	-11.450	-47.936	-1.53E-12	178.478	-107.917
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	0.650	3.695	-16.352	-273.339	379.800	126.698	-159.428
		0.810842	-11.450	-52.561	-1.53E-12	162.147	-111.639
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	0.975	3.562	-16.352	-281.264	379.800	46.576	-164.742
		0.810842	-11.450	-57.186	-1.53E-12	144.313	-115.360
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
73	1.300	3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-1.53E-12	124.976	-119.081
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0	3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-2.52E-12	124.976	-119.081
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.325	3.296	-16.352	-297.113	379.800	-141.397	-175.371
		0.810842	-11.450	-66.436	-2.52E-12	104.135	-122.803
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.650	3.163	-16.352	-305.038	379.800	-239.246	-180.685
		0.810842	-11.450	-71.061	-2.52E-12	81.792	-126.524
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	0.975	3.030	-16.352	-312.963	379.800	-339.671	-185.999
		0.810842	-11.450	-75.686	-2.52E-12	57.945	-130.245
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
74	1.300	2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-2.52E-12	32.596	-133.966
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
75	0	2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-3.08E-12	32.596	-133.966
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
75	0.325	2.765	-16.352	-328.812	379.800	-548.248	-196.628
		0.810842	-11.450	-84.936	-3.08E-12	5.743	-137.688
		Min: A C E G I J M AM AO			Max: B D F H K S AP AQ		
75	0.650	2.905	-16.352	-409.633	379.800	-505.886	-201.942
		0.810842	-11.450	-89.561	-3.08E-12	-22.613	-141.409
		Min: A C E G I J N AM AO			Max: B D F H K S AP AQ		
75	0.975	2.776	-16.352	-417.558	379.800	-640.307	-207.256
		0.810842	-11.450	-94.186	-3.08E-12	-52.471	-145.130
		Min: A C E G I J N AM AO			Max: B D F H K S AP AQ		
75	1.300	2.644	-16.352	-425.483	379.800	-777.301	-212.570
		0.810842	-11.450	-98.811	-3.08E-12	-83.833	-148.852
		Min: A C E G I J N AM AO			Max: E D F H K S AP AQ		
76	0	7.040	-4.100	96.301	-127.576	-215.069	-145.511
		3.526	2.967	434.962	-234.993	-616.520	-205.582
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	0.425	6.866	-4.100	90.253	-127.576	-175.427	-147.254
		3.526	2.967	424.599	-234.993	-433.863	-204.322
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	0.850	6.692	-4.100	84.205	-127.576	-138.355	-148.997
		3.526	2.967	414.236	-234.993	-255.611	-203.061
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	1.275	6.518	-4.100	78.156	-127.576	-103.853	-150.739
		3.526	2.967	319.473	-108.393	-117.633	-201.800
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
76	1.700	6.344	-4.100	72.108	-127.576	-71.922	-152.482
		3.526	2.967	309.109	-108.393	15.941	-200.539
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
77	0	6.344	-4.100	72.108	-127.576	-71.922	-152.482
		3.526	2.967	309.109	-108.393	15.941	-200.539
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
77	0.425	6.170	-4.100	66.060	-127.576	-42.561	-154.225
		3.526	2.967	298.746	-108.393	145.110	-199.278
		Min: B D F H K S AM AP			Max: A C E G I J O AO AQ		
77	0.850	5.997	-4.100	60.012	-127.576	-15.770	-155.967
		-0.641686	5.23E-09	274.803	-189.900	19.158	-180.365
		Min: B D F H K S AM AP			Max: A C E G I J P AO AQ		
77	1.275	5.823	-4.100	53.964	-127.576	8.450	-157.710
		-0.641686	5.23E-09	264.440	-189.900	133.747	-180.365
		Min: B D F H K S AM AP			Max: A C E G I J P AO AQ		
77	1.700	5.649	-4.100	47.916	-127.576	30.100	-159.453
		-0.641686	5.23E-09	254.077	-189.900	243.932	-180.365
		Min: B D F H K S AM AP			Max: A C E G I J P AO AQ		
78	0	5.649	-4.100	47.916	-127.576	30.100	-159.453
		-0.641686	4.63E-09	254.077	-189.900	243.932	-180.365

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F H K S AM AP		Max: A C E G I J P AO AQ			
78	0.425	5.475	-4.100	41.868	-127.576	49.179	-161.195
		-0.641686	4.63E-09	243.713	-189.900	349.712	-180.365
		Min: B D F H K S AM AP		Max: A C E G I J P AO AQ			
78	0.850	-2.783	2.967	25.996	144.807	320.860	-192.974
		-0.641686	4.63E-09	233.350	-189.900	451.088	-180.365
		Min: B D F H K O AM AP		Max: A C E G I J P AO AQ			
78	1.275	-2.956	2.967	19.948	144.807	330.623	-191.713
		-0.641686	4.63E-09	222.987	-189.900	548.060	-180.365
		Min: B D F H K O AM AP		Max: A C E G I J P AO AQ			
78	1.700	-3.130	2.967	13.900	144.807	337.816	-190.452
		-0.641686	4.63E-09	212.624	-189.900	640.627	-180.365
		Min: B D F H K O AM AP		Max: A C E G I J P AO AQ			
79	0	-4.175	2.967	13.900	144.807	502.695	-190.452
		0.403304	4.11E-09	212.624	-189.900	475.748	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	0.425	-4.349	2.967	7.852	144.807	507.318	-189.191
		0.403304	4.11E-09	202.261	-189.900	563.911	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	0.850	-4.523	2.967	1.804	144.807	505.370	-187.930
		0.403304	4.11E-09	191.897	-189.900	647.670	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	1.275	-4.697	2.967	-4.244	144.807	506.851	-186.669
		0.403304	4.11E-09	181.534	-189.900	727.024	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
79	1.700	-4.871	2.967	-10.292	144.807	505.762	-185.408
		0.403304	4.11E-09	171.171	-189.900	801.974	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	0	-4.871	2.967	-10.292	144.807	505.762	-185.408
		0.403304	3.94E-09	171.171	-189.900	801.974	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	0.425	-5.044	2.967	-16.340	144.807	500.103	-184.147
		0.403304	3.94E-09	76.408	-63.300	853.525	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AQ			
80	0.850	-5.218	2.967	-22.388	144.807	491.873	-182.887
		0.403304	3.94E-09	66.045	-63.300	883.800	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	1.275	-5.392	2.967	-28.436	144.807	481.073	-181.626
		0.403304	3.94E-09	55.682	-63.300	909.667	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
80	1.700	-5.566	2.967	-34.484	144.807	467.703	-180.366
		0.403304	3.94E-09	45.318	-63.300	931.130	-180.365
		Min: B D F H K O AM AP AQ		Max: A C E G I J P AO			
81	0	-11.847	3.62E-09	-48.064	63.300	1085.477	-180.365
		6.684	-2.967	31.738	-144.807	313.356	-180.365
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	0.425	-12.021	3.62E-09	-58.427	63.300	1062.847	-180.365

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		6.684	-2.967	25.690	-144.807	325.559	-181.626
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	0.850	-12.195	3.62E-09	-68.790	63.300	1035.814	-180.365
		6.684	-2.967	19.642	-144.807	335.193	-182.887
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	1.275	-12.368	3.62E-09	-79.154	63.300	1004.375	-180.365
		6.684	-2.967	13.594	-144.807	342.255	-184.147
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
81	1.700	-12.542	3.62E-09	-173.917	189.900	951.653	-180.365
		6.684	-2.967	7.546	-144.807	346.748	-185.408
		Min: A C E H J K P AM AP AQ		Max: B D F G I Q AO			
82	0	-11.497	3.50E-09	-173.917	189.900	786.774	-180.365
		5.639	-2.967	7.546	-144.807	511.627	-185.408
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	0.425	-11.671	3.50E-09	-184.280	189.900	710.657	-180.365
		5.639	-2.967	1.498	-144.807	513.549	-186.669
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	0.850	-11.845	3.50E-09	-194.643	189.900	630.136	-180.365
		5.639	-2.967	-4.550	-144.807	512.900	-187.930
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	1.275	-12.019	3.50E-09	-205.006	189.900	545.210	-180.365
		5.639	-2.967	-10.598	-144.807	509.682	-189.191
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
82	1.700	-12.193	3.50E-09	-215.370	189.900	455.880	-180.365
		5.639	-2.967	-16.646	-144.807	503.892	-190.452
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	0	-12.193	3.56E-09	-215.370	189.900	455.880	-180.365
		5.639	-2.967	-16.646	-144.807	503.892	-190.452
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	0.425	-12.366	3.56E-09	-225.733	189.900	362.146	-180.365
		5.639	-2.967	-22.694	-144.807	495.533	-191.713
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	0.850	-12.540	3.56E-09	-236.096	189.900	264.007	-180.365
		5.639	-2.967	-28.742	-144.807	484.603	-192.974
		Min: A C E H J K P AM AP		Max: B D F G I Q AO AQ			
83	1.275	-12.714	3.56E-09	-246.459	189.900	161.464	-180.365
		13.723	4.100	-44.614	127.576	211.754	-161.195
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
83	1.700	-12.888	3.56E-09	-256.822	189.900	54.517	-180.365
		13.723	4.100	-50.662	127.576	191.508	-159.453
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
84	0	-12.888	3.51E-09	-256.822	189.900	54.517	-180.365
		13.723	4.100	-50.662	127.576	191.508	-159.453
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
84	0.425	-13.062	3.51E-09	-267.185	189.900	-56.834	-180.365
		13.723	4.100	-56.710	127.576	168.692	-157.710
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
84	0.850	-13.236	3.51E-09	-277.549	189.900	-172.590	-180.365
		13.723	4.100	-62.758	127.576	143.305	-155.967
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
84	1.275	-9.241	-2.967	-301.492	108.393	-47.805	-199.278
		13.723	4.100	-68.806	127.576	115.347	-154.225
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
84	1.700	-9.415	-2.967	-311.855	108.393	-178.142	-200.539
		13.723	4.100	-74.854	127.576	84.819	-152.482
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	0	-9.415	-2.967	-311.855	108.393	-178.142	-200.539
		13.723	4.100	-74.854	127.576	84.819	-152.482
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	0.425	-9.589	-2.967	-322.218	108.393	-312.882	-201.800
		13.723	4.100	-80.902	127.576	51.721	-150.735
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	0.850	-9.763	-2.967	-332.581	108.393	-452.027	-203.061
		13.723	4.100	-86.950	127.576	16.052	-148.997
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	1.275	-9.937	-2.967	-427.345	234.993	-631.446	-204.322
		13.723	4.100	-92.998	127.576	-22.187	-147.254
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
85	1.700	-10.111	-2.967	-437.708	234.993	-815.270	-205.582
		13.723	4.100	-99.046	127.576	-62.996	-145.511
		Min: A C E H J K Q AM AP		Max: B D F G I M AO AQ			
86	0	3.365	11.450	97.611	-1.01E-12	-68.240	-148.852
		5.197	16.352	424.263	-379.800	-761.707	-212.570
		Min: B D F H I M AM AP AQ		Max: A C E G J K R AO			
86	0.325	3.232	11.450	92.986	-1.01E-12	-37.266	-145.130
		5.197	16.352	416.358	-379.800	-625.103	-207.256
		Min: B D F H I M AM AP AQ		Max: A C E G J K R AO			
86	0.650	3.099	11.450	88.362	-1.01E-12	-7.799	-141.409
		5.197	16.352	408.434	-379.800	-491.074	-201.942
		Min: B D F H I M AM AP AQ		Max: A C E G J K R AO			
86	0.975	2.966	11.450	83.737	-1.01E-12	20.167	-137.688
		4.919	16.352	327.613	-379.800	-533.824	-196.626
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
86	1.300	2.833	11.450	79.112	-1.01E-12	46.630	-133.966
		4.919	16.352	319.688	-379.800	-428.638	-191.313
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0	2.833	11.450	79.112	-5.45E-13	46.630	-133.966
		4.919	16.352	319.688	-379.800	-428.638	-191.313
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0.325	2.700	11.450	74.487	-5.45E-13	71.590	-130.245
		4.919	16.352	311.763	-379.800	-326.027	-185.999
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0.650	2.567	11.450	69.862	-5.45E-13	95.046	-126.524
		4.919	16.352	303.838	-379.800	-225.952	-180.685

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	0.975	2.434	11.450	65.237	-5.45E-13	117.000	-122.803
		4.919	16.352	295.914	-379.800	-128.532	-175.371
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
87	1.300	2.301	11.450	60.612	-5.45E-13	137.450	-119.081
		4.919	16.352	287.989	-379.800	-33.648	-170.056
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0	2.301	11.450	60.612	7.48E-13	137.450	-119.081
		4.919	16.352	287.989	-379.800	-33.648	-170.056
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0.325	2.168	11.450	55.987	7.48E-13	156.398	-115.360
		4.919	16.352	280.064	-379.800	58.661	-164.742
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0.650	2.035	11.450	51.362	7.48E-13	173.842	-111.639
		4.919	16.352	272.139	-379.800	148.394	-159.428
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	0.975	1.902	11.450	46.737	7.48E-13	189.783	-107.917
		4.919	16.352	264.214	-379.800	235.551	-154.113
		Min: B D F H I M AM AP AQ		Max: A C E G J K S AO			
88	1.300	0.156708	16.352	14.960	2.70E-13	451.307	-148.799
		4.919	16.352	256.290	-379.800	320.133	-148.799
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0	0.156708	16.352	14.960	2.43E-12	451.307	-148.799
		4.919	16.352	256.290	-379.800	320.133	-148.799
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0.325	0.023767	16.352	10.335	2.43E-12	455.417	-143.485
		4.919	16.352	248.365	-379.800	402.139	-143.485
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0.650	-0.109174	16.352	5.710	2.43E-12	458.025	-138.171
		4.919	16.352	240.440	-379.800	481.570	-138.171
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	0.975	-0.242116	16.352	1.085	2.43E-12	459.129	-132.856
		4.919	16.352	232.515	-379.800	558.425	-132.856
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
89	1.300	-0.375057	16.352	-3.540	2.43E-12	458.730	-127.542
		4.919	16.352	140.191	-253.200	615.825	-127.542
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0	-0.375057	16.352	-3.540	1.29E-12	458.730	-127.542
		4.919	16.352	140.191	-253.200	615.825	-127.542
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0.325	-0.507998	16.352	-8.165	1.29E-12	456.828	-122.228
		4.919	16.352	132.266	-253.200	660.099	-122.228
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0.650	-0.640939	16.352	-12.790	1.29E-12	453.422	-116.914
		4.919	16.352	124.341	-253.200	701.798	-116.914
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	0.975	-0.773881	16.352	-17.415	1.29E-12	448.514	-111.599

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		4.919	16.352	116.416	-253.200	740.921	-111.599
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
90	1.300	-0.906822	16.352	-22.040	1.29E-12	442.103	-106.285
		4.919	16.352	108.491	-253.200	777.468	-106.285
		Min: B D F H I R AM AP AQ		Max: A C E G J K S AO			
91	0	-0.906822	16.352	-22.040	2.29E-12	442.103	-106.285
		5.423	16.352	100.082	-379.800	456.550	-106.285
		Min: B D F H I R AM AP AQ		Max: A C E G J K T AO			
91	0.325	-1.040	16.352	-26.665	2.29E-12	434.188	-100.971
		5.423	16.352	92.157	-379.800	487.789	-100.971
		Min: B D F H I R AM AP AQ		Max: A C E G J K T AO			
91	0.650	-1.173	16.352	-31.290	2.29E-12	424.770	-95.657
		5.423	16.352	84.232	-379.800	516.452	-95.657
		Min: E D F H I R AM AP AQ		Max: A C E G J K T AO			
91	0.975	-1.468	16.352	-36.833	2.29E-12	491.586	-90.342
		5.585	16.352	77.226	-379.800	464.803	-90.342
		Min: E D F H I K R AM AP AQ		Max: A C E G J T AO			
91	1.300	-1.601	16.352	-43.018	2.29E-12	478.610	-85.028
		5.585	16.352	70.861	-379.800	488.868	-85.028
		Min: E D F H I K R AM AP AQ		Max: A C E G J T AO			
92	0	-1.601	16.352	-43.018	5.94E-13	478.610	-85.028
		5.585	16.352	70.861	-379.800	488.868	-85.028
		Min: E D F H I K R AM AP AQ		Max: A C E G J T AO			
92	0.325	-2.012	16.352	-122.099	4.26E-14	818.993	-79.714
		5.585	16.352	64.497	-379.800	510.863	-79.714
		Min: E D F H I K S AM AP AQ		Max: A C E G J T AO			
92	0.650	-2.145	16.352	-125.633	4.26E-14	839.186	-74.400
		5.585	16.352	59.480	-379.800	469.910	-74.400
		Min: A C E H I K S AM AP AQ		Max: E D F G J T AO			
92	0.975	-2.278	16.352	-137.558	4.26E-14	795.768	-69.085
		5.585	16.352	54.855	-379.800	488.489	-69.085
		Min: A C E H I K S AM AP AQ		Max: E D F G J T AO			
92	1.300	-2.410	16.352	-145.483	4.26E-14	749.774	-63.771
		5.585	16.352	50.231	-379.800	505.566	-63.771
		Min: A C E H I K S AM AP AQ		Max: E D F G J T AO			
93	0	-2.410	16.352	-145.483	6.91E-13	749.774	-63.771
		5.585	16.352	50.231	-379.800	505.566	-63.771
		Min: A C E H I K S AM AP AQ		Max: E D F G J T AO			
93	0.325	-2.543	16.352	-153.407	6.91E-13	701.204	-58.457
		6.030	13.901	11.987	4.87E-13	46.304	-49.696
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			
93	0.650	-2.676	16.352	-161.332	6.91E-13	650.059	-53.143
		6.030	13.901	7.363	4.87E-13	49.448	-45.178
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			
93	0.975	-2.809	16.352	-169.257	6.91E-13	596.338	-47.828
		6.030	13.901	2.738	4.87E-13	51.090	-40.660
		Min: A C E H I K S AM AP AQ		Max: E D F G J P AO			

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
93	1.300	-2.942	16.352	-177.182	6.91E-13	540.042	-42.514
		6.030	13.901	-1.887	4.87E-13	51.228	-36.142
		Min: A C E H I K S AM AP AQ		Max: E D F G J P AO			
94	0	-2.942	16.352	-177.182	1.05E-12	540.042	-42.514
		6.030	13.901	-1.887	7.58E-13	51.228	-36.142
		Min: A C E H I K S AM AP AQ		Max: B D F G J P AO			
94	0.325	-2.572	16.352	-193.516	-126.600	572.042	-37.200
		6.030	13.901	-6.512	7.58E-13	49.863	-31.624
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
94	0.650	-2.704	16.352	-201.441	-126.600	507.861	-31.886
		6.030	13.901	-11.137	7.58E-13	46.995	-27.107
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
94	0.975	-2.837	16.352	-209.365	-126.600	441.105	-26.571
		6.030	13.901	-15.762	7.58E-13	42.624	-22.589
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
94	1.300	-2.970	16.352	-217.290	-126.600	371.774	-21.257
		6.030	13.901	-20.387	7.58E-13	36.749	-18.071
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0	-2.970	16.352	-217.290	-126.600	371.774	-21.257
		6.030	13.901	-20.387	1.50E-12	36.749	-18.071
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0.325	-3.103	16.352	-225.215	-126.600	299.867	-15.943
		6.030	13.901	-25.012	1.50E-12	29.372	-13.553
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0.650	-3.236	16.352	-317.540	2.90E-12	208.504	-10.629
		6.030	13.901	-29.637	1.50E-12	20.492	-9.036
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	0.975	-3.369	16.352	-325.465	2.90E-12	104.016	-5.314
		6.030	13.901	-34.262	1.50E-12	10.108	-4.518
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
95	1.300	-3.502	16.352	-333.389	2.90E-12	-3.048	-2.22E-07
		6.030	13.901	-38.887	1.50E-12	-1.779	-1.89E-07
		Min: A C E H I K T AM AP AQ		Max: B D F G J P AO			
96	0	0.204525	2.01E-08	7.115	2.35E-12	-1.779	-4.15E-11
		-6.55E-12	1.96E-08	12.192	3.11E-12	-3.048	5.34E-11
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.125	0.153394	2.01E-08	5.336	2.35E-12	-1.001	2.47E-09
		-6.55E-12	1.96E-08	9.144	3.11E-12	-1.714	2.51E-09
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.250	0.102262	2.01E-08	3.558	2.35E-12	-0.444707	4.98E-09
		-6.55E-12	1.96E-08	6.096	3.11E-12	-0.761998	4.96E-09
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.375	0.051131	2.01E-08	1.779	2.35E-12	-0.111177	7.49E-09
		-6.55E-12	1.96E-08	3.048	3.11E-12	-0.190500	7.42E-09
		Min: B D F G T AM AO AQ		Max: AR AT AV AY AZ BA BI...			
96	0.500	2.01E-09	2.01E-08	7.11E-08	2.35E-12	-4.80E-12	1.00E-08
		-6.55E-12	1.96E-08	1.22E-07	3.11E-12	-1.43E-12	9.87E-09

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min: E D F G T AM AO AQ				Max: AR AT AV AY AZ BA BI...		
290	0	-433.416	-3.572	-31.459	2.547	53.551	19.808
		-433.416	-3.572	27.892	-2.463	-14.312	19.808
	Min: AR AT AV AX BA BT CD				Max: AR AT AV AX AZ BE		
290	3.300	-433.416	-3.572	-31.162	2.547	-49.773	8.020
		-433.416	-3.572	27.892	-2.463	77.732	8.020
	Min: AR AT AV AX BA BT CD				Max: AR AT AV AX AZ BE		
290	6.600	-433.416	-3.572	-30.865	2.547	-152.116	-3.767
		-433.416	-3.572	27.892	-2.463	169.776	-3.767
	Min: AR AT AV AX BA BT CD				Max: AR AT AV AX AZ BE		
290	9.900	-433.416	-3.572	-30.568	2.547	-253.480	-15.554
		-433.416	-3.572	27.892	-2.463	261.820	-15.554
	Min: AR AT AV AX BA BT CD				Max: AR AT AV AX AZ BE		
290	13.200	-433.416	-3.572	-30.271	2.547	-353.864	-27.341
		-433.416	-3.572	27.892	-2.463	353.864	-27.341
	Min: AR AT AV AX BA BT CD				Max: AR AT AV AX AZ BE		
291	0	-602.123	4.634	-31.459	-2.547	53.551	-23.407
		-602.123	4.634	27.892	2.463	-14.312	-23.407
	Min: AR AT AV AX BA BZ CD				Max: AR AT AV AX AZ BH		
291	3.300	-602.123	4.634	-31.162	-2.547	-49.773	-8.113
		-602.123	4.634	27.892	2.463	77.732	-8.113
	Min: AR AT AV AX BA BZ CD				Max: AR AT AV AX AZ BH		
291	6.600	-602.123	4.634	-30.865	-2.547	-152.116	7.180
		-602.123	4.634	27.892	2.463	169.776	7.180
	Min: AR AT AV AX BA BZ CD				Max: AR AT AV AX AZ BH		
291	9.900	-602.123	4.634	-30.568	-2.547	-253.480	22.474
		-602.123	4.634	27.892	2.463	261.820	22.474
	Min: AR AT AV AX BA BZ CD				Max: AR AT AV AX AZ BH		
291	13.200	-602.123	4.634	-30.271	-2.547	-353.864	37.768
		-602.123	4.634	27.892	2.463	353.864	37.768
	Min: AR AT AV AX BA BZ CD				Max: AR AT AV AX AZ BH		

CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título:
Fecha: 24/5/01 13.42.42

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 370 cm, alto 90 cm y canto 87 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 437 T
Cortante reducido a un canto útil del borde del apoyo = 417 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 229 cm2 lo que implica una cuantía geométrica igual a 0.00711
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 437 T < Vu1 = 1931.40 T
Es necesario disponer armadura a cortante al ser Vrd = 417.00 T > Vu2 = 161.76 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°

Vcu = 134.80 T. Vsu= 282.20 T.
As cálculo = 90.10 cm2/m. As mínima = 37.00 cm2/m
Mínimo de armadura a disponer = 90.10 cm2/m

2.4.2. Comprobación del punzonamiento del tablero

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
E	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOE
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
AT	PL.PERM	5	1.000	RETRACCION
AU	PLUS	6	1.000	SOB UNIF 1
AV	PLUS	7	1.000	SOB UNIF 2
AW	PLUS	8	1.000	SOB UNIF 3
AX	PLUS	9	1.000	SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOE
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOE
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

2.4.3. Refuerzo de armaduras bajo apoyos

2.4.3. **Refuerzo de armadura bajo apoyos**

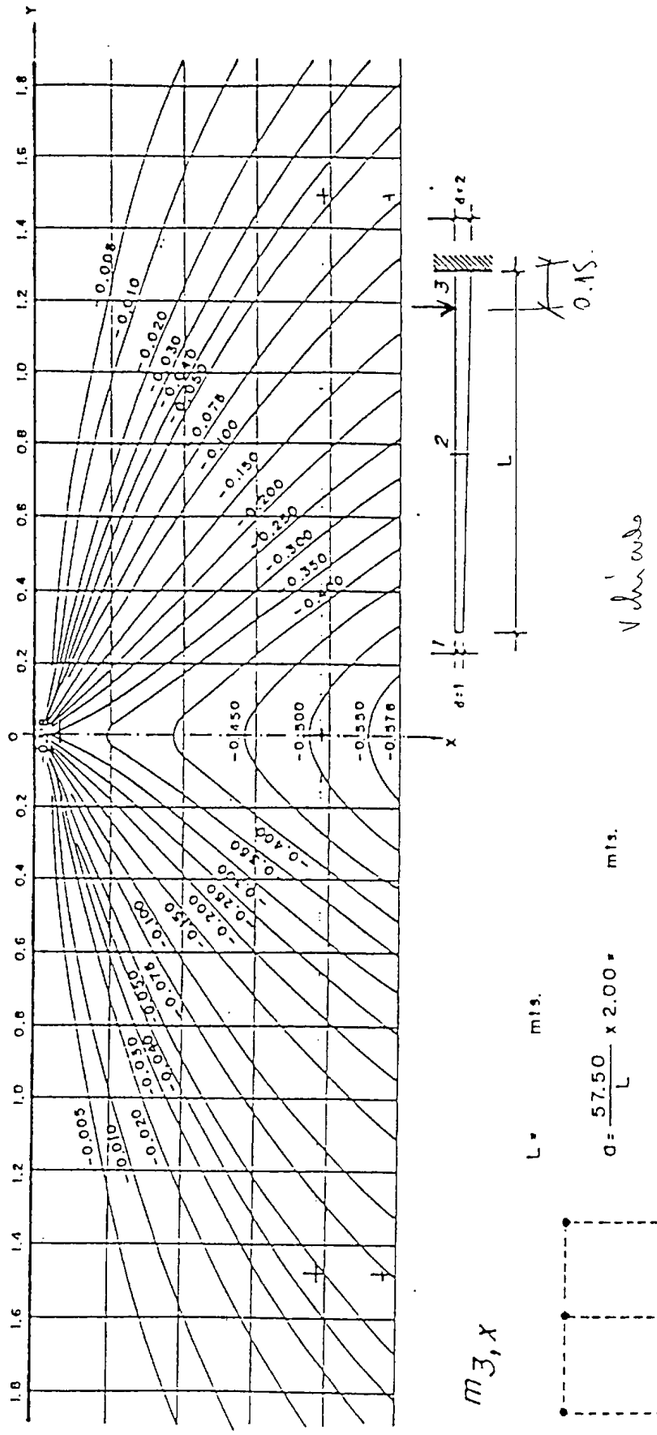
Estribos : Nmaxd = 151.68 Mp (en cada apoyo)

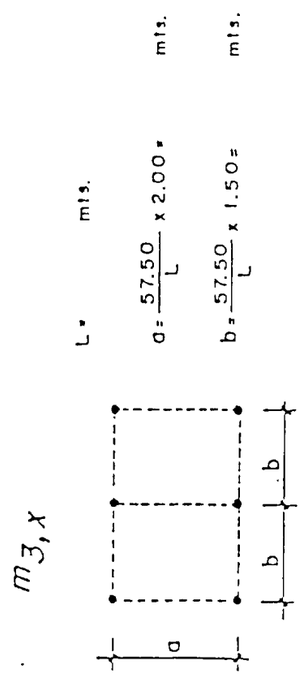
$$As = \frac{0.25 \times Nmaxd}{4.20\ Mp/cm^2}$$

$As = 9.10\ cm^2$

Adoptamos 6 x Φ 16 en cada dirección.

2.4.4. Verificación de las armaduras del voladizo





Cálculo de la armadura del voladizo

Datos :

Longitud del voladizo (m) = **1.50**

Canto mínimo (m) = **0.20**
Canto máximo (m) = **0.30**
Canto util (m) = **0.27**

Carga acera (t/m)= **1.00**

Ancho Acera (m) = **0.85**

Distancia G acera (m) = **1.33**

Peso Propio:

Mpp (mt/m) = -2.615625 V (t/m) = 0.87

Carga muerta :

Mcm (mt/m) = -1.325 V (t/m) = 1.00

Sobrecarga uniforme :

Msu (mt/m) = -0.45 V (t/m) = 0.60

Vehículo 60 t : Coeficientes bajo carga = 0.15
Coeficientes a 1.50 m = 0

Mveh (mt/m) = -1.5 V (t/m) = 10

Momento total diseño : Md (mt/m) = -8.24

As (cm^2/m) = 8.98 ϕ 16 / 20

Cortante total de diseño : Vd (t/m) = 3.43 a un canto útil

Vcu (t/m) = 13.35 verifica

3. Cálculo de la subestructura

3.1. Acciones

Loadcase Factor Stage Init.def Title
1 1.0000 PESO PROPIO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-8.77E-07	-9.44E-05	30.731			
10	8.77E-07	-9.44E-05	30.731			
156	-8.77E-07	9.44E-05	30.731			
160	8.77E-07	9.44E-05	30.731			
166	1.29E-10	0.739549	193.743	-3.253	1.02E-09	-1.01E-09
167	1.31E-10	-0.739549	193.743	3.253	1.04E-09	1.01E-09
Sums :	4.25E-12	-3.55E-15	510.411			
min:	-8.77E-07	-0.739549	30.731	-3.253	1.02E-09	-1.01E-09
max:	8.77E-07	0.739549	193.743	3.253	1.04E-09	1.01E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	4.63E-06	0.000410	0.337475	-0.000675	0.000150	1.63E-05
2	2.58E-06	0.000412	0.156680	-0.000622	0.000111	1.25E-05
3	1.54E-12	0.000412	0.048380	-0.000586	1.18E-16	4.69E-13
4	-2.58E-06	0.000412	0.156680	-0.000622	-0.000111	-1.25E-05
5	-4.63E-06	0.000410	0.337475	-0.000675	-0.000150	-1.63E-05
6	3.81E-06	0.000410	-3.07E-96	-0.000675	0.000150	1.68E-05
7	1.95E-06	0.000412	-0.154471	-0.000622	0.000111	1.25E-05
8	-8.06E-11	0.000412	-0.244623	-0.000586	1.18E-16	4.69E-13
9	-1.95E-06	0.000412	-0.154471	-0.000622	-0.000111	-1.25E-05
10	-3.81E-06	0.000410	-3.07E-96	-0.000675	-0.000150	-1.68E-05
11	-3.13E-07	0.000411	-0.869963	-0.000623	6.78E-05	1.35E-09
12	1.76E-08	0.000412	-0.940651	-0.000577	5.45E-05	9.42E-10
13	-8.18E-10	0.000412	-0.984826	-0.000546	4.76E-16	4.78E-13
14	-1.92E-08	0.000412	-0.940651	-0.000577	-5.45E-05	-9.41E-10
15	3.11E-07	0.000411	-0.869963	-0.000623	-6.78E-05	-1.34E-09
16	-1.57E-06	0.000411	-1.596	-0.000477	2.02E-05	-3.78E-11
17	-8.41E-07	0.000412	-1.618	-0.000456	1.73E-05	3.54E-10
18	-1.48E-09	0.000412	-1.631	-0.000440	5.39E-16	3.85E-13
19	8.38E-07	0.000412	-1.618	-0.000456	-1.73E-05	-3.54E-10
20	1.57E-06	0.000411	-1.596	-0.000477	-2.02E-05	3.85E-11
21	-1.54E-06	0.000412	-2.103	-0.000295	7.15E-07	-2.33E-10
22	-9.27E-07	0.000412	-2.103	-0.000287	1.06E-06	-1.58E-11
23	-1.92E-09	0.000412	-2.104	-0.000281	5.45E-17	2.21E-13
24	9.21E-07	0.000412	-2.103	-0.000287	1.06E-06	1.82E-11
25	1.54E-06	0.000412	-2.103	-0.000295	-7.15E-07	2.33E-10
26	-1.31E-06	0.000412	-2.361	-0.000101	-6.04E-06	-2.91E-10
27	-7.58E-07	0.000412	-2.354	-9.89E-05	-4.60E-06	-2.06E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-2.09E-09	0.000411	-2.351	-9.71E-05	-1.04E-15	4.71E-14
29	7.54E-07	0.000412	-2.354	-9.89E-05	4.60E-06	2.06E-10
30	1.30E-06	0.000412	-2.361	-0.000101	6.04E-06	2.91E-10
31	-7.38E-07	0.000412	-2.373	7.86E-05	-8.57E-06	-7.52E-10
32	-2.95E-07	0.000411	-2.364	8.02E-05	-6.74E-06	-5.00E-10
33	-2.00E-09	0.000411	-2.359	8.12E-05	-2.73E-15	-1.11E-13
34	2.91E-07	0.000411	-2.364	8.02E-05	6.74E-06	5.00E-10
35	7.34E-07	0.000412	-2.373	7.86E-05	8.57E-06	7.51E-10
36	9.23E-07	0.000412	-2.174	0.000218	-1.20E-05	-1.88E-09
37	9.68E-07	0.000411	-2.162	0.000222	-9.63E-06	-9.44E-10
38	-1.69E-09	0.000412	-2.154	0.000225	-4.94E-15	-2.37E-13
39	-9.72E-07	0.000411	-2.162	0.000222	9.63E-06	9.44E-10
40	-9.27E-07	0.000412	-2.174	0.000218	1.20E-05	1.88E-09
41	4.59E-06	0.000412	-1.838	0.000287	-2.25E-05	-3.34E-09
42	3.66E-06	0.000410	-1.814	0.000299	-1.82E-05	-1.01E-09
43	-1.21E-09	0.000413	-1.800	0.000308	-7.49E-15	-2.99E-13
44	-3.66E-06	0.000410	-1.814	0.000299	1.82E-05	1.01E-09
45	-4.60E-06	0.000412	-1.838	0.000287	2.25E-05	3.34E-09
46	9.78E-06	0.000407	-1.476	0.000254	-5.00E-05	-2.83E-09
47	7.69E-06	0.000410	-1.424	0.000282	-4.07E-05	9.61E-10
48	-6.93E-10	0.000419	-1.391	0.000304	-1.01E-14	-2.60E-13
49	-7.69E-06	0.000410	-1.424	0.000282	4.07E-05	-9.61E-10
50	-9.78E-06	0.000407	-1.476	0.000254	5.00E-05	2.83E-09
51	1.13E-05	0.000395	-1.239	0.000101	-9.86E-05	4.16E-09
52	1.04E-05	0.000408	-1.133	0.000139	-8.54E-05	8.99E-09
53	-3.11E-10	0.000434	-1.056	0.000185	-1.23E-14	-1.18E-13
54	-1.04E-05	0.000408	-1.133	0.000139	8.54E-05	-8.99E-09
55	-1.13E-05	0.000395	-1.239	0.000101	9.86E-05	-4.16E-09
56	1.53E-06	0.000368	-1.266	-0.000143	-0.000131	1.42E-08
57	-5.75E-07	0.000400	-1.120	-0.000141	-0.000128	3.73E-08
58	-2.45E-10	0.000472	-0.989274	-0.000133	-1.40E-14	9.96E-14
59	5.75E-07	0.000400	-1.120	-0.000141	0.000128	-3.73E-08
60	-1.53E-06	0.000366	-1.266	-0.000143	0.000131	-1.42E-08
61	-7.30E-06	0.000316	-1.771	-0.000448	8.44E-05	6.55E-09
62	-7.14E-06	0.000328	-1.681	-0.000481	-7.24E-05	9.59E-09
63	-7.16E-10	0.000345	-1.617	-0.000521	-1.31E-14	2.85E-13
64	7.14E-06	0.000328	-1.681	-0.000481	7.24E-05	-9.59E-09
65	7.30E-06	0.000316	-1.771	-0.000448	8.44E-05	-6.54E-09
66	-6.66E-06	0.000245	-2.656	-0.000568	-3.23E-05	-6.78E-11
67	-4.92E-06	0.000246	-2.622	-0.000585	-2.61E-05	1.51E-09
68	-1.66E-09	0.000250	-2.601	-0.000596	-1.08E-14	4.03E-13
69	4.91E-06	0.000246	-2.622	-0.000585	2.61E-05	-1.51E-09
70	6.65E-06	0.000245	-2.656	-0.000568	3.23E-05	6.91E-11
71	-3.62E-06	0.000165	-3.577	-0.000491	-1.32E-05	-1.03E-09
72	-2.44E-06	0.000164	-3.563	-0.000495	-1.06E-05	-2.20E-10
73	-2.64E-09	0.000165	-3.555	-0.000498	-8.52E-15	3.65E-13
74	2.44E-06	0.000164	-3.563	-0.000495	1.06E-05	2.20E-10
75	3.61E-06	0.000165	-3.577	-0.000491	1.32E-05	1.03E-09
76	-1.86E-06	8.26E-05	-4.244	-0.000278	-8.80E-06	-5.19E-10
77	-1.17E-06	8.22E-05	-4.235	-0.000279	-6.94E-06	-2.58E-10
78	-3.32E-09	8.22E-05	-4.229	-0.000280	-6.96E-15	2.09E-13
79	1.16E-06	8.22E-05	-4.235	-0.000279	6.94E-06	2.59E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	1.86E-06	8.26E-05	-4.244	-0.000278	8.80E-06	5.20E-10
81	-1.39E-06	-1.18E-13	-4.485	5.44E-17	-8.14E-06	1.40E-16
82	-8.29E-07	3.80E-14	-4.477	4.93E-17	-6.38E-06	1.39E-16
83	-3.56E-09	2.47E-13	-4.471	4.10E-17	-6.42E-15	1.39E-16
84	8.22E-07	4.56E-13	-4.477	3.56E-17	6.38E-06	1.39E-16
85	1.38E-06	6.12E-13	-4.485	3.61E-17	8.14E-06	1.39E-16
86	-1.86E-06	-8.26E-05	-4.244	0.000278	-8.80E-06	5.19E-10
87	-1.17E-06	-8.22E-05	-4.235	0.000279	-6.94E-06	2.58E-10
88	-3.32E-09	-8.22E-05	-4.229	0.000280	-6.94E-15	-2.08E-13
89	1.16E-06	-8.22E-05	-4.235	0.000279	6.94E-06	-2.59E-10
90	1.86E-06	-8.26E-05	-4.244	0.000278	8.80E-06	-5.20E-10
91	-3.62E-06	-0.000165	-3.577	0.000491	-1.32E-05	1.03E-09
92	-2.44E-06	-0.000164	-3.563	0.000495	-1.06E-05	2.20E-10
93	-2.64E-09	-0.000165	-3.555	0.000498	-8.49E-15	-3.65E-13
94	2.44E-06	-0.000164	-3.563	0.000495	1.06E-05	-2.20E-10
95	3.61E-06	-0.000165	-3.577	0.000491	1.32E-05	-1.03E-09
96	-6.66E-06	-0.000245	-2.656	0.000568	-3.23E-05	6.78E-11
97	-4.92E-06	-0.000246	-2.622	0.000585	-2.61E-05	-1.51E-09
98	-1.66E-09	-0.000250	-2.601	0.000596	-1.08E-14	-4.03E-13
99	4.91E-06	-0.000246	-2.622	0.000585	2.61E-05	1.51E-09
100	6.65E-06	-0.000245	-2.656	0.000568	3.23E-05	-6.91E-11
101	-7.30E-06	-0.000316	-1.771	0.000448	-8.44E-05	-6.55E-09
102	-7.14E-06	-0.000328	-1.681	0.000481	-7.24E-05	-9.59E-09
103	-7.18E-10	-0.000345	-1.617	0.000521	-1.30E-14	-2.85E-13
104	7.14E-06	-0.000328	-1.681	0.000481	7.24E-05	9.59E-09
105	7.30E-06	-0.000316	-1.771	0.000448	8.44E-05	6.54E-09
106	1.53E-06	-0.000368	-1.266	0.000143	-0.000131	-1.42E-08
107	-5.75E-07	-0.000400	-1.120	0.000141	-0.000128	-3.73E-08
108	-2.48E-10	-0.000472	-0.989274	0.000133	-1.40E-14	-9.93E-14
109	5.75E-07	-0.000400	-1.120	0.000141	0.000128	3.73E-08
110	-1.53E-06	-0.000366	-1.266	0.000143	0.000131	1.42E-08
111	1.13E-05	-0.000395	-1.239	-0.000101	-9.86E-05	-4.16E-09
112	1.04E-05	-0.000408	-1.133	-0.000139	-8.54E-05	-8.99E-09
113	-3.11E-10	-0.000434	-1.056	-0.000185	-1.23E-14	-1.18E-13
114	-1.04E-05	-0.000408	-1.133	-0.000139	8.54E-05	8.99E-09
115	-1.13E-05	-0.000395	-1.239	-0.000101	9.86E-05	4.16E-09
116	9.78E-06	-0.000407	-1.476	-0.000254	-5.00E-05	2.83E-09
117	7.69E-06	-0.000410	-1.424	-0.000282	-4.07E-05	-9.61E-10
118	-6.96E-10	-0.000419	-1.391	-0.000304	-1.00E-14	2.60E-13
119	-7.69E-06	-0.000410	-1.424	-0.000282	4.07E-05	9.61E-10
120	-9.78E-06	-0.000407	-1.476	-0.000254	5.00E-05	-2.83E-09
121	4.59E-06	-0.000412	-1.838	-0.000287	-2.25E-05	3.34E-09
122	3.66E-06	-0.000410	-1.814	-0.000299	-1.82E-05	1.01E-09
123	-1.22E-09	-0.000413	-1.800	-0.000308	-7.41E-15	2.99E-13
124	-3.66E-06	-0.000410	-1.814	-0.000299	1.82E-05	-1.01E-09
125	-4.60E-06	-0.000412	-1.838	-0.000287	2.25E-05	-3.34E-09
126	9.23E-07	-0.000412	-2.174	-0.000218	1.20E-05	1.88E-09
127	9.68E-07	-0.000411	-2.162	-0.000222	9.63E-06	9.44E-10
128	-1.70E-09	-0.000412	-2.154	-0.000225	4.86E-15	2.32E-13
129	-9.72E-07	-0.000411	-2.162	-0.000222	9.63E-06	-9.44E-10
130	-9.27E-07	-0.000412	-2.174	-0.000218	1.20E-05	-1.88E-09
131	-7.38E-07	-0.000412	-2.373	-7.86E-05	-8.57E-06	7.52E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-2.95E-07	-0.000411	-2.364	-8.02E-05	-6.74E-06	5.00E-10
133	-2.01E-09	-0.000411	-2.359	-8.12E-05	-2.66E-15	1.12E-13
134	2.91E-07	-0.000411	-2.364	-8.02E-05	6.74E-06	-5.00E-10
135	7.34E-07	-0.000412	-2.373	-7.86E-05	8.57E-06	-7.51E-10
136	-1.31E-06	-0.000412	-2.361	0.000101	-6.04E-06	2.91E-10
137	-7.58E-07	-0.000412	-2.354	9.89E-05	-4.60E-06	2.06E-10
138	-2.09E-09	-0.000411	-2.351	9.71E-05	-9.83E-16	-4.68E-14
139	7.54E-07	-0.000412	-2.354	9.89E-05	4.60E-06	-2.06E-10
140	1.30E-06	-0.000412	-2.361	0.000101	6.04E-06	-2.91E-10
141	-1.54E-06	-0.000412	-2.103	0.000295	7.15E-07	2.33E-10
142	-9.27E-07	-0.000412	-2.103	0.000287	1.06E-06	1.58E-11
143	-1.92E-09	-0.000412	-2.104	0.000281	1.02E-16	-2.20E-13
144	9.23E-07	-0.000412	-2.103	0.000287	-1.06E-06	-1.62E-11
145	1.54E-06	-0.000412	-2.103	0.000295	-7.15E-07	-2.33E-10
146	-1.57E-06	-0.000411	-1.596	0.000477	2.02E-05	3.78E-11
147	-8.41E-07	-0.000412	-1.618	0.000456	1.73E-05	-3.54E-10
148	-1.49E-09	-0.000412	-1.631	0.000440	5.70E-16	-3.84E-13
149	8.38E-07	-0.000412	-1.618	0.000456	-1.73E-05	3.54E-10
150	1.57E-06	-0.000411	-1.596	0.000477	-2.02E-05	-3.85E-11
151	-3.13E-07	-0.000411	-0.869963	0.000623	6.78E-05	-1.35E-09
152	1.76E-08	-0.000412	-0.940651	0.000577	5.45E-05	-9.42E-10
153	-8.24E-10	-0.000412	-0.984826	0.000546	4.92E-16	-4.77E-13
154	-1.92E-08	-0.000412	-0.940651	0.000577	-5.45E-05	9.41E-10
155	3.11E-07	-0.000411	-0.869963	0.000623	-6.78E-05	1.34E-09
156	3.81E-06	-0.000410	-3.07E-96	0.000675	0.000150	-1.68E-09
157	1.95E-06	-0.000412	-0.154471	0.000622	-0.000111	1.25E-09
158	-8.65E-11	-0.000412	-0.244623	0.000586	1.22E-16	-4.69E-13
159	-1.95E-06	-0.000412	-0.154471	0.000622	-0.000111	1.25E-09
160	-3.81E-06	-0.000410	-3.07E-96	0.000675	-0.000150	1.68E-09
161	4.63E-06	-0.000410	0.337475	0.000675	0.000150	-1.63E-09
162	2.58E-06	-0.000412	0.156680	0.000622	0.000111	-1.25E-09
163	1.48E-10	-0.000412	0.048380	0.000586	1.22E-16	-4.69E-13
164	-2.58E-06	-0.000412	0.156680	0.000622	-0.000111	1.25E-09
165	-4.63E-06	-0.000410	0.337475	0.000675	-0.000150	1.63E-09
166	-0	-7.40E-98	-1.94E-95	+0	-0	+0
167	-0	7.40E-98	-1.94E-95	-0	-0	-0
min:	-1.13E-05	-0.000472	-4.485	-0.000675	-0.000150	-3.73E-08
max:	1.13E-05	0.000472	0.337475	0.000675	0.000150	3.73E-08

Loadcase Factor Stage Init.def Title
2 1.0000 PESO PAVIMENTO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-4.17E-08	-4.50E-06	1.462			
10	4.17E-08	-4.50E-06	1.462			
156	-4.17E-08	4.50E-06	1.462			
160	4.17E-08	4.50E-06	1.462			
166	6.23E-12	0.035307	9.219	-0.155311	4.94E-11	-4.84E-11
167	6.34E-12	-0.035307	9.219	0.155311	5.01E-11	4.83E-11
Sums :	2.03E-13	-5.34E-16	24.288			
min:	-4.17E-08	-0.035307	1.462	-0.155311	4.94E-11	-4.84E-11
max:	4.17E-08	0.035307	9.219	0.155311	5.01E-11	4.83E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	2.20E-07	1.96E-05	0.016083	-3.22E-05	6.83E-06	7.68E-11
2	1.23E-07	1.97E-05	0.007812	-2.97E-05	5.05E-06	5.96E-11
3	7.54E-12	1.97E-05	0.002860	-2.79E-05	5.51E-18	2.24E-14
4	-1.23E-07	1.97E-05	0.007812	-2.97E-05	-5.05E-06	-5.96E-11
5	-2.20E-07	1.96E-05	0.016083	-3.22E-05	-6.83E-06	-7.68E-11
6	1.81E-07	1.96E-05	-1.46E-97	-3.22E-05	6.83E-06	8.01E-11
7	9.29E-08	1.97E-05	-0.007019	-2.97E-05	5.05E-06	5.96E-11
8	-3.64E-12	1.97E-05	-0.011107	-2.79E-05	5.51E-18	2.24E-14
9	-9.29E-08	1.97E-05	-0.007019	-2.97E-05	-5.05E-06	-5.96E-11
10	-1.81E-07	1.96E-05	-1.46E-97	-3.22E-05	-6.83E-06	-8.00E-11
11	-1.49E-08	1.96E-05	-0.041463	-2.97E-05	2.90E-06	6.40E-11
12	8.30E-10	1.97E-05	-0.044494	-2.75E-05	2.34E-06	4.48E-11
13	-3.88E-11	1.97E-05	-0.046393	-2.60E-05	2.19E-17	2.28E-14
14	-9.10E-10	1.97E-05	-0.044494	-2.75E-05	-2.34E-06	-4.48E-11
15	1.48E-08	1.96E-05	-0.041463	-2.97E-05	-2.90E-06	-6.40E-11
16	-7.45E-08	1.96E-05	-0.076084	-2.28E-05	6.40E-07	-1.80E-12
17	-4.00E-08	1.96E-05	-0.076767	-2.17E-05	5.72E-07	1.69E-11
18	-7.03E-11	1.97E-05	-0.077219	-2.10E-05	2.41E-17	1.83E-14
19	3.99E-08	1.96E-05	-0.076767	-2.17E-05	-5.72E-07	-1.68E-11
20	7.47E-08	1.96E-05	-0.076084	-2.28E-05	-6.40E-07	1.84E-12
21	-7.34E-08	1.97E-05	-0.100242	-1.41E-05	-2.87E-07	-1.11E-11
22	-4.41E-08	1.96E-05	-0.099950	-1.37E-05	-2.00E-07	-7.80E-12
23	-9.11E-11	1.97E-05	-0.099770	-1.34E-05	2.65E-19	1.05E-14
24	4.39E-08	1.96E-05	-0.099950	-1.37E-05	2.00E-07	7.80E-13
25	7.32E-08	1.97E-05	-0.100242	-1.41E-05	2.87E-07	1.11E-11
26	-6.22E-08	1.97E-05	-0.112589	-4.87E-06	-6.08E-07	-1.35E-11
27	-3.61E-08	1.96E-05	-0.111958	-4.75E-06	-4.69E-07	-9.82E-12

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-9.93E-11	1.96E-05	-0.111569	-4.67E-06	-5.28E-17	2.27E-15
29	3.59E-08	1.96E-05	-0.111958	-4.75E-06	4.69E-07	9.82E-12
30	6.22E-08	1.97E-05	-0.112589	-4.87E-06	6.08E-07	1.35E-11
31	-3.50E-08	1.97E-05	-0.113230	3.70E-06	-7.28E-07	-3.59E-11
32	-1.40E-08	1.96E-05	-0.112473	3.77E-06	-5.71E-07	-2.39E-11
33	-9.54E-11	1.96E-05	-0.112011	3.82E-06	-1.34E-16	-5.28E-15
34	1.38E-08	1.96E-05	-0.112473	3.77E-06	5.71E-07	2.39E-11
35	3.48E-08	1.97E-05	-0.113230	3.70E-06	7.28E-07	3.59E-11
36	4.43E-08	1.97E-05	-0.103835	1.03E-05	-8.93E-07	-8.97E-11
37	4.63E-08	1.96E-05	-0.102906	1.05E-05	-7.08E-07	-4.50E-11
38	-8.45E-11	1.97E-05	-0.102342	1.07E-05	-2.40E-16	-1.13E-14
39	-4.55E-08	1.96E-05	-0.102906	1.05E-05	7.08E-07	4.50E-11
40	-4.45E-08	1.97E-05	-0.103835	1.03E-05	8.93E-07	8.97E-11
41	2.19E-07	1.97E-05	-0.087853	1.36E-05	-1.39E-06	-1.59E-10
42	1.75E-07	1.96E-05	-0.086403	1.42E-05	-1.11E-06	-4.79E-11
43	-5.79E-11	1.97E-05	-0.085524	1.46E-05	-3.62E-16	-1.42E-14
44	-1.75E-07	1.96E-05	-0.086403	1.42E-05	1.11E-06	4.79E-11
45	-2.20E-07	1.97E-05	-0.087853	1.36E-05	1.39E-06	1.59E-10
46	4.67E-07	1.95E-05	-0.070693	1.21E-05	-2.70E-06	-1.35E-10
47	3.67E-07	1.96E-05	-0.067867	1.34E-05	-2.19E-06	4.60E-11
48	-3.31E-11	2.00E-05	-0.066108	1.44E-05	-4.86E-16	-1.23E-14
49	-3.67E-07	1.96E-05	-0.067867	1.34E-05	2.19E-06	-4.60E-11
50	-4.67E-07	1.95E-05	-0.070693	1.21E-05	2.70E-06	1.35E-10
51	5.41E-07	1.89E-05	-0.059433	4.76E-06	-5.01E-06	1.99E-10
52	4.98E-07	1.95E-05	-0.054079	6.60E-06	-4.31E-06	4.29E-10
53	-1.49E-11	2.07E-05	-0.050235	8.77E-06	-5.94E-16	-5.50E-15
54	-4.98E-07	1.95E-05	-0.054079	6.60E-06	4.31E-06	-4.29E-10
55	-5.41E-07	1.89E-05	-0.059433	4.76E-06	5.01E-06	-1.99E-10
56	7.25E-08	1.76E-05	-0.060797	-6.82E-06	-6.58E-06	6.81E-10
57	-2.77E-08	1.91E-05	-0.053507	-6.74E-06	-6.32E-06	1.78E-09
58	-1.15E-11	2.26E-05	-0.047073	-6.35E-06	-6.75E-16	4.75E-15
59	2.77E-08	1.91E-05	-0.053507	-6.74E-06	6.32E-06	-1.78E-09
60	-7.25E-08	1.76E-05	-0.060797	-6.82E-06	6.58E-06	-6.81E-10
61	-3.49E-07	1.51E-05	-0.084864	-2.13E-05	-4.34E-06	3.12E-10
62	-3.41E-07	1.57E-05	-0.080242	-2.29E-05	-3.70E-06	4.58E-10
63	-3.42E-11	1.65E-05	-0.076998	-2.48E-05	-6.29E-16	1.36E-14
64	3.41E-07	1.57E-05	-0.080242	-2.29E-05	3.70E-06	-4.58E-10
65	3.49E-07	1.51E-05	-0.084864	-2.13E-05	4.34E-06	-3.12E-10
66	-3.18E-07	1.17E-05	-0.126965	-2.71E-05	-1.86E-06	-3.44E-12
67	-2.35E-07	1.18E-05	-0.125025	-2.79E-05	-1.49E-06	7.20E-11
68	-7.90E-11	1.20E-05	-0.123845	-2.85E-05	-5.24E-16	1.92E-14
69	2.35E-07	1.18E-05	-0.125025	-2.79E-05	1.49E-06	-7.19E-11
70	3.18E-07	1.17E-05	-0.126965	-2.71E-05	1.86E-06	3.50E-12
71	-1.72E-07	7.87E-06	-0.170824	-2.34E-05	-9.48E-07	-4.94E-11
72	-1.16E-07	7.85E-06	-0.169837	-2.36E-05	-7.54E-07	-1.05E-11
73	-1.26E-10	7.88E-06	-0.169238	-2.37E-05	-4.13E-16	1.74E-14
74	1.16E-07	7.85E-06	-0.169837	-2.36E-05	7.54E-07	1.06E-11
75	1.72E-07	7.87E-06	-0.170824	-2.34E-05	9.48E-07	4.94E-11
76	-8.88E-08	3.94E-06	-0.202580	-1.32E-05	-7.39E-07	-2.48E-11
77	-5.57E-08	3.93E-06	-0.201812	-1.33E-05	-5.80E-07	-1.23E-11
78	-1.58E-10	3.92E-06	-0.201345	-1.33E-05	-3.39E-16	9.94E-15
79	5.54E-08	3.93E-06	-0.201812	-1.33E-05	5.80E-07	1.24E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	8.84E-08	3.94E-06	-0.202580	-1.32E-05	7.39E-07	2.48E-11
81	-6.60E-08	-5.64E-15	-0.214053	2.62E-18	-7.08E-07	6.66E-18
82	-3.94E-08	1.81E-15	-0.213318	2.35E-18	-5.54E-07	6.65E-18
83	-1.70E-10	1.18E-14	-0.212870	1.92E-18	-3.13E-16	6.65E-18
84	3.91E-08	2.18E-14	-0.213318	1.66E-18	5.54E-07	6.65E-18
85	6.56E-08	2.92E-14	-0.214053	1.72E-18	7.08E-07	6.64E-18
86	-8.88E-08	-3.94E-06	-0.202580	1.32E-05	-7.39E-07	2.48E-11
87	-5.57E-08	-3.93E-06	-0.201812	1.33E-05	-5.80E-07	1.23E-11
88	-1.58E-10	-3.92E-06	-0.201345	1.33E-05	-3.38E-16	-9.92E-15
89	5.54E-08	-3.93E-06	-0.201812	1.33E-05	5.80E-07	-1.24E-11
90	8.84E-08	-3.94E-06	-0.202580	1.32E-05	7.39E-07	-2.48E-11
91	-1.72E-07	-7.87E-06	-0.170824	2.34E-05	-9.48E-07	4.94E-11
92	-1.16E-07	-7.85E-06	-0.169837	2.36E-05	-7.54E-07	1.05E-11
93	-1.26E-10	-7.85E-06	-0.169238	2.37E-05	-4.11E-16	-1.74E-14
94	1.16E-07	-7.85E-06	-0.169837	2.36E-05	7.54E-07	-1.06E-11
95	1.72E-07	-7.87E-06	-0.170824	2.34E-05	9.48E-07	-4.94E-11
96	-3.18E-07	-1.17E-05	-0.126965	2.71E-05	-1.86E-06	3.44E-12
97	-2.35E-07	-1.18E-05	-0.125025	2.79E-05	-1.49E-06	-7.20E-11
98	-7.91E-11	-1.20E-05	-0.123845	2.85E-05	-5.21E-16	-1.92E-14
99	2.35E-07	-1.18E-05	-0.125025	2.79E-05	1.49E-06	7.19E-11
100	3.18E-07	-1.17E-05	-0.126965	2.71E-05	1.86E-06	-3.50E-12
101	-3.49E-07	-1.51E-05	-0.084464	2.13E-05	-4.34E-06	-3.12E-10
102	-3.41E-07	-1.57E-05	-0.080242	2.29E-05	-3.70E-06	-4.58E-10
103	-3.43E-11	-1.65E-05	-0.076998	2.48E-05	-6.26E-16	-1.36E-14
104	3.41E-07	-1.57E-05	-0.080242	2.29E-05	3.70E-06	4.58E-10
105	3.49E-07	-1.51E-05	-0.084864	2.13E-05	4.34E-06	3.12E-10
106	7.25E-08	-1.76E-05	-0.060797	6.82E-06	-6.58E-06	-6.81E-10
107	-2.77E-08	-1.91E-05	-0.053507	6.74E-06	-6.32E-06	-1.78E-09
108	-1.19E-11	-2.26E-05	-0.047073	6.35E-06	-6.72E-16	-4.74E-15
109	2.77E-08	-1.91E-05	-0.053507	6.74E-06	6.32E-06	1.78E-09
110	-7.25E-08	-1.76E-05	-0.060797	6.82E-06	6.58E-06	6.81E-10
111	5.41E-07	-1.89E-05	-0.059433	-4.76E-06	-5.01E-06	-1.99E-10
112	4.98E-07	-1.95E-05	-0.054079	-6.60E-06	-4.31E-06	-4.29E-10
113	-1.51E-11	-2.07E-05	-0.050235	-8.77E-06	-5.91E-16	5.52E-15
114	-4.98E-07	-1.95E-05	-0.054079	-6.60E-06	4.31E-06	4.29E-10
115	-5.41E-07	-1.89E-05	-0.059433	-4.76E-06	5.01E-06	1.99E-10
116	4.67E-07	-1.95E-05	-0.070693	-1.21E-05	-2.70E-06	1.35E-10
117	3.67E-07	-1.96E-05	-0.067867	-1.34E-05	-2.19E-06	-4.60E-11
118	-3.32E-11	-2.00E-05	-0.066108	-1.44E-05	-4.82E-16	1.24E-14
119	-3.67E-07	-1.96E-05	-0.067867	-1.34E-05	2.19E-06	4.60E-11
120	-4.67E-07	-1.95E-05	-0.070693	-1.21E-05	2.70E-06	-1.35E-10
121	2.19E-07	-1.97E-05	-0.087853	-1.36E-05	-1.39E-06	1.59E-10
122	1.75E-07	-1.96E-05	-0.086403	-1.42E-05	-1.11E-06	4.79E-11
123	-5.80E-11	-1.97E-05	-0.085524	-1.46E-05	-3.58E-16	1.42E-14
124	-1.75E-07	-1.96E-05	-0.086403	-1.42E-05	1.11E-06	-4.79E-11
125	-2.20E-07	-1.97E-05	-0.087853	-1.36E-05	1.39E-06	-1.59E-10
126	4.43E-08	-1.97E-05	-0.103835	-1.03E-05	-8.93E-07	8.97E-11
127	4.63E-08	-1.96E-05	-0.102906	-1.05E-05	-7.08E-07	4.50E-11
128	-8.08E-11	-1.97E-05	-0.102342	-1.07E-05	-2.36E-16	1.13E-14
129	-4.65E-08	-1.96E-05	-0.102906	-1.05E-05	7.08E-07	-4.50E-11
130	-4.45E-08	-1.97E-05	-0.103835	-1.03E-05	8.93E-07	-8.97E-11
131	-3.50E-08	-1.97E-05	-0.113230	-3.70E-06	-7.28E-07	3.59E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-1.40E-08	-1.96E-05	-0.112473	-3.77E-06	-5.71E-07	2.39E-11
133	-9.56E-11	-1.96E-05	-0.112011	-3.82E-06	-1.30E-16	5.29E-15
134	1.38E-08	-1.96E-05	-0.112473	-3.77E-06	5.71E-07	-2.39E-11
135	3.48E-08	-1.97E-05	-0.113230	-3.70E-06	7.28E-07	-3.59E-11
136	-6.22E-08	-1.97E-05	-0.112589	4.87E-06	-6.08E-07	1.39E-11
137	-3.61E-08	-1.96E-05	-0.111958	4.75E-06	-4.69E-07	9.82E-12
138	-9.96E-11	-1.96E-05	-0.111569	4.67E-06	-4.98E-17	-2.26E-15
139	3.59E-08	-1.96E-05	-0.111958	4.75E-06	4.69E-07	-9.82E-12
140	6.20E-08	-1.97E-05	-0.112589	4.87E-06	6.08E-07	-1.39E-11
141	-7.34E-08	-1.97E-05	-0.100242	1.41E-05	-2.87E-07	1.11E-11
142	-4.41E-08	-1.96E-05	-0.099950	1.37E-05	-2.00E-07	7.66E-13
143	-9.14E-11	-1.97E-05	-0.099770	1.34E-05	2.60E-18	-1.05E-14
144	4.39E-08	-1.96E-05	-0.099950	1.37E-05	2.00E-07	-7.80E-13
145	7.32E-08	-1.97E-05	-0.100242	1.41E-05	2.87E-07	-1.11E-11
146	-7.48E-08	-1.96E-05	-0.076084	2.28E-05	6.40E-07	1.80E-12
147	-4.00E-08	-1.96E-05	-0.076767	2.17E-05	5.72E-07	-1.69E-11
148	-7.06E-11	-1.97E-05	-0.077219	2.10E-05	2.56E-17	-1.83E-14
149	3.99E-08	-1.96E-05	-0.076767	2.17E-05	-5.72E-07	1.68E-11
150	7.47E-08	-1.96E-05	-0.076084	2.28E-05	-6.40E-07	-1.84E-12
151	-1.49E-08	-1.96E-05	-0.041463	2.97E-05	2.90E-06	-6.40E-11
152	8.30E-10	-1.97E-05	-0.044494	2.75E-05	2.34E-06	-4.48E-11
153	-3.91E-11	-1.97E-05	-0.046393	2.60E-05	2.26E-17	-2.28E-14
154	-9.10E-10	-1.97E-05	-0.044494	2.75E-05	-2.34E-06	4.48E-11
155	1.48E-08	-1.96E-05	-0.041463	2.97E-05	-2.90E-06	6.40E-11
156	1.81E-07	-1.96E-05	-1.46E-97	3.22E-05	6.83E-06	-8.01E-11
157	9.29E-08	-1.97E-05	-0.007019	2.97E-05	5.05E-06	-5.96E-11
158	-3.93E-12	-1.97E-05	-0.011107	2.79E-05	5.72E-18	-2.23E-14
159	-9.29E-08	-1.97E-05	-0.007019	2.97E-05	-5.05E-06	5.96E-11
160	-1.81E-07	-1.96E-05	-1.46E-97	3.22E-05	-6.83E-06	8.00E-11
161	2.20E-07	-1.96E-05	0.016083	3.22E-05	6.83E-06	-7.68E-11
162	1.23E-07	-1.97E-05	0.007812	2.97E-05	5.05E-06	-5.96E-11
163	7.25E-12	-1.97E-05	0.002860	2.79E-05	5.71E-18	-2.23E-14
164	-1.23E-07	-1.97E-05	0.007812	2.97E-05	-5.05E-06	5.96E-11
165	-2.20E-07	-1.96E-05	0.016083	3.22E-05	-6.83E-06	7.68E-11
166	-0	-3.53E-99	-9.22E-97	+0	-0	+0
167	-0	3.53E-99	-9.22E-97	-0	+0	-0
min:	-5.41E-07	-2.26E-05	-0.214053	-3.22E-05	-6.83E-06	-1.78E-09
max:	5.41E-07	2.26E-05	0.016083	3.22E-05	6.83E-06	1.78E-09

Loadcase	Factor	Stage	Init.def	Title
3	1.0000			PESO BARRERAS

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-1.52E-07	-1.72E-05	5.307			
10	1.52E-07	-1.72E-05	5.307			
156	-1.52E-07	1.72E-05	5.307			
160	1.52E-07	1.72E-05	5.307			
166	2.78E-11	0.134950	33.386	-0.593620	2.19E-10	-1.83E-10
167	2.82E-11	-0.134950	33.386	0.593620	2.21E-10	1.83E-10
Sums :	7.93E-13	-6.38E-16	88.000			
min:	-1.52E-07	-0.134950	5.307	-0.593620	2.19E-10	-1.83E-10
max:	1.52E-07	0.134950	33.386	0.593620	2.21E-10	1.83E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	7.94E-07	7.49E-05	0.059667	-0.000119	-7.99E-06	2.63E-10
2	4.46E-07	7.51E-05	0.049601	-0.000110	4.58E-06	2.17E-10
3	3.94E-11	7.53E-05	0.042284	-0.000104	1.41E-17	8.28E-14
4	-4.46E-07	7.51E-05	0.049601	-0.000110	-4.58E-06	-2.17E-10
5	-7.94E-07	7.49E-05	0.059667	-0.000119	7.99E-06	-2.63E-10
6	6.59E-07	7.49E-05	-5.31E-97	-0.000120	3.64E-06	2.94E-10
7	3.38E-07	7.51E-05	-0.005565	-0.000110	4.58E-06	2.17E-10
8	-2.04E-12	7.53E-05	-0.009738	-0.000104	1.42E-17	8.28E-14
9	-3.38E-07	7.51E-05	-0.005565	-0.000110	-4.58E-06	-2.17E-10
10	-6.59E-07	7.49E-05	-5.31E-97	-0.000120	-3.64E-06	-2.93E-10
11	-5.45E-08	7.49E-05	-0.153959	-0.000111	-1.07E-05	2.32E-10
12	2.86E-09	7.51E-05	-0.145023	-0.000102	-5.29E-06	1.63E-10
13	-1.32E-10	7.52E-05	-0.141238	-9.71E-05	3.55E-17	8.44E-14
14	-3.13E-09	7.51E-05	-0.145023	-0.000102	5.29E-06	-1.63E-10
15	5.42E-08	7.49E-05	-0.153959	-0.000111	1.07E-05	-2.32E-10
16	-2.72E-07	7.50E-05	-0.283052	-8.52E-05	-1.89E-05	-6.52E-12
17	-1.45E-07	7.51E-05	-0.265596	-8.15E-05	-1.17E-05	6.11E-11
18	-2.49E-10	7.52E-05	-0.256559	-7.88E-05	2.67E-19	6.83E-14
19	1.45E-07	7.51E-05	-0.265596	-8.15E-05	1.17E-05	-6.10E-11
20	2.71E-07	7.50E-05	-0.283052	-8.52E-05	1.89E-05	6.64E-12
21	-2.66E-07	7.51E-05	-0.374148	-5.37E-05	-2.22E-05	-4.05E-11
22	-1.60E-07	7.51E-05	-0.353156	-5.23E-05	-1.45E-05	-3.23E-12
23	-3.26E-10	7.51E-05	-0.341828	-5.13E-05	-1.31E-16	3.99E-14
24	1.60E-07	7.51E-05	-0.353156	-5.23E-05	1.45E-05	3.31E-12
25	2.66E-07	7.51E-05	-0.374148	-5.37E-05	2.22E-05	4.06E-11
26	-2.25E-07	7.51E-05	-0.422331	-2.03E-05	-2.34E-05	-5.24E-11
27	-1.30E-07	7.51E-05	-0.400115	-1.98E-05	-1.55E-05	-3.73E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-3.58E-10	7.51E-05	-0.388029	-1.95E-05	-3.69E-16	9.96E-15
29	1.29E-07	7.51E-05	-0.400115	-1.98E-05	1.55E-05	3.73E-11
30	2.24E-07	7.51E-05	-0.422331	-2.03E-05	2.34E-05	5.24E-11
31	-1.21E-07	7.52E-05	-0.427948	1.09E-05	-2.38E-05	-1.37E-10
32	-4.57E-08	7.51E-05	-0.405277	1.12E-05	-1.58E-05	-9.05E-11
33	-3.46E-10	7.51E-05	-0.392927	1.14E-05	-7.08E-16	-1.75E-14
34	4.50E-08	7.51E-05	-0.405277	1.12E-05	1.58E-05	9.05E-11
35	1.20E-07	7.52E-05	-0.427948	1.09E-05	2.38E-05	1.37E-10
36	1.81E-07	7.52E-05	-0.397006	3.52E-05	-2.44E-05	-3.40E-10
37	1.84E-07	7.50E-05	-0.373715	3.59E-05	-1.63E-05	-1.70E-10
38	-2.95E-10	7.51E-05	-0.361000	3.63E-05	-1.14E-15	-3.93E-14
39	-1.84E-07	7.50E-05	-0.373715	3.59E-05	1.63E-05	1.70E-10
40	-1.82E-07	7.52E-05	-0.397006	3.52E-05	2.44E-05	3.40E-10
41	8.44E-07	7.51E-05	-0.341958	4.73E-05	-2.62E-05	-6.00E-10
42	6.71E-07	7.49E-05	-0.316793	4.94E-05	-1.78E-05	-1.79E-10
43	-2.14E-10	7.54E-05	-0.302947	5.08E-05	-1.62E-15	-5.00E-14
44	-6.71E-07	7.49E-05	-0.316793	4.94E-05	1.78E-05	1.79E-10
45	-8.45E-07	7.51E-05	-0.341958	4.73E-05	2.62E-05	6.00E-10
46	1.78E-06	7.43E-05	-0.282356	4.18E-05	-3.09E-05	-4.98E-10
47	1.40E-06	7.47E-05	-0.252236	4.67E-05	-2.17E-05	1.81E-10
48	-1.26E-10	7.65E-05	-0.235219	5.04E-05	-2.11E-15	-4.35E-14
49	-1.40E-06	7.47E-05	-0.252236	4.67E-05	2.17E-05	-1.81E-10
50	-1.78E-06	7.43E-05	-0.282356	4.18E-05	3.09E-05	4.98E-10
51	2.05E-06	7.21E-05	-0.243820	1.56E-05	-3.93E-05	7.74E-10
52	1.89E-06	7.44E-05	-0.204574	2.23E-05	-2.93E-05	1.65E-09
53	-6.20E-11	7.93E-05	-0.180024	3.02E-05	-2.55E-15	-1.89E-14
54	-1.89E-06	7.44E-05	-0.204574	2.23E-05	2.93E-05	-1.65E-09
55	-2.05E-06	7.21E-05	-0.243820	1.56E-05	3.93E-05	-7.74E-10
56	2.49E-07	6.72E-05	-0.250783	-2.62E-05	-4.50E-05	2.61E-09
57	-1.22E-07	7.30E-05	-0.204451	-2.58E-05	-3.67E-05	6.80E-09
58	-5.20E-11	8.62E-05	-0.170475	-2.43E-05	-2.89E-15	1.80E-14
59	1.22E-07	7.30E-05	-0.204451	-2.58E-05	3.67E-05	-6.80E-09
60	-2.49E-07	6.72E-05	-0.250783	-2.62E-05	4.50E-05	-2.61E-09
61	-1.35E-06	5.77E-05	-0.340131	-7.84E-05	-3.70E-05	1.17E-09
62	-1.31E-06	5.98E-05	-0.303392	-8.40E-05	-2.72E-05	1.75E-09
63	-1.34E-10	6.29E-05	-0.280925	-9.11E-05	-2.72E-15	4.99E-14
64	1.31E-06	5.98E-05	-0.303392	-8.40E-05	2.72E-05	-1.75E-09
65	1.35E-06	5.77E-05	-0.340131	-7.84E-05	3.70E-05	-1.17E-09
66	-1.21E-06	4.46E-05	-0.494245	-9.88E-05	-2.79E-05	-2.60E-11
67	-8.97E-07	4.50E-05	-0.467265	-0.000102	-1.92E-05	2.70E-10
68	-2.98E-10	4.57E-05	-0.452296	-0.000104	-2.34E-15	7.00E-14
69	8.96E-07	4.50E-05	-0.467265	-0.000102	1.92E-05	-2.70E-10
70	1.21E-06	4.46E-05	-0.494245	-9.88E-05	2.79E-05	2.62E-11
71	-6.47E-07	3.01E-05	-0.654286	-8.52E-05	-2.46E-05	-1.93E-10
72	-4.39E-07	3.00E-05	-0.630777	-8.60E-05	-1.65E-05	-4.27E-11
73	-4.67E-10	3.01E-05	-0.617931	-8.65E-05	-1.94E-15	6.33E-14
74	4.38E-07	3.00E-05	-0.630777	-8.60E-05	1.65E-05	4.29E-11
75	6.46E-07	3.01E-05	-0.654286	-8.52E-05	2.46E-05	1.93E-10
76	-3.26E-07	1.51E-05	-0.770030	-4.83E-05	-2.39E-05	-9.51E-11
77	-2.05E-07	1.50E-05	-0.747321	-4.84E-05	-1.59E-05	-4.78E-11
78	-5.86E-10	1.50E-05	-0.734954	-4.85E-05	-1.67E-15	3.62E-14
79	2.04E-07	1.50E-05	-0.747321	-4.84E-05	1.59E-05	4.79E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	3.25E-07	1.51E-05	-0.770030	-4.83E-05	2.39E-05	9.52E-11
81	-2.39E-07	-2.19E-14	-0.811829	9.93E-18	-2.37E-05	2.51E-17
82	-1.43E-07	6.18E-15	-0.789241	8.99E-18	-1.58E-05	2.50E-17
83	-6.28E-10	4.37E-14	-0.776945	7.09E-18	-1.58E-15	2.50E-17
84	1.42E-07	8.13E-14	-0.789241	6.29E-18	1.58E-05	2.50E-17
85	2.38E-07	1.09E-13	-0.811829	6.44E-18	2.37E-05	2.50E-17
86	-3.26E-07	-1.51E-05	-0.770030	4.83E-05	-2.39E-05	9.51E-11
87	-2.05E-07	-1.50E-05	-0.747321	4.84E-05	-1.59E-05	4.78E-11
88	-5.86E-10	-1.50E-05	-0.734954	4.85E-05	-1.67E-15	-3.61E-14
89	2.04E-07	-1.50E-05	-0.747321	4.84E-05	1.59E-05	-4.79E-11
90	3.25E-07	-1.51E-05	-0.770030	4.83E-05	2.39E-05	-9.52E-11
91	-6.47E-07	-3.01E-05	-0.654286	8.52E-05	-2.46E-05	1.93E-10
92	-4.39E-07	-3.00E-05	-0.630777	8.60E-05	-1.65E-05	4.27E-11
93	-4.67E-10	-3.01E-05	-0.617931	8.65E-05	-1.93E-15	-6.33E-14
94	4.38E-07	-3.00E-05	-0.630777	8.60E-05	1.65E-05	-4.29E-11
95	6.46E-07	-3.01E-05	-0.654286	8.52E-05	2.46E-05	-1.93E-10
96	-1.21E-06	-4.46E-05	-0.494245	9.88E-05	-2.79E-05	2.60E-11
97	-8.97E-07	-4.50E-05	-0.467265	0.000102	-1.92E-05	-2.70E-10
98	-2.98E-10	-4.57E-05	-0.452296	0.000104	-2.33E-15	-7.00E-14
99	8.96E-07	-4.50E-05	-0.467265	0.000102	1.92E-05	2.70E-10
100	1.21E-06	-4.46E-05	-0.494245	9.88E-05	2.79E-05	-2.62E-11
101	-1.35E-06	-5.77E-05	-0.340131	7.84E-05	-3.70E-05	-1.17E-09
102	-1.31E-06	-5.98E-05	-0.303392	8.40E-05	-2.72E-05	-1.75E-09
103	-1.34E-10	-6.29E-05	-0.280925	9.11E-05	-2.71E-15	-4.99E-14
104	1.31E-06	-5.98E-05	-0.303392	8.40E-05	2.72E-05	1.75E-09
105	1.35E-06	-5.77E-05	-0.340131	7.84E-05	3.70E-05	1.17E-09
106	2.49E-07	-6.72E-05	-0.250783	2.62E-05	-4.50E-05	-2.61E-09
107	-1.22E-07	-7.30E-05	-0.204451	2.58E-05	-3.67E-05	-6.80E-09
108	-5.24E-11	-8.62E-05	-0.170475	2.43E-05	-2.88E-15	-1.79E-14
109	1.22E-07	-7.30E-05	-0.204451	2.58E-05	3.67E-05	6.80E-09
110	-2.49E-07	-6.72E-05	-0.250783	2.62E-05	4.50E-05	2.61E-09
111	2.05E-06	-7.21E-05	-0.243820	-1.56E-05	-3.93E-05	-7.74E-10
112	1.89E-06	-7.44E-05	-0.204574	-2.23E-05	-2.93E-05	-1.65E-09
113	-6.25E-11	-7.93E-05	-0.180024	-3.02E-05	-2.54E-15	1.89E-14
114	-1.89E-06	-7.44E-05	-0.204574	-2.23E-05	2.93E-05	1.65E-09
115	-2.05E-06	-7.21E-05	-0.243820	-1.56E-05	3.93E-05	7.74E-10
116	1.78E-06	-7.43E-05	-0.282356	-4.18E-05	-3.09E-05	4.98E-10
117	1.40E-06	-7.47E-05	-0.252236	-4.67E-05	-2.17E-05	-1.81E-10
118	-1.27E-10	-7.65E-05	-0.235219	-5.04E-05	-2.10E-15	4.36E-14
119	-1.40E-06	-7.47E-05	-0.252236	-4.67E-05	2.17E-05	1.81E-10
120	-1.78E-06	-7.43E-05	-0.282356	-4.18E-05	3.09E-05	-4.98E-10
121	8.44E-07	-7.51E-05	-0.341958	-4.73E-05	-2.62E-05	6.00E-10
122	6.71E-07	-7.49E-05	-0.316793	-4.94E-05	-1.78E-05	1.79E-10
123	-2.15E-10	-7.54E-05	-0.302947	-5.08E-05	-1.61E-15	5.01E-14
124	-6.71E-07	-7.49E-05	-0.316793	-4.94E-05	1.78E-05	-1.79E-10
125	-8.45E-07	-7.51E-05	-0.341958	-4.73E-05	2.62E-05	-6.00E-10
126	1.81E-07	-7.52E-05	-0.397006	-3.52E-05	-2.44E-05	3.40E-10
127	1.84E-07	-7.50E-05	-0.373715	-3.59E-05	-1.63E-05	1.70E-10
128	-2.96E-10	-7.51E-05	-0.361000	-3.63E-05	-1.12E-15	3.93E-14
129	-1.84E-07	-7.50E-05	-0.373715	-3.59E-05	1.63E-05	-1.70E-10
130	-1.82E-07	-7.52E-05	-0.397006	-3.52E-05	2.44E-05	-3.40E-10
131	-1.21E-07	-7.52E-05	-0.427948	-1.09E-05	-2.38E-05	1.37E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-4.57E-08	-7.51E-05	-0.405277	-1.12E-05	-1.58E-05	9.05E-11
133	-3.47E-10	-7.51E-05	-0.392927	-1.14E-05	-6.95E-16	1.75E-14
134	4.50E-08	-7.51E-05	-0.405277	-1.12E-05	1.58E-05	-9.05E-11
135	1.20E-07	-7.52E-05	-0.427948	-1.09E-05	2.38E-05	-1.37E-10
136	-2.25E-07	-7.51E-05	-0.422331	2.03E-05	-2.34E-05	5.24E-11
137	1.30E-07	-7.51E-05	-0.400115	1.98E-05	-1.55E-05	3.73E-11
138	-3.59E-10	-7.51E-05	-0.388029	1.95E-05	-3.58E-16	-9.91E-15
139	1.29E-07	-7.51E-05	-0.400115	1.98E-05	1.55E-05	-3.73E-11
140	2.24E-07	-7.51E-05	-0.422331	2.03E-05	2.34E-05	-5.24E-11
141	-2.66E-07	-7.51E-05	-0.374148	5.37E-05	-2.22E-05	4.05E-11
142	-1.60E-07	-7.51E-05	-0.353156	5.23E-05	-1.45E-05	3.23E-12
143	-3.27E-10	-7.51E-05	-0.341828	5.13E-05	-1.22E-16	-3.99E-14
144	1.60E-07	-7.51E-05	-0.353156	5.23E-05	1.45E-05	-3.31E-12
145	2.66E-07	-7.51E-05	-0.374148	5.37E-05	2.22E-05	-4.06E-11
146	-2.72E-07	-7.50E-05	-0.283052	8.52E-05	-1.89E-05	6.52E-12
147	-1.45E-07	-7.51E-05	-0.265596	8.15E-05	-1.17E-05	-6.11E-11
148	-2.50E-10	-7.52E-05	-0.256559	7.88E-05	5.72E-18	-6.82E-14
149	1.45E-07	-7.51E-05	-0.265596	8.15E-05	1.17E-05	6.10E-11
150	2.71E-07	-7.50E-05	-0.283052	8.52E-05	1.89E-05	-6.64E-12
151	-5.45E-08	-7.49E-05	-0.153959	0.000111	-1.07E-05	-2.32E-10
152	2.86E-09	-7.51E-05	-0.145023	0.000102	-5.29E-06	-1.63E-10
153	-1.33E-10	-7.52E-05	-0.141238	9.71E-05	3.81E-17	-8.43E-14
154	-3.13E-09	-7.51E-05	-0.145023	0.000102	5.29E-06	1.63E-10
155	5.42E-08	-7.49E-05	-0.153959	0.000111	1.07E-05	2.32E-10
156	6.59E-07	-7.49E-05	-5.31E-97	0.000120	3.64E-06	-2.94E-10
157	3.38E-07	-7.51E-05	-0.005565	0.000110	4.58E-06	-2.17E-10
158	-3.12E-12	-7.53E-05	-0.009738	0.000104	1.52E-17	-8.28E-14
159	-3.38E-07	-7.51E-05	-0.005565	0.000110	-4.58E-06	2.17E-10
160	-6.59E-07	-7.49E-05	-5.31E-97	0.000120	-3.64E-06	2.93E-10
161	7.94E-07	-7.49E-05	0.059667	0.000119	-7.99E-06	-2.63E-10
162	4.46E-07	-7.51E-05	0.049601	0.000110	4.58E-06	-2.17

Loadcase Factor Stage Init.def Title
5 1.0000 RETRACCION

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-5.69E-05	-1.441	-0.295944			
10	5.69E-05	-1.441	-0.295944			
156	-5.69E-05	1.441	-0.295944			
160	5.69E-05	1.441	-0.295944			
166	3.22E-12	-1.846	0.591887	12.714	-2.36E-11	-2.24E-10
167	4.16E-12	1.846	0.591887	-12.714	-1.70E-11	2.22E-10
Sums :	-1.12E-12	1.41E-11	-1.20E-12			
min:	-5.69E-05	-1.846	-0.295944	-12.714	-2.36E-11	-2.24E-10
max:	5.69E-05	1.846	0.591887	12.714	-1.70E-11	2.22E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000436	6.411	-0.009271	1.85E-05	-1.53E-06	3.76E-07
2	0.000365	6.412	-0.007449	1.80E-05	-1.13E-06	3.64E-07
3	9.19E-12	6.412	-0.006357	1.77E-05	6.53E-17	-1.27E-14
4	-0.000369	6.412	-0.007449	1.80E-05	1.13E-06	-3.64E-07
5	-0.000436	6.411	-0.009271	1.85E-05	1.53E-06	-3.76E-07
6	0.000247	6.265	2.96E-98	1.85E-05	-1.53E-06	3.76E-07
7	0.000187	6.266	0.001568	1.80E-05	-1.13E-06	3.64E-07
8	1.55E-11	6.266	0.002486	1.77E-05	6.53E-17	-1.27E-14
9	-0.000187	6.266	0.001568	1.80E-05	1.13E-06	-3.64E-07
10	-0.000247	6.265	2.96E-98	1.85E-05	1.53E-06	-3.76E-07
11	-4.00E-05	5.887	0.023979	1.79E-05	-7.30E-07	1.30E-07
12	-3.41E-05	5.887	0.024740	1.75E-05	-5.85E-07	1.29E-07
13	3.37E-11	5.887	0.025214	1.72E-05	-1.63E-15	-1.30E-14
14	3.41E-05	5.887	0.024740	1.75E-05	5.85E-07	-1.29E-07
15	4.00E-05	5.887	0.023979	1.79E-05	7.30E-07	-1.30E-07
16	-8.92E-05	5.508	0.046209	1.60E-05	-2.70E-07	3.20E-09
17	-6.46E-05	5.508	0.046493	1.58E-05	-2.26E-07	2.74E-08
18	5.18E-11	5.508	0.046674	1.57E-05	-1.58E-16	-1.21E-14
19	6.46E-05	5.508	0.046493	1.58E-05	2.26E-07	-2.74E-08
20	8.92E-05	5.508	0.046209	1.60E-05	2.70E-07	-3.20E-09
21	-5.77E-05	5.129	0.065289	1.31E-05	-8.34E-08	-2.38E-08
22	-4.20E-05	5.129	0.065377	1.31E-05	-7.01E-08	-4.01E-09
23	6.79E-11	5.129	0.065430	1.30E-05	2.53E-15	-1.02E-14
24	4.20E-05	5.129	0.065377	1.31E-05	7.01E-08	4.01E-09
25	5.77E-05	5.129	0.065289	1.31E-05	8.34E-08	2.38E-08
26	-2.53E-05	4.750	0.079923	9.20E-06	-3.10E-08	-1.71E-09
27	-1.90E-05	4.750	0.079955	9.19E-06	-2.65E-08	-7.69E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	8.11E-11	4.750	0.079973	9.19E-06	4.30E-15	-7.61E-15
29	1.90E-05	4.750	0.079955	9.19E-06	2.65E-08	7.69E-09
30	2.53E-05	4.750	0.079923	9.20E-06	3.10E-08	1.71E-09
31	-9.08E-06	4.371	0.088724	4.16E-06	-6.89E-08	-6.42E-09
32	-7.15E-06	4.371	0.088796	4.22E-06	-5.83E-08	-3.95E-09
33	9.05E-11	4.371	0.088838	4.27E-06	4.95E-15	-4.27E-15
34	7.15E-06	4.371	0.088796	4.22E-06	5.83E-08	3.95E-09
35	9.08E-06	4.371	0.088724	4.16E-06	6.89E-08	6.42E-09
36	-6.35E-06	3.992	0.090196	-2.07E-06	-2.58E-07	1.31E-09
37	-5.03E-06	3.992	0.090466	-1.85E-06	-2.13E-07	-2.58E-10
38	9.50E-11	3.992	0.090628	-1.70E-06	4.92E-15	2.66E-15
39	5.03E-06	3.992	0.090466	-1.85E-06	2.13E-07	2.58E-10
40	6.35E-06	3.992	0.090196	-2.07E-06	2.58E-07	-1.31E-09
41	-1.24E-05	3.613	0.082702	-9.59E-06	-7.92E-07	5.57E-09
42	-9.51E-06	3.613	0.083528	-9.03E-06	-6.39E-07	8.06E-10
43	9.23E-11	3.613	0.084029	-8.64E-06	4.54E-15	6.49E-15
44	9.51E-06	3.613	0.083528	-9.03E-06	6.39E-07	-8.06E-10
45	1.24E-05	3.613	0.082702	-9.59E-06	7.92E-07	-5.57E-09
46	-2.19E-05	3.234	0.064570	-1.83E-05	-1.81E-06	2.93E-09
47	-1.76E-05	3.234	0.066492	-1.74E-05	-1.53E-06	-3.91E-09
48	7.92E-11	3.234	0.067823	-1.65E-05	4.03E-15	1.40E-14
49	1.76E-05	3.234	0.066492	-1.74E-05	1.53E-06	3.91E-09
50	2.19E-05	3.234	0.064570	-1.83E-05	1.81E-06	-2.93E-09
51	-2.19E-05	2.856	0.035029	-2.67E-05	-2.29E-06	-1.42E-08
52	-2.25E-05	2.855	0.037677	-2.71E-05	-2.47E-06	-2.33E-08
53	5.39E-11	2.855	0.040520	-2.60E-05	3.71E-15	2.05E-14
54	2.25E-05	2.855	0.037677	-2.71E-05	2.47E-06	2.33E-08
55	2.19E-05	2.856	0.035029	-2.67E-05	2.29E-06	1.42E-08
56	3.43E-06	2.477	-0.003629	-3.24E-05	-4.21E-07	-3.53E-08
57	5.56E-06	2.477	-0.003204	-3.47E-05	-2.97E-07	-9.29E-08
58	2.04E-11	2.476	-0.003022	-4.32E-05	3.66E-15	2.20E-14
59	-5.56E-06	2.477	-0.003204	-3.47E-05	2.97E-07	9.29E-08
60	-3.43E-06	2.477	-0.003629	-3.24E-05	4.21E-07	3.53E-08
61	2.34E-05	1.981	-0.057496	-3.01E-05	2.00E-06	-1.12E-08
62	2.07E-05	1.981	-0.059751	-3.02E-05	2.01E-06	-2.26E-08
63	-3.04E-11	1.981	-0.061933	-2.89E-05	3.66E-15	2.15E-14
64	-2.07E-05	1.981	-0.059751	-3.02E-05	-2.01E-06	2.26E-08
65	-2.34E-05	1.981	-0.057496	-3.01E-05	-2.00E-06	1.12E-08
66	1.63E-05	1.486	-0.103145	-2.29E-05	1.03E-06	3.66E-09
67	1.22E-05	1.486	-0.104227	-2.23E-05	8.35E-07	-2.35E-09
68	-6.55E-11	1.486	-0.104901	-2.18E-05	3.17E-15	1.69E-14
69	-1.22E-05	1.486	-0.104227	-2.23E-05	-8.35E-07	2.35E-09
70	-1.63E-05	1.486	-0.103145	-2.29E-05	-1.03E-06	-3.66E-09
71	5.94E-06	0.990624	-0.135527	-1.51E-05	2.69E-07	3.65E-09
72	4.36E-06	0.990626	-0.135808	-1.49E-05	2.20E-07	1.23E-09
73	-9.34E-11	0.990625	-0.135977	-1.47E-05	2.75E-15	1.06E-14
74	-4.36E-06	0.990626	-0.135808	-1.49E-05	-2.20E-07	-1.23E-09
75	-5.94E-06	0.990624	-0.135527	-1.51E-05	-2.69E-07	-3.65E-09
76	1.11E-06	0.495312	-0.154698	-7.48E-06	4.94E-08	1.42E-09
77	8.57E-07	0.495313	-0.154750	-7.43E-06	4.20E-08	8.18E-10
78	-1.06E-10	0.495313	-0.154781	-7.40E-06	2.60E-15	5.02E-15
79	-8.58E-07	0.495313	-0.154750	-7.43E-06	-4.20E-08	-8.18E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-1.11E-06	0.495312	-0.154698	-7.48E-06	-4.94E-08	-1.42E-09
81	-3.47E-08	-5.90E-12	-0.161052	-2.98E-17	1.10E-08	7.78E-17
82	1.91E-08	-5.81E-12	-0.161064	-2.81E-17	9.65E-09	7.79E-17
83	-1.10E-10	-5.69E-12	-0.161070	-2.54E-17	2.57E-15	7.78E-17
84	-1.94E-08	-5.58E-12	-0.161064	-2.24E-17	-9.65E-09	7.77E-17
85	3.45E-08	-5.49E-12	-0.161052	-2.04E-17	-1.10E-08	7.74E-17
86	1.11E-06	-0.495312	-0.154698	7.48E-06	4.94E-08	-1.42E-09
87	8.57E-07	-0.495313	-0.154750	7.43E-06	4.20E-08	-8.18E-10
88	-1.06E-10	-0.495313	-0.154781	7.40E-06	2.59E-15	-4.86E-15
89	-8.58E-07	-0.495313	-0.154750	7.43E-06	-4.20E-08	8.18E-10
90	-1.11E-06	-0.495312	-0.154698	7.48E-06	-4.94E-08	1.42E-09
91	5.94E-06	-0.990624	-0.135527	1.51E-05	2.69E-07	-3.65E-09
92	4.36E-06	-0.990626	-0.135808	1.49E-05	2.20E-07	-1.23E-09
93	-9.39E-11	-0.990625	-0.135977	1.47E-05	2.74E-15	-1.04E-14
94	-4.36E-06	-0.990626	-0.135808	1.49E-05	-2.20E-07	1.23E-09
95	-5.94E-06	-0.990624	-0.135527	1.51E-05	-2.69E-07	3.65E-09
96	1.63E-05	-1.486	-0.103145	2.29E-05	1.03E-06	-3.66E-09
97	1.22E-05	-1.486	-0.104227	2.23E-05	8.35E-07	2.35E-09
98	-7.03E-11	-1.486	-0.104901	2.18E-05	3.15E-15	-1.67E-14
99	-1.22E-05	-1.486	-0.104227	2.23E-05	-8.35E-07	-2.35E-09
100	-1.63E-05	-1.486	-0.103145	2.29E-05	-1.03E-06	3.66E-09
101	2.34E-05	-1.981	-0.057496	3.01E-05	2.00E-06	1.12E-08
102	2.07E-05	-1.981	-0.059751	3.02E-05	2.01E-06	2.26E-08
103	-3.15E-11	-1.981	-0.061933	2.89E-05	3.63E-15	-2.13E-14
104	-2.07E-05	-1.981	-0.059751	3.02E-05	-2.01E-06	-2.26E-08
105	-2.34E-05	-1.981	-0.057496	3.01E-05	-2.00E-06	-1.12E-08
106	3.43E-06	-2.477	-0.003629	3.24E-05	-4.21E-07	3.53E-08
107	5.56E-06	-2.477	-0.003204	3.47E-05	-2.97E-07	9.29E-08
108	1.90E-11	-2.476	-0.003022	4.32E-05	3.63E-15	-2.18E-14
109	-5.56E-06	-2.477	-0.003204	3.47E-05	2.97E-07	-9.29E-08
110	-3.43E-06	-2.477	-0.003629	3.24E-05	4.21E-07	-3.53E-08
111	-2.19E-05	-2.856	0.035029	2.67E-05	-2.29E-06	1.42E-08
112	-2.25E-05	-2.855	0.037677	2.71E-05	-2.47E-06	2.33E-08
113	5.23E-11	-2.855	0.040520	2.60E-05	3.68E-15	-2.04E-14
114	2.25E-05	-2.855	0.037677	2.71E-05	2.47E-06	-2.33E-08
115	2.19E-05	-2.856	0.035029	2.67E-05	2.29E-06	-1.42E-08
116	-2.19E-05	-3.234	0.064570	1.83E-05	-1.81E-06	-2.93E-09
117	-1.76E-05	-3.234	0.066492	1.74E-05	-1.53E-06	3.91E-09
118	7.74E-11	-3.234	0.067823	1.65E-05	4.00E-15	-1.38E-14
119	1.76E-05	-3.234	0.066492	1.74E-05	1.53E-06	-3.91E-09
120	2.19E-05	-3.234	0.064570	1.83E-05	1.81E-06	2.93E-09
121	-1.24E-05	-3.613	0.082702	9.59E-06	-7.92E-07	-5.57E-09
122	-9.51E-06	-3.613	0.083528	9.03E-06	-6.39E-07	-8.06E-10
123	9.03E-11	-3.613	0.084029	8.64E-06	4.52E-15	-6.33E-15
124	9.51E-06	-3.613	0.083528	9.03E-06	6.39E-07	8.06E-10
125	1.24E-05	-3.613	0.082702	9.59E-06	7.92E-07	5.57E-09
126	-6.35E-06	-3.992	0.090196	2.07E-06	-2.58E-07	-1.31E-09
127	-5.03E-06	-3.992	0.090466	1.85E-06	-2.13E-07	2.58E-10
128	9.28E-11	-3.992	0.090628	1.70E-06	4.90E-15	-9.90E-17
129	5.03E-06	-3.992	0.090466	1.85E-06	2.13E-07	-2.58E-10
130	6.35E-06	-3.992	0.090196	2.07E-06	2.58E-07	1.31E-09
131	-9.08E-06	-4.371	0.088724	-4.16E-06	-6.89E-08	6.42E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-7.15E-06	-4.371	0.088796	-4.22E-06	-5.83E-08	3.95E-09
133	8.81E-11	-4.371	0.088838	-4.27E-06	4.93E-15	4.43E-15
134	7.15E-06	-4.371	0.088796	-4.22E-06	5.83E-08	-3.95E-09
135	9.08E-06	-4.371	0.088724	-4.16E-06	6.89E-08	-6.42E-09
136	-2.53E-05	-4.750	0.079923	-9.20E-06	-3.10E-08	1.71E-09
137	-1.90E-05	-4.750	0.079955	-9.19E-06	-2.65E-08	7.69E-09
138	7.84E-11	-4.750	0.079973	-9.19E-06	4.29E-15	7.78E-15
139	1.90E-05	-4.750	0.079955	-9.19E-06	2.65E-08	-7.69E-09
140	2.53E-05	-4.750	0.079923	-9.20E-06	3.10E-08	-1.71E-09
141	-5.77E-05	-5.129	0.065289	-1.31E-05	-8.34E-08	2.38E-08
142	-4.20E-05	-5.129	0.065377	-1.31E-05	-7.01E-08	4.01E-09
143	6.51E-11	-5.129	0.065430	-1.30E-05	2.52E-15	1.04E-14
144	4.20E-05	-5.129	0.065377	-1.31E-05	7.01E-08	-4.01E-09
145	5.77E-05	-5.129	0.065289	-1.31E-05	8.34E-08	-2.38E-08
146	-8.92E-05	-5.508	0.046209	-1.60E-05	-2.70E-07	-3.20E-09
147	-6.46E-05	-5.508	0.046493	-1.58E-05	-2.26E-07	-2.74E-08
148	4.87E-11	-5.508	0.046674	-1.57E-05	-1.66E-16	1.23E-14
149	6.46E-05	-5.508	0.046493	-1.58E-05	2.26E-07	2.74E-08
150	8.92E-05	-5.508	0.046209	-1.60E-05	2.70E-07	3.20E-09
151	-4.00E-05	-5.887	0.023979	-1.79E-05	-7.30E-07	-1.30E-07
152	-3.41E-05	-5.887	0.024740	-1.75E-05	-5.85E-07	-1.29E-07
153	3.04E-11	-5.887	0.025214	-1.72E-05	-1.63E-15	1.31E-14
154	3.41E-05	-5.887	0.024740	-1.75E-05	5.85E-07	1.29E-07
155	4.00E-05	-5.887	0.023979	-1.79E-05	7.30E-07	1.30E-07
156	0.000247	-6.265	2.96E-98	-1.85E-05	-1.53E-06	-3.76E-07
157	0.000187	-6.266	0.001568	-1.80E-05	-1.13E-06	-3.64E-07
158	1.20E-11	-6.266	0.002486	-1.77E-05	6.47E-17	1.28E-14
159	-0.000187	-6.266	0.001568	-1.80E-05	1.13E-06	3.64E-07
160	-0.000247	-6.265	2.96E-98	-1.85E-05	1.53E-06	3.76E-07
161	0.000436	-6.411	-0.009271	-1.85E-05	-1.53E-06	-3.76E-07
162	0.000369	-6.412	-0.007449	-1.80E-05	-1.13E-06	-3.64E-07
163	5.59E-12	-6.412	-0.006357	-1.77E-05	6.47E-17	1.28E-14
164	-0.000369	-6.412	-0.007449	-1.80E-05	1.13E-06	3.64E-07
165	-0.000436	-6.411	-0.009271	-1.85E-05	1.53E-06	3.76E-07
166	-0	1.85E-97	-5.92E-98	-1.27E-99	+0	+0
167	-0	-1.85E-97	-5.92E-98	1.27E-99	+0	-0
min:	-0.000436	-6.412	-0.161070	-4.32E-05	-2.47E-06	-3.76E-07
max:	0.000436	6.412	0.090628	4.32E-05	2.47E-06	3.76E-07

Loadcase Factor Stage Init.def Title
60 1.0000 FRENADO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-4.14E-05	-1.116	-0.371460			
10	4.14E-05	-1.116	-0.371460			
156	-4.14E-05	-1.116	0.371460			
160	4.14E-05	-1.116	0.371460			
166	1.47E-11	-3.763	-0.958693	25.552	7.27E-11	-2.38E-10
167	-1.57E-11	-3.763	0.958693	25.552	-8.03E-11	-2.38E-10
Sums :	-1.83E-12	-11.990	6.52E-13			
min:	-4.14E-05	-3.763	-0.958693	25.552	-8.03E-11	-2.38E-10
max:	4.14E-05	-1.116	0.958693	25.552	7.27E-11	-2.38E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000321	4.852	-0.012012	2.40E-05	-1.91E-06	2.82E-07
2	0.000270	4.852	-0.009726	2.34E-05	-1.42E-06	2.70E-07
3	-1.99E-11	4.852	-0.008355	2.29E-05	4.72E-17	-1.70E-14
4	-0.000270	4.852	-0.009726	2.34E-05	1.42E-06	-2.70E-07
5	-0.000321	4.852	-0.012012	2.40E-05	1.91E-06	-2.82E-07
6	0.000180	4.852	3.71E-98	2.40E-05	-1.91E-06	2.82E-07
7	0.000135	4.852	0.001968	2.34E-05	-1.42E-06	2.70E-07
8	-1.14E-11	4.852	0.003119	2.29E-05	4.72E-17	-1.70E-14
9	-0.000135	4.852	0.001968	2.34E-05	1.42E-06	-2.70E-07
10	-0.000180	4.852	3.71E-98	2.40E-05	1.91E-06	-2.82E-07
11	-3.40E-05	4.852	0.031075	2.33E-05	-9.15E-07	9.45E-08
12	-2.86E-05	4.852	0.032029	2.27E-05	-7.33E-07	9.21E-08
13	1.29E-11	4.852	0.032624	2.23E-05	-1.17E-15	-1.74E-14
14	2.86E-05	4.852	0.032029	2.27E-05	7.33E-07	-9.21E-08
15	3.40E-05	4.852	0.031075	2.33E-05	9.15E-07	-9.45E-08
16	-6.87E-05	4.852	0.059953	2.09E-05	-3.38E-07	-4.56E-10
17	-4.97E-05	4.852	0.060309	2.06E-05	-2.83E-07	1.54E-08
18	3.70E-11	4.852	0.060535	2.04E-05	-2.51E-18	-1.63E-14
19	4.97E-05	4.852	0.060309	2.06E-05	2.83E-07	-1.54E-08
20	6.87E-05	4.852	0.059953	2.09E-05	3.38E-07	4.55E-10
21	-4.37E-05	4.853	0.084878	1.72E-05	-1.05E-07	-1.99E-08
22	-3.18E-05	4.853	0.084988	1.71E-05	-8.84E-08	-7.87E-09
23	5.86E-11	4.853	0.085054	1.71E-05	2.07E-15	-1.39E-14
24	3.18E-05	4.853	0.084988	1.71E-05	8.84E-08	7.87E-09
25	4.37E-05	4.853	0.084878	1.72E-05	1.05E-07	1.99E-08
26	-1.93E-05	4.853	0.104212	1.23E-05	-4.81E-08	-1.38E-08
27	-1.45E-05	4.853	0.104263	1.23E-05	-4.11E-08	-1.00E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	7.66E-11	4.853	0.104290	1.23E-05	3.45E-15	-1.07E-14
29	1.45E-05	4.853	0.104263	1.23E-05	4.11E-08	1.00E-08
30	1.93E-05	4.853	0.104212	1.23E-05	4.81E-08	1.38E-08
31	-8.82E-06	4.853	0.116197	5.92E-06	-1.32E-07	-4.10E-09
32	-6.97E-06	4.853	0.116336	6.05E-06	-1.12E-07	-6.24E-09
33	9.01E-11	4.853	0.116417	6.14E-06	3.94E-15	-6.43E-15
34	6.97E-06	4.853	0.116336	6.05E-06	1.12E-07	6.24E-09
35	8.82E-06	4.853	0.116197	5.92E-06	1.32E-07	4.10E-09
36	-1.18E-05	4.853	0.118895	-1.99E-06	-4.90E-07	4.58E-09
37	-9.14E-06	4.853	0.119407	-1.57E-06	-4.03E-07	-2.45E-09
38	9.70E-11	4.853	0.119714	-1.29E-06	3.81E-15	-3.40E-16
39	9.14E-06	4.853	0.119407	-1.57E-06	4.03E-07	2.45E-09
40	1.18E-05	4.853	0.118895	-1.99E-06	4.90E-07	-4.58E-09
41	-2.63E-05	4.853	0.110135	-1.16E-05	-1.47E-06	1.04E-08
42	-1.99E-05	4.853	0.111672	-1.06E-05	-1.19E-06	-2.20E-09
43	9.38E-11	4.853	0.112604	-9.88E-06	3.23E-15	8.41E-15
44	1.99E-05	4.853	0.111672	-1.06E-05	1.19E-06	2.20E-09
45	2.63E-05	4.853	0.110135	-1.16E-05	1.47E-06	-1.04E-08
46	-4.55E-05	4.853	0.087747	-2.26E-05	-3.26E-06	4.31E-09
47	-3.64E-05	4.853	0.091219	-2.12E-05	-2.77E-06	-1.25E-08
48	7.52E-11	4.853	0.093654	-1.96E-05	2.42E-15	1.88E-14
49	3.64E-05	4.853	0.091219	-2.12E-05	2.77E-06	1.25E-08
50	4.55E-05	4.853	0.087747	-2.26E-05	3.26E-06	-4.31E-09
51	-4.52E-05	4.853	0.051406	-3.24E-05	-3.71E-06	-3.07E-08
52	-4.62E-05	4.853	0.055775	-3.35E-05	-4.21E-06	-5.22E-08
53	3.94E-11	4.852	0.060838	-3.18E-05	1.96E-15	2.62E-14
54	4.62E-05	4.853	0.055775	-3.35E-05	4.21E-06	5.22E-08
55	4.52E-05	4.853	0.051406	-3.24E-05	3.71E-06	3.07E-08
56	7.24E-06	4.853	0.006608	-3.61E-05	5.20E-07	-7.44E-08
57	1.18E-05	4.852	0.005935	-4.07E-05	7.52E-07	-1.95E-07
58	-4.26E-12	4.852	0.004895	-5.85E-05	2.00E-15	2.33E-14
59	-1.18E-05	4.852	0.005935	-4.07E-05	-7.52E-07	1.95E-07
60	-7.24E-06	4.853	0.006608	-3.61E-05	-5.20E-07	7.44E-08
61	4.75E-05	4.853	0.044517	-2.27E-05	4.98E-06	-2.59E-08
62	4.21E-05	4.853	-0.050088	-2.25E-05	4.89E-06	-5.26E-08
63	-6.12E-11	4.853	-0.055250	-1.94E-05	2.07E-15	1.69E-14
64	-4.21E-05	4.853	-0.050088	-2.25E-05	-4.89E-06	5.26E-08
65	-4.75E-05	4.853	-0.044517	-2.27E-05	-4.98E-06	2.59E-08
66	3.32E-05	4.853	-0.067773	-3.97E-06	2.40E-06	4.42E-09
67	2.49E-05	4.853	-0.070291	-2.60E-06	1.95E-06	-1.12E-08
68	-8.27E-11	4.853	-0.071855	-1.45E-06	1.12E-15	4.11E-15
69	-2.49E-05	4.853	-0.070291	-2.60E-06	-1.95E-06	1.12E-08
70	-3.32E-05	4.853	-0.067773	-3.97E-06	-2.40E-06	-4.42E-09
71	1.24E-05	4.853	-0.061603	1.06E-05	6.13E-07	4.38E-09
72	9.08E-06	4.853	-0.062244	1.11E-05	5.04E-07	-3.92E-09
73	-6.95E-11	4.853	-0.062629	1.14E-05	2.87E-16	-8.37E-15
74	-9.08E-06	4.853	-0.062244	1.11E-05	-5.04E-07	3.92E-09
75	-1.24E-05	4.853	-0.061603	1.06E-05	-6.13E-07	-4.38E-09
76	2.83E-06	4.853	-0.035615	1.91E-05	1.13E-07	-2.00E-11
77	2.13E-06	4.853	-0.035733	1.92E-05	9.54E-08	-4.52E-09
78	-3.77E-11	4.853	-0.035803	1.93E-05	2.29E-17	-1.52E-14
79	-2.13E-06	4.853	-0.035733	1.92E-05	-9.54E-08	4.52E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-2.83E-06	4.853	-0.035615	1.91E-05	-1.13E-07	2.00E-11
81	8.84E-13	4.853	1.17E-13	2.19E-05	4.32E-17	-1.65E-09
82	8.84E-13	4.853	6.91E-14	2.19E-05	4.32E-17	-5.19E-09
83	8.85E-13	4.853	4.31E-15	2.19E-05	4.32E-17	-1.72E-14
84	8.85E-13	4.853	-6.05E-14	2.19E-05	4.33E-17	5.19E-09
85	2.85E-13	4.853	-1.09E-13	2.19E-05	4.33E-17	1.65E-09
86	-2.83E-06	4.853	0.035615	1.91E-05	-1.13E-07	-2.00E-11
87	-2.13E-06	4.853	0.035733	1.92E-05	-9.54E-08	-4.52E-09
88	3.95E-11	4.853	0.035803	1.93E-05	6.34E-17	-1.52E-14
89	2.13E-06	4.853	0.035733	1.92E-05	9.54E-08	4.52E-09
90	2.83E-06	4.853	0.035615	1.91E-05	1.13E-07	2.00E-11
91	-1.24E-05	4.852	0.061603	1.06E-05	-6.13E-07	4.38E-09
92	-9.08E-06	4.853	0.062244	1.11E-05	-5.04E-07	3.92E-09
93	7.12E-11	4.853	0.062629	1.14E-05	-2.00E-16	-8.36E-15
94	9.08E-06	4.853	0.062244	1.11E-05	5.04E-07	3.92E-09
95	1.24E-05	4.853	0.061603	1.06E-05	6.13E-07	-4.38E-09
96	-3.32E-05	4.853	0.067773	-3.97E-06	-2.40E-06	4.42E-09
97	-2.49E-05	4.853	0.070291	-2.60E-06	-1.95E-06	-1.12E-08
98	6.45E-11	4.853	0.071855	-1.45E-06	-1.03E-15	4.12E-15
99	2.49E-05	4.853	0.070291	-2.60E-06	1.95E-06	1.12E-08
100	3.32E-05	4.853	0.067773	-3.97E-06	2.40E-06	-4.42E-09
101	-4.75E-05	4.853	0.044517	-2.27E-05	-4.98E-06	-2.59E-08
102	-4.21E-05	4.853	0.050088	-2.25E-05	-4.89E-06	-5.26E-08
103	6.29E-11	4.853	0.055250	-1.94E-05	-1.98E-15	1.69E-14
104	4.21E-05	4.853	0.050088	-2.25E-05	4.89E-06	5.26E-08
105	4.75E-05	4.853	0.044517	-2.27E-05	4.98E-06	2.59E-08
106	-7.26E-06	4.853	-0.002244	-1.61E-05	-5.20E-07	-7.44E-09
107	-1.18E-05	4.852	-0.005935	-4.07E-05	-7.52E-07	-1.95E-07
108	6.01E-12	4.852	-0.004895	-5.85E-05	-1.91E-15	2.33E-14
109	1.18E-05	4.852	-0.005935	-4.07E-05	7.52E-07	1.95E-07
110	7.24E-06	4.853	-0.006608	-3.61E-05	5.20E-07	7.44E-08
111	4.52E-05	4.853	-0.051406	-3.24E-05	3.71E-06	-3.07E-08
112	4.62E-05	4.853	-0.055775	-3.35E-05	4.21E-06	-5.22E-08
113	-3.76E-11	4.852	-0.060838	-3.18E-05	-1.88E-15	2.62E-14
114	-4.62E-05	4.853	-0.055775	-3.35E-05	-4.21E-06	5.22E-08
115	-4.52E-05	4.853	-0.051406	-3.24E-05	-3.71E-06	3.07E-08
116	4.55E-05	4.853	-0.087747	-2.26E-05	3.26E-06	4.31E-09
117	3.64E-05	4.853	-0.091219	-2.12E-05	2.77E-06	-1.25E-08
118	-7.35E-11	4.853	-0.093654	-1.96E-05	-2.35E-15	1.88E-14
119	-3.64E-05	4.853	-0.091219	-2.12E-05	-2.77E-06	1.25E-08
120	-4.55E-05	4.853	-0.087747	-2.26E-05	-3.26E-06	-4.31E-09
121	2.63E-05	4.853	-0.110175	-1.16E-05	1.47E-06	1.04E-08
122	1.99E-05	4.853	-0.111672	-1.06E-05	1.19E-06	-2.20E-09
123	-9.20E-11	4.853	-0.112604	-9.88E-06	-3.17E-15	8.40E-15
124	-1.99E-05	4.853	-0.111672	-1.06E-05	-1.19E-06	2.20E-09
125	-2.63E-05	4.853	-0.110135	-1.16E-05	-1.47E-06	-1.04E-08
126	1.18E-05	4.853	-0.118895	-1.99E-06	4.90E-07	4.58E-09
127	9.14E-06	4.853	-0.119407	-1.57E-06	4.03E-07	-2.45E-09
128	-9.52E-11	4.853	-0.119714	-1.29E-06	-3.76E-15	-3.47E-15
129	-9.14E-06	4.853	-0.119407	-1.57E-06	-4.03E-07	2.45E-09
130	-1.18E-05	4.853	-0.118895	-1.99E-06	-4.90E-07	-4.58E-09
131	8.82E-06	4.853	-0.116197	5.92E-06	1.32E-07	-4.10E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	6.97E-06	4.853	-0.116336	6.05E-06	1.12E-07	-6.24E-09
133	-8.83E-11	4.853	-0.116417	6.14E-06	-3.89E-15	-6.44E-15
134	-6.97E-06	4.853	-0.116336	6.05E-06	-1.12E-07	6.24E-09
135	-8.82E-06	4.853	-0.116197	5.92E-06	-1.32E-07	4.10E-09
136	1.93E-05	4.853	-0.104212	1.23E-05	4.81E-08	-1.38E-08
137	1.45E-05	4.853	-0.104263	1.23E-05	4.11E-08	-1.00E-08
138	-7.49E-11	4.853	-0.104290	1.23E-05	-3.41E-15	-1.07E-14
139	-1.45E-05	4.853	-0.104263	1.23E-05	-4.11E-08	1.00E-08
140	-1.93E-05	4.853	-0.104212	1.23E-05	-4.81E-08	1.38E-08
141	4.37E-05	4.853	-0.084878	1.72E-05	1.05E-07	-1.99E-08
142	3.18E-05	4.853	-0.084988	1.71E-05	8.84E-08	-7.87E-09
143	-5.68E-11	4.853	-0.085054	1.71E-05	-2.05E-15	-1.39E-14
144	-3.18E-05	4.853	-0.084988	1.71E-05	-8.84E-08	7.87E-09
145	-4.37E-05	4.853	-0.084878	1.72E-05	-1.05E-07	1.99E-08
146	6.87E-05	4.852	-0.059953	2.09E-05	3.38E-07	-4.56E-10
147	4.97E-05	4.852	-0.060309	2.06E-05	2.83E-07	1.54E-08
148	-3.52E-11	4.852	-0.060535	2.04E-05	2.05E-17	-1.63E-14
149	-4.97E-05	4.852	-0.060309	2.06E-05	-2.83E-07	-1.54E-08
150	-6.87E-05	4.852	-0.059953	2.09E-05	-3.38E-07	4.55E-10
151	3.40E-05	4.852	-0.031075	2.33E-05	9.15E-07	9.45E-08
152	2.86E-05	4.852	-0.032029	2.27E-05	7.33E-07	9.21E-08
153	-1.10E-11	4.852	-0.032624	2.23E-05	1.18E-15	-1.74E-14
154	-2.86E-05	4.852	-0.032029	2.27E-05	-7.33E-07	-9.21E-08
155	-3.40E-05	4.852	-0.031075	2.33E-05	-9.15E-07	-9.45E-08
156	-0.000180	4.852	-3.71E-98	2.40E-05	1.91E-06	2.82E-07
157	-0.000135	4.852	-0.001968	2.34E-05	1.42E-06	2.70E-07
158	1.33E-11	4.852	-0.003119	2.29E-05	-4.59E-17	-1.70E-14
159	0.000135	4.852	-0.001968	2.34E-05	-1.42E-06	-2.70E-07
160	0.000180	4.852	-3.71E-98	2.40E-05	-1.91E-06	-2.82E-07
161	-0.000321	4.852	0.012012	2.40E-05	1.91E-06	2.82E-07
162	-0.000270	4.852	0.009726	2.34E-05	1.42E-06	2.70E-07
163	2.18E-11	4.852	0.006355	2.29E-05	-4.59E-17	-1.70E-14
164	0.000270	4.852	0.009726	2.34E-05	-1.42E-06	-2.70E-07
165	0.000321	4.852	0.012012	2.40E-05	-1.91E-06	-2.82E-07
166	+0	3.76E-97	9.59E-98	-2.56E-99	-0	+0
167	+0	3.76E-97	-9.59E-98	-2.56E-99	+0	+0
min:	-0.000321	3.76E-97	-0.119714	-5.85E-05	-4.98E-06	-2.82E-07
max:	0.000321	4.853	0.119714	2.40E-05	4.98E-06	2.82E-07

Loadcase Factor Stage Init.def Title
62 1.000C VIENTO TRANSV SIN SOB.

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	1.531	0.004263	3.948			
10	1.531	-0.004262	-4.140			
156	1.531	-0.004263	3.948			
160	1.531	0.004262	-4.140			
166	5.242	-0.002368	-0.604205	0.010415	32.670	-0.040211
167	5.242	0.002368	-0.604205	-0.010415	32.670	0.040211
Sums :	16.609	2.71E-12	-1.592			
min:	1.531	-0.004263	-4.140	-0.010415	32.670	-0.040211
max:	5.242	0.004263	3.948	0.010415	32.670	0.040211

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-6.653	-0.018533	0.026975	-5.39E-05	1.91E-06	7.49E-06
2	-6.653	-0.010398	0.014646	-3.21E-05	-7.19E-07	7.16E-06
3	-6.654	-1.59E-06	-0.000444	1.85E-06	-4.09E-06	7.06E-06
4	-6.653	0.010395	-0.016000	3.60E-05	-2.85E-07	7.16E-06
5	-6.653	0.018532	-0.029105	5.82E-05	2.51E-06	7.49E-06
6	-6.657	-0.018533	-3.95E-97	-5.39E-05	1.91E-06	7.49E-06
7	-6.657	-0.010398	-0.001395	-3.21E-05	-7.19E-07	7.16E-06
8	-6.657	-1.59E-06	0.000483	1.85E-06	-4.09E-06	7.06E-06
9	-6.657	0.010395	0.002008	3.60E-05	-2.85E-07	7.16E-06
10	-6.657	0.018532	4.14E-97	5.82E-05	2.51E-06	7.50E-06
11	-6.666	-0.018397	-0.078384	-5.90E-05	-3.02E-05	7.40E-06
12	-6.666	-0.010341	-0.044333	-3.40E-05	-3.09E-05	7.15E-06
13	-6.666	-1.49E-06	0.002825	1.73E-06	-3.20E-05	7.11E-06
14	-6.667	0.010338	0.049918	3.76E-05	-3.08E-05	7.15E-06
15	-6.667	0.018394	0.083881	6.29E-05	-3.01E-05	7.40E-06
16	-6.676	-0.018020	-0.160357	-6.04E-05	-6.30E-05	7.14E-06
17	-6.676	-0.010174	-0.089811	-3.56E-05	-6.30E-05	7.01E-06
18	-6.676	-1.38E-06	0.004875	1.40E-06	-6.33E-05	7.02E-06
19	-6.676	0.010171	0.099686	3.85E-05	-6.32E-05	7.01E-06
20	-6.676	0.018017	0.170451	6.35E-05	-6.32E-05	7.14E-06
21	-6.685	-0.017445	-0.243800	-6.13E-05	-9.55E-05	6.86E-06
22	-6.685	-0.009877	-0.136877	-3.64E-05	-9.55E-05	6.77E-06
23	-6.685	-1.32E-06	0.006382	9.02E-07	-9.56E-05	6.79E-06
24	-6.685	0.009874	0.149849	3.83E-05	-9.57E-05	6.77E-06
25	-6.685	0.017442	0.257119	6.32E-05	-9.58E-05	6.86E-06
26	-6.694	-0.016699	-0.328103	-6.18E-05	-0.000128	6.54E-06
27	-6.694	-0.009471	-0.184815	-3.69E-05	-0.000128	6.46E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-6.694	-1.30E-06	0.007183	3.27E-07	-0.000128	6.48E-06
29	-6.694	0.009468	0.199421	3.76E-05	-0.000128	6.46E-06
30	-6.694	0.016696	0.343096	6.24E-05	-0.000128	6.54E-06
31	-6.702	-0.015809	-0.412739	-6.18E-05	-0.000160	6.17E-06
32	-6.702	-0.008981	-0.233267	-3.72E-05	-0.000160	6.10E-06
33	-6.702	-1.29E-06	0.007238	-2.31E-07	-0.000160	6.12E-06
34	-6.702	0.008978	0.247989	3.67E-05	-0.000161	6.10E-06
35	-6.702	0.015806	0.427869	6.14E-05	-0.000161	6.17E-06
36	-6.710	-0.014805	-0.497063	-6.13E-05	-0.000192	5.75E-06
37	-6.710	-0.008425	-0.281822	-3.71E-05	-0.000192	5.70E-06
38	-6.710	-1.27E-06	0.006630	-6.81E-07	-0.000192	5.71E-06
39	-6.710	0.008422	0.295340	3.57E-05	-0.000193	5.70E-06
40	-6.710	0.014803	0.511011	6.00E-05	-0.000193	5.75E-06
41	-6.717	-0.013719	-0.579960	-5.96E-05	-0.000223	5.30E-06
42	-6.717	-0.007819	-0.329813	-3.63E-05	-0.000223	5.27E-06
43	-6.717	-1.26E-06	0.005550	-9.40E-07	-0.000224	5.28E-06
44	-6.717	0.007817	0.341213	3.44E-05	-0.000224	5.27E-06
45	-6.717	0.013716	0.591859	5.79E-05	-0.000224	5.30E-06
46	-6.724	-0.012582	-0.659056	-5.54E-05	-0.000253	4.84E-06
47	-6.724	-0.007176	-0.376080	-3.43E-05	-0.000253	4.82E-06
48	-6.724	-1.35E-06	0.004299	-9.30E-07	-0.000254	4.81E-06
49	-6.724	0.007174	0.385093	3.26E-05	-0.000253	4.82E-06
50	-6.724	0.012580	0.668746	5.39E-05	-0.000253	4.84E-06
51	-6.730	-0.011431	-0.729023	-4.58E-05	-0.000277	4.41E-06
52	-6.730	-0.006504	-0.418531	-2.99E-05	-0.000278	4.39E-06
53	-6.730	-1.64E-06	0.003277	-5.62E-07	-0.000283	4.29E-06
54	-6.730	0.006502	0.425773	2.91E-05	-0.000279	4.39E-06
55	-6.730	0.011429	0.737272	4.52E-05	-0.000278	4.41E-06
56	-6.735	-0.010273	-0.780684	-2.93E-05	-0.000293	4.02E-06
57	-6.735	-0.005832	-0.451527	-1.80E-05	-0.000295	3.96E-06
58	-6.735	-2.01E-06	0.003085	4.26E-07	-0.000316	3.95E-06
59	-6.735	0.005828	0.458725	1.89E-05	-0.000296	3.96E-06
60	-6.735	0.010273	0.789146	3.02E-05	-0.000294	4.03E-06
61	-6.742	-0.008625	-0.817406	-1.08E-05	-0.000312	3.42E-06
62	-6.742	-0.004886	-0.467607	-4.42E-06	-0.000313	3.32E-06
63	-6.742	-1.23E-06	0.005063	1.64E-06	-0.000316	3.39E-06
64	-6.742	0.004884	0.478344	7.44E-06	-0.000314	3.32E-06
65	-6.742	0.008623	0.829060	1.36E-05	-0.000313	3.42E-06
66	-6.747	-0.006714	-0.829054	-2.74E-06	-0.000319	2.68E-06
67	-6.747	-0.003788	-0.471430	-7.32E-07	-0.000319	2.59E-06
68	-6.747	-7.29E-07	0.008147	1.87E-06	-0.000320	2.60E-06
69	-6.747	0.003787	0.488065	4.40E-06	-0.000320	2.59E-06
70	-6.747	0.006712	0.846252	6.30E-06	-0.000320	2.68E-06
71	-6.751	-0.004590	-0.831749	-3.45E-07	-0.000322	1.83E-06
72	-6.751	-0.002588	-0.471515	4.06E-07	-0.000322	1.77E-06
73	-6.751	-4.71E-07	0.011133	1.56E-06	-0.000322	1.78E-06
74	-6.751	0.002587	0.494044	2.69E-06	-0.000322	1.77E-06
75	-6.751	0.004589	0.854715	3.42E-06	-0.000322	1.83E-06
76	-6.753	-0.002329	-0.831989	1.35E-07	-0.000323	9.30E-07
77	-6.753	-0.001313	-0.470729	4.22E-07	-0.000323	9.00E-07
78	-6.753	-2.43E-07	0.013243	8.75E-07	-0.000323	9.02E-07
79	-6.753	0.001313	0.497461	1.32E-06	-0.000323	8.99E-07

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-6.753	0.002328	0.859129	1.61E-06	-0.000323	9.30E-07
81	-6.754	-2.46E-11	-0.831895	-5.18E-16	-0.000323	9.00E-15
82	-6.754	-1.45E-11	-0.470347	-3.19E-16	-0.000323	9.00E-15
83	-6.754	-9.92E-13	0.014000	7.67E-18	-0.000323	9.00E-15
84	-6.754	1.25E-11	0.498591	3.34E-16	-0.000323	9.00E-15
85	-6.754	2.26E-11	0.860544	5.31E-16	-0.000323	9.00E-15
86	-6.753	0.002329	-0.831989	-1.35E-07	-0.000323	-9.30E-07
87	-6.753	0.001313	-0.470729	-4.22E-07	-0.000323	-9.00E-07
88	-6.753	2.43E-07	0.013243	-8.75E-07	-0.000323	-9.02E-07
89	-6.753	-0.001313	0.497461	-1.32E-06	-0.000323	-8.99E-07
90	-6.753	-0.002328	0.859129	-1.61E-06	-0.000323	-9.30E-07
91	-6.751	0.004590	-0.831749	3.45E-07	-0.000322	-1.83E-06
92	-6.751	0.002588	-0.471515	-4.06E-07	-0.000322	-1.77E-06
93	-6.751	4.71E-07	0.011133	-1.56E-06	-0.000322	-1.78E-06
94	-6.751	-0.002587	0.494044	-2.69E-06	-0.000322	-1.77E-06
95	-6.751	-0.004589	0.854715	-3.42E-06	-0.000322	-1.83E-06
96	-6.747	0.006714	-0.829054	2.74E-06	-0.000319	-2.68E-06
97	-6.747	0.003788	-0.471430	7.32E-07	-0.000319	-2.59E-06
98	-6.747	7.29E-07	0.008147	-1.87E-06	-0.000320	-2.60E-06
99	-6.747	-0.003787	0.488065	-4.40E-06	-0.000320	-2.59E-06
100	-6.747	-0.006712	0.846252	-6.30E-06	-0.000320	-2.68E-06
101	-6.742	0.008625	-0.817406	1.08E-05	-0.000312	-3.42E-06
102	-6.742	0.004686	-0.467607	4.42E-06	-0.000313	-3.32E-06
103	-6.742	1.23E-06	0.005063	-1.64E-06	-0.000316	-3.39E-06
104	-6.742	-0.004884	0.478344	-7.44E-06	-0.000314	-3.32E-06
105	-6.742	-0.008623	0.829060	-1.36E-05	-0.000313	-3.42E-06
106	-6.735	0.010273	-0.780684	2.93E-05	-0.000293	-4.02E-06
107	-6.735	0.005832	-0.451527	1.80E-05	-0.000295	-3.96E-06
108	-6.735	2.01E-06	0.003085	-4.26E-07	-0.000316	-3.95E-06
109	-6.735	-0.005828	0.458725	-1.89E-05	-0.000296	-3.96E-06
110	-6.735	-0.010273	0.789146	-3.02E-05	-0.000294	-4.03E-06
111	-6.730	0.011431	-0.729023	4.58E-05	-0.000277	-4.41E-06
112	-6.730	0.006504	-0.418531	2.99E-05	-0.000278	-4.39E-06
113	-6.730	1.64E-06	0.003277	5.62E-07	-0.000283	-4.29E-06
114	-6.730	-0.006502	0.425773	-2.91E-05	-0.000279	-4.39E-06
115	-6.730	-0.011429	0.737272	-4.52E-05	-0.000278	-4.41E-06
116	-6.724	0.012582	-0.659056	5.54E-05	-0.000253	-4.84E-06
117	-6.724	0.007176	-0.376080	3.43E-05	-0.000253	-4.82E-06
118	-6.724	1.35E-06	0.004299	9.30E-07	-0.000254	-4.81E-06
119	-6.724	-0.007174	0.385093	-3.26E-05	-0.000253	-4.82E-06
120	-6.724	-0.012580	0.668746	-5.39E-05	-0.000253	-4.84E-06
121	-6.717	0.013719	-0.579960	5.96E-05	-0.000223	-5.30E-06
122	-6.717	0.007819	-0.329813	3.63E-05	-0.000223	-5.27E-06
123	-6.717	1.26E-06	0.005550	9.40E-07	-0.000224	-5.28E-06
124	-6.717	-0.007817	0.341213	-3.44E-05	-0.000224	-5.27E-06
125	-6.717	-0.013716	0.591859	-5.79E-05	-0.000224	-5.30E-06
126	-6.710	0.014805	-0.497063	6.13E-05	-0.000192	-5.75E-06
127	-6.710	0.008425	-0.281822	3.71E-05	-0.000192	-5.70E-06
128	-6.710	1.27E-06	0.006630	6.81E-07	-0.000192	-5.71E-06
129	-6.710	-0.008422	0.295340	-3.57E-05	-0.000193	-5.70E-06
130	-6.710	-0.014803	0.511011	-6.00E-05	-0.000193	-5.75E-06
131	-6.702	0.015809	-0.412739	6.18E-05	-0.000160	-6.17E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-6.702	0.008981	-0.233267	3.72E-05	-0.000160	-6.10E-06
133	-6.702	1.29E-06	0.007238	2.31E-07	-0.000160	-6.12E-06
134	-6.702	-0.008978	0.247989	-3.67E-05	-0.000161	-6.10E-06
135	-6.702	-0.015806	0.427869	-6.14E-05	-0.000161	-6.17E-06
136	-6.694	0.016699	-0.328103	6.18E-05	-0.000128	-6.54E-06
137	-6.694	0.009471	-0.184819	3.69E-05	-0.000128	-6.46E-06
138	-6.694	1.30E-06	0.007183	-3.27E-07	-0.000128	-6.48E-06
139	-6.694	-0.009468	0.199421	-3.76E-05	-0.000128	-6.46E-06
140	-6.694	-0.016696	0.343096	-6.24E-05	-0.000128	-6.54E-06
141	-6.685	0.017445	-0.243800	6.13E-05	-9.55E-05	-6.86E-06
142	-6.685	0.009877	-0.136877	3.64E-05	-9.55E-05	-6.77E-06
143	-6.685	1.32E-06	0.006382	-9.02E-07	-9.56E-05	-6.79E-06
144	-6.685	-0.009874	0.149849	-3.83E-05	-9.57E-05	-6.77E-06
145	-6.685	-0.017442	0.257119	-6.32E-05	-9.58E-05	-6.86E-06
146	-6.676	0.018020	-0.160357	6.04E-05	-6.30E-05	-7.14E-06
147	-6.676	0.010174	-0.089811	3.56E-05	-6.30E-05	-7.01E-06
148	-6.676	1.38E-06	0.004875	-1.40E-06	-6.33E-05	-7.02E-06
149	-6.676	-0.010171	0.099686	-3.85E-05	-6.32E-05	-7.01E-06
150	-6.676	-0.018017	0.170451	-6.35E-05	-6.32E-05	-7.14E-06
151	-6.666	0.018397	-0.078384	5.90E-05	-3.02E-05	-7.40E-06
152	-6.666	0.010341	-0.044333	3.40E-05	-3.09E-05	-7.15E-06
153	-6.666	1.49E-06	0.002825	-1.73E-06	-3.20E-05	-7.11E-06
154	-6.667	-0.010338	0.049918	-3.76E-05	-3.08E-05	-7.15E-06
155	-6.667	-0.018394	0.083881	-6.29E-05	-3.01E-05	-7.40E-06
156	-6.657	0.018533	-3.95E-97	5.39E-05	1.91E-06	-7.49E-06
157	-6.657	0.010398	-0.001395	3.21E-05	-7.19E-07	-7.16E-06
158	-6.657	1.59E-06	0.000483	-1.85E-06	-4.09E-06	-7.06E-06
159	-6.657	-0.010395	0.002008	-3.60E-05	-2.85E-07	-7.16E-06
160	-6.657	-0.018532	4.14E-97	-5.82E-05	2.51E-06	-7.50E-06
161	-6.653	0.018533	0.026975	5.39E-05	1.91E-06	-7.49E-06
162	-6.653	0.010398	0.014646	3.21E-05	-7.19E-07	-7.16E-06
163	-6.654	1.59E-06	-0.000444	-1.85E-06	-4.09E-06	-7.06E-06
164	-6.653	-0.010395	-0.016000	-3.60E-05	-2.85E-07	-7.16E-06
165	-6.653	-0.018532	-0.029105	-5.82E-05	2.51E-06	-7.49E-06
166	-5.24E-97	+0	6.04E-98	-0	-3.27E-99	+0
167	-5.24E-97	-0	6.04E-98	+0	-3.27E-99	-0
min:	-6.754	-0.018533	-0.831989	-6.35E-05	-0.000323	-7.50E-06
max:	-5.24E-97	0.018533	0.860544	6.35E-05	2.51E-06	7.50E-06

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOE
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	20.036			
	1.761	1.141	100.469			
	Min: AP AR AS AT AX AY BU...			Max: A B D E F G J AL AN AO		
10	2.283	-3.686	16.626			
	-0.568555	1.138	97.227			
	Min: AP AR AS AT AU AV BC...			Max: A B D G H I AB AN AO		
156	-1.091	2.568	20.407			
	1.761	-2.257	100.840			
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.		
160	2.283	2.571	16.997			
	-0.568596	-2.254	97.599			
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...		
166	3.374	-1.935	218.118	15.604	23.708	-0.028301
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09
	Min: CF CH CI CL DC DN DO...			Max: DS DT DV DW DX DY EM...		
167	3.374	-1.829	219.077	9.951	23.708	0.028301
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...		

Articulo 46 EHE

Dimensiones del soporte

Ancho (m)	0.89
Canto (m)	1.20
Canto útil (m)	1.15

u1 (m)	18.64

Losa sin armadura de punzonamiento

Nd (t)	568.50
β	1.15
Fsd,ef	653.78
τsd (t/m2)	***30.49***

ξ	1.417
ϕ (pm)	25
nº (pm)	5.71428
As (cm2)	28.05
ρ	2.439E-03
fck (Mpa)	25
τrd (MPa)	0.311
τrd (t/m2)	***31.07***

τsd (t/m2)	***< τrd (t/m2)***

Loadcase 63 — Factor 1.0000 — Stage — Init.def Title: VIENTO TRANSV CON SOB

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	3.976	0.010057	10.805			
10	3.976	-0.010056	-11.366			
156	3.976	-0.010057	10.805			
160	3.976	0.010056	-11.366			
166	11.245	-0.006921	-1.766	0.030443	79.020	-0.094356
167	11.245	0.006921	-1.766	-0.030443	79.020	0.094356
Sums :	38.395	7.08E-12	-4.654			
min:	3.976	-0.010057	-11.366	-0.030443	79.020	-0.094356
max:	11.245	0.010057	10.805	0.030443	79.020	0.094356

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-17.278	-0.043724	0.073702	-0.000147	5.17E-06	1.78E-05
2	-17.280	-0.024489	0.039996	-8.75E-05	-2.01E-06	1.69E-05
3	-17.280	-4.64E-06	-0.001299	5.42E-06	-1.12E-05	1.67E-05
4	-17.280	0.024480	-0.043955	9.90E-05	-7.41E-07	1.69E-05
5	-17.279	0.043720	-0.079930	0.000160	6.93E-06	1.78E-05
6	-17.287	-0.043724	-1.08E-96	-0.000147	5.17E-06	1.78E-05
7	-17.288	-0.024489	-0.003766	-8.75E-05	-2.01E-06	1.69E-05
8	-17.289	-4.64E-06	0.001413	5.42E-06	-1.12E-05	1.67E-05
9	-17.288	0.024480	0.005559	9.90E-05	-7.41E-07	1.69E-05
10	-17.288	0.043720	1.14E-96	0.000160	6.93E-06	1.78E-05
11	-17.310	-0.043373	-0.214224	-0.000161	-8.27E-05	1.75E-05
12	-17.311	-0.024344	-0.120932	-9.27E-05	-8.46E-05	1.69E-05
13	-17.311	-4.36E-06	0.008257	5.05E-06	-8.76E-05	1.68E-05
14	-17.311	0.024336	0.137259	0.000103	-8.43E-05	1.69E-05
15	-17.311	0.043367	0.230291	0.000173	-8.24E-05	1.75E-05
16	-17.333	-0.042412	-0.438312	-0.000165	-0.000172	1.68E-05
17	-17.333	-0.023925	-0.245094	-9.71E-05	-0.000173	1.65E-05
18	-17.333	-4.02E-06	0.014249	4.09E-06	-0.000173	1.65E-05
19	-17.333	0.023918	0.273960	0.000106	-0.000173	1.65E-05
20	-17.333	0.042404	0.467818	0.000174	-0.000173	1.68E-05
21	-17.354	-0.040957	-0.666482	-0.000168	-0.000261	1.61E-05
22	-17.354	-0.023182	-0.373674	-9.95E-05	-0.000261	1.59E-05
23	-17.354	-3.86E-06	0.018654	2.64E-06	-0.000262	1.59E-05
24	-17.355	0.023175	0.411593	0.000105	-0.000262	1.59E-05
25	-17.355	0.040950	0.705414	0.000173	-0.000262	1.61E-05
26	-17.375	-0.039093	-0.897068	-0.000169	-0.000350	1.53E-05
27	-17.375	-0.022177	-0.504742	-0.000101	-0.000350	1.51E-05

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
26	-17.375	-3.80E-06	0.020996	9.56E-07	-0.000351	1.52E-05
29	-17.375	0.022170	0.040125	0.000103	-0.000351	1.53E-05
30	-17.376	0.039086	0.940894	0.000171	-0.000351	1.53E-05
31	-17.394	-0.036900	-1.129	-0.000169	-0.000439	1.44E-05
32	-17.394	-0.020977	-0.637285	-0.000102	-0.000439	1.42E-05
33	-17.394	-3.76E-06	0.021159	-6.74E-07	-0.000439	1.43E-05
34	-17.395	0.020969	0.680320	0.000100	-0.000440	1.42E-05
35	-17.395	0.036892	1.173	0.000168	-0.000440	1.44E-05
36	-17.412	-0.034463	-1.359	-0.000168	-0.000526	1.33E-05
37	-17.412	-0.019637	-0.770197	-0.000102	-0.000526	1.32E-05
38	-17.412	-3.70E-06	0.019379	-1.99E-06	-0.000527	1.33E-05
39	-17.413	0.019629	0.809712	9.76E-05	-0.000527	1.32E-05
40	-17.413	0.034455	1.400	0.000164	-0.000527	1.33E-05
41	-17.429	-0.031875	-1.586	-0.000163	-0.000611	1.22E-05
42	-17.429	-0.018202	-0.901608	-9.93E-05	-0.000611	1.22E-05
43	-17.429	-3.68E-06	0.016225	-2.75E-06	-0.000612	1.22E-05
44	-17.429	0.018195	0.934933	9.40E-05	-0.000612	1.22E-05
45	-17.430	0.031867	1.621	0.000158	-0.000613	1.22E-05
46	-17.444	-0.029234	-1.803	-0.000152	-0.000691	1.12E-05
47	-17.444	-0.016707	-1.028	-9.39E-05	-0.000692	1.12E-05
48	-17.444	-3.94E-06	0.012566	-2.72E-06	-0.000695	1.11E-05
49	-17.445	0.016699	1.055	8.89E-05	-0.000693	1.12E-05
50	-17.445	0.029226	1.831	0.000147	-0.000693	1.12E-05
51	-17.458	-0.026642	-1.994	-0.000125	-0.000757	1.02E-05
52	-17.458	-0.015173	-1.144	-8.19E-05	-0.000762	1.02E-05
53	-17.458	-4.78E-06	0.009580	-1.64E-06	-0.000775	9.87E-06
54	-17.458	0.015165	1.166	7.94E-05	-0.000764	1.02E-05
55	-17.459	0.026636	2.018	0.000124	-0.000760	1.02E-05
56	-17.471	-0.024118	-2.135	-8.01E-05	-0.000802	9.45E-06
57	-17.471	-0.013684	-1.235	-4.91E-05	-0.000807	9.29E-06
58	-17.470	-5.87E-06	0.009018	1.25E-06	-0.000866	9.26E-06
59	-17.471	0.013674	1.256	5.18E-05	-0.000810	9.29E-06
60	-17.472	0.024118	2.160	8.28E-05	-0.000806	9.47E-06
61	-17.486	-0.020482	-2.236	-2.95E-05	-0.000853	8.17E-06
62	-17.486	-0.011586	-1.279	-1.20E-05	-0.000857	7.89E-06
63	-17.486	-3.58E-06	0.014799	4.78E-06	-0.000866	8.12E-06
64	-17.487	0.011580	1.310	2.08E-05	-0.000859	7.89E-06
65	-17.487	0.020476	2.270	3.77E-05	-0.000856	8.17E-06
66	-17.499	-0.016081	-2.267	-7.37E-06	-0.000874	6.48E-06
67	-17.499	-0.009046	-1.289	-1.79E-06	-0.000874	6.23E-06
68	-17.499	-2.13E-06	0.023815	5.47E-06	-0.000875	6.26E-06
69	-17.499	0.009041	1.337	1.25E-05	-0.000875	6.23E-06
70	-17.500	0.016075	2.318	1.78E-05	-0.000875	6.48E-06
71	-17.508	-0.011055	-2.275	-8.06E-07	-0.000880	4.46E-06
72	-17.508	-0.006213	-1.289	1.31E-06	-0.000880	4.28E-06
73	-17.509	-1.38E-06	0.032541	4.56E-06	-0.000881	4.29E-06
74	-17.509	0.006210	1.354	7.75E-06	-0.000881	4.28E-06
75	-17.509	0.011052	2.342	9.79E-06	-0.000882	4.46E-06
76	-17.514	-0.005627	-2.275	4.56E-07	-0.000883	2.27E-06
77	-17.514	-0.003163	-1.286	1.27E-06	-0.000883	2.18E-06
78	-17.514	-7.10E-07	0.038710	2.56E-06	-0.000883	2.18E-06
79	-17.515	0.003162	1.364	3.83E-06	-0.000884	2.18E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-17.515	0.005625	2.354	4.63E-06	-0.000884	2.27E-06
81	-17.516	-6.38E-11	-2.275	-1.34E-15	-0.000884	2.34E-14
82	-17.516	-3.77E-11	-1.285	-8.28E-16	-0.000884	2.34E-14
83	-17.516	-2.59E-12	0.040924	2.00E-17	-0.000884	2.34E-14
84	-17.517	3.25E-11	1.368	8.66E-16	-0.000885	2.34E-14
85	-17.517	5.87E-11	2.358	1.38E-15	-0.000885	2.34E-14
86	-17.514	0.005627	-2.275	-4.56E-07	-0.000883	-2.27E-06
87	-17.514	0.003163	-1.286	-1.27E-06	-0.000883	-2.18E-06
88	-17.514	7.10E-07	0.038710	-2.56E-06	-0.000883	-2.18E-06
89	-17.515	-0.003162	1.364	-3.83E-06	-0.000884	-2.18E-06
90	-17.515	-0.005625	2.354	-4.63E-06	-0.000884	-2.27E-06
91	-17.508	0.011055	-2.275	8.06E-07	-0.000880	-4.46E-06
92	-17.508	0.006213	-1.289	-1.31E-06	-0.000880	-4.28E-06
93	-17.509	1.38E-06	0.032541	-4.56E-06	-0.000881	-4.29E-06
94	-17.509	-0.006210	1.354	-7.75E-06	-0.000881	-4.28E-06
95	-17.509	-0.011052	2.342	-9.79E-06	-0.000882	-4.46E-06
96	-17.499	0.016081	-2.267	7.37E-06	-0.000874	-6.48E-06
97	-17.499	0.009046	-1.289	1.79E-06	-0.000874	-6.23E-06
98	-17.499	2.13E-06	0.023815	-5.47E-06	-0.000875	-6.26E-06
99	-17.499	-0.009041	1.337	-1.25E-05	-0.000875	-6.23E-06
100	-17.500	0.016075	2.318	-1.78E-05	-0.000875	-6.48E-06
101	-17.486	0.020482	-2.236	2.95E-05	-0.000853	-8.17E-06
102	-17.486	0.011586	-1.279	1.20E-05	-0.000857	-7.89E-06
103	-17.486	3.58E-06	0.014799	-4.78E-06	-0.000866	-8.12E-06
104	-17.487	-0.011580	1.310	-2.08E-05	-0.000859	-7.89E-06
105	-17.487	-0.020476	2.270	-3.77E-05	-0.000856	-8.17E-06
106	-17.471	0.024118	-2.135	8.01E-05	-0.000802	-9.45E-06
107	-17.471	0.013684	-1.235	4.91E-05	-0.000807	-9.29E-06
108	-17.470	5.87E-06	0.009018	-1.25E-06	-0.000866	-9.26E-06
109	-17.471	-0.013674	1.256	-5.18E-05	-0.000810	-9.29E-06
110	-17.472	-0.024118	2.160	-8.28E-05	-0.000806	-9.47E-06
111	-17.458	0.026642	-1.994	0.000125	-0.000757	-1.02E-05
112	-17.458	0.015173	-1.144	8.19E-05	-0.000762	-1.02E-05
113	-17.458	4.78E-06	0.009580	1.64E-06	-0.000775	-9.87E-06
114	-17.458	-0.015165	1.166	-7.94E-05	-0.000764	-1.02E-05
115	-17.459	-0.026636	2.018	-0.000124	-0.000760	-1.02E-05
116	-17.444	0.029234	-1.803	0.000152	-0.000691	-1.12E-05
117	-17.444	0.016707	-1.028	9.39E-05	-0.000692	-1.12E-05
118	-17.444	3.94E-06	0.012566	2.72E-06	-0.000695	-1.11E-05
119	-17.445	-0.016699	1.055	-8.89E-05	-0.000693	-1.12E-05
120	-17.445	-0.029226	1.831	-0.000147	-0.000693	-1.12E-05
121	-17.428	0.031875	-1.586	0.000163	-0.000611	-1.22E-05
122	-17.429	0.018202	-0.901608	9.93E-05	-0.000611	-1.22E-05
123	-17.429	3.68E-06	0.016225	2.75E-06	-0.000612	-1.22E-05
124	-17.429	-0.018195	0.934933	-9.40E-05	-0.000612	-1.22E-05
125	-17.430	-0.031867	1.621	-0.000158	-0.000613	-1.22E-05
126	-17.412	0.034463	-1.359	0.000168	-0.000526	-1.33E-05
127	-17.412	0.019637	-0.770197	0.000102	-0.000526	-1.32E-05
128	-17.412	3.70E-06	0.019379	1.99E-06	-0.000527	-1.33E-05
129	-17.413	-0.019629	0.809712	-9.76E-05	-0.000527	-1.32E-05
130	-17.413	-0.034455	1.400	-0.000164	-0.000527	-1.33E-05
131	-17.394	0.036900	-1.129	0.000169	-0.000439	-1.44E-05

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-17.394	0.020977	-0.637285	0.000102	-0.000439	-1.42E-05
133	-17.394	3.76E-06	0.021159	6.74E-07	-0.000439	-1.43E-05
134	-17.395	-0.020969	0.680320	-0.000100	-0.000440	-1.42E-05
135	-17.395	-0.036892	1.173	-0.000168	-0.000440	-1.44E-05
136	-17.375	0.035093	-0.897068	0.000169	-0.000350	-1.53E-05
137	-17.375	0.022177	-0.504742	0.000101	-0.000350	-1.51E-05
138	-17.375	3.80E-06	0.020996	-9.56E-07	-0.000351	-1.52E-05
139	-17.375	-0.022170	0.547425	-0.000103	-0.000351	-1.51E-05
140	-17.376	-0.039086	0.940894	-0.000171	-0.000351	-1.53E-05
141	-17.354	0.040957	-0.666482	0.000168	-0.000261	-1.61E-05
142	-17.354	0.023182	-0.373674	9.95E-05	-0.000261	-1.59E-05
143	-17.354	3.86E-06	0.018654	-2.64E-06	-0.000262	-1.59E-05
144	-17.355	-0.023175	0.411593	-0.000105	-0.000262	-1.59E-05
145	-17.355	-0.040950	0.705414	-0.000173	-0.000262	-1.61E-05
146	-17.333	0.042412	-0.438312	0.000165	-0.000172	-1.68E-05
147	-17.333	0.023925	-0.245094	9.71E-05	-0.000173	-1.65E-05
148	-17.333	4.02E-06	0.014249	-4.09E-06	-0.000173	-1.65E-05
149	-17.333	-0.023918	0.273960	-0.000106	-0.000173	-1.65E-05
150	-17.333	-0.042404	0.467818	-0.000174	-0.000173	-1.68E-05
151	-17.310	0.043373	-0.214224	0.000161	-8.27E-05	-1.75E-05
152	-17.311	0.024344	-0.120932	9.27E-05	-8.46E-05	-1.69E-05
153	-17.311	4.36E-06	0.008257	-5.05E-06	-8.76E-05	-1.68E-05
154	-17.311	-0.024336	0.137259	-0.000103	-8.43E-05	-1.69E-05
155	-17.311	-0.043367	0.230291	-0.000173	-8.24E-05	-1.75E-05
156	-17.287	0.043724	-1.08E-96	0.000147	5.17E-06	-1.78E-05
157	-17.288	-0.024489	-0.003766	8.75E-05	-2.01E-06	-1.69E-05
158	-17.289	4.64E-06	0.001411	-5.42E-06	-1.12E-05	-1.67E-05
159	-17.288	-0.024480	0.005559	-9.90E-05	-7.41E-07	-1.69E-05
160	-17.288	-0.043720	1.14E-96	-0.000160	6.93E-06	-1.78E-05
161	-17.278	0.043724	0.073702	0.000147	5.17E-06	-1.78E-05
162	-17.280	0.024489	0.039996	8.75E-05	-2.01E-06	-1.69E-05
163	-17.280	4.64E-06	-0.001299	-5.42E-06	-1.12E-05	-1.67E-05
164	-17.280	-0.024480	-0.043955	-9.90E-05	-7.41E-07	-1.69E-05
165	-17.279	-0.043720	-0.079930	-0.000160	6.93E-06	-1.78E-05
166	-1.12E-96	+0	1.77E-97	-0	-7.90E-99	+0
167	-1.12E-96	-0	1.77E-97	+0	-7.90E-99	-0
min:	-17.517	-0.043724	-2.275	-0.000174	-0.000885	-1.78E-05
max:	-1.12E-96	0.043724	2.358	0.000174	6.93E-06	1.78E-05

Loadcase 64 — Factor 1.0000 — Stage — Init.def Title: TEMPERATURA (-)

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-7.09E-05	-1.795	-0.368725			
10	7.09E-05	-1.795	-0.368725			
156	-7.09E-05	1.795	-0.368725			
160	7.09E-05	1.795	-0.368725			
166	3.69E-12	-2.300	0.737449	15.841	-3.18E-11	-2.79E-10
167	5.11E-12	2.300	0.737449	-15.841	-2.18E-11	2.76E-10
Sums :	-2.06E-12	1.30E-11	-1.43E-12			
min:	-7.09E-05	-2.300	-0.368725	-15.841	-3.18E-11	-2.79E-10
max:	7.09E-05	2.300	0.737449	15.841	-2.18E-11	2.76E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000543	7.988	-0.011551	2.31E-05	-1.90E-06	4.69E-07
2	0.000459	7.989	-0.009281	2.25E-05	-1.41E-06	4.53E-07
3	1.22E-11	7.989	-0.007920	2.20E-05	8.16E-17	-1.57E-14
4	-0.000459	7.989	-0.009281	2.25E-05	1.41E-06	-4.53E-07
5	-0.000543	7.988	-0.011551	2.31E-05	1.90E-06	-4.69E-07
6	0.000300	7.806	3.69E-98	2.31E-05	-1.90E-06	4.69E-07
7	0.000233	7.807	0.001954	2.25E-05	-1.41E-06	4.53E-07
8	2.01E-11	7.807	0.003097	2.20E-05	8.16E-17	-1.57E-14
9	-0.000233	7.807	0.001954	2.25E-05	1.41E-06	-4.53E-07
10	-0.000300	7.806	3.69E-98	2.31E-05	1.90E-06	-4.69E-07
11	-4.98E-05	7.334	0.029877	2.23E-05	-9.09E-07	1.62E-07
12	-4.25E-05	7.335	0.030824	2.18E-05	-7.28E-07	1.61E-07
13	4.28E-11	7.335	0.021415	2.14E-05	-2.02E-15	-1.61E-14
14	4.25E-05	7.335	0.030824	2.18E-05	7.28E-07	-1.61E-07
15	4.98E-05	7.334	0.029877	2.23E-05	9.09E-07	-1.62E-07
16	-0.000111	6.862	0.057573	2.00E-05	-3.37E-07	3.98E-09
17	-8.04E-05	6.863	0.057927	1.97E-05	-2.81E-07	3.42E-08
18	6.53E-11	6.863	0.058152	1.95E-05	-1.93E-16	-1.51E-14
19	8.04E-05	6.863	0.057927	1.97E-05	2.81E-07	-3.42E-08
20	0.000111	6.862	0.057573	2.00E-05	3.37E-07	-3.98E-09
21	-7.19E-05	6.390	0.081346	1.64E-05	-1.04E-07	-2.97E-08
22	-5.23E-05	6.390	0.081455	1.63E-05	-8.74E-08	-4.99E-09
23	8.53E-11	6.390	0.081521	1.62E-05	3.16E-15	-1.27E-14
24	5.23E-05	6.390	0.081455	1.63E-05	8.74E-08	4.99E-09
25	7.19E-05	6.390	0.081346	1.64E-05	1.04E-07	2.97E-08
26	-3.15E-05	5.918	0.099578	1.15E-05	-3.87E-08	-2.13E-08
27	-2.36E-05	5.918	0.099619	1.15E-05	-3.30E-08	-9.58E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	1.02E-10	5.918	0.099641	1.14E-05	5.37E-15	-9.46E-15
29	2.36E-05	5.918	0.099619	1.15E-05	3.30E-08	9.58E-09
30	3.15E-05	5.918	0.099578	1.15E-05	3.87E-08	2.13E-08
31	-1.13E-05	5.446	0.110544	5.18E-06	-8.58E-08	-8.00E-09
32	-8.90E-06	5.446	0.110634	5.26E-06	-7.26E-08	-4.92E-09
33	1.13E-10	5.446	0.110686	5.32E-06	6.16E-15	-5.30E-15
34	8.90E-06	5.446	0.110634	5.26E-06	7.26E-08	4.92E-09
35	1.13E-05	5.446	0.110544	5.18E-06	8.58E-08	8.00E-09
36	-7.91E-06	4.974	0.112378	-2.58E-06	-3.21E-07	1.63E-09
37	-6.27E-06	4.974	0.112714	-2.30E-06	-2.65E-07	-3.22E-10
38	1.19E-10	4.974	0.112916	-2.11E-06	6.15E-15	3.49E-16
39	6.27E-06	4.974	0.112714	-2.30E-06	2.65E-07	3.22E-10
40	7.91E-06	4.974	0.112378	-2.58E-06	3.21E-07	-1.63E-09
41	-1.55E-05	4.502	0.103041	-1.20E-05	-9.86E-07	6.95E-09
42	-1.18E-05	4.502	0.104070	-1.13E-05	-7.96E-07	1.00E-09
43	1.16E-10	4.502	0.104694	-1.08E-05	5.67E-15	8.11E-15
44	1.18E-05	4.502	0.104070	-1.13E-05	7.96E-07	-1.00E-09
45	1.55E-05	4.502	0.103041	-1.20E-05	9.86E-07	-6.95E-09
46	-2.73E-05	4.030	0.080449	-2.27E-05	-2.25E-06	3.65E-05
47	-2.19E-05	4.030	0.082845	-2.17E-05	-1.90E-06	-4.88E-09
48	9.52E-11	4.030	0.084503	-2.06E-05	5.04E-15	1.75E-14
49	2.19E-05	4.030	0.082845	-2.17E-05	1.90E-06	4.88E-09
50	2.73E-05	4.030	0.080449	-2.27E-05	2.25E-06	-3.65E-09
51	-2.73E-05	3.558	0.043644	-3.33E-05	-2.85E-06	-1.77E-08
52	-2.80E-05	3.558	0.046942	-3.38E-05	-3.08E-06	-2.91E-08
53	6.77E-11	3.558	0.050485	-3.24E-05	4.65E-15	2.56E-14
54	2.80E-05	3.558	0.046942	-3.38E-05	3.08E-06	2.91E-08
55	2.73E-05	3.558	0.043644	-3.33E-05	2.85E-06	1.77E-08
56	4.27E-06	3.086	-0.004522	-4.04E-05	-5.24E-07	-4.40E-08
57	6.92E-06	3.086	-0.003992	-4.32E-05	-3.70E-07	-1.16E-07
58	2.59E-11	3.085	-0.003765	-5.38E-05	4.56E-15	2.74E-14
59	-6.92E-06	3.086	-0.003992	-4.32E-05	3.70E-07	1.16E-07
60	-4.27E-06	3.086	-0.004522	-4.04E-05	5.24E-07	4.40E-08
61	2.91E-05	2.469	-0.071635	-3.75E-05	2.49E-06	-1.40E-08
62	2.58E-05	2.469	-0.074445	-3.76E-05	2.51E-06	-2.92E-08
63	-3.74E-11	2.468	-0.077164	-3.60E-05	4.57E-15	2.68E-14
64	-2.58E-05	2.469	-0.074445	-3.76E-05	-2.51E-06	2.82E-08
65	-2.91E-05	2.469	-0.071635	-3.75E-05	-2.49E-06	1.40E-08
66	2.03E-05	1.851	-0.128511	-2.85E-05	1.29E-06	4.56E-09
67	1.52E-05	1.851	-0.129860	-2.78E-05	1.04E-06	-2.92E-09
68	-8.62E-11	1.851	-0.130700	-2.72E-05	3.97E-15	2.11E-14
69	-1.52E-05	1.851	-0.129860	-2.78E-05	-1.04E-06	2.92E-09
70	-2.03E-05	1.851	-0.128511	-2.85E-05	-1.29E-06	-4.56E-09
71	7.40E-06	1.234	-0.168857	-1.88E-05	3.35E-07	4.55E-09
72	5.43E-06	1.234	-0.169207	-1.85E-05	2.74E-07	1.53E-09
73	-1.16E-10	1.234	-0.169417	-1.83E-05	3.44E-15	1.32E-14
74	-5.43E-06	1.234	-0.169207	-1.85E-05	-2.74E-07	-1.53E-09
75	-7.40E-06	1.234	-0.168857	-1.88E-05	-3.35E-07	-4.55E-09
76	1.38E-06	0.617123	-0.192743	-9.31E-06	6.16E-08	1.77E-09
77	1.07E-06	0.617124	-0.192807	-9.26E-06	5.23E-08	1.02E-09
78	-1.32E-10	0.617125	-0.192845	-9.22E-06	3.25E-15	6.28E-15
79	-1.07E-06	0.617124	-0.192807	-9.26E-06	-5.23E-08	-1.02E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-1.38E-06	0.617123	-0.192743	-9.31E-06	-6.16E-08	-1.77E-09
81	-4.32E-08	-5.58E-12	-0.200660	-3.02E-17	1.37E-08	1.18E-16
82	2.38E-08	-5.45E-12	-0.200674	-2.76E-17	1.20E-08	1.18E-16
83	-1.37E-10	-5.27E-12	-0.200681	-2.33E-17	3.22E-15	1.18E-16
84	-2.41E-08	-5.09E-12	-0.200674	-1.88E-17	-1.20E-08	1.18E-16
85	4.30E-08	-4.96E-12	-0.200660	-1.59E-17	-1.37E-08	1.18E-16
86	1.38E-06	-0.617123	-0.192743	9.31E-06	6.16E-08	-1.77E-09
87	1.07E-06	-0.617124	-0.192807	9.26E-06	5.23E-08	-1.02E-09
88	-1.32E-10	-0.617125	-0.192845	9.22E-06	3.24E-15	-6.04E-15
89	-1.07E-06	-0.617124	-0.192807	9.26E-06	-5.23E-08	1.02E-09
90	-1.38E-06	-0.617123	-0.192743	9.31E-06	-6.16E-08	1.77E-09
91	7.40E-06	-1.234	-0.168857	1.88E-05	3.35E-07	-4.55E-09
92	5.43E-06	-1.234	-0.169207	1.85E-05	2.74E-07	-1.53E-09
93	-1.17E-10	-1.234	-0.169417	1.83E-05	3.42E-15	-1.29E-14
94	-5.43E-06	-1.234	-0.169207	1.85E-05	-2.74E-07	1.53E-09
95	-7.40E-06	-1.234	-0.168857	1.88E-05	-3.35E-07	4.55E-09
96	2.03E-05	-1.851	-0.128511	2.85E-05	1.29E-06	-4.56E-09
97	1.52E-05	-1.851	-0.129860	2.78E-05	1.04E-06	2.92E-09
98	-8.74E-11	-1.851	-0.130700	2.72E-05	3.94E-15	-2.08E-14
99	-1.52E-05	-1.851	-0.129860	2.78E-05	-1.04E-06	-2.92E-09
100	-2.03E-05	-1.851	-0.128511	2.85E-05	-1.29E-06	4.56E-09
101	2.91E-05	-2.469	-0.071635	3.75E-05	2.49E-06	1.40E-08
102	2.58E-05	-2.469	-0.074445	3.76E-05	2.51E-06	2.82E-08
103	-3.90E-11	-2.468	-0.077164	3.60E-05	4.53E-15	-2.66E-14
104	-2.58E-05	-2.469	-0.074445	3.76E-05	-2.51E-06	-2.82E-08
105	-2.91E-05	-2.469	-0.071635	3.75E-05	-2.49E-06	-1.40E-08
106	4.27E-06	-3.086	-0.004522	4.04E-05	-5.24E-07	4.40E-08
107	6.92E-06	-3.086	-0.003992	4.32E-05	-3.70E-07	1.16E-07
108	2.39E-11	-3.085	-0.003765	4.53E-15	-2.71E-14	
109	-6.92E-06	-3.086	-0.003992	4.32E-05	3.70E-07	-1.16E-07
110	-4.27E-06	-3.086	-0.004522	4.04E-05	5.24E-07	-4.40E-08
111	-2.73E-05	-3.558	0.043644	3.33E-05	-2.85E-06	1.77E-08
112	-2.80E-05	-3.558	0.046942	3.38E-05	-3.08E-06	2.91E-08
113	6.53E-11	-3.558	0.050485	3.24E-05	4.60E-15	-2.53E-14
114	2.80E-05	-3.558	0.046942	3.38E-05	3.08E-06	-2.91E-08
115	2.73E-05	-3.558	0.043644	3.33E-05	2.85E-06	-1.77E-08
116	-2.73E-05	-4.030	0.080449	2.27E-05	-2.25E-06	-3.65E-09
117	-2.18E-05	-4.030	0.082845	2.17E-05	-1.90E-06	4.88E-09
118	9.66E-11	-4.030	0.084503	2.06E-05	5.00E-15	-1.72E-14
119	2.19E-05	-4.030	0.082845	2.17E-05	1.90E-06	-4.88E-09
120	2.73E-05	-4.030	0.080449	2.27E-05	2.25E-06	3.65E-09
121	-1.55E-05	-4.502	0.103041	1.20E-05	-9.86E-07	-6.95E-09
122	-1.18E-05	-4.502	0.104070	1.13E-05	-7.96E-07	-1.00E-09
123	1.13E-10	-4.502	0.104694	1.08E-05	5.64E-15	-7.86E-15
124	1.18E-05	-4.502	0.104070	1.13E-05	7.96E-07	1.00E-09
125	1.55E-05	-4.502	0.103041	1.20E-05	9.86E-07	6.95E-09
126	-7.91E-06	-4.974	0.112378	2.58E-06	-3.21E-07	-1.63E-09
127	-6.27E-06	-4.974	0.112714	2.30E-06	-2.65E-07	3.22E-10
128	1.16E-10	-4.974	0.112916	2.11E-06	6.11E-15	-9.80E-17
129	6.27E-06	-4.974	0.112714	2.30E-06	2.65E-07	-3.22E-10
130	7.91E-06	-4.974	0.112378	2.58E-06	3.21E-07	1.63E-09
131	-1.13E-05	-5.446	0.110544	-5.18E-06	-8.58E-08	8.00E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-8.90E-06	-5.446	0.110634	-5.26E-06	-7.26E-08	4.92E-09
133	1.10E-10	-5.446	0.110686	-5.32E-06	6.15E-15	5.55E-15
134	8.90E-06	-5.446	0.110634	-5.26E-06	7.26E-08	-4.92E-09
135	1.13E-05	-5.446	0.110544	-5.18E-06	8.58E-08	-8.00E-09
136	-3.15E-05	-5.918	0.099578	-1.15E-05	-3.87E-08	2.13E-08
137	-2.36E-05	-5.918	0.099619	-1.15E-05	-3.30E-08	9.58E-09
138	9.77E-11	-5.918	0.099641	-1.14E-05	5.35E-15	9.71E-15
139	2.36E-05	-5.918	0.099619	-1.15E-05	3.30E-08	-9.58E-09
140	3.15E-05	-5.918	0.099578	-1.15E-05	3.87E-08	-2.13E-08
141	-7.19E-05	-6.390	0.081346	-1.64E-05	-1.04E-07	2.97E-08
142	-5.23E-05	-6.390	0.081521	-1.62E-05	-8.74E-08	4.99E-09
143	8.10E-11	-6.390	0.081521	-1.62E-05	3.14E-15	1.29E-14
144	5.23E-05	-6.390	0.081455	-1.63E-05	8.74E-08	-4.99E-09
145	7.19E-05	-6.390	0.081346	-1.64E-05	1.04E-07	-2.97E-08
146	-0.000111	-6.862	0.057573	-2.00E-05	-3.37E-07	-3.98E-09
147	-8.04E-05	-6.863	0.057927	-1.97E-05	-2.81E-07	-3.42E-08
148	6.06E-11	-6.863	0.058152	-1.95E-05	-2.04E-15	1.54E-14
149	8.04E-05	-6.862	0.057927	-1.97E-05	2.81E-07	3.42E-08
150	0.000111	-6.862	0.057573	-2.00E-05	3.37E-07	3.98E-09
151	-4.98E-05	-7.334	0.029877	-2.23E-05	-9.09E-07	-1.62E-07
152	-4.25E-05	-7.335	0.030824	-2.18E-05	-7.28E-07	-1.61E-07
153	3.78E-11	-7.335	0.031415	-2.14E-05	-2.03E-15	1.64E-14
154	4.25E-05	-7.335	0.030824	-2.18E-05	7.28E-07	1.61E-07
155	4.98E-05	-7.334	0.029877	-2.23E-05	9.09E-07	1.62E-07
156	0.000308	-7.806	3.69E-98	-2.31E-05	-1.90E-06	-4.69E-07
157	0.000233	-7.807	0.001954	-2.25E-05	-1.41E-06	-4.53E-07
158	1.48E-11	-7.807	0.003097	-2.20E-05	8.08E-17	1.60E-14
159	-0.000233	-7.807	0.001954	-2.25E-05	1.41E-06	4.53E-07
160	-0.000308	-7.806	3.69E-98	-2.31E-05	1.90E-06	4.69E-07
161	0.000543	-7.988	-0.011551	-2.31E-05	-1.90E-06	-4.69E-07
162	0.000459	-7.989	-0.009281	-2.25E-05	-1.41E-06	-4.53E-07
163	6.80E-12	-7.989	-0.007920	-2.20E-05	8.08E-17	1.60E-14
164	-0.000459	-7.989	-0.009281	-2.25E-05	1.41E-06	4.53E-07
165	-0.000543	-7.988	-0.011551	-2.31E-05	1.90E-06	4.69E-07
166	-0	2.30E-97	-7.37E-98	-1.58E-99	+0	+0
167	-0	-2.30E-97	-7.37E-98	1.58E-99	+0	-0
min:	-0.000543	-7.989	-0.200681	-5.38E-05	-3.08E-06	-4.69E-07
max:	0.000543	7.989	0.112916	5.38E-05	3.08E-06	4.69E-07

Loadcase Factor Stage Init.def Title
65 1.0000 TEMPERATURA (+)

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	7.09E-05	1.795	0.368725			
10	-7.09E-05	1.795	0.368725			
156	7.09E-05	-1.795	0.368725			
160	-7.09E-05	-1.795	0.368725			
166	-3.69E-12	2.300	-0.737449	-15.841	3.18E-11	2.79E-10
167	-5.11E-12	-2.300	-0.737449	15.841	2.18E-11	-2.76E-10
Sums :	2.06E-12	-1.30E-11	1.43E-12			
min:	-7.09E-05	-2.300	-0.737449	-15.841	2.18E-11	-2.76E-10
max:	7.09E-05	2.300	0.368725	15.841	3.18E-11	2.79E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-0.000543	-7.988	0.011551	-2.31E-05	1.90E-06	-4.69E-07
2	-0.000459	-7.989	0.009281	-2.25E-05	1.41E-06	-4.53E-07
3	-1.22E-11	-7.989	0.007920	-2.20E-05	-8.16E-17	1.57E-14
4	0.000459	-7.989	0.009281	-2.25E-05	-1.41E-06	4.53E-07
5	0.000543	-7.988	0.011551	-2.31E-05	-1.90E-06	4.69E-07
6	-0.000308	-7.806	-3.69E-98	-2.31E-05	1.90E-06	-4.69E-07
7	-0.000233	-7.807	-0.001954	-2.25E-05	1.41E-06	-4.53E-07
8	-2.01E-11	-7.807	-0.003097	-2.20E-05	-8.16E-17	1.57E-14
9	0.000233	-7.807	-0.001954	-2.25E-05	-1.41E-06	4.53E-07
10	0.000308	-7.806	-3.69E-98	-2.31E-05	-1.90E-06	4.69E-07
11	4.98E-05	-7.334	-0.029877	-2.23E-05	9.09E-07	-1.62E-07
12	4.25E-05	-7.335	-0.030824	-2.18E-05	7.28E-07	-1.61E-07
13	-4.28E-11	-7.335	-0.031415	-2.14E-05	2.02E-15	1.61E-14
14	-4.25E-05	-7.335	-0.030824	-2.18E-05	-7.28E-07	1.61E-07
15	-4.98E-05	-7.334	-0.029877	-2.23E-05	-9.09E-07	1.62E-07
16	0.000111	-6.862	-0.057573	-2.00E-05	3.37E-07	-3.98E-09
17	8.04E-05	-6.863	-0.057927	-1.97E-05	2.81E-07	-3.42E-08
18	-6.53E-11	-6.863	-0.058152	-1.95E-05	1.93E-16	1.51E-14
19	-8.04E-05	-6.863	-0.057927	-1.97E-05	-2.81E-07	3.42E-08
20	-0.000111	-6.862	-0.057573	-2.00E-05	-3.37E-07	3.98E-09
21	7.19E-05	-6.390	-0.081346	-1.64E-05	1.04E-07	2.97E-08
22	5.23E-05	-6.390	-0.081455	-1.63E-05	8.74E-08	4.99E-09
23	-8.53E-11	-6.390	-0.081521	-1.62E-05	-3.16E-15	1.27E-14
24	-5.23E-05	-6.390	-0.081455	-1.63E-05	-8.74E-08	-4.99E-09
25	-7.19E-05	-6.390	-0.081346	-1.64E-05	-1.04E-07	-2.97E-08
26	3.15E-05	-5.918	-0.099578	-1.15E-05	3.87E-08	2.13E-08
27	2.36E-05	-5.918	-0.099619	-1.15E-05	3.30E-08	9.58E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-1.02E-10	-5.918	-0.099641	-1.14E-05	-5.37E-15	9.46E-15
29	-2.36E-05	-5.918	-0.099619	-1.15E-05	-3.30E-08	-9.58E-09
30	-3.15E-05	-5.918	-0.099578	-1.15E-05	-3.87E-08	-2.13E-08
31	1.13E-05	-5.446	-0.110544	-5.18E-06	8.58E-08	8.00E-09
32	8.90E-06	-5.446	-0.110634	-5.26E-06	7.26E-08	4.92E-09
33	-1.13E-10	-5.446	-0.110686	-5.32E-06	-6.18E-15	5.30E-15
34	-8.90E-06	-5.446	-0.110634	-5.26E-06	-7.26E-08	-4.92E-09
35	-1.13E-05	-5.446	-0.110544	-5.18E-06	-8.58E-08	-8.00E-09
36	7.91E-06	-4.974	-0.112378	2.58E-06	3.21E-07	-1.63E-09
37	6.27E-06	-4.974	-0.112714	2.30E-06	2.65E-07	3.22E-10
38	-1.19E-10	-4.974	-0.112916	2.11E-06	-6.15E-15	-3.49E-16
39	-6.27E-06	-4.974	-0.112714	2.30E-06	-2.65E-07	-3.22E-10
40	-7.91E-06	-4.974	-0.112378	2.58E-06	-3.21E-07	1.63E-09
41	1.55E-05	-4.502	-0.103041	1.20E-05	9.86E-07	-6.95E-09
42	1.18E-05	-4.502	-0.104070	1.13E-05	7.96E-07	-1.00E-09
43	-1.16E-10	-4.502	-0.104694	1.08E-05	-5.67E-15	-8.11E-15
44	-1.18E-05	-4.502	-0.104070	1.13E-05	-7.96E-07	1.00E-09
45	-1.55E-05	-4.502	-0.103041	1.20E-05	-9.86E-07	6.95E-09
46	2.73E-05	-4.030	-0.080449	2.27E-05	2.25E-06	-3.65E-09
47	2.19E-05	-4.030	-0.082845	2.17E-05	1.90E-06	4.88E-09
48	-9.92E-11	-4.030	-0.084503	2.06E-05	-5.04E-15	-1.75E-14
49	-2.19E-05	-4.030	-0.082845	2.17E-05	-1.90E-06	-4.88E-09
50	-2.73E-05	-4.030	-0.080449	2.27E-05	-2.25E-06	3.65E-09
51	2.73E-05	-3.558	-0.043644	3.33E-05	2.85E-06	1.77E-08
52	2.80E-05	-3.558	-0.046942	3.38E-05	3.08E-06	2.91E-08
53	-6.77E-11	-3.558	-0.050485	3.24E-05	-4.65E-15	-2.56E-14
54	-2.80E-05	-3.558	-0.046942	3.38E-05	-3.08E-06	-2.91E-08
55	-2.73E-05	-3.558	-0.043644	3.33E-05	-2.85E-06	-1.77E-08
56	-4.27E-06	-3.086	0.004522	4.04E-05	5.24E-07	4.40E-08
57	-6.92E-06	-3.086	0.003992	4.32E-05	3.70E-07	1.16E-07
58	-2.59E-11	-3.085	0.003765	5.38E-05	-4.58E-15	-2.74E-14
59	6.92E-06	-3.086	0.003992	4.32E-05	-3.70E-07	-1.16E-07
60	4.27E-06	-3.086	0.004522	4.04E-05	-5.24E-07	-4.40E-08
61	-2.91E-05	-2.469	0.071635	3.75E-05	-2.49E-06	1.40E-08
62	-2.58E-05	-2.469	0.074445	3.76E-05	-2.51E-06	2.82E-08
63	3.74E-11	-2.468	0.077164	3.60E-05	-4.57E-15	-2.68E-14
64	2.58E-05	-2.469	0.074445	3.76E-05	2.51E-06	-2.82E-08
65	2.91E-05	-2.469	0.071635	3.75E-05	2.49E-06	-1.40E-08
66	-2.03E-05	-1.851	0.128511	2.85E-05	-1.29E-06	4.56E-09
67	-1.52E-05	-1.851	0.129860	2.78E-05	-1.04E-06	2.92E-09
68	8.62E-11	-1.851	0.130700	2.72E-05	-3.97E-15	-2.11E-14
69	1.52E-05	-1.851	0.129860	2.78E-05	1.04E-06	-2.92E-09
70	2.03E-05	-1.851	0.128511	2.85E-05	1.29E-06	4.56E-09
71	-7.40E-06	-1.234	0.168857	1.88E-05	-3.35E-07	-4.55E-09
72	-5.43E-06	-1.234	0.169207	1.85E-05	-2.74E-07	-1.53E-09
73	1.16E-10	-1.234	0.169417	1.83E-05	-3.44E-15	-1.32E-14
74	5.43E-06	-1.234	0.169207	1.85E-05	2.74E-07	1.53E-09
75	7.40E-06	-1.234	0.168857	1.88E-05	3.35E-07	4.55E-09
76	-1.38E-06	-0.617123	0.192743	9.31E-06	-6.16E-08	-1.77E-09
77	-1.07E-06	-0.617124	0.192807	9.26E-06	-5.23E-08	-1.02E-09
78	1.32E-10	-0.617125	0.192845	9.22E-06	-3.25E-15	-6.28E-15
79	1.07E-06	-0.617124	0.192807	9.26E-06	5.23E-08	1.02E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	1.38E-06	-0.617123	0.192743	9.31E-06	6.16E-08	1.77E-09
81	4.32E-08	5.58E-12	0.200660	3.02E-17	-1.37E-08	-1.18E-16
82	-2.38E-08	5.45E-12	0.200674	2.76E-17	-1.20E-08	-1.18E-16
83	1.37E-10	5.27E-12	0.200681	2.33E-17	-3.22E-15	-1.18E-16
84	2.41E-08	5.09E-12	0.200674	1.88E-17	1.20E-08	-1.18E-16
85	-4.30E-08	4.96E-12	0.200660	1.59E-17	1.37E-08	-1.18E-16
86	-1.38E-06	0.617123	0.192743	-9.31E-06	-6.16E-08	1.77E-09
87	-1.07E-06	0.617124	0.192807	-9.26E-06	-5.23E-08	1.02E-09
88	1.32E-10	0.617125	0.192845	-9.22E-06	-3.24E-15	6.04E-15
89	1.07E-06	0.617124	0.192807	-9.26E-06	5.23E-08	-1.02E-09
90	1.38E-06	0.617123	0.192743	-9.31E-06	6.16E-08	-1.77E-09
91	-7.40E-06	1.234	0.168857	-1.88E-05	3.35E-07	4.55E-09
92	-5.43E-06	1.234	0.169207	-1.85E-05	2.74E-07	1.53E-09
93	1.17E-10	1.234	0.169417	-1.83E-05	-3.42E-15	1.29E-14
94	5.43E-06	1.234	0.169207	-1.85E-05	2.74E-07	-1.53E-09
95	7.40E-06	1.234	0.168857	-1.88E-05	3.35E-07	-4.55E-09
96	-2.03E-05	1.851	0.128511	-2.85E-05	-1.29E-06	4.56E-09
97	-1.52E-05	1.851	0.129860	-2.78E-05	-1.04E-06	-2.92E-09
98	8.74E-11	1.851	0.130700	-2.72E-05	-3.94E-15	2.08E-14
99	1.52E-05	1.851	0.129860	-2.78E-05	1.04E-06	2.92E-09
100	2.03E-05	1.851	0.128511	-2.85E-05	1.29E-06	-4.56E-09
101	-2.91E-05	2.469	0.071635	-3.75E-05	-2.49E-06	-1.40E-08
102	-2.58E-05	2.469	0.074445	-3.76E-05	-2.51E-06	-2.82E-08
103	3.90E-11	2.468	0.077164	-3.60E-05	-4.53E-15	2.66E-14
104	2.58E-05	2.469	0.074445	-3.76E-05	2.51E-06	2.82E-08
105	2.91E-05	2.469	0.071635	-3.75E-05	2.49E-06	1.40E-08
106	-4.27E-06	3.086	0.004522	-4.04E-05	5.24E-07	-4.40E-08
107	-6.92E-06	3.086	0.003992	-4.32E-05	3.70E-07	-1.16E-07
108	-2.39E-11	3.085	0.003765	-4.53E-15	2.71E-14	
109	6.92E-06	3.086	0.003992	-4.32E-05	-3.70E-07	1.16E-07
110	4.27E-06	3.086	0.004522	-4.04E-05	-5.24E-07	4.40E-08
111	2.73E-05	3.558	-0.043644	-3.33E-05	2.85E-06	-1.77E-08
112	2.80E-05	3.558	-0.046942	-3.38E-05	3.08E-06	-2.91E-08
113	-6.53E-11	3.558	-0.050485	-3.24E-05	-4.60E-15	2.53E-14
114	-2.80E-05	3.558	-0.046942	-3.38E-05	-3.08E-06	2.91E-08
115	-2.73E-05	3.558	-0.043644	-3.33E-05	-2.85E-06	1.77E-08
116	2.73E-05	4.030	-0.080449	-2.27E-05	2.25E-06	3.65E-09
117	2.19E-05	4.030	-0.082845	-2.17E-05	1.90E-06	-4.88E-09
118	-9.66E-11	4.030	-0.084503	-2.06E-05	-5.00E-15	1.72E-14
119	-2.19E-05	4.030	-0.082845	-2.17E-05	-1.90E-06	4.88E-09
120	-2.73E-05	4.030	-0.080449	-2.27E-05	-2.25E-06	-3.65E-09
121	1.55E-05	4.502	-0.103041	-1.20E-05	9.86E-07	6.95E-09
122	1.18E-05	4.502	-0.104070	-1.13E-05	7.96E-07	1.00E-09
123	-1.13E-10	4.502	-0.104694	-1.08E-05	5.64E-15	7.86E-15
124	-1.18E-05	4.502	-0.104070	-1.13E-05	-7.96E-07	-1.00E-09
125	-1.55E-05	4.502	-0.103041	-1.20E-05	-9.86E-07	-6.95E-09
126	7.91E-06	4.974	-0.112378	-2.58E-06	3.21E-07	1.63E-09
127	6.27E-06	4.974	-0.112714	-2.30E-06	2.65E-07	-3.22E-10
128	-1.16E-10	4.974	-0.112916	-2.11E-06	6.11E-15	5.80E-17
129	-6.27E-06	4.974	-0.112714	-2.30E-06	-2.65E-07	3.22E-10
130	-7.91E-06	4.974	-0.112378	-2.58E-06	-3.21E-07	-1.63E-09
131	1.13E-05	5.446	-0.110544	5.18E-06	8.58E-08	-8.00E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	8.90E-06	5.446	-0.110634	5.26E-06	7.26E-08	-4.92E-09
133	-1.10E-10	5.446	-0.110686	5.32E-06	-6.15E-15	-5.55E-15
134	-8.90E-06	5.446	-0.110634	5.26E-06	-7.26E-08	4.92E-09
135	-1.13E-05	5.446	-0.110544	5.18E-06	-8.58E-08	8.00E-09
136	3.15E-05	5.918	-0.099578	1.15E-05	3.87E-08	-2.13E-08
137	2.36E-05	5.918	-0.099619	1.15E-05	3.30E-08	-9.58E-09
138	-9.77E-11	5.918	-0.099641	1.14E-05	-5.35E-15	-9.71E-15
139	-2.36E-05	5.918	-0.099619	1.15E-05	-3.30E-08	9.58E-09
140	-3.15E-05	5.918	-0.099578	1.15E-05	-3.87E-08	2.13E-08
141	7.19E-05	6.390	-0.081346	1.64E-05	1.04E-07	-2.97E-08
142	5.23E-05	6.390	-0.081455	1.63E-05	8.74E-08	-4.99E-09
143	-8.10E-11	6.390	-0.081521	1.62E-05	-3.14E-15	-1.29E-14
144	-5.23E-05	6.390	-0.081455	1.63E-05	-8.74E-08	4.99E-09
145	-7.19E-05	6.390	-0.081346	1.64E-05	-1.04E-07	2.97E-08
146	0.000111	6.862	-0.057573	2.00E-05	3.37E-07	3.98E-09
147	8.04E-05	6.863	-0.057927	1.97E-05	2.81E-07	3.42E-08
148	-6.06E-11	6.863	-0.058152	1.95E-05	2.04E-16	-1.54E-14
149	-8.04E-05	6.863	-0.057927	1.97E-05	-2.81E-07	-3.42E-08
150	-0.000111	6.862	-0.057573	2.00E-05	-3.37E-07	-3.98E-09
151	4.98E-05	7.334	-0.029877	2.23E-05	9.09E-07	1.62E-07
152	4.25E-05	7.335	-0.030824	2.18E-05	7.28E-07	1.61E-07
153	-3.78E-11	7.335	-0.031415	2.14E-05	2.03E-15	-1.64E-14
154	-4.25E-05	7.335	-0.030824	2.18E-05	-7.28E-07	-1.61E-07
155	-4.98E-05	7.334	-0.029877	2.23E-05	-9.09E-07	-1.62E-07
156	-0.000308	7.806	-3.69E-98	2.31E-05	1.90E-06	4.69E-07
157	-0.000233	7.807	-0.001954	2.25E-05	1.41E-06	4.53E-07
158	-1.48E-11	7.807	-0.003097	2.20E-05	-8.08E-17	-1.60E-14
159	0.000233	7.807	-0.001954	2.25E-05	-1.41E-06	-4.53E-07
160	0.000308	7.806	-3.69E-98	2.31E-05	-1.90E-06	-4.69E-07
161	-0.000543	7.988	0.011551	2.31E-05	1.90E-06	4.69E-07
162	-0.000459	7.989	0.009281	2.25E-05	1.41E-06	4.53E-07
163	-6.80E-12	7.989	0.007920	2.20E-05	-8.08E-17	-1.60E-14
164	0.000459	7.989	0.009281	2.25E-05	-1.41E-06	-4.53E-07
165	0.000543	7.988	0.011551	2.31E-05	-1.90E-06	-4.69E-07
166	+0	-2.30E-97	7.37E-98	1.58E-99	-0	+0
167	+0	2.30E-97	7.37E-98	-1.58E-99	-0	+0
min:	-0.000543	-7.989	-0.112916	-5.38E-05	-3.08E-06	-4.69E-07
max:	0.000543	7.989	0.200681	5.38E-05	3.08E-06	4.69E-07

Loadcase	Factor	Stage	Init.def	Title
66	1.0000			GRADIENTE

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-0.001262	0.001005	7.143			
10	0.001262	0.001005	7.143			
156	-0.001262	-0.001005	7.143			
160	0.001262	-0.001005	7.143			
166	8.72E-09	1.119	-14.286	-4.921	4.38E-08	-1.08E-08
167	8.72E-09	-1.119	-14.286	4.921	4.38E-08	1.08E-08
Sums :	-2.51E-12	1.24E-14	-8.01E-12			
min:	-0.001262	-1.119	-14.286	-4.921	4.38E-08	-1.08E-08
max:	0.001262	1.119	7.143	4.921	4.38E-08	1.08E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.014881	-0.004368	-0.348553	0.000739	3.71E-05	2.47E-05
2	0.003935	0.002525	-0.393333	0.000753	2.76E-05	2.25E-06
3	1.98E-08	0.003102	-0.419966	0.000762	1.63E-13	1.92E-12
4	-0.003935	0.002525	-0.393333	0.000753	-2.76E-05	-2.25E-06
5	-0.014881	-0.004368	-0.348553	0.000739	-3.71E-05	-2.47E-05
6	0.00547	-0.004368	-7.14E-97	0.000655	3.71E-05	1.29E-05
7	0.002811	0.002525	-0.038120	0.000668	2.76E-05	2.25E-06
8	1.88E-08	0.003102	-0.060421	0.000677	1.63E-13	1.92E-12
9	-0.002811	0.002525	-0.038120	0.000668	-2.76E-05	-2.25E-06
10	-0.005487	-0.004368	-7.14E-97	0.000655	-3.71E-05	-1.29E-05
11	-0.001962	-0.001357	0.711610	0.000450	1.75E-05	1.42E-06
12	-0.000546	0.000966	0.693319	0.000461	1.41E-05	1.79E-06
13	1.63E-08	0.002190	0.681895	0.000468	9.18E-13	1.93E-12
14	0.000546	0.000966	0.693315	0.000461	-1.41E-05	-1.79E-06
15	0.001962	-0.001357	0.711610	0.000450	-1.75E-05	-1.42E-06
16	-0.001782	0.000280	1.179	0.000275	6.49E-06	-5.63E-07
17	-0.001114	0.000509	1.172	0.000280	5.42E-06	1.80E-07
18	1.38E-08	0.001145	1.168	0.000284	1.44E-12	1.91E-12
19	0.001114	0.000509	1.172	0.000280	-5.42E-06	-1.80E-07
20	0.001782	0.000280	1.179	0.000275	-6.49E-06	5.63E-07
21	-0.000845	0.000754	1.436	0.000124	1.99E-06	-5.39E-07
22	-0.000613	0.000502	1.434	0.000126	1.67E-06	-2.16E-07
23	1.13E-08	0.000666	1.432	0.000128	1.65E-12	1.86E-12
24	0.000613	0.000502	1.434	0.000126	-1.67E-06	2.16E-07
25	0.000845	0.000754	1.436	0.000124	-1.99E-06	5.39E-07
26	-0.000276	0.000777	1.513	-1.54E-06	4.76E-07	-2.75E-07
27	-0.000212	0.000565	1.512	-1.02E-06	4.03E-07	-1.65E-07

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	8.87E-09	0.000553	1.512	-6.65E-07	1.68E-12	1.80E-12
29	0.000212	0.000565	1.512	-1.02E-06	-4.03E-07	1.65E-07
30	0.000276	0.000777	1.513	-1.54E-06	-4.76E-07	2.75E-07
31	-4.29E-05	0.000709	1.443	-0.000102	1.61E-07	-9.84E-08
32	-3.75E-05	0.000606	1.443	-0.000102	1.39E-07	-7.46E-08
33	6.54E-09	0.000566	1.443	-0.000102	1.63E-12	1.73E-12
34	3.75E-05	0.000606	1.443	-0.000102	-1.39E-07	7.46E-08
35	4.29E-05	0.000709	1.443	-0.000102	-1.61E-07	9.84E-08
36	2.15E-05	0.000657	1.260	-0.000175	4.79E-07	-2.19E-08
37	1.33E-05	0.000622	1.259	-0.000176	4.00E-07	-2.38E-08
38	4.31E-09	0.000596	1.259	-0.000176	1.54E-12	1.63E-12
39	-1.33E-05	0.000622	1.259	-0.000176	-4.00E-07	2.38E-08
40	-2.15E-05	0.000657	1.260	-0.000175	-4.79E-07	2.19E-08
41	2.84E-05	0.000631	0.998538	-0.000222	1.70E-06	3.12E-11
42	2.03E-05	0.000625	0.996761	-0.000223	1.39E-06	-3.68E-09
43	2.22E-09	0.000618	0.995693	-0.000224	1.44E-12	1.52E-12
44	-2.03E-05	0.000625	0.996761	-0.000223	-1.39E-06	3.68E-09
45	-2.84E-05	0.000631	0.998538	-0.000222	-1.70E-06	-2.81E-11
46	2.46E-05	0.000616	0.694735	-0.000241	4.56E-06	4.42E-09
47	1.89E-05	0.000623	0.689920	-0.000244	3.78E-06	4.38E-09
48	2.99E-10	0.000634	0.686792	-0.000246	1.34E-12	1.39E-12
49	-1.89E-05	0.000623	0.689920	-0.000244	-3.78E-06	-4.38E-09
50	-2.46E-05	0.000616	0.694735	-0.000241	-4.56E-06	-4.42E-09
51	1.73E-05	0.000596	0.383001	-0.000235	8.45E-06	1.24E-08
52	1.67E-05	0.000619	0.373760	-0.000238	7.80E-06	1.61E-08
53	-1.43E-09	0.000660	0.366175	-0.000242	1.24E-12	1.23E-12
54	-1.67E-05	0.000619	0.373760	-0.000238	-7.80E-06	-1.61E-08
55	-1.73E-05	0.000596	0.383001	-0.000235	-8.45E-06	-1.24E-08
56	-1.39E-06	0.000557	0.092200	-0.000210	9.13E-06	2.28E-08
57	-2.74E-06	0.000607	0.082040	-0.000208	8.88E-06	5.72E-08
58	-2.95E-09	0.000717	0.072945	-0.000201	1.12E-12	1.06E-12
59	2.74E-06	0.000607	0.082040	-0.000208	-8.88E-06	-5.72E-08
60	1.38E-06	0.000557	0.092200	-0.000210	-9.13E-06	-2.28E-08
61	-1.45E-05	0.000481	-0.230820	-0.000168	3.65E-06	6.91E-09
62	-1.27E-05	0.000496	-0.234622	-0.000165	2.91E-06	1.39E-08
63	-4.59E-09	0.000522	-0.236859	-0.000163	1.12E-12	8.51E-13
64	1.27E-05	0.000496	-0.234622	-0.000165	-2.91E-06	-1.39E-08
65	1.45E-05	0.000481	-0.230820	-0.000168	-3.65E-06	-6.91E-09
66	-1.01E-05	0.000372	-0.479242	-0.000124	8.04E-07	-2.33E-09
67	-7.54E-06	0.000373	-0.480081	-0.000124	6.63E-07	1.42E-09
68	-5.85E-09	0.000379	-0.480575	-0.000123	1.12E-12	6.34E-13
69	7.53E-06	0.000373	-0.480081	-0.000124	-6.63E-07	-1.42E-09
70	1.01E-05	0.000372	-0.479242	-0.000124	-8.04E-07	2.33E-09
71	-3.66E-06	0.000250	-0.655278	-8.26E-05	1.22E-07	-2.27E-09
72	-2.69E-06	0.000249	-0.655407	-8.25E-05	1.05E-07	-7.75E-10
73	-6.75E-09	0.000250	-0.655481	-8.24E-05	1.11E-12	4.21E-13
74	2.68E-06	0.000249	-0.655407	-8.25E-05	-1.05E-07	7.76E-10
75	3.65E-06	0.000250	-0.655278	-8.26E-05	-1.22E-07	2.28E-09
76	-6.79E-07	0.000125	-0.760587	-4.13E-05	4.15E-09	-8.77E-10
77	-5.28E-07	0.000125	-0.760601	-4.13E-05	4.35E-09	-5.08E-10
78	-7.28E-09	0.000124	-0.760602	-4.12E-05	1.11E-12	2.10E-13
79	5.13E-07	0.000125	-0.760601	-4.13E-05	-4.34E-09	5.09E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	6.65E-07	0.000125	-0.760597	-4.13E-05	-4.15E-09	8.78E-10
81	2.49E-08	4.31E-14	-0.795675	-3.82E-18	-8.51E-09	-6.74E-17
82	-1.19E-08	-3.24E-14	-0.795666	-4.69E-18	-6.71E-09	-6.74E-17
83	-7.46E-09	-1.33E-13	-0.795659	-6.19E-18	1.11E-12	-6.74E-17
84	-3.05E-09	-2.35E-13	-0.795666	-7.21E-18	6.71E-09	-6.74E-17
85	-3.98E-08	-3.10E-13	-0.795675	-6.76E-18	8.51E-09	-6.74E-17
86	-6.79E-07	-0.000125	-0.760597	4.13E-05	4.15E-09	8.77E-10
87	-5.28E-07	-0.000125	-0.760601	4.13E-05	4.35E-09	5.08E-10
88	-7.28E-09	-0.000124	-0.760602	4.12E-05	1.11E-12	-2.11E-13
89	5.13E-07	-0.000125	-0.760601	4.13E-05	-4.34E-09	-5.09E-10
90	6.65E-07	-0.000125	-0.760597	4.13E-05	-4.15E-09	-8.78E-10
91	-3.66E-06	-0.000250	-0.655278	8.26E-05	1.22E-07	2.27E-09
92	-2.69E-06	-0.000249	-0.655407	8.25E-05	1.05E-07	7.75E-10
93	-6.75E-09	-0.000250	-0.655481	8.24E-05	1.11E-12	-4.21E-13
94	2.68E-06	-0.000249	-0.655407	8.25E-05	-1.05E-07	-7.76E-10
95	3.65E-06	-0.000250	-0.655278	8.26E-05	-1.22E-07	-2.28E-09
96	-1.01E-05	-0.000372	-0.479242	0.000124	8.04E-07	2.33E-09
97	-7.54E-06	-0.000373	-0.480081	0.000124	6.63E-07	-1.42E-09
98	-5.85E-09	-0.000379	-0.480575	0.000123	1.12E-12	-6.34E-13
99	7.53E-06	-0.000373	-0.480081	0.000124	-6.63E-07	1.42E-09
100	1.01E-05	-0.000372	-0.479242	0.000124	-8.04E-07	-2.33E-09
101	-1.45E-05	-0.000481	-0.230820	0.000168	3.65E-06	-6.91E-09
102	-1.27E-05	-0.000496	-0.234622	0.000165	2.91E-06	-1.39E-08
103	-4.59E-09	-0.000522	-0.236859	0.000163	1.12E-12	-8.51E-13
104	1.27E-05	-0.000496	-0.234622	0.000165	-2.91E-06	1.39E-08
105	1.45E-05	-0.000481	-0.230820	0.000168	-3.65E-06	6.91E-09
106	-1.39E-06	-0.000557	0.092200	0.000210	9.13E-06	-2.28E-08
107	-2.74E-06	-0.000607	0.082040	0.000208	8.88E-06	-5.72E-08
108	-2.95E-09	-0.000717	0.072945	0.000201	1.12E-12	-1.06E-12
109	2.74E-06	-0.000607	0.082040	0.000208	-8.88E-06	5.72E-08
110	1.38E-06	-0.000557	0.092200	0.000210	-9.13E-06	2.28E-08
111	1.73E-05	-0.000596	0.383001	0.000235	8.45E-06	-1.24E-08
112	1.67E-05	-0.000619	0.373760	0.000238	7.80E-06	-1.61E-08
113	-1.43E-09	-0.000660	0.366175	0.000242	1.24E-12	-1.23E-12
114	-1.67E-05	-0.000619	0.373760	0.000238	-7.80E-06	1.61E-08
115	-1.73E-05	-0.000596	0.383001	0.000235	-8.45E-06	1.24E-08
116	2.46E-05	-0.000616	0.694735	0.000241	4.56E-06	-4.42E-09
117	1.89E-05	-0.000623	0.689920	0.000244	3.78E-06	-4.38E-09
118	3.01E-10	-0.000634	0.686792	0.000246	1.34E-12	-1.39E-12
119	-1.89E-05	-0.000623	0.689920	0.000244	-3.78E-06	4.38E-09
120	-2.46E-05	-0.000616	0.694735	0.000241	-4.56E-06	4.42E-09
121	2.84E-05	-0.000631	0.998538	0.000222	1.70E-06	-3.12E-11
122	2.03E-05	-0.000625	0.996761	0.000223	1.39E-06	3.68E-09
123	2.23E-09	-0.000618	0.995693	0.000224	1.44E-12	-1.52E-12
124	-2.03E-05	-0.000625	0.996761	0.000223	-1.39E-06	-3.68E-09
125	-2.84E-05	-0.000631	0.998538	0.000222	-1.70E-06	2.81E-11
126	2.15E-05	-0.000657	1.260	0.000175	4.79E-07	2.19E-08
127	1.33E-05	-0.000622	1.259	0.000176	4.00E-07	2.38E-08
128	4.32E-09	-0.000596	1.259	0.000176	1.54E-12	-1.63E-12
129	-1.33E-05	-0.000622	1.259	0.000176	-4.00E-07	-2.38E-08
130	-2.15E-05	-0.000657	1.260	0.000175	-4.79E-07	-2.19E-08
131	-4.29E-05	-0.000709	1.443	0.000102	1.61E-07	9.84E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-3.75E-05	-0.000606	1.443	0.000102	1.39E-07	7.46E-08
133	6.54E-09	-0.000566	1.443	0.000102	1.63E-12	-1.73E-12
134	3.75E-05	-0.000606	1.443	0.000102	-1.39E-07	-7.46E-08
135	4.29E-05	-0.000709	1.443	0.000102	-1.61E-07	-9.84E-08
136	-0.000276	-0.000777	1.513	1.54E-06	4.76E-07	2.75E-07
137	-0.000212	-0.000565	1.512	1.02E-06	4.03E-07	1.65E-07
138	8.87E-09	-0.000553	1.512	6.65E-07	1.68E-12	-1.80E-12
139	0.000212	-0.000565	1.512	1.02E-06	-4.03E-07	-1.65E-07
140	0.000276	-0.000777	1.513	1.54E-06	-4.76E-07	-2.75E-07
141	-0.000845	-0.000754	1.436	-0.000124	1.99E-06	5.39E-07
142	-0.000613	-0.000502	1.434	-0.000126	1.67E-06	2.16E-07
143	1.13E-08	-0.000666	1.432	-0.000128	1.65E-12	-1.86E-12
144	0.000613	-0.000502	1.434	-0.000126	-1.67E-06	-2.16E-07
145	0.000845	-0.000754	1.436	-0.000124	-1.99E-06	-5.39E-07
146	-0.001782	-0.000280	1.179	-0.000275	6.49E-06	5.63E-07
147	-0.001114	-0.000509	1.172	-0.000280	5.42E-06	-1.80E-07
148	1.38E-08	-0.001145	1.168	-0.000284	1.44E-12	-1.91E-12
149	0.001114	-0.000509	1.172	-0.000280	-5.42E-06	1.80E-07
150	0.001782	-0.000280	1.179	-0.000275	-6.49E-06	-5.63E-07
151	-0.001962	0.001357	0.711610	-0.000450	1.75E-05	-1.42E-06
152	-0.000546	-0.000966	0.693319	-0.000461	1.41E-05	-1.79E-06
153	1.63E-08	-0.002190	0.681895	-0.000468	9.18E-13	-1.93E-12
154	0.000546	-0.000966	0.693319	-0.000461	-1.41E-05	1.79E-06
155	0.001962	0.001357	0.711610	-0.000450	-1.75E-05	1.42E-06
156	0.005487	0.004368	-7.14E-97	-0.000655	3.71E-05	-1.29E-05
157	0.002811	-0.002525	-0.038120	-0.000668	2.76E-05	-2.25E-06
158	1.88E-08	-0.003102	-0.060421	-0.000677	1.63E-13	-1.92E-12
159	-0.002811	-0.002525	-0.038120	-0.000668	-2.76E-05	2.25E-06
160	-0.005487	0.004368	-7.14E-97	-0.000655	-3.71E-05	1.29E-05
161	0.014881	0.004368	-0.348553	-0.000739	3.71E-05	-2.47E-05
162	0.003935	-0.002525	-0.393333	-0.000753	2.76E-05	-2.25E-06
163	1.98E-08	-0.003102	-0.419966	-0.000762	1.63E-13	-1.92E-12
164	-0.003935	-0.002525	-0.393333	-0.000753	-2.76E-05	2.25E-06
165	-0.014881	-0.004368	-0.348553	-0.000739	-3.71E-05	2.47E-05
166	-0	-1.12E-97	1.43E-96	+0	-0	+0
167	-0	1.12E-97	1.43E-96	-0	-0	-0
min:	-0.014881	-0.004368	-0.795675	-0.000762	-3.71E-05	-2.47E-05
max:	0.014881	0.004368	1.513	0.000762	3.71E-05	2.47E-05

3.2. Combinación de acciones

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIC
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OF	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOE
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000		SOB UNIF 5
AZ	PLUS	11	1.000		VEHICULO HIPOTESIS 11
BA	OR	12	1.000		VEHICULO HIPOTESIS 12
BB	OR	13	1.000		VEHICULO HIPOTESIS 13
BC	OR	14	1.000		VEHICULO HIPOTESIS 14
BD	OR	15	1.000		VEHICULO HIPOTESIS 15
BE	OR	16	1.000		VEHICULO HIPOTESIS 16
BF	OR	17	1.000		VEHICULO HIPOTESIS 17
BG	OR	18	1.000		VEHICULO HIPOTESIS 18
BH	OR	19	1.000		VEHICULO HIPOTESIS 19
BI	OR	20	1.000		VEHICULO HIPOTESIS 20
BJ	OR	21	1.000		VEHICULO HIPOTESIS 21
BK	OR	22	1.000		VEHICULO HIPOTESIS 22
BL	OR	23	1.000		VEHICULO HIPOTESIS 23
BM	OR	24	1.000		VEHICULO HIPOTESIS 24
BN	OR	25	1.000		VEHICULO POSICION 25
BO	OR	26	1.000		VEHICULO POSICION 26
BP	OR	27	1.000		VEHICULO POSICION 27
BQ	OR	28	1.000		VEHICULO POSICION 28
BR	OR	29	1.000		VEHICULO POSICION 29
BS	OR	30	1.000		VEHICULO POSICION 30
BT	OR	31	1.000		VEHICULO POSICION 31
BU	OR	32	1.000		VEHICULO POSICION 32
BV	OR	33	1.000		VEHICULO POSICION 33
BW	OR	34	1.000		VEHICULO POSICION 34
BX	OR	35	1.000		VEHICULO POSICION 35
BY	OR	36	1.000		VEHICULO POSICION 36
BZ	OR	37	1.000		VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000		FRENADO
CB	PLUS	63	0.300000		VIENTO TRANSV CON SOE
CC	PLUS	64	0.600000		TEMPERATURA (-)
CD	OR	65	0.600000		TEMPERATURA (+)
CE	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
CF	PERM.	1	1.000		PESO PROPIO
CG	PL.PERM	2	1.500		PESO PAVIMENTO
CH	OR	2	1.000		PESO PAVIMENTO
CI	PL.PERM	3	1.000		PESO BARRERAS
CJ	PLUS	46	1.000		SOB UNIF VANO 1
CK	PLUS	47	1.000		SOB UNIF VANO 2
CL	PLUS	48	1.000		SOB UNIF VANO 3
CM	PLUS	11	1.000		VEHICULO HIPOTESIS 11
CN	OR	12	1.000		VEHICULO HIPOTESIS 12
CO	OR	13	1.000		VEHICULO HIPOTESIS 13
CP	OR	14	1.000		VEHICULO HIPOTESIS 14
CQ	OR	15	1.000		VEHICULO HIPOTESIS 15
CR	OR	16	1.000		VEHICULO HIPOTESIS 16
CS	OR	17	1.000		VEHICULO HIPOTESIS 17
CT	OR	18	1.000		VEHICULO HIPOTESIS 18
CU	OR	19	1.000		VEHICULO HIPOTESIS 19
CV	OR	20	1.000		VEHICULO HIPOTESIS 20
CW	OR	21	1.000		VEHICULO HIPOTESIS 21
CX	OR	22	1.000		VEHICULO HIPOTESIS 22
CY	OR	23	1.000		VEHICULO HIPOTESIS 23
CZ	OR	24	1.000		VEHICULO HIPOTESIS 24

DA	OR	25	1.000		VEHICULO POSICION 25
DB	OR	26	1.000		VEHICULO POSICION 26
DC	OR	27	1.000		VEHICULO POSICION 27
DD	OR	28	1.000		VEHICULO POSICION 28
DE	OR	29	1.000		VEHICULO POSICION 29
DF	OR	30	1.000		VEHICULO POSICION 30
DG	OR	31	1.000		VEHICULO POSICION 31
DH	OR	32	1.000		VEHICULO POSICION 32
DI	OR	33	1.000		VEHICULO POSICION 33
DJ	OR	34	1.000		VEHICULO POSICION 34
DK	OR	35	1.000		VEHICULO POSICION 35
DL	OR	36	1.000		VEHICULO POSICION 36
DM	OR	37	1.000		VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000		FRENADO
DO	PLUS	63	0.300000		VIENTO TRANSV CON SOE
DP	PLUS	64	0.600000		TEMPERATURA (-)
DQ	OF	65	0.600000		TEMPERATURA (+)
DR	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
DS	PERM.	1	1.000		PESO PROPIO
DT	PL.PERM	2	1.500		PESO PAVIMENTO
DU	OR	2	1.000		PESO PAVIMENTO
DV	PL.PERM	3	1.000		PESO BARRERAS
DW	PL.PERM	5	1.000		RETRACCION
DX	PLUS	46	1.000		SOB UNIF VANO 1
DY	PLUS	47	1.000		SOB UNIF VANO 2
DZ	PLUS	48	1.000		SOB UNIF VANO 3
EA	PLUS	11	1.000		VEHICULO HIPOTESIS 11
EB	OR	12	1.000		VEHICULO HIPOTESIS 12
EC	OR	13	1.000		VEHICULO HIPOTESIS 13
ED	OR	14	1.000		VEHICULO HIPOTESIS 14
EE	OR	15	1.000		VEHICULO HIPOTESIS 15
EF	OR	16	1.000		VEHICULO HIPOTESIS 16
EG	OR	17	1.000		VEHICULO HIPOTESIS 17
EH	OR	18	1.000		VEHICULO HIPOTESIS 18
EI	OR	19	1.000		VEHICULO HIPOTESIS 19
EJ	OR	20	1.000		VEHICULO HIPOTESIS 20
EK	OR	21	1.000		VEHICULO HIPOTESIS 21
EL	OR	22	1.000		VEHICULO HIPOTESIS 22
EM	OR	23	1.000		VEHICULO HIPOTESIS 23
EN	OR	24	1.000		VEHICULO HIPOTESIS 24
EO	OR	25	1.000		VEHICULO POSICION 25
EP	OR	26	1.000		VEHICULO POSICION 26
EQ	OR	27	1.000		VEHICULO POSICION 27
ER	OR	28	1.000		VEHICULO POSICION 28
ES	OR	29	1.000		VEHICULO POSICION 29
ET	OR	30	1.000		VEHICULO POSICION 30
EU	OR	31	1.000		VEHICULO POSICION 31
EV	OR	32	1.000		VEHICULO POSICION 32
EW	OR	33	1.000		VEHICULO POSICION 33
EX	OR	34	1.000		VEHICULO POSICION 34
EY	OR	35	1.000		VEHICULO POSICION 35
EZ	OR	36	1.000		VEHICULO POSICION 36
FA	OF	37	1.000		VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000		FRENADO

FC	PLUS	63	0.300000		VIENTO TRANSV CON SOE
FD	PLUS	64	0.600000		TEMPERATURA (-)
FE	OR	65	0.600000		TEMPERATURA (+)
FF	PLUS	66	0.600000		GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.091	-3.683	20.036				
	1.761	1.141	100.469				
	Min: AP AR AS AT AX AY BU...			Max: A B D E F G J AL AN AO			
10	2.283	-3.686	16.626				
	-0.568555	1.138	97.227				
	Min: AP AR AS AT AU AV BC...			Max: A B D G H I AB AN AO			
156	-1.091	2.568	20.407				
	1.761	-2.257	100.840				
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.			
160	2.283	2.571	16.997				
	-0.568596	-2.254	97.599				
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...			
166	3.374	-1.935	218.118	15.604	23.708	-0.028301	
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09	
	Min: CF CH CI CL DC DN DO...			Max: DS DT DV DW DX DY EM...			
167	3.374	-1.829	219.077	9.951	23.708	0.028301	
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09	
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...			

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.091	-3.683	26.641				
	2.283	1.009	60.789				
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F M AL AN			
10	-1.090	1.006	57.547				
	2.284	-3.686	23.231				
	Min: A C D H I AE AN			Max: AP AQ AS AT AU AV AW...			
156	-1.091	2.567	27.013				
	2.283	-2.125	61.160				
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F O AK AL AN			
160	-1.091	-2.122	57.919				
	2.284	2.570	23.603				
	Min: A C D H I AG AK AN			Max: AP AQ AS AT AU AV AW...			
166	-2.615	3.395	313.122	-17.884	-3.159	0.221212	
	5.989	-4.252	319.171	36.214	26.867	-0.249513	
	Min: A C D E F M AN			Max: AP AQ AS AT AW AX AY...			
167	-2.615	-7.158	314.081	43.438	-3.159	-0.221212	

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
	5.989	0.488287	320.130	-10.660	26.867	0.249513	
	Min: A C D E F O AK AN			Max: AP AQ AS AT AW AX AY...			

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-0.167731	-3.836	34.498				
	0.835704	1.280	53.022				
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DO DQ...			
10	1.360	-3.839	31.088				
	0.356995	1.277	49.781				
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR			
156	0.835745	-2.396	53.394				
	-0.167690	2.720	34.870				
	Min: CF CH CI CL DL DN DQ...			Max: DS DT DV DW DX DY ET...			
160	0.356954	-2.393	50.152				
	1.360	2.723	31.460				
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EE...			
166	3.374	-8.324	297.858	52.598	23.708	-0.028301	
	5.35E-09	6.034	296.749	-29.975	2.74E-08	-1.18E-08	
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR			
167	5.35E-09	-8.757	297.708	55.530	2.73E-08	1.16E-08	
	3.374	4.560	298.816	-27.044	23.708	0.028301	
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...			

DEFORMATIONS: --
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]	
2	0	-9.927	-4.388	-1.45E-08	-0.001116	0.000178	-1.26E-05	
		4.745	16.012	-2.36E-09	-0.000181	0.000186	2.63E-05	
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...			
2	1.300	-9.912	15.434	-1.030	-0.000782	-7.75E-05	-1.13E-05	
		4.718	-4.186	-0.728517	-0.000510	0.000188	1.76E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN			
31	0	-9.912	-10.583	-1.061	0.000805	-7.66E-05	1.14E-05	
		4.718	9.037	-0.759594	0.000534	0.000189	-1.75E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN			
31	1.300	-9.927	9.239	-1.74E-08	0.001141	0.000180	1.29E-05	
		4.745	-11.161	-3.23E-09	0.000205	0.000188	-2.61E-05	
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...			

DEFORMATIONS: --
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]	
75	0	-9.759	-1.872	-1.330	-2.92E-05	-0.001310	-1.79E-05	
		4.522	10.104	-1.311	5.37E-06	0.001078	2.09E-05	
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY...			
75	1.300	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05	
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05	
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...			
76	0	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05	
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05	
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...			
76	1.700	-9.702	8.576	-3.304	-0.001163	-0.001535	-2.04E-05	
		4.457	-1.215	-2.834	-0.000935	0.001276	2.28E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN			
85	0	-9.702	-3.725	-3.248	0.001143	-0.001535	2.04E-05	
		4.457	6.071	-2.779	0.000916	0.001276	-2.28E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN			
85	1.700	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05	
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05	
		Min: A B D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...			
86	0	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05	
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05	
		Min: A B D E F G O AK AL AN AO			Max: AP AR AS AT AX AY BW...			
86	1.300	-9.759	6.724	-1.391	-2.60E-06	0.001310	1.79E-05	
		4.522	-5.252	-1.371	-3.72E-05	0.001078	-2.09E-05	
		Min: A B D E F G O AK AL AN.			Max: AP AR AS AT AX AY BW...			
130	0	-9.931	16.026	-1.74E-09	-0.000134	-0.000184	-2.10E-05	
		4.741	-4.375	-1.39E-08	-0.001072	-0.000176	1.79E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN			
130	1.300	-9.911	-4.173	-0.859427	-0.000459	-0.000213	-1.24E-05	
		4.719	15.447	-0.965400	-0.000733	5.27E-05	1.65E-05	
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...			
159	0	-9.911	9.024	-0.690504	0.000482	-0.000214	1.23E-05	
		4.719	-10.596	-0.996477	0.000756	5.17E-05	-1.66E-05	
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...			
159	1.300	-9.931	-11.174	-2.41E-09	0.000158	-0.000186	2.07E-05	
		4.741	9.226	-1.66E-08	0.001096	-0.000178	-1.82E-05	
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN			

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-3.633	-5.566	-1.43E-08	-0.001098	0.000283	2.93E-05
		0.729265	16.677	-9.22E-09	-0.000709	0.000154	-2.00E-05
		Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...			
2	1.300	-3.666	-5.281	-1.474	-0.001105	0.000194	2.26E-05
		0.755751	16.016	-0.908772	-0.000646	7.11E-05	-2.06E-05
		Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...			
31	0	0.755785	-11.165	-0.939849	0.000669	7.20E-05	2.07E-05
		-3.666	10.132	-1.505	0.001128	0.000195	-2.25E-05
		Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...			
31	1.300	0.729085	-11.826	-1.07E-08	0.000733	0.000156	2.02E-05
		-3.634	10.417	-1.63E-08	0.001122	0.000285	-2.91E-05
		Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...			
75	0	-5.237	-2.959	-2.341	0.000825	-0.000232	2.96E-06
		-1.03E-09	10.666	-0.931812	-8.42E-05	7.32E-13	7.37E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
75	1.300	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
76	0	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
76	1.700	-5.245	-2.305	-1.595	-0.000298	-0.000260	2.44E-06
		-4.04E-09	9.138	-2.679	-0.000971	6.64E-13	1.02E-12
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
85	0	-3.98E-09	-4.286	-2.623	0.000951	6.61E-13	-1.01E-12
		-5.245	7.157	-1.544	0.000279	-0.000260	-2.44E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
85	1.700	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
86	0	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
86	1.300	-1.08E-09	-5.814	-0.992653	5.24E-05	7.30E-13	-7.10E-13
		-5.237	7.810	-2.402	-0.000856	-0.000232	-2.96E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...			
130	0	-1.552	-5.553	-1.37E-08	-0.001054	-0.000282	-2.40E-05
		-5.915	16.691	-8.59E-09	-0.000661	-0.000152	2.53E-05
		Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...			
130	1.300	-1.526	-5.268	-1.409	-0.001057	-0.000219	-1.74E-05
		-5.949	16.029	-0.839682	-0.000594	-9.58E-05	2.59E-05
		Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...			

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
159	0	-5.949	-11.178	-0.870759	0.000617	-9.68E-05	-2.60E-05
		-1.526	10.119	-1.440	0.001080	-0.000220	1.73E-05
		Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...			
159	1.300	-5.915	-11.839	-9.85E-09	0.000685	-0.000154	-2.56E-05
		-1.552	10.404	-1.55E-08	0.001078	-0.000284	2.37E-05
		Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...			

ENVELOPE for < N > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-352.379	-0.710816	-2.90E-10	3.88E-09	2.13E-09	11.174
		-218.116	-1.935	-3.374	0.028301	23.708	15.604
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DQ...			
290	13.200	-352.379	-0.710816	-2.90E-10	3.88E-09	-1.70E-09	1.791
		-218.118	-1.935	-2.582	0.028301	-15.598	-9.938
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DQ...			
291	0	-353.338	-3.053	-2.78E-10	-3.63E-09	2.08E-09	14.381
		-219.077	-1.829	-3.374	-0.028301	23.708	9.951
		Min: DS DT DV DW DY DZ EQ...		Max: CF CH CI CJ CW DO DQ...			
291	13.200	-353.338	-3.053	-2.78E-10	-3.63E-09	-1.59E-09	-25.914
		-219.077	-1.829	-2.582	-0.028301	-15.598	-14.186
		Min: DS DT DV DW DY DZ EQ...		Max: CF CH CI CJ CW DO DQ...			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-313.535	-3.098	2.525	-0.264263	-3.487	20.929
		-316.630	-1.529	-5.898	0.292564	27.196	11.566
		Min: AP AR AS AT AU AV BE...		Max: A B D G H I AD AK AL...			
290	13.200	-319.171	-4.252	-5.197	0.249513	-46.963	-19.909
		-313.122	3.395	2.615	-0.221212	31.365	26.929
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F M AN			
291	0	-314.494	-0.665613	2.525	0.264263	-3.487	4.626
		-317.589	-2.234	-5.898	-0.292564	27.196	13.988
		Min: AP AR AS AT AU AV BF...		Max: A B D G H I AH AL AN...			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
291	13.200	-320.130	0.488287	-5.197	-0.249513	-46.963	-4.214
		-314.081	-7.158	2.615	0.221212	31.365	-51.052
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F O AK AN			

ENVELOPE for < Mz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.749	6.034	-5.36E-09	1.18E-08	2.74E-08	-29.975
		-297.858	-8.324	-3.374	0.028301	23.708	52.598
		Min: CF CG CI CK CZ DQ DR		Max: DS DU DV DW DX DZ EK...			
290	13.200	-297.858	-8.324	-2.582	0.028301	-15.598	-57.273
		-296.749	6.034	-5.36E-09	1.18E-08	-4.34E-08	49.670
		Min: DS DU DV DW DX DZ EK...		Max: CF CG CI CK CZ DQ DR			
291	0	-298.816	4.560	-3.374	-0.028301	23.708	-27.044
		-297.708	-9.797	-5.35E-09	-1.16E-08	2.73E-08	55.530
		Min: DS DU DV DW DX DZ EQ...		Max: CF CG CI CK CZ DN DQ...			
291	13.200	-297.708	-9.797	-5.35E-09	-1.16E-08	-4.33E-08	-73.793
		-298.816	4.560	-2.582	-0.028301	-15.598	33.150
		Min: CF CG CI CK CZ DN DQ...		Max: DS DU DV DW DX DZ EQ...			

PILAS

Introducción

Del cálculo del tablero como emparrillado espacial se han obtenido para las distintas hipótesis los valores de las reacciones del tablero, tanto verticales como horizontales.

Con dichos valores se han obtenido las reacciones para las distintas hipótesis de carga, que responden a lo dispuesto por la "Instrucción sobre a las acciones a considerar en el proyecto de puentes de carretera" (IAP).

La pila se ha calculado en segundo orden, considerando la longitud de pandeo real de las mismas, que se obtiene del cálculo de los autovalores estáticos del modelo con sus rigideces resultantes mediante el programa STATIK·3. Con estos valores se ha utilizado la fórmula de la EHE para esbelteces medias.

ENVELOPE SPECIFIC.: DD 'COMBINACION ELU'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	PL.PERM	2	2.025		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.350		PESO BARRERAS
E	PLUS	6	1.500		SOB UNIF 1
F	PLUS	7	1.500		SOB UNIF 2
G	PLUS	8	1.500		SOB UNIF 3
H	PLUS	9	1.500		SOB UNIF 4
I	PLUS	10	1.500		SOB UNIF 5
J	PLUS	11	1.500		VEHICULO HIPOTESIS 11
K	OR	12	1.500		VEHICULO HIPOTESIS 12
(	OR	13	1.500		VEHICULO HIPOTESIS 13
M	OR	14	1.500		VEHICULO HIPOTESIS 14
N	OR	15	1.500		VEHICULO HIPOTESIS 15
O	OR	16	1.500		VEHICULO HIPOTESIS 16
P	OR	17	1.500		VEHICULO HIPOTESIS 17
Q	OR	18	1.500		VEHICULO HIPOTESIS 18
R	OR	19	1.500		VEHICULO HIPOTESIS 19
S	OR	20	1.500		VEHICULO HIPOTESIS 20
T	OR	21	1.500		VEHICULO HIPOTESIS 21
U	OR	22	1.500		VEHICULO HIPOTESIS 22
V	OR	23	1.500		VEHICULO HIPOTESIS 23
W	OR	24	1.500		VEHICULO HIPOTESIS 24
X	OR	25	1.500		VEHICULO POSICION 25
Y	OR	26	1.500		VEHICULO POSICION 26
Z	OR	27	1.500		VEHICULO POSICION 27
AA	OR	28	1.500		VEHICULO POSICION 28
AB	OR	29	1.500		VEHICULO POSICION 29
AC	OR	30	1.500		VEHICULO POSICION 30
AD	OR	31	1.500		VEHICULO POSICION 31
(	OR	32	1.500		VEHICULO POSICION 32
AF	OR	33	1.500		VEHICULO POSICION 33
AG	OR	34	1.500		VEHICULO POSICION 34
AH	OR	35	1.500		VEHICULO POSICION 35
AI	OR	36	1.500		VEHICULO POSICION 36
AJ	OR	37	1.500		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.500		FRENADO
AL	PLUS	63	0.750000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.900000		TEMPERATURA (-)
AN	OR	65	0.900000		TEMPERATURA (+)
AO	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.500		SOB UNIF 1
(	PLUS	7	1.500		SOB UNIF 2
AW	PLUS	8	1.500		SOB UNIF 3
AX	PLUS	9	1.500		SOB UNIF 4

AY	PLUS	10	1.500	SOB UNIF 5
AZ	PLUS	11	1.500	VEHICULO HIPOTESIS 11
BA	OR	12	1.500	VEHICULO HIPOTESIS 12
BB	OR	13	1.500	VEHICULO HIPOTESIS 13
BC	OR	14	1.500	VEHICULO HIPOTESIS 14
BD	OR	15	1.500	VEHICULO HIPOTESIS 15
BE	OR	16	1.500	VEHICULO HIPOTESIS 16
BF	OR	17	1.500	VEHICULO HIPOTESIS 17
BG	OR	18	1.500	VEHICULO HIPOTESIS 18
BH	OR	19	1.500	VEHICULO HIPOTESIS 19
BI	OR	20	1.500	VEHICULO HIPOTESIS 20
BJ	OR	21	1.500	VEHICULO HIPOTESIS 21
BK	OR	22	1.500	VEHICULO HIPOTESIS 22
BL	OR	23	1.500	VEHICULO HIPOTESIS 23
BM	OR	24	1.500	VEHICULO HIPOTESIS 24
BN	OR	25	1.500	VEHICULO POSICION 25
BO	OR	26	1.500	VEHICULO POSICION 26
BP	OR	27	1.500	VEHICULO POSICION 27
BQ	OR	28	1.500	VEHICULO POSICION 28
BR	OR	29	1.500	VEHICULO POSICION 29
BS	OR	30	1.500	VEHICULO POSICION 30
BT	OR	31	1.500	VEHICULO POSICION 31
BU	OR	32	1.500	VEHICULO POSICION 32
BV	OR	33	1.500	VEHICULO POSICION 33
BW	OR	34	1.500	VEHICULO POSICION 34
BX	OR	35	1.500	VEHICULO POSICION 35
BY	OR	36	1.500	VEHICULO POSICION 36
BZ	OR	37	1.500	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.500	FRENADO
CB	PLUS	63	0.750000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.900000	TEMPERATURA (-)
CD	OR	65	0.900000	TEMPERATURA (+)
CE	PLUS	66	0.900000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.350	PESO PROPIO
CG	PL.PERM	2	2.025	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.350	PESO BARRERAS
CJ	PLUS	46	1.500	SOB UNIF VANO 1
CK	PLUS	47	1.500	SOB UNIF VANO 2
CL	PLUS	48	1.500	SOB UNIF VANO 3
CM	PLUS	11	1.500	VEHICULO HIPOTESIS 11
CN	OR	12	1.500	VEHICULO HIPOTESIS 12
CO	OR	13	1.500	VEHICULO HIPOTESIS 13
CP	OR	14	1.500	VEHICULO HIPOTESIS 14
CQ	OR	15	1.500	VEHICULO HIPOTESIS 15
CR	OR	16	1.500	VEHICULO HIPOTESIS 16
CS	OR	17	1.500	VEHICULO HIPOTESIS 17
CT	OR	18	1.500	VEHICULO HIPOTESIS 18
CU	OR	19	1.500	VEHICULO HIPOTESIS 19
CV	OR	20	1.500	VEHICULO HIPOTESIS 20
CW	OR	21	1.500	VEHICULO HIPOTESIS 21
CX	OR	22	1.500	VEHICULO HIPOTESIS 22
CY	OR	23	1.500	VEHICULO HIPOTESIS 23
CZ	OR	24	1.500	VEHICULO HIPOTESIS 24

DA	OR	25	1.500	VEHICULO POSICION 25
DB	OR	26	1.500	VEHICULO POSICION 26
DC	OR	27	1.500	VEHICULO POSICION 27
DD	OR	28	1.500	VEHICULO POSICION 28
DE	OR	29	1.500	VEHICULO POSICION 29
DF	OR	30	1.500	VEHICULO POSICION 30
DG	OR	31	1.500	VEHICULO POSICION 31
DH	OR	32	1.500	VEHICULO POSICION 32
DI	OR	33	1.500	VEHICULO POSICION 33
DJ	OR	34	1.500	VEHICULO POSICION 34
DK	OR	35	1.500	VEHICULO POSICION 35
DL	OR	36	1.500	VEHICULO POSICION 36
DM	OR	37	1.500	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.500	FRENADO
DO	PLUS	63	0.750000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.900000	TEMPERATURA (-)
DQ	OR	65	0.900000	TEMPERATURA (+)
DR	PLUS	66	0.900000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.500	SOB UNIF VANO 1
DY	PLUS	47	1.500	SOB UNIF VANO 2
DZ	PLUS	48	1.500	SOB UNIF VANO 3
EA	PLUS	11	1.500	VEHICULO HIPOTESIS 11
EB	OR	12	1.500	VEHICULO HIPOTESIS 12
EC	OR	13	1.500	VEHICULO HIPOTESIS 13
ED	OR	14	1.500	VEHICULO HIPOTESIS 14
EE	OR	15	1.500	VEHICULO HIPOTESIS 15
EF	OR	16	1.500	VEHICULO HIPOTESIS 16
EG	OR	17	1.500	VEHICULO HIPOTESIS 17
EH	OR	18	1.500	VEHICULO HIPOTESIS 18
EI	OR	19	1.500	VEHICULO HIPOTESIS 19
EJ	OR	20	1.500	VEHICULO HIPOTESIS 20
EK	OR	21	1.500	VEHICULO HIPOTESIS 21
EL	OR	22	1.500	VEHICULO HIPOTESIS 22
EM	OR	23	1.500	VEHICULO HIPOTESIS 23
EN	OR	24	1.500	VEHICULO HIPOTESIS 24
EO	OR	25	1.500	VEHICULO POSICION 25
EP	OR	26	1.500	VEHICULO POSICION 26
EQ	OR	27	1.500	VEHICULO POSICION 27
ER	OR	28	1.500	VEHICULO POSICION 28
ES	OR	29	1.500	VEHICULO POSICION 29
ET	OR	30	1.500	VEHICULO POSICION 30
EU	OR	31	1.500	VEHICULO POSICION 31
EV	OR	32	1.500	VEHICULO POSICION 32
EW	OR	33	1.500	VEHICULO POSICION 33
EX	OR	34	1.500	VEHICULO POSICION 34
EY	OR	35	1.500	VEHICULO POSICION 35
EZ	OR	36	1.500	VEHICULO POSICION 36
FA	OR	37	1.500	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.500	FRENADO

FC	PLUS	63	0.750000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.900000	TEMPERATURA (-)
FE	OR	65	0.900000	TEMPERATURA (+)
FF	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

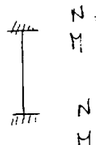
Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-532.928	1.468	-3.91E-10	4.56E-09	3.45E-09	-4.127
		-240.240	-3.998	-7.100	0.092619	56.217	34.882
		Min: CF CG CI CJ CK CY DP			Max: DS DU DV DW DZ EQ FB...		
290	15.800	-491.027	1.468	-3.91E-10	4.56E-09	-2.72E-09	19.064
		-209.202	-3.998	-4.730	0.092619	-37.235	-28.292
		Min: CF CG CI CJ CK CY DP			Max: DS DU DV DW DZ EQ FB...		
291	0	-534.296	-5.955	-3.76E-10	-4.27E-09	3.37E-09	40.434
		-241.608	-0.488936	-7.100	-0.092619	56.217	1.425
		Min: CF CG CI CK CL DA DN...			Max: DS DU DV DW DX EK FC...		
291	15.800	-492.396	-5.955	-3.76E-10	-4.27E-09	-2.57E-09	-53.656
		-210.571	-0.488936	-4.730	-0.092619	-37.235	-6.300
		Min: CF CG CI CK CL DA DN...			Max: DS DU DV DW DX EK FC...		





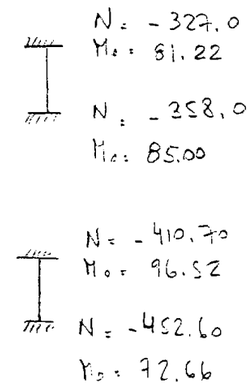
ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-382.931	2.082	3.581	-0.208855	-10.548	-10.877
		-482.776	-2.744	-10.681	0.301474	66.765	31.198
		Min: AP AR AS AT AU AV BC...			Max: A B D G H I AE AK AL...		
290	15.800	-440.876	-2.744	-8.311	0.301474	-83.272	-12.156
		-351.893	2.082	3.581	-0.208855	46.037	22.023
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
291	0	-385.249	-4.110	3.581	0.208855	-10.548	27.043
		-483.194	-4.203	-10.681	-0.301474	66.765	25.250
		Min: AP AR AS AT AU AV BE...			Max: A B D G H I AG AL AN...		
291	15.800	-442.244	-1.743	-8.311	-0.301474	-83.272	-22.436
		-353.262	-6.570	3.581	0.208855	46.037	-56.615
		Min: A B D G H I AG AL AM...			Max: AP AR AS AT AU AV BE...		



ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-451.231	6.221	-6.83E-09	1.50E-08	4.38E-08	-36.352
		-358.047	-8.601	-7.100	0.092619	56.217	63.721
		Min: CF CG CI CK CZ DQ DR			Max: DS DU DV DW DX DZ EK...		
290	15.800	-327.010	-8.601	-4.730	0.092619	-37.235	-72.182
		-409.331	6.221	-6.83E-09	1.50E-08	-6.41E-08	61.935
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
291	0	-359.415	4.114	-7.100	-0.092619	56.217	-27.414
		-452.600	-10.706	-6.82E-09	-1.47E-08	4.37E-08	72.659
		Min: DS DU DV DW DX DZ EQ...			Max: CF CG CI CK CZ DN DQ...		
291	15.800	-410.695	-10.708	-6.82E-09	-1.47E-08	-6.40E-08	-96.527
		-328.376	4.114	-4.730	-0.092619	-37.235	37.591
		Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		



ENVELOPE for < Vz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-482.776	-2.744	-10.681	0.301474	66.765	31.198
		-382.931	2.082	3.581	-0.208855	-10.548	-10.877
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
290	15.800	-440.876	-2.744	-8.311	0.301474	-83.272	-12.156
		-351.893	2.082	3.581	-0.208855	46.037	22.023
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
291	0	-484.144	-1.743	-10.681	-0.301474	66.765	5.109
		-384.299	-6.570	3.581	0.208855	-10.548	47.184
		Min: A B D G H I AG AL AM...			Max: AP AR AS AT AU AV BE...		
291	15.800	-442.244	-1.743	-8.311	-0.301474	-83.272	-22.436
		-353.262	-6.570	3.581	0.208855	46.037	-56.615
		Min: A B D G H I AG AL AM...			Max: AP AR AS AT AU AV BE...		

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 1 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **66.2** Md (KNm) = 648.4

Nd (T) = **-209.2** Nd (KN) = -2050.2

Pie de pórtico

Md (Tm) = **46.8** Md (KNm) = 458.2

Nd (T) = **-240.2** Nd (KN) = -2354.4

Hormigón : **HA - 30**

fck (N/mm^2)= **30**

γ c = **1.50**

fcd (N/mm^2)= 20.0

Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**

fyk (N/mm^2)= **500**

γ s = **1.15**

fyd (N/mm^2)= 434.8

Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**

Ancho B(m): **0.00**

Long. L(m) : **0.00**

Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**

Nº de fustes : **1**

Altura Hp (m): **15.80**

Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.316 Máxima excentricidad de cálculo de 1er orden

Lo = 15.80

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

β = 1.50

e_a = 0.272

e_{tot} (m) = 0.589

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 123.16
Nd (t) = -209.20

Md (KNm) = 1207.0
Nd (KN) = -2050.2

Pie de pórtico

Md (tm) = 141.44
Nd (t) = -240.24

Md (KNm) = 1386.1
Nd (KN) = -2354.4

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 2 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **53.7** Md (KNm) = 525.8
Nd (T) = **-492.4** Nd (KN) = -4825.5

Pie de pórtico

Md (Tm) = **40.4** Md (KNm) = 396.2
Nd (T) = **-534.3** Nd (KN) = -5236.1

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

$e_e = 0.109$ Máxima excentricidad de cálculo de 1er orden

Lo = 15.80

$\varepsilon y =$ fyd / Es = 0.002070

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

$\beta = 1.50$

$e_a = 0.236$

e_{tot} (m) = 0.345

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 169.65
Nd (t) = -492.40

Md (KNm) = 1662.5
Nd (KN) = -4825.5

Pie de pórtico

Md (tm) = 184.08
Nd (t) = -534.30

Md (KNm) = 1804.0
Nd (KN) = -5236.1

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 3 :

Solicitaciones :

Cabeza de pórtico

Md (Tm) = **84.2** Md (KNm) = 824.7
Nd (T) = **-440.9** Nd (KN) = -4320.8

Pie de pórtico

Md (Tm) = **74.0** Md (KNm) = 725.2
Nd (T) = **-482.8** Nd (KN) = -4731.4

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A *\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

$e_e = 0.191$ Máxima excentricidad de cálculo de 1er orden

Lo = 15.80

$\varepsilon y =$ fyd / Es = 0.002070

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

$\beta = 1.50$

$e_a = 0.256$

e_{tot} (m) = 0.447

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 197.22
Nd (t) = -440.90

Md (KNm) = 1932.7
Nd (KN) = -4320.8

Pie de pórtico

Md (tm) = 215.96
Nd (t) = -482.80

Md (KNm) = 2116.4
Nd (KN) = -4731.4

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 4 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **81.2** Md (KNm) = 796.0
Nd (T) = **-327.0** Nd (KN) = -3204.6

Pie de pórtico

Md (Tm) = **85.0** Md (KNm) = 833.0
Nd (T) = **-358.0** Nd (KN) = -3508.4

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces Ψ = (Σ E * I / L soportes) / (Σ E * I / L dintel)

Cabeza del pórtico Ψ B = 0.00

En el pie del pórtico Ψ A = 0.00

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A *\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

α = 1.000

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0{,}12\ \beta)(\varepsilon y+\varepsilon)\ \frac{(h+20e_e)}{(h+10ee)}\ \frac{Lo^2}{50\ ic}$

e_e = 0.248 Máxima excentricidad de cálculo de 1er orden

Lo = 15.80

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\ is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

β = 1.50

e_a = 0.265

e_{tot} (m) = 0.514

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 167.95
Nd (t) = -327.00

Md (KNm) = 1645.9
Nd (KN) = -3204.6

Pie de pórtico

Md (tm) = 183.87
Nd (t) = -358.00

Md (KNm) = 1801.9
Nd (KN) = -3508.4

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 5 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **96.2** Md (KNm) = 942.8
Nd (T) = **-410.7** Nd (KN) = -4024.9

Pie de pórtico

Md (Tm) = **72.7** Md (KNm) = 712.1
Nd (T) = **-452.6** Nd (KN) = -4435.5

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\frac{(h+20e_e)}{(h+10ee)}\frac{Lo^2}{50\,ic}$$

e_e = 0.234 Máxima excentricidad de cálculo de 1er orden

Lo = 15.80

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$$is^2 = \frac{1}{6}(d - d')^2$$

β = 1.50

e_a = 0.263

e_{tot} (m) = 0.498

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 204.36
Nd (t) = -410.70

Md (KNm) = 2002.7
Nd (KN) = -4024.9

Pie de pórtico

Md (tm) = 225.21
Nd (t) = -452.60

Md (KNm) = 2207.0
Nd (KN) = -4435.5

Características mecánicas Sección "PILAS" (sin coef. homogeneiz.)

Area	Ax = 7.858E3 cm2		
Momento de inercia	Iy = 4.918E6 cm4	Iz = 4.909E6 cm4	Ip = 9.827E6 cm4
Const. de torsión			Ix = 9.817E6 cm4
Momento estático	Zy =166.73E3 cm3	Zz = 166.73E3 cm3	
Baricentro	ys = -0.0000 m	zs = 0.0000 m	Angulo= 0.0 Grad
Dist. al borde	yl = -0.5000 m	yr = 0.5000 m	
	zo = 0.5000 m	zu = -0.5000 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.0000 m z = 0.0000 m

Sección parcial circular:

Nombre	Material	w	ym[m]	zm[m]	r[m]	ix[cm4]
C1	H300	1.0	0.0000	0.0000	0.5000	9.82E+06

Armadura "B1" As-tot =74.3302 cm2 (0.95 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
CR 6 / C1	AEH500	1.0	1	5.3093	-0.1001	0.4387
CR 5 / C1	AEH500	1.0	1	5.3093	0.1001	0.4387
CR 7 / C1	AEH500	1.0	1	5.3093	-0.2806	0.3518
CR 4 / C1	AEH500	1.0	1	5.3093	0.2806	0.3518
CR 8 / C1	AEH500	1.0	1	5.3093	-0.4054	0.1952
CR 3 / C1	AEH500	1.0	1	5.3093	0.4054	0.1952
CR 9 / C1	AEH500	1.0	1	5.3093	-0.4500	0.0000
CR 2 / C1	AEH500	1.0	1	5.3093	0.4500	0.0000
CR 15 / C1	AEH500	1.0	1	5.3093	0.4054	-0.1952
CR 10 / C1	AEH500	1.0	1	5.3093	-0.4054	-0.1952
CR 14 / C1	AEH500	1.0	1	5.3093	0.2806	-0.3518
CR 11 / C1	AEH500	1.0	1	5.3093	-0.2806	-0.3518
CR 13 / C1	AEH500	1.0	1	5.3093	0.1001	-0.4387
CR 12 / C1	AEH500	1.0	1	5.3093	-0.1001	-0.4387

Dimensionamiento a flexión: Viga Sección "PILAS"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-240.2400	141.4400	0.0000	
2	2	-534.3000	184.0800	0.0000	
3	2	-492.4000	169.6500	0.0000	
4	2	-440.9000	197.2200	0.0000	
5	2	-482.8000	215.9600	0.0000	
6	2	-327.0000	167.9500	0.0000	
7	2	-358.0000	183.8700	0.0000	
8	2	-410.7000	204.3600	0.0000	
9	2	-452.6000	225.2100	0.0000	

Parametros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

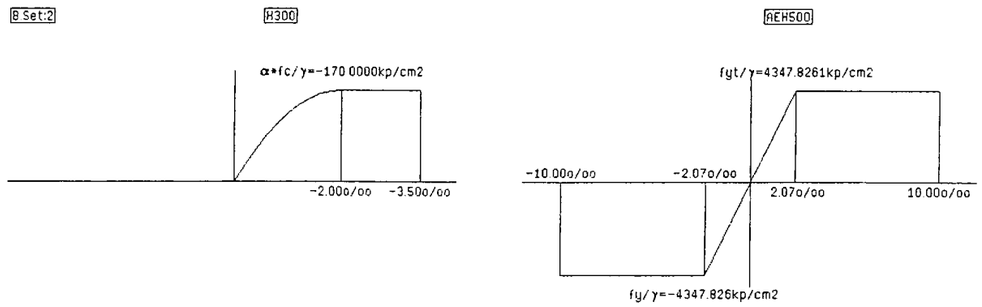
No	Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
9	AEH500	-0.1001	0.4387			0.5000	6.2045	6.2045
9	AEH500	0.1001	0.4387			0.5000	6.2045	6.2045
9	AEH500	-0.2806	0.3518			0.5000	6.2045	6.2045
9	AEH500	0.2806	0.3518			0.5000	6.2045	6.2045
9	AEH500	-0.4054	0.1952			0.5000	6.2045	6.2045
9	AEH500	0.4054	0.1952			0.5000	6.2045	6.2045
9	AEH500	-0.4500	0.0000			0.5000	6.2045	6.2045
9	AEH500	0.4500	0.0000			0.5000	6.2045	6.2045
9	AEH500	0.4054	-0.1952			0.5000	6.2045	6.2045
9	AEH500	-0.4054	-0.1952			0.5000	6.2045	6.2045
9	AEH500	0.2806	-0.3518			0.5000	6.2045	6.2045
9	AEH500	-0.2806	-0.3518			0.5000	6.2045	6.2045
9	AEH500	0.1001	-0.4387			0.5000	6.2045	6.2045
9	AEH500	-0.1001	-0.4387			0.5000	6.2045	6.2045

Max.x/h = 0.61 As-top/bot = 37.2268/49.6358 As = 1.11 % = 86.8626

18 ϕ 25

Nota: Es necesaria armadura de compresión

Material acorde a la sección: "PILAS"



ENVELOPE SPECIFIC.: DE 'COMBINACION FRECUENTE'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	0.500000		SOB UNIF 1
F	PLUS	7	0.500000		SOB UNIF 2
G	PLUS	8	0.500000		SOB UNIF 3
H	PLUS	9	0.500000		SOB UNIF 4
I	PLUS	10	0.500000		SOB UNIF 5
J	PLUS	11	0.500000		VEHICULO HIPOTESIS 11
K	OR	12	0.500000		VEHICULO HIPOTESIS 12
L	OR	13	0.500000		VEHICULO HIPOTESIS 13
M	OR	14	0.500000		VEHICULO HIPOTESIS 14
N	OR	15	0.500000		VEHICULO HIPOTESIS 15
O	OR	16	0.500000		VEHICULO HIPOTESIS 16
P	OR	17	0.500000		VEHICULO HIPOTESIS 17
Q	OR	18	0.500000		VEHICULO HIPOTESIS 18
R	OR	19	0.500000		VEHICULO HIPOTESIS 19
S	OR	20	0.500000		VEHICULO HIPOTESIS 20
T	OR	21	0.500000		VEHICULO HIPOTESIS 21
U	OR	22	0.500000		VEHICULO HIPOTESIS 22
V	OR	23	0.500000		VEHICULO HIPOTESIS 23
W	OR	24	0.500000		VEHICULO HIPOTESIS 24
X	OR	25	0.500000		VEHICULO POSICION 25
Y	OR	26	0.500000		VEHICULO POSICION 26
Z	OR	27	0.500000		VEHICULO POSICION 27
AA	OR	28	0.500000		VEHICULO POSICION 28
AB	OR	29	0.500000		VEHICULO POSICION 29
AC	OR	30	0.500000		VEHICULO POSICION 30
AD	OR	31	0.500000		VEHICULO POSICION 31
AE	OR	32	0.500000		VEHICULO POSICION 32
AF	OR	33	0.500000		VEHICULO POSICION 33
AG	OR	34	0.500000		VEHICULO POSICION 34
AH	OR	35	0.500000		VEHICULO POSICION 35
AI	OR	36	0.500000		VEHICULO POSICION 36
AJ	OR	37	0.500000		VEHICULO HIPOTESIS 37
AK	PLUS	60	0.500000		FRENADO
AL	PLUS	63	0.100000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.200000		TEMPERATURA (-)
AN	OR	65	0.200000		TEMPERATURA (+)
AO	PLUS	66	0.200000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PLUS	46	0.500000		SOB UNIF VANO 1
AU	PLUS	47	0.500000		SOB UNIF VANO 2
AV	PLUS	48	0.500000		SOB UNIF VANO 3
AW	PLUS	11	0.500000		VEHICULO HIPOTESIS 11
AX	OR	12	0.500000		VEHICULO HIPOTESIS 12

AY	OR	13	0.500000	VEHICULO HIPOTESIS 13
AZ	OR	14	0.500000	VEHICULO HIPOTESIS 14
BA	OR	15	0.500000	VEHICULO HIPOTESIS 15
BB	OR	16	0.500000	VEHICULO HIPOTESIS 16
BC	OR	17	0.500000	VEHICULO HIPOTESIS 17
BD	OR	18	0.500000	VEHICULO HIPOTESIS 18
BE	OR	19	0.500000	VEHICULO HIPOTESIS 19
BF	OR	20	0.500000	VEHICULO HIPOTESIS 20
BG	OR	21	0.500000	VEHICULO HIPOTESIS 21
BH	OR	22	0.500000	VEHICULO HIPOTESIS 22
BI	OR	23	0.500000	VEHICULO HIPOTESIS 23
BJ	OR	24	0.500000	VEHICULO HIPOTESIS 24
BK	OR	25	0.500000	VEHICULO POSICION 25
BL	OR	26	0.500000	VEHICULO POSICION 26
BM	OR	27	0.500000	VEHICULO POSICION 27
BN	OR	28	0.500000	VEHICULO POSICION 28
BO	OR	29	0.500000	VEHICULO POSICION 29
BP	OR	30	0.500000	VEHICULO POSICION 30
BQ	OR	31	0.500000	VEHICULO POSICION 31
BR	OR	32	0.500000	VEHICULO POSICION 32
BS	OR	33	0.500000	VEHICULO POSICION 33
BT	OR	34	0.500000	VEHICULO POSICION 34
BU	OR	35	0.500000	VEHICULO POSICION 35
BV	OR	36	0.500000	VEHICULO POSICION 36
BW	OR	37	0.500000	VEHICULO HIPOTESIS 37
BX	PLUS	60	0.500000	FRENADO
BY	PLUS	63	0.100000	VIENTO TRANSV CON SOB
BZ	PLUS	64	0.200000	TEMPERATURA (-)
CA	OR	65	0.200000	TEMPERATURA (+)
CB	PLUS	66	0.200000	GRADIENTE

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-327.126	1.023	-2.25E-10	2.15E-09	2.03E-09	-4.585
		-259.861	-0.710604	-0.946625	0.012349	7.496	7.682
		Min: AP AQ AS AT AU BI BZ			Max: AP AR AS AV BM BX BY...		
290	15.800	-296.088	1.023	-2.25E-10	2.15E-09	-1.53E-09	11.577
		-228.823	-0.710604	-0.630625	0.012349	-4.965	-3.546
		Min: AP AQ AS AT AU BI BZ			Max: AP AR AS AV BM BX BY...		
291	0	-327.582	-2.519	-2.22E-10	-2.05E-09	2.02E-09	16.688
		-260.317	-0.785143	-0.946625	-0.012349	7.496	4.420
		Min: AP AQ AS AU AV BK BX...			Max: AP AR AS AT BG BY CA...		
291	15.800	-296.545	-2.519	-2.22E-10	-2.05E-09	-1.49E-09	-23.108
		-229.279	-0.785143	-0.630625	-0.012349	-4.965	-7.985
		Min: AP AQ AS AU AV BK BX...			Max: AP AR AS AT BG BY CA...		

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-305.739	1.395	1.194	-0.069618	-3.516	-7.987
		-312.094	-0.460030	-2.140	0.081968	11.012	7.606
		Min: A C D E F M AN			Max: A B D G H I AE AK AL...		
290	15.800	-281.057	-0.460030	-1.824	0.081968	-20.310	0.337661
		-274.701	1.395	1.194	-0.069618	15.346	14.059
		Min: A B D G H I AE AK AL...			Max: A C D E F M AN		
291	0	-306.406	-2.345	1.194	0.069618	-3.516	15.614
		-312.339	-1.582	-2.140	-0.081968	11.012	8.972
		Min: A C D E F O AK AM			Max: A B D G H I AG AL AN...		
	15.800	-281.513	-1.036	-1.824	-0.081968	-20.310	-11.868
		-275.157	-2.891	1.194	0.069618	15.346	-25.590
		Min: A B D G H I AG AL AM...			Max: A C D E F O AK AN		

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-301.420	2.254	-1.64E-09	4.76E-09	1.08E-08	-12.668
		-297.603	-1.892	-0.946625	0.012349	7.496	14.636
		Min: AP AQ AS AU BJ CA CB			Max: AP AR AS AT AV BG BX...		
290	15.800	-266.566	-1.892	-0.630625	0.012349	-4.965	-15.254
		-270.383	2.254	-1.64E-09	4.76E-09	-1.50E-08	22.946
		Min: AP AR AS AT AV BG BX...			Max: AP AQ AS AU BJ CA CB		
291	0	-298.060	0.396074	-0.946625	-0.012349	7.496	-2.534
		-301.876	-3.750	-1.63E-09	-4.66E-09	1.08E-08	24.771
		Min: AP AR AS AT AV BM BY...			Max: AP AQ AS AU BJ BX CA...		
291	15.800	-270.839	-3.750	-1.63E-09	-4.66E-09	-1.50E-08	-34.477
		-267.022	0.396074	-0.630625	-0.012349	-4.965	3.724
		Min: AP AQ AS AU BJ BX CA...			Max: AP AR AS AT AV BM BY...		

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: Fisuracion de la pila
Fecha: 7/5/01 15.33.40

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 88.6 cm Alto = 88.6 cm Canto útil = 83.85 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 24.54 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 25 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0033037
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 17.72 cm
Area de hormigón eficaz, Ac,eficaz = 1962.49 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 32.90 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 1708.9 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 1298.4 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 20.54 cm
Alargamiento medio de las fisuras, Esm = 0.000259675
Apertura de fisura, Wk = 0.000 mm
La sección no se ha llegado a fisurar por no rebasarse fct,m en el hormigón

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.000 mm
Apertura de fisura máxima, Wmax = 0.300 mm

4.2. Cálculo de la cimentación

ENVELOPE SPECIFIC.: DC 'COMBINACION CARACTERISTICA' ELS

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-382.897	-0.046015	-2.83E-10	3.29E-09	2.46E-09	5.849
		-249.322	-1.697	-2.840	0.037048	22.487	16.018
		Min: DS DT DV DW DX DY EM...			Max: CF CH CI CL DC DN DO...		
290	15.800	-351.860	-0.046015	-2.83E-10	3.29E-09	-2.01E-09	5.122
		-218.285	-1.697	-1.892	0.037048	-14.894	-10.797
		Min: DS DT DV DW DX DY EM...			Max: CF CH CI CL DC DN DO...		
291	0	-383.810	-2.945	-2.70E-10	-3.10E-09	2.39E-09	18.355
		-250.234	-1.294	-2.840	-0.037048	22.487	8.186
		Min: DS DT DV DW DY DZ EO...			Max: CF CH CI CJ CW DO DQ...		
291	15.800	-352.772	-2.945	-2.70E-10	-3.10E-09	-1.89E-09	-28.183
		-219.197	-1.294	-1.892	-0.037048	-14.894	-12.264
		Min: DS DT DV DW DY DZ EO...			Max: CF CH CI CJ CW DO DQ...		

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-344.096	2.356	2.388	-0.139237	-7.032	-14.482
		-349.816	-2.853	-5.227	0.176284	29.519	29.394
		Min: A C D E F M AN			Max: AP AQ AS AT AW AX AY...		
290	15.800	-318.778	-2.853	-4.279	0.176284	-45.585	-15.680
		-313.059	2.356	2.388	-0.139237	30.691	22.735
		Min: AP AQ AS AT AW AX AY...			Max: A C D E F M AN		
291	0	-346.066	-2.611	2.388	0.139237	-7.032	16.278
		-349.671	-2.875	-5.227	-0.176284	29.519	17.219
		Min: AP AR AS AT AU AV BE...			Max: A B D G H I AG AL AN...		
291	15.800	-319.691	-0.138718	-4.279	-0.176284	-45.585	-7.381
		-313.971	-5.347	2.388	0.139237	30.691	-45.796
		Min: AP AQ AS AT AW AX AY...			Max: A C D E F O AK AN		

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-328.009	4.219	-4.57E-09	1.01E-08	2.93E-08	-24.615
		-328.284	-5.863	-2.840	0.037048	22.487	44.225
		Min: CF CG CI CK CZ DQ DR			Max: DS DU DV DW DX DZ EK...		
290	15.800	-297.247	-5.863	-1.892	0.037048	-14.894	-48.405
		-296.972	4.219	-4.57E-09	1.01E-08	-4.29E-08	42.051
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
291	0	-329.196	2.871	-2.840	-0.037048	22.487	-20.021
		-328.921	-7.211	-4.56E-09	-9.94E-09	2.93E-08	48.819
		Min: DS DU DV DW DX DZ EQ...			Max: CF CG CI CK CZ DN DQ...		
291	15.800	-297.884	-7.211	-4.56E-09	-9.94E-09	-4.28E-08	-65.112
		-298.159	2.871	-1.892	-0.037048	-14.894	25.344
		Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 1 :
Dirección transversal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **14.9** Mk (KNm) = 146.0
Nk (t) = **-218.3** Nk (KN) = -2139.3

Pie de pórtico
Mk (tm) = **22.5** Mk (KNm) = 220.5
Nk (t) = **-249.3** Nk (KN) = -2443.3

Dirección longitudinal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **10.8** Mk (KNm) = 105.8
Nk (t) = **-218.3** Nk (KN) = -2139.3

Pie de pórtico
Mk (tm) = **16.0** Mk (KNm) = 157.0
Nk (t) = **-249.3** Nk (KN) = -2443.3

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A * \Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.090 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.064 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 15.80

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :

e_a = 0.228

e_{tot} (m) = 0.319

Pie de pórtico

Mk (tm) = 79.42
Nk (t) = -249.32

Mk (KNm) = 778.3
Nk (KN) = -2443.3

Solicitaciones de cálculo longitudinales :

e_a = 0.215

e_{tot} (m) = 0.280

Pie de pórtico

Mk (tm) = 69.73
Nk (t) = -249.32

Mk (KNm) = 683.3
Nk (KN) = -2443.3

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2° orden en las zapatas ELS
HIPOTESIS 2 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-352.8** Nk (KN) = -3457.4

Pie de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-383.8** Nk (KN) = -3761.2

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **28.2** Mk (KNm) = 276.4
Nk (t) = **-352.8** Nk (KN) = -3457.4

Pie de pórtico

Mk (tm) = **18.4** Mk (KNm) = 180.3
Nk (t) = **-383.8** Nk (KN) = -3761.2

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A * \Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.000 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.080 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 15.80

$\varepsilon y = fyd / Es$ = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :
e_a = 0.155

e_{tot} (m) = 0.155

Pie de pórtico

Mk (tm) = 59.43
Nk (t) = -383.80

Mk (KNm) = 582.4
Nk (KN) = -3761.2

Solicitaciones de cálculo longitudinales :
e_a = 0.224

e_{tot} (m) = 0.304

Pie de pórtico

Mk (tm) = 116.50
Nk (t) = -383.80

Mk (KNm) = 1141.7
Nk (KN) = -3761.2

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 3 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **30.7** Mk (KNm) = 300.9
Nk (t) = **-314.0** Nk (KN) = -3077.2

Pie de pórtico

Mk (tm) = **29.6** Mk (KNm) = 290.1
Nk (t) = **-349.7** Nk (KN) = -3427.1

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **45.8** Mk (KNm) = 448.8
Nk (t) = **-314.0** Nk (KN) = -3077.2

Pie de pórtico

Mk (tm) = **17.2** Mk (KNm) = 168.6
Nk (t) = **-349.7** Nk (KN) = -3427.1

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A *\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **63.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.098 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.146 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 15.80

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :
e_a = 0.231

e_{tot} (m) = 0.329

Pie de pórtico

Mk (tm) = 115.11
Nk (t) = -349.70

Mk (KNm) = 1128.0
Nk (KN) = -3427.1

Solicitaciones de cálculo longitudinales :
e_a = 0.247

e_{tot} (m) = 0.393

Pie de pórtico

Mk (tm) = 137.28
Nk (t) = -349.70

Mk (KNm) = 1345.3
Nk (KN) = -3427.1

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 4 :

Dirección transversal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-297.9** Nk (KN) = -2919.4

Pie de pórtico
Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-328.9** Nk (KN) = -3223.4

Dirección longitudinal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **65.1** Mk (KNm) = 638.1
Nk (t) = **-297.9** Nk (KN) = -2919.4

Pie de pórtico
Mk (tm) = **48.8** Mk (KNm) = 478.4
Nk (t) = **-328.9** Nk (KN) = -3223.4

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **15.80**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.0888

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A*\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 15.80

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ **= 63.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

$e_e = 0.000$ Máxima excentricidad de cálculo de 1er orden transversal
$e_e = 0.219$ Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 15.80

$\varepsilon y =$ fyd / Es = 0.002070

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$$\beta = \frac{(d - d')^2}{4\,is^2}$$ Factor de armado

De tablas se obtiene :

$$is^2 = \frac{1}{6}(d - d')^2 \qquad \beta = 1.50$$

Solicitaciones de cálculo transversales :
$e_a = 0.155$

e_{tot} (m) = 0.155

Pie de pórtico

Mk (tm) = 50.93
Nk (t) = -328.92

Mk (KNm) = 499.1
Nk (KN) = -3223.4

Solicitaciones de cálculo longitudinales :
$e_a = 0.261$

e_{tot} (m) = 0.480

Pie de pórtico

Mk (tm) = 157.76
Nk (t) = -328.92

Mk (KNm) = 1546.1
Nk (KN) = -3223.4

Comprobación de punzonamiento
Articulo 46 EHE

Dimensiones del soporte

Ancho (m)	0.89
Canto (m)	1.20
Canto útil (m)	1.15

u1 (m)	18.64

Losa sin armadura de punzonamiento

Nd (t)	534.30
β	1.15
Fsd,ef	614.45
τsd (t/m2)	***28.66***

ξ	1.417
ϕ (pm)	25
nº (pm)	5.71428
As (cm2)	28.05
ρ	2.439E-03
fck (Mpa)	25
τrd (MPa)	0.311
τrd (t/m2)	***31.07***

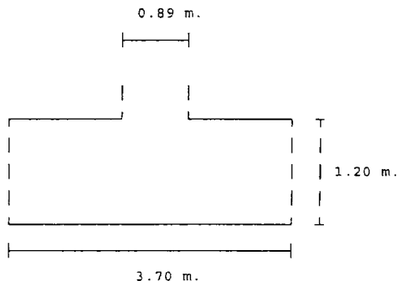
τsd (t/m2)	***< τrd (t/m2)***

..uctura .....:PS Camino 13C PK 312+491

Pila Nº : 1

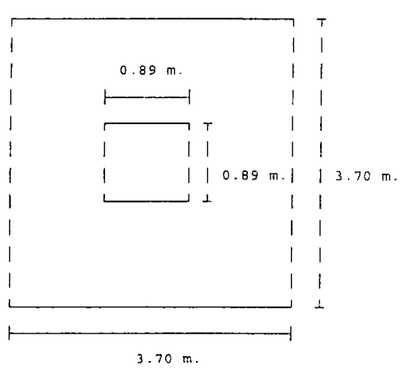
©DIBUJO

* dibujo sin escala



ALZADO

Dirección del eje del tablero



PLANTA

CARACTERISTICAS DE LOS MATERIALES Y CIMENTACION

Fck (Kg/cm²) ..... 250 γcd ... 1.50

Fyk (Kg/cm²) ..... 5100 γyd ... 1.15

Recubrimiento de armaduras ..... 4.0 cms

Tensión admisible del terreno ..... 5.00 Kg/cm²

Coeficiente de rozamiento en cimentación ... 0.55

Coeficiente de seguridad al deslizamiento... 1.50

Coeficiente de seguridad al vuelco 1.80

©ESFUERZOS CONSIDERADOS

* Longitudinal y transversal según la dirección del eje del tablero
* Esfuerzos en t y m.t

Hipótesis	Axil	F.Long	F.Trans	M.Long	M.Trans	γf
1	249.32	1.70	2.84	69.73	79.42	1.50
2	383.80	2.95	0.00	116.50	59.43	1.50
3	349.70	2.90	5.20	137.28	115.11	1.50
4	328.92	7.20	0.00	157.76	50.93	1.50

RESULTADOS DE CALCULO

©Tensiones sobre el Terreno en Kg/cm² y coeficientes de seguridad

Hipótesis	σ1	σ2	σ3	σ4	σcob	Cd	Cv
1	3.95	1.99	2.25	0.29	2.89	56.24	6.49
2	5.23	3.82	2.39	0.98	3.96	79.21	6.55
3	5.96	3.08	2.62	-0.25	4.26	41.33	5.14
4	5.28	4.07	1.33	0.13	3.86	28.26	4.11

Tensión cobaricéntrica Máxima 4.26 Kg/cm² para la Hipótesis 3

©Esfuerzos de cálculo

* Esfuerzos en m.t/m y t/m Armaduras en cm²/m

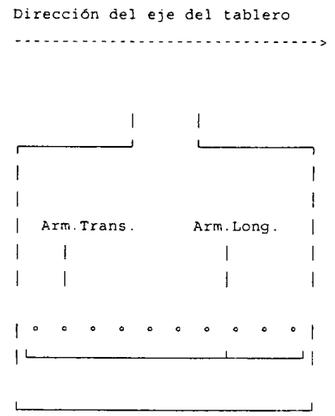
Recubrimiento de armaduras= 4.0 cms

Uc= 1933 t/m

Vcu long..= 149.76 t/m
Vcu trans.= 149.76 t/m

Hipótesis	M.long	M.trans	Ar.long	Ar.trans	Vd long.	Vd Trans.
1	60.76	60.12	11.98	11.85	2.97	2.97
2	80.65	84.19	15.97	16.69	4.26	4.22
3	92.42	93.55	18.35	18.58	4.94	4.93
4	78.79	85.54	15.59	16.96	4.32	4.23

©DIBUJO DE LA ARMADURA



ALZADO

Armadura longitudinal Máxima 18.35 cm²/m para la Hipótesis 3

Armadura transversal Máxima 18.58 cm²/m para la Hipótesis 3

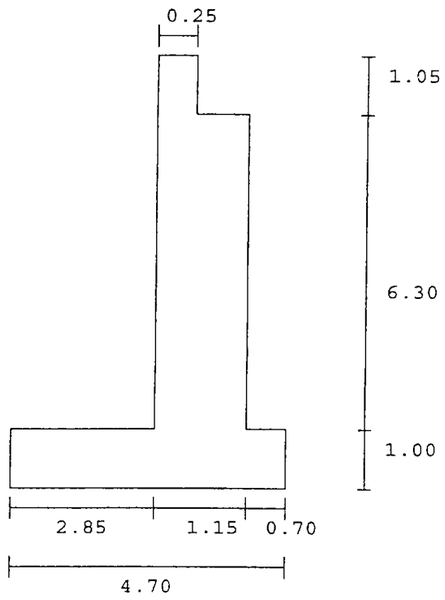
ESTRIBOS

Estructura ....:PS Camino 13C PK 312+491

Estribo .....:E-1

DATOS GEOMETRICOS (sin escala)

* Cotas en mtrs.



Area de la sección 12.21 m²

MATERIALES

Hormigón en zapata ..... 250 Kg/cm²

Hormigón en alzados ..... 300 Kg/cm²

Coeficiente de seguridad del hormigón 1.50

Acero en armaduras, zapata y alzado ..... 5100 Kg/cm²

Coeficiente de seguridad del acero 1.15

CARACTERISTICAS DEL TERRENO

Densidad de las tierras (t/m3) 2.00

Coeficiente de empuje activo horizontal 0.33

Tensión admisible del terreno en cimentación (Kg/cm²) 4.0

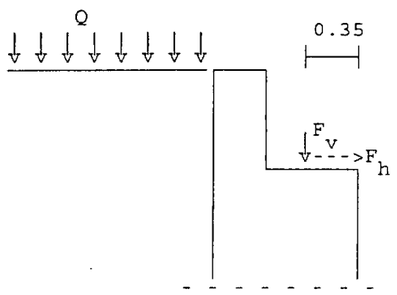
Coeficiente de rozamiento en cota de cimentación 0.55

Coeficiente de seguridad al deslizamiento (Cd) 1.50

Coeficiente de seguridad al vuelco (Cv) 1.80

Altura considerada de empuje de tierras (mtrs.) 8.35

CARGAS ACTUANTES



Reacciones Verticales (Fv t/m)

Cargas Permanentes : 9.95

Sobrecargas Máximas: 12.55
Sobrecargas Mínimas: 0.00
Sobrecarga q (t/m²): 1.00

Reacciones Horizontales (Fh t/m)

Reológicas : 0.38
Temperatura : 0.47
Frenado : 0.40

COMBINACIONES

A) 1.35*(Peso Propio)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

B) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)

C) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Máximas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

D) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Mínimas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

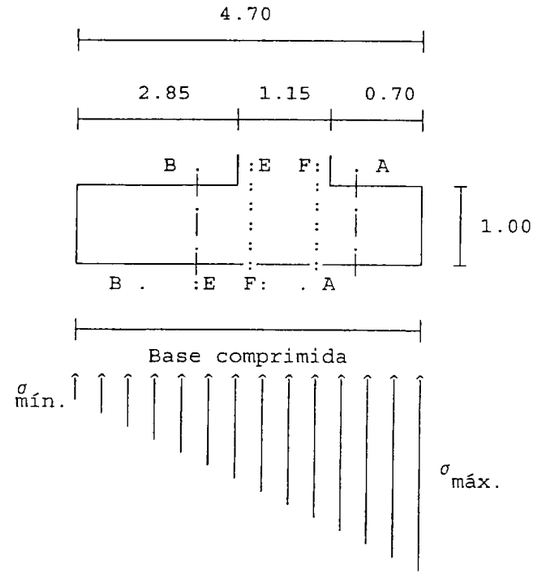
ESFUERZOS DE COMBINACIONES

Combinación	Fv(t/m)	Fh(t/m)	Q(t/m²)
A	0.00 0.00	0.00 0.00	1.00 1.25
B	9.95 13.43	0.85 1.22	1.00 1.50
C	22.50 32.26	1.25 1.31	1.00 1.50
D	9.95 13.43	1.25 1.82	1.00 1.50

COMPROBACION DE ESTABILIDAD:

Hipótesis	ΣFv(t/m)	ΣFh(t/m)	Cd	ΣMe(mt/m)	ΣMv(mt/m)	Cv
A	75.26	25.76	1.61	198.38	75.54	2.63
B	85.21	26.61	1.76	208.83	81.75	2.55
C	97.76	27.01	1.99	222.00	84.67	2.62
D	85.21	27.01	1.73	208.83	84.67	2.47

TENSIONES EN CIMIENTOS



COMPROBACION DE TENSIONES:

Hipótesis	σmáx. (t/m²)	σmín. (t/m²)	σcob. (t/m²)	Base comprimida
A	30.69	1.34	23.06	4.70
B	38.09	0.00	28.57	4.47
C	46.40	0.00	34.80	4.21
D	38.99	0.00	29.24	4.37

ARMADURAS:

ZAPATA

CORTANTE: fcv= 64.55 t/m² (EH-91)

Sección A-A | d = 0.34 m.
Vcu= 43.57 t/m (EH-91)

Sección B-B | d = 0.95 m.
Vcu= 61.32 t/m (EH-91)

FLEXION: | d = 0.95 m.
Uc = 1346 t/m

ZAPATA DELANTERA:

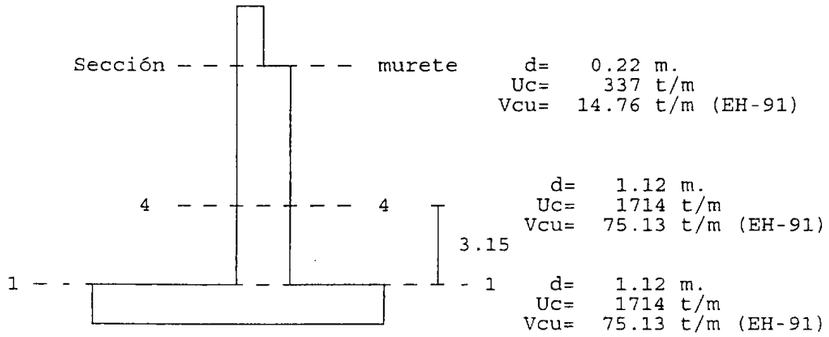
Hipót.	Vd(A-A) (t/m)	Vcu t/m (EHE)	Md(F-F) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	9.10	24.30	14.72	15.58	12.14	3.62
B	11.50	24.30	18.53	19.65	12.14	3.62
C	14.02	24.30	22.57	23.97	12.14	3.62
D	11.84	24.30	19.05	20.21	12.14	3.62

ZAPATA TRASERA:

Hipót.	Vd(B-B) (t/m)	Vcu t/m (EHE)	Md(E-E) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)	
A	-36.12	28.97	-83.77	91.27	20.58	4.00	Aα= 1.99 cm²/
B	-39.27	29.65	-89.54	97.80	22.05	4.28	Aα= 2.68 cm²/
C	-39.47	29.51	-88.36	96.47	21.75	4.22	Aα= 2.77 cm²/
D	-40.66	29.96	-92.29	100.94	22.76	4.41	Aα= 2.98 cm²/

ALZADO

fcv= 67.08 t/m²



SECCION 1-1:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	29.77	35.22	25.34	76.26	69.50	16.93	18.40
B	31.60	38.15	38.77	89.18	81.57	18.53	18.40
C	31.68	41.40	57.60	93.97	86.06	19.41	18.40
D	32.20	38.53	38.77	92.96	85.12	19.19	18.40

SECCION 4-4:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	10.46	32.50	13.11	15.46	13.86	15.46	18.40
B	12.03	34.46	26.54	23.05	20.71	15.46	18.40
C	12.12	37.21	45.37	27.56	24.79	15.46	18.40
D	12.63	34.46	26.54	24.94	22.42	15.46	18.40

SECCION MURETE:

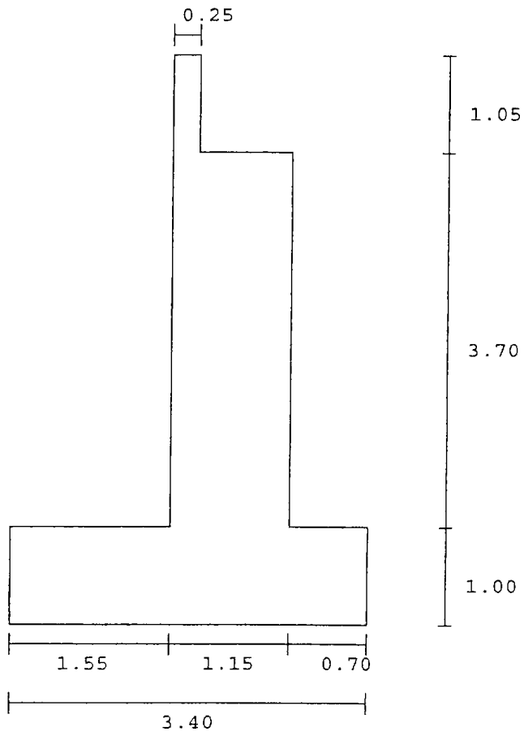
Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm^2/m)	Reparto (cm^2/m)
A	0.98	8.15	0.89	0.42	1.91	3.04	4.00
B	1.07	8.15	0.89	0.46	2.12	3.04	4.00
C	1.07	8.15	0.89	0.46	2.12	3.04	4.00
D	1.07	8.15	0.89	0.46	2.12	3.04	4.00

Estructura ....:PS Camino 13C PK 312+491

Estribo .....:E-2

DATOS GEOMETRICOS (sin escala)

* Cotas en mtrs.



Area de la sección 7.92 m²

MATERIALES

Hormigón en zapata y alzado ..... 250 Kg/cm²

Coeficiente de seguridad del hormigón 1.50

Acero en armaduras, zapata y alzado ..... 5100 Kg/cm²

Coeficiente de seguridad del acero 1.15

CARACTERISTICAS DEL TERRENO

Densidad de las tierras (t/m3) 2.00

Coeficiente de empuje activo horizontal 0.33

Tensión admisible del terreno en cimentación (Kg/cm²) 3.0

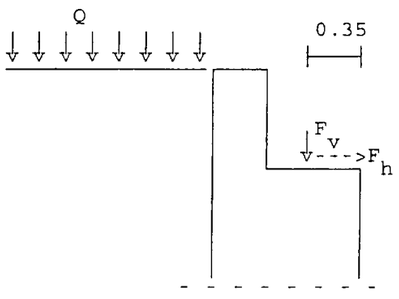
Coeficiente de rozamiento en cota de cimentación 0.55

Coeficiente de seguridad al deslizamiento (Cd) 1.50

Coeficiente de seguridad al vuelco (Cv) 1.80

Altura considerada de empuje de tierras (mtrs.) 5.75

CARGAS ACTUANTES



Reacciones Verticales (Fv t/m)

Cargas Permanentes : 9.95

Sobrecargas Máximas: 12.55
Sobrecargas Mínimas: 0.00
Sobrecarga q (t/m²): 1.00

Reacciones Horizontales (Fh t/m)

Reológicas : 0.38
Temperatura : 0.47
Frenado : 0.40

COMBINACIONES

A) 1.35*(Peso Propio)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

B) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)

C) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Máximas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

D) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Mínimas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

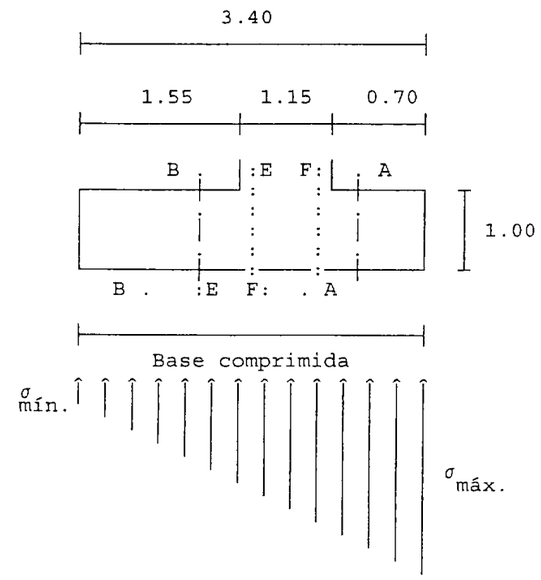
ESFUERZOS DE COMBINACIONES

Combinación	Fv(t/m)	Fh(t/m)	Q(t/m²)
A	0.00 0.00	0.00 0.00	1.00 1.25
B	9.95 13.43	0.85 1.22	1.00 1.50
C	22.50 32.26	1.25 1.31	1.00 1.50
D	9.95 13.43	1.25 1.82	1.00 1.50

COMPROBACION DE ESTABILIDAD:

Hipótesis	ΣFv(t/m)	ΣFh(t/m)	Cd	ΣMe(mt/m)	ΣMv(mt/m)	Cv
A	36.07	12.81	1.55	71.87	26.37	2.73
B	46.02	13.66	1.85	82.31	30.36	2.71
C	58.57	14.06	2.29	95.49	32.24	2.96
D	46.02	14.06	1.80	82.31	32.24	2.55

TENSIONES EN CIMIENTOS



COMPROBACION DE TENSIONES:

Hipótesis	σmáx. (t/m²)	σmín. (t/m²)	σcob. (t/m²)	Base comprimida
A	18.82	2.40	14.30	3.40
B	27.18	0.00	20.38	3.39
C	36.16	0.00	27.12	3.24
D	28.20	0.00	21.15	3.26

ARMADURAS:

ZAPATA

CORTANTE: fcv= 64.55 t/m² (EH-91)

Sección A-A | d = 0.34 m.
Vcu= 43.57 t/m (EH-91)

Sección B-B | d = 0.95 m.
Vcu= 122.64 t/m (EH-91)

FLEXION: | d = 0.95 m.
Uc = 1346 t/m

ZAPATA DELANTERA:

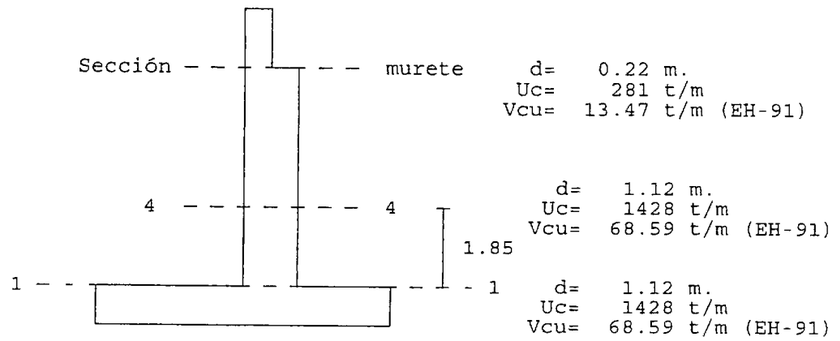
Hipót.	Vd(A-A) (t/m)	Vcu t/m (EHE)	Md(F-F) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	5.29	24.30	8.41	8.88	12.14	3.62
B	7.84	24.30	12.41	13.13	12.14	3.62
C	10.49	24.30	16.62	17.61	12.14	3.62
D	8.22	24.30	12.96	13.72	12.14	3.62

ZAPATA TRASERA:

Hipót.	Vd(B-B) (t/m)	Vcu t/m (EHE)	Md(E-E) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	-14.87	24.30	-19.86	21.07	12.14	3.62
B	-16.32	24.30	-21.49	22.82	12.14	3.62
C	-15.18	24.30	-19.66	20.85	12.14	3.62
D	-17.33	24.30	-22.71	24.12	12.14	3.62

ALZADO

fcv= 61.24 t/m²



SECCION 1-1:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	13.13	29.31	15.25	21.94	19.72	12.88	18.40
B	14.74	31.27	28.68	30.40	27.40	12.88	18.40
C	14.82	34.02	47.50	34.96	31.56	12.88	18.40
D	15.34	31.27	28.68	32.62	29.43	12.88	18.40

SECCION 4-4:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	5.36	28.26	8.07	5.36	4.79	12.88	18.40
B	6.82	30.22	21.50	10.98	9.84	12.88	18.40
C	6.90	32.97	40.32	15.38	13.80	12.88	18.40
D	7.42	30.22	21.50	12.09	10.84	12.88	18.40

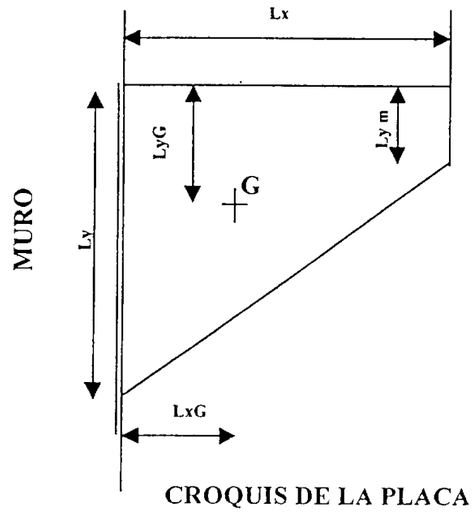
ϕ16/15+ϕ12/15

ϕ20/20

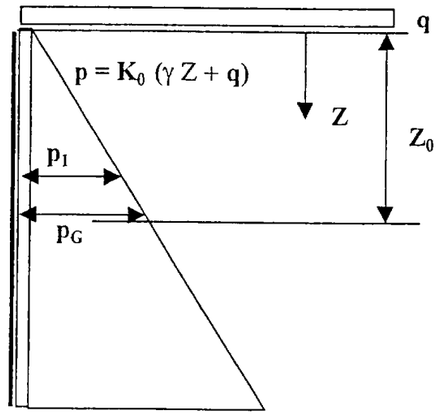
SECCION MURETE:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	0.98	7.23	0.89	0.42	1.91	2.53	4.00
B	1.07	7.23	0.89	0.46	2.12	2.53	4.00
C	1.07	7.23	0.89	0.46	2.12	2.53	4.00
D	1.07	7.23	0.89	0.46	2.12	2.53	4.00

ALETAS MURO DE ESTRIBOS



CROQUIS DE LA PLACA



PRESIONES SOBRE LA PLACA

1, DATOS

GEOMETRIA

Ly_m =	0.500	m
L_Y =	2.600	m
L_X =	2.100	m
L_{YG} =	0.894	m
L_{XG} =	0.813	m
h =	0.300	m
r =	0.035	m
d_x =	0.265	m
d_y =	0.245	m
b = b_w =	1.000	m

EMPUJES

q =	1.80	tm^{-2}
γ =	2.00	tm^{-3}
Φ =	33	º
K_0 =	0.5	
$p_1 = K_0 ((L_{y\,m}) \gamma + q)$ =	1.4	tm^{-2}
$p_G = K_0 ((L_{yG})^* \gamma + q)$ =	1.8	tm^{-2}
γ_f =	1.5	

MATERIALES

H-30

f_{ck} =	3000	tm^{-2}
γ_c =	1.5	
f_{cd} =	2000	tm^{-2}
f_{cv} =	70.7	tm^{-2}

BS500

f_{yk} =	51000	tm^{-2}
γ_y =	1.15	
f_{yd} =	44348	tm^{-2}
f_{yad} =	42000	tm^{-2}

2. DETERMINACIÓN DE LAS SOLICITACIO

$M_{xGd} = \gamma_f \times A \times p_G \times L_{xG} / L_y$ = 2.7

$M_{x1d} = \gamma_f \times p_1 \times L_x^{\,2} / 2$ = 4.6

$V_{xd} = \gamma_f \times A \times p_G / L_y$ = 3.4

3. DIMENSIONAMIENTO

3,1, FLEXIÓN

ARMADURAS MÍNIMAS :

DIRECCIÓN X : $A_{s\,total} = 1{,}6 / 1000 \times h \times b$ =
$A_{s\,min\,c/cara} = 0{,}53 / 1000 \times h$ ›

DIRECCIÓN Y : $A_{s\,total} = 0{,}9 / 1000 \times h \times b$ =
$A_{s\,min\,c/cara} = 0{,}3 / 1000 \times h$ x

DIRECCIÓN X $U_{cx} = 0.85 \times f_{cd} \times d_x \times b$ =
CARA INTERIOR (TIERRAS)

M_d = 4.6

$U_{s1} = U_c \times (1 - (1 - 2 \times M_d /$
$A_{s1} = U_{s1} / f_{yd}$ =

3.2. CORTANTE

DIRECCIÓN X :

$V_{u1x} = 0{,}30 \times b_w \times d_x f_{cd}$ = 159 t

$Vcu = (0.12\ \xi\ (100\ \rho l\ fck)^{1/3})\ bo\ d$ = 12.4

Vd_x = 3.4 t

$Vd_x < V_{u1x}$
$Vd_x < V_{cux}$ No requiere armaduras de cortante

OBJETO DE LA PRUEBA

El objeto de esta prueba consiste en comprobar que la estructura en estudio presenta un comportamiento satisfactorio frente a las sobrecargas de cálculo. Dichas sobrecargas son las definidas en la "Instrucción sobre las acciones a considerar en el Proyecto de Puentes de Carreteras: I.A.P.", dada por Orden Ministerial del 12 de Febrero de 1998.

El tren tipo, definido en dicha Instrucción, ha sido sustituido por camiones, cuyas características se indican mas adelante, que, de acuerdo con las "Recomendaciones para el Proyecto y Ejecución de Pruebas de Carga en Puentes de Carretera" del M.O.P.U., originen esfuerzos **"no mas desfavorables que los del tren de cargas de la Instrucción, estimándose como suficientes si tales esfuerzos oscilan en torno al 60 % de los valores teóricos producidos por el tren de carga de la IAP" (Artículo 6.1 de las Recomendaciones).**

DESCRIPCIÓN DEL ENSAYO Y PLAN DE CARGAS

La estructura a ensayar consiste en un tablero continuo tipo losa maciza, con tres vanos de 13.00m – 17.00 m – 13.00 m , con un ancho total de 7.70 m, y un ancho de plataforma de 6.00 m.

El tablero está formado por una losa maciza de hormigón armado de canto constante 0.90 m y un ancho total de 7.70 m, medidos perpendiculares al eje de replanteo de la estructura. El apoyo de la losa sobre los estribos, se realiza mediante dos aparatos de neopreno, y sobre las pilas se empotra el tablero.

El estudio de los momentos máximos flectores positivos se va a realizar en las situaciones siguientes:

El estudio de los momentos flectores positivos vano 1 en el estado de carga 1.

El estudio de los momentos flectores positivos vano 2 en el estado de carga 2.

Los camiones adoptados corresponden a un vehículo con una carga total de 25.0 toneladas, correspondiendo 7.0 t. al eje delantero y 9 t. a cada uno de los dos ejes traseros, siendo las dimensiones del vehículo:

Ancho total . . . . . 2,50 m.

Ancho de la vía anterior. . . . . .2.00 m.

Ancho de las vías posteriores . . . . 2.00 m.

Longitud total. . . . . 8.40 m.

Voladizo posterior. . . . . 1.85 m.

Distancia eje 1º al 2º. . . . . 3,80 m.

Distancia eje 2º al 3º. . . . . 1,35 m.

La disposición de los vehículos durante la realización de la prueba de carga será la siguiente:

Para obtener el máximo momento flector positivo en el vano 1 se colocarán 2 filas de dos camiones en paralelo (cuatro camiones en total situados en el centro del vano 1.

Para obtener el máximo momento flector positivo en el vano 2 se colocarán 2 filas de dos camiones en paralelo (cuatro camiones en total), situados en el centro del vano 2.

El Plan de Carga constará de dos estados de carga, compuestos de los siguientes escalones de carga:

Estado de carga nº 1:

Escalón - 0 : Puente descargado

Escalón - 1 : Carga de la primera fila de camiones en vano 1

Escalón - 2 : Carga de la segunda fila de camiones (máxima flexión positiva en centro de vano)

Estado de carga nº 2:

Escalón - 3 : Paso del primer escalón a la posición sobre el vano 2.

Escalón - 4 : Paso del segundo escalón a la posición sobre el vano 2.(máxima flexión positiva)

Estado de carga nº 3:

Escalón - 7 : Descarga del primer escalón

Escalón - 8 : Descarga del segundo escalón

Escalón - 9 : Puente descargado

Cumpliendo este plan de carga, no se pasará al escalón siguiente hasta que los aparatos de medida no acusen la estabilización de las lecturas, lo que se supondrá ha ocurrido cuando la diferencia entre dos lecturas efectuadas en un intervalo no inferior a 10 minutos, sea inferior al 5% de la flecha correspondiente a la última lectura.

MEDIDAS A REALIZAR

Se determinarán, mediante el uso de flexímetros si el tráfico inferior lo permite, o bien nivelación de alta precisión en caso contrario, los descensos producidos en los apoyos de la losa sobre estribos, pilas y en la sección central de cada vano. El número de unidades de medida será catorce (14), cuatro (4) para los apoyos de los estribos, cuatro (4) para los apoyos en las pilas y seis (6) en el centro de vano

La media de los valores medidos en los apoyos se restará al valor obtenido en las secciones centrales, para determinar la flecha de la losa. Se registrarán en cada escalón todos los valores obtenidos.

Durante la ejecución de las pruebas se medirá la temperatura ambiente en la zona del puente. Deberán elegirse las horas adecuadas para que las condiciones climatológicas perturben lo menos posible el comportamiento de la estructura.

CONCLUSIONES

Estado de carga nº 1:

Máxima flexión positiva en el centro del vano 1 :

Los máximos momentos flectores positivos de sobrecargas, en mT, previstos en el cálculo del tablero, para las secciones más cargadas del centro de vano 1 son:

Barras	S.Unif.+ Carro	Prueba de carga	Porcentaje
70	183.46	109.67	60 %

Las flechas que se esperan para este estado de carga son las siguientes:

Punto de la sección central vano 1 2.03 mm.

Punto de la sección central vano 2 -0.63 mm.

Punto de la sección central vano 3 0.10 mm.

Estado de carga nº 2

Máxima flexión positiva en el centro del vano 2 :

Los máximos momentos flectores positivos de sobrecargas, en mT, previstos en el cálculo del tablero, para las secciones más cargadas del vano 2 son:

Barras	S.Unif.+ Carro	Prueba de carga	Porcentaje
80	199.67	117.406	59 %

Las flechas que se esperan para este estado de carga son las siguientes:

Punto de la sección central vano 1 -0.81 mm.

Punto de la sección central vano 2 3.60 mm.

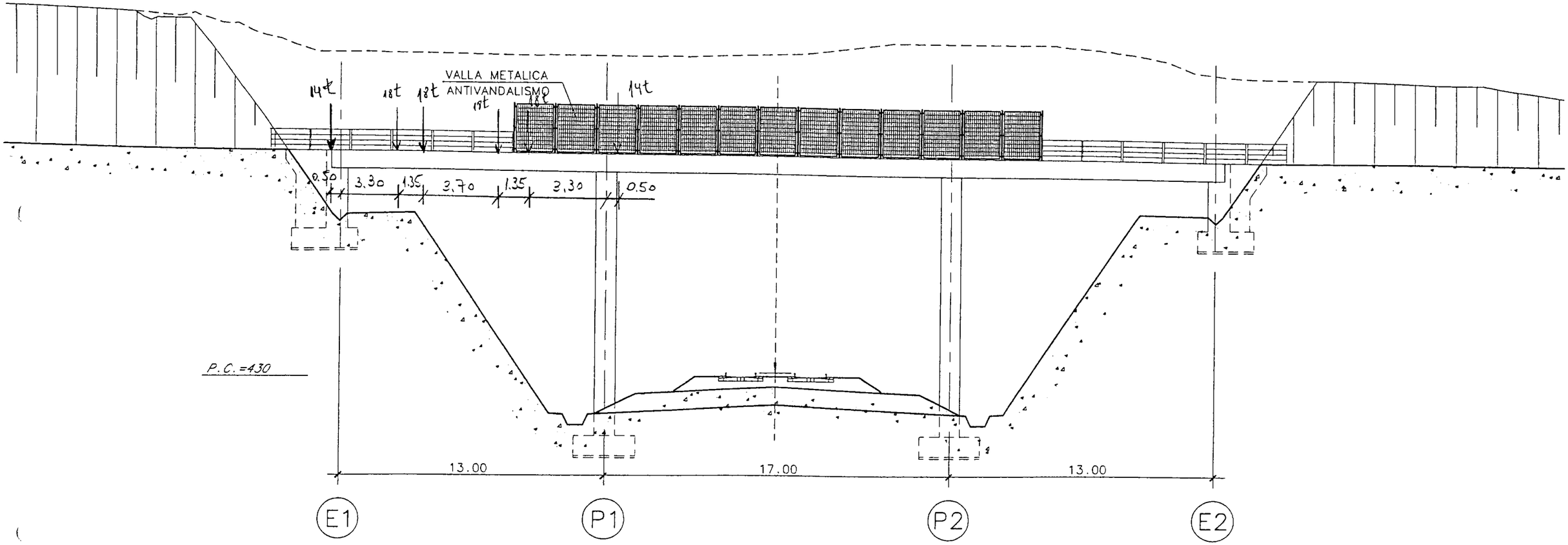
Punto de la sección central vano 3 -0.81 mm.

En todas ellas, se considera positivo el movimiento descendente y negativo el ascendente. Estas flechas corresponden a la deformación de la estructura sin incluir la correspondiente al descenso de apoyos, por lo que, en el ensayo, se obtendrán deduciendo del valor medido en la sección central el correspondiente a la media de registros efectuados en las proximidades de los apoyos, y que representa el descenso de los mismos.

El módulo de elasticidad supuesto para el cálculo de las flechas ha sido: $\mathbf{E = 3{,}55 \cdot 10^6\ T/m^2}$. por lo que las flechas indicadas deberán modificarse con la relación entre este módulo supuesto y el correspondiente al hormigón realmente colocado en obra, el cual, podrá evaluarse a partir de las indicaciones dadas en el art 39.6 dela EH

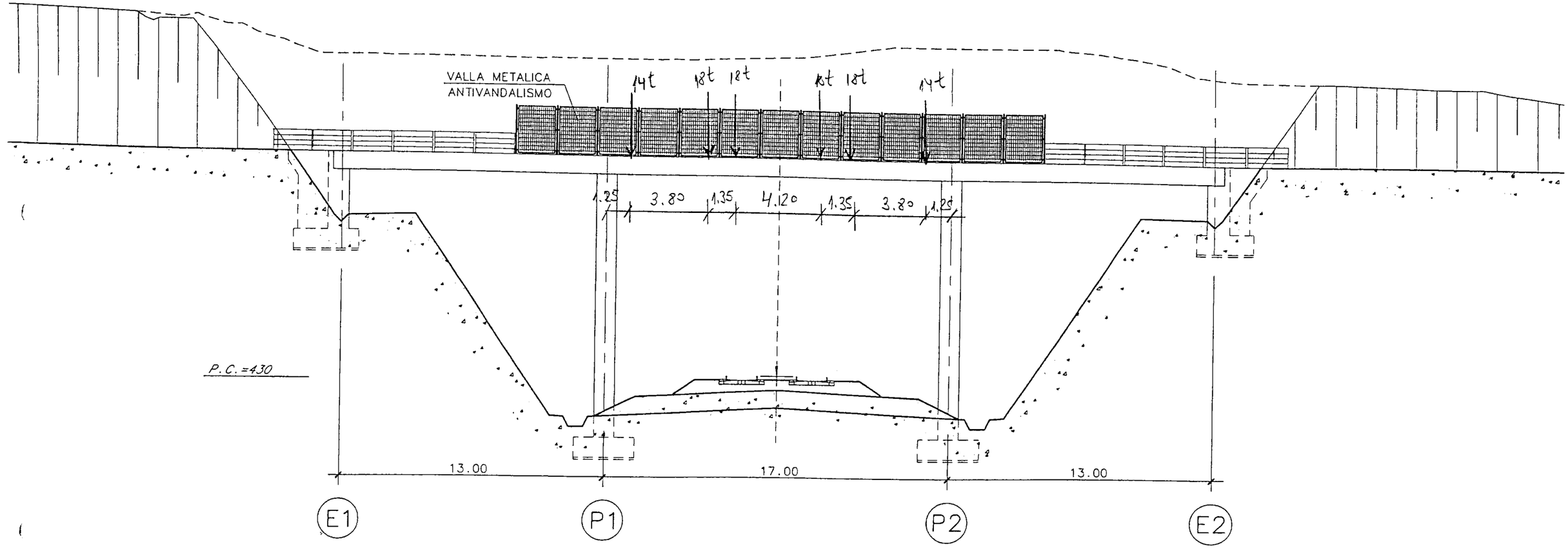
Esquemas

ESTADO DE CARGA 1



ALZADO
ESCALA 1:200

ESTADO DE CARGA 2



ALZADO
ESCALA 1:200

Listados de ordenador

LOADING: 'Y'
Loadcase Factor Stage Init.def Title
70 1.0000 prueba de carga 1

SECTION FORCES: "ALL"

Memb	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-1.08E-12	0	-14.000	0	-7.00E-08	0
65	0.500	-1.08E-12	0	-14.000	0	-7.000	0
66	0	-0.221654	0	30.917	0	-7.000	0
66	1.300	-0.221654	0	30.917	0	33.192	0
67	0	-0.221654	0	30.917	0	33.192	0
67	1.300	-0.221654	0	30.917	0	73.383	0
68	0	-0.221654	0	30.917	0	73.383	0
68	0.700	-0.221654	0	30.917	0	95.021	0
68	0.700	-0.221654	0	12.917	0	95.027	0
68	1.300	-0.221654	0	12.917	0	102.775	0
69	0	-0.221654	0	12.917	0	102.775	0
69	0.750	-0.221654	0	12.917	0	112.461	0
69	0.750	-0.221654	0	-5.083	0	112.462	0
69	1.300	-0.221654	0	-5.083	0	109.667	0
70	0	-0.221654	0	-5.083	0	109.667	0
70	1.300	-0.221654	0	-5.083	0	103.058	0
71	0	-0.221654	0	-5.083	0	103.058	0
71	1.300	-0.221654	0	-5.083	0	96.450	0
72	0	-0.221654	0	-5.083	0	96.450	0
72	0.550	-0.221654	0	-5.083	0	93.655	0
72	0.550	-0.221654	0	-23.083	0	93.651	0
72	1.300	-0.221654	0	-23.083	0	76.341	0
73	0	-0.221654	0	-23.083	0	76.341	0
73	0.600	-0.221654	0	-23.083	0	62.494	0
73	0.600	-0.221654	0	-41.083	0	62.486	0
73	1.300	-0.221654	0	-41.083	0	33.733	0
74	0	-0.221654	0	-41.083	0	33.733	0
74	1.300	-0.221654	0	-41.083	0	-19.675	0
75	0	-0.221654	0	-41.083	0	-19.675	0
75	1.300	-0.221654	0	-41.083	0	-73.084	0
76	0	0.974456	0	18.139	0	-61.502	0
76	0.500	0.974456	0	18.139	0	-52.435	0
76	0.500	0.974456	0	4.139	0	-52.432	0
76	1.700	0.974456	0	4.139	0	-47.465	0

SECTION FORCES: "ALL"

Memb	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
77	0	0.974456	0	4.139	0	-47.465	0
77	1.700	0.974456	0	4.139	0	-40.429	0
78	0	0.974456	0	4.139	0	-40.429	0
78	1.700	0.974456	0	4.139	0	-33.392	0
79	0	0.974456	0	4.139	0	-33.392	0
79	1.700	0.974456	0	4.139	0	-26.356	0
80	0	0.974456	0	4.139	0	-26.356	0
80	1.700	0.974456	0	4.139	0	-19.319	0
81	0	0.974456	0	4.139	0	-19.319	0
81	1.700	0.974456	0	4.139	0	-12.283	0
82	0	0.974456	0	4.139	0	-12.283	0
82	1.700	0.974456	0	4.139	0	-5.247	0
83	0	0.974456	0	4.139	0	-5.247	0
83	1.700	0.974456	0	4.139	0	1.790	0
84	0	0.974456	0	4.139	0	1.790	0
84	1.700	0.974456	0	4.139	0	8.826	0
85	0	0.974456	0	4.139	0	8.826	0
85	1.700	0.974456	0	4.139	0	15.863	0
86	0	0.221233	0	-0.791433	0	10.289	0
86	1.300	0.221233	0	-0.791433	0	9.260	0
87	0	0.221233	0	-0.791433	0	9.260	0
87	1.300	0.221233	0	-0.791433	0	8.231	0
88	0	0.221233	0	-0.791433	0	8.231	0
88	1.300	0.221233	0	-0.791433	0	7.202	0
89	0	0.221233	0	-0.791433	0	7.202	0
89	1.300	0.221233	0	-0.791433	0	6.173	0
90	0	0.221233	0	-0.791433	0	6.173	0
90	1.300	0.221233	0	-0.791433	0	5.144	0
91	0	0.221233	0	-0.791433	0	5.144	0
91	1.300	0.221233	0	-0.791433	0	4.115	0
92	0	0.221233	0	-0.791433	0	4.115	0
92	1.300	0.221233	0	-0.791433	0	3.087	0
93	0	0.221233	0	-0.791433	0	3.087	0
93	1.300	0.221233	0	-0.791433	0	2.058	0

SECTION FORCES: "ALL"

Memb	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
94	0	0.221233	0	-0.791433	0	2.058	0
94	1.300	0.221233	0	-0.791433	0	1.029	0
95	0	0.221233	0	-0.791433	0	1.029	0
95	1.300	0.221233	0	-0.791433	0	1.03E-08	0
96	0	1.20E-12	0	3.24E-14	0	-4.26E-14	0
96	0.500	1.20E-12	0	3.24E-14	0	-2.64E-14	0
290	0	-59.222	-1.196	0	0	0	4.207
290	13.200	-59.222	-1.196	0	0	0	-11.582
291	0	4.931	0.753222	0	0	0	-4.368
291	13.200	4.931	0.753222	0	0	0	5.574
	min:	-59.222	-1.196	-41.083	0	-73.084	-11.582
	max:	4.931	0.753222	30.917	0	112.462	5.574

Loadcase Factor Stage Init.def Title
71 1.0000 prueba de carga 2

SECTION FORCES: "ALL"

Memb	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-5.76E-16	0	2.08E-13	0	-6.69E-14	0
65	0.500	-5.76E-16	0	2.08E-13	0	3.70E-14	0
66	0	-0.000904	0	-6.559	0	-8.53E-08	0
66	1.300	-0.000904	0	-6.559	0	-8.527	0
67	0	-0.000904	0	-6.559	0	-8.527	0
67	1.300	-0.000904	0	-6.559	0	-17.053	0
68	0	-0.000904	0	-6.559	0	-17.053	0
68	1.300	-0.000904	0	-6.559	0	-25.580	0
69	0	-0.000904	0	-6.559	0	-25.580	0
69	1.300	-0.000904	0	-6.559	0	-34.106	0
70	0	-0.000904	0	-6.559	0	-34.106	0
70	1.300	-0.000904	0	-6.559	0	-42.633	0
71	0	-0.000904	0	-6.559	0	-42.633	0
71	1.300	-0.000904	0	-6.559	0	-51.160	0

SECTION FORCES: "ALL"

Memb	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
72	0	-0.000904	0	-6.559	0	-51.160	0
72	1.300	-0.000904	0	-6.559	0	-59.686	0
73	0	-0.000904	0	-6.559	0	-59.686	0
73	1.300	-0.000904	0	-6.559	0	-68.213	0
74	0	-0.000904	0	-6.559	0	-68.213	0
74	1.300	-0.000904	0	-6.559	0	-76.740	0
75	0	-0.000904	0	-6.559	0	-76.740	0
75	1.300	-0.000904	0	-6.559	0	-85.266	0
76	0	-2.30E	0	49.820	0	-105.568	0
76	1.250	-2.30E	0	49.820	0	-43.301	0
76	1.250	-2.30E	0	35.820	0	-43.286	0
76	1.700	-2.30E	0	35.820	0	-27.173	0
77	0	-2.30E	0	35.820	0	-27.173	0
77	1.700	-2.30E	0	35.820	0	33.722	0
78	0	-2.30E	0	35.820	0	33.722	0
78	1.650	-2.30E	0	35.820	0	92.819	0
78	1.650	-2.30E	0	17.820	0	92.826	0
78	1.700	-2.30E	0	17.820	0	93.716	0
79	0	-2.30E	0	17.820	0	93.716	0
79	1.350	-2.30E	0	17.820	0	117.771	0
79	1.350	-2.30E	0	-0.179549	0	117.774	0
79	1.700	-2.30E	0	-0.179549	0	117.711	0
80	0	-2.30E	0	-0.179549	0	117.711	0
80	1.700	-2.30E	0	-0.179549	0	117.406	0
81	0	-2.30E	0	-0.179549	0	117.406	0
81	1.700	-2.30E	0	-0.179549	0	117.101	0
82	0	-2.30E	0	-0.179549	0	117.101	0
82	0.450	-2.30E	0	-0.179549	0	117.020	0
82	0.450	-2.30E	0	-18.180	0	117.017	0
82	1.700	-2.30E	0	-18.180	0	94.295	0
83	0	-2.30E	0	-18.180	0	94.295	0
83	0.0995	-2.30E	0	-18.180	0	92.480	0
83	0.100	-2.30E	0	-36.180	0	92.471	0
83	1.700	-2.30E	0	-36.180	0	34.590	0
84	0	-2.30E	0	-36.180	0	34.590	0
84	1.700	-2.30E	0	-36.180	0	-26.915	0
85	0	-2.30E	0	-36.180	0	-26.915	0
85	0.450	-2.30E	0	-36.180	0	-43.190	0

SECTION FORCES: "ALL"

Memb	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
85	0.450	-2.30E	0	-50.180	0	-43.204	0
85	1.700	-2.30E	0	-50.180	0	-105.920	0
86	0	0.001901	0	6.583	0	-85.581	0
86	1.300	0.001901	0	6.583	0	-77.022	0
87	0	0.001901	0	6.583	0	-77.022	0
87	1.300	0.001901	0	6.583	0	-68.464	0
88	0	0.001901	0	6.583	0	-68.464	0
88	1.300	0.001901	0	6.583	0	-59.906	0
89	0	0.001901	0	6.583	0	-59.906	0
89	1.300	0.001901	0	6.583	0	-51.348	0
90	0	0.001901	0	6.583	0	-51.348	0
90	1.300	0.001901	0	6.583	0	-42.790	0
91	0	0.001901	0	6.583	0	-42.790	0
91	1.300	0.001901	0	6.583	0	-34.232	0
92	0	0.001901	0	6.583	0	-34.232	0
92	1.300	0.001901	0	6.583	0	-25.674	0
93	0	0.001901	0	6.583	0	-25.674	0
93	1.300	0.001901	0	6.583	0	-17.116	0
94	0	0.001901	0	6.583	0	-17.116	0
94	1.300	0.001901	0	6.583	0	-8.558	0
95	0	0.001901	0	6.583	0	-8.558	0
95	1.300	0.001901	0	6.583	0	-8.56E-08	0
96	0	1.33E-14	0	1.27E-13	0	2.77E-13	0
96	0.500	1.33E-14	0	1.27E-13	0	3.40E-13	0
290	0	-56.379	2.308	0	0	0	-10.157
290	13.200	-56.379	2.308	0	0	0	20.302
291	0	-56.763	-2.310	0	0	0	10.156
291	13.200	-56.763	-2.310	0	0	0	-20.340
	min:	-56.763	-2.310	-50.180	0	-105.920	-20.340
	max:	0.001901	2.308	49.820	0	117.774	20.302

ENVELOPE SPECIFIC.: EU 'COMBINACION SOBRECARGAS'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	0		PESO PROPIO
B	PLUS	6	1.000		SOB UNIF 1
C	PLUS	7	1.000		SOBRECARGA UNIF 2
D	PLUS	8	1.000		SOB UNIF 3
E	PLUS	11	1.000		VEHICULO HIPOTESIS 11
F	OR	12	1.000		VEHICULO HIPOTESIS 12
G	OR	13	1.000		VEHICULO HIPOTESIS 13
H	OR	14	1.000		VEHICULO HIPOTESIS 14
I	OR	15	1.000		VEHICULO HIPOTESIS 15
J	OR	16	1.000		VEHICULO HIPOTESIS 16
K	OR	17	1.000		VEHICULO HIPOTESIS 17
L	OR	18	1.000		VEHICULO HIPOTESIS 18
M	OR	19	1.000		VEHICULO HIPOTESIS 19
N	OR	20	1.000		VEHICULO HIPOTESIS 20
O	OR	21	1.000		VEHICULO HIPOTESIS 21
P	OR	22	1.000		VEHICULO HIPOTESIS 22
Q	OR	23	1.000		VEHICULO HIPOTESIS 23
R	OR	24	1.000		VEHICULO HIPOTESIS 24
S	OR	25	1.000		VEHICULO POSICION 25
T	OR	26	1.000		VEHICULO POSICION 26
U	OR	27	1.000		VEHICULO POSICION 27
V	OR	28	1.000		VEHICULO POSICION 28
W	OR	29	1.000		VEHICULO POSICION 29
X	OR	30	1.000		VEHICULO POSICION 30
Y	OR	31	1.000		VEHICULO POSICION 31
Z	OR	32	1.000		VEHICULO POSICION 32
AA	OR	33	1.000		VEHICULO POSICION 33
AE	OR	34	1.000		VEHICULO POSICION 34
AC	OR	35	1.000		VEHICULO POSICION 35
AD	OR	36	1.000		VEHICULO POSICION 36
AE	OR	37	1.000		VEHICULO HIPOTESIS 37

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-2.54E-15	-1.18E-10	6.15E-14	1.18E-13	-4.34E-14	6.30E-10
		1.15E-12	4.13E-09	-1.60E-08	-2.26E-13	6.50E-13	-5.95E-10
	Min: A C I				Max: A E D F		
65	0.500	-2.78E-13	4.08E-05	-1.600	2.11E-13	-0.400000	1.45E-09
		1.54E-12	4.13E-09	-5.15E-13	-2.26E-13	6.97E-14	1.47E-09
	Min: A E C E				Max: A D F		
66	0	-0.107568	-3.294	9.523	4.15E-14	-0.400000	-4.52E-08
		0.003163	-3.875	47.002	-3.19E-14	6.11E-07	-5.28E-08
	Min: A E C I				Max: A D E		

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
66	1.300	0.000661	-3.294	-8.769	4.15E-14	-11.400	-4.282
		-0.105066	-3.875	41.135	30.000	72.779	-5.037
		Min: A C I			Max: A E D E		
67	0	0.000661	-3.294	-8.769	4.15E-14	-11.400	-4.282
		-0.105066	-3.875	41.135	30.000	72.779	-5.037
		Min: A C I			Max: A E D E		
67	1.300	0.000661	-3.294	-8.769	4.15E-14	-22.800	-8.565
		-0.105066	-3.875	16.975	60.000	118.550	-10.074
		Min: A C I			Max: A E D E		
68	0	0.000661	-3.294	-8.769	4.15E-14	-22.800	-8.565
		-0.105066	-3.875	16.975	60.000	118.550	-10.074
		Min: A C I			Max: A E D E		
68	1.300	0.000661	-3.294	-8.769	4.15E-14	-34.199	-12.847
		-0.224418	-3.875	30.822	4.82E-14	144.142	-15.112
		Min: A C I			Max: A B D F		
69	0	0.000661	-3.294	-8.769	2.80E-13	-34.199	-12.847
		-0.224418	-3.875	30.822	3.79E-13	144.142	-15.112
		Min: A C I			Max: A E D F		
69	1.300	0.000661	-3.294	-8.769	2.80E-13	-45.599	-17.129
		-0.224418	-3.875	6.662	30.000	177.506	-20.149
		Min: A C I			Max: A E D F		
70	0	0.000661	-3.294	-8.769	2.85E-13	-45.599	-17.129
		-0.224418	-3.875	6.662	30.000	177.506	-20.149
		Min: A C I			Max: A E D F		
70	1.300	0.000661	-3.294	-8.769	2.85E-13	-56.999	-21.411
		-0.224418	-3.875	2.502	30.000	183.463	-25.186
		Min: A C I			Max: A E D F		
71	0	0.000661	-3.294	-8.769	3.84E-14	-56.999	-21.411
		-0.224418	-3.875	-17.498	60.000	183.463	-25.186
		Min: A C I			Max: A E D F		
71	1.300	0.000661	-3.294	-8.769	3.84E-14	-68.399	-25.694
		-0.224418	-3.875	-21.658	60.000	158.011	-30.223
		Min: A C I			Max: A E D F		
72	0	0.000661	-3.294	-8.769	-2.62E-13	-68.399	-25.694
		-0.224418	-3.875	-21.658	60.000	158.011	-30.223
		Min: A C I			Max: A E D F		
72	1.300	0.000661	-3.294	-8.769	-2.62E-13	-79.799	-29.976
		-0.224418	-3.875	-45.818	90.000	105.152	-35.260
		Min: A C I			Max: A E D F		
73	0	0.000661	-3.294	-8.769	-4.31E-13	-79.799	-29.976
		-0.224418	-3.875	-45.818	90.000	105.152	-35.260
		Min: A C I			Max: A B D F		
73	1.300	0.000661	-3.294	-8.769	-4.31E-13	-91.198	-34.258

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.158576	-3.875	-27.252	30.000	72.235	-40.298
		Min: A C I			Max: A E D G		
74	0	0.000661	-3.294	-8.769	-7.42E-13	-91.198	-34.258
		-0.158576	-3.875	-27.252	30.000	72.235	-40.298
		Min: A C I			Max: A E D G		
74	1.300	-0.107568	-3.294	-27.917	-7.42E-13	-108.002	-38.540
		-0.050347	-3.875	-32.264	60.000	18.507	-45.335
		Min: A E C I			Max: A D G		
75	0	-0.107568	-3.294	-27.917	-9.21E-13	-108.002	-38.540
		-0.050347	-3.875	-32.264	60.000	18.507	-45.335
		Min: A E C I			Max: A D G		
75	1.300	-0.107568	-3.294	-32.077	-9.21E-13	-146.998	-42.823
		0.331790	-2.713	1.301	-7.30E-13	16.919	-35.273
		Min: A E C I			Max: A D L		
76	0	-2.577	1.37E-09	59.279	-45.000	-168.219	-42.740
		1.500	-0.971664	-6.533	-30.231	25.623	-34.481
		Min: A E C I			Max: A D L		
76	1.700	0.325916	0.971664	28.293	30.231	-86.370	-49.348
		-0.415103	0.703027	31.139	-25.686	24.920	-47.521
		Min: A E C F			Max: A D H		
77	0	0.325916	0.971664	28.293	30.231	-86.370	-49.348
		-0.415103	0.703027	31.139	-25.686	24.920	-47.521
		Min: A E C F			Max: A D H		
77	1.700	1.500	0.971664	6.533	30.231	-63.225	-47.696
		-1.590	0.703027	27.459	4.314	77.185	-46.326
		Min: A E F			Max: A C D H		
78	0	1.500	0.971664	6.533	30.231	-63.225	-47.696
		-1.590	0.703027	27.459	4.314	77.185	-46.326
		Min: A B F			Max: A C D H		
78	1.700	1.983	0.971664	4.454	30.231	-54.666	-46.044
		-3.060	1.10E-09	40.880	-45.000	109.171	-42.740
		Min: A E G F			Max: A C I		
79	0	1.983	0.971664	4.454	30.231	-54.666	-46.044
		-3.060	9.75E-10	40.880	-45.000	109.171	-42.740
		Min: A E D F			Max: A C I		
79	1.700	1.983	0.971664	4.454	30.231	-47.094	-44.392
		-3.060	9.75E-10	35.440	-45.000	174.043	-42.740
		Min: A E D F			Max: A C I		
80	0	1.983	0.971664	4.454	30.231	-47.094	-44.392
		-3.060	9.34E-10	35.440	-45.000	174.043	-42.740
		Min: A E D F			Max: A C I		
80	1.700	1.983	0.971664	4.454	30.231	-39.522	-42.740
		-3.060	9.34E-10	10.000	-15.000	199.667	-42.740

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A E D F			Max: A C I		
81	0	1.983	-0.971664	-4.454	-30.231	-39.522	-42.740
		-3.060	8.59E-10	-10.000	15.000	199.667	-42.740
		Min: A E D L			Max: A C I		
81	1.700	1.983	-0.971664	-4.454	-30.231	-47.094	-44.392
		-3.060	8.59E-10	-35.440	45.000	174.043	-42.740
		Min: A B D L			Max: A C I		
82	0	1.983	-0.971664	-4.454	-30.231	-47.094	-44.392
		-3.060	8.28E-10	-35.440	45.000	174.043	-42.740
		Min: A B D L			Max: A C I		
82	1.700	1.983	-0.971664	-4.454	-30.231	-54.666	-46.044
		-3.060	8.28E-10	-40.880	45.000	109.171	-42.740
		Min: A B D L			Max: A C I		
83	0	1.983	-0.971664	-4.454	-30.231	-54.666	-46.044
		-3.060	8.43E-10	-40.880	45.000	109.171	-42.740
		Min: A B D L			Max: A C I		
83	1.700	1.500	-0.971664	-6.533	-30.231	-63.225	-47.696
		-1.590	-0.703027	-27.459	-4.314	77.185	-46.326
		Min: A D L			Max: A B C J		
84	0	1.500	-0.971664	-6.533	-30.231	-63.225	-47.696
		-1.590	-0.703027	-27.459	-4.314	77.185	-46.326
		Min: A D L			Max: A B C J		
84	1.700	0.325916	-0.971664	-28.293	-30.231	-86.370	-49.348
		-0.415103	-0.703027	-31.139	25.686	24.920	-47.521
		Min: A C D L			Max: A B J		
85	0	0.325916	-0.971664	-28.293	-30.231	-86.370	-49.348
		-0.415103	-0.703027	-31.139	25.686	24.920	-47.521
		Min: A C D L			Max: A B J		
85	1.700	-2.577	7.33E-10	-59.279	45.000	-168.219	-42.740
		1.500	0.971664	6.533	30.231	25.623	-34.481
		Min: A C D I			Max: A E F		
86	0	-0.107568	3.294	32.077	-3.27E-13	-146.998	-42.823
		0.331790	2.713	-1.301	-2.40E-13	16.919	-35.273
		Min: A C D I			Max: A E F		
86	1.300	-0.107568	3.294	27.917	-3.27E-13	-108.002	-38.540
		-0.050347	3.875	32.264	-60.000	18.507	-45.335
		Min: A C D I			Max: A E K		
87	0	-0.107568	3.294	27.917	-1.02E-13	-108.002	-38.540
		-0.050347	3.875	32.264	-60.000	18.507	-45.335
		Min: A C D I			Max: A E K		
87	1.300	0.000661	3.294	8.769	-1.02E-13	-91.198	-34.258
		-0.158576	3.875	27.252	-30.000	72.235	-40.298
		Min: A C I			Max: A E D K		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
88	0	0.000661	3.294	8.769	9.81E-14	-91.198	-34.258
		-0.158576	3.875	27.252	-30.000	72.235	-40.298
		Min: A C I			Max: A E D K		
88	1.300	0.000661	3.294	8.769	9.81E-14	-79.798	-29.976
		-0.224418	3.875	45.818	-90.000	105.152	-35.260
		Min: A C I			Max: A B D L		
89	0	0.000661	3.294	8.769	3.92E-13	-79.798	-29.976
		-0.224418	3.875	45.818	-90.000	105.152	-35.260
		Min: A C I			Max: A B D L		
89	1.300	0.000661	3.294	8.769	3.92E-13	-68.399	-25.694
		-0.224418	3.875	21.658	-60.000	158.011	-30.223
		Min: A C I			Max: A B D L		
90	0	0.000661	3.294	8.769	2.24E-13	-68.399	-25.694
		-0.224418	3.875	21.658	-60.000	158.011	-30.223
		Min: A C I			Max: A B D L		
90	1.300	0.000661	3.294	8.769	2.24E-13	-56.999	-21.411
		-0.224418	3.875	17.498	-60.000	183.463	-25.186
		Min: A C I			Max: A B D L		
91	0	0.000661	3.294	8.769	-3.16E-15	-56.999	-21.411
		-0.224418	3.875	-2.502	-30.000	183.463	-25.186
		Min: A C I			Max: A B D L		
91	1.300	0.000661	3.294	8.769	-3.16E-15	-45.599	-17.129
		-0.224418	3.875	-6.662	-30.000	177.506	-20.149
		Min: A C I			Max: A B D L		
92	0	0.000661	3.294	8.769	1.72E-13	-45.599	-17.129
		-0.224418	3.875	-6.662	-30.000	177.506	-20.149
		Min: A C I			Max: A B D L		
92	1.300	0.000661	3.294	8.769	1.72E-13	-34.199	-12.847
		-0.224418	3.875	-30.822	1.07E-14	144.142	-15.112
		Min: A C I			Max: A B D L		
93	0	0.000661	3.294	8.769	1.16E-13	-34.199	-12.847
		-0.224418	3.875	-30.822	1.64E-13	144.142	-15.112
		Min: A C I			Max: A B D L		
93	1.300	0.000661	3.294	8.769	1.16E-13	-22.800	-8.565
		-0.105066	3.875	-16.975	-60.000	118.550	-10.074
		Min: A C I			Max: A E D M		
94	0	0.000661	3.294	8.769	1.80E-13	-22.800	-8.565
		-0.105066	3.875	-16.975	-60.000	118.550	-10.074
		Min: A C I			Max: A E D M		
94	1.300	0.000661	3.294	8.769	1.80E-13	-11.400	-4.282
		-0.105066	3.875	-41.135	-30.000	72.779	-5.037
		Min: A C I			Max: A E D M		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
95	0	0.000661	3.294	8.769	3.55E-13	-11.400	-4.282
		-0.105066	3.875	-41.135	-30.000	72.779	-5.037
		Min: A C I			Max: A E D M		
95	1.300	-0.107568	3.294	-9.523	3.55E-13	-0.400000	-4.48E-08
		0.003163	3.875	-47.000	6.86E-13	6.11E-07	-5.25E-08
		Min: A C D I			Max: A E M		
96	0	3.03E-12	4.65E-09	1.600	7.37E-13	-0.400000	1.27E-11
		9.19E-16	4.71E-09	2.08E-13	-1.61E-13	2.07E-13	-3.66E-10
		Min: A E D L			Max: A C I		
96	0.500	1.22E-12	4.76E-09	1.60E-08	5.56E-13	-1.64E-12	2.37E-09
		9.19E-16	4.71E-09	2.08E-13	-1.61E-13	3.11E-13	1.99E-09
		Min: A E D M			Max: A C I		
290	0	3.345	-0.520912	-1.742	-0.791553	-7.242	3.045
		3.345	-0.520912	1.742	0.791553	7.242	3.045
		Min: A AC			Max: A K		
290	13.200	-15.522	-0.585552	-4.846	0.627517	-59.769	-5.652
		-15.522	-0.585552	4.846	-0.627517	59.769	-5.652
		Min: A W			Max: A E		
291	0	3.345	0.520912	-1.742	0.791553	-7.242	-3.045
		3.345	0.520912	1.742	-0.791553	7.242	-3.045
		Min: A Y			Max: A G		
291	13.200	-55.500	0.837354	-4.846	-0.627517	-59.769	8.123
		-55.500	0.837354	4.846	0.627517	59.769	8.123
		Min: A AC			Max: A H		

LOADING: 'Y'

Loadcase	Factor	Stage	Init.def	Title
70	1.0000			prueba de carga 1

Displacements (in global coordinate directions): 'ALL'

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
65	0	0	-5.70E-4	2.49E-4	-4.98E-4	0	0
65	0.500	0	-5.70E-4	2.5E-12	-5.00E-4	0	0
66	0	0	-5.70E-4	-6.5E-12	-5.00E-4	0	0
66	1.300	0	-5.70E-4	-6.44E-4	-4.82E-4	0	0
67	0	0	-5.70E-4	-6.44E-4	-4.82E-4	0	0
67	1.300	0	-5.70E-4	-0.00123	-4.08E-4	0	0
68	0	0	-5.70E-4	-0.00123	-4.08E-4	0	0
68	1.300	0	-5.70E-4	-0.00168	-2.83E-4	0	0
69	0	0	-5.70E-4	-0.00168	-2.83E-4	0	0
69	1.300	0	-5.70E-4	-0.00195	-1.32E-4	0	0
70	0	0	-5.70E-4	-0.00195	-1.32E-4	0	0
70	1.300	0	-5.70E-4	-0.00203	1.48E-5	0	0
71	0	0	-5.70E-4	-0.00203	1.48E-5	0	0
71	1.300	0	-5.70E-4	-0.00192	1.52E-4	0	0
72	0	0	-5.70E-4	-0.00192	1.52E-4	0	0
72	1.300	0	-5.70E-4	-0.00164	2.76E-4	0	0
73	0	0	-5.70E-4	-0.00164	2.76E-4	0	0
73	1.300	0	-5.70E-4	-0.00122	3.56E-4	0	0
74	0	0	-5.70E-4	-0.00122	3.56E-4	0	0
74	1.300	0	-5.70E-4	-7.44E-4	3.65E-4	0	0
75	0	0	-5.70E-4	-7.44E-4	3.65E-4	0	0
75	1.300	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
76	0	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
76	1.700	0	-5.70E-4	1.27E-4	2.07E-4	0	0
77	0	0	-5.70E-4	1.27E-4	2.07E-4	0	0
77	1.700	0	-5.69E-4	4.11E-4	1.28E-4	0	0
78	0	0	-5.69E-4	4.11E-4	1.28E-4	0	0
78	1.700	0	-5.69E-4	5.70E-4	6.15E-5	0	0
79	0	0	-5.69E-4	5.70E-4	6.15E-5	0	0
79	1.700	0	-5.69E-4	6.27E-4	7.55E-6	0	0

Displacements (in global coordinate directions): 'ALL'

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
80	0	0	-5.69E-4	6.27E-4	7.55E-6	0	0
80	1.700	0	-5.69E-4	6.03E-4	-3.37E-5	0	0
81	0	0	-5.69E-4	6.03E-4	-3.37E-5	0	0
81	1.700	0	-5.69E-4	5.19E-4	-6.22E-5	0	0
82	0	0	-5.69E-4	5.19E-4	-6.22E-5	0	0
82	1.700	0	-5.69E-4	3.98E-4	-7.80E-5	0	0
83	0	0	-5.69E-4	3.98E-4	-7.80E-5	0	0
83	1.700	0	-5.69E-4	2.61E-4	-8.12E-5	0	0
84	0	0	-5.69E-4	2.61E-4	-8.12E-5	0	0
84	1.700	0	-5.69E-4	1.30E-4	-7.16E-5	0	0
85	0	0	-5.69E-4	1.30E-4	-7.16E-5	0	0
85	1.700	0	-5.69E-4	2.52E-5	-4.93E-5	0	0
86	0	0	-5.69E-4	2.52E-5	-4.93E-5	0	0
86	1.300	0	-5.69E-4	-3.00E-5	-3.58E-5	0	0
87	0	0	-5.69E-4	-3.00E-5	-3.58E-5	0	0
87	1.300	0	-5.69E-4	-6.85E-5	-2.37E-5	0	0
88	0	0	-5.69E-4	-6.85E-5	-2.37E-5	0	0
88	1.300	0	-5.69E-4	-9.23E-5	-1.31E-5	0	0
89	0	0	-5.69E-4	-9.23E-5	-1.31E-5	0	0
89	1.300	0	-5.69E-4	-1.03E-4	-3.83E-6	0	0
90	0	0	-5.69E-4	-1.03E-4	-3.83E-6	0	0
90	1.300	0	-5.69E-4	-9.34E-5	1.04E-5	0	0
91	0	0	-5.69E-4	-9.34E-5	1.04E-5	0	0
91	1.300	0	-5.68E-4	-7.65E-5	1.53E-5	0	0
92	0	0	-5.68E-4	-7.65E-5	1.53E-5	0	0
92	1.300	0	-5.68E-4	-5.41E-5	1.85E-5	0	0
93	0	0	-5.68E-4	-5.41E-5	1.85E-5	0	0
93	1.300	0	-5.68E-4	-2.82E-5	2.10E-5	0	0
94	0	0	-5.68E-4	-2.82E-5	2.10E-5	0	0
94	1.300	0	-5.68E-4	-2.5E-13	2.17E-5	0	0
95	0	0	-5.68E-4	1.1E-13	2.17E-5	0	0
95	0.500	0	-5.68E-4	1.09E-5	2.17E-5	0	0

Displacements (in global coordinate directions): 'ALL'

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
290	0	0	2.3E-19	-3.0E-12	+3.4E-12	0	0
290	13.200	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
291	0	0	-2.4E-19	2.5E-13	3.6E-12	0	0
291	13.200	0	-5.69E-4	2.52E-5	-4.93E-5	0	0
	min:	0	-0.000570	-0.002029	-0.000590	0	0
	max:	0	2.27E-19	0.000627	0.000369	0	0

Loadcase 71 | Factor 1.0000 | Stage | Init.def | Title: prueba de carga 2

Displacements (in global coordinate directions): 'ALL'

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
65	0	0	-2.32E-6	-8.70E-5	1.74E-4	0	0
65	0.500	0	-2.32E-6	-8.7E-13	1.74E-4	0	0
66	0	0	-2.32E-6	2.3E-12	1.74E-4	0	0
66	1.300	0	-2.32E-6	2.24E-4	1.69E-4	0	0
67	0	0	-2.32E-6	2.24E-4	1.69E-4	0	0
67	1.300	0	-2.32E-6	4.32E-4	1.51E-4	0	0
68	0	0	-2.32E-6	4.32E-4	1.51E-4	0	0
68	1.300	0	-2.32E-6	6.10E-4	1.21E-4	0	0
69	0	0	-2.32E-6	6.10E-4	1.21E-4	0	0
69	1.300	0	-2.32E-6	7.42E-4	7.55E-5	0	0
70	0	0	-2.32E-6	7.42E-4	7.55E-5	0	0
70	1.300	0	-2.32E-6	8.13E-4	2.69E-5	0	0
71	0	0	-2.32E-6	8.13E-4	2.69E-5	0	0
71	1.300	0	-2.32E-6	8.07E-4	-3.78E-5	0	0
72	0	0	-2.32E-6	8.07E-4	-3.78E-5	0	0
72	1.300	0	-2.32E-6	7.09E-4	-1.14E-4	0	0
73	0	0	-2.32E-6	7.09E-4	-1.14E-4	0	0
73	1.300	0	-2.32E-6	5.04E-4	-2.03E-4	0	0
74	0	0	-2.32E-6	5.04E-4	-2.03E-4	0	0
74	1.300	0	-2.32E-6	1.77E-4	-3.03E-4	0	0

Displacements (in global coordinate directions): 'ALL'

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
75	0	0	-2.32E-6	1.77E-4	-3.03E-4	0	0
75	1.300	0	-2.32E-6	-2.83E-4	-4.15E-4	0	0
76	0	0	-2.32E-6	-2.83E-4	-4.15E-4	0	0
76	1.700	0	-2.58E-6	-0.00111	-5.30E-4	0	0
77	0	0	-2.58E-6	-0.00111	-5.30E-4	0	0
77	1.700	0	-2.84E-6	-0.00201	-5.24E-4	0	0
78	0	0	-2.84E-6	-0.00201	-5.24E-4	0	0
78	1.700	0	-3.09E-6	-0.00283	-4.08E-4	0	0
79	0	0	-3.09E-6	-0.00283	-4.08E-4	0	0
79	1.700	0	-3.35E-6	-0.00337	-2.13E-4	0	0
80	0	0	-3.35E-6	-0.00337	-2.13E-4	0	0
80	1.700	0	-3.61E-6	-0.00356	-8.32E-7	0	0
81	0	0	-3.61E-6	-0.00356	-8.32E-7	0	0
81	1.700	0	-3.86E-6	-0.00337	2.11E-4	0	0
82	0	0	-3.86E-6	-0.00337	2.11E-4	0	0
82	1.700	0	-4.12E-6	-0.00284	4.07E-4	0	0
83	0	0	-4.12E-6	-0.00284	4.07E-4	0	0
83	1.700	0	-4.37E-6	-0.00203	5.25E-4	0	0
84	0	0	-4.37E-6	-0.00203	5.25E-4	0	0
84	1.700	0	-4.63E-6	-0.00111	5.32E-4	0	0
85	0	0	-4.63E-6	-0.00111	5.32E-4	0	0
85	1.700	0	-4.89E-6	-2.95E-4	4.16E-4	0	0
86	0	0	-4.89E-6	-2.95E-4	4.16E-4	0	0
86	1.300	0	-4.89E-6	-1.77E-4	3.04E-4	0	0
87	0	0	-4.89E-6	-1.77E-4	3.04E-4	0	0
87	1.300	0	-4.89E-6	5.95E-4	2.03E-4	0	0
88	0	0	-4.89E-6	5.05E-4	2.03E-4	0	0
88	1.300	0	-4.89E-6	7.11E-4	1.15E-4	0	0
89	0	0	-4.89E-6	7.11E-4	1.15E-4	0	0
89	1.300	0	-4.89E-6	8.05E-4	3.81E-5	0	0
90	0	0	-4.89E-6	8.05E-4	3.81E-5	0	0
90	1.300	0	-4.89E-6	8.15E-4	-2.65E-5	0	0
91	0	0	-4.89E-6	8.15E-4	-2.65E-5	0	0
91	1.300	0	-4.89E-6	7.44E-4	-8.01E-5	0	0

Displacements (in global coordinate directions): 'ALL'

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
92	0	0	-4.89E-6	7.44E-4	-8.01E-5	0	0
92	1.300	0	-4.89E-6	6.12E-4	-1.21E-4	0	0
93	0	0	-4.89E-6	6.12E-4	-1.21E-4	0	0
93	1.300	0	-4.89E-6	4.34E-4	-1.51E-4	0	0
94	0	0	-4.89E-6	4.34E-4	-1.51E-4	0	0
94	1.300	0	-4.89E-6	2.24E-4	-1.69E-4	0	0
95	0	0	-4.89E-6	2.24E-4	-1.69E-4	0	0
95	1.300	0	-4.89E-6	2.3E-12	-1.75E-4	0	0
96	0	0	-4.89E-6	-8.7E-13	-1.75E-4	0	0
96	0.500	0	-4.89E-6	-8.73E-5	-1.75E-4	0	0
290	0	0	-5.5E-19	-2.9E-12	8.3E-12	0	0
290	13.200	0	-2.32E-6	-2.88E-4	-4.15E-4	0	0
291	0	0	5.5E-19	-2.9E-12	-8.3E-12	0	0
291	13.200	0	-4.89E-6	-2.90E-4	4.16E-4	0	0
	min:	0	-4.89E-06	-0.003545	-0.000530	0	0
	max:	0	5.48E-19	0.000815	0.000532	0	0

CÁLCULOS ESTRUCTURALES

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COL. Nº 9.859

Estructura E-14. (PK 313+500)

ESTRUCTURA E-14 (PK 313+500)

ÍNDICE

CÁLCULOS ESTRUCTURALES

1. INTRODUCCIÓN
   - 1.1 DESCRIPCIÓN DE LA SOLUCIÓN ADOPTADA
   - 1.2 INSTRUCCIONES Y NORMAS EMPLEADAS
   - 1.3 CARACTERÍSTICAS DE LOS MATERIALES
   - 1.4 NIVELES DE CONTROL Y COEFICIENTES DE SEGURIDAD
   - 1.5 CARACTERÍSTICAS DE LA CIMENTACIÓN
   - 1.6 PROCEDIMIENTO DE CÁLCULO Y DESCRIPCIÓN DE LOS PROGRAMAS UTILIZADOS
2. TABLERO
   - 2.1 DEFINICIÓN GEOMÉTRICA DEL TABLERO
   - 2.2 CÁLCULO DE LAS ACCIONES
     - 2.2.1. ACCIONES PERMANENTES
       - 2.2.1.1 PESO PROPIO
       - 2.2.1.2 CARGA MUERTA
     - 2.2.2. ACCIONES PERMANENTES DE VALOR NO CONSTANTE
       - 2.2.2.1 REOLÓGICAS: RETRACCIÓN
       - 2.2.2.2 SOBRECARGAS DEL TERRENO
     - 2.2.3. ACCIONES VARIABLES
       - 2.2.3.1. SOBRECARGAS DE USO
       - 2.2.3.2. ACCIONES CLIMÁTICAS
     - 2.2.4. ACCIONES ACCIDENTALES
       - 2.2.4.1. ACCIONES SÍSMICAS
   - 2.3. CÁLCULO COMO EMPARRILLADO
     - 2.3.1. MODELO DE CÁLCULO
     - 2.3.2. CÁLCULO DE LOS COEFICIENTES DE REPARTO
     - 2.3.3. CÁLCULO DE LAS ARMADURAS PASIVAS TRANSVERSALES. MÉTODO DE WOOD
     - 2.3.4. RIOSTRAS SOBRE PILAS Y ESTRIBOS
     - 2.3.5. REACCIONES Y CÁLCULO DE NEOPRENOS EN PLANTA
   - 2.4. COMPROBACIÓN LONGITUDINAL DEL TABLERO
     - 2.4.1. VERIFICACIÓN DE LAS SECCIONES
       - 2.4.1.1. COMPROBACIÓN DE ESTADO LÍMITES FISURACIÓN
       - 2.4.1.2. COMPROBACIÓN DE ESTADOS LÍMITES ÚLTIMOS POR FLEXIÓN LONGITUDINAL
       - 2.4.1.3. VERIFICACIÓN DE LAS SECCIONES A ESFUERZOS DE CORTANTE (E.L.U.)
     - 2.4.2. COMPROBACIÓN DEL PUNZONAMIENTO DEL TABLERO
     - 2.4.3. REFUERZO DE ARMADURAS BAJO APOYOS
     - 2.4.4. VERIFICACIÓN DE LAS ARMADURAS DEL VOLADIZO
3. CÁLCULO DE LA SUBESTRUCTURA
   - 3.1. ACCIONES
   - 3.2. COMBINACIÓN DE ACCIONES
4. PILAS
   - 4.1. CÁLCULO DEL FUSTE
   - 4.2. CÁLCULO DE LA CIMENTACIÓN
5. ESTRIBOS
   - 5.1. CÁLCULO Y DIMENSIONAMIENTO

- PROYECTO DE PRUEBA DE CARGA

Cálculos Estructurales

1. Introducción

1.1. Descripción de la solución adoptada

La Reposición del Camí de les Codines, (Estructura E-14) ubicada en el P.K. 313+500, de la obra "Línea de Alta Velocidad Madrid-Barcelona-Frontera Francesa. Tramo: Lleida-Martorell. Subtramo III-B " consta de tres vanos, con luces de 13.00 m, 17.00 m y 13.00 m, con una longitud total de 43.80 m. Está apoyada en los extremos en estribos del tipo cerrado y en los puntos intermedios en pilas con un único fuste de sección circular con diámetro de 1.00 m, la cimentación es del tipo superficial.

El tablero es una sección maciza de hormigón de 7.70 m de ancho con un canto de 0.90m y con voladizos laterales de 1.50 m de longitud con 0.30 m de canto en el arranque y 0.20m en el extremo. La sección tiene bombeo del 2%. El ancho inferior del núcleo es de 3.70 m.

Ambos estribos son cerrados y están cimentados mediante zapatas directamente en el terreno.

Las pilas tienen un único fuste circular de 1.00 m de diámetro, y están empotradas en el tablero.La cimentación es superficial mediante zapatas.

La ejecución del tablero se realizará en una sola fase, con hormigonado completo de la losa sobre cimbra.

1.2. Instrucciones y normas empleadas

Para el cálculo de las acciones que actúan sobre los diversos elementos de la estructura, se ha utilizado la "Instrucción sobre las acciones a considerar en el proyecto de puentes de carreteras (IAP)", aprobada el 12 de febrero de 1998.

Se ha tenido en cuenta la "Norma de Construcción Sismorresistente (Parte General y Edificación) NCS-94", aprobada por Real Decreto 2543/1994 de 29 de Diciembre.

Para el dimensionamiento y comprobación de los elementos de hormigón armado y de hormigón pretensado se ha seguido la "Instrucción de Hormigón Estructural" EHE, aprobada por Real Decreto 2661/1998 de 11 de Diciembre.

- Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.

La aceleración sísmica básica de la zona es a_b =0.04 g y el coeficiente de contribución K=1.0.

La aceleración sísmica de cálculo será entonces:

$\alpha_\chi = \rho\ \alpha_\beta$

$\rho = (\tau/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04$ g

$a_c = 0.052$ g < 0.06 g

Conforme con lo prescrito en la NCS-94, como la aceleración de cálculo es $a_c = 0.052$ g < 0.06 g no se deberán tener en cuenta las acciones sísmicas.

1.3. Características de los materiales

Hormigones - Resistencia Característica

Hormigón en capas de regularización	$\phi_{\chi K} \geq 150$ kp/cm²
Hormigón en zapatas	$\phi_{\chi K} \geq 250$ kp/cm²
Hormigón en alzados estribos	$\phi_{\chi K} \geq 300$ kp/cm²
Hormigón en pilas	$\phi_{\chi K} \geq 300$ kp/cm²
Hormigón en tablero	$\phi_{\chi K} \geq 300$ kp/cm²

Aceros

Armaduras pasivas B-500-S (límite elástico f yk ≥5100 kp/cm²

1.4. Niveles de control y coeficientes de seguridad

Hormigones	:	Nivel de control normal	$\gamma_\chi = 1.50$
Aceros :		Nivel de control normal	$\gamma_\psi = 1.15$
Acciones	:		
		Nivel de control intenso	$\gamma_F = 1.50$ (acciones variables)
		Conforme a la IAP	$\gamma_{G^*} = 1.50$ (acción del terreno)
			$\gamma_G = 1.35$ (acciones permanentes y reológicas

1.5. Características de la cimentación

Se han considerado las siguientes tensiones admisibles en la cimentación:

Estructura	Profundidad de cimentación	Tensión admisible del terreno	Observaciones
Estribo 1	2.50 m	3.00 kp/cm²	
Pila 1	1.50 m	5.00 kp/cm²	
Pila 2	1.50 m	5.00 kp/cm²	
Estribo 2	2.50 m	3.00 kp/cm²	

1.6. Procedimiento de cálculo y descripción de los programas utilizados

El cálculo del tablero se realiza mediante programas de ordenador en modelos estructurales de emparrillado plano y reticulado plano, basados en la matriz de rigidez y equilibrio de los nudos, donde se suponen las hipótesis básicas de la Resistencia de Materiales es decir, de linealidad geométrica y del material, despreciando la deformación por esfuerzo cortante.

Se ejecuta el cálculo con un modelo de emparrillado espacial mediante el programa STATIK·3, del que se obtienen los esfuerzos transversales y los esfuerzos longitudinales incluyendo el efecto del reparto transversal de las cargas y del empotramiento de la pila en el tablero.

Considerando los esfuerzos obtenidos se realizan las comprobaciones de fisuración y el cálculo a rotura del tablero mediante el postprocesador FAGUS·3.

Se completa el cálculo con el dimensionamiento de la armadura de la losa en sentido transversal mediante la aplicación de la regla de WOOD-ARMER y los cálculos de esfuerzos locales, como por ejemplo los de apoyo.

Los estribos y las pilas, tanto en alzado como en fundaciones, se calcularon y dimensionaron en hormigón armado.

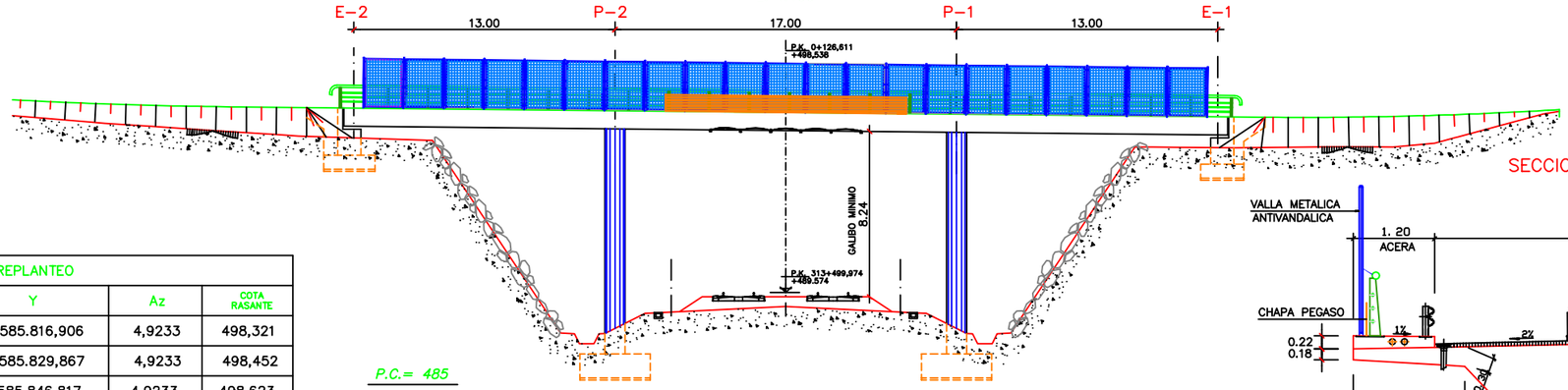
Para el desarrollo de los cálculos resueltos por ordenador se han utilizado los siguientes programas:

- STATIK-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10, 1997) .

- FAGUS-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10 1997) .

2.1. Geometría (Ver planos)

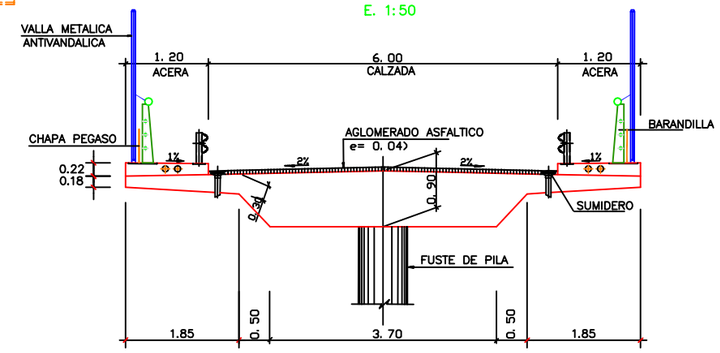
ALZADO
E. 1:150

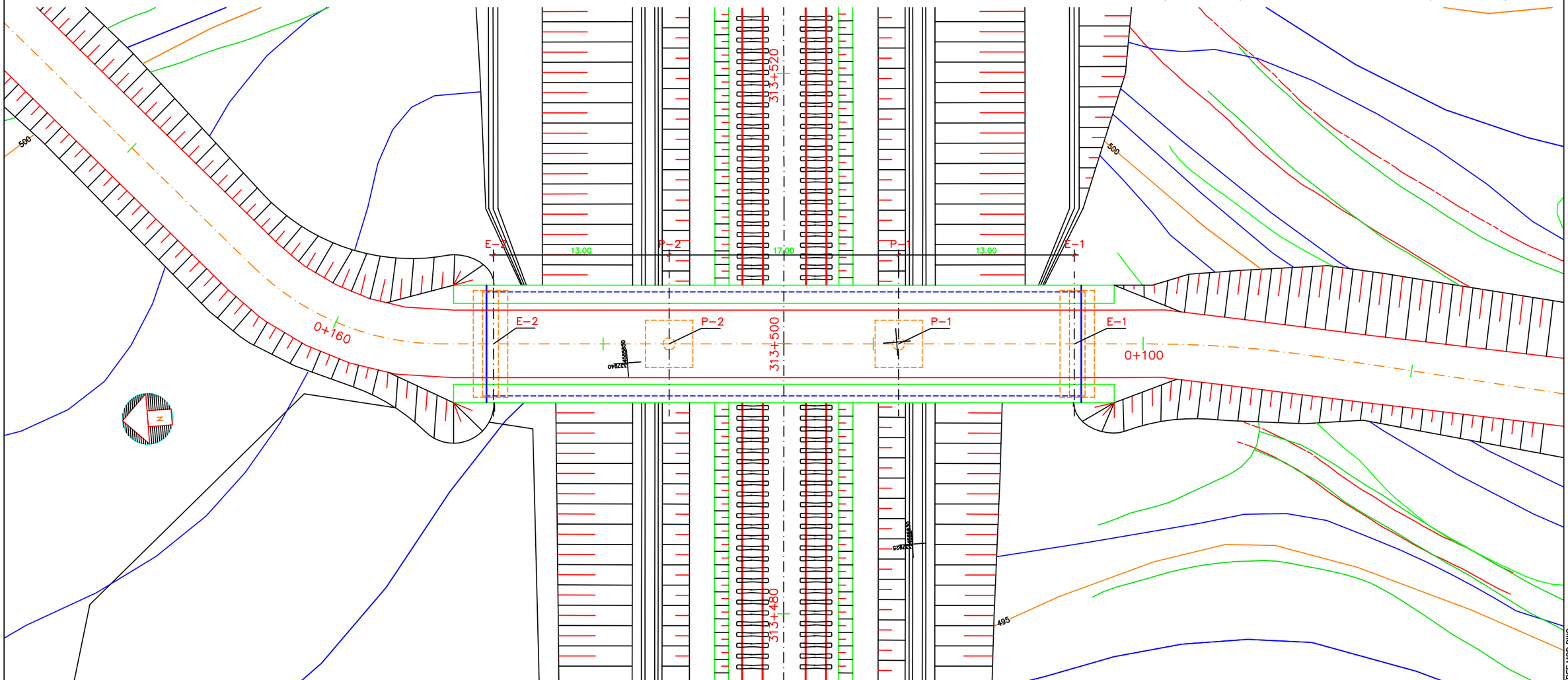


PLANTA
E. 1:150

CUADRO DE REPLANTEO					
ESTRIBOS Y PILAS	P.K. EJE DE REPLANTEO	X	Y	Az	COTA RASANTE
E–1	0+105,111	337.938,849	4.585.816,906	4,9233	498,321
P–1	0+118,111	337.939,858	4.585.829,867	4,9233	498,452
P–2	0+135,111	337.941,171	4.585.846,817	4,9233	498,623
E–2	0+148,111	337.942,171	4.585.859,778	4,9233	498,753

SECCION TRANSVERSAL
E. 1:50





GIF Gestor de Infraestructuras Ferroviarias	TITULO: LIQUIDACION DE LA MODIFICACION Nº1 DEL PROYECTO CONSTRUCTIVO L.A.V. MADRID–ZARAGOZA–BARCELONA–FRONTERA FRANCESA TRAMO: LLEIDA–MARTORELL, SUBTRAMO III–B PLATAFORMA	EL INGENIERO DE C.C. Y P. AUTOR DE LA LIQUIDACION: FDO: D.JAIME GARCIA–GERMAN LOPEZ–BELMONTE	CONFORME: Sacyr EL CONTRATISTA	ESCALA: 1:50 (en A–1) Numérica; 1:150 Gráfica (0 1 2m. / 0 3 6m.)	FECHA: ABRIL 2.003	TITULO DEL PLANO: PASO SUPERIOR E–14 P.K. 313+500 CAMI DE LES CODINES PLANO GENERAL	Nº DEL PLANO: 2.9–11.1 Hoja 1 de 1

2.9–11.1.DWG/REF:MOD.DWG

2.2. Cálculo de las acciones

2.2. Cálculo de las acciones

2.2.1. Acciones permanentes

2.2.1.1. Peso propio

El peso propio de la estructura de hormigón se calcula con un peso específico

$$\gamma = 2.50 Mp/m^3.$$

2.2.1.2. Carga muerta

Cm = 1.00 t/m cada acera

pav = 0.04 m x 2.30 t/m 3 = 0.092 t/m2

2.2.2. Acciones permanentes de valor no constante

2.2.2.1. Reológicas: Retracción

Se han calculado considerando una humedad relativa del 60%, y un espesor medio de 337 mm. La edad del hormigón al entrar en carga es de 28 días, y el mismo es de endurecimiento normal. Los valores utilizados son:

ε retracción =-0.00029167

Cálculo de la retracción del hormigón

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\, \beta s\, (t - t_s)$

Edad del hormigón al comienzo de la retracción (días)	ts = **28.0**
Edad del hormigón en el instante de evaluación (días)	t = **10000.0**
Coeficiente básico de retracción	$\varepsilon_{cso} = \varepsilon_s\ \beta_{HR}$
Resistencia característica del hormigón	f ck (N / mm2) = **30**
	ε_s = 0.00042
Humedad relativa en tanto por ciento	HR = **70**
	β_{HR} = -1.0184
	ε_{cso} = -0.0004277
Area de la seccion transversal (m^2)	Ac = **4.653**
Perímetro en contacto con la atmósfera (m)	u = **16.255**
Espesor medio (mm)	e = 572
Coeficiente de evolución temporal de la retracción	$\beta s(t - ts)$ = 0.6819

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\, \beta s\, (t - t_s)$ = -0.00029167

2.2.2.2. Sobrecargas del terreno

El relleno de tierras en el trasdós de los estribos se realiza con material del terraplén, que tiene las siguientes características:

Peso específico	:	$\gamma_T = 2.0\ Mp/m^3$
Ángulo de fricción interna	:	$\phi = 30°$
Coeficiente de empuje activo	:	$\lambda_\alpha = 0.33$

2.2.3. Acciones variables

2.2.3.1. Sobrecargas de uso

2.2.3.1.1. Tren de cargas

a) Componentes verticales

Como el ancho de plataforma es inferior a 12.0 m, conforme a la IAP se ha utilizado el siguiente tren de cargas:

- Sobrecarga uniforme: 0.40 Mp/m²
- Vehículo de 60 Mp

b) Componentes horizontales

b.1) Frenado y arranque

Se considerará la actuación de esta fuerza sobre la estructura.

$$F_F = \frac{6.00 \text{ x } 43.80 \text{ m x } 0.4 \text{ Mp m}^{-2} + 60 \text{ Mp}}{20}$$

$F_F = 8.28$ Mp

Valor mínimo: $F_F = 12.00$ Mp

b.2) Fuerza centrífuga

La estructura está ubicada en un tramo de radio infinito, por lo tanto esta fuerza no actúa.

2.2.3.2. Acciones climáticas

a.) Viento

CALCULO DE LAS ACCIONES DEBIDAS AL VIENTO CONFORME A LA I.A.P

Proyecto : GIF SUBTRAMO IIIB
Estructura : PS 315+880

Velocidad de referencia : V_{REF} (m/seg) = **28.00**

Velocidad de cálculo : V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

Factor de topografía : C_T = **1.10**

Período de retorno (años) T = **100**

Factor de riesgo : $C_R = (0.562x\{1-0.2x \ln [- \ln (1- 1/T)]\}) 1/2$
$C_R = 1.04$

Factor de altura : $C_Z = K_Z \times LN (Z/ Zo)$ si $Z > Z_{MIN}$
$C_Z = K_Z \times LN (Z_{MIN}/ Zo)$ si $Z < Z_{MIN}$

Los valores de K_Z , Zo y Z_{MIN} se obtendrán de la tabla adjunta .

Tipo de Entorno	K_Z	Zo (m)	Z_{MIN} (m)
I	0.17	0.01	2.00
II	0.19	0.05	4.00
III	0.22	0.30	8.00
IV	0.24	1.00	16.00

K_Z = **0.22**

Zo = **0.3**

Z_{MIN} = **8.00**

OBTENCIÓN DE LA VELOCIDAD DE CÁLCULO PARA EL TABLERO :

En función de la altura Z considerada se obtendrán los valores de C_Z y C_G y en consecuencia de V_C

V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

V_{REF} (m/seg) = 28.00

Para el tablero la altura considerada será : Z (m) = **13.00**

$C_Z = 0.829$

Factor de ráfaga : $C_G = (1 + 7 \times K_Z / C_Z / C_T)^{1/2}$

$C_G = 1.640$

ACCIÓN DEL VIENTO SOBRE EL TABLERO

El empuje producido sobre cualquier elemento del puente se calculará con la siguiente fórmula :

$$F\,(Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde :

C_D : Coeficiente de arrastre

A : Área expuesta

$1/2\ \rho\ V_C^2$: Presión básica de cálculo (N/m^2)

ρ : masa específica del aire 1.25 kg/m^3

V_C : Velocidad de cálculo (m/seg)

EMPUJE TRANSVERSAL DE VIENTO

Empuje del Viento : $F\,(Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$

TABLERO DE ALMA LLENA

Altura Z del tablero : Z (m) = **13.00**
Ancho del tablero : B (m) = **7.70**
Longitud del tramo : L (m) = **44.00**
Altura de barrera : $h_{BARRERA}$ (m) = **0.20** De tabla se obtiene : η = **2.00**
Altura equivalente : $h_{TABLERO}$ (m) = **1.10**

$h_{BAR.\ OPAC}(m) = h_{BARRERA} + \Sigma\ \eta\ h_{BARRERA}$

$h_{BAR.\ OPAC}(m) = 0.60$

$h_{SOBREC.}$ (m) = **2.00**

Sin sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{BARRERA\ OPACA}$

h_{eq} (m) = 1.70

Con sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{SOBRECARGA} + h_{BARRERA}$

h_{eq} (m) = 3.50

Área expuesta : A (m^2) = $L \times h_{eq}$

Sin sobrecarga : A (m^2) = 74.8
Con sobrecarga : A (m^2) = 154.0
Coeficiente de arrastre : $C_D = 2.50 - 0.3 \times (B / h_{eq})$
$1.30 < C_D < 2.40$
Sin sobrecarga : C_D = 1.30
Con sobrecarga : C_D = 1.84

Cálculo del empuje transversal del viento sobre el tablero :

$$F\,(Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde : V_C (m/seg) = 43.50
ρ (kg/m^3) = 1.25

Empuje sin la sobrecarga en el tablero : **F (Mp) = 11.50**

Longitud tramo L_T (m) = 44.00 **F (Mp/m) = 0.26**

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : **d (m) = 0.78**

Empuje con la sobrecarga en el tablero : **F (Mp) = 33.51**

Longitud tramo L_T (m) = 44.00 **F (Mp/m) = 0.76**

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : **d (m) = 1.86**

2.2.3.2.b) Nieve

La estructura está en Zona II.

$$q = 0.80 \times S_K$$

$$q = 0.80 \times 40\ Kp/m^2 = 0.032\ Mp/m^2$$

Es despreciable.

2.2.3.2.c) Térmicas

De acuerdo con la I.A.P. se ha considerado un incremento uniforme de temperatura que es función de los siguientes parámetros:

- La estructura está ubicada en la región climática denominada zona IV (Z = 4) .
- La sección del tablero está formada por una losa maciza de hormigón (S = 1), con un canto total de 0.90 m (h = 0.90).

$$\Delta T = K\, z^a\, h^b\, s^c = 23.89 \times 4^{.292} \times 0.90^{-0.139}$$

Sobre la base de estos datos se obtiene que el rango anual de la temperatura media es de 36.34 °C, y por lo tanto consideraremos un incremento uniforme de temperatura de

$$\Delta T = \pm 36.34\ ^\circ C$$

$$\varepsilon_\tau = \pm 36.34 \times 10^{-5}$$

El incremento de temperatura entre caras superior e inferior del tablero, gradiente térmico vertical, será:

- Gradiente térmico vertical positivo °C/m

Losa maciza de hormigón:

$\Delta T_{SI} = K\ \Delta T_{SI}$, ref.

$K = K_1 \cdot K_2$ $\qquad K_1 = 0.85$

$\qquad K_2 = 1.56$

ΔT_{SI}, ref = 11.50°C

$\Delta T_{SI} = 1.33 \times 11.50$°C/m

$\Delta T_{SI} = 15.30$ °C/m

- Gradiente térmico vertical inverso

Tableros de hormigón: con pavimento bituminoso 0.0 °C

2.2.4. Acciones accidentales

2.2.4.1. Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.

La aceleración sísmica básica de la zona es ab≤ 0.04 g.

$a_c = \rho\ a_b$

$\rho = (t/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04\ g = 0.052\ g \leq 0.06\ g$ $\qquad$ No se consideran las acciones sísmicas.

2.3. Cálculo como emparrillado

2.3. Cálculo como emparrillado

Se ha generado el modelo de emparrillado mediante el programa STATIK3, y se han introducido todas las cargas, lo que nos permitirá obtener los esfuerzos transversales con la influencia de la posición de las cargas, el ancho del tablero, y el apoyo puntual en las pilas, consideradas empotradas y con su correspondiente altura.

Se han introducido las acciones individuales, correspondientes a cada hipótesis básica de cálculo.

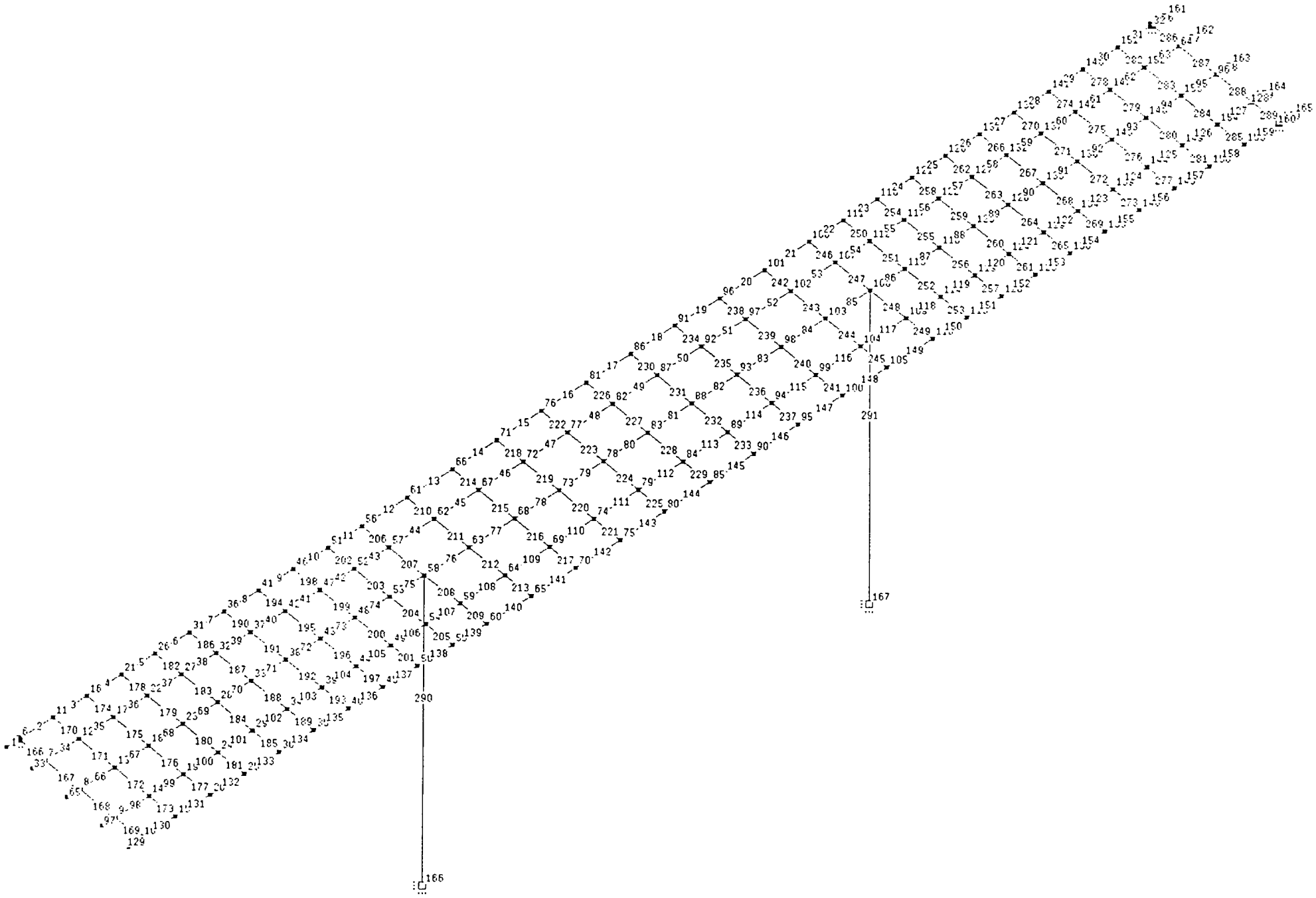
Posteriormente se ha calculado la envolvente pésima de esfuerzos para cada acción, con los diferentes coeficientes de ponderación de la Instrucción.

Por aplicación de la regla de WOOD-ARMER a dichos esfuerzos de cálculo se obtienen las armaduras transversales necesarias.

Finalmente se calculan los coeficientes de reparto transversal.

2.3.1. Modelo de cálculo

Scale 1 : 142.9
Structure - GEOMETRIA



****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (167 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	R XYZ	Specialities
1	0.00000	0.00000	0.00000			
2	1.12000	0.00000	0.00000			
3	2.62000	0.00000	0.00000			
4	4.12000	0.00000	0.00000			
5	5.24000	0.00000	0.00000			
6	0.00000	0.50000	0.00000	SSB	FFF	
7	1.12000	0.50000	0.00000			
8	2.62000	0.50000	0.00000			
9	4.12000	0.50000	0.00000			
10	5.24000	0.50000	0.00000	SSB	FFF	
11	0.00000	1.80000	0.00000			
12	1.12000	1.80000	0.00000			
13	2.62000	1.80000	0.00000			
14	4.12000	1.80000	0.00000			
15	5.24000	1.80000	0.00000			
16	0.00000	3.10000	0.00000			
17	1.12000	3.10000	0.00000			
18	2.62000	3.10000	0.00000			
19	4.12000	3.10000	0.00000			
20	5.24000	3.10000	0.00000			
21	0.00000	4.40000	0.00000			
22	1.12000	4.40000	0.00000			
23	2.62000	4.40000	0.00000			
24	4.12000	4.40000	0.00000			
25	5.24000	4.40000	0.00000			
26	0.00000	5.70000	0.00000			
27	1.12000	5.70000	0.00000			
28	2.62000	5.70000	0.00000			
29	4.12000	5.70000	0.00000			
30	5.24000	5.70000	0.00000			
31	0.00000	7.00000	0.00000			
32	1.12000	7.00000	0.00000			
33	2.62000	7.00000	0.00000			
34	4.12000	7.00000	0.00000			
35	5.24000	7.00000	0.00000			
36	0.00000	8.30000	0.00000			
37	1.12000	8.30000	0.00000			
38	2.62000	8.30000	0.00000			
39	4.12000	8.30000	0.00000			
40	5.24000	8.30000	0.00000			
41	0.00000	9.60000	0.00000			
42	1.12000	9.60000	0.00000			

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
43	2.62000	9.60000	0.00000		
44	4.12000	9.60000	0.00000		
45	5.24000	9.60000	0.00000		
46	0.00000	10.90000	0.00000		
47	1.12000	10.90000	0.00000		
48	2.62000	10.90000	0.00000		
49	4.12000	10.90000	0.00000		
50	5.24000	10.90000	0.00000		
51	0.00000	12.20000	0.00000		
52	1.12000	12.20000	0.00000		
53	2.62000	12.20000	0.00000		
54	4.12000	12.20000	0.00000		
55	5.24000	12.20000	0.00000		
56	0.00000	13.50000	0.00000		
57	1.12000	13.50000	0.00000		
58	2.62000	13.50000	0.00000		
59	4.12000	13.50000	0.00000		
60	5.24000	13.50000	0.00000		
61	0.00000	15.20000	0.00000		
62	1.12000	15.20000	0.00000		
63	2.62000	15.20000	0.00000		
64	4.12000	15.20000	0.00000		
65	5.24000	15.20000	0.00000		
66	0.00000	16.90000	0.00000		
67	1.12000	16.90000	0.00000		
68	2.62000	16.90000	0.00000		
69	4.12000	16.90000	0.00000		
70	5.24000	16.90000	0.00000		
71	0.00000	18.60000	0.00000		
72	1.12000	18.60000	0.00000		
73	2.62000	18.60000	0.00000		
74	4.12000	18.60000	0.00000		
75	5.24000	18.60000	0.00000		
76	0.00000	20.30000	0.00000		
77	1.12000	20.30000	0.00000		
78	2.62000	20.30000	0.00000		
79	4.12000	20.30000	0.00000		
80	5.24000	20.30000	0.00000		
81	0.00000	22.00000	0.00000		
82	1.12000	22.00000	0.00000		
83	2.62000	22.00000	0.00000		
84	4.12000	22.00000	0.00000		
85	5.24000	22.00000	0.00000		
86	0.00000	23.70000	0.00000		
87	1.12000	23.70000	0.00000		
88	2.62000	23.70000	0.00000		
89	4.12000	23.70000	0.00000		
90	5.24000	23.70000	0.00000		
91	0.00000	25.40000	0.00000		
92	1.12000	25.40000	0.00000		
93	2.62000	25.40000	0.00000		
94	4.12000	25.40000	0.00000		
95	5.24000	25.40000	0.00000		

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
96	0.00000	27.10000	0.00000		
97	1.12000	27.10000	0.00000		
98	2.62000	27.10000	0.00000		
99	4.12000	27.10000	0.00000		
100	5.24000	27.10000	0.00000		
101	0.00000	28.80000	0.00000		
102	1.12000	28.80000	0.00000		
103	2.62000	28.80000	0.00000		
104	4.12000	28.80000	0.00000		
105	5.24000	28.80000	0.00000		
106	0.00000	30.50000	0.00000		
107	1.12000	30.50000	0.00000		
108	2.62000	30.50000	0.00000		
109	4.12000	30.50000	0.00000		
110	5.24000	30.50000	0.00000		
111	0.00000	31.80000	0.00000		
112	1.12000	31.80000	0.00000		
113	2.62000	31.80000	0.00000		
114	4.12000	31.80000	0.00000		
115	5.24000	31.80000	0.00000		
116	0.00000	33.10000	0.00000		
117	1.12000	33.10000	0.00000		
118	2.62000	33.10000	0.00000		
119	4.12000	33.10000	0.00000		
120	5.24000	33.10000	0.00000		
121	0.00000	34.40000	0.00000		
122	1.12000	34.40000	0.00000		
123	2.62000	34.40000	0.00000		
124	4.12000	34.40000	0.00000		
125	5.24000	34.40000	0.00000		
126	0.00000	35.70000	0.00000		
127	1.12000	35.70000	0.00000		
128	2.62000	35.70000	0.00000		
129	4.12000	35.70000	0.00000		
130	5.24000	35.70000	0.00000		
131	0.00000	37.00000	0.00000		
132	1.12000	37.00000	0.00000		
133	2.62000	37.00000	0.00000		
134	4.12000	37.00000	0.00000		
135	5.24000	37.00000	0.00000		
136	0.00000	38.30000	0.00000		
137	1.12000	38.30000	0.00000		
138	2.62000	38.30000	0.00000		
139	4.12000	38.30000	0.00000		
140	5.24000	38.30000	0.00000		
141	0.00000	39.60000	0.00000		
142	1.12000	39.60000	0.00000		
143	2.62000	39.60000	0.00000		
144	4.12000	39.60000	0.00000		
145	5.24000	39.60000	0.00000		
146	0.00000	40.90000	0.00000		
147	1.12000	40.90000	0.00000		
148	2.62000	40.90000	0.00000		

Joints	X [M]	Y [M]	Z [M]	V XYZ	R XYZ
149	4.12000	40.90000	0.00000		
150	5.24000	40.90000	0.00000		
151	0.00000	42.20000	0.00000		
152	1.12000	42.20000	0.00000		
153	2.62000	42.20000	0.00000		
154	4.12000	42.20000	0.00000		
155	5.24000	42.20000	0.00000		
156	0.00000	43.50000	0.00000	SSE	FFF
157	1.12000	43.50000	0.00000		
158	2.62000	43.50000	0.00000		
159	4.12000	43.50000	0.00000		
160	5.24000	43.50000	0.00000	SSE	FFF
161	0.00000	44.00000	0.00000		
162	1.12000	44.00000	0.00000		
163	2.62000	44.00000	0.00000		
164	4.12000	44.00000	0.00000		
165	5.24000	44.00000	0.00000		
166	2.62000	13.50000	-13.20000	BBE	BBE
167	2.62000	30.50000	-13.20000	BBE	BBE

ELASTICALLY SUPPORTED JOINTS: ('B'=Fixed 'F'=Free)

Joint	V-X [T/M]	V-Y [T/M]	V-Z [T/M]	R-X [TM/ARC]	R-Y [TM/ARC]	R-Z [TM/ARC]
6	2.300E+02	2.300E+02	E	F	F	F
10	2.300E+02	2.300E+02	E	F	F	F
156	2.300E+02	2.300E+02	E	F	F	F
160	2.300E+02	2.300E+02	E	F	F	F

B A R D A T A : (286 bars)

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
1	1	6	0.50000	%Q0001			O oS
2	6	11	1.30000	%Q0001			O oS
3	11	16	1.30000	%Q0001			O oS
4	16	21	1.30000	%Q0001			O oS
5	21	26	1.30000	%Q0001			O oS
6	26	31	1.30000	%Q0001			O oS
7	31	36	1.30000	%Q0001			O oS
8	36	41	1.30000	%Q0001			O oS
9	41	46	1.30000	%Q0001			O oS
10	46	51	1.30000	%Q0001			O oS
11	51	56	1.30000	%Q0001			O oS
12	56	61	1.70000	%Q0001			O oS
13	61	66	1.70000	%Q0001			O oS
14	66	71	1.70000	%Q0001			O oS
15	71	76	1.70000	%Q0001			O oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
16	76	81	1.70000	%Q0001			O oS
17	81	86	1.70000	%Q0001			O oS
18	86	91	1.70000	%Q0001			O oS
19	91	96	1.70000	%Q0001			O oS
20	96	101	1.70000	%Q0001			O oS
21	101	106	1.70000	%Q0001			O oS
22	106	111	1.30000	%Q0001			O oS
23	111	116	1.30000	%Q0001			O oS
24	116	121	1.30000	%Q0001			O oS
25	121	126	1.30000	%Q0001			O oS
26	126	131	1.30000	%Q0001			O oS
27	131	136	1.30000	%Q0001			O oS
28	136	141	1.30000	%Q0001			O oS
29	141	146	1.30000	%Q0001			O oS
30	146	151	1.30000	%Q0001			O oS
31	151	156	1.30000	%Q0001			O oS
32	156	161	0.50000	%Q0001			O oS
33	2	7	0.50000	%Q0002			oS
34	7	12	1.30000	%Q0002			oS
35	12	17	1.30000	%Q0002			oS
36	17	22	1.30000	%Q0002			oS
37	22	27	1.30000	%Q0002			oS
38	27	32	1.30000	%Q0002			oS
39	32	37	1.30000	%Q0002			oS
40	37	42	1.30000	%Q0002			oS
41	42	47	1.30000	%Q0002			oS
42	47	52	1.30000	%Q0002			oS
43	52	57	1.30000	%Q0002			oS
44	57	62	1.70000	%Q0002			oS
45	62	67	1.70000	%Q0002			oS
46	67	72	1.70000	%Q0002			oS
47	72	77	1.70000	%Q0002			oS
48	77	82	1.70000	%Q0002			oS
49	82	87	1.70000	%Q0002			oS
50	87	92	1.70000	%Q0002			oS
51	92	97	1.70000	%Q0002			oS
52	97	102	1.70000	%Q0002			oS
53	102	107	1.70000	%Q0002			oS
54	107	112	1.30000	%Q0002			oS
55	112	117	1.30000	%Q0002			oS
56	117	122	1.30000	%Q0002			oS
57	122	127	1.30000	%Q0002			oS
58	127	132	1.30000	%Q0002			oS
59	132	137	1.30000	%Q0002			oS
60	137	142	1.30000	%Q0002			oS
61	142	147	1.30000	%Q0002			oS
62	147	152	1.30000	%Q0002			oS
63	152	157	1.30000	%Q0002			oS
64	157	162	0.50000	%Q0002			oS
65	3	8	0.50000	%Q0003			oS
66	8	13	1.30000	%Q0003			oS
67	13	18	1.30000	%Q0003			oS
68	18	23	1.30000	%Q0003			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
69	23	28	1.30000	%Q0003			oS
70	28	33	1.30000	%Q0003			oS
71	33	38	1.30000	%Q0003			oS
72	38	43	1.30000	%Q0003			oS
73	43	48	1.30000	%Q0003			oS
74	48	53	1.30000	%Q0003			oS
75	53	58	1.30000	%Q0003			oS
76	58	63	1.70000	%Q0003			oS
77	63	68	1.70000	%Q0003			oS
78	68	73	1.70000	%Q0003			oS
79	73	78	1.70000	%Q0003			oS
80	78	83	1.70000	%Q0003			oS
81	83	88	1.70000	%Q0003			oS
82	88	93	1.70000	%Q0003			oS
83	93	98	1.70000	%Q0003			oS
84	98	103	1.70000	%Q0003			oS
85	103	108	1.70000	%Q0003			oS
86	108	113	1.30000	%Q0003			oS
87	113	118	1.30000	%Q0003			oS
88	118	123	1.30000	%Q0003			oS
89	123	128	1.30000	%Q0003			oS
90	128	133	1.30000	%Q0003			oS
91	133	138	1.30000	%Q0003			oS
92	138	143	1.30000	%Q0003			oS
93	143	148	1.30000	%Q0003			oS
94	148	153	1.30000	%Q0003			oS
95	153	158	1.30000	%Q0003			oS
96	158	163	0.50000	%Q0003			oS
97	4	9	0.50000	%Q0004			oS
98	9	14	1.30000	%Q0004			oS
99	14	19	1.30000	%Q0004			oS
100	19	24	1.30000	%Q0004			oS
101	24	29	1.30000	%Q0004			oS
102	29	34	1.30000	%Q0004			oS
103	34	39	1.30000	%Q0004			oS
104	39	44	1.30000	%Q0004			oS
105	44	49	1.30000	%Q0004			oS
106	49	54	1.30000	%Q0004			oS
107	54	59	1.30000	%Q0004			oS
108	59	64	1.70000	%Q0004			oS
109	64	69	1.70000	%Q0004			oS
110	69	74	1.70000	%Q0004			oS
111	74	79	1.70000	%Q0004			oS
112	79	84	1.70000	%Q0004			oS
113	84	89	1.70000	%Q0004			oS
114	89	94	1.70000	%Q0004			oS
115	94	99	1.70000	%Q0004			oS
116	99	104	1.70000	%Q0004			oS
117	104	109	1.70000	%Q0004			oS
118	109	114	1.30000	%Q0004			oS
119	114	119	1.30000	%Q0004			oS
120	119	124	1.30000	%Q0004			oS
121	124	129	1.30000	%Q0004			oS

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
94	0	-0.020072	0.094451	-1.289	7.273	23.591	-0.066626
94	0.250	-0.020072	0.094451	-1.289	7.273	23.269	-0.043026
94	0.250	-0.020072	0.094451	-7.159	7.273	23.268	-0.043001
94	1.300	-0.020072	0.094451	-7.159	7.273	15.752	0.056160
95	0	-0.006242	0.074536	-2.251	8.398	11.771	-0.045544
95	0.450	-0.006242	0.074536	-2.251	8.398	10.759	-0.012013
95	0.450	-0.006242	0.074536	-8.121	8.398	10.758	-0.011993
95	1.300	-0.006242	0.074536	-8.121	8.398	3.856	0.051352
96	0	1.55E-14	1.35E-11	1.94E-13	-1.31E-14	8.62E-14	-1.67E-12
96	0.500	1.55E-14	1.35E-11	1.94E-13	-1.31E-14	1.83E-13	5.09E-12
118	0	-0.297004	0.008031	1.700	-0.755571	-6.227	-0.029052
118	1.300	-0.297004	0.008031	1.700	-0.755571	-4.017	-0.018612
119	0	-0.282596	0.037119	3.016	-0.990281	-3.782	-0.048622
119	1.300	-0.282596	0.037119	3.016	-0.990281	0.138715	-0.000366
120	0	-0.259164	0.047407	2.971	-0.885716	0.180852	-0.052682
120	1.300	-0.259164	0.047407	2.971	-0.885716	4.044	0.008747
121	0	-0.230761	0.052335	2.796	-0.712264	4.122	-0.053431
121	1.300	-0.230761	0.052335	2.796	-0.712264	7.756	0.014604
122	0	-0.200389	0.054357	2.514	-0.445641	7.895	-0.051874
122	1.300	-0.200389	0.054357	2.514	-0.445641	11.162	0.018790
123	0	-0.169481	0.054662	1.994	0.022768	11.324	-0.049123
123	1.300	-0.169481	0.054662	1.994	0.022768	13.917	0.021938
124	0	-0.137994	0.053975	1.060	0.785441	13.995	-0.045838
124	1.300	-0.137994	0.053975	1.060	0.785441	15.373	0.024330
125	0	-0.104570	0.052587	-0.666001	1.764	15.017	-0.042385
125	1.300	-0.104570	0.052587	-0.666001	1.764	14.151	0.025974
126	0	-0.068254	0.050111	-2.475	2.380	13.007	-0.038319
126	1.300	-0.068254	0.050111	-2.475	2.380	9.790	0.026825
127	0	-0.034843	0.038694	-4.056	2.354	7.659	-0.028783
127	1.300	-0.034843	0.038694	-4.056	2.354	2.383	0.021519
128	0	-8.05E-14	-5.35E-13	-2.36E-13	-6.82E-15	5.19E-14	6.56E-13
128	0.500	-8.05E-14	-5.35E-13	-2.36E-13	-6.82E-15	-6.61E-14	3.88E-13
150	0	-0.368224	-0.013698	-0.187710	-0.093445	-1.721	-0.305014
150	1.300	-0.368224	-0.013698	-0.187710	-0.093445	-1.965	-0.322821
151	0	-0.349592	0.028507	0.066596	-0.127315	-0.778654	-0.169270
151	1.300	-0.349592	0.028507	0.066596	-0.127315	-0.692079	-0.132211

SECTION FORCES: 'ALL'

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
152	0	-0.318417	0.071726	0.352297	-0.118634	0.562924	0.021610
152	1.300	-0.318417	0.071726	0.352297	-0.118634	1.021	0.114854
153	0	-0.282022	0.089460	0.464671	-0.093340	2.081	0.237365
153	1.300	-0.282022	0.089460	0.464671	-0.093340	2.685	0.353662
154	0	-0.243102	0.101582	0.542715	-0.055568	3.460	0.434459
154	1.300	-0.243102	0.101582	0.542715	-0.055568	4.166	0.566515
155	0	-0.203337	0.125521	0.710379	0.007606	4.476	0.581328
155	1.300	-0.203337	0.125521	0.710379	0.007606	5.399	0.744504
156	0	-0.164110	0.172385	1.049	0.105575	4.917	0.648387
156	1.300	-0.164110	0.172385	1.049	0.105575	6.261	0.872487
157	0	-0.127035	0.234467	1.512	0.216189	4.645	0.615841
157	1.300	-0.127035	0.234467	1.512	0.216189	6.611	0.920648
158	0	-0.093721	0.209195	1.360	0.268788	3.940	0.519954
158	1.300	-0.093721	0.209195	1.360	0.268788	5.707	0.791907
159	0	-0.064576	-0.067689	-0.739888	0.218566	2.901	0.370254
159	1.300	-0.064576	-0.067689	-0.739888	0.218566	1.939	0.282258
160	0	6.69E-14	-5.29E-12	2.62E-12	-1.08E-16	-1.03E-12	9.50E-13
160	0.500	6.69E-14	-5.29E-12	2.62E-12	-1.08E-16	2.79E-13	-1.69E-12
	min:	-0.368224	-0.858537	-22.896	-1.583	-15.359	-2.337
	max:	0.407944	3.261	7.982	8.398	28.709	1.406

2.3.2. Cálculo de los coeficientes de reparto

Coeficientes de excentricidad a Flexión

Hipotesis	Barras	My (tm)	Iy (m^4)	Coef Flexion
H12	6	20.25	0.0275	1.51
	38	36.31	0.0632	
	70	43.67	0.0943	
	102	23.4	0.0632	
	134	10.87	0.0275	
H15	16	19.053	0.0275	1.38
	48	37.9	0.0632	
	80	46.53	0.0943	
	112	25.43	0.0632	
	144	9.63	0.0275	
H18	26	16.87	0.0275	1.29
	58	36.31	0.0632	
	90	43.722	0.0943	
	122	23.43	0.0632	
	154	10.873	0.0275	

Coeficiente Flexion = 1.39

Coeficiente Cortante = 2.81

Coeficientes de excentricidad cortante

Hipotesis	Barras	Vz (t)	Iy (m^4)	Coef Cortante
H11	2	22.89	0.0275	4.96
	34	10.48	0.0632	
	66	8.12	0.0943	
	98	4.06	0.0632	
	130	0.74	0.0275	
H13	11	8.08	0.0275	1.50
	43	13.22	0.0632	
	75	26.44	0.0943	
	107	4.72	0.0632	
	139	1.75	0.0275	
H14	12	11.55	0.0275	2.00
	44	14.05	0.0632	
	76	25.35	0.0943	
	108	4.55	0.0632	
	140	2.41	0.0275	
H16	21	11.55	0.0275	1.99
	53	14.05	0.0632	
	85	25.35	0.0943	
	117	4.94	0.0632	
	149	2.40	0.0275	
H17	22	8.08	0.0275	1.45
	54	13.22	0.0632	
	86	26.45	0.0943	
	118	6.29	0.0632	
	150	1.75	0.0275	
H19	31	22.90	0.0275	4.96
	63	10.48	0.0632	
	95	8.12	0.0943	
	127	4.06	0.0632	
	159	0.74	0.0275	

Loadcase Factor Stage Init.def Title
11 1.0000 VEHICULO HIPOTESIS 11

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.126491	0.057984	40.227			
10	0.126487	0.065156	6.303			
156	0.059326	0.056961	0.888022			
160	0.059331	0.065923	-0.448044			
166	-0.366341	-0.621683	15.628	2.239	-0.737014	0.065050
167	-0.005295	0.375660	-2.557	-2.148	0.634102	0.073680
Sums :	-3.53E-11	1.67E-11	60.000			
min:	-0.366341	-0.621683	-2.557	-2.148	-0.737014	0.065050
max:	0.126491	0.375660	40.227	2.239	0.634102	0.073680

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	7.18E-14	-1.05E-12	6.95E-14	7.74E-17	-1.07E-12	3.34E-13
1	0.500	7.18E-14	-1.05E-12	6.95E-14	7.74E-17	-1.03E-12	-1.90E-13
2	0	-0.014961	-3.261	22.896	-1.351	-9.755	1.406
2	0.650	-0.014961	-3.261	22.896	-1.351	9.704	-1.366
2	0.850	-0.014961	-1.869	12.993	-1.351	9.708	-1.366
2	1.300	-0.014961	-1.869	12.993	-1.351	15.554	-2.207
3	0	0.038421	-1.560	10.915	-0.881404	4.820	-0.657412
3	1.050	0.038421	-1.560	10.915	-0.881404	16.279	-2.295
3	1.050	0.038421	-0.168092	1.012	-0.881404	16.281	-2.295
3	1.300	0.038421	-0.168092	1.012	-0.881404	16.534	-2.327
4	0	0.083569	-0.533194	3.597	-0.399957	10.726	-1.488
4	1.250	0.083569	-0.533194	3.597	-0.399957	15.222	-2.155
4	1.250	0.083569	0.858537	-6.305	-0.399957	15.222	-2.155
4	1.300	0.083569	0.858537	-6.305	-0.399957	14.907	-2.112
5	0	0.125143	0.441007	-3.350	-0.049571	12.960	-1.809
5	1.300	0.125143	0.441007	-3.350	-0.049571	8.605	-1.235
6	0	0.165467	0.315521	-2.454	0.052411	6.781	-1.231
6	1.300	0.165467	0.315521	-2.454	0.052411	5.591	-0.820693
7	0	0.206219	0.288850	-2.263	0.080788	6.283	-0.888226
7	1.300	0.206219	0.288850	-2.263	0.080788	3.341	-0.512721

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
8	0	0.248424	0.276262	-2.185	0.086999	4.205	-0.603273
8	1.300	0.248424	0.276262	-2.185	0.086999	1.364	-0.244137
9	0	0.294783	0.255121	-2.074	0.076454	2.213	-0.329988
9	1.300	0.294783	0.255121	-2.074	0.076454	-0.482633	0.001670
10	0	0.349055	0.204178	-1.762	0.058909	0.207413	-0.057599
10	1.300	0.349055	0.204178	-1.762	0.058909	-2.083	0.207832
11	0	0.407944	0.141896	-1.257	0.067321	-1.515	0.166952
11	1.300	0.407944	0.141896	-1.257	0.067321	-3.150	0.351417
12	0	0.440530	0.116675	-0.868013	0.110335	-2.042	0.233026
12	1.700	0.440530	0.116675	-0.868013	0.110335	-3.516	0.431367
33	0	3.00E-14	-5.60E-12	-3.17E-12	-6.44E-16	-5.05E-15	2.54E-12
33	0.500	3.00E-14	-5.60E-12	-3.17E-12	-6.44E-16	-1.59E-12	-2.59E-12
34	0	-0.002518	-0.061418	10.482	-8.276	1.657	0.042887
34	0.850	-0.002518	-0.061418	10.482	-8.276	10.565	-0.009311
34	0.850	-0.002518	-0.061418	6.352	-8.276	10.567	-0.009327
34	1.300	-0.002516	-0.061418	6.352	-8.276	13.425	-0.036957
35	0	0.020486	-0.064843	7.246	-6.036	15.319	0.038953
35	1.050	0.020486	-0.064843	7.246	-6.036	22.926	-0.029124
35	1.050	0.020486	-0.064843	3.116	-6.036	22.928	-0.029141
35	1.300	0.020486	-0.064843	3.116	-6.036	23.706	-0.045344
36	0	0.054023	-0.059442	1.217	-2.968	23.903	0.031101
36	1.250	0.054023	-0.059442	1.217	-2.968	25.424	-0.043193
36	1.250	0.054023	-0.059442	-2.913	-2.968	25.423	-0.043209
36	1.300	0.054023	-0.059442	-2.913	-2.968	25.278	-0.046173
37	0	0.087182	-0.056054	-4.627	-0.626269	24.957	0.025834
37	1.300	0.087182	-0.056054	-4.627	-0.626269	18.942	-0.047036
38	0	0.119339	-0.055570	-4.120	0.313490	18.626	0.022660
38	1.300	0.119339	-0.055570	-4.120	0.313490	13.271	-0.049581
39	0	0.150994	-0.056243	-3.587	0.606696	13.269	0.020153
39	1.300	0.150994	-0.056243	-3.587	0.606696	8.606	-0.052963
40	0	0.182360	-0.058250	-3.399	0.675479	8.710	0.018308
40	1.300	0.182360	-0.058250	-3.399	0.675479	4.291	-0.057417
41	0	0.212062	-0.062978	-3.407	0.617467	4.473	0.017648
41	1.300	0.212062	-0.062978	-3.407	0.617467	0.043393	-0.064224
42	0	0.239784	-0.073328	-3.510	0.472629	0.300299	0.018724
42	1.300	0.239784	-0.073328	-3.510	0.472629	-4.262	-0.076602
43	0	0.278019	-0.084771	-2.711	0.481551	-4.089	0.015444

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
43	1.300	0.278019	-0.084771	-2.711	0.481551	-7.613	-0.094758
65	0	8.44E-15	-6.15E-12	-1.01E-12	2.26E-14	3.33E-13	-8.52E-13
65	0.500	8.44E-15	-6.15E-12	-1.01E-12	2.26E-14	-1.70E-13	-3.93E-12
66	0	-0.006242	-0.074536	8.121	-8.398	3.856	0.051352
66	0.850	-0.006242	-0.074536	8.121	-8.398	10.758	-0.011993
66	0.650	-0.006242	-0.074536	2.251	-8.398	10.759	-0.012013
66	1.300	-0.006242	-0.074536	2.251	-8.398	11.771	-0.045544
67	0	-0.020072	-0.094451	7.159	-7.273	15.752	0.056160
67	1.050	-0.020072	-0.094451	7.159	-7.273	23.268	-0.043601
67	1.050	-0.020072	-0.094451	1.289	-7.273	23.269	-0.043028
67	1.300	-0.020072	-0.094451	1.289	-7.273	23.591	-0.066626
68	0	-0.029126	-0.091885	2.540	-4.380	25.420	0.045753
68	1.250	-0.029126	-0.091885	2.540	-4.380	28.595	-0.069091
68	1.250	-0.029126	-0.091885	-3.330	-4.380	28.595	-0.069115
68	1.300	-0.029126	-0.091885	-3.330	-4.380	28.429	-0.073697
69	0	-0.033361	-0.088746	-3.341	-1.548	28.709	0.037421
69	1.300	-0.033361	-0.088746	-3.341	-1.548	24.366	-0.077949
70	0	-0.035127	-0.088221	-4.161	0.186281	24.094	0.021586
70	1.300	-0.035127	-0.088221	-4.161	0.186281	18.685	-0.083101
71	0	-0.036861	-0.088468	-4.537	0.974517	18.463	0.026181
71	1.300	-0.036861	-0.088468	-4.537	0.974517	12.564	-0.088626
72	0	-0.041141	-0.087893	-4.600	1.297	12.509	0.020137
72	1.300	-0.041141	-0.087893	-4.600	1.297	6.529	-0.094124
73	0	-0.052404	-0.084608	-4.643	1.417	6.639	0.013219
73	1.300	-0.052404	-0.084608	-4.643	1.417	0.602162	-0.096771
74	0	-0.079791	-0.080599	-5.102	1.451	0.960007	0.008685
74	1.300	-0.079791	-0.080599	-5.102	1.451	-5.673	-0.096094
75	0	-0.143674	-0.113126	-7.982	1.583	-4.982	0.012294
75	1.300	-0.143674	-0.113126	-7.982	1.583	-15.359	-0.134770
97	0	-9.97E-14	-2.53E-12	-6.99E-13	7.69E-15	2.82E-14	-4.00E-13
97	0.500	-9.97E-14	-2.53E-12	-6.99E-13	7.69E-15	-3.21E-13	-1.67E-12
98	0	-0.034843	-0.038694	4.058	-2.354	2.383	0.021519
98	1.300	-0.034843	-0.038694	4.058	-2.354	7.659	-0.028783
99	0	-0.068254	-0.050111	2.475	-2.380	9.790	0.026825
99	1.300	-0.068254	-0.050111	2.475	-2.380	13.007	-0.038319
100	0	-0.104570	-0.052587	0.666001	-1.764	14.151	0.025974
100	1.300	-0.104570	-0.052587	0.666001	-1.764	15.017	-0.042389

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
101	0	-0.137994	-0.053975	-1.060	-0.785441	15.373	0.024330
101	1.300	-0.137994	-0.053975	-1.060	-0.785441	13.995	-0.045836
102	0	-0.169481	-0.054662	-1.994	-0.022768	13.917	0.021938
102	1.300	-0.169481	-0.054662	-1.994	-0.022768	11.324	-0.049122
103	0	-0.200389	-0.054357	-2.514	0.445641	11.162	0.018790
103	1.300	-0.200389	-0.054357	-2.514	0.445641	7.895	-0.051874
104	0	-0.230761	-0.052335	-2.796	0.712264	7.756	0.014604
104	1.300	-0.230761	-0.052335	-2.796	0.712264	4.122	-0.053431
105	0	-0.259164	-0.047407	-2.971	0.885716	4.044	0.008747
105	1.300	-0.259164	-0.047407	-2.971	0.885716	0.180852	-0.052682
106	0	-0.282596	-0.037119	-3.016	0.990281	0.138719	-0.000368
106	1.300	-0.282596	-0.037119	-3.016	0.990281	-3.782	-0.048622
107	0	-0.297004	-0.008031	-1.700	0.755571	-4.017	-0.018612
107	1.300	-0.297004	-0.008031	-1.700	0.755571	-6.227	-0.029052
129	0	4.23E-13	-4.80E-11	6.62E-12	-1.07E-15	-9.45E-13	9.75E-12
129	0.500	4.23E-13	-4.80E-11	6.62E-12	-1.07E-15	2.37E-12	-1.43E-11
130	0	-0.064576	0.067689	0.739888	-0.218566	1.939	0.282258
130	1.300	-0.064576	0.067689	0.739888	-0.218566	2.901	0.370254
131	0	-0.093721	-0.209195	-1.360	-0.268788	5.707	0.791907
131	1.300	-0.093721	-0.209195	-1.360	-0.268788	3.940	0.519954
132	0	-0.127035	-0.234467	-1.512	-0.216189	6.611	0.920648
132	1.300	-0.127035	-0.234467	-1.512	-0.216189	4.645	0.615841
133	0	-0.164110	-0.172385	-1.049	-0.105575	6.281	0.872487
133	1.300	-0.164110	-0.172385	-1.049	-0.105575	4.917	0.648387
134	0	-0.203337	-0.125521	-0.710379	-0.007606	5.399	0.744504
134	1.300	-0.203337	-0.125521	-0.710379	-0.007606	4.476	0.581328
135	0	-0.243102	-0.101582	-0.542715	0.055568	4.166	0.566515
135	1.300	-0.243102	-0.101582	-0.542715	0.055568	3.460	0.434459
136	0	-0.282022	-0.089460	-0.464671	0.093340	2.685	0.353662
136	1.300	-0.282022	-0.089460	-0.464671	0.093340	2.081	0.237365
137	0	-0.318417	-0.071726	-0.352297	0.118634	1.021	0.114854
137	1.300	-0.318417	-0.071726	-0.352297	0.118634	0.562924	0.021610
138	0	-0.349592	-0.028507	-0.066596	0.127315	-0.692079	-0.132211
138	1.300	-0.349592	-0.028507	-0.066596	0.127315	-0.778654	-0.169270

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
139	0	-0.368224	0.013698	0.187710	0.093445	-1.965	-0.322821
139	1.300	-0.368224	0.013698	0.187710	0.093445	-1.721	-0.305014
min:		-0.366224	-3.261	-7.982	-8.398	-15.359	-2.337
max:		0.440530	0.858537	22.896	1.583	28.709	1.406

Loadcase Factor Stage Init.def Title
12 1.0000 VEHICULO HIPOTESIS 12

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.356267	0.119217	26.355			
10	0.356258	0.139359	-1.750			
156	0.167580	0.116429	2.334			
160	0.167591	0.141617	-1.442			
166	-1.031	-1.294	39.877	4.653	-2.071	0.182707
167	-0.016854	0.777781	-5.337	-4.462	1.781	0.207035
Sums :	-1.00E-10	3.49E-11	60.000			
min:	-1.031	-1.294	-5.337	-4.462	-2.071	0.182707
max:	0.356267	0.777781	39.877	4.653	1.781	0.207035

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	1.37E-13	2.94E-11	3.45E-12	7.81E-18	-2.18E-12	-3.73E-12
1	0.500	1.37E-13	2.94E-11	3.45E-12	7.81E-18	-4.58E-13	1.10E-11
2	0	-0.016069	-2.132	14.244	-1.218	-8.539	1.287
2	1.300	-0.016069	-2.132	14.244	-1.218	9.978	-1.485
3	0	0.122943	-1.604	10.871	-1.108	-1.467	0.232305
3	1.300	0.122943	-1.604	10.871	-1.108	12.665	-1.853
4	0	0.246818	-1.537	10.420	-0.978476	2.571	-0.343902
4	1.300	0.246818	-1.537	10.420	-0.978476	16.117	-2.342
5	0	0.365282	-1.696	11.557	-0.824340	7.100	-0.989046

SECTION FORCES: "ALL"

Memb.Distance [m]		N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
5	1.100	0.365282	-1.696	11.557	-0.824340	19.811	-2.855
5	1.100	0.365282	-0.304692	1.654	-0.824340	19.813	-2.855
5	1.300	0.365282	-0.304692	1.654	-0.824340	20.144	-2.916
6	0	0.480783	-0.781442	5.032	-0.508455	13.706	-1.928
6	1.300	0.480783	-0.781442	5.032	-0.508455	20.247	-2.944
6	1.300	0.480783	-0.781442	5.032	-0.508455	20.246	-2.944
7	0	0.595501	0.065382	-1.020	-0.180607	16.870	-2.386
7	1.300	0.595501	0.065382	-1.020	-0.180607	15.544	-2.201
8	0	0.712738	-0.426990	2.430	0.106270	15.112	-2.155
8	0.200	0.712738	-0.426990	2.430	0.106270	15.596	-2.240
8	0.200	0.712738	0.964741	-7.473	0.106270	15.597	-2.240
8	1.300	0.712738	0.964741	-7.473	0.106270	7.378	-1.179
9	0	0.838741	0.739216	-5.963	0.179405	9.074	-1.327
9	1.300	0.838741	0.739216	-5.963	0.179405	1.322	-0.365602
10	0	0.982928	0.581839	-4.955	0.153655	3.033	-0.505554
10	1.300	0.982928	0.581839	-4.955	0.153655	-3.409	0.250837
11	0	1.134	0.409490	-3.559	0.178239	-1.899	0.138817
11	1.300	1.134	0.409490	-3.559	0.178239	-6.526	0.671154
12	0	1.212	0.347214	-2.510	0.293701	-3.617	0.347955
12	1.700	1.212	0.347214	-2.510	0.293701	-7.884	0.938219
33	0	-1.37E-13	-1.99E-11	-5.01E-12	-1.19E-15	-2.03E-13	7.82E-12
33	0.500	-1.37E-13	-1.99E-11	-5.01E-12	-1.19E-15	-2.71E-12	-2.15E-12
34	0	0.006287	-0.159494	4.670	-8.199	-0.093201	0.109912
34	1.300	0.006287	-0.159494	4.670	-8.199	5.978	-0.097430
35	0	0.074586	-0.175620	6.980	-8.036	6.502	0.105015
35	1.300	0.074586	-0.175620	6.980	-8.036	15.576	-0.123291
36	0	0.169190	-0.166604	7.656	-7.251	15.165	0.087503
36	1.300	0.169190	-0.166604	7.656	-7.251	25.115	-0.129083
37	0	0.262361	-0.161108	7.895	-6.009	24.773	0.074975
37	1.100	0.262361	-0.161108	7.895	-6.009	33.456	-0.102224
37	1.100	0.262361	-0.161108	3.765	-6.009	33.458	-0.102266
37	1.300	0.262361	-0.161108	3.765	-6.009	34.210	-0.134466
38	0	0.353211	-0.158138	2.044	-3.821	33.659	0.064575
38	1.300	0.353211	-0.158138	2.044	-3.821	36.317	-0.140983
38	1.300	0.353211	-0.158138	2.044	-3.821	36.317	-0.141004
39	0	0.443040	-0.158002	-3.952	-1.432	35.940	0.056159
39	1.300	0.443040	-0.158002	-3.952	-1.432	30.803	-0.149243

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
40	0	0.531310	-0.161114	-5.755	0.574990	30.658	0.049574
40	0.200	0.531310	-0.161114	-5.755	0.574990	29.507	0.017372
40	0.200	0.531310	-0.161114	-9.685	0.574990	29.505	0.017330
40	1.300	0.531310	-0.161114	-9.885	0.574990	18.634	-0.159875
41	0	0.614730	-0.171123	-9.876	1.323	18.515	0.046085
41	1.300	0.614730	-0.171122	-9.876	1.323	5.675	-0.176375
42	0	0.690970	-0.193078	-9.647	1.220	6.178	0.045663
42	1.300	0.690970	-0.193078	-9.647	1.220	-6.364	-0.205339
43	0	0.789748	-0.210549	-7.687	1.268	-5.899	0.031003
43	1.300	0.789748	-0.210549	-7.687	1.268	-15.892	-0.242710
65	0	-1.54E-12	1.40E-12	-4.09E-13	-3.67E-16	-2.89E-15	-6.26E-12
65	0.500	-1.54E-12	1.40E-12	-4.09E-13	-3.67E-16	-2.07E-13	-5.56E-12
66	0	-0.011795	-0.206237	4.765	-11.382	1.984	0.142276
66	1.300	-0.011795	-0.206237	4.765	-11.382	8.179	-0.125832
67	0	-0.039707	-0.263938	7.544	-12.477	10.322	0.157365
67	1.300	-0.039707	-0.263938	7.544	-12.477	20.128	-0.185754
68	0	-0.059366	-0.260113	8.073	-12.005	21.473	0.130407
68	1.300	-0.059366	-0.260113	8.073	-12.005	31.968	-0.207740
69	0	-0.069728	-0.253397	7.490	-10.057	32.817	0.107974
69	1.100	-0.069728	-0.253397	7.490	-10.057	41.055	-0.170730
69	1.100	-0.069726	-0.253397	1.620	-10.057	41.056	-0.170756
69	1.300	-0.069728	-0.253397	1.620	-10.057	41.350	-0.221442
70	0	-0.074454	-0.250968	1.377	-6.719	41.879	0.090490
70	1.300	-0.074454	-0.250968	1.377	-6.719	43.669	-0.235726
70	1.300	-0.074454	-0.250968	1.377	-6.719	43.669	-0.235765
71	0	-0.078136	-0.249879	-4.914	-2.850	43.722	0.073915
71	1.300	-0.078136	-0.249879	-4.914	-2.850	37.334	-0.250926
72	0	-0.086647	-0.247061	-5.106	0.509968	37.066	0.056181
72	0.200	-0.086647	-0.247061	-5.106	0.509968	36.046	0.006801
72	0.200	-0.086647	-0.247061	-10.976	0.509968	36.044	0.006737
72	1.300	-0.086647	-0.247061	-10.976	0.509968	23.972	-0.264998
73	0	-0.109680	-0.237656	-11.745	2.571	23.848	0.036716
73	1.300	-0.109680	-0.237656	-11.745	2.571	8.579	-0.272217
74	0	-0.166577	-0.226656	-13.243	3.488	9.166	0.024209
74	1.300	-0.166577	-0.226656	-13.243	3.488	-8.050	-0.270444
75	0	-0.300038	-0.318468	-20.229	4.207	-6.449	0.034514
75	1.300	-0.300038	-0.318468	-20.229	4.207	-32.746	-0.375494

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
97	0	4.84E-13	-8.34E-12	-1.10E-13	1.88E-14	-1.65E-13	-1.66E-12
97	0.500	4.84E-13	-8.34E-12	-1.10E-13	1.88E-14	-2.21E-13	-5.83E-12
98	0	-0.083706	-0.115716	3.876	-5.144	1.557	0.067294
98	1.300	-0.083706	-0.115716	3.876	-5.144	6.995	-0.083137
99	0	-0.173205	-0.145038	3.398	-5.849	8.703	0.079036
99	1.300	-0.173205	-0.145038	3.398	-5.849	13.121	-0.109513
100	0	-0.274573	-0.150725	3.019	-5.871	14.665	0.075246
100	1.300	-0.274573	-0.150725	3.019	-5.671	18.589	-0.120696
101	0	-0.369385	-0.154357	1.936	-5.060	19.962	0.070223
101	1.300	-0.369385	-0.154357	1.936	-5.060	22.479	-0.130441
102	0	-0.459224	-0.155746	-0.314943	-3.471	23.403	0.063020
102	1.300	-0.459224	-0.155746	-0.314943	-3.471	22.994	-0.139450
103	0	-0.547159	-0.154492	-2.869	-1.574	23.430	0.053831
103	1.300	-0.547159	-0.154492	-2.869	-1.574	19.700	-0.147006
104	0	-0.633166	-0.149624	-5.254	0.206062	19.707	0.042462
104	1.300	-0.633166	-0.149624	-5.254	0.206062	12.877	-0.152048
105	0	-0.713482	-0.139034	-6.734	1.506	12.633	0.027722
105	1.300	-0.713482	-0.139034	-6.734	1.506	3.878	-0.153022
106	0	-0.780879	-0.117645	-7.381	2.267	3.674	0.005820
106	1.300	-0.780879	-0.117645	-7.381	2.267	-5.922	-0.147119
107	0	-0.830107	-0.050671	-4.460	1.942	-6.584	-0.040001
107	1.300	-0.830107	-0.050671	-4.460	1.942	-12.381	-0.105873
129	0	1.33E-12	-9.62E-11	1.36E-11	1.11E-15	-1.33E-12	9.67E-12
129	0.500	1.33E-12	-9.62E-11	1.36E-11	1.11E-15	5.47E-12	-3.84E-11
130	0	-0.153293	-0.538540	-3.100	-0.643662	4.736	0.702451
130	1.300	-0.153293	-0.538540	-3.100	-0.643662	0.706078	0.002349
131	0	-0.243192	-0.656167	-4.292	-0.744803	7.823	1.084
131	1.300	-0.243192	-0.656167	-4.292	-0.744803	2.244	0.230891
132	0	-0.340646	-0.718644	-4.657	-0.750734	9.887	1.376
132	1.300	-0.340646	-0.718644	-4.657	-0.750734	3.833	0.444222
133	0	-0.447105	-0.688298	-4.379	-0.647593	10.992	1.527
133	1.300	-0.447105	-0.688298	-4.379	-0.647593	5.299	0.632380
134	0	-0.558892	-0.578505	-3.583	-0.449138	10.873	1.496
134	1.300	-0.558892	-0.578505	-3.583	-0.449138	6.215	0.744054
135	0	-0.671822	-0.444691	-2.640	-0.207333	9.481	1.264

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
135	1.300	-0.671822	-0.444691	-2.640	-0.207333	6.048	0.706363
136	0	-0.782810	-0.317506	-1.755	0.021533	6.882	0.903791
136	1.300	-0.782810	-0.317506	-1.755	0.021533	4.600	0.491033
137	0	-0.888886	-0.214773	-1.048	0.197358	3.388	0.397658
137	1.300	-0.888886	-0.214773	-1.048	0.197358	2.026	0.118453
138	0	-0.985018	-0.085070	-0.161729	0.287465	-0.556182	-0.175491
138	1.300	-0.985018	-0.085070	-0.161729	0.287465	-0.766430	-0.286082
139	0	-1.052	0.030547	0.526329	0.237943	-3.658	-0.685835
139	1.300	-1.052	0.030547	0.526329	0.237943	-2.974	-0.606127
	min:	-1.052	-2.132	-20.225	-12.477	-32.746	-2.944
	max:	1.212	0.964741	14.244	4.207	43.722	1.527

Loadcase Factor Stage Init.def Title
13 1.0000 VEHICULO HIPOTESIS 13

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.570715	0.074503	14.915			
10	0.570708	0.105836	-7.570			
156	0.275936	0.070252	3.378			
160	0.275944	0.109735	-2.876			
166	-1.639	-0.860788	55.444	3.060	-3.243	0.284786
167	-0.054322	0.500460	-3.289	-2.928	2.775	0.324107
Sums :	-1.65E-10	2.39E-11	60.000			
min:	-1.639	-0.860788	-7.570	-2.928	-3.243	0.284786
max:	0.570715	0.500460	55.444	3.060	2.775	0.324107

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
1	0	-6.05E-14	2.51E-11	2.02E-12	-3.16E-17	-4.81E-12	-1.87E-12
1	0.500	-6.05E-14	2.51E-11	2.02E-12	-3.16E-17	-3.79E-12	1.07E-11
2	0	0.050768	-1.403	8.571	-0.849102	-5.990	0.958860
2	1.300	0.050768	-1.403	8.571	-0.849102	5.151	-0.864901
3	0	0.250819	-1.098	7.003	-0.829354	-3.149	0.464081
3	1.300	0.250819	-1.098	7.003	-0.829354	5.955	-0.963913
4	0	0.437055	-1.065	6.758	-0.793100	-1.969	0.286992
4	1.300	0.437055	-1.065	6.758	-0.793100	6.817	-1.097
5	0	0.620303	-1.065	6.734	-0.777255	-0.916715	0.121705
5	1.300	0.620303	-1.065	6.734	-0.777255	7.837	-1.263
6	0	0.803102	-1.071	6.775	-0.764288	0.224092	-0.061093
6	1.300	0.803102	-1.071	6.775	-0.764288	9.031	-1.454
7	0	0.986173	-1.097	6.962	-0.746362	1.581	-0.274079
7	1.300	0.986173	-1.097	6.962	-0.746362	10.631	-1.701
8	0	1.172	-1.241	7.952	-0.688208	3.491	-0.562373
8	1.300	1.172	-1.241	7.952	-0.688208	12.829	-2.176
9	0	1.367	-1.748	11.446	-0.456609	8.157	-1.239
9	0.0499	1.367	-1.748	11.446	-0.456609	8.726	-1.326
9	0.0501	1.367	-0.356429	1.543	-0.456609	8.730	-1.326
9	1.300	1.367	-0.356429	1.543	-0.456609	10.656	-1.772
10	0	1.575	-1.042	6.289	-0.215304	7.273	-1.150
10	0.250	1.575	-1.042	6.289	-0.215304	8.845	-1.410
10	0.250	1.575	0.349613	-3.614	-0.215304	8.845	-1.410
10	1.300	1.575	0.349613	-3.614	-0.215304	5.051	-1.043
11	0	1.777	-0.381440	1.825	0.089659	4.101	-0.775083
11	0.450	1.777	-0.381440	1.825	0.089659	4.922	-0.946682
11	0.450	1.777	1.010	-8.078	0.089659	4.921	-0.946600
11	1.300	1.777	1.010	-8.078	0.089659	-1.944	-0.087984
12	0	1.863	0.677065	-4.715	0.399680	1.305	-0.459542
12	1.700	1.863	0.677065	-4.715	0.399680	-6.710	0.691469
33	0	-8.76E-13	-3.09E-11	-2.10E-12	1.88E-16	-2.81E-13	1.53E-11
33	0.500	-8.76E-13	-3.09E-11	-2.10E-12	1.88E-16	-1.33E-12	-1.34E-13
34	0	0.044586	-0.235035	1.385	-5.938	-0.579117	0.156383
34	1.300	0.044586	-0.235035	1.385	-5.938	1.221	-0.149162
35	0	0.163529	-0.266696	2.576	-6.147	1.046	0.155965
35	1.300	0.163529	-0.266696	2.576	-6.147	4.395	-0.190740
36	0	0.317521	-0.258547	2.593	-6.029	3.689	0.133939

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
36	1.300	0.317521	-0.258547	2.593	-6.029	7.059	-0.202172
37	0	0.467416	-0.253574	2.619	-5.936	6.189	0.117190
37	1.300	0.467416	-0.253574	2.619	-5.936	9.593	-0.212457
38	0	0.612289	-0.251950	2.814	-5.827	8.719	0.102883
38	1.300	0.612289	-0.251950	2.814	-5.827	12.378	-0.224652
39	0	0.755653	-0.252622	3.320	-5.599	11.618	0.089944
39	1.300	0.755653	-0.252622	3.320	-5.599	15.934	-0.238464
40	0	0.896483	-0.255395	3.722	-4.931	15.604	0.077897
40	1.300	0.896483	-0.255395	3.722	-4.931	20.443	-0.254116
41	0	1.029	-0.260636	1.746	-3.305	20.478	0.066064
41	0.0499	1.029	-0.260636	1.746	-3.305	20.565	0.053066
41	0.0501	1.029	-0.260636	-2.384	-3.305	20.565	0.052996
41	1.300	1.029	-0.260636	-2.384	-3.305	17.585	-0.272763
42	0	1.148	-0.274217	-4.755	-1.560	17.994	0.054476
42	0.250	1.148	-0.274217	-4.755	-1.560	16.806	-0.014042
42	0.250	1.148	-0.274217	-8.885	-1.560	16.804	-0.014113
42	1.300	1.148	-0.274217	-8.885	-1.560	7.476	-0.302005
43	0	1.283	-0.261753	-9.091	0.309191	7.877	0.016054
43	0.450	1.283	-0.261753	-9.091	0.309191	3.787	-0.101701
43	0.450	1.283	-0.261753	-13.221	0.309191	3.784	-0.101765
43	1.300	1.283	-0.261753	-13.221	0.309191	-7.452	-0.324224
65	0	-1.65E-13	-5.80E-12	-8.88E-16	3.78E-15	-4.30E-14	-1.16E-11
65	0.500	-1.65E-13	-5.80E-12	-8.88E-16	3.78E-15	-4.34E-14	-1.45E-11
66	0	-0.006166	-0.330042	1.409	-9.405	0.577546	0.227714
66	1.300	-0.006166	-0.330042	1.409	-9.405	2.409	-0.201340
67	0	-0.027603	-0.421901	2.268	-10.554	3.011	0.251526
67	1.300	-0.027603	-0.421901	2.268	-10.554	5.960	-0.296946
68	0	-0.041344	-0.415244	2.556	-10.888	6.275	0.208136
68	1.300	-0.041344	-0.415244	2.556	-10.888	9.601	-0.331661
69	0	-0.048428	-0.404478	2.601	-10.874	9.744	0.172383
69	1.300	-0.048428	-0.404478	2.601	-10.874	13.125	-0.353439
70	0	-0.051539	-0.401786	2.567	-10.570	13.269	0.145312
70	1.300	-0.051539	-0.401786	2.567	-10.570	16.606	-0.377010
71	0	-0.054067	-0.401716	2.285	-9.760	16.926	0.119785
71	1.300	-0.054067	-0.401716	2.285	-9.760	19.896	-0.402445
72	0	-0.060136	-0.398369	1.607	-7.945	20.509	0.091661
72	1.300	-0.060136	-0.398369	1.607	-7.945	22.598	-0.426018

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
73	0	-0.075849	-0.382716	1.358	-4.841	23.439	0.060015
73	0.0499	-0.075849	-0.382716	1.358	-4.841	23.506	0.040929
73	0.0501	-0.075849	-0.382716	-4.512	-4.841	23.506	0.040836
73	1.300	-0.075849	-0.382716	-4.512	-4.841	17.867	-0.437516
74	0	-0.113629	-0.364004	-6.199	-1.067	19.052	0.039011
74	0.250	-0.113629	-0.364004	-6.199	-1.067	17.504	-0.051943
74	0.250	-0.113629	-0.364004	-12.069	-1.067	17.501	-0.052037
74	1.300	-0.113629	-0.364004	-12.069	-1.067	4.830	-0.434195
75	0	-0.202043	-0.509851	-20.578	2.984	6.793	0.054486
75	0.450	-0.202043	-0.509851	-20.578	2.984	-2.465	-0.174880
75	0.450	-0.202043	-0.509851	-26.448	2.984	-2.471	-0.175013
75	1.300	-0.202043	-0.509851	-26.448	2.984	-24.948	-0.608320
97	0	-5.49E-13	-1.43E-11	-8.42E-14	2.92E-15	-7.38E-14	-1.35E-12
97	0.500	-5.49E-13	-1.43E-11	-8.42E-14	2.92E-15	-1.16E-13	-8.52E-12
98	0	-0.098550	-0.204806	1.189	-5.056	1.126	0.126835
98	1.300	-0.098550	-0.204806	1.189	-5.056	2.672	-0.139412
99	0	-0.232232	-0.245297	0.560083	-5.567	3.483	0.137777
99	1.300	-0.232232	-0.245297	0.560083	-5.567	4.212	-0.181110
100	0	-0.391149	-0.247514	0.634553	-5.755	5.184	0.125418
100	1.300	-0.391149	-0.247514	0.634553	-5.755	6.009	-0.196350
101	0	-0.541980	-0.249286	0.650567	-5.765	7.009	0.114120
101	1.300	-0.541980	-0.249286	0.650567	-5.765	7.855	-0.209951
102	0	-0.686097	-0.250469	0.416947	-5.550	8.858	0.101808
102	1.300	-0.686097	-0.250469	0.416947	-5.550	9.400	-0.223802
103	0	-0.828072	-0.250019	-0.159567	-4.993	10.432	0.088103
103	1.300	-0.828072	-0.250019	-0.159567	-4.993	10.224	-0.236921
104	0	-0.967622	-0.246724	-1.341	-3.887	11.292	0.072526
104	1.300	-0.967622	-0.246724	-1.341	-3.887	9.549	-0.246215
105	0	-1.096	-0.239105	-3.738	-2.065	10.498	0.053883
105	1.300	-1.098	-0.239105	-3.738	-2.065	5.638	-0.256954
106	0	-1.211	-0.224428	-6.282	0.012458	6.223	0.028350
106	1.300	-1.211	-0.224428	-6.282	0.012458	-1.943	-0.263406
107	0	-1.314	-0.156047	-4.721	1.037	-2.452	-0.030771
107	1.300	-1.314	-0.156047	-4.721	1.037	-8.589	-0.233632
129	0	3.24E-13	-1.64E-10	2.05E-11	2.39E-17	-1.66E-12	2.37E-11
129	0.500	3.24E-13	-1.64E-10	2.05E-11	2.39E-17	8.57E-12	-5.82E-11

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
130	0	-0.168976	-0.913872	-5.244	-0.682229	4.882	0.768486
130	1.300	-0.168976	-0.913872	-5.244	-0.682229	-1.936	-0.419548
131	0	-0.334850	-0.809962	-5.085	-0.732555	5.141	0.718032
131	1.300	-0.334850	-0.809962	-5.085	-0.732555	-1.469	-0.334919
132	0	-0.502422	-0.840058	-5.215	-0.750158	5.881	0.823364
132	1.300	-0.502422	-0.840058	-5.215	-0.750158	-0.899400	-0.268711
133	0	-0.677649	-0.858896	-5.274	-0.750603	6.565	0.906895
133	1.300	-0.677649	-0.858896	-5.274	-0.750603	-0.292107	-0.209669
134	0	-0.858094	-0.857467	-5.243	-0.721139	7.052	0.952411
134	1.300	-0.858094	-0.857467	-5.243	-0.721139	0.235666	-0.162296
135	0	-1.040	-0.834404	-5.081	-0.644189	7.100	0.933662
135	1.300	-1.040	-0.834404	-5.081	-0.644189	0.454848	-0.151063
136	0	-1.221	-0.770309	-4.629	-0.492431	6.296	0.795627
136	1.300	-1.221	-0.770309	-4.629	-0.492431	0.280471	-0.205775
137	0	-1.402	-0.620455	-3.547	-0.255388	4.146	0.467609
137	1.300	-1.402	-0.620455	-3.547	-0.255388	-0.464921	-0.338982
138	0	-1.579	-0.370223	-1.757	-0.005971	0.764744	-0.040931
138	1.300	-1.579	-0.370223	-1.757	-0.005971	-1.520	-0.522221
139	0	-1.725	-0.106651	-0.112078	0.106710	-2.402	-0.546416
139	1.300	-1.725	-0.106651	-0.112078	0.106710	-2.547	-0.685062
	min:	-1.725	-1.748	-26.448	-10.888	-24.948	-2.176
	max:	1.863	1.010	11.446	2.984	23.506	0.958860

Loadcase	Factor	Stage	Init.def	Title
14	1.0000			VEHICULO HIPOTESIS 14

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.647634	-0.073082	7.153			
10	0.647639	-0.047158	-10.476			
156	0.390235	-0.077848	3.801			
160	0.350230	-0.044529	-5.426			
166	-1.730	1.024	56.508	-4.021	-2.915	0.241741
167	-0.345981	-0.784014	8.439	3.932	2.340	0.289956
Sums :	-2.00E-10	-1.68E-11	60.000			
min:	-1.730	-0.784014	-10.476	-4.021	-2.915	0.241741
max:	0.647639	1.024	56.508	3.932	2.340	0.289956

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.981	-1.570	11.552	-0.405653	-5.099	0.365924
12	0.850	1.981	-1.570	11.552	-0.405653	4.718	-0.968178
12	0.850	1.981	-0.178115	1.649	-0.405653	4.720	-0.968475
12	1.700	1.981	-0.178115	1.649	-0.405653	6.122	-1.120
13	0	1.866	-1.163	8.877	-0.030892	3.364	-0.819953
13	0.650	1.866	-1.163	8.877	-0.030892	9.133	-1.576
13	0.650	1.866	0.228415	-1.026	-0.030892	9.134	-1.576
13	1.700	1.866	0.228415	-1.026	-0.030892	8.058	-1.336
14	0	1.751	-0.537146	4.276	0.263660	9.390	-1.622
14	0.450	1.751	-0.537146	4.276	0.263660	11.314	-1.863
14	0.450	1.751	0.854585	-5.626	0.263660	11.314	-1.863
14	1.700	1.751	0.854585	-5.626	0.263660	4.282	-0.795275
15	0	1.654	0.623125	-4.038	0.361146	8.899	-1.534
15	1.700	1.654	0.623125	-4.038	0.361146	2.035	-0.474533
16	0	1.562	0.596762	-3.855	0.375666	7.071	-1.266
16	1.700	1.562	0.596762	-3.855	0.375666	0.517135	-0.251964
17	0	1.472	0.592469	-3.822	0.383119	5.730	-1.068
17	1.700	1.472	0.592469	-3.822	0.383119	-0.767757	-0.060518
18	0	1.381	0.591353	-3.817	0.384672	4.511	-0.884986
18	1.700	1.381	0.591353	-3.817	0.384672	-1.978	0.120314

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
19	0	1.294	0.585144	-3.797	0.378401	3.284	-0.699281
19	1.700	1.294	0.585144	-3.797	0.378401	-3.171	0.295462
20	0	1.217	0.553102	-3.646	0.360113	1.936	-0.494719
20	1.700	1.217	0.553102	-3.646	0.360113	-4.261	0.445554
21	0	1.162	0.472947	-3.128	0.359144	0.586372	-0.296056
21	1.700	1.162	0.472947	-3.128	0.359144	-4.731	0.507953
44	0	1.427	0.083943	14.052	-2.795	-9.706	-0.233892
44	0.850	1.427	0.083943	14.052	-2.795	2.236	-0.162555
44	0.850	1.427	0.083943	9.922	-2.795	2.240	-0.162526
44	1.700	1.427	0.083943	9.922	-2.795	10.672	-0.091188
45	0	1.335	0.103071	8.200	-0.394724	9.354	-0.238700
45	0.650	1.335	0.103071	8.200	-0.394724	14.683	-0.171722
45	0.650	1.335	0.103071	4.070	-0.394724	14.685	-0.171666
45	1.700	1.335	0.103071	4.070	-0.394724	18.958	-0.063478
46	0	1.281	0.090739	0.982586	1.717	18.431	-0.216010
46	0.450	1.281	0.090739	0.982586	1.717	18.873	-0.175192
46	0.450	1.281	0.090736	-3.147	1.717	18.873	-0.175162
46	1.700	1.281	0.090739	-3.147	1.717	14.939	-0.061753
47	0	1.214	0.086715	-3.017	2.651	15.037	-0.204926
47	1.700	1.214	0.086715	-3.017	2.651	9.908	-0.057510
48	0	1.143	0.085532	-2.490	2.862	10.875	-0.157165
48	1.700	1.143	0.085532	-2.490	2.862	6.643	-0.051764
49	0	1.071	0.085307	-2.342	2.930	7.777	-0.190342
49	1.700	1.071	0.085307	-2.342	2.930	3.795	-0.045319
50	0	1.001	0.084562	-2.302	2.946	4.978	-0.183106
50	1.700	1.001	0.084562	-2.302	2.946	1.063	-0.039350
51	0	0.930042	0.081480	-2.315	2.909	2.276	-0.174283
51	1.700	0.930042	0.081480	-2.315	2.909	-1.660	-0.035767
52	0	0.856681	0.072190	-2.439	2.785	-0.377674	-0.161778
52	1.700	0.856681	0.072190	-2.439	2.785	-4.523	-0.039055
53	0	0.787361	0.043080	-2.218	2.718	-3.250	-0.140451
53	1.700	0.787361	0.043080	-2.218	2.718	-7.022	-0.067215
76	0	-0.428075	0.307467	25.351	-7.563	-27.563	-0.598204
76	0.850	-0.428075	0.307467	25.351	-7.563	-6.019	-0.336905
76	0.850	-0.428075	0.307467	19.481	-7.563	-6.011	-0.336804
76	1.700	-0.428075	0.307467	19.481	-7.563	10.544	-0.075509
77	0	-0.307777	0.130097	11.237	-2.412	7.593	-0.370463
77	0.650	-0.307777	0.130097	11.237	-2.412	14.895	-0.285922

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
77	0.650	-0.307777	0.130097	5.367	-2.412	14.898	-0.285878
77	1.700	-0.307777	0.130097	5.367	-2.412	20.533	-0.149258
78	0	-0.273298	0.146402	4.552	1.926	19.045	-0.364714
78	0.450	-0.273298	0.146402	4.552	1.926	21.093	-0.318858
78	0.450	-0.273298	0.146402	-1.316	1.926	21.094	-0.318808
78	1.700	-0.273298	0.146402	-1.316	1.926	19.446	-0.135830
79	0	-0.263858	0.152773	-2.096	4.317	18.526	-0.378716
79	1.700	-0.263858	0.152773	-2.096	4.317	14.964	-0.119003
80	0	-0.262181	0.152929	-2.366	5.155	14.581	-0.365950
80	1.700	-0.262181	0.152929	-2.366	5.155	10.559	-0.105970
81	0	-0.262265	0.152632	-2.352	5.415	10.470	-0.353015
81	1.700	-0.262265	0.152632	-2.352	5.415	6.472	-0.093540
82	0	-0.263634	0.152482	-2.329	5.494	6.468	-0.340338
82	1.700	-0.263634	0.152482	-2.329	5.494	2.510	-0.081119
83	0	-0.270618	0.152963	-2.325	5.510	2.563	-0.328325
83	1.700	-0.270618	0.152963	-2.325	5.510	-1.389	-0.068288
84	0	-0.296994	0.158339	-2.449	5.519	-1.180	-0.319230
84	1.700	-0.296994	0.158339	-2.449	5.519	-5.343	-0.050054
85	0	-0.369443	0.172823	-4.367	5.730	-4.711	-0.306163
85	1.700	-0.369443	0.172823	-4.367	5.730	-12.136	-0.012364
108	0	-1.747	-0.014709	4.551	-3.723	-9.503	-0.129875
108	1.700	-1.747	-0.014709	4.551	-3.723	-1.766	-0.154886
109	0	-1.700	0.067739	4.937	-1.899	-0.176822	-0.202757
109	1.700	-1.700	0.067739	4.937	-1.899	8.217	-0.087601
110	0	-1.649	0.079741	1.677	0.603659	7.750	-0.205561
110	1.700	-1.649	0.079741	1.677	0.603659	10.601	-0.070001
111	0	-1.582	0.084429	0.056140	2.079	9.400	-0.203109
111	1.700	-1.582	0.084429	0.056140	2.079	9.496	-0.059579
112	0	-1.512	0.085440	-0.545864	2.685	8.266	-0.197330
112	1.700	-1.512	0.085440	-0.545864	2.685	7.338	-0.052081
113	0	-1.441	0.085522	-0.763634	2.895	6.132	-0.190724
113	1.700	-1.441	0.085522	-0.763634	2.895	4.834	-0.045337
114	0	-1.370	0.086215	-0.831333	2.965	3.646	-0.184601
114	1.700	-1.370	0.086215	-0.831333	2.965	2.233	-0.038036
115	0	-1.298	0.089498	-0.868392	3.010	1.067	-0.180305
115	1.700	-1.298	0.089498	-0.868392	3.010	-0.409271	-0.028157

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
116	0	-1.222	0.099276	-0.925528	3.053	-1.545	-0.180346
116	1.700	-1.222	0.099276	-0.925528	3.053	-3.118	-0.011577
117	0	-1.120	0.118870	0.217933	2.845	-4.536	-0.189433
117	1.700	-1.120	0.118870	0.217933	2.845	-4.165	0.012647
140	0	-2.136	-0.333144	-2.404	-0.463896	-0.772527	-0.404796
140	1.700	-2.136	-0.333144	-2.404	-0.463896	-4.859	-0.971142
141	0	-2.097	0.029898	-0.147304	-0.251642	0.544233	-0.243504
141	1.700	-2.097	0.029898	-0.147304	-0.251642	0.293817	-0.192677
142	0	-2.014	0.285429	1.640	0.063354	1.415	-0.108824
142	1.700	-2.014	0.285429	1.640	0.063354	4.203	0.376404
143	0	-1.925	0.378782	2.296	0.263517	1.588	-0.072561
143	1.700	-1.925	0.378782	2.296	0.263517	5.492	0.571369
144	0	-1.835	0.401916	2.456	0.348183	1.096	-0.129464
144	1.700	-1.835	0.401916	2.456	0.348183	5.271	0.553794
145	0	-1.744	0.405193	2.479	0.377699	0.215903	-0.239623
145	1.700	-1.744	0.405193	2.479	0.377699	4.429	0.449006
146	0	-1.653	0.405690	2.478	0.387796	-0.840811	-0.375302
146	1.700	-1.653	0.405690	2.478	0.387796	3.372	0.314371
147	0	-1.559	0.411857	2.503	0.394728	-1.989	-0.524812
147	1.700	-1.559	0.411857	2.503	0.394728	2.265	0.175345
148	0	-1.458	0.437455	2.650	0.397111	-3.191	-0.682981
148	1.700	-1.458	0.437455	2.650	0.397111	1.315	0.060693
149	0	-1.344	0.444054	2.681	0.370244	-4.005	-0.791596
149	1.700	-1.344	0.444054	2.681	0.370244	0.547870	-0.036705
	min:	-2.136	-1.570	-5.626	-7.563	-27.563	-1.863
	max:	1.981	0.854585	25.351	5.730	21.094	0.571369

Loadcase	Factor	Stage	Init.def	Title
15	1.0000			VEHICULO HIPOTESIS 15

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.528423	0.002300	3.960			
10	0.528423	-0.002789	-9.374			
156	0.528423	-0.002300	3.960			
160	0.528423	0.002789	-9.374			
166	-1.057	1.910	35.414	-8.404	-0.292662	-0.024550
167	-1.057	-1.910	35.414	8.404	-0.292662	0.024550
Sums :	-1.87E-10	9.27E-13	60.000			
min:	-1.057	-1.910	-9.374	-8.404	-0.292662	-0.024550
max:	0.528423	1.910	35.414	8.404	-0.292662	0.024550

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.507	-0.771054	5.709	-0.513219	-10.486	1.184
12	1.700	1.507	-0.771054	5.709	-0.513219	-0.782081	-0.126376
13	0	1.439	-0.987060	7.301	-0.503702	-7.515	0.777587
13	1.700	1.439	-0.987060	7.301	-0.503702	4.857	-0.900416
14	0	1.405	-1.099	7.934	-0.545886	-2.450	0.106238
14	1.700	1.405	-1.099	7.934	-0.545886	11.038	-1.763
15	0	1.397	-1.209	8.649	-0.511940	3.562	-0.720506
15	1.700	1.397	-1.209	8.649	-0.511940	18.265	-2.776
16	0	1.397	-1.745	12.430	-0.202002	12.777	-2.005
16	0.200	1.397	-1.745	12.430	-0.202002	15.260	-2.354
16	0.200	1.397	-0.353230	2.527	-0.202002	15.263	-2.354
16	1.700	1.397	-0.353230	2.527	-0.202002	19.053	-2.884
17	0	1.397	0.353230	-2.527	0.202002	19.053	-2.884
17	1.7E-4	1.397	0.353230	-2.527	0.202002	19.053	-2.884
17	1.500	1.397	0.353230	-2.527	0.202002	15.263	-2.354
17	1.500	1.397	1.745	-12.430	0.202002	15.260	-2.354
17	1.700	1.397	1.745	-12.430	0.202002	12.777	-2.005
18	0	1.397	1.209	-8.649	0.511940	18.265	-2.776
18	1.700	1.397	1.209	-8.649	0.511940	3.562	-0.720506
19	0	1.405	1.099	-7.934	0.545886	11.038	-1.763

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
116	0	-1.700	-0.067739	-4.937	1.899	8.217	-0.067601
116	1.700	-1.700	-0.067739	-4.937	1.899	-0.176822	-0.202757
117	0	-1.747	0.014709	-4.551	3.723	-1.766	-0.154886
117	1.700	-1.747	0.014709	-4.551	3.723	-9.503	-0.129879
140	0	-1.344	-0.444054	-2.681	-0.370244	0.547870	-0.036705
140	1.700	-1.344	-0.444054	-2.681	-0.370244	-4.009	-0.791596
141	0	-1.458	-0.437455	-2.650	-0.397111	1.315	0.060692
141	1.700	-1.458	-0.437455	-2.650	-0.397111	-3.191	-0.682981
142	0	-1.559	-0.411857	-2.503	-0.394728	2.265	0.175345
142	1.700	-1.559	-0.411857	-2.503	-0.394728	-1.589	-0.524612
143	0	-1.653	-0.405690	-2.478	-0.387796	3.372	0.314371
143	1.700	-1.653	-0.405690	-2.478	-0.387796	-0.840811	-0.375302
144	0	-1.744	-0.405193	-2.479	-0.377699	4.429	0.449006
144	1.700	-1.744	-0.405193	-2.479	-0.377699	0.215903	-0.239823
145	0	-1.835	-0.401916	-2.456	-0.348183	5.271	0.553794
145	1.700	-1.835	-0.401916	-2.456	-0.348183	1.096	-0.129464
146	0	-1.925	-0.378782	-2.296	-0.263517	5.492	0.571369
146	1.700	-1.925	-0.378782	-2.296	-0.263517	1.588	-0.072561
147	0	-2.014	-0.285429	-1.640	-0.063354	4.203	0.376404
147	1.700	-2.014	-0.285429	-1.640	-0.063354	1.415	-0.108824
148	0	-2.097	-0.029898	0.147304	0.251642	0.293817	-0.192677
148	1.700	-2.097	-0.029898	0.147304	0.251642	0.544233	-0.243504
149	0	-2.136	0.333144	2.404	0.463896	-4.859	-0.971142
149	1.700	-2.136	0.333144	2.404	0.463896	-0.772527	-0.404798
	min:	-2.136	-0.854585	-25.351	-5.730	-27.563	-1.863
	max:	1.981	1.570	5.626	7.563	21.094	0.571369

Loadcase Factor Stage Init.def Title
17 1.0000 VEHICULO HIPOTESIS 17

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.275936	-0.070252	3.376			
10	0.275944	-0.109739	-2.878			
156	0.570715	-0.074503	14.915			
160	0.570708	-0.105836	-7.570			
166	-0.054322	-0.500460	-3.289	2.928	2.775	-0.324107
167	-1.639	0.860789	55.444	-3.060	-3.243	-0.284786
Sums :	-1.22E-10	-2.24E-11	60.000			
min:	-1.639	-0.500460	-7.570	-3.060	-3.243	-0.324107
max:	0.570715	0.860789	55.444	2.928	2.775	-0.284786

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	1.777	-1.010	8.078	-0.089659	-1.944	-0.087984
22	0.850	1.777	-1.010	8.078	-0.089659	4.921	-0.946600
22	0.850	1.777	0.381440	-1.825	-0.089659	4.922	-0.946682
22	1.300	1.777	0.381440	-1.825	-0.089659	4.101	-0.775083
23	0	1.575	-0.349613	3.614	0.215304	5.051	-1.043
23	1.050	1.575	-0.349613	3.614	0.215304	8.845	-1.410
23	1.050	1.575	1.042	-6.289	0.215304	8.845	-1.410
23	1.300	1.575	1.042	-6.289	0.215304	7.273	-1.150
24	0	1.367	0.356429	-1.543	0.456609	10.658	-1.772
24	1.250	1.367	0.356429	-1.543	0.456609	8.730	-1.326
24	1.250	1.367	1.748	-11.446	0.456609	8.728	-1.326
24	1.300	1.367	1.748	-11.446	0.456609	8.157	-1.239
25	0	1.172	1.241	-7.952	0.688208	13.829	-2.176
25	1.300	1.172	1.241	-7.952	0.688208	3.451	-0.562373
26	0	0.986173	1.097	-6.962	0.746362	10.631	-1.701
26	1.300	0.986173	1.097	-6.962	0.746362	1.581	-0.274079
27	0	0.803102	1.071	-6.775	0.764288	9.031	-1.454
27	1.300	0.803102	1.071	-6.775	0.764288	0.224092	-0.061093
28	0	0.620303	1.065	-6.734	0.777255	7.837	-1.263
28	1.300	0.620303	1.065	-6.734	0.777255	-0.916715	0.121705

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
29	0	0.437055	1.065	-6.758	0.793100	6.817	-1.097
29	1.300	0.437055	1.065	-6.758	0.793100	-1.969	0.286992
30	0	0.250819	1.098	-7.003	0.829354	5.955	-0.963913
30	1.300	0.250819	1.098	-7.003	0.829354	-3.149	0.464081
31	0	0.050768	1.403	-8.571	0.849102	5.151	-0.864901
31	1.300	0.050768	1.403	-8.571	0.849102	-5.990	0.958860
32	0	-2.83E-13	6.20E-11	1.02E-11	1.28E-16	-4.55E-12	-2.95E-11
32	0.500	-2.83E-13	6.20E-11	1.02E-11	1.28E-16	5.71E-13	1.54E-12
54	0	1.283	0.261753	13.221	-0.309191	-7.452	-0.324224
54	0.650	1.283	0.261753	13.221	-0.309191	3.784	-0.101765
54	0.650	1.283	0.261753	9.091	-0.309191	3.787	-0.101701
54	1.300	1.283	0.261753	9.091	-0.309191	7.877	0.016054
55	0	1.148	0.274217	8.885	1.560	7.476	-0.302005
55	1.050	1.148	0.274217	8.885	1.560	16.804	-0.014113
55	1.050	1.148	0.274217	4.755	1.560	16.806	-0.014042
55	1.300	1.148	0.274217	4.755	1.560	17.994	0.054476
56	0	1.029	0.260636	2.384	3.305	17.585	-0.272763
56	1.250	1.029	0.260636	2.384	3.305	20.565	0.052998
56	1.250	1.029	0.260636	-1.746	3.305	20.565	0.053066
56	1.300	1.029	0.260636	-1.746	3.305	20.478	0.066064
57	0	0.896483	0.255395	-3.722	4.931	20.443	-0.254116
57	1.300	0.896483	0.255395	-3.722	4.931	15.604	0.077697
58	0	0.755653	0.252622	-3.320	5.599	15.934	-0.238464
58	1.300	0.755653	0.252622	-3.320	5.599	11.618	0.089544
59	0	0.612289	0.251950	-2.814	5.827	12.378	-0.224652
59	1.300	0.612289	0.251950	-2.814	5.827	8.719	0.102863
60	0	0.467416	0.253574	-2.619	5.936	9.593	-0.212457
60	1.300	0.467416	0.253574	-2.619	5.936	6.189	0.117190
61	0	0.317521	0.258547	-2.593	6.029	7.059	-0.202172
61	1.300	0.317521	0.258547	-2.593	6.029	3.689	0.133939
62	0	0.163529	0.266696	-2.576	6.147	4.395	-0.190740
62	1.300	0.163529	0.266696	-2.576	6.147	1.046	0.155965
63	0	0.044566	0.235035	-1.385	5.938	1.221	-0.149162
63	1.300	0.044586	0.235035	-1.385	5.938	-0.579117	0.156363
64	0	-6.38E-13	4.57E-11	-8.79E-13	-1.08E-16	4.54E-13	-2.09E-11
64	0.500	-6.38E-13	4.57E-11	-8.79E-13	-1.08E-16	5.41E-14	1.57E-12
86	0	-0.202043	0.509851	26.448	-2.984	-24.948	-0.608320

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
86	0.850	-0.202043	0.509851	26.448	-2.984	-2.471	-0.175013
86	0.850	-0.202043	0.509851	20.578	-2.984	-2.465	-0.174880
86	1.300	-0.202043	0.509851	20.578	-2.984	6.793	0.054486
87	0	-0.113629	0.364004	12.069	1.067	4.830	-0.434195
87	1.050	-0.113629	0.364004	12.069	1.067	17.501	-0.052037
87	1.050	-0.113629	0.364004	6.199	1.067	17.504	-0.051943
87	1.300	-0.113629	0.364004	6.199	1.067	19.052	0.039011
88	0	-0.075849	0.382716	4.512	4.841	17.667	-0.437516
88	1.250	-0.075849	0.382716	4.512	4.841	23.506	0.040830
88	1.250	-0.075849	0.382716	-1.356	4.841	23.506	0.040929
88	1.300	-0.075849	0.382716	-1.356	4.841	23.439	0.060015
89	0	-0.060136	0.398369	-1.607	7.945	22.598	-0.426018
89	1.300	-0.060136	0.398369	-1.607	7.945	20.509	0.091861
90	0	-0.054067	0.401716	-2.285	9.760	19.896	-0.402445
90	1.300	-0.054067	0.401716	-2.285	9.760	16.926	0.119785
91	0	-0.051539	0.401786	-2.567	10.570	16.606	-0.377010
91	1.300	-0.051539	0.401786	-2.567	10.570	13.269	0.145312
92	0	-0.048428	0.404478	-2.601	10.874	13.125	-0.353439
92	1.300	-0.048428	0.404478	-2.601	10.874	9.744	0.172383
93	0	-0.041344	0.415244	-2.558	10.888	9.601	-0.331681
93	1.300	-0.041344	0.415244	-2.558	10.888	6.275	0.208136
94	0	-0.027603	0.421901	-2.268	10.554	5.960	-0.296946
94	1.300	-0.027603	0.421901	-2.268	10.554	3.011	0.251526
95	0	-0.008166	0.330042	-1.409	9.405	2.409	-0.201340
95	1.300	-0.008166	0.330042	-1.409	9.405	0.577546	0.227714
96	0	-2.10E-12	1.99E-11	-1.62E-13	-1.46E-15	1.27E-13	1.05E-12
96	0.500	-2.10E-12	1.99E-11	-1.62E-13	-1.46E-15	4.61E-14	1.10E-11
116	0	-1.314	0.156047	4.721	-1.037	-8.589	-0.233632
116	1.300	-1.314	0.156047	4.721	-1.037	-2.452	-0.030771
119	0	-1.211	0.224428	6.282	-0.012458	-1.943	-0.263406
119	1.300	-1.211	0.224428	6.282	-0.012458	6.223	0.028350
120	0	-1.098	0.239105	3.738	2.065	5.638	-0.256954
120	1.300	-1.098	0.239105	3.738	2.065	10.496	0.053883
121	0	-0.967622	0.246724	1.341	3.887	9.549	-0.248215
121	1.300	-0.967622	0.246724	1.341	3.887	11.292	0.072526
122	0	-0.828072	0.250019	0.159567	4.993	10.224	-0.236921
122	1.300	-0.828072	0.250019	0.159567	4.993	10.432	0.088103

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
123	0	-0.686097	0.250469	-0.416947	5.550	9.400	-0.223802
123	1.300	-0.686097	0.250469	-0.416947	5.550	8.858	0.101808
124	0	-0.541980	0.249286	-0.650567	5.765	7.855	-0.209951
124	1.300	-0.541980	0.249286	-0.650567	5.765	7.009	0.114120
125	0	-0.391149	0.247514	-0.634553	5.755	6.009	-0.196350
125	1.300	-0.391149	0.247514	-0.634553	5.755	5.184	0.125418
126	0	-0.232232	0.245297	-0.560083	5.567	4.212	-0.181110
126	1.300	-0.232232	0.245297	-0.560083	5.567	3.483	0.137777
127	0	-0.098550	0.204806	-1.189	5.056	2.672	-0.139413
127	1.300	-0.098550	0.204806	-1.189	5.056	1.126	0.126835
128	0	7.18E-13	2.34E-11	-1.41E-13	9.31E-16	6.30E-14	-1.54E-12
128	0.500	7.18E-13	2.34E-11	-1.41E-13	9.31E-16	1.22E-14	1.02E-11
150	0	-1.725	0.106651	0.112078	-0.106710	-2.547	-0.685062
150	1.300	-1.725	0.106651	0.112078	-0.106710	-2.402	-0.546416
151	0	-1.579	0.370223	1.757	0.005971	-1.520	-0.522221
151	1.300	-1.579	0.370223	1.757	0.005971	0.764744	-0.040931
152	0	-1.402	0.620455	3.547	0.255388	-0.464921	-0.338983
152	1.300	-1.402	0.620455	3.547	0.255388	4.146	0.467609
153	0	-1.221	0.770309	4.629	0.492431	0.280471	-0.205775
153	1.300	-1.221	0.770309	4.629	0.492431	6.298	0.795627
154	0	-1.040	0.834404	5.081	0.644189	0.494848	-0.151063
154	1.300	-1.040	0.834404	5.081	0.644189	7.100	0.933662
155	0	-0.858094	0.857467	5.243	0.721139	0.235686	-0.162296
155	1.300	-0.858094	0.857467	5.243	0.721139	7.052	0.952411
156	0	-0.677649	0.858896	5.274	0.750603	-0.292107	-0.209669
156	1.300	-0.677649	0.858896	5.274	0.750603	6.565	0.906895
157	0	-0.502422	0.840058	5.215	0.750158	-0.699400	-0.268711
157	1.300	-0.502422	0.840058	5.215	0.750158	5.881	0.823364
158	0	-0.334850	0.809962	5.085	0.732555	-1.469	-0.334919
158	1.300	-0.334850	0.809962	5.085	0.732555	5.141	0.716032
159	0	-0.168976	0.913872	5.244	0.682229	-1.936	-0.419548
159	1.300	-0.168976	0.913872	5.244	0.682229	4.882	0.768486
160	0	-3.66E-14	-3.21E-11	9.65E-12	1.89E-17	-4.26E-12	1.13E-11
160	0.500	-3.66E-14	-3.21E-11	9.65E-12	1.89E-17	5.64E-13	-4.76E-12

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
min:		-1.725	-1.010	-11.446	-2.984	-24.948	-2.176
max:		1.777	1.748	26.448	10.888	23.506	0.958860

Loadcase Factor Stage Init.def Title
18 1.0000 VEHICULO HIPOTESIS 18

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.167580	-0.116429	2.334			
10	0.167591	-0.141617	-1.442			
156	0.356267	-0.119217	26.359			
160	0.356258	-0.139359	-1.790			
166	-0.016694	-0.777781	-5.337	4.462	1.761	-0.207035
167	-1.031	1.294	39.877	-4.653	-2.071	-0.182707
Sums :	-7.17E-11	-3.40E-11	60.000			
min:	-1.031	-0.777781	-5.337	-4.653	-2.071	-0.207035
max:	0.356267	1.294	39.877	4.462	1.761	-0.182707

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	1.134	-0.409490	3.559	-0.178239	-6.526	0.671154
22	1.300	1.134	-0.409490	3.559	-0.178239	-1.899	0.138817
23	0	0.982928	-0.581839	4.955	-0.153659	-3.409	0.250837
23	1.300	0.982928	-0.581839	4.955	-0.153659	3.033	-0.505554
24	0	0.838741	-0.739216	5.963	-0.179405	1.322	-0.365602
24	1.300	0.838741	-0.739216	5.963	-0.179405	9.074	-1.327
25	0	0.712738	-0.964741	7.473	-0.106270	7.378	-1.179
25	1.100	0.712738	-0.964741	7.473	-0.106270	15.597	-2.240
25	1.100	0.712738	0.426990	-2.430	-0.106270	15.598	-2.240
25	1.300	0.712738	0.426990	-2.430	-0.106270	15.112	-2.155
26	0	0.595501	-0.065382	1.020	0.180607	15.544	-2.301
26	1.300	0.595501	-0.065382	1.020	0.180607	16.670	-2.386

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
26	1.300	0.595501	-0.065382	1.020	0.180607	16.870	-2.386
27	0	0.480783	0.781442	-5.032	0.508455	20.248	-2.944
27	1.300	0.480783	0.781442	-5.032	0.508455	13.706	-1.926
28	0	0.365282	0.304692	-1.654	0.824340	20.144	-2.916
28	0.200	0.365282	0.304692	-1.654	0.824340	19.813	-2.855
28	0.200	0.365282	1.696	-11.557	0.824340	19.811	-2.855
28	1.300	0.365282	1.696	-11.557	0.824340	7.100	-0.989046
29	0	0.246818	1.537	-10.420	0.976476	16.117	-2.342
29	1.300	0.246818	1.537	-10.420	0.976476	2.571	-0.343902
30	0	0.122943	1.604	-10.871	1.108	12.665	-1.853
30	1.300	0.122942	1.604	-10.871	1.108	-1.467	0.232305
31	0	-0.016069	2.132	-14.244	1.218	9.978	-1.485
31	1.300	-0.016069	2.132	-14.244	1.218	-6.539	1.287
32	0	-3.83E-13	1.05E-11	2.13E-12	-4.06E-16	-2.48E-12	-1.21E-11
32	0.500	-3.83E-13	1.05E-11	2.13E-12	-4.06E-16	-1.41E-12	-6.86E-12
54	0	0.769748	0.210549	7.687	-1.268	-15.892	-0.242710
54	1.300	0.769748	0.210549	7.687	-1.268	-5.899	0.031003
55	0	0.690970	0.193078	9.647	-1.220	-6.364	-0.205339
55	1.300	0.690970	0.193078	9.647	-1.220	6.178	0.045663
56	0	0.614730	0.171123	9.676	-1.323	5.675	-0.176375
56	1.300	0.614730	0.171123	9.876	-1.323	18.515	0.046085
57	0	0.531310	0.161114	9.885	-0.574990	18.634	-0.159875
57	1.100	0.531310	0.161114	9.885	-0.574990	29.505	0.017330
57	1.100	0.531310	0.161114	5.755	-0.574990	29.507	0.017372
57	1.300	0.531310	0.161114	5.755	-0.574990	30.656	0.049574
58	0	0.443040	0.158002	3.952	1.432	30.803	-0.149243
58	1.300	0.443040	0.158002	3.952	1.432	35.939	0.056139
58	1.300	0.443040	0.158002	3.952	1.432	35.940	0.056159
59	0	0.353211	0.158136	-2.044	3.821	36.317	-0.141004
59	1.300	0.353211	0.158136	-2.044	3.821	33.659	0.064575
60	0	0.262361	0.161108	-3.765	6.009	34.210	-0.134466
60	0.200	0.262361	0.161108	-3.765	6.009	33.458	-0.102266
60	0.200	0.262361	0.161108	-7.895	6.009	33.456	-0.102224
60	1.300	0.262361	0.161108	-7.895	6.009	24.773	0.074975
61	0	0.169190	0.166604	-7.656	7.251	25.119	-0.129083
61	1.300	0.169190	0.166604	-7.656	7.251	15.165	0.087503
62	0	0.074586	0.175620	-6.980	8.036	15.576	-0.123291

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
62	1.300	0.074586	0.175620	-6.980	8.036	6.502	0.105015
63	0	0.006287	0.159494	-4.670	8.199	5.978	-0.097430
63	1.300	0.006287	0.159494	-4.670	8.199	-0.093201	0.109912
64	0	-6.94E-13	8.58E-12	-2.71E-12	2.70E-15	1.11E-12	-6.08E-12
64	0.500	-6.94E-13	8.58E-12	-2.71E-12	2.70E-15	-2.44E-13	-1.80E-12
86	0	-0.300038	0.318466	20.229	-4.207	-32.746	-0.379494
86	1.300	-0.300038	0.318466	20.229	-4.207	-6.449	0.034514
87	0	-0.166577	0.226656	13.243	-3.488	-8.050	-0.270444
87	1.300	-0.166577	0.226656	13.243	-3.488	9.166	0.024209
88	0	-0.109680	0.237656	11.745	-2.571	8.579	-0.272237
88	1.300	-0.109680	0.237656	11.745	-2.571	23.848	0.036716
89	0	-0.086647	0.247061	10.976	-0.509968	23.972	-0.264998
89	1.100	-0.086647	0.247061	10.976	-0.509968	36.044	0.006737
89	1.100	-0.086647	0.247061	5.106	-0.509968	36.046	0.006801
89	1.300	-0.086647	0.247061	5.106	-0.509968	37.066	0.056181
90	0	-0.078136	0.249879	4.914	2.850	37.334	-0.250928
90	1.300	-0.078136	0.249879	4.914	2.850	43.722	0.073882
90	1.300	-0.078136	0.249879	4.914	2.850	43.722	0.073915
91	0	-0.074454	0.250968	-1.377	6.719	43.669	-0.235769
91	1.300	-0.074454	0.250968	-1.377	6.719	41.879	0.090450
92	0	-0.069728	0.253397	-1.620	10.057	41.380	-0.221442
92	0.200	-0.069728	0.253397	-1.620	10.057	41.056	-0.170796
92	0.200	-0.069728	0.253397	-7.490	10.057	41.055	-0.170730
92	1.300	-0.069728	0.253397	-7.490	10.057	32.817	0.107974
93	0	-0.059366	0.260113	-8.073	12.005	31.968	-0.207740
93	1.300	-0.059366	0.260113	-8.073	12.005	21.473	0.130407
94	0	-0.039707	0.263938	-7.544	12.477	20.128	-0.185754
94	1.300	-0.039707	0.263938	-7.544	12.477	10.322	0.157365
95	0	-0.011795	0.206237	-4.765	11.382	8.179	-0.125832
95	1.300	-0.011795	0.206237	-4.765	11.382	1.984	0.142276
96	0	-2.24E-12	7.71E-12	-1.33E-13	-5.81E-15	2.83E-13	2.05E-12
96	0.500	-2.24E-12	7.71E-12	-1.33E-13	-5.81E-15	2.16E-13	5.91E-12
118	0	-0.830107	0.050671	4.460	-1.942	-12.381	-0.105873
118	1.300	-0.830107	0.050671	4.460	-1.942	-6.584	-0.040001
119	0	-0.780679	0.117645	7.381	-2.267	-5.922	-0.147119
119	1.300	-0.780679	0.117645	7.381	-2.267	3.674	0.005820

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
120	0	-0.713482	0.139034	6.734	-1.506	3.878	-0.153022
120	1.300	-0.713482	0.139034	6.734	-1.506	12.633	0.027722
121	0	-0.633166	0.149624	5.254	-0.206062	12.877	-0.152048
121	1.300	-0.633166	0.149624	5.254	-0.206062	19.707	0.042462
122	0	-0.547159	0.154492	2.869	1.574	19.700	-0.147008
122	1.300	-0.547159	0.154492	2.869	1.574	23.430	0.053831
123	0	-0.459224	0.155746	0.314943	3.471	22.994	-0.139450
123	1.300	-0.459224	0.155746	0.314943	3.471	23.403	0.063020
124	0	-0.369385	0.154357	-1.936	5.060	22.479	-0.130441
124	1.300	-0.369385	0.154357	-1.936	5.060	19.962	0.070223
125	0	-0.274573	0.150725	-3.019	5.871	18.589	-0.120696
125	1.300	-0.274573	0.150725	-3.019	5.871	14.665	0.075246
126	0	-0.173205	0.145038	-3.398	5.849	13.121	-0.109513
126	1.300	-0.173205	0.145036	-3.398	5.849	8.703	0.079036
127	0	-0.063706	0.115716	-3.876	5.144	6.995	-0.083137
127	1.300	-0.063706	0.115716	-3.876	5.144	1.957	0.067294
128	0	1.64E-13	5.97E-12	-4.49E-13	1.94E-16	2.40E-13	-1.38E-12
128	0.500	1.64E-13	5.97E-12	-4.49E-13	1.94E-16	1.53E-14	1.60E-12
150	0	-1.052	-0.030547	-0.526329	-0.237943	-2.974	-0.606127
150	1.300	-1.052	-0.030547	-0.526329	-0.237943	-3.656	-0.645839
151	0	-0.985018	0.085070	0.161729	-0.287465	-0.766430	-0.286083
151	1.300	-0.985018	0.085070	0.161729	-0.287465	-0.556182	-0.175491
152	0	-0.868886	0.214773	1.046	-0.197358	2.026	0.118453
152	1.300	-0.868886	0.214773	1.046	-0.197356	3.368	0.397658
153	0	-0.782810	0.317506	1.755	-0.021533	4.600	0.491033
153	1.300	-0.782810	0.317506	1.755	-0.021533	6.882	0.903791
154	0	-0.671822	0.444691	2.640	0.207333	6.046	0.706363
154	1.300	-0.671822	0.444691	2.640	0.207333	9.481	1.284
155	0	-0.558892	0.578505	3.583	0.449138	6.215	0.744054
155	1.300	-0.558892	0.578505	3.583	0.449138	10.873	1.496
156	0	-0.447105	0.688298	4.379	0.647593	5.289	0.632380
156	1.300	-0.447105	0.688298	4.379	0.647593	10.992	1.527
157	0	-0.340646	0.718644	4.657	0.750734	3.833	0.444222
157	1.300	-0.340646	0.718644	4.657	0.750734	9.867	1.376
158	0	-0.243192	0.656167	4.292	0.744803	2.244	0.230891

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
158	1.300	-0.243192	0.656167	4.292	0.744803	7.823	1.084
159	0	-0.153293	0.538540	3.100	0.643662	0.706076	0.002349
159	1.300	-0.153293	0.538540	3.100	0.643662	4.736	0.702451
160	0	-1.68E-12	-2.63E-13	3.41E-12	-7.26E-17	-2.32E-12	-5.16E-13
160	0.500	-1.68E-12	-2.63E-13	3.41E-12	-7.26E-17	-6.16E-13	-6.47E-13
	min:	-1.052	-0.964741	-14.244	-4.207	-32.746	-2.944
	max:	1.134	2.132	20.229	12.477	43.722	1.527

Loadcase Factor Stage Init.def Title
15 1.0000 VEHICULO HIPOTESIS 19

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.059326	-0.056961	0.888022			
10	0.059331	-0.065923	-0.448044			
156	0.126491	-0.057984	40.227			
160	0.126487	-0.065156	6.303			
166	-0.005295	-0.375660	-2.597	2.148	0.634102	-0.073680
167	-0.366341	0.621683	15.628	-2.239	-0.737014	-0.065050
Sums :	-2.44E-11	-1.63E-11	60.000			
min:	-0.366341	-0.375660	-2.597	-2.239	-0.737014	-0.073680
max:	0.126491	0.621683	40.227	2.148	0.634102	-0.065050

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
22	0	0.407944	-0.141696	1.257	-0.067321	-3.150	0.351417
22	1.300	0.407944	-0.141896	1.257	-0.067321	-1.515	0.166952
23	0	0.349055	-0.204178	1.762	-0.058909	-2.083	0.207832
23	1.300	0.349055	-0.204178	1.762	-0.058909	0.207413	-0.057599
24	0	0.294783	-0.255121	2.074	-0.076454	-0.482633	0.001670
24	1.300	0.294783	-0.255121	2.074	-0.076454	2.213	-0.329988
25	0	0.248424	-0.276262	2.185	-0.086999	1.364	-0.244137
25	1.300	0.248424	-0.276262	2.185	-0.086999	4.205	-0.603277
26	0	0.206219	-0.288850	2.263	-0.080788	3.341	-0.512721
26	1.300	0.206219	-0.288850	2.263	-0.080788	6.283	-0.868226
27	0	0.165467	-0.315521	2.454	-0.052411	5.591	-0.820693
27	1.300	0.165467	-0.315521	2.454	-0.052411	8.781	-1.231
28	0	0.125143	-0.441007	3.350	0.049571	8.605	-1.235
28	1.300	0.125143	-0.441007	3.350	0.049571	12.960	-1.809
29	0	0.083569	-0.858537	6.305	0.399957	14.907	-2.112
29	0.0499	0.083569	-0.858537	6.305	0.399957	15.222	-2.155
29	0.0501	0.083569	0.533194	-3.597	0.399957	15.222	-2.155
29	1.300	0.083569	0.533194	-3.597	0.399957	10.726	-1.486
30	0	0.038421	0.168092	-1.012	0.881404	16.534	-2.337
30	0.250	0.038421	0.168092	-1.012	0.881404	16.281	-2.295
30	0.250	0.038421	1.560	-10.915	0.881404	16.279	-2.295
30	1.300	0.038421	1.560	-10.915	0.881404	4.820	-0.657412
31	0	-0.014961	1.869	-12.993	1.351	15.554	-2.207
31	0.450	-0.014961	1.869	-12.993	1.351	9.708	-1.366
31	0.450	-0.014961	3.261	-22.896	1.351	9.704	-1.366
31	1.300	-0.014961	3.261	-22.896	1.351	-9.755	1.406
32	0	2.49E-13	2.46E-11	3.75E-12	-2.92E-16	-1.06E-12	-8.39E-12
32	0.500	2.49E-13	2.46E-11	3.75E-12	-2.92E-16	8.14E-13	3.92E-12
54	0	0.278019	0.084771	2.711	-0.481551	-7.613	-0.094758
54	1.300	0.278019	0.084771	2.711	-0.481551	-4.089	0.015444
55	0	0.239784	0.073328	3.510	-0.472629	-4.262	-0.076602
55	1.300	0.239784	0.073328	3.510	-0.472629	0.300299	0.018724
56	0	0.212062	0.062978	3.407	-0.617467	0.043393	-0.064224
56	1.300	0.212062	0.062978	3.407	-0.617467	4.473	0.017648
57	0	0.182360	0.058250	3.399	-0.675479	4.291	-0.057417
57	1.300	0.182360	0.058250	3.399	-0.675479	8.710	0.018308
58	0	0.150994	0.056243	3.587	-0.606696	8.606	-0.052963

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
58	1.300	0.150994	0.056243	3.587	-0.606696	13.269	0.020153
59	0	0.119339	0.055570	4.120	-0.313490	13.271	-0.049581
59	1.300	0.119339	0.055570	4.120	-0.313490	18.626	0.022660
60	0	0.087182	0.056054	4.627	0.626269	18.942	-0.047036
60	1.300	0.087182	0.056054	4.627	0.626269	24.957	0.025834
61	0	0.054023	0.059442	2.913	2.968	25.276	-0.046173
61	0.0499	0.054023	0.059442	2.913	2.968	25.423	-0.043209
61	0.0501	0.054023	0.059442	-1.217	2.968	25.424	-0.043193
61	1.300	0.054023	0.059442	-1.217	2.968	23.903	0.031101
62	0	0.020486	0.064843	-3.116	6.036	23.706	-0.045344
62	0.250	0.020486	0.064843	-3.116	6.036	22.928	-0.029141
62	0.250	0.020486	0.064843	-7.246	6.036	22.926	-0.029124
62	1.300	0.020486	0.064843	-7.246	6.036	15.319	0.038953
63	0	-0.002518	0.061418	-6.352	8.276	13.425	-0.036957
63	0.450	-0.002518	0.061418	-6.352	8.276	10.567	-0.009327
63	0.450	-0.002518	0.061418	-10.482	8.276	10.565	-0.009311
63	1.300	-0.002518	0.061418	-10.482	8.276	1.657	0.042887
64	0	-7.82E-13	9.33E-13	-9.61E-13	8.34E-16	4.85E-13	-2.30E-12
64	0.500	-7.82E-13	9.33E-13	-9.61E-13	8.34E-16	3.91E-15	-1.83E-12
86	0	-0.143874	0.113126	7.982	-1.583	-15.359	-0.134770
86	1.300	-0.143874	0.113126	7.982	-1.583	-4.982	0.012294
87	0	-0.079791	0.080599	5.102	-1.451	-5.673	-0.096094
87	1.300	-0.079791	0.080599	5.102	-1.451	0.960007	0.008685
88	0	-0.052404	0.084608	4.643	-1.417	0.602162	-0.096771
88	1.300	-0.052404	0.084608	4.643	-1.417	6.639	0.013219
89	0	-0.041141	0.087893	4.600	-1.297	6.529	-0.094124
89	1.300	-0.041141	0.087893	4.600	-1.297	12.509	0.020137
90	0	-0.036861	0.088468	4.537	-0.974517	12.564	-0.088828
90	1.300	-0.036861	0.088468	4.537	-0.974517	18.463	0.026181
91	0	-0.035127	0.088221	4.161	-0.186281	18.685	-0.083101
91	1.300	-0.035127	0.088221	4.161	-0.186281	24.094	0.031586
92	0	-0.033361	0.088746	3.341	1.548	24.366	-0.077949
92	1.300	-0.033361	0.088746	3.341	1.548	28.709	0.037421
93	0	-0.029126	0.091885	3.330	4.380	28.429	-0.073697
93	0.0499	-0.029126	0.091885	3.330	4.380	28.595	-0.069115
93	0.0501	-0.029126	0.091885	-2.540	4.380	28.595	-0.069091
93	1.300	-0.029126	0.091885	-2.540	4.380	25.420	0.045753

LOAD COMBINATION DY: 'COMB1'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION DZ: 'COMB2'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
12	1.5000			VEHICULO HIPOTESIS 12
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EA: 'COMB3'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
13	1.5000			VEHICULO HIPOTESIS 13
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EB: 'COMB4'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
14	1.5000			VEHICULO HIPOTESIS 14
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EC: 'COMB5'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
15	1.5000			VEHICULO HIPOTESIS 15
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION ED: 'COMB6'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
20	1.5000			VEHICULO HIPOTESIS 20
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EE: 'COMB7'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
21	1.5000			VEHICULO HIPOTESIS 21
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EF: 'COMB8'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
22	1.5000			VEHICULO HIPOTESIS 22
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EG: 'COMB9'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
23	1.5000			VEHICULO HIPOTESIS 23
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EH: 'COMB10'

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
2	2.0250			PESO PAVIMENTO
3	1.3500			PESO BARRERAS
5	1.3500			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
9	1.5000			SOB UNIF 4
10	1.5000			SOB UNIF 5
24	1.5000			VEHICULO HIPOTESIS 24
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EI: 'COMB11'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EJ: 'COMB12'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
11	1.5000			VEHICULO HIPOTESIS 11
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EK: 'COMB13'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
12	1.5000			VEHICULO HIPOTESIS 12
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EL: 'COMB14'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
13	1.5000			VEHICULO HIPOTESIS 13
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EM: 'COMB15'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
14	1.5000			VEHICULO HIPOTESIS 14
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

LOAD COMBINATION EN: 'COMB16'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			PESO PROPIO
2	1.0000			PESO PAVIMENTO
3	1.0000			PESO BARRERAS
5	1.0000			RETRACCION
6	1.5000			SOB UNIF 1
7	1.5000			SOB UNIF 2
8	1.5000			SOB UNIF 3
15	1.5000			VEHICULO HIPOTESIS 15
60	1.5000			FRENADO
63	0.45000			VIENTO TRANSV CON SOB
64	0.90000			TEMPERATURA (-)
66	0.90000			GRADIENTE

RESUMEN DE ARMADURAS DE WOOD-ARMER

NUDO	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
8	0 a 1.15	15.98	26.26	14.26	15.32
13	1.15 a 2.45	22.56	18.33	1.75	7.14
18	2.45 a 3.75	29.13	13.59	0.00	7.22
23	3.75 a 5.05	34.73	12.47	1.08	6.17
28	5.05 a 6.35	42.76	10.29	1.14	8.28
33	6.35 a 7.65	40.00	9.34	1.33	8.34
38	7.65 a 8.95	32.21	8.07	1.87	9.61
43	8.95 a 10.25	25.57	7.03	3.48	11.92
48	10.25 a 11.55	16.72	6.70	12.99	14.36
53	11.55 a 12.85	3.97	6.49	25.79	22.28

Nudo	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
58	12.85 a 14.55	2.90	3.97	49.40	33.91
63	14.55 a 16.25	9.00	5.74	15.98	17.16
68	16.25 a 17.95	22.18	4.64	1.40	6.18
73	17.95 a 19.65	35.80	3.61	0.00	3.20
78	19.65 a 21.35	44.43	2.03	0.00	2.56
83	21.35 a 23.05	47.04	2.02	0.00	2.47
88	23.05 a 24.75	43.86	2.62	0.00	2.57
93	24.75 a 26.45	34.69	3.55	0.00	3.30
98	26.45 a 28.15	20.59	4.66	1.96	7.14
103	28.15 a 29.85	4.93	6.41	18.54	18.49

Nudo	Dist.	ARMADURA INFERIOR		ARMADURA SUPERIOR	
		AsLONG	AsTRANS	AsLONG	AsTRANS
Nº	(m)	(cm2/m)	(cm2/m)	(cm2/m)	(cm2/m)
108	29.85 a 31.15	1.85	4.32	48.90	31.15
113	31.15 a 32.45	3.28	5.90	24.11	18.90
118	32.45 a 33.75	11.37	5.78	11.31	12.44
123	33.75 a 35.05	18.10	6.05	2.88	10.53
128	35.05 a 36.35	23.93	7.00	1.37	8.00
133	36.35 a 37.65	27.47	7.54	0.88	6.90
138	37.65 a 38.95	28.48	8.01	0.67	6.84
143	38.95 a 40.25	26.69	8.69	1.02	7.35
148	40.25 a 41.55	22.89	10.24	2.10	8.64
153	41.55 a 42.85	18.19	14.11	5.49	8.70
158	42.85 a 44	11.00	17.46	9.87	4.70

Armadura inferior longitudinal: $47.04 \frac{cm^2}{m} \times 3.70m = 174.05 cm^2$

centro Vano $\phi 25/0.10 \rightarrow 18\phi 25 + 18\phi 25$ ($176.76 cm^2$)

Armadura inferior longitudinal base: $22.56 \frac{cm^2}{m} \times 3.60m = 83.50 cm^2$

$\phi 25/0.20 \rightarrow 18\phi 25$

Armadura sup. longitudinal apoyo: $49.40 cm^2/m$

En el nucleo central: $\phi 20/0.20 + \phi 25/0.20 + 14\phi 20$ (4.70m)

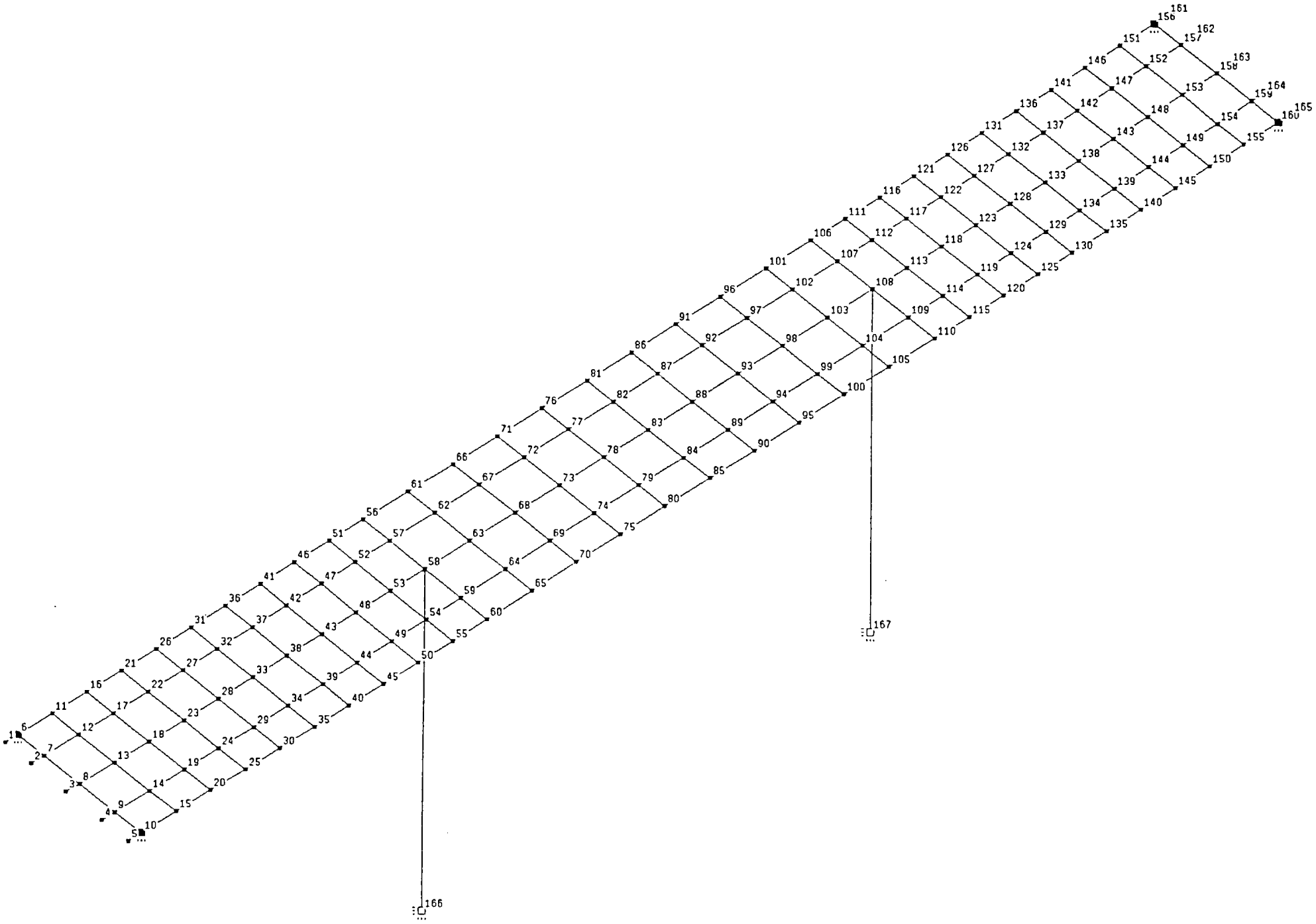
Voladizos

Armadura sup. longitudinal base: $15.70 cm^2/m$

2.3.3. Cálculo de las armaduras pasivas transversales. Método de Wood.

Scale 1 : 142.9
Structure - NUDOS

ARMADURAS



Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
122	129	134	1.30000	%Q0004			oS
123	134	139	1.30000	%Q0004			oS
124	139	144	1.30000	%Q0004			oS
125	144	149	1.30000	%Q0004			oS
126	149	154	1.30000	%Q0004			oS
127	154	159	1.30000	%Q0004			oS
128	159	164	0.50000	%Q0004			oS
129	5	10	0.50000	%Q0005			O oS
130	10	15	1.30000	%Q0005			O oS
131	15	20	1.30000	%Q0005			O oS
132	20	25	1.30000	%Q0005			O oS
133	25	30	1.30000	%Q0005			O oS
134	30	35	1.30000	%Q0005			O oS
135	35	40	1.30000	%Q0005			O oS
136	40	45	1.30000	%Q0005			O oS
137	45	50	1.30000	%Q0005			O oS
138	50	55	1.30000	%Q0005			O oS
139	55	60	1.30000	%Q0005			O oS
140	60	65	1.70000	%Q0005			O oS
141	65	70	1.70000	%Q0005			O oS
142	70	75	1.70000	%Q0005			O oS
143	75	80	1.70000	%Q0005			O oS
144	80	85	1.70000	%Q0005			O oS
145	85	90	1.70000	%Q0005			O oS
146	90	95	1.70000	%Q0005			O oS
147	95	100	1.70000	%Q0005			O oS
148	100	105	1.70000	%Q0005			O oS
149	105	110	1.70000	%Q0005			O oS
150	110	115	1.30000	%Q0005			O oS
151	115	120	1.30000	%Q0005			O oS
152	120	125	1.30000	%Q0005			O oS
153	125	130	1.30000	%Q0005			O oS
154	130	135	1.30000	%Q0005			O oS
155	135	140	1.30000	%Q0005			O oS
156	140	145	1.30000	%Q0005			O oS
157	145	150	1.30000	%Q0005			O oS
158	150	155	1.30000	%Q0005			O oS
159	155	160	1.30000	%Q0005			O oS
160	160	165	0.50000	%Q0005			O oS
166	6	7	1.12000	%Q0006			oS
167	7	8	1.50000	%Q0006			oS
168	8	9	1.50000	%Q0006			oS
169	9	10	1.12000	%Q0006			oS
170	11	12	1.12000	%Q0007			oS
171	12	13	1.50000	%Q0007			oS
172	13	14	1.50000	%Q0007			oS
173	14	15	1.12000	%Q0007			oS
174	16	17	1.12000	%Q0007			oS
175	17	18	1.50000	%Q0007			oS
176	18	19	1.50000	%Q0007			oS
177	19	20	1.12000	%Q0007			oS
178	21	22	1.12000	%Q0007			oS
179	22	23	1.50000	%Q0007			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
180	23	24	1.50000	%Q0007			oS
181	24	25	1.12000	%Q0007			oS
182	26	27	1.12000	%Q0007			oS
183	27	28	1.50000	%Q0007			oS
184	28	29	1.50000	%Q0007			oS
185	29	30	1.12000	%Q0007			oS
186	31	32	1.12000	%Q0007			oS
187	32	33	1.50000	%Q0007			oS
188	33	34	1.50000	%Q0007			oS
189	34	35	1.12000	%Q0007			oS
190	36	37	1.12000	%Q0007			oS
191	37	38	1.50000	%Q0007			oS
192	38	39	1.50000	%Q0007			oS
193	39	40	1.12000	%Q0007			oS
194	41	42	1.12000	%Q0007			oS
195	42	43	1.50000	%Q0007			oS
196	43	44	1.50000	%Q0007			oS
197	44	45	1.12000	%Q0007			oS
198	46	47	1.12000	%Q0007			oS
199	47	48	1.50000	%Q0007			oS
200	48	49	1.50000	%Q0007			oS
201	49	50	1.12000	%Q0007			oS
202	51	52	1.12000	%Q0007			oS
203	52	53	1.50000	%Q0007			oS
204	53	54	1.50000	%Q0007			oS
205	54	55	1.12000	%Q0007			oS
206	56	57	1.12000	%Q0008			oS
207	57	58	1.50000	%Q0008			oS
208	58	59	1.50000	%Q0008			oS
209	59	60	1.12000	%Q0008			oS
210	61	62	1.12000	%Q0009			oS
211	62	63	1.50000	%Q0009			oS
212	63	64	1.50000	%Q0009			oS
213	64	65	1.12000	%Q0009			oS
214	66	67	1.12000	%Q0009			oS
215	67	68	1.50000	%Q0009			oS
216	68	69	1.50000	%Q0009			oS
217	69	70	1.12000	%Q0009			oS
218	71	72	1.12000	%Q0009			oS
219	72	73	1.50000	%Q0009			oS
220	73	74	1.50000	%Q0009			oS
221	74	75	1.12000	%Q0009			oS
222	76	77	1.12000	%Q0009			oS
223	77	78	1.50000	%Q0009			oS
224	78	79	1.50000	%Q0009			oS
225	79	80	1.12000	%Q0009			oS
226	81	82	1.12000	%Q0009			oS
227	82	83	1.50000	%Q0009			oS
228	83	84	1.50000	%Q0009			oS
229	84	85	1.12000	%Q0009			oS
230	86	87	1.12000	%Q0009			oS
231	87	88	1.50000	%Q0009			oS
232	88	89	1.50000	%Q0009			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
233	89	90	1.12000	%Q0009			oS
234	91	92	1.12000	%Q0009			oS
235	92	93	1.50000	%Q0009			oS
236	93	94	1.50000	%Q0009			oS
237	94	95	1.12000	%Q0009			oS
238	96	97	1.12000	%Q0009			oS
239	97	98	1.50000	%Q0009			oS
240	98	99	1.50000	%Q0009			oS
241	99	100	1.12000	%Q0009			oS
242	101	102	1.12000	%Q0009			oS
243	102	103	1.50000	%Q0009			oS
244	103	104	1.50000	%Q0009			oS
245	104	105	1.12000	%Q0009			oS
246	106	107	1.12000	%Q0010			oS
247	107	108	1.50000	%Q0010			oS
248	108	109	1.50000	%Q0010			oS
249	109	110	1.12000	%Q0010			oS
250	111	112	1.12000	%Q0011			oS
251	112	113	1.50000	%Q0011			oS
252	113	114	1.50000	%Q0011			oS
253	114	115	1.12000	%Q0011			oS
254	116	117	1.12000	%Q0011			oS
255	117	118	1.50000	%Q0011			oS
256	118	119	1.50000	%Q0011			oS
257	119	120	1.12000	%Q0011			oS
258	121	122	1.12000	%Q0011			oS
259	122	123	1.50000	%Q0011			oS
260	123	124	1.50000	%Q0011			oS
261	124	125	1.12000	%Q0011			oS
262	126	127	1.12000	%Q0011			oS
263	127	128	1.50000	%Q0011			oS
264	128	129	1.50000	%Q0011			oS
265	129	130	1.12000	%Q0011			oS
266	131	132	1.12000	%Q0011			oS
267	132	133	1.50000	%Q0011			oS
268	133	134	1.50000	%Q0011			oS
269	134	135	1.12000	%Q0011			oS
270	136	137	1.12000	%Q0011			oS
271	137	138	1.50000	%Q0011			oS
272	138	139	1.50000	%Q0011			oS
273	139	140	1.12000	%Q0011			oS
274	141	142	1.12000	%Q0011			oS
275	142	143	1.50000	%Q0011			oS
276	143	144	1.50000	%Q0011			oS
277	144	145	1.12000	%Q0011			oS
278	146	147	1.12000	%Q0011			oS
279	147	148	1.50000	%Q0011			oS
280	148	149	1.50000	%Q0011			oS
281	149	150	1.12000	%Q0011			oS
282	151	152	1.12000	%Q0011			oS
283	152	153	1.50000	%Q0011			oS
284	153	154	1.50000	%Q0011			oS
285	154	155	1.12000	%Q0011			oS

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	end	Specialities
286	156	157	1.12000	%Q0012			oS
287	157	158	1.50000	%Q0012			oS
288	158	159	1.50000	%Q0012			oS
289	159	160	1.12000	%Q0012			oS
290*	166	58	13.20000	PILAS			oS
291*	167	108	13.20000	PILAS			oS

Bars marked with *** are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

Cross sections marked with *** (i.e *HEB200) are rotated 90 degr.
about the local x-axis.

O = Rotated bars (bar orientations)
oS = Bars without shear deformation.

HAUNCHED AND NON DEFAULT ORIENTED MEMBERS:

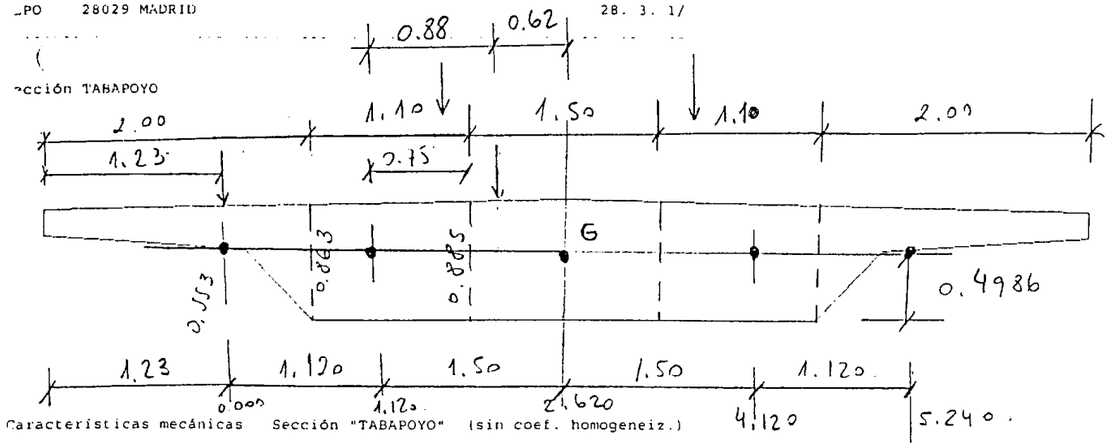
Bar	haunched bars CS-Start	CS-End	Bar orientation x/kl/angle Beta	y/k2	z
1			-8.0000		
2			-8.0000		
3			-8.0000		
4			-8.0000		
5			-8.0000		
6			-8.0000		
7			-8.0000		
8			-8.0000		
9			-8.0000		
10			-8.0000		
11			-8.0000		
12			-8.0000		
13			-8.0000		
14			-8.0000		
15			-8.0000		
16			-8.0000		
17			-8.0000		
18			-8.0000		
19			-8.0000		
20			-8.0000		
21			-8.0000		
22			-8.0000		
23			-8.0000		
24			-8.0000		
25			-8.0000		
26			-8.0000		
27			-8.0000		
28			-8.0000		
29			-8.0000		

Bar	haunched bars CS-Start	CS-End	Bar orientation x/kl/angle Beta	y/k2	z
30			-8.0000		
31			-8.0000		
32			-8.0000		
129			8.0000		
130			8.0000		
131			8.0000		
132			8.0000		
133			8.0000		
134			8.0000		
135			8.0000		
136			8.0000		
137			8.0000		
138			8.0000		
139			8.0000		
140			8.0000		
141			8.0000		
142			8.0000		
143			8.0000		
144			8.0000		
145			8.0000		
146			8.0000		
147			8.0000		
148			8.0000		
149			8.0000		
150			8.0000		
151			8.0000		
152			8.0000		
153			8.0000		
154			8.0000		
155			8.0000		
156			8.0000		
157			8.0000		
158			8.0000		
159			8.0000		
160			8.0000		

CROSS SECTION VALUES: CS-Name	Ax [M2] Ix [M4] zi [M1]	Iy [M4] Fy [M2] zu [M1]	Iz [M4] Fz [M2] yl [M1]	Phi [Degr] yr [M1]
%Q0001	6.9575E-01	2.7466E-02	2.4561E-01	8.01
(L1)	8.0250E-03	6.9575E-01	6.9575E-01	
	-0.4986	0.3644	-0.7703	1.2297
%Q0002	9.4930E-01	6.3194E-02	1.3370E-01	0.00
(L2E)	6.1400E-02	9.4930E-01	9.4930E-01	
	-0.4986	0.3644	-0.7500	0.3500

CROSS SECTION VALUES: CS-Name	Ax [M2] Ix [M4] zi [M1]	Iy [M4] Fy [M2] zu [M1]	Iz [M4] Fz [M2] yl [M1]	Phi [Degr] yr [M1]
%Q0003	1.3500E+00	9.4309E-02	2.5312E-01	0.00
(L2)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.7500	0.7500
%Q0004	9.4930E-01	6.3194E-02	1.3370E-01	0.00
(L2R)	6.1400E-02	9.4930E-01	9.4930E-01	
	-0.4986	0.3644	-0.3500	0.7500
%Q0005	6.9575E-01	2.7466E-02	2.4561E-01	-8.01
(L3)	8.0250E-03	6.9575E-01	6.9575E-01	
	-0.4986	0.3644	-1.2297	0.7703
%Q0006	1.0350E+00	7.2304E-02	1.1990E-01	0.00
(TRANS0)	7.2950E-02	1.0350E+00	1.0350E+00	
	-0.4986	0.4014	-0.5000	0.6500
%Q0007	1.1700E+00	8.1733E-02	1.6478E-01	0.00
(TRANS1)	9.0350E-02	1.1700E+00	1.1700E+00	
	-0.4986	0.4014	-0.6500	0.6500
%Q0008	1.3500E+00	9.4309E-02	2.6660E-01	0.00
(TRANS5)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.6500	0.8500
%Q0009	1.5300E+00	1.0691E-01	3.6847E-01	0.00
(TRANS2)	1.3810E-01	1.5300E+00	1.5300E+00	
	-0.4986	0.4014	-0.8500	0.8500
%Q0010	1.3500E+00	9.4309E-02	2.6660E-01	0.00
(TRANS6)	1.1410E-01	1.3500E+00	1.3500E+00	
	-0.4986	0.4014	-0.8500	0.6500
%Q0011	1.1700E+00	8.1733E-02	1.6478E-01	0.00
(TRANS3)	9.0350E-02	1.1700E+00	1.1700E+00	
	-0.4986	0.4014	-0.6500	0.6500
%Q0012	1.0350E+00	7.2304E-02	1.1990E-01	0.00
(TRANS4)	7.2950E-02	1.0350E+00	1.0350E+00	
	-0.4986	0.4014	-0.6500	0.5000
PILAS	7.8576E-01	4.9180E-02	4.9086E-02	0.00
	9.8175E-02	7.8576E-01	7.8576E-01	
	-0.5000	0.5000	-0.5000	0.5000

Sección TABAPOYO



Características mecánicas Sección "TABAPOYO" (sin coef. homogeneiz.)

Area Ax = 46.53E3 cm2 = 4.653 m²
Momento de inercia Iy = 28.62E6 cm4 Iz = 1.372E9 cm4 Ip = 1.400E9 cm4
Const. de torsión Ix = 50.83E6 cm4
Momento estático Zy = 998.79E3 cm3 Zz = 6.642E6 cm3
Baricentro ys = 0.0000 m zs = 0.4986 m Angulo= 0.0 Grad
Dist. al borde yl = -3.8500 m yr = 3.8500 m
zo = 0.4014 m zu = -0.4986 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TABAPOYO" (sin coef. homogeneiz.)

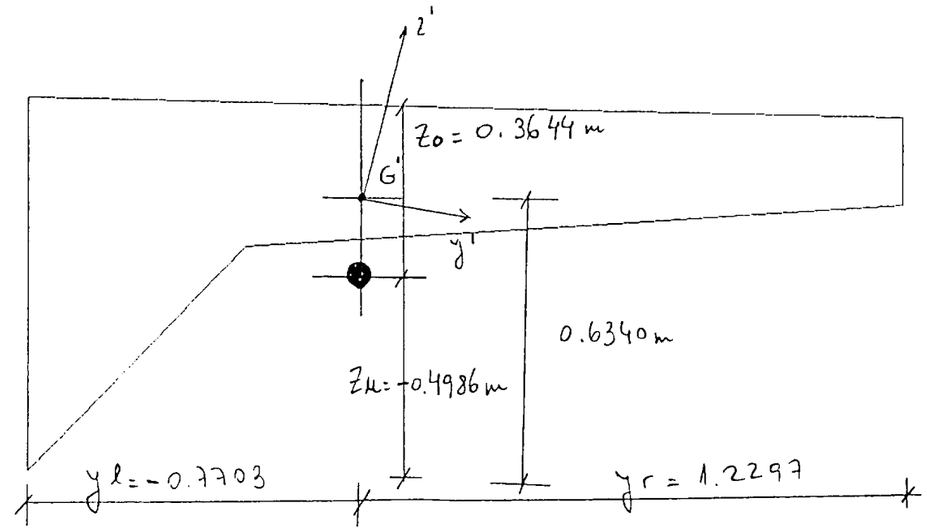
Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

No se ha entrado ninguna armadura!

Sección L1



Características mecánicas Sección "L1" (sin coef. homogeneiz.)

Area Ax = 6.958E3 cm2
Momento de inercia Iy = 1.471E6 cm4 Iz = 24.56E6 cm4 Ip = 26.03E6 cm4
rel. a ejes dados Iye= 1.919E6 cm4 Ize= 24.11E6 cm4 Iyz= -3.2E00 cm4
Const. de torsión Ix = 1.605E6 cm4 $I_{x0.50} = 0.008025\ m^4$
Momento estático Zy = 87.62E3 cm3 Zz = 356.13E3 cm3
Baricentro ys = 0.7703 m zs = 0.6340 m Angulo= 8.0 Grad
Dist. al borde yl = -0.7703 m yr = 1.2297 m
zo = 0.2290 m zu = -0.6340 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L1" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	6957.500	529.028	1.60E+06	3)

Puntos de contorno [m]:

1	0.0000	0.0000	2	0.5000	0.5230	3	2.0000	0.6230
4	2.0000	0.8230	5	0.0000	0.8630	6	0.0000	0.0000

No se ha entrado ninguna armadura!

$$I_y = 1{,}471\ 10^6\ cm^4 + 6.758\ 10^3\ cm^2\ (6340\ cm - 49.86 cm)^2$$

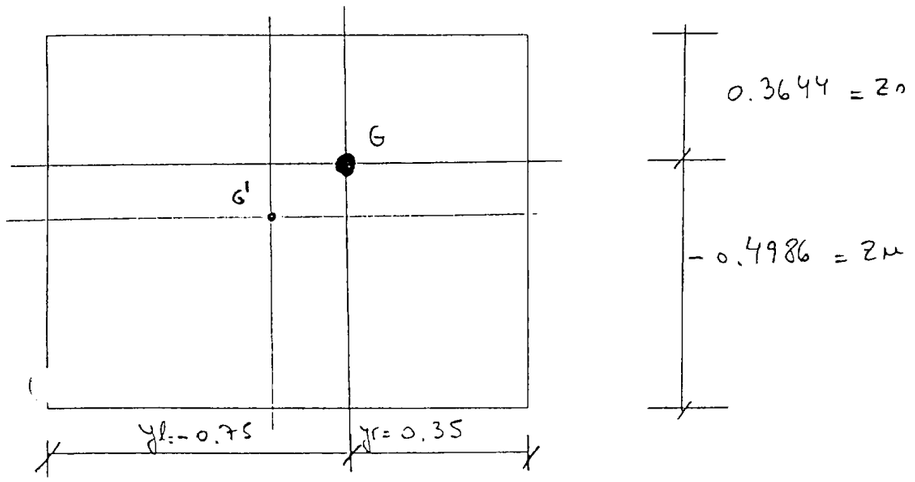
$$I_y = 0.027466\ m^4$$

$$I_x = 0.008025\ m^4$$

$$Z_u = -0.4986\ m \qquad Z_o = 0.3644\ m$$

$$BETA = -8.00^\circ$$

ección L2B



Características mecánicas Sección "L2B" (sin coef. homogeneiz.)

Area Ax = 9.493E3 cm2
Momento de inercia Iy = 5.892E6 cm4 Iz = 9.572E6 cm4 Ip = 15.46E6 cm4
Const. de torsión Ix = 12.28E6 cm4
Momento estático Zy =204.81E3 cm3 Zz = 261.06E3 cm3
Baricentro ys = 0.5500 m zs = 0.4315 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5500 m yr = 0.5500 m
zo = 0.4315 m zu = -0.4315 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2B" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	9493.000	392.600	1.23E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.1000	0.0000	3	1.1000	0.8630
4	0.0000	0.8630	5	0.0000	0.0000		

No se ha entrado ninguna armadura!

$I_x = 12.28\ 10^6\ cm^4 \times 0.50 = 0.0614\ m^4$

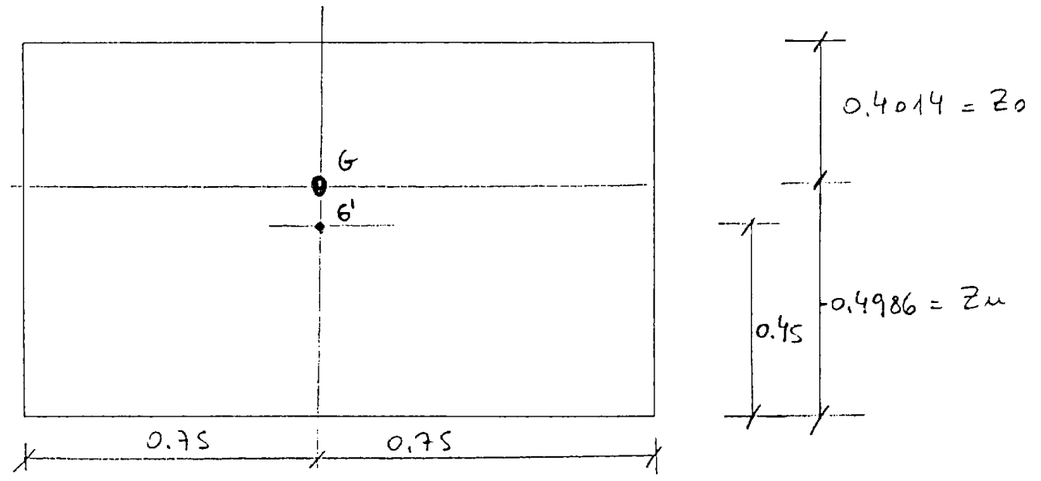
$I_y = 5.892\ 10^6 + 9.493\ 10^3 \times (49.86\ cm - 43.15\ cm)^2$

$I_y = 0.063194.0\ m^4$

$I_z = 9.572\ 10^6 + 9.493\ 10^3 \times (75. - 55)^2$

$I_z = 0.133692\ m^4$

Sección L2



Características mecánicas Sección "L2" (sin coef. homogeneiz.)

Area Ax = 13.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.7500 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "L2" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.5000	0.0000	3	1.5000	0.9000
4	0.0000	0.9000	5	0.0000	0.0000		

No se ha entrado ninguna armadura!

$I_x = 22.82\ 10^6\ cm^4 \times 0.50 = 0.1141\ m^4$

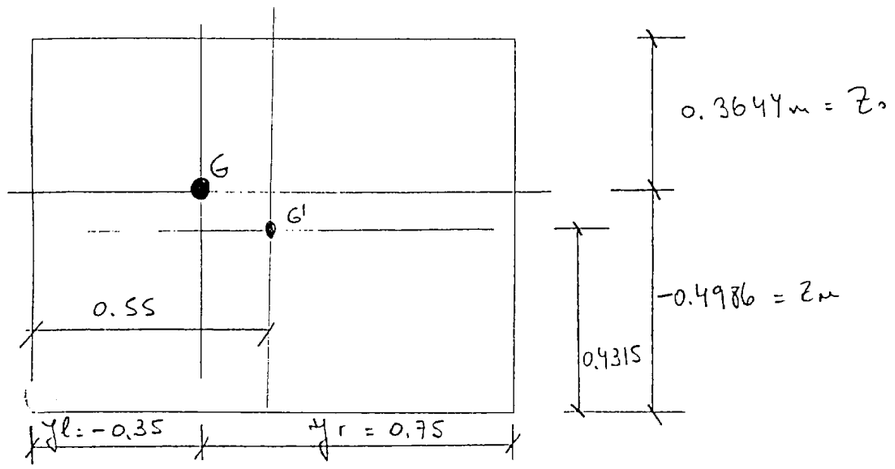
$I_y = 9.112\ 10^6\ cm^4 + 13.50\ 10^3\ cm^2 \times (49.86\ cm - 45.0\ cm)^2$

$I_y = 0.0943086\ m^4$

$Z_\mu = -0.4986\ m$

$Z_o = 0.4014\ m$

ección L2A



Características mecánicas Sección "L2A" (sin coef. homogeneiz.)

```
Area                 Ax = 9.493E3 cm2
Momento de inercia   Iy = 5.892E6 cm4  Iz =  9.572E6 cm4  Ip = 15.46E6 cm4
Const. de torsión                                          Ix = 12.28E6 cm4
Momento estático     Zy =204.81E3 cm3  Zz = 261.06E3 cm3
Baricentro           ys =   0.5500 m   zs =   0.4315 m   Angulo=  0.0 Grad
Dist. al borde       yl =  -0.5500 m   yr =   0.5500 m
                     zo =   0.4315 m   zu =  -0.4315 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T Punto de aplic. de fuerzas en el baricentro de la sección
```

Contorno de sección parcial, Sección "L2A" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	9493.000	392.600	1.23E+07	1)

Puntos de contorno [m]:

1	0.0000	0.0000	2	1.1000	0.0000	3	1.1000	0.8630
4	0.0000	0.8630	5	0.0000	0.0000		

No se ha entrado ninguna armadura!

$I_x = 12.28\,10^6\,cm^4 \times 0.50 = 0.0614\,m^4$

$I_y = 5.892\,10^6\,cm^4 + 9.493\times10^3\,cm^2 \times (49.86\,cm - 43.15\,cm)^2$

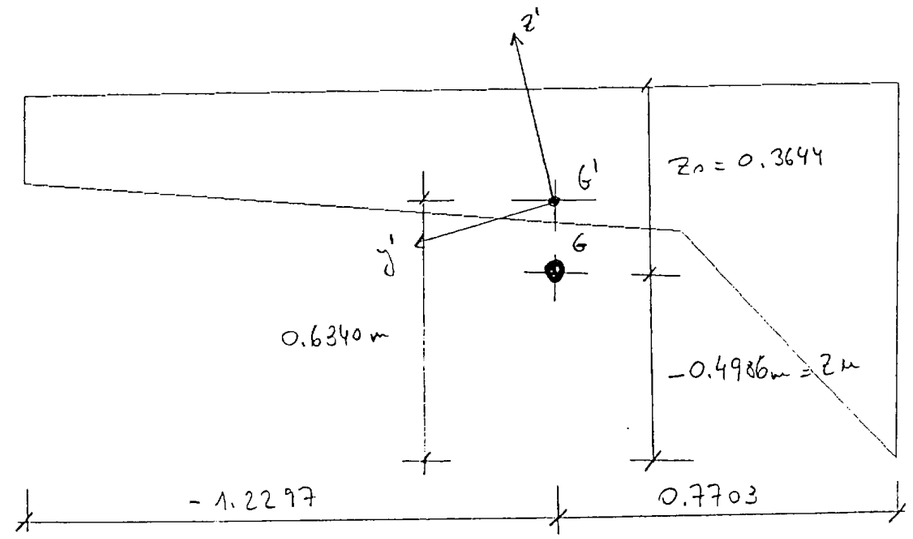
$I_y = 0.063194\,m^4$

$I_z = 9.572\,10^6\,cm^4 + 9.493\times10^3\,cm^2 \times (55.0\,cm - 35.0\,cm)^2$

$I_z = 0.1337\,m^4$

$Z_u = -0.4986\,m \qquad Z_o = 0.3644$

Sección L3



Características mecánicas Sección "L3" (sin coef. homogeneiz.)

```
Area                 Ax = 6.957E3 cm2
Momento de inercia   Iy = 1.471E6 cm4  Iz =  24.56E6 cm4  Ip = 26.03E6 cm4
rel. a ejes dados    Iye= 1.919E6 cm4  Ize=  24.11E6 cm4  Iyz= 3.186E6 cm4
Const. de torsión                                          Ix = 1.605E6 cm4
Momento estático     Zy = 87.62E3 cm3  Zz = 356.13E3 cm3
Baricentro           ys =   1.2297 m   zs =   0.6340 m   Angulo=  0.0 Grad
Dist. al borde       yl =  -1.2297 m   yr =   0.7703 m
                     zo =   0.2290 m   zu =  -0.6340 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
```

Contorno de sección parcial, Sección "L3" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	6957.500	529.028	1.60E+06	3)

Puntos de contorno [m]:

1	0.0000	0.8230	2	0.0000	0.6230	3	1.5000	0.5230
4	2.0000	0.0000	5	2.0000	0.8630	6	0.0000	0.8230

No se ha entrado ninguna armadura!

$I_x = 1.605\,10^6\,cm^4 \times 0.50 = 0.008025\,m^4$

$I_y = 1.471\,10^6\,cm^4 + 6.957\,10^3\,cm^2\,(63.40\,cm - 49.86\,cm)^2$

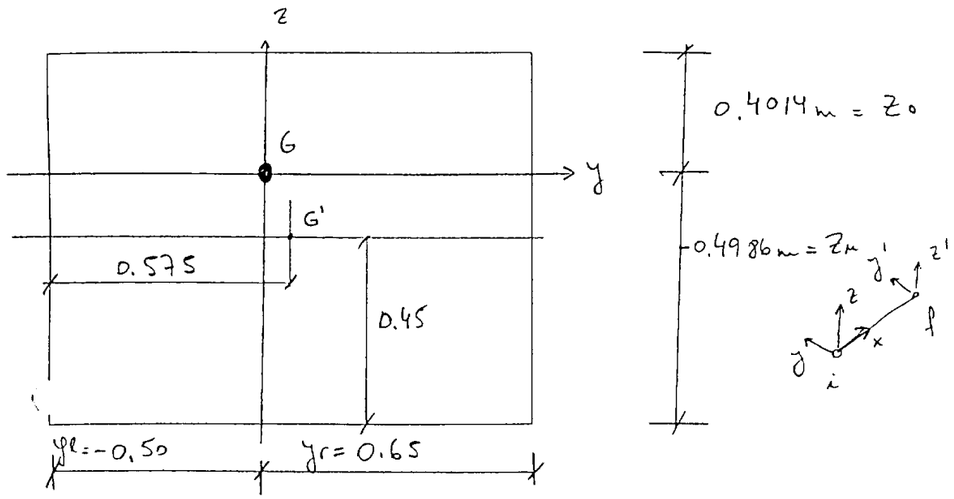
$I_y = 0.027464\,m^4$

$Z_o = 0.3644\,m \qquad Z_u = -0.4986$

$BETA = 8.00^\circ$

(

ección TRANS0



Características mecánicas Sección "TRANS0" (sin coef. homogeneiz.)

Area Ax = 10.35E3 cm2
Momento de inercia Iy = 6.986E6 cm4 Iz = 11.41E6 cm4 Ip = 18.39E6 cm4
Const. de torsión Ix = 14.59E6 cm4
Momento estático Zy =232.88E3 cm3 Zz = 297.56E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5750 m yr = 0.5750 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Cc rno de sección parcial, Sección "TRANS0" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	10350.0	410.000	1.46E+07	1)

Puntos de contorno [m]:

1	-0.5750	0.0000	2	0.5750	0.0000	3	0.5750	0.9000
4	0.5750	0.9000	5	0.5750	0.0000			

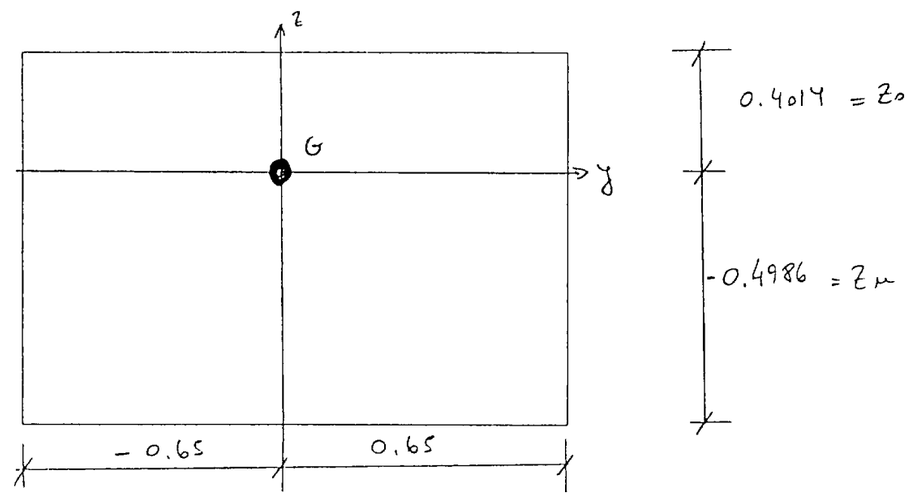
No se ha entrado ninguna armadura!

$$Ix = 14.59\,10^{6}\,cm^{4} \times 0.50 = 0.07295\,m^{4}$$

$$Iy = 6.986\,10^{6}\,cm^{4} + 10.35 \times 10^{3}\,cm^{2} \times (49.86cm - 45.0cm)^{2}$$
$$Iy = 0.0723046\,m^{4}$$

$$Iz = 11.41\,10^{6}\,cm^{4} + 10.35\,10^{3}\,cm^{2} \times (57.5cm - 50\,cm)^{2}$$
$$Iz = 0.119921\,m^{4}$$

Sección TRANS1



Características mecánicas Sección "TRANS1" (sin coef. homogeneiz.)

Area Ax = 11.70E3 cm2
Momento de inercia Iy = 7.897E6 cm4 Iz = 16.48E6 cm4 Ip = 24.37E6 cm4
Const. de torsión Ix = 18.07E6 cm4
Momento estático Zy =263.25E3 cm3 Zz = 380.25E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.6500 m yr = 0.6500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS1" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	11700.0	440.000	1.81E+07	1)

Puntos de contorno [m]:

1	-0.6500	0.0000	2	0.6500	0.0000	3	0.6500	0.9000
4	-0.6500	0.9000	5	0.6500	0.0000			

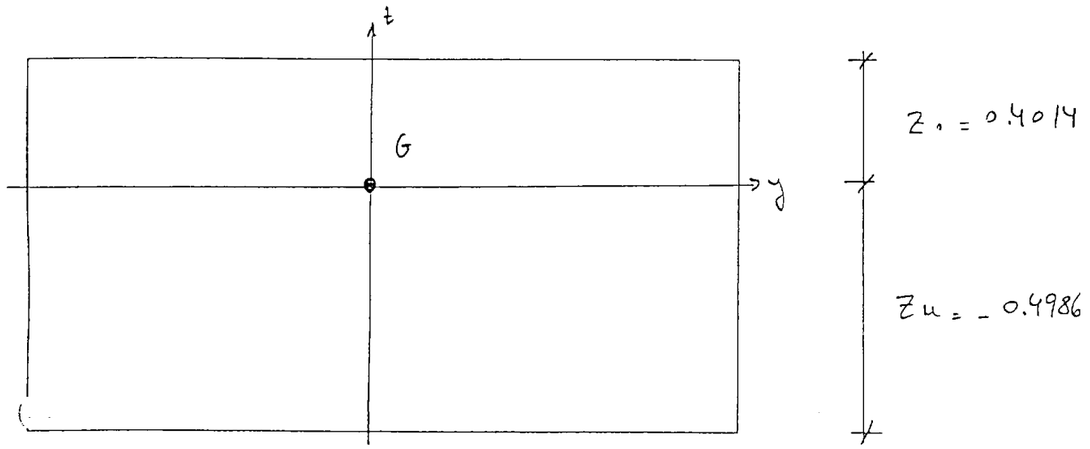
No se ha entrado ninguna armadura!

$$Ix = 18.07\,10^{6}\,cm^{4} \times 0.50 = 0.09035\,m^{4}$$

$$Iy = 7.897\,10^{6}\,cm^{4} + 11.70\,10^{3}\,cm^{2} \times (49.86\,cm - 45.0)^{2}$$
$$Iy = 0.0817334\,m^{4}$$

$$Zm = -0.4986\,m \qquad Zo = 0.4014\,m$$

cción TRANS2



Características mecánicas Sección "TRANS2" (sin coef. homogeneiz.)

Area	Ax = 15.30E3 cm2			
Momento de inercia	Iy = 10.33E6 cm4	Iz = 36.85E6 cm4	Ip = 47.17E6 cm4	
Const. de torsión			Ix = 27.62E6 cm4	
Momento estático	Zy =344.25E3 cm3	Zz = 650.25E3 cm3		
Baricentro	ys = 0.0000 m	zs = 0.4500 m	Angulo= 0.0 Grad	
Dist. al borde	yl = -0.8500 m	yr = 0.8500 m		
	zo = 0.4500 m	zu = -0.4500 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS2" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	15300.0	520.000	2.76E+07	1)

Puntos de contorno [m]:

1	0.8500	0.0000	2	0.8500	0.0000	3	0.8500	0.9000
4	0.8500	0.9000	5	-0.8500	0.0000			

No se ha entrado ninguna armadura!

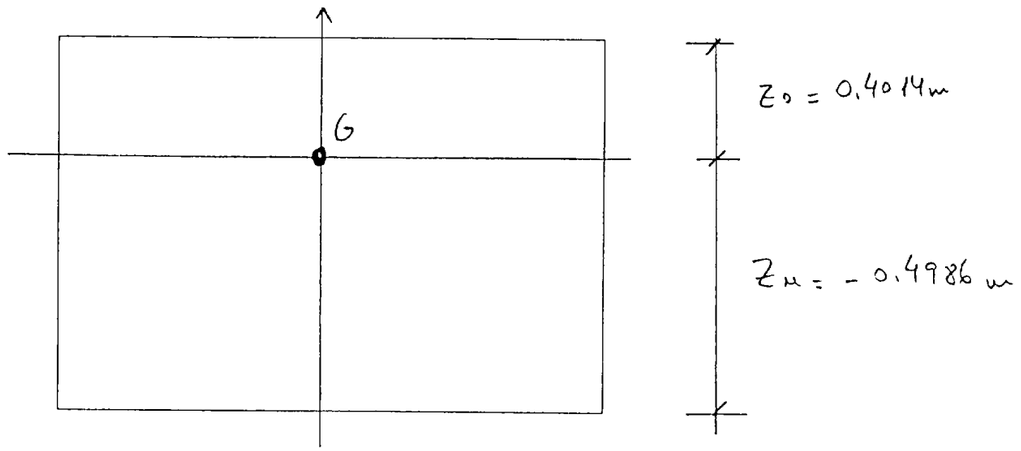
$I_x = 27.62\ 10^6\ cm^4 \times 0.50 = 0.1381\ m^4$

$I_y = 10.33\ 10^6\ cm^4 + 15.30\ 10^3\ cm^2 \times (49.86\ cm - 45.00)^2$

$I_y = 0.106913\ m^4$

$Z_u = -0.4986\ m \qquad Z_o = 0.4014\ m$

Sección TRANS3



Características mecánicas Sección "TRANS3" (sin coef. homogeneiz.)

Area	Ax = 11.70E3 cm2			
Momento de inercia	Iy = 7.897E6 cm4	Iz = 16.48E6 cm4	Ip = 24.37E6 cm4	
Const. de torsión			Ix = 18.07E6 cm4	
Momento estático	Zy =263.25E3 cm3	Zz = 380.25E3 cm3		
Baricentro	ys = -0.0000 m	zs = 0.4500 m	Angulo= 0.0 Grad	
Dist. al borde	yl = -0.6500 m	yr = 0.6500 m		
	zo = 0.4500 m	zu = -0.4500 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS3" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	11700.0	440.000	1.81E+07	1)

Puntos de contorno [m]:

1	-0.6500	0.0000	2	0.6500	0.0000	3	0.6500	0.9000
4	0.6500	0.9000	5	0.6500	0.0000			

No se ha entrado ninguna armadura!

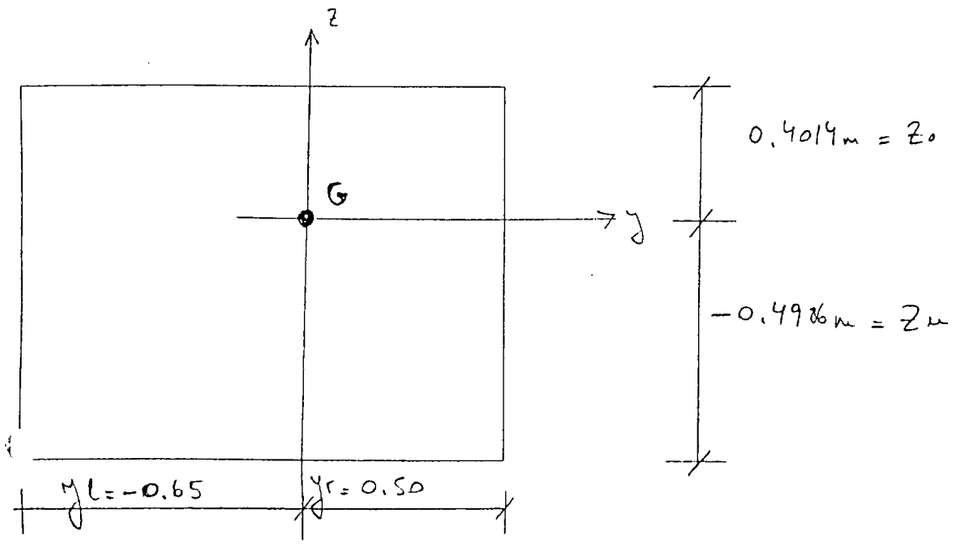
$I_x = 18.07\ 10^6\ cm^4 \times 0.50 = 0.09035\ m^4$

$I_y = 7.897\ 10^6\ cm^4 + 11.70 \times 10^3\ cm^2 \times (49.86\ cm - 45.00)^2$

$I_y = 0,0817335\ m^4$

$Z_u = -0.4986\ m \qquad Z_o = 0,4014\ m$

Sección TRANS4



Características mecánicas Sección "TRANS4" (sin coef. homogeneiz.)

Area Ax = 10.35E3 cm2
Momento de inercia Iy = 6.986E6 cm4 Iz = 11.41E6 cm4 Ip = 18.39E6 cm4
Const. de torsión Ix = 14.59E6 cm4
Momento estático Zy =232.88E3 cm3 Zz = 297.56E3 cm3
Baricentro ys = -0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.5750 m yr = 0.5750 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS4" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	10350.0	410.000	1.46E+07	1)

Puntos de contorno [m]:
1 -0.5750 0.0000 2 0.5750 0.0000 3 0.5750 0.9000
4 -0.5750 0.9000 5 -0.5750 0.0000

No se ha entrado ninguna armadura!

$I_x = 14.59\ 10^6\ cm^4 \times 0.50 = 0.07295\ m^4$

$I_y = 6.986\ 10^6\ cm^4 + 10.35\ 10^3\ cm^2 \times (49.86\ cm - 45.0\ cm)^2$

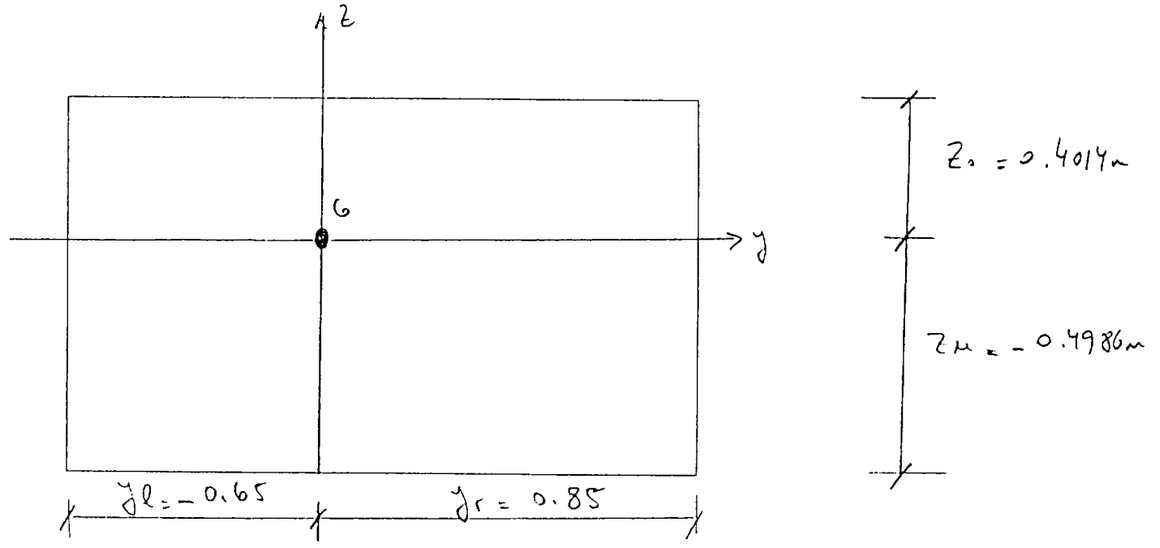
$I_y = 0.0723046\ m^4$

$I_z = 11,41\ 10^6\ cm^4 + 10.35\ 10^3\ cm^2 \times (65.0 - 57,50)^2$

$I_z = 0,11992\ m^4$

$z_u = -0.4986\ m \qquad z_o = 0.4014\ m$

Sección TRANS5



Características mecánicas Sección "TRANS5" (sin coef. homogeneiz.)

Area Ax = 13.50E3 cm2
Momento de inercia Iy = 9.112E6 cm4 Iz = 25.31E6 cm4 Ip = 34.42E6 cm4
Const. de torsión Ix = 22.82E6 cm4
Momento estático Zy =303.75E3 cm3 Zz = 506.25E3 cm3
Baricentro ys = 0.0000 m zs = 0.4500 m Angulo= 0.0 Grad
Dist. al borde yl = -0.7500 m yr = 0.7500 m
zo = 0.4500 m zu = -0.4500 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS5" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:
1 -0.7500 0.0000 2 0.7500 0.0000 3 0.7500 0.9000
4 -0.7500 0.9000 5 0.7500 0.0000

No se ha entrado ninguna armadura!

$I_x = 22,82\ 10^6\ cm^4 \times 0,50 = 0,1141\ m^4$

$I_y = 9.112\ 10^6\ cm^4 + 13,50\ 10^3\ cm^2\ (49.86-45)^2$

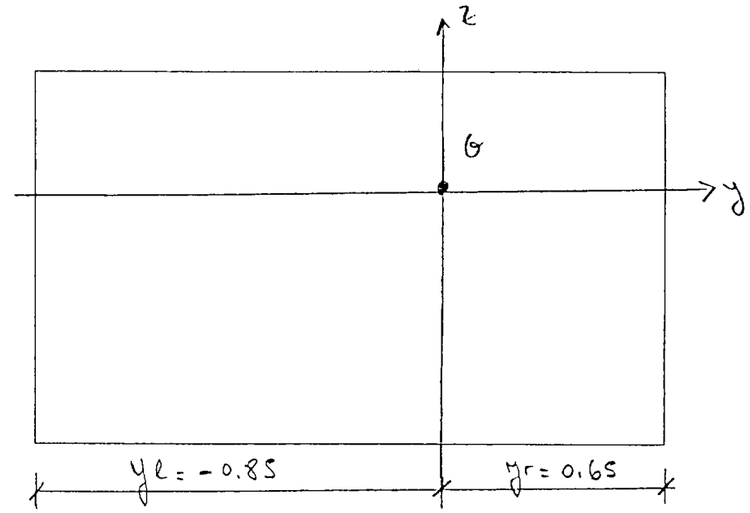
$I_y = 0,094309\ m^4$

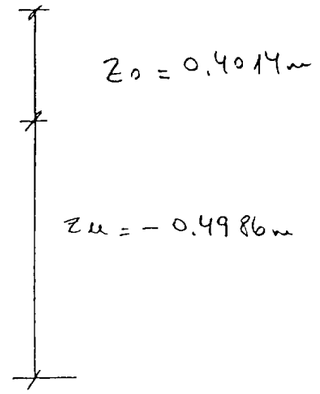
$I_z = 25,31\ 10^6\ cm^4 + 13.50\ 10^3\ cm^2\ (75-65)^2$

$I_z = 0.2666\ m^4$

$z_u = -0.4986\ m \qquad z_o = 0,4014\ m$

Sección TRANS6





Características mecánicas Sección "TRANS6" (sin coef. homogeneiz.)

Area	Ax = 13.50E3 cm2			
Momento de inercia	Iy = 9.112E6 cm4	Iz = 25.31E6 cm4	Ip = 34.42E6 cm4	
Const. de torsión			Ix = 22.82E6 cm4	
Momento estático	Zy =303.75E3 cm3	Zz = 506.25E3 cm3		
Baricentro	ys = 0.0000 m	zs = 0.4500 m	Angulo= 0.0 Grad	
Dist. al borde	yl = -0.7500 m	yr = 0.7500 m		
	zo = 0.4500 m	zu = -0.4500 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "TRANS6" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	HJ00	1.00	13500.0	480.000	2.28E+07	1)

Puntos de contorno [m]:

1	-0.7500	0.0000	2	0.7500	0.0000	3	0.7500	0.9000
4	0.7500	0.9000	5	0.7500	0.0000		

No se ha entrado ninguna armadura!

$$I_x = 22.82\,10^6\,cm^4 \times 0.50 = 0.1141\ m^4$$

$$I_y = 9.112\,10^6\,cm^4 + 13.50\,10^3\,cm^2\,(49.86 - 45)^2$$

$$I_y = 0.09430\ m^4$$

$$I_t = 25.31\,10^6\,cm^4 + 13.50\,10^3\,cm^2\,(75 - 65)^2$$

$$I_t = 0.2666\ m^4$$

$$z_u = -0.4986\ m \qquad z_o = 0.4014$$

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 .. 291	3.2900E+06	1.3700E+06

STS-Run ok

Load case 1: PESO PROPIO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Mas.forcZ gl const.	-2.500		Stab	1 .. 160

Load case 2: PESO PAVIMENTO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-0.106000		Stab	1 .. 32
Force Z pj const.	-0.101000		Stab	33 .. 64
Force Z pj const.	-0.138000		Stab	65 .. 96
Force Z pj const.	-0.101000		Stab	97 .. 128
Force Z pj const.	-0.106000		Stab	129 .. 160

Load case 3: PESO BARRERAS

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-1.000		Stab	1
Moment X lo const.	-1.023		Stab	1
Force Z pj const.	-1.000		Stab	2
Moment X lo const.	-1.023		Stab	2
Force Z pj const.	-1.000		Stab	3
Moment X lo const.	-1.023		Stab	3
Force Z pj const.	-1.000		Stab	4
Moment X lo const.	-1.023		Stab	4
Force Z pj const.	-1.000		Stab	5
Moment X lo const.	-1.023		Stab	5
Force Z pj const.	-1.000		Stab	6
Moment X lo const.	-1.023		Stab	6
Force Z pj const.	-1.000		Stab	7
Moment X lo const.	-1.023		Stab	7
Force Z pj const.	-1.000		Stab	8
Moment X lo const.	-1.023		Stab	8
Force Z pj const.	-1.000		Stab	9
Moment X lo const.	-1.023		Stab	9
Force Z pj const.	-1.000		Stab	10
Moment X lo const.	-1.023		Stab	10
Force Z pj const.	-1.000		Stab	11
Moment X lo const.	-1.023		Stab	11
Force Z pj const.	-1.000		Stab	12
Moment X lo const.	-1.023		Stab	12
Force Z pj const.	-1.000		Stab	13
Moment X lo const.	-1.023		Stab	13
Force Z pj const.	-1.000		Stab	14
Moment X lo const.	-1.023		Stab	14
Force Z pj const.	-1.000		Stab	15
Moment X lo const.	-1.023		Stab	15
Force Z pj const.	-1.000		Stab	16
Moment X lo const.	-1.023		Stab	16
Force Z pj const.	-1.000		Stab	17
Moment X lo const.	-1.023		Stab	17
Force Z pj const.	-1.000		Stab	18
Moment X lo const.	-1.023		Stab	18
Force Z pj const.	-1.000		Stab	19
Moment X lo const.	-1.023		Stab	19
Force Z pj const.	-1.000		Stab	20
Moment X lo const.	-1.023		Stab	20
Force Z pj const.	-1.000		Stab	21
Moment X lo const.	-1.023		Stab	21
Force Z pj const.	-1.000		Stab	22
Moment X lo const.	-1.023		Stab	22
Force Z pj const.	-1.000		Stab	23
Moment X lo const.	-1.023		Stab	23
Force Z pj const.	-1.000		Stab	24
Moment X lo const.	-1.023		Stab	24
Force Z pj const.	-1.000		Stab	25

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Moment X lo const.	-1.023		Stab	25
Force Z pj const.	-1.000		Stab	26
Moment X lo const.	-1.023		Stab	26
Force Z pj const.	-1.000		Stab	27
Moment X lo const.	-1.023		Stab	27
Force Z pj const.	-1.000		Stab	28
Moment X lo const.	-1.023		Stab	28
Force Z pj const.	-1.000		Stab	29
Moment X lo const.	-1.023		Stab	29
Force Z pj const.	-1.000		Stab	30
Moment X lo const.	-1.023		Stab	30
Force Z pj const.	-1.000		Stab	31
Moment X lo const.	-1.023		Stab	31
Force Z pj const.	-1.000		Stab	32
Moment X lo const.	-1.023		Stab	32
Force Z pj const.	-1.000		Stab	129
Moment X lo const.	1.023		Stab	129
Force Z pj const.	-1.000		Stab	130
Moment X lo const.	1.023		Stab	130
Force Z pj const.	-1.000		Stab	131
Moment X lo const.	1.023		Stab	131
Force Z pj const.	-1.000		Stab	132
Moment X lo const.	1.023		Stab	132
Force Z pj const.	-1.000		Stab	133
Moment X lo const.	1.023		Stab	133
Force Z pj const.	-1.000		Stab	134
Moment X lo const.	1.023		Stab	134
Force Z pj const.	-1.000		Stab	135
Moment X lo const.	1.023		Stab	135
Force Z pj const.	-1.000		Stab	136
Moment X lo const.	1.023		Stab	136
Force Z pj const.	-1.000		Stab	137
Moment X lo const.	1.023		Stab	137
Force Z pj const.	-1.000		Stab	138
Moment X lo const.	1.023		Stab	138
Force Z pj const.	-1.000		Stab	139
Moment X lo const.	1.023		Stab	139
Force Z pj const.	-1.000		Stab	140
Moment X lo const.	1.023		Stab	140
Force Z pj const.	-1.000		Stab	141
Moment X lo const.	1.023		Stab	141
Force Z pj const.	-1.000		Stab	142
Moment X lo const.	1.023		Stab	142
Force Z pj const.	-1.000		Stab	143
Moment X lo const.	1.023		Stab	143
Force Z pj const.	-1.000		Stab	144
Moment X lo const.	1.023		Stab	144
Force Z pj const.	-1.000		Stab	145
Moment X lo const.	1.023		Stab	145
Force Z pj const.	-1.000		Stab	146
Moment X lo const.	1.023		Stab	146
Force Z pj const.	-1.000		Stab	147
Moment X lo const.	1.023		Stab	147

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-1.000		Stab	148
Moment X lo const.	1.023		Stab	148
Force Z pj const.	-1.000		Stab	149
Moment X lo const.	1.023		Stab	149
Force Z pj const.	-1.000		Stab	150
Moment X lo const.	1.023		Stab	150
Force Z pj const.	-1.000		Stab	151
Moment X lo const.	1.023		Stab	151
Force Z pj const.	-1.000		Stab	152
Moment X lo const.	1.023		Stab	152
Force Z pj const.	-1.000		Stab	153
Moment X lo const.	1.023		Stab	153
Force Z pj const.	-1.000		Stab	154
Moment X lo const.	1.023		Stab	154
Force Z pj const.	-1.000		Stab	155
Moment X lo const.	1.023		Stab	155
Force Z pj const.	-1.000		Stab	156
Moment X lo const.	1.023		Stab	156
Force Z pj const.	-1.000		Stab	157
Moment X lo const.	1.023		Stab	157
Force Z pj const.	-1.000		Stab	158
Moment X lo const.	1.023		Stab	158
Force Z pj const.	-1.000		Stab	159
Moment X lo const.	1.023		Stab	159
Force Z pj const.	-1.000		Stab	160
Moment X lo const.	1.023		Stab	160

Load case 5: RETRACCION

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Strain X lo const.	-0.000292		Stab	1 .. 160

Load case 6: SOB UNIF 1

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-0.800000		Stab	1 .. 32

Load case 7: SOB UNIF 2

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-0.440000		Stab	33 .. 64

Load case 8: SOB UNIF 3

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-0.600000		Stab	65 .. 96

Load case 9: SOB UNIF 4

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-0.440000		Stab	97 .. 128

Load case 10: SOB UNIF 5

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z pj const.	-0.800000		Stab	129 .. 160

Load case 11: VEHICULO HIPOTESIS 11

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z gl conc.	-10.000	0.850000	Stab	2
Force Z gl conc.	-10.000	1.050	Stab	3
Force Z gl conc.	-10.000	1.250	Stab	4
Force Z gl conc.	-4.130	0.850000	Stab	34
Force Z gl conc.	-4.130	1.050	Stab	35
Force Z gl conc.	-4.130	1.250	Stab	36
Force Z gl conc.	-5.870	0.850000	Stab	66
Force Z gl conc.	-5.870	1.050	Stab	67
Force Z gl conc.	-5.870	1.250	Stab	68

Load case 12: VEHICULO HIPOTESIS 12

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	1.100	Stab	5
Force	Z	gl conc.	-10.000	1.300	Stab	6
Force	Z	gl conc.	-10.000	0.200000	Stab	8
Force	Z	gl conc.	-4.130	1.100	Stab	37
Force	Z	gl conc.	-4.130	1.300	Stab	38
Force	Z	gl conc.	-4.130	0.200000	Stab	40
Force	Z	gl conc.	-5.870	1.100	Stab	69
Force	Z	gl conc.	-5.870	1.300	Stab	70
Force	Z	gl conc.	-5.870	0.200000	Stab	72

Load case 13: VEHICULO HIPOTESIS 13

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.050000	Stab	9
Force	Z	gl conc.	-10.000	0.250000	Stab	10
Force	Z	gl conc.	-10.000	0.450000	Stab	11
Force	Z	gl conc.	-4.130	0.050000	Stab	41
Force	Z	gl conc.	-4.130	0.250000	Stab	42
Force	Z	gl conc.	-4.130	0.450000	Stab	43
Force	Z	gl conc.	-5.870	0.050000	Stab	73
Force	Z	gl conc.	-5.870	0.250000	Stab	74
Force	Z	gl conc.	-5.870	0.450000	Stab	75

Load case 14: VEHICULO HIPOTESIS 14

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.850000	Stab	12
Force	Z	gl conc.	-10.000	0.650000	Stab	13
Force	Z	gl conc.	-10.000	0.450000	Stab	14
Force	Z	gl conc.	-4.130	0.850000	Stab	44
Force	Z	gl conc.	-4.130	0.650000	Stab	45
Force	Z	gl conc.	-4.130	0.450000	Stab	46
Force	Z	gl conc.	-5.870	0.850000	Stab	76
Force	Z	gl conc.	-5.870	0.650000	Stab	77
Force	Z	gl conc.	-5.870	0.450000	Stab	78

Load case 15: VEHICULO HIPOTESIS 15

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.200000	Stab	16
Force	Z	gl conc.	-10.000	0	Stab	17
Force	Z	gl conc.	-10.000	1.500	Stab	17
Force	Z	gl conc.	-4.130	0.200000	Stab	48
Force	Z	gl conc.	-4.130	0	Stab	49
Force	Z	gl conc.	-4.130	1.500	Stab	49
Force	Z	gl conc.	-5.870	0.200000	Stab	80
Force	Z	gl conc.	-5.870	0	Stab	81
Force	Z	gl conc.	-5.870	1.500	Stab	81

Load case 16: VEHICULO HIPOTESIS 16

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	1.250	Stab	19
Force	Z	gl conc.	-10.000	1.050	Stab	20
Force	Z	gl conc.	-10.000	0.850000	Stab	21
Force	Z	gl conc.	-4.130	1.250	Stab	51
Force	Z	gl conc.	-4.130	1.050	Stab	52
Force	Z	gl conc.	-4.130	0.850000	Stab	53
Force	Z	gl conc.	-5.870	1.250	Stab	83
Force	Z	gl conc.	-5.870	1.050	Stab	84
Force	Z	gl conc.	-5.870	0.850000	Stab	85

Load case 17: VEHICULO HIPOTESIS 17

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.850000	Stab	22
Force	Z	gl conc.	-10.000	1.050	Stab	23
Force	Z	gl conc.	-10.000	1.250	Stab	24
Force	Z	gl conc.	-4.130	0.850000	Stab	54
Force	Z	gl conc.	-4.130	1.050	Stab	55
Force	Z	gl conc.	-4.130	1.250	Stab	56
Force	Z	gl conc.	-5.870	0.850000	Stab	86
Force	Z	gl conc.	-5.870	1.050	Stab	87
Force	Z	gl conc.	-5.870	1.250	Stab	88

Load case 18: VEHICULO HIPOTESIS 18

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	1.100	Stab	25
Force	Z	gl conc.	-10.000	1.300	Stab	26
Force	Z	gl conc.	-10.000	0.200000	Stab	28
Force	Z	gl conc.	-4.130	1.100	Stab	57
Force	Z	gl conc.	-4.130	1.300	Stab	58
Force	Z	gl conc.	-4.130	0.200000	Stab	60
Force	Z	gl conc.	-5.870	1.100	Stab	89
Force	Z	gl conc.	-5.870	1.300	Stab	90
Force	Z	gl conc.	-5.870	0.200000	Stab	92

Load case 19: VEHICULO HIPOTESIS 19

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-10.000	0.050000	Stab	29
Force	Z	gl conc.	-10.000	0.250000	Stab	30
Force	Z	gl conc.	-10.000	0.450000	Stab	31
Force	Z	gl conc.	-4.130	0.050000	Stab	61
Force	Z	gl conc.	-4.130	0.250000	Stab	62
Force	Z	gl conc.	-4.130	0.450000	Stab	63
Force	Z	gl conc.	-5.870	0.050000	Stab	93
Force	Z	gl conc.	-5.870	0.250000	Stab	94
Force	Z	gl conc.	-5.870	0.450000	Stab	95

Load case 20: VEHICULO HIPOTESIS 20

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	0.850000	Stab	34
Force	Z	gl conc.	-6.670	1.050	Stab	35
Force	Z	gl conc.	-6.670	1.250	Stab	36
Force	Z	gl conc.	-6.670	0.850000	Stab	66
Force	Z	gl conc.	-6.670	1.050	Stab	67
Force	Z	gl conc.	-6.670	1.250	Stab	68
Force	Z	gl conc.	-6.670	0.850000	Stab	98
Force	Z	gl conc.	-6.670	1.050	Stab	99
Force	Z	gl conc.	-6.670	1.250	Stab	100

Load case 21: VEHICULO HIPOTESIS 21

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	1.100	Stab	37
Force	Z	gl conc.	-6.670	1.300	Stab	38
Force	Z	gl conc.	-6.670	0.200000	Stab	40
Force	Z	gl conc.	-6.670	1.100	Stab	69
Force	Z	gl conc.	-6.670	1.300	Stab	70
Force	Z	gl conc.	-6.670	0.200000	Stab	72
Force	Z	gl conc.	-6.670	1.100	Stab	101
Force	Z	gl conc.	-6.670	1.300	Stab	102
Force	Z	gl conc.	-6.670	0.200000	Stab	104

Load case 22: VEHICULO HIPOTESIS 22

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	0.050000	Stab	41
Force	Z	gl conc.	-6.670	0.250000	Stab	42
Force	Z	gl conc.	-6.670	0.450000	Stab	43
Force	Z	gl conc.	-6.670	0.050000	Stab	73
Force	Z	gl conc.	-6.670	0.250000	Stab	74
Force	Z	gl conc.	-6.670	0.450000	Stab	75
Force	Z	gl conc.	-6.670	0.050000	Stab	105
Force	Z	gl conc.	-6.670	0.250000	Stab	106
Force	Z	gl conc.	-6.670	0.450000	Stab	107

Load case 23: VEHICULO HIPOTESIS 23

Loadtype			Value(a)	Distanc Value(b)	Joint -/member	numb
Force	Z	gl conc.	-6.670	0.850000	Stab	44
Force	Z	gl conc.	-6.670	0.650000	Stab	45
Force	Z	gl conc.	-6.670	0.450000	Stab	46
Force	Z	gl conc.	-6.670	0.850000	Stab	76
Force	Z	gl conc.	-6.670	0.650000	Stab	77
Force	Z	gl conc.	-6.670	0.450000	Stab	78
Force	Z	gl conc.	-6.670	0.850000	Stab	108
Force	Z	gl conc.	-6.670	0.650000	Stab	109
Force	Z	gl conc.	-6.670	0.450000	Stab	110

Load case 24: VEHICULO HIPOTESIS 24

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.200000	Stab	48
Force	Z	gl conc.	-6.670	0	Stab	49
Force	Z	gl conc.	-6.670	1.500	Stab	49
Force	Z	gl conc.	-6.670	0.200000	Stab	80
Force	Z	gl conc.	-6.670	0	Stab	81
Force	Z	gl conc.	-6.670	1.500	Stab	81
Force	Z	gl conc.	-6.670	0.200000	Stab	112
Force	Z	gl conc.	-6.670	0	Stab	113
Force	Z	gl conc.	-6.670	1.500	Stab	113

Load case 25: VEHICULO POSICION 25

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	1.250	Stab	51
Force	Z	gl conc.	-6.670	1.050	Stab	52
Force	Z	gl conc.	-6.670	0.850000	Stab	53
Force	Z	gl conc.	-6.670	1.250	Stab	83
Force	Z	gl conc.	-6.670	1.050	Stab	84
Force	Z	gl conc.	-6.670	0.850000	Stab	85
Force	Z	gl conc.	-6.670	1.250	Stab	115
Force	Z	gl conc.	-6.670	1.050	Stab	116
Force	Z	gl conc.	-6.670	0.850000	Stab	117

Load case 26: VEHICULO POSICION 26

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.850000	Stab	54
Force	Z	gl conc.	-6.670	1.050	Stab	55
Force	Z	gl conc.	-6.670	1.250	Stab	56
Force	Z	gl conc.	-6.670	0.850000	Stab	86
Force	Z	gl conc.	-6.670	1.050	Stab	87
Force	Z	gl conc.	-6.670	1.250	Stab	88
Force	Z	gl conc.	-6.670	0.850000	Stab	118
Force	Z	gl conc.	-6.670	1.050	Stab	119
Force	Z	gl conc.	-6.670	1.250	Stab	120

Load case 27: VEHICULO POSICION 27

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	1.100	Stab	57
Force	Z	gl conc.	-6.670	1.300	Stab	58
Force	Z	gl conc.	-6.670	0.200000	Stab	60
Force	Z	gl conc.	-6.670	1.100	Stab	89
Force	Z	gl conc.	-6.670	1.300	Stab	90
Force	Z	gl conc.	-6.670	0.200000	Stab	92
Force	Z	gl conc.	-6.670	1.100	Stab	121
Force	Z	gl conc.	-6.670	1.300	Stab	122
Force	Z	gl conc.	-6.670	0.200000	Stab	124

Load case 28: VEHICULO POSICION 28

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-6.670	0.050000	Stab	61
Force	Z	gl conc.	-6.670	0.250000	Stab	62
Force	Z	gl conc.	-6.670	0.450000	Stab	63
Force	Z	gl conc.	-6.670	0.050000	Stab	93
Force	Z	gl conc.	-6.670	0.250000	Stab	94
Force	Z	gl conc.	-6.670	0.450000	Stab	95
Force	Z	gl conc.	-6.670	0.050000	Stab	125
Force	Z	gl conc.	-6.670	0.250000	Stab	126
Force	Z	gl conc.	-6.670	0.450000	Stab	127

Load case 29: VEHICULO POSICION 29

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	66
Force	Z	gl conc.	-5.870	1.050	Stab	67
Force	Z	gl conc.	-5.870	1.250	Stab	68
Force	Z	gl conc.	-4.130	0.850000	Stab	98
Force	Z	gl conc.	-4.130	1.050	Stab	99
Force	Z	gl conc.	-4.130	1.250	Stab	100
Force	Z	gl conc.	-10.000	0.850000	Stab	130
Force	Z	gl conc.	-10.000	1.050	Stab	131
Force	Z	gl conc.	-10.000	1.250	Stab	132

Load case 30: VEHICULO POSICION 30

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	1.100	Stab	69
Force	Z	gl conc.	-5.870	1.300	Stab	70
Force	Z	gl conc.	-5.870	0.200000	Stab	72
Force	Z	gl conc.	-4.130	1.100	Stab	101
Force	Z	gl conc.	-4.130	1.300	Stab	102
Force	Z	gl conc.	-4.130	0.200000	Stab	104
Force	Z	gl conc.	-10.000	1.100	Stab	133
Force	Z	gl conc.	-10.000	1.300	Stab	134
Force	Z	gl conc.	-10.000	0.200000	Stab	136

Load case 31: VEHICULO POSICION 31

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.050000	Stab	73
Force	Z	gl conc.	-5.870	0.250000	Stab	74
Force	Z	gl conc.	-5.870	0.450000	Stab	75
Force	Z	gl conc.	-4.130	0.050000	Stab	105
Force	Z	gl conc.	-4.130	0.250000	Stab	106
Force	Z	gl conc.	-4.130	0.450000	Stab	107
Force	Z	gl conc.	-10.000	0.050000	Stab	137
Force	Z	gl conc.	-10.000	0.250000	Stab	138
Force	Z	gl conc.	-10.000	0.450000	Stab	139

Load case 32: VEHICULO POSICION 32

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	76
Force	Z	gl conc.	-5.870	0.650000	Stab	77
Force	Z	gl conc.	-5.870	0.450000	Stab	78
Force	Z	gl conc.	-4.130	0.850000	Stab	108
Force	Z	gl conc.	-4.130	0.650000	Stab	109
Force	Z	gl conc.	-4.130	0.450000	Stab	110
Force	Z	gl conc.	-10.000	0.850000	Stab	140
Force	Z	gl conc.	-10.000	0.650000	Stab	141
Force	Z	gl conc.	-10.000	0.450000	Stab	142

Load case 33: VEHICULO POSICION 33

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.200000	Stab	80
Force	Z	gl conc.	-5.870	0	Stab	81
Force	Z	gl conc.	-5.870	1.500	Stab	81
Force	Z	gl conc.	-4.130	0.200000	Stab	112
Force	Z	gl conc.	-4.130	0	Stab	113
Force	Z	gl conc.	-4.130	1.500	Stab	113
Force	Z	gl conc.	-10.000	0.200000	Stab	144
Force	Z	gl conc.	-10.000	0	Stab	145
Force	Z	gl conc.	-10.000	1.500	Stab	145

Load case 34: VEHICULO POSICION 34

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	1.250	Stab	83
Force	Z	gl conc.	-5.870	1.050	Stab	84
Force	Z	gl conc.	-5.870	0.850000	Stab	85
Force	Z	gl conc.	-4.130	1.250	Stab	115
Force	Z	gl conc.	-4.130	1.050	Stab	116
Force	Z	gl conc.	-4.130	0.850000	Stab	117
Force	Z	gl conc.	-10.000	1.250	Stab	147
Force	Z	gl conc.	-10.000	1.050	Stab	148
Force	Z	gl conc.	-10.000	0.850000	Stab	149

Load case 35: VEHICULO POSICION 35

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-5.870	0.850000	Stab	86
Force	Z	gl conc.	-5.870	1.050	Stab	87
Force	Z	gl conc.	-5.870	1.250	Stab	88
Force	Z	gl conc.	-4.130	0.850000	Stab	118
Force	Z	gl conc.	-4.130	1.050	Stab	119
Force	Z	gl conc.	-4.130	1.250	Stab	120
Force	Z	gl conc.	-10.000	0.850000	Stab	150
Force	Z	gl conc.	-10.000	1.050	Stab	151
Force	Z	gl conc.	-10.000	1.250	Stab	152

Load case 36: VEHICULO POSICION 36

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z gl conc.	-5.870	1.100	Stab	89
Force Z gl conc.	-5.870	1.300	Stab	90
Force Z gl conc.	-5.870	0.200000	Stab	92
Force Z gl conc.	-4.130	1.100	Stab	121
Force Z gl conc.	-4.130	1.300	Stab	122
Force Z gl conc.	-4.130	0.200000	Stab	124
Force Z gl conc.	-10.000	1.100	Stab	153
Force Z gl conc.	-10.000	1.300	Stab	154
Force Z gl conc.	-10.000	0.200000	Stab	156

Load case 37: VEHICULO HIPOTESIS 37

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Z gl conc.	-5.870	0.050000	Stab	93
Force Z gl conc.	-5.870	0.250000	Stab	94
Force Z gl conc.	-5.870	0.450000	Stab	95
Force Z gl conc.	-4.130	0.050000	Stab	125
Force Z gl conc.	-4.130	0.250000	Stab	126
Force Z gl conc.	-4.130	0.450000	Stab	127
Force Z gl conc.	-10.000	0.050000	Stab	157
Force Z gl conc.	-10.000	0.250000	Stab	158
Force Z gl conc.	-10.000	0.450000	Stab	159

Load case 46: SOB UNIF VANO 1

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb		
Force Z pj const.	-0.800000		Stab .. 139	1 .. 11	129
Force Z pj const.	-0.440000		Stab .. 107	33 .. 43	97
Force Z pj const.	-0.600000		Stab	65 .. 75	

Load case 47: SOB UNIF VANO 2

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb		
Force Z pj const.	-0.440000		Stab .. 117	44 .. 53	108
Force Z pj const.	-0.600000		Stab	76 .. 85	
Force Z pj const.	-0.800000		Stab .. 149	12 .. 21	140

Load case 48: SOB UNIF VANO 3

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb		
Force Z pj const.	-0.440000		Stab .. 128	54 .. 64	118
Force Z pj const.	-0.600000		Stab	86 .. 96	
Force Z pj const.	-0.800000		Stab .. 160	22 .. 32	150

Load case 60: FRENADO

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force X lo const.	0.054500		Stab	1 .. 160

Load case 62: VIENTO TRANSV SIN SOB.

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Y lo const.	0.260000		Stab	129 .. 160
Force X pj const.	-0.200000		Stab	290 .. 291

Load case 63: VIENTO TRANSV CON SOB

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Force Y lo const.	0.760000		Stab	129 .. 160
Force X pj const.	-0.200000		Stab	290 .. 291

Load case 64: TEMPERATURA (-)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Strain X lo const.	-0.000363		Stab	1 .. 160

Load case 65: TEMPERATURA (+)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Strain X lo const.	0.000363		Stab	1 .. 160

Load case 66: GRADIENTE

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Curvat. Y lo const.	0.000170		Stab	1 .. 160

2.3.4. Riostras sobre pilas y estribos

Plane (2-D) frame -analysis

****
STRUCTURAL - DATA
****

RIOSTRA ESTRIBOS

Project title :

J O I N T D A T A : (9 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000			
2	0.850000	0.000000	0.000000	B	B F	
3	1.850000	0.000000	0.000000			
4	2.850000	0.000000	0.000000			
5	3.850000	0.000000	0.000000			
6	4.850000	0.000000	0.000000			
7	5.850000	0.000000	0.000000			
8	6.850000	0.000000	0.000000	F	B F	
9	7.700000	0.000000	0.000000			

B A R D A T A : (8 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	2	0.850000	RIOSTRAE			oS
2	2	3	1.000000	RIOSTRAE			oS
3	3	4	1.000000	RIOSTRAE			oS
4	4	5	1.000000	RIOSTRAE			oS
5	5	6	1.000000	RIOSTRAE			oS
6	6	7	1.000000	RIOSTRAE			oS
7	7	8	1.000000	RIOSTRAE			oS
8	8	9	0.850000	RIOSTRAE			oS

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2]	Iy [M4]	Fz [M2]
	zl [M1]	zu [M1]	
RIOSTRAE	6.7500E-01	4.5562E-02	5.6250E-01
	-0.4500	0.4500	

CS-Name	Ax [M2]	Iy [M4]	Fz [M2]
	zl [M1]	zu [M1]	

MATERIAL PROPERT. :

Bar	(to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 ..	8	3.5500E+06	1.3000E+06

STS-Run ok

****
Load case 1: carga permanente
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-9.950		Stab 1 8 2 .. 7

****
Load case 2: Sobrecarga maxima
****

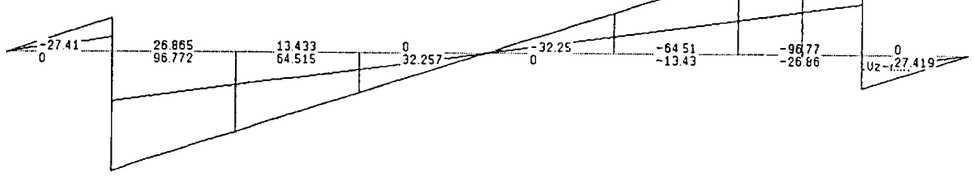
Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-12.550		Stab 1 8 2 .. 7

ENVELOPE SPECIFIC.: AB ''

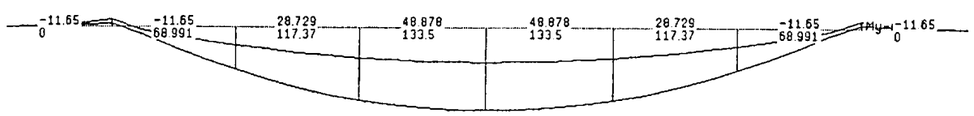
Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		carga permanente
B	PLUS	2	1.500		Sobrecarga maxima

Scale 1 : 50.2
nt. Forces envelope Vz, GWSP AB, Subsys. "ALL"
Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 1.00E-02
min: -9.68E+01 max: 4.03E+01 [t]
- Envelope Shear force Vz-max, Scale 1.00E-02
min: -4.03E+01 max: 9.68E+01 [t]
Text envelopes [t]

Vd=83.64t



Scale 1 : 50.2
nt. Forces envelope My, GWSP AB, Subsys. "ALL"
Structure: Elmnts.
Envelope Moment My-min, Scale 5.00E-03
min: -1.17E+01 max: 5.56E+01 [tm]
- Envelope Moment My-max, Scale 5.00E-03
min: -4.85E+00 max: 1.34E+02 [tm]
Text envelopes [tm]



Características mecánicas Sección "RIOSTRAE" (sin coef. homogeneiz.)

Area	Ax = 6.750E3 cm2		
Momento de inercia	Iy = 4.556E6 cm4	Iz = 3.164E6 cm4	Ip = 7.720E6 cm4
Const. de torsión			Ix = 6.276E6 cm4
Momento estático	Zy =151.88E3 cm3	Zz = 126.56E3 cm3	
Baricentro	ys = 0.00 cm	zs = 45.00 cm	Angulo= 0.0 Grad
Dist. al borde	yl = -37.50 cm	yr = 37.50 cm	
	zo = 45.00 cm	zu = -45.00 cm	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSTRAE" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	6750.000	330.000	6.28E+06	1)

Puntos de contorno [cm]:

1	37.50	0.00	2	37.50	90.00	3	-37.50	90.00
4	-37.50	0.00						

Armadura "B1" As-tot =2.00 cm2 (0.03 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-33.50	86.00
					33.50	86.00
BOTTOM / RQS	AEH500	10.0	2	1.00	-33.50	4.00
					33.50	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	75.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	67.00	-33.50	45.00	33.50	45.00
SWT	Torsion	75.00	90.00	0.00	0.00	0.00	90.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "RIOSTRAE"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	1335.00	0.00	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

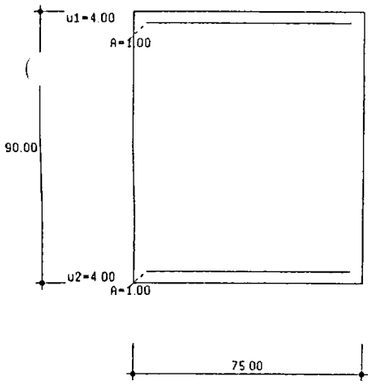
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

o Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-33.50	86.00	33.50	86.00	1.00	----	1.00
1 AEH500	-33.50	4.00	33.50	4.00	1.00	38.77	38.77

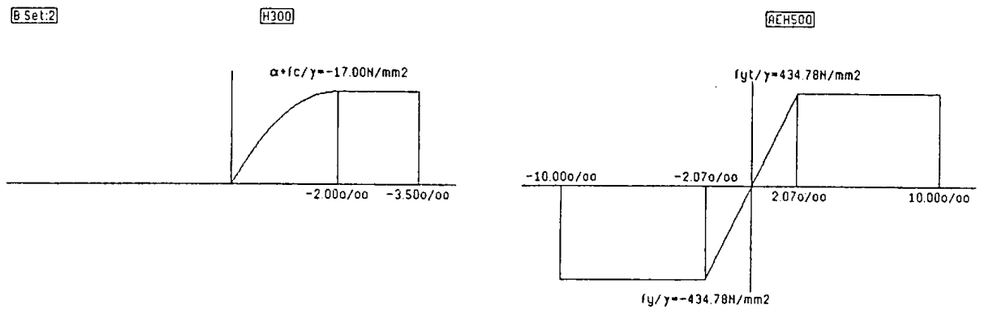
←7ϕ32

ax.x/h = 0.20 As-top/bot = 1.00/38.77 As = 0.59 % = 39.77

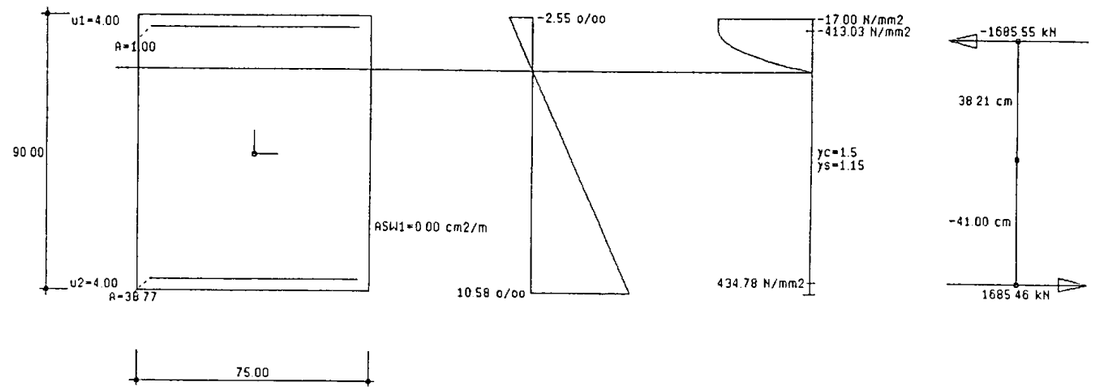
ección RIOSTRAE



Material acorde a la sección: "RIOSTRAE"



Dimensionamiento, Sección "RIOSTRAE"



Características mecánicas Sección "RIOSTRAE" (sin coef. homogeneiz.)

Area Ax = 6.750E3 cm2
Momento de inercia Iy = 4.556E6 cm4 Iz = 3.164E6 cm4 Ip = 7.720E6 cm4
Const. de torsión Ix = 6.276E6 cm4
Momento estático Zy =151.88E3 cm3 Zz = 126.56E3 cm3
Baricentro ys = 0.00 cm zs = 45.00 cm Angulo= 0.0 Grad
Dist. al borde yl = -37.50 cm yr = 37.50 cm
zo = 45.00 cm zu = -45.00 cm

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSTRAE" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	6750.000	330.000	6.28E+06	1)

Puntos de contorno [cm]:
1 37.50 0.00 2 37.50 90.00 3 -37.50 90.00
4 -37.50 0.00

Armadura "B1" As-tot =39.77 cm2 (0.59 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-33.50	86.00
					33.50	86.00
BOTTOM / RQS	AEH500	10.0	2	38.77	-33.50	4.00
					33.50	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	75.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	67.00	-33.50	45.00	33.50	45.00
SWT	Torsion	75.00	90.00	0.00	0.00	0.00	90.00

unto de resultados:

omb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
₃W1	Res.Kmb.			
Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)				

)imensionamiento a flexión: Viga Sección "RIOSTRAE"/"B1"

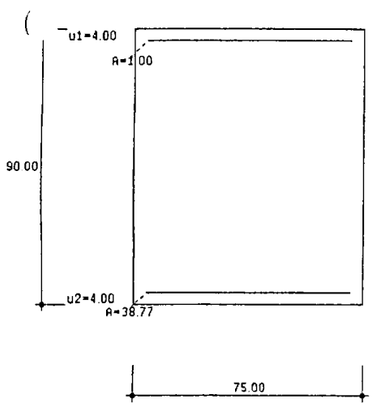
ɔ Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1 2	0.00	-116.50	0.00	

ará ros de cálculo empleados:
.et:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
et 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

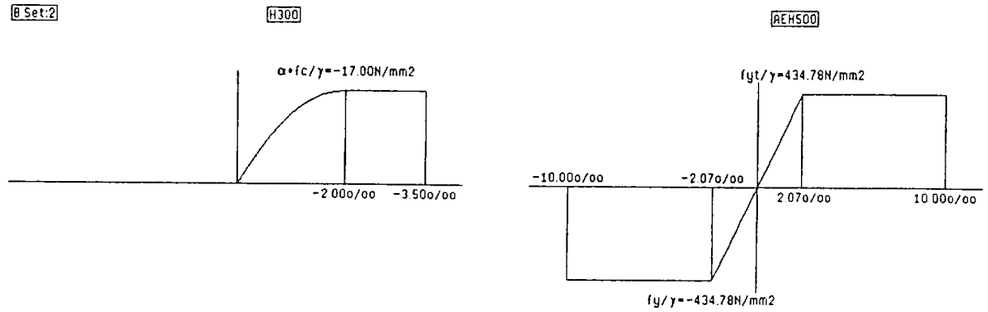
₁o Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500	-33.50	86.00	33.50	86.00	1.00	3.17	3.17
AEH500	-33.50	4.00	33.50	4.00	1.00	----	1.00

lax.x/h = 0.05 As-top/bot = 3.17/1.00 As = 0.06 % = 4.17

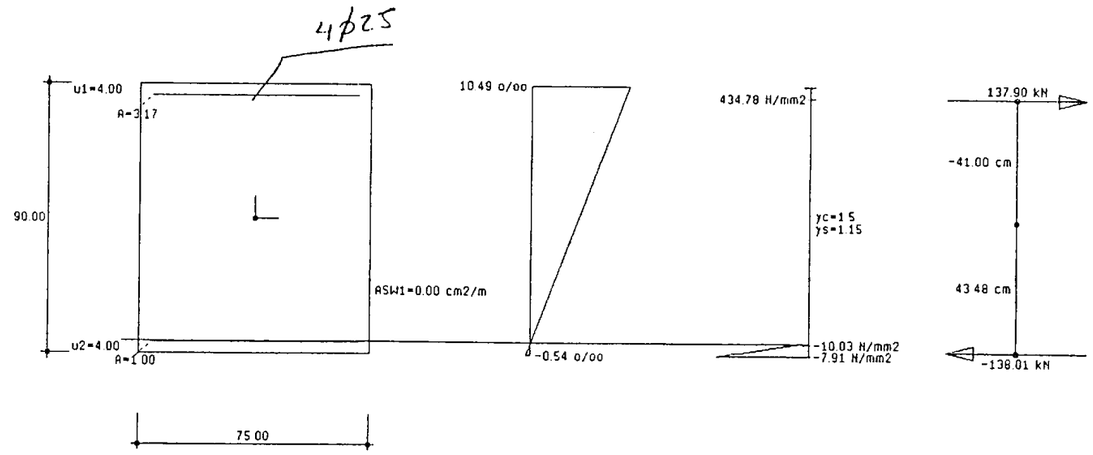
ɔección RIOSTRAE



Material acorde a la sección: "RIOSTRAE"



Dimensionamiento, Sección "RIOSTRAE"



CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título: Riotra de estribos
Fecha: 24/5/01 13.46.18

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 75 cm, alto 90 cm y canto 86 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 96 T
Cortante reducido a un canto útil del borde del apoyo = 80 T
Axil de cálculo (Tracciones positivas) = -50 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 56 cm2 lo que implica una cuantía geométrica igual a 0.00868
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 96 T < Vu1 = 387.00 T
Es necesario disponer armadura a cortante al ser Vrd = 80.00 T > Vu2 = 42.01 T
Valores de las tensiones: Eje X = -7.41 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 41.80°
Vcu = 29.30 T. Vsu= 50.70 T.
As cálculo = 16.38 cm2/m. As mínima = 7.50 cm2/m
Mínimo de armadura a disponer = 16.38 cm2/m

$$A_{st} = \frac{0.865\,m}{0.15\,m} \times 2 \times 2 \times 0.78\,cm^2 = 18\,cm^2$$

2 cercos ϕ 10 a 0.15 m

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
19	1.700	1.405	1.099	-7.934	0.545886	-2.450	0.106238
20	0	1.439	0.967060	-7.301	0.503702	4.897	-0.900416
20	1.700	1.439	0.967060	-7.301	0.503702	-7.515	0.777587
21	0	1.507	0.771054	-5.709	0.513219	-0.782081	-0.126378
21	1.700	1.507	0.771054	-5.709	0.513219	-10.488	1.184
44	0	0.948071	0.068811	7.346	-3.833	-20.421	-0.203802
44	1.700	0.948071	0.068811	7.346	-3.833	-7.932	-0.086823
45	0	0.915570	0.032415	8.681	-3.931	-9.890	-0.158320
45	1.700	0.915570	0.032415	8.681	-3.931	4.868	-0.103215
46	0	0.924465	0.008662	8.615	-4.181	2.822	-0.131977
46	1.700	0.924465	0.008662	8.615	-4.181	17.468	-0.117252
47	0	0.926294	0.000665	9.316	-3.687	16.055	-0.124002
47	1.700	0.926294	0.000665	9.316	-3.687	31.893	-0.122872
48	0	0.925801	-0.000307	7.400	-1.465	31.504	-0.123151
48	0.200	0.925801	-0.000307	7.400	-1.465	32.983	-0.123213
48	0.200	0.925801	-0.000307	3.270	-1.465	32.985	-0.123213
48	1.700	0.925801	-0.000307	3.270	-1.465	37.889	-0.123673
49	0	0.925801	0.000307	-3.270	1.465	37.889	-0.123673
49	1.7E-4	0.925801	0.000307	-3.270	1.465	37.888	-0.123673
49	1.500	0.925801	0.000307	-3.270	1.465	32.985	-0.123213
49	1.500	0.925801	0.000307	-7.400	1.465	32.983	-0.123213
49	1.700	0.925801	0.000307	-7.400	1.465	31.504	-0.123151
50	0	0.926294	-0.000665	-9.316	3.687	31.893	-0.122872
50	1.700	0.926294	-0.000665	-9.316	3.687	16.055	-0.124002
51	0	0.924465	-0.008662	-8.615	4.181	17.468	-0.117252
51	1.700	0.924465	-0.008662	-8.615	4.181	2.822	-0.131977
52	0	0.915570	-0.032415	-8.681	3.931	4.868	-0.103215
52	1.700	0.915570	-0.032415	-8.681	3.931	-9.890	-0.158320
53	0	0.948071	-0.068811	-7.346	3.833	-7.932	-0.086823
53	1.700	0.948071	-0.068811	-7.346	3.833	-20.421	-0.203802
76	0	-0.863785	0.068842	17.191	-8.896	-38.710	-0.310988
76	1.700	-0.863785	0.068842	17.191	-8.896	-9.486	-0.193956
77	0	-0.638549	-0.014736	10.671	-8.344	-11.790	-0.213656
77	1.700	-0.638549	-0.014736	10.671	-8.344	6.351	-0.238707
78	0	-0.574242	-0.004510	10.134	-7.808	5.803	-0.229596
78	1.700	-0.574242	-0.004510	10.134	-7.808	22.031	-0.237263

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
79	0	-0.557422	-0.001347	9.376	-6.137	23.424	-0.232973
79	1.700	-0.557422	-0.001347	9.376	-6.137	39.363	-0.235262
80	0	-0.554613	-0.000458	9.077	-2.392	39.911	-0.233680
80	0.200	-0.554613	-0.000458	9.077	-2.392	41.725	-0.233772
80	0.200	-0.554613	-0.000458	3.207	-2.392	41.727	-0.233772
80	1.700	-0.554613	-0.000458	3.207	-2.392	46.537	-0.234456
81	0	-0.554613	0.000458	-3.207	2.392	46.537	-0.234456
81	1.7E-4	-0.554613	0.000458	-3.207	2.392	46.537	-0.234456
81	1.500	-0.554613	0.000458	-3.207	2.392	41.727	-0.233772
81	1.500	-0.554613	0.000458	-9.077	2.392	41.725	-0.233772
81	1.700	-0.554613	0.000458	-9.077	2.392	39.911	-0.233680
82	0	-0.557422	0.001347	-9.376	6.137	39.363	-0.235262
82	1.700	-0.557422	0.001347	-9.376	6.137	23.424	-0.232973
83	0	-0.574242	0.004510	-10.134	7.808	23.031	-0.237263
83	1.700	-0.574242	0.004510	-10.134	7.808	5.803	-0.229596
84	0	-0.638549	0.014736	-10.671	8.344	6.351	-0.238707
84	1.700	-0.638549	0.014736	-10.671	8.344	-11.790	-0.213656
85	0	-0.863785	-0.068842	-17.191	8.896	-9.486	-0.193956
85	1.700	-0.863785	-0.068842	-17.191	8.896	-38.710	-0.310988
108	0	-1.636	-0.115891	2.988	-4.529	-15.244	-0.009203
108	1.700	-1.636	-0.115891	2.988	-4.529	-10.166	-0.206217
109	0	-1.687	-0.033618	5.897	-4.847	-7.848	-0.091358
109	1.700	-1.687	-0.033618	5.897	-4.847	2.177	-0.148509
110	0	-1.702	-0.010901	5.230	-4.228	3.817	-0.113453
110	1.700	-1.702	-0.010901	5.230	-4.228	12.708	-0.131985
111	0	-1.705	-0.002860	4.122	-3.131	14.444	-0.121213
111	1.700	-1.705	-0.002860	4.122	-3.131	21.451	-0.126075
112	0	-1.706	-0.000512	1.572	-1.183	22.755	-0.123330
112	1.700	-1.706	-0.000512	1.572	-1.183	25.427	-0.124200
113	0	-1.706	0.000512	-1.572	1.183	25.427	-0.124200
113	1.700	-1.706	0.000512	-1.572	1.183	22.755	-0.123330
114	0	-1.705	0.002860	-4.122	3.131	21.451	-0.126075
114	1.700	-1.705	0.002860	-4.122	3.131	14.444	-0.121213
115	0	-1.702	0.010901	-5.230	4.228	12.706	-0.131985
115	1.700	-1.702	0.010901	-5.230	4.228	3.617	-0.113453
116	0	-1.687	0.033618	-5.897	4.847	2.177	-0.148509
116	1.700	-1.687	0.033618	-5.897	4.847	-7.848	-0.091358

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
117	0	-1.638	0.115891	-2.988	4.529	-10.166	-0.206217
117	1.700	-1.638	0.115891	-2.988	4.529	-15.244	-0.009203
140	0	-1.864	-0.509523	-3.246	-0.582016	-2.228	-0.494184
140	1.700	-1.864	-0.509523	-3.246	-0.582016	-7.746	-1.360
141	0	-1.939	-0.386727	-2.588	-0.631405	0.896835	-0.081695
141	1.700	-1.939	-0.386727	-2.588	-0.631405	-3.503	-0.739130
142	0	-1.964	-0.285594	-1.969	-0.553202	4.783	0.446028
142	1.700	-1.964	-0.285594	-1.969	-0.553202	1.435	-0.039483
143	0	-1.971	-0.218098	-1.531	-0.401412	8.201	0.916682
143	1.700	-1.971	-0.218098	-1.531	-0.401412	5.598	0.545914
144	0	-1.972	-0.084172	-0.594388	-0.150588	9.636	1.114
144	1.700	-1.972	-0.084172	-0.594388	-0.150588	8.626	0.971106
145	0	-1.972	0.084172	0.594388	0.150588	8.626	0.971106
145	1.700	-1.972	0.084172	0.594388	0.150588	9.636	1.114
146	0	-1.971	0.218098	1.531	0.401412	5.598	0.545914
146	1.700	-1.971	0.218098	1.531	0.401412	8.201	0.916682
147	0	-1.964	0.285594	1.969	0.553202	1.435	-0.039483
147	1.700	-1.964	0.285594	1.969	0.553202	4.783	0.446028
148	0	-1.939	0.386727	2.588	0.631405	-3.503	-0.739130
148	1.700	-1.939	0.386727	2.588	0.631405	0.896835	-0.081695
149	0	-1.864	0.509523	3.246	0.582016	-7.746	-1.360
149	1.700	-1.864	0.509523	3.246	0.582016	-2.228	-0.494184
	min:	-1.972	-1.745	-17.191	-8.896	-38.710	-2.884
	max:	1.507	1.745	17.191	8.896	46.537	1.184

Loadcase	Factor	Stage	Init.def	Title
16	1.0000			VENICULO HIPOTESIS 16

SUPPORT REACTIONS

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	0.390235	0.077846	3.601			
10	0.390230	0.041925	-5.426			
156	0.647634	0.073082	7.153			
160	0.647639	0.047158	-10.476			
166	-0.345981	0.784014	8.435	-3.932	2.340	-0.289956
167	-1.730	-1.024	56.508	4.021	-2.915	-0.241741
Sums :	-1.62E-10	1.87E-11	60.000			
min:	-1.730	-1.024	-10.476	-3.932	-2.915	-0.289956
max:	0.647639	0.784014	56.508	4.021	2.340	-0.241741

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
12	0	1.162	-0.472947	3.128	-0.359144	-4.731	0.507953
12	1.700	1.162	-0.472947	3.128	-0.359144	0.586372	-0.296056
13	0	1.217	-0.553102	3.646	-0.360113	-4.261	0.445554
13	1.700	1.217	-0.553102	3.646	-0.360113	1.936	-0.494719
14	0	1.294	-0.585144	3.797	-0.378401	-3.171	0.295462
14	1.700	1.294	-0.585144	3.797	-0.378401	3.284	-0.699261
15	0	1.381	-0.591353	3.817	-0.384672	-1.978	0.120314
15	1.700	1.381	-0.591353	3.817	-0.384672	4.511	-0.884985
16	0	1.472	-0.592469	3.822	-0.383119	-0.767757	-0.060516
16	1.700	1.472	-0.592469	3.822	-0.383119	5.730	-1.068
17	0	1.562	-0.596762	3.855	-0.375666	0.517135	-0.251964
17	1.700	1.562	-0.596762	3.855	-0.375666	7.071	-1.266
18	0	1.654	-0.623125	4.038	-0.361146	2.035	-0.474533
18	1.700	1.654	-0.623125	4.038	-0.361146	8.899	-1.534
19	0	1.751	-0.854585	5.626	-0.263660	4.282	-0.795275
19	1.250	1.751	-0.854585	5.626	-0.263660	11.314	-1.863
19	1.250	1.751	0.537146	-4.276	-0.263660	11.314	-1.863
19	1.700	1.751	0.537146	-4.276	-0.263660	9.390	-1.622
20	0	1.866	-0.228415	1.026	0.030892	8.058	-1.336

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
20	1.050	1.866	-0.228415	1.026	0.030892	9.134	-1.576
20	1.050	1.866	1.163	-8.877	0.030892	9.133	-1.576
20	1.700	1.866	1.163	-8.877	0.030892	3.364	-0.819953
21	0	1.981	0.178115	-1.649	0.405653	6.122	-1.120
21	0.850	1.981	0.178115	-1.649	0.405653	4.720	-0.968475
21	0.850	1.981	1.570	-11.552	0.405653	4.718	-0.968178
21	1.700	1.981	1.570	-11.552	0.405653	-5.099	0.365924
44	0	0.787361	-0.043080	2.218	-2.718	-7.022	-0.067215
44	1.700	0.787361	-0.043080	2.218	-2.718	-3.250	-0.140451
45	0	0.856681	-0.072190	2.439	-2.785	-4.523	-0.039055
45	1.700	0.856681	-0.072190	2.439	-2.785	-0.377674	-0.161778
46	0	0.930042	-0.081480	2.315	-2.909	-1.660	-0.035767
46	1.700	0.930042	-0.081480	2.315	-2.909	2.276	-0.174283
47	0	1.001	-0.084562	2.302	-2.946	1.063	-0.039350
47	1.700	1.001	-0.084562	2.302	-2.946	4.978	-0.183106
48	0	1.071	-0.085307	2.342	-2.930	3.795	-0.045319
48	1.700	1.071	-0.085307	2.342	-2.930	7.777	-0.190342
49	0	1.143	-0.085532	2.490	-2.862	6.643	-0.051764
49	1.700	1.143	-0.085532	2.490	-2.862	10.875	-0.197169
50	0	1.214	-0.086715	3.017	-2.651	9.906	-0.057510
50	1.700	1.214	-0.086715	3.017	-2.651	15.037	-0.204526
51	0	1.281	-0.090739	3.147	-1.717	14.939	-0.061753
51	1.250	1.281	-0.090739	3.147	-1.717	18.873	-0.175162
51	1.250	1.281	-0.090739	-0.982586	-1.717	18.873	-0.175192
51	1.700	1.281	-0.090739	-0.982586	-1.717	16.431	-0.216010
52	0	1.335	-0.103071	-4.070	0.394724	18.958	-0.063478
52	1.050	1.335	-0.103071	-4.070	0.394724	14.685	-0.171686
52	1.050	1.335	-0.103071	-8.200	0.394724	14.683	-0.171721
52	1.700	1.335	-0.103071	-8.200	0.394724	9.354	-0.238700
53	0	1.427	-0.083943	-9.922	2.795	10.672	-0.091188
53	0.850	1.427	-0.083943	-9.522	2.795	2.240	-0.162526
53	0.850	1.427	-0.083943	-14.052	2.795	2.236	-0.162555
53	1.700	1.427	-0.083942	-14.052	2.795	-9.706	-0.233892
76	0	-0.389443	-0.172823	4.367	-5.730	-12.136	-0.012364
76	1.700	-0.389443	-0.172823	4.367	-5.730	-4.711	-0.306163
77	0	-0.296994	-0.158339	2.445	-5.519	-5.343	-0.050054
77	1.700	-0.296994	-0.158339	2.445	-5.519	-1.180	-0.319230
78	0	-0.270618	-0.152963	2.325	-5.510	-1.369	-0.068268

SECTION FORCES: "ALL"

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
78	1.700	-0.270618	-0.152963	2.325	-5.510	2.563	-0.328325
79	0	-0.263634	-0.152482	2.329	-5.494	2.510	-0.081119
79	1.700	-0.263634	-0.152482	2.329	-5.494	6.468	-0.340338
80	0	-0.262265	-0.152632	2.352	-5.415	6.472	-0.093540
80	1.700	-0.262265	-0.152632	2.352	-5.415	10.470	-0.353015
81	0	-0.262181	-0.152929	2.366	-5.155	10.559	-0.105970
81	1.700	-0.262181	-0.152929	2.366	-5.155	14.581	-0.365950
82	0	-0.263858	-0.152773	2.096	-4.317	14.964	-0.119003
82	1.700	-0.263858	-0.152773	2.096	-4.317	18.526	-0.378716
83	0	-0.273298	-0.146402	1.318	-1.926	19.446	-0.135830
83	1.250	-0.273298	-0.146402	1.318	-1.926	21.094	-0.318808
83	1.250	-0.273298	-0.146402	-4.552	-1.926	21.093	-0.318856
83	1.700	-0.273298	-0.146402	-4.552	-1.926	19.045	-0.384714
84	0	-0.307777	-0.130097	-5.367	2.412	20.533	-0.149298
84	1.050	-0.307777	-0.130097	-5.367	2.412	14.858	-0.285878
84	1.050	-0.307777	-0.130097	-11.237	2.412	14.895	-0.285922
84	1.700	-0.307777	-0.130097	-11.237	2.412	7.593	-0.370463
85	0	-0.428075	-0.307467	-19.481	7.563	10.544	-0.075509
85	0.850	-0.428075	-0.307467	-19.481	7.563	-6.011	-0.336804
85	0.850	-0.428075	-0.307467	-25.351	7.563	-6.019	-0.336909
85	1.700	-0.428075	-0.307467	-25.351	7.563	-27.563	-0.598204
108	0	-1.120	-0.118870	-0.217933	-2.845	-4.165	0.012647
108	1.700	-1.120	-0.118870	-0.217933	-2.845	-4.536	-0.189433
109	0	-1.222	-0.099276	0.925528	-3.053	-3.116	-0.011577
109	1.700	-1.222	-0.099276	0.925528	-3.053	-1.545	-0.180346
110	0	-1.298	-0.089498	0.868392	-3.010	-0.409271	-0.028157
110	1.700	-1.298	-0.089498	0.868392	-3.010	1.067	-0.180305
111	0	-1.370	-0.086215	0.831333	-2.965	2.233	-0.038036
111	1.700	-1.370	-0.086215	0.831333	-2.965	3.646	-0.184601
112	0	-1.441	-0.085522	0.763634	-2.895	4.834	-0.045337
112	1.700	-1.441	-0.085522	0.763634	-2.895	6.132	-0.190724
113	0	-1.512	-0.085440	0.545864	-2.685	7.138	-0.052081
113	1.700	-1.512	-0.085440	0.545864	-2.685	8.266	-0.197330
114	0	-1.582	-0.084429	-0.056140	-2.079	9.496	-0.059579
114	1.700	-1.582	-0.084429	-0.056140	-2.079	9.400	-0.203109
115	0	-1.649	-0.079741	-1.677	-0.603659	10.601	-0.070001
115	1.700	-1.649	-0.079741	-1.677	-0.603659	7.750	-0.205561

lane (2-D) frame -analysis

****
STRUCTURAL - DATA *
****

RIOSTRA PILAS

roject title :

O I N T D A T A : (7 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000	B	B	
2	0.391667	0.000000	0.000000			
3	0.783333	0.000000	0.000000			
4	1.175000	0.000000	0.000000			
5	1.566667	0.000000	0.000000			
6	1.958333	0.000000	0.000000			
7	2.350000	0.000000	0.000000			

AR DATA : (6 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	2	0.391667	RIOSPIL			oS
2	2	3	0.391667	RIOSPIL			oS
3	3	4	0.391667	RIOSPIL			oS
4	4	5	0.391667	RIOSPIL			oS
5	5	6	0.391667	RIOSPIL			oS
6	6	7	0.391667	RIOSPIL			oS

oS = Bars without shear deformation

ROSS SECTION VALUES:

CS-Name	Ax [M2]	Iy [M4]	Fz [M2]
	zl [M1]	zu [M1]	
RIOSPIL	1.8000E+00	1.2150E-01	1.5000E+00
	-0.4500	0.4500	

CS-Name	Ax [M2] zl [M1]	Iy [M4] zu [M1]	Fz [M2]

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
1 .. 6	3.5500E+06	1.3000E+06

STS-Run ok

==========
Load case 1: cargas permanentes
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-50.280		Stab 1 .. 6

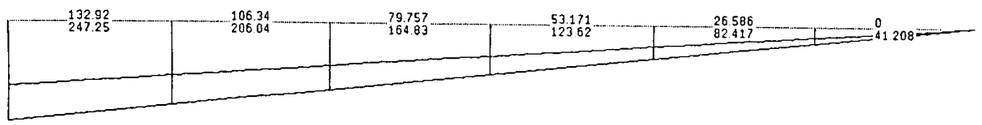
==========
Load case 2: sobrecargas maximas
==========

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-24.890		Stab 1 .. 6

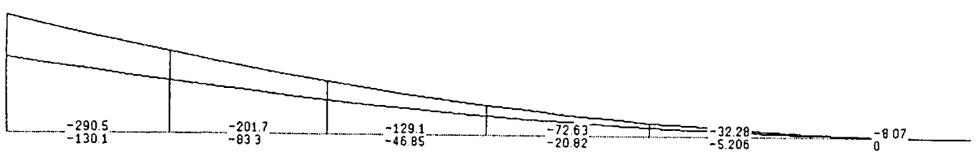
ENVELOPE SPECIFIC.: AA ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		cargas permanentes
B	PLUS	2	1.500		sobrecargas maximas

Scale 1 : 15.3
Int. Forces envelope Vz, GWSP AA, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 1.00E-03
  min: 2.66E-07 max: 1.60E+02 [t]
- Envelope Shear force Vz-max, Scale 1.00E-03
  min: 4.12E-07 max: 2.47E+02 [t]
- 1 envelopes [t]



Scale 1 : 15.3
Int. Forces envelope My, GWSP AA, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 1.00E-03
  min: -2.91E+02 max: 2.65E-13 [tm]
- Envelope Moment My-max, Scale 1.00E-03
  min: -1.87E+02 max: 1.12E-12 [tm]
- 1 envelopes [tm]



Características mecánicas Sección "RIOSPIL" (sin coef. homogeneiz.)

Area	Ax = 18.00E3 cm2		
Momento de inercia	Iy = 12.15E6 cm4	Iz = 60.00E6 cm4	Ip = 72.15E6 cm4
Const. de torsión			Ix = 34.87E6 cm4
Momento estático	Zy =405.00E3 cm3	Zz = 900.00E3 cm3	
Baricentro	ys = -0.00 cm	zs = 45.00 cm	Angulo= 0.0 Grad
Dist. al borde	yl = -100.00 cm	yr = 100.00 cm	
	zo = 45.00 cm	zu = -45.00 cm	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "RIOSPIL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	18000.0	580.000	3.49E+07	1)

Puntos de contorno [cm]:
1 100.00 0.00 2 100.00 90.00 3 -100.00 90.00
4 -100.00 0.00

Armadura "B1" As-tot =2.00 cm2 (0.01 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-96.00	86.00
					96.00	86.00
BOTTOM / RQS	AEH500	10.0	2	1.00	-96.00	4.00
					96.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	200.00	82.00	0.00	86.00	0.00	4.00
SWY	Vy	90.00	192.00	-96.00	45.00	96.00	45.00
SWT	Torsion	200.00	90.00	0.00	0.00	0.00	90.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "RIOSPIL"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-2905.00	0.00	

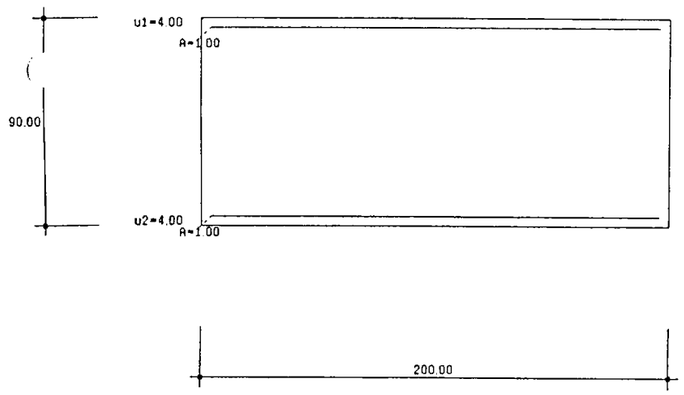
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-96.00	86.00	96.00	86.00	1.00	83.30	83.30
AEH500	-96.00	4.00	96.00	4.00	1.00	----	1.00

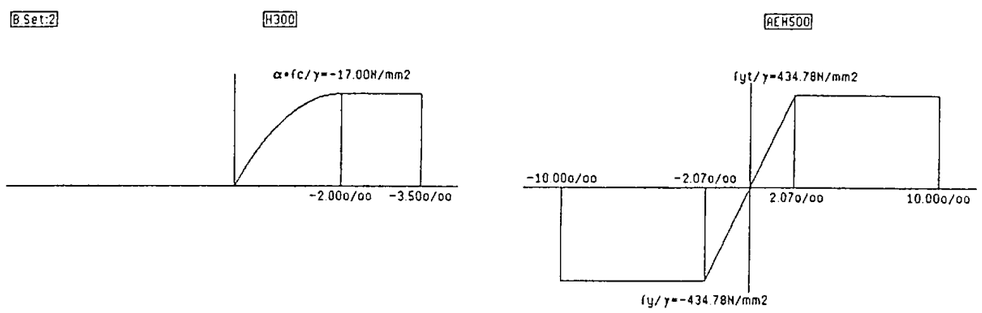
x.x/h = 0.18 As-top/bot = 83.30/1.00 As = 0.47 % = 84.30

$(10\phi25 + 10\phi25) = 98.20\,cm^2$

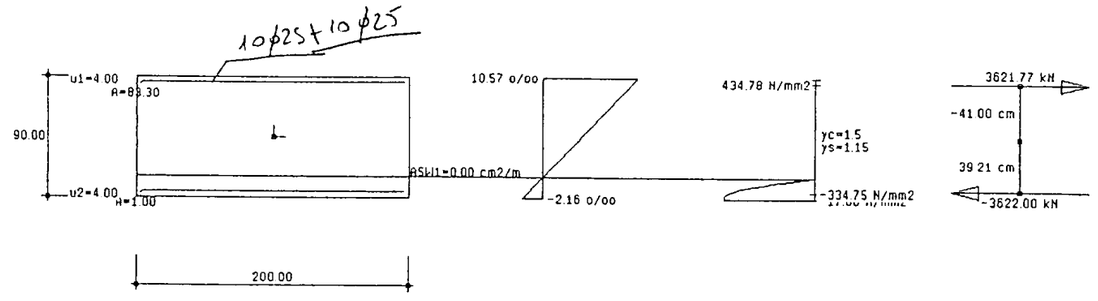
cción RIOSPIL



aterial acorde a la sección: "RIOSPIL"



Dimensionamiento, Sección "RIOSPIL"



CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título: Riotra de pilas
Fecha: 24/5/01 13.48.28

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 200 cm, alto 90 cm y canto 86 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 247 T
Cortante reducido a un canto útil del borde del apoyo = 247 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 98 cm2 lo que implica una cuantía geométrica igual a 0.00570
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 247 T < Vu1 = 1032.00 T
Es necesario disponer armadura a cortante al ser Vrd = 247.00 T > Vu2 = 80.42 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°
Vcu = 67.01 T. Vsu= 179.99 T.
As cálculo = 58.14 cm2/m. As mínima = 20.00 cm2/m
Mínimo de armadura a disponer = 58.14 cm2/m

$$A_{st} = \frac{0.865\,m}{0.10\,m} \cdot 4 \times 2 \times 1.13\,cm^2 = 78.19\,cm^2$$

4 c ϕ12 /0.10

2.3.5. Reacciones y cálculo de neoprenos en planta

PS 315+880

CARACTERÍSTICAS DE LOS NEOPRENOS

APOYOS	DIMENSIONES	δadm.	OBSERVACION
	mm	mm	
E-1	200 x 400 x 52 (37)	25.9	
E-2	200 x 400 x 52 (37)	25.9	

RESUMEN DE LOS DESPLAZAMIENTOS DE LOS APARATOS DE APOYO

APOYOS	DESPLAZAMIENTOS (mm)							
	Reológicos	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{H1}	δ_{H2}	δadm.
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm	mm
E-1	6.42	8.00	6.65	0.00	21.00	18.95	25.93	25.90
E-2	6.42	8.00	6.65	0.00	21.00	18.95	25.93	25.90

$\delta_{H1} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (0{,}5 \times 0.6 \times \delta_{V\ C/SC})^2)^{0,5}$

$\delta_{H2} = ((\delta_R + 0.6 \times \delta_T + 0.6\ \delta_F)^2 + (\delta_{V\ C/SC})^2)^{0,5}$

RESUMEN DE LOS DESPLAZAMIENTOS DE LAS JUNTAS DE DILATACION

	DESPLAZAMIENTOS (mm)				
APOYOS	Reológicos	Térmicos	Frenado	δ_{MAX}	δ_{MIN}
	δ_R	δ_T	δ_F	mm	mm
E-1	6.42	8.00	6.65	21	15
E-2	6.42	8.00	6.65	21	15

J.D. ESTRIBOS DE 30 mm DE RECORRIDO, CON 15 mm DE APERTURA INICIAL

COMPROBACION DE TENSIONES DE LOS APARATOS DE APOYO

ESTRIBO 1 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) : 100.9 σ_{max} (tm^{-2}) = 1261 < 1500 tm^{-2}

REACCION MINIMA (t): 16.00 σ_{min} (tm^{-2}) = 200 > 200 tm^{-2}

ESTRIBO 2 : APOYOS DE DIMENSIONES (mm) = 200 x 400 x 52 (37)

REACCION MAXIMA (t) : 101.12 σ_{max} (tm^{-2}) = 1264 < 1500 tm^{-2}

REACCION MINIMA (t): 16.00 σ_{min} (tm^{-2}) = 200 > 200 tm^{-2}

RESUMEN DE LAS FUERZAS HORIZONTALES

APOYOS	FUERZAS HORIZONTALES (t)					Resultante
	Reológicas	Térmicas	Frenado	Viento (s/S.C.)	Viento (c/S.C.)	
	F_R	F_T	F_F	$F_{V\ S/SC}$	$F_{V\ C/SC}$	F_{FT}
E-1	1.45	1.80	1.53	1.90	4.90	4.3
E-2	1.45	1.80	1.53	1.90	4.90	4.3

CALCULO DE LAS RIGIDECES PARA STATIK3

APOYOS	RIGIDECES HORIZONTALES (t/m)						
	ALTURA PILAR	I PILAR	E PILAR	F APOYO	T APOYO	K LONG	K TRANSV
E-1	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59
E-2	4.00	0.7428	3000000.00	0.08	0.037	193.51	194.59

RESUMEN DE LOS DESPLAZAMIENTOS TOTALES (APOYOS+PILARES)

APOYOS	DESPLAZAMIENTOS (mm)						
	Reológicos+Acort. Elas	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{H1}	δ_{H2}
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm
E-1	6.42	8.00	6.65	0.00	21.00	18.95	25.93
E-2	6.42	8.00	6.65	0.00	21.00	18.95	25.93

$\delta_{H1} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (0{,}5 \times 0.6 \times \delta_{V\ C/SC})^2)^{0,5}$

$\delta_{H2} = ((\delta_R + 0.6 \times \delta_T + 0.6\ \delta_F)^2 + (\delta_{V\ C/SC})^2)^{0,5}$

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOE
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
AT	PL.PERM	5	1.000	RETRACCION
AU	PLUS	6	1.000	SOB UNIF 1
AV	PLUS	7	1.000	SOB UNIF 2
AW	PLUS	8	1.000	SOB UNIF 3
AX	PLUS	9	1.000	SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOE
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOE
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOE
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.091	-3.683	20.036				
	1.761	1.141	100.469				
	Min: AP AR AS AT AX AY BU...			Max: A E D E F G J AL AN AO			
10	2.283	-3.686	16.626				
	-0.568555	1.138	97.227				
	Min: AP AR AS AT AU AV BC...			Max: A E D G H I AE AN AO			
156	-1.091	2.568	20.407				
	1.761	-2.257	100.840				
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.			
160	2.283	2.571	16.997				
	-0.568596	-2.254	97.599				
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...			
166	3.374	-1.935	218.118	15.604	23.708	-0.028301	
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09	
	Min: CF CH CI CL DC DN DO...			Max: DS DT DV DW DX DY EN...			
167	3.374	-1.829	219.077	9.951	23.708	0.028301	
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09	
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...			

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.091	-3.683	26.641				
	2.283	1.009	60.789				
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F M AL AN			
10	-1.090	1.006	57.547				
	2.284	-3.686	23.231				
	Min: A C D H I AE AN			Max: AP AQ AS AT AU AV AW...			
156	-1.091	2.567	27.013				
	2.283	-2.125	61.160				
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F O AK AL AN			
160	-1.091	-2.122	57.919				
	2.284	2.570	23.603				
	Min: A C D H I AG AK AN			Max: AP AQ AS AT AU AV AW...			
166	-2.615	3.395	313.122	-17.884	-3.159	0.221212	
	5.989	-4.252	319.171	36.214	26.867	-0.249513	
	Min: A C D E F M AN			Max: AP AQ AS AT AW AX AY...			
167	-2.615	-7.158	314.081	43.438	-3.159	-0.221212	

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
	5.989	0.488287	320.130	-10.660	26.867	0.249513	
	Min: A C D E F O AK AN			Max: AP AQ AS AT AW AX AY...			

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-0.167731	-3.836	34.498				
	0.835704	1.280	53.022				
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DO DQ...			
10	1.360	-3.839	31.088				
	0.356995	1.277	49.781				
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR			
156	0.835745	-2.396	53.394				
	-0.167690	2.720	34.870				
	Min: CF CH CI CL DL DN DQ...			Max: DS DT DV DW DX DY ET...			
160	0.356954	-2.393	50.152				
	1.360	2.723	31.460				
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EE...			
166	3.374	-8.324	297.858	52.598	23.708	-0.028301	
	5.36E-09	6.034	296.749	-29.975	2.74E-08	-1.18E-08	
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR			
167	5.35E-09	-9.797	297.708	55.530	2.73E-08	1.16E-08	
	3.374	4.560	298.816	-27.044	23.708	0.028301	
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...			

DEFORMATIONS: **
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]	
2	0	-9.927	-4.388	-1.45E-08	-0.001116	0.000178	-1.26E-05	
		4.745	16.012	-2.36E-09	-0.000181	0.000186	2.63E-05	
		Min: A C D E F M AL AN				Max: AP AQ AS AT AW AX AY...		
2	1.300	-9.912	15.434	-1.030	-0.000782	-7.75E-05	-1.13E-05	
		4.718	-4.186	-0.728517	-0.000510	0.000188	1.76E-05	
		Min: AP AQ AS AT AU AV AW...				Max: A C D H I AE AN		
31	0	-9.912	-10.583	-1.061	0.000805	-7.66E-05	1.14E-05	
		4.718	9.037	-0.759594	0.000534	0.000189	-1.75E-05	
		Min: AP AQ AS AT AU AV AW...				Max: A C D H I AG AK AN		
31	1.300	-9.927	9.239	-1.74E-08	0.001141	0.000180	1.29E-05	
		4.745	-11.161	-3.23E-09	0.000205	0.000188	-2.61E-05	
		Min: A C D E F O AK AL AN				Max: AP AQ AS AT AW AX AY...		

DEFORMATIONS: **
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]	
75	0	-9.759	-1.872	-1.330	-2.92E-05	-0.001310	-1.79E-05	
		4.522	10.104	-1.311	5.37E-06	0.001078	2.09E-05	
		Min: A E D E F G M AL AN AO				Max: AP AR AS AT AX AY BU...		
75	1.300	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05	
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05	
		Min: A E D E F G M AL AN AO				Max: AP AR AS AT AX AY BU...		
76	0	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05	
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05	
		Min: A E D E F G M AL AN AO				Max: AP AR AS AT AX AY BU...		
76	1.700	-9.702	8.576	-3.304	-0.001163	-0.001535	-2.04E-05	
		4.457	-1.219	-2.834	-0.000935	0.001276	2.28E-05	
		Min: AP AQ AS AT AU AV AW...				Max: A C D H I AE AN		
85	0	-9.702	-3.725	-3.248	0.001143	-0.001535	2.04E-05	
		4.457	6.071	-2.779	0.000916	0.001276	-2.28E-05	
		Min: AP AQ AS AT AU AV AW...				Max: A C D H I AG AK AN		
85	1.700	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05	
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05	
		Min: A E D E F G O AL AN AO				Max: AP AR AS AT AX AY BW. .		
86	0	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05	
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05	
		Min: A B D E F G O AL AN AO				Max: AP AR AS AT AX AY BW...		
86	1.300	-9.759	6.724	-1.391	-2.60E-06	-0.001310	1.79E-05	
		4.522	-5.252	-1.371	-3.72E-05	0.001078	-2.09E-05	
		Min: A B D E F G O AK AL AN.				Max: AP AR AS AT AX AY BW...		
130	0	-9.931	16.026	-1.74E-09	-0.000134	-0.000184	-2.10E-05	
		4.741	-4.375	-1.39E-08	-0.001072	-0.000176	1.79E-05	
		Min: AP AQ AS AT AU AV AW...				Max: A C D H I AE AN		
130	1.300	-9.911	-4.173	-0.659427	-0.000459	-0.000213	-1.24E-05	
		4.719	15.447	-0.965400	-0.000733	5.27E-05	1.65E-05	
		Min: A C D E F M AL AN				Max: AP AQ AS AT AW AX AY...		
159	0	-9.911	9.024	-0.690504	0.000482	-0.000214	1.23E-05	
		4.719	-10.596	-0.996477	0.000756	5.17E-05	-1.66E-05	
		Min: A C D E F O AK AL AN				Max: AP AQ AS AT AW AX AY...		
159	1.300	-9.931	-11.174	-2.41E-09	0.000158	-0.000186	2.07E-05	
		4.741	9.226	-1.66E-08	0.001096	-0.000178	-1.82E-05	
		Min: AP AQ AS AT AU AV AW...				Max: A C D H I AG AK AN		

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

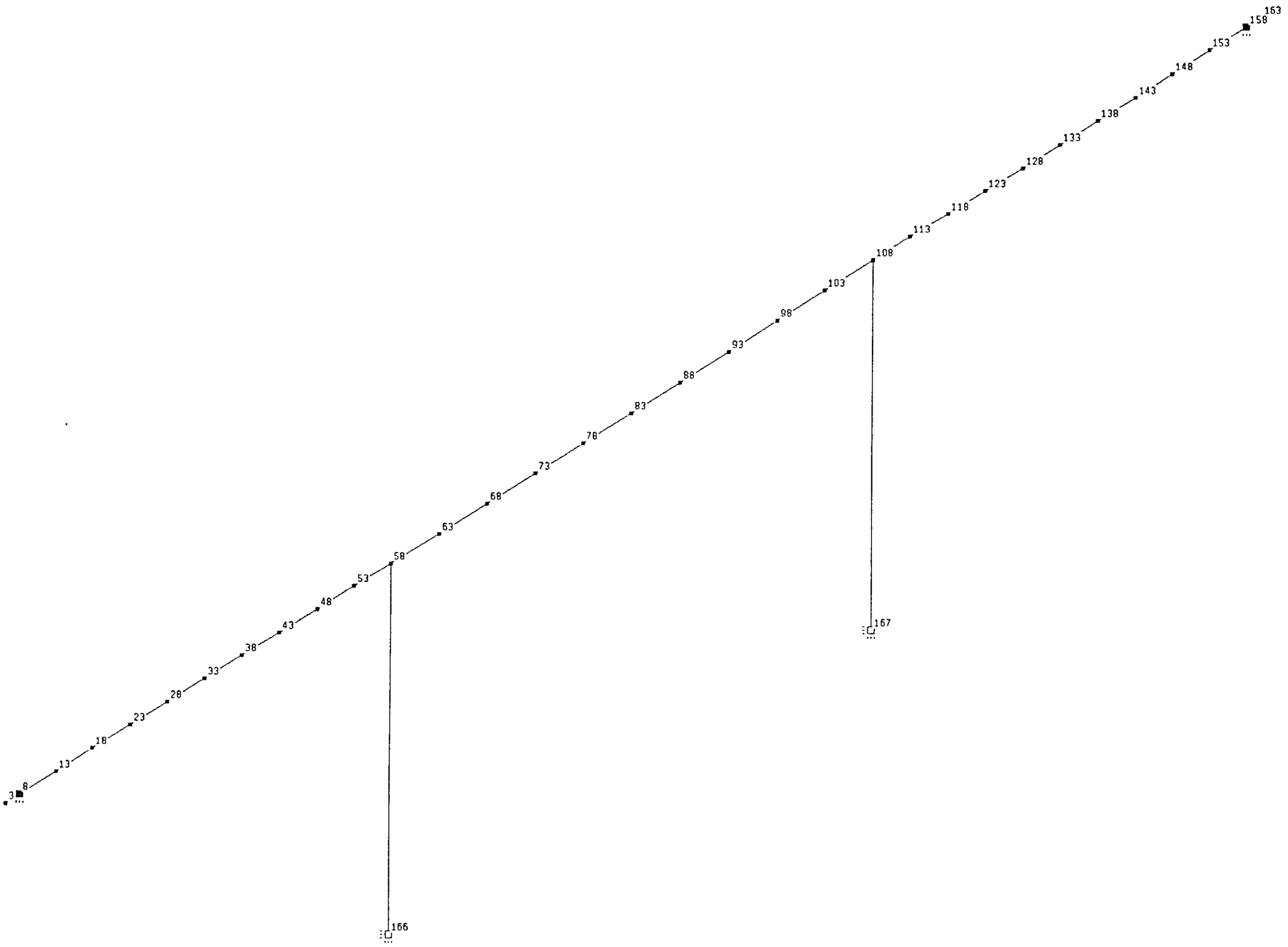
Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-3.633	-5.566	-1.43E-08	-0.001098	0.000283	2.93E-05
	0.729265	16.677	-9.22E-09	-0.000709	0.000154	-2.00E-05	
	Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...				
2	1.300	-3.666	-5.281	-1.474	-0.001105	0.000194	2.26E-05
	0.755751	16.016	-0.908772	-0.000646	7.11E-05	-2.06E-05	
	Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...				
31	0	0.755785	-11.165	-0.939849	0.000669	7.20E-05	2.07E-05
	-3.666	10.132	-1.505	0.001128	0.000195	-2.25E-05	
	Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...				
31	1.300	0.729085	-11.826	-1.07E-08	0.000733	0.000156	2.02E-05
	-3.634	10.417	-1.63E-08	0.001122	0.000285	-2.91E-05	
	Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...				
75	0	-5.237	-2.959	-2.341	0.000825	-0.000232	2.96E-06
	-1.03E-09	10.666	-0.931812	-8.42E-05	7.32E-13	7.37E-13	
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
75	1.300	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
	-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13	
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
76	0	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
	-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13	
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
76	1.700	-5.245	-2.305	-1.599	-0.000298	-0.000260	2.44E-06
	-4.04E-09	9.136	-2.679	-0.000971	6.64E-13	1.02E-12	
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
85	0	-3.98E-09	-4.286	-2.623	0.000951	6.61E-13	-1.01E-12
	-5.245	7.157	-1.544	0.000279	-0.000260	-2.44E-06	
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...				
85	1.700	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
	-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06	
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...				
86	0	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
	-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06	
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...				
86	1.300	-1.08E-09	-5.814	-0.992653	5.24E-05	7.30E-13	-7.10E-13
	-5.237	7.810	-2.402	-0.000856	-0.000232	-2.96E-06	
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DQ...				
130	0	-1.552	-5.553	-1.37E-08	-0.001054	-0.000282	-2.40E-05
	-5.915	16.691	-8.59E-09	-0.000661	-0.000152	2.53E-05	
	Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...				
130	1.300	-1.526	-5.268	-1.409	-0.001057	-0.000219	-1.74E-05
	-5.949	16.029	-0.839682	-0.000594	-9.58E-05	2.59E-05	
	Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...				

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

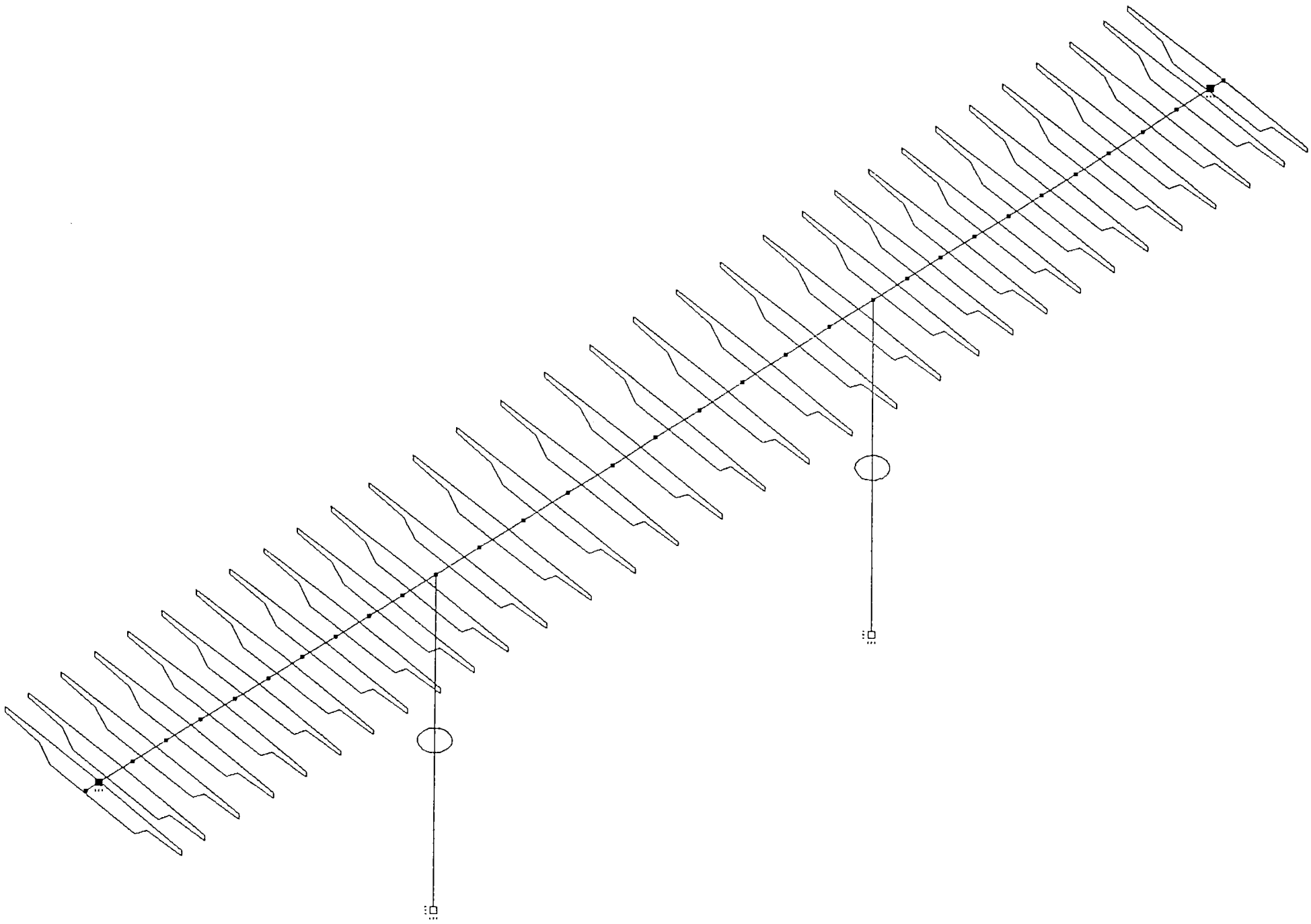
Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
159	0	-5.949	-11.178	-0.870759	0.000617	-9.68E-05	-2.60E-05
	-1.526	10.119	-1.440	0.001080	-0.000220	1.73E-05	
	Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...				
159	1.300	-5.915	-11.839	-9.85E-09	0.000685	-0.000154	-2.56E-05
	-1.552	10.404	-1.55E-08	0.001078	-0.000284	2.37E-05	
	Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...				

2.4. Comprobación Longitudinal del tablero

Scale 1 : 129.0
Structure - GEOMETRIA



Scale 1 : 147.9
Structure - SECCIONES



****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (35 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
3	2.62000	0.00000	0.00000			
8	2.62000	0.50000	0.00000	SSB	FFF	
13	2.62000	1.80000	0.00000			
18	2.62000	3.10000	0.00000			
23	2.62000	4.40000	0.00000			
28	2.62000	5.70000	0.00000			
33	2.62000	7.00000	0.00000			
38	2.62000	8.30000	0.00000			
43	2.62000	9.60000	0.00000			
48	2.62000	10.90000	0.00000			
53	2.62000	12.20000	0.00000			
58	2.62000	13.50000	0.00000			
63	2.62000	15.20000	0.00000			
68	2.62000	16.90000	0.00000			
73	2.62000	18.60000	0.00000			
78	2.62000	20.30000	0.00000			
83	2.62000	22.00000	0.00000			
88	2.62000	23.70000	0.00000			
93	2.62000	25.40000	0.00000			
98	2.62000	27.10000	0.00000			
103	2.62000	28.80000	0.00000			
108	2.62000	30.50000	0.00000			
113	2.62000	31.80000	0.00000			
118	2.62000	33.10000	0.00000			
123	2.62000	34.40000	0.00000			
128	2.62000	35.70000	0.00000			
133	2.62000	37.00000	0.00000			
138	2.62000	38.30000	0.00000			
143	2.62000	39.60000	0.00000			
148	2.62000	40.90000	0.00000			
153	2.62000	42.20000	0.00000			
158	2.62000	43.50000	0.00000	SSB	FFF	
163	2.62000	44.00000	0.00000			
166	2.62000	13.50000	-13.20000	BBE	BBE	
167	2.62000	30.50000	-13.20000	BBE	BBE	

ELASTICALLY SUPPORTED JOINTS: ('B'=Fixed 'F'=Free)

Joint	V-X [T/M]	V-Y [T/M]	V-Z [T/M]	R-X [TM/ARC]	R-Y [TM/ARC]	R-Z [TM/ARC]
8	3.892E+02	3.892E+02	B	F	F	F
158	3.892E+02	3.892E+02	B	F	F	F

B A R D A T A : (34 bars)

Bar	Incidences Start	End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
65	3	8	0.50000	TABAPOYO			oS
66	8	13	1.30000	TABAPOYO			oS
67	13	18	1.30000	TABAPOYO			oS
68	18	23	1.30000	TABAPOYO			oS
69	23	28	1.30000	TABAPOYO			oS
70	28	33	1.30000	TABAPOYO			oS
71	33	38	1.30000	TABAPOYO			oS
72	38	43	1.30000	TABAPOYO			oS
73	43	48	1.30000	TABAPOYO			oS
74	48	53	1.30000	TABAPOYO			oS
75	53	58	1.30000	TABAPOYO			oS
76	58	63	1.70000	TABAPOYO			oS
77	63	68	1.70000	TABAPOYO			oS
78	68	73	1.70000	TABAPOYO			oS
79	73	78	1.70000	TABAPOYO			oS
80	78	83	1.70000	TABAPOYO			oS
81	83	88	1.70000	TABAPOYO			oS
82	88	93	1.70000	TABAPOYO			oS
83	93	98	1.70000	TABAPOYO			oS
84	98	103	1.70000	TABAPOYO			oS
85	103	108	1.70000	TABAPOYO			oS
86	108	113	1.30000	TABAPOYO			oS
87	113	118	1.30000	TABAPOYO			oS
88	118	123	1.30000	TABAPOYO			oS
89	123	128	1.30000	TABAPOYO			oS
90	128	133	1.30000	TABAPOYO			oS
91	133	138	1.30000	TABAPOYO			oS
92	138	143	1.30000	TABAPOYO			oS
93	143	148	1.30000	TABAPOYO			oS
94	148	153	1.30000	TABAPOYO			oS
95	153	158	1.30000	TABAPOYO			oS
96	158	163	0.50000	TABAPOYO			oS
290*	166	58	13.20000	PILAS			oS
291*	167	108	13.20000	PILAS			oS

Bars marked with '*' are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2] / Ix [M4] / zl [M]	Iy [M4] / Fy [M2] / zu [M]	Iz [M4] / Fz [M2] / yl [M]	Phi [Degr] / yr [M]
PILAS	7.8576E-01	4.9180E-02	4.9086E-02	0.00
	9.8175E-02	7.8576E-01	7.8576E-01	
	-0.5000	0.5000	-0.5000	0.5000
TABAPOYO	4.6531E+00	2.8617E-01	1.3718E-01	0.00
	5.0835E-01	4.6531E+00	4.6531E+00	
	-0.4986	0.4014	-3.8500	3.8500

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [T/ M2]	Shear-M [T/ M2]
65 .. 291	3.2900E+06	1.3700E+06

STS-Run ok

****
Load case 1: PESO PROPIO
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Mas.forcZ gl const.	-2.500		Stab 65 .. 96

****
Load case 2: PESO PAVIMENTO
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z pj const.	-0.552000		Stab 65 .. 96

****
Load case 3: PESO BARRERAS
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-2.046		Stab 65 .. 96

****
Load case 5: RETRACCION
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Strain X lo const.	-0.000292		Stab 65 .. 96

****
Load case 6: SOB UNIF 1
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 65 .. 75

****
Load case 7: SOBRECARGA UNIF 2
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 76 .. 85

****
Load case 8: SOB UNIF 3
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-3.200		Stab 86 .. 96

****
Load case 9: SOB UNIF EXC
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb
Force Z gl const.	-1.600		Stab 65
Moment X lo const.	-3.080		Stab 65
Force Z gl const.	-1.600		Stab 66
Moment X lo const.	-3.080		Stab 66
Force Z gl const.	-1.600		Stab 67
Moment X lo const.	-3.080		Stab 67
Force Z gl const.	-1.600		Stab 68
Moment X lo const.	-3.080		Stab 68
Force Z gl const.	-1.600		Stab 69
Moment X lo const.	-3.080		Stab 69
Force Z gl const.	-1.600		Stab 70
Moment X lo const.	-3.080		Stab 70
Force Z gl const.	-1.600		Stab 71
Moment X lo const.	-3.080		Stab 71
Force Z gl const.	-1.600		Stab 72
Moment X lo const.	-3.080		Stab 72
Force Z gl const.	-1.600		Stab 73
Moment X lo const.	-3.080		Stab 73
Force Z gl const.	-1.600		Stab 74
Moment X lo const.	-3.080		Stab 74
Force Z gl const.	-1.600		Stab 75
Moment X lo const.	-3.080		Stab 75
Force Z gl const.	-1.600		Stab 76
Moment X lo const.	-3.080		Stab 76
Force Z gl const.	-1.600		Stab 77
Moment X lo const.	-3.080		Stab 77
Force Z gl const.	-1.600		Stab 78
Moment X lo const.	-3.080		Stab 78
Force Z gl const.	-1.600		Stab 79
Moment X lo const.	-3.080		Stab 79
Force Z gl const.	-1.600		Stab 80
Moment X lo const.	-3.080		Stab 80
Force Z gl const.	-1.600		Stab 81
Moment X lo const.	-3.080		Stab 81
Force Z gl const.	-1.600		Stab 82
Moment X lo const.	-3.080		Stab 82
Force Z gl const.	-1.600		Stab 83
Moment X lo const.	-3.080		Stab 83
Force Z gl const.	-1.600		Stab 84
Moment X lo const.	-3.080		Stab 84
Force Z gl const.	-1.600		Stab 85
Moment X lo const.	-3.080		Stab 85
Force Z gl const.	-1.600		Stab 86
Moment X lo const.	-3.080		Stab 86
Force Z gl const.	-1.600		Stab 87
Moment X lo const.	-3.080		Stab 87
Force Z gl const.	-1.600		Stab 88
Moment X lo const.	-3.080		Stab 88
Force Z gl const.	-1.600		Stab 89

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Moment	X	lo const.	-3.080		Stab	89
Force	Z	gl const.	-1.600		Stab	90
Moment	X	lo const.	-3.080		Stab	90
Force	Z	gl const.	-1.600		Stab	91
Moment	X	lo const.	-3.080		Stab	91
Force	Z	gl const.	-1.600		Stab	92
Moment	X	lo const.	-3.080		Stab	92
Force	Z	gl const.	-1.600		Stab	93
Moment	X	lo const.	-3.080		Stab	93
Force	Z	gl const.	-1.600		Stab	94
Moment	X	lo const.	-3.080		Stab	94
Force	Z	gl const.	-1.600		Stab	95
Moment	X	lo const.	-3.080		Stab	95
Force	Z	gl const.	-1.600		Stab	96
Moment	X	lo const.	-3.080		Stab	96

Load case 10: SOB UNIF EXC

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Moment	X	lo const.	3.080		Stab	65
Force	Z	lo const.	-1.600		Stab	65
Moment	X	lo const.	3.080		Stab	66
Force	Z	lo const.	-1.600		Stab	66
Moment	X	lo const.	3.080		Stab	67
Force	Z	lo const.	-1.600		Stab	67
Moment	X	lo const.	3.080		Stab	68
Force	Z	lo const.	-1.600		Stab	68
Moment	X	lo const.	3.080		Stab	69
Force	Z	lo const.	-1.600		Stab	69
Moment	X	lo const.	3.080		Stab	70
Force	Z	lo const.	-1.600		Stab	70
Moment	X	lo const.	3.080		Stab	71
Force	Z	lo const.	-1.600		Stab	71
Moment	X	lo const.	3.080		Stab	72
Force	Z	lo const.	-1.600		Stab	72
Moment	X	lo const.	3.080		Stab	73
Force	Z	lo const.	-1.600		Stab	73
Moment	X	lo const.	3.080		Stab	74
Force	Z	lo const.	-1.600		Stab	74
Moment	X	lo const.	3.080		Stab	75
Force	Z	lo const.	-1.600		Stab	75
Moment	X	lo const.	3.080		Stab	76
Force	Z	lo const.	-1.600		Stab	76
Moment	X	lo const.	3.080		Stab	77

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	lo const.	-1.600		Stab	77
Moment	X	lo const.	3.080		Stab	78
Force	Z	lo const.	-1.600		Stab	78
Moment	X	lo const.	3.080		Stab	79
Force	Z	lo const.	-1.600		Stab	79
Moment	X	lo const.	3.080		Stab	80
Force	Z	lo const.	-1.600		Stab	80
Moment	X	lo const.	3.080		Stab	81
Force	Z	lo const.	-1.600		Stab	81
Moment	X	lo const.	3.080		Stab	82
Force	Z	lo const.	-1.600		Stab	82
Moment	X	lo const.	3.080		Stab	83
Force	Z	lo const.	-1.600		Stab	83
Moment	X	lo const.	3.080		Stab	84
Force	Z	lo const.	-1.600		Stab	84
Moment	X	lo const.	3.080		Stab	85
Force	Z	lo const.	-1.600		Stab	85
Moment	X	lo const.	3.080		Stab	86
Force	Z	lo const.	-1.600		Stab	86
Moment	X	lo const.	3.080		Stab	87
Force	Z	lo const.	-1.600		Stab	87
Moment	X	lo const.	3.080		Stab	88
Force	Z	lo const.	-1.600		Stab	88
Moment	X	lo const.	3.080		Stab	89
Force	Z	lo const.	-1.600		Stab	89
Moment	X	lo const.	3.080		Stab	90
Force	Z	lo const.	-1.600		Stab	90
Moment	X	lo const.	3.080		Stab	91
Force	Z	lo const.	-1.600		Stab	91
Moment	X	lo const.	3.080		Stab	92
Force	Z	lo const.	-1.600		Stab	92
Moment	X	lo const.	3.080		Stab	93
Force	Z	lo const.	-1.600		Stab	93
Moment	X	lo const.	3.080		Stab	94
Force	Z	lo const.	-1.600		Stab	94
Moment	X	lo const.	3.080		Stab	95
Force	Z	lo const.	-1.600		Stab	95
Moment	X	lo const.	3.080		Stab	96
Force	Z	lo const.	-1.600		Stab	96

Load case 11: VEHICULO HIPOTESIS 11

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	66
Moment	X	lo conc.	-30.000	0.850000	Stab	66
Force	Z	gl conc.	-20.000	1.050	Stab	67
Moment	X	lo conc.	-30.000	1.050	Stab	67
Force	Z	gl conc.	-20.000	1.250	Stab	68
Moment	X	lo conc.	-30.000	1.250	Stab	68

Load case 12: VEHICULO HIPOTESIS 12

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	69
Force	Z	gl conc.	-20.000	1.300	Stab	70
Force	Z	gl conc.	-20.000	0.200000	Stab	72
Moment	X	lo conc.	-30.000	1.100	Stab	69
Moment	X	lo conc.	-30.000	1.300	Stab	70
Moment	X	lo conc.	-30.000	0.200000	Stab	72

Load case 13: VEHICULO HIPOTESIS 13

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	73
Force	Z	gl conc.	-20.000	0.250000	Stab	74
Force	Z	gl conc.	-20.000	0.450000	Stab	75
Moment	X	lo conc.	-30.000	0.050000	Stab	73
Moment	X	lo conc.	-30.000	0.250000	Stab	74
Moment	X	lo conc.	-30.000	0.450000	Stab	75

Load case 14: VEHICULO HIPOTESIS 14

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	76
Force	Z	gl conc.	-20.000	0.650000	Stab	77
Force	Z	gl conc.	-20.000	0.450000	Stab	78
Moment	X	lo conc.	-30.000	0.850000	Stab	76
Moment	X	lo conc.	-30.000	0.650000	Stab	77
Moment	X	lo conc.	-30.000	0.450000	Stab	78

Load case 15: VEHICULO HIPOTESIS 15

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.200000	Stab	80
Force	Z	gl conc.	-20.000	0	Stab	81
Force	Z	gl conc.	-20.000	1.500	Stab	81
Moment	X	lo conc.	-30.000	0.200000	Stab	80
Moment	X	lo conc.	-30.000	0	Stab	81
Moment	X	lo conc.	-30.000	1.500	Stab	81

Load case 16: VEHICULO HIPOTESIS 16

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.250	Stab	83
Force	Z	gl conc.	-20.000	1.050	Stab	84
Force	Z	gl conc.	-20.000	0.850000	Stab	85
Moment	X	lo conc.	-30.000	1.250	Stab	83
Moment	X	lo conc.	-30.000	1.050	Stab	84
Moment	X	lo conc.	-30.000	0.850000	Stab	85

Load case 17: VEHICULO HIPOTESIS 17

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	86
Force	Z	gl conc.	-20.000	1.050	Stab	87
Force	Z	gl conc.	-20.000	1.250	Stab	88
Moment	X	lo conc.	-30.000	0.850000	Stab	86
Moment	X	lo conc.	-30.000	1.050	Stab	87
Moment	X	lo conc.	-30.000	1.250	Stab	88

Load case 18: VEHICULO HIPOTESIS 18

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	89
Force	Z	gl conc.	-20.000	1.300	Stab	90
Force	Z	gl conc.	-20.000	0.200000	Stab	92
Moment	X	lo conc.	-30.000	1.100	Stab	89
Moment	X	lo conc.	-30.000	1.300	Stab	90
Moment	X	lo conc.	-30.000	0.200000	Stab	92

Load case 19: VEHICULO HIPOTESIS 19

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	93
Force	Z	gl conc.	-20.000	0.250000	Stab	94
Force	Z	gl conc.	-20.000	0.450000	Stab	95
Moment	X	lo conc.	-30.000	0.050000	Stab	93
Moment	X	lo conc.	-30.000	0.250000	Stab	94
Moment	X	lo conc.	-30.000	0.450000	Stab	95

Load case 20: VEHICULO HIPOTESIS 20

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	66
Force	Z	gl conc.	-20.000	1.050	Stab	67
Force	Z	gl conc.	-20.000	1.250	Stab	68

Load case 21: VEHICULO HIPOTESIS 21

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	69
Force	Z	gl conc.	-20.000	1.300	Stab	70
Force	Z	gl conc.	-20.000	0.200000	Stab	72

Load case 22: VEHICULO HIPOTESIS 22

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	73
Force	Z	gl conc.	-20.000	0.250000	Stab	74
Force	Z	gl conc.	-20.000	0.450000	Stab	75

Load case 23: VEHICULO HIPOTESIS 23

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	76
Force	Z	gl conc.	-20.000	0.650000	Stab	77
Force	Z	gl conc.	-20.000	0.450000	Stab	78

Load case 24: VEHICULO HIPOTESIS 24

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.200000	Stab	80
Force	Z	gl conc.	-20.000	0	Stab	81
Force	Z	gl conc.	-20.000	1.500	Stab	81

Load case 25: VEHICULO POSICION 25

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.250	Stab	83
Force	Z	gl conc.	-20.000	1.050	Stab	84
Force	Z	gl conc.	-20.000	0.850000	Stab	85

Load case 26: VEHICULO POSICION 26

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	86
Force	Z	gl conc.	-20.000	1.050	Stab	87
Force	Z	gl conc.	-20.000	1.250	Stab	88

Load case 27: VEHICULO POSICION 27

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	89
Force	Z	gl conc.	-20.000	1.300	Stab	90
Force	Z	gl conc.	-20.000	0.200000	Stab	92

Load case 28: VEHICULO POSICION 28

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	93
Force	Z	gl conc.	-20.000	0.250000	Stab	94
Force	Z	gl conc.	-20.000	0.450000	Stab	95

Load case 29: VEHICULO POSICION 29

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	66
Force	Z	gl conc.	-20.000	1.050	Stab	67
Force	Z	gl conc.	-20.000	1.250	Stab	68
Moment	X	lo conc.	30.000	0.850000	Stab	66
Moment	X	lo conc.	30.000	1.050	Stab	67
Moment	X	lo conc.	30.000	1.250	Stab	68

Load case 30: VEHICULO POSICION 30

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	69
Force	Z	gl conc.	-20.000	1.300	Stab	70
Force	Z	gl conc.	-20.000	0.200000	Stab	72
Moment	X	lo conc.	30.000	1.100	Stab	69
Moment	X	lo conc.	30.000	1.300	Stab	70
Moment	X	lo conc.	30.000	0.200000	Stab	72

Load case 31: VEHICULO POSICION 31

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	73
Force	Z	gl conc.	-20.000	0.250000	Stab	74
Force	Z	gl conc.	-20.000	0.450000	Stab	75
Moment	X	lo conc.	30.000	0.050000	Stab	73
Moment	X	lo conc.	30.000	0.250000	Stab	74
Moment	X	lo conc.	30.000	0.450000	Stab	75

Load case 32: VEHICULO POSICION 32

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	76
Force	Z	gl conc.	-20.000	0.650000	Stab	77
Force	Z	gl conc.	-20.000	0.450000	Stab	78
Moment	X	lo conc.	30.000	0.850000	Stab	76
Moment	X	lo conc.	30.000	0.650000	Stab	77
Moment	X	lo conc.	30.000	0.450000	Stab	78

Load case 33: VEHICULO POSICION 33

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.200000	Stab	80
Force	Z	gl conc.	-20.000	0	Stab	81
Force	Z	gl conc.	-20.000	1.500	Stab	81
Moment	X	lo conc.	30.000	0.200000	Stab	80
Moment	X	lo conc.	30.000	0	Stab	81
Moment	X	lo conc.	30.000	1.500	Stab	81

Load case 34: VEHICULO POSICION 34

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.250	Stab	83
Force	Z	gl conc.	-20.000	1.050	Stab	84
Force	Z	gl conc.	-20.000	0.850000	Stab	85
Moment	X	lo conc.	30.000	1.250	Stab	83
Moment	X	lo conc.	30.000	1.050	Stab	84
Moment	X	lo conc.	30.000	0.850000	Stab	85

Load case 35: VEHICULO POSICION 35

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.850000	Stab	86
Force	Z	gl conc.	-20.000	1.050	Stab	87
Force	Z	gl conc.	-20.000	1.250	Stab	88
Moment	X	lo conc.	30.000	0.850000	Stab	86
Moment	X	lo conc.	30.000	1.050	Stab	87
Moment	X	lo conc.	30.000	1.250	Stab	88

Load case 36: VEHICULO POSICION 36

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	1.100	Stab	89
Force	Z	gl conc.	-20.000	1.300	Stab	90
Force	Z	gl conc.	-20.000	0.200000	Stab	92
Moment	X	lo conc.	30.000	1.100	Stab	89
Moment	X	lo conc.	30.000	1.300	Stab	90
Moment	X	lo conc.	30.000	0.200000	Stab	92

Load case 37: VEHICULO HIPOTESIS 37

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	Z	gl conc.	-20.000	0.050000	Stab	93
Force	Z	gl conc.	-20.000	0.250000	Stab	94
Force	Z	gl conc.	-20.000	0.450000	Stab	95
Moment	X	lo conc.	30.000	0.050000	Stab	93
Moment	X	lo conc.	30.000	0.250000	Stab	94
Moment	X	lo conc.	30.000	0.450000	Stab	95

Load case 60: FRENADO

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	lo const.	0.272700		Stab	65 .. 96

Load case 62: VIENTO TRANSV SIN SOB.

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl const.	-0.260000		Stab	65 .. 96
Force	X	pj const.	-0.200000		Stab	290 .. 291

Load case 63: VIENTO TRANSV CON SOB

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl const.	-0.760000		Stab	65 .. 96
Force	X	pj const.	-0.200000		Stab	290 .. 291

Load case 64: TEMPERATURA (-)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Strain X lo const.	-0.000363		Stab	65 .. 96

Load case 65: TEMPERATURA (+)

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Strain X lo const.	0.000363		Stab	65 .. 96

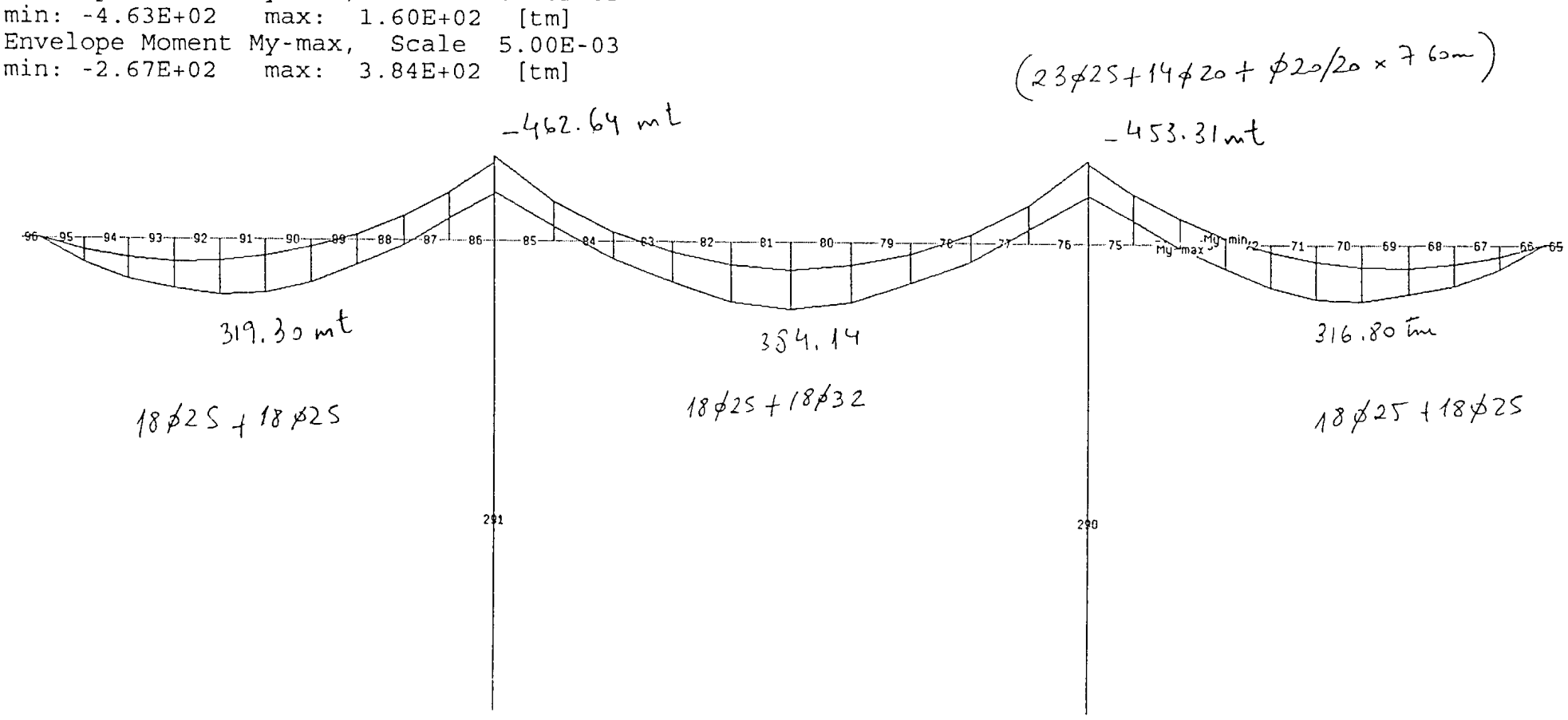
Load case 66: GRADIENTE

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Curvat. Y lo const.	0.000170		Stab	65 .. 96

S T

2.4.1.1. Comprobación de estados límitesfisuración

Scale 1 : 173.7
Int. Forces envelope My, GWSP EO (COMBINACION FRECUENTE), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -4.63E+02 max: 1.60E+02 [tm]
- Envelope Moment My-max, Scale 5.00E-03
  min: -2.67E+02 max: 3.84E+02 [tm]



ENVELOPE SPECIFIC.: EG 'COMBINACION FRECUENTE'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	0.600000		SOB UNIF 1
F	PLUS	7	0.600000		SOBRECARGA UNIF 2
G	PLUS	8	0.600000		SOB UNIF 3
H	PLUS	11	0.840000		VEHICULO HIPOTESIS 11
I	OR	12	0.840000		VEHICULO HIPOTESIS 12
J	OR	13	0.840000		VEHICULO HIPOTESIS 13
K	OR	14	0.840000		VEHICULO HIPOTESIS 14
L	OR	15	0.840000		VEHICULO HIPOTESIS 15
M	OR	16	0.840000		VEHICULO HIPOTESIS 16
N	OR	17	0.840000		VEHICULO HIPOTESIS 17
O	OR	18	0.840000		VEHICULO HIPOTESIS 18
P	OR	19	0.840000		VEHICULO HIPOTESIS 19
Q	OR	20	0.840000		VEHICULO HIPOTESIS 20
R	OR	21	0.840000		VEHICULO HIPOTESIS 21
S	OR	22	0.840000		VEHICULO HIPOTESIS 22
T	OR	23	0.840000		VEHICULO HIPOTESIS 23
U	OR	24	0.840000		VEHICULO HIPOTESIS 24
V	OR	25	0.840000		VEHICULO POSICION 25
W	OR	26	0.840000		VEHICULO POSICION 26
X	OR	27	0.840000		VEHICULO POSICION 27
Y	OR	28	0.840000		VEHICULO POSICION 28
Z	OR	29	0.840000		VEHICULO POSICION 29
AA	OR	30	0.840000		VEHICULO POSICION 30
AE	OR	31	0.840000		VEHICULO POSICION 31
AC	OR	32	0.840000		VEHICULO POSICION 32
AD	OR	33	0.840000		VEHICULO POSICION 33
AE	OR	34	0.840000		VEHICULO POSICION 34
AF	OR	35	0.840000		VEHICULO POSICION 35
AG	OR	36	0.840000		VEHICULO POSICION 36
AH	OR	37	0.840000		VEHICULO HIPOTESIS 37
AI	PLUS	60	0.600000		FRENADO
AJ	PLUS	63	0.100000		VIENTO TRANSV CON SOB
AK	PLUS	64	0.200000		TEMPERATURA (-)
AL	OR	65	0.200000		TEMPERATURA (+)
AM	PLUS	66	0.200000		GRADIENTE
ALTERNATIVE ENVELOPE :					
AN	PERM.	1	1.000		PESO PROPIO
AO	PL.PERM	2	1.500		PESO PAVIMENTO
AP	OR	2	1.000		PESO PAVIMENTO
AQ	PL.PERM	3	1.000		PESO BARRERAS
AR	PLUS	9	0.600000		SOB UNIF EXC
AS	PLUS	10	0.600000		SOB UNIF EXC
AT	PLUS	11	0.840000		VEHICULO HIPOTESIS 11
AU	OR	12	0.840000		VEHICULO HIPOTESIS 12
AV	OR	13	0.840000		VEHICULO HIPOTESIS 13
AW	OR	14	0.840000		VEHICULO HIPOTESIS 14
AX	OR	15	0.840000		VEHICULO HIPOTESIS 15
AY	OR	16	0.840000		VEHICULO HIPOTESIS 16
AZ	OR	17	0.840000		VEHICULO HIPOTESIS 17
BA	OR	18	0.840000		VEHICULO HIPOTESIS 18
BB	OR	19	0.840000		VEHICULO HIPOTESIS 19
BC	OR	20	0.840000		VEHICULO HIPOTESIS 20
BD	OR	21	0.840000		VEHICULO HIPOTESIS 21
BE	OR	22	0.840000		VEHICULO HIPOTESIS 22
BF	OR	23	0.840000		VEHICULO HIPOTESIS 23
BG	OR	24	0.840000		VEHICULO HIPOTESIS 24
BH	OR	25	0.840000		VEHICULO POSICION 25
BI	OR	26	0.840000		VEHICULO POSICION 26
BJ	OR	27	0.840000		VEHICULO POSICION 27
BK	OR	28	0.840000		VEHICULO POSICION 28
BL	OR	29	0.840000		VEHICULO POSICION 29
BM	OR	30	0.840000		VEHICULO POSICION 30
BN	OR	31	0.840000		VEHICULO POSICION 31
BO	OR	32	0.840000		VEHICULO POSICION 32
BP	OR	33	0.840000		VEHICULO POSICION 33
BQ	OR	34	0.840000		VEHICULO POSICION 34
BR	OR	35	0.840000		VEHICULO POSICION 35
BS	OR	36	0.840000		VEHICULO POSICION 36
BT	OR	37	0.840000		VEHICULO HIPOTESIS 37
BU	PLUS	60	0.600000		FRENADO
BV	PLUS	63	0.100000		VIENTO TRANSV CON SOB
BW	PLUS	64	0.200000		TEMPERATURA (-)
BX	OR	65	0.200000		TEMPERATURA (+)
BY	PLUS	66	0.200000		GRADIENTE

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-8.17E-10	-9.94E-11	-7.25E-08	9.92E-14	-8.29E-13	5.30E-10
		9.01E-13	3.47E-09	-8.08E-08	-1.90E-13	-2.20E-13	-5.00E-10
	Min: A B D F L AI AK AM			Max: A C D E G I AL			
65	0.500	-0.081810	3.43E-09	-8.213	1.77E-13	-2.053	1.22E-09
		1.08E-12	3.47E-09	-7.115	-1.90E-13	-1.779	1.23E-09
	Min: AN AO AQ AR AS AT BU...			Max: A C D G I AK			
66	0	1.649	-2.767	73.437	3.48E-14	-2.053	-3.80E-08
		-0.630755	-3.255	110.846	-2.68E-14	-1.779	-4.43E-08
	Min: A B D E F L AI AK			Max: A C D G H AL AM			
66	1.300	1.501	-2.767	42.637	3.48E-14	65.674	-3.597
		-0.695688	-3.255	84.993	25.200	136.597	-4.231
	Min: A C D F L AI AK			Max: A E D E G H AL AM			
67	0	1.501	-2.767	42.637	3.48E-14	65.674	-3.597
		-0.695688	-3.255	84.993	25.200	136.597	-4.231
	Min: A C D F L AI AK			Max: A B D E G H AL AM			
67	1.300	1.289	-2.767	24.137	3.48E-14	109.077	-7.194
		-0.695688	-3.255	46.838	50.400	229.007	-8.463
	Min: A C D F L AI AK			Max: A B D E G H AL AM			
68	0	1.289	-2.767	24.137	3.48E-14	109.077	-7.194
		-0.695688	-3.255	46.838	50.400	229.007	-8.463
	Min: A C D F L AI AK			Max: A B D E G H AL AM			
68	1.300	1.076	-2.767	5.637	3.48E-14	128.430	-10.791
		-0.795944	-3.255	40.609	4.05E-14	281.248	-12.694
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
69	0	1.076	-2.767	5.637	2.35E-13	128.430	-10.791
		-0.795944	-3.255	40.609	3.18E-13	281.248	-12.694
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
69	1.300	0.863157	-2.767	-12.863	2.35E-13	123.733	-14.388
		-0.795944	-3.255	2.455	25.200	316.800	-16.925
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
70	0	0.863157	-2.767	-12.863	2.40E-13	123.733	-14.388
		-0.795944	-3.255	2.455	25.200	316.800	-16.925
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
70	1.300	0.650451	-2.767	-31.363	2.40E-13	94.986	-17.985
		-0.795944	-3.255	-18.900	25.200	306.110	-21.156
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
71	0	0.650451	-2.767	-31.363	3.23E-14	94.986	-17.985
		-0.795944	-3.255	-35.700	50.400	306.110	-21.156
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
71	1.300	0.437745	-2.767	-49.862	3.23E-14	42.190	-21.583
		-0.795944	-3.255	-57.054	50.400	245.820	-25.388
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
72	0	0.437745	-2.767	-49.862	-2.20E-13	42.190	-21.583
		-0.795944	-3.255	-57.054	50.400	245.820	-25.388
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
72	1.300	0.225039	-2.767	-68.362	-2.20E-13	-34.656	-25.180
		-0.795944	-3.255	-95.209	75.600	139.289	-29.619
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
73	0	0.225039	-2.767	-68.362	-3.62E-13	-34.656	-25.180
		-0.795944	-3.255	-95.209	75.600	139.289	-29.619
	Min: A C D F L AI AK			Max: A B D E G I AL AM			
73	1.300	0.012337	-2.767	-88.407	-3.62E-13	-136.729	-28.777
		-0.740640	-3.255	-95.929	25.200	27.468	-33.850
	Min: A B D F L AI AK			Max: A C D E G J AL AM			
74	0	0.012337	-2.767	-88.407	-6.23E-13	-136.729	-28.777
		-0.740640	-3.255	-95.929	25.200	27.468	-33.850
	Min: A B D F L AI AK			Max: A C D E G J AL AM			
74	1.300	-0.265306	-2.767	-118.754	-6.23E-13	-267.158	-32.374
		-0.675703	-3.255	-122.236	50.400	-125.284	-38.081
	Min: A B D E F L AI AK			Max: A C D G J AL AM			
75	0	-0.265306	-2.767	-118.754	-7.73E-13	-267.158	-32.374
		-0.675703	-3.255	-122.236	50.400	-125.284	-38.081
	Min: A B D E F L AI AK			Max: A C D G J AL AM			
75	1.300	-0.478012	-2.767	-140.109	-7.73E-13	-435.419	-35.971
		-0.354707	-2.279	-112.540	-6.13E-13	-262.317	-29.629
	Min: A B D E F L AI AK			Max: A C D G O AL AM			
76	0	-4.027	1.15E-09	166.074	-37.800	-453.307	-35.902
		2.447	-0.816198	114.873	-25.394	-257.553	-28.964
	Min: A B D E F L AI			Max: A C D G O AI AK AM			
76	1.700	-1.588	0.816198	116.690	25.394	-206.732	-41.452
		0.560163	0.590543	122.326	-21.576	-74.093	-39.918
	Min: A E D E F I AL			Max: A C D G K AI AK AM			
77	0	-1.588	0.816198	116.690	25.394	-206.732	-41.452
		0.560163	0.590543	122.326	-21.576	-74.093	-39.918
	Min: A E D E F I AL			Max: A C D G K AI AK AM			
77	1.700	-0.865035	0.816198	77.565	25.394	-44.387	-40.065
		-0.440823	0.590543	92.533	3.624	107.950	-38.914
	Min: A C D E I AL			Max: A B D F G K AI AK AM			
78	0	-0.865035	0.816198	77.565	25.394	-44.387	-40.065
		-0.440823	0.590543	92.533	3.624	107.950	-38.914
	Min: A C D E I AL			Max: A B D F G K AI AK AM			
78	1.700	-0.575585	0.816198	52.125	25.394	65.382	-38.677
		-1.838	9.21E-10	79.952	-37.800	232.449	-35.902
	Min: A C D E G I AL			Max: A E D F L AI AK AM			
79	0	-0.575585	0.816198	52.125	25.394	65.382	-38.677
		-1.838	8.19E-10	79.952	-37.800	232.449	-35.902
	Min: A C D E G I AL			Max: A E D F L AI AK AM			
79	1.700	-0.575585	0.816198	27.933	25.394	133.432	-37.290
		-2.116	8.19E-10	52.027	-37.800	344.631	-35.902
	Min: A C D E G I AL			Max: A E D F L AI AK AM			
80	0	-0.575585	0.816198	27.933	25.394	133.432	-37.290
		-2.116	7.85E-10	52.027	-37.800	344.631	-35.902
	Min: A C D E G I AL			Max: A E D F L AI AK AM			
80	1.700	-0.575585	0.816198	3.741	25.394	160.355	-35.902
		-2.394	7.85E-10	7.302	-12.600	384.141	-35.902
	Min: A C D E G I AL			Max: A E D F L AI AK AM			
81	0	-0.575585	-0.816198	-4.840	-25.394	160.355	-35.902
		-2.394	7.21E-10	-8.400	12.600	384.141	-35.902
	Min: A C D E G O AI AL			Max: A B D F L AK AM			
81	1.700	-0.853739	-0.816198	-29.032	-25.394	131.565	-37.290
		-2.394	7.21E-10	-53.125	37.800	342.764	-35.902
	Min: A C D E G O AI AL			Max: A B D F L AK AM			
82	0	-0.853739	-0.816198	-29.032	-25.394	131.565	-37.290
		-2.394	6.96E-10	-53.125	37.800	342.764	-35.902
	Min: A C D E G O AI AL			Max: A B D F L AK AM			
82	1.700	-1.132	-0.816198	-53.224	-25.394	61.648	-38.677
		-2.394	6.96E-10	-81.051	37.800	228.715	-35.902
	Min: A C D E G O AI AL			Max: A E D F L AK AM			
83	0	-1.132	-0.816198	-53.224	-25.394	61.648	-38.677
		-2.394	7.08E-10	-81.051	37.800	228.715	-35.902
	Min: A C D E G O AI AL			Max: A E D F L AK AM			
83	1.700	-1.699	-0.816198	-78.663	-25.394	-49.988	-40.065
		-1.275	-0.590543	-93.632	-3.624	102.348	-38.914
	Min: A C D G O AI AL			Max: A E D E F M AK AM			
84	0	-1.699	-0.816198	-78.663	-25.394	-49.988	-40.065
		-1.275	-0.590543	-93.632	-3.624	102.348	-38.914
	Min: A C D G O AI AL			Max: A E D E F M AK AM			
84	1.700	-2.700	-0.816198	-117.788	-25.394	-214.200	-41.452
		-0.552453	-0.590543	-123.424	21.576	-81.561	-39.918
	Min: A E D F G O AI AL			Max: A C D E M AK AM			
85	0	-2.700	-0.816198	-117.788	-25.394	-214.200	-41.452
		-0.552453	-0.590543	-123.424	21.576	-81.561	-39.918
	Min: A E D F G O AI AL			Max: A C D E M AK AM			
85	1.700	-5.417	6.16E-10	-167.172	37.800	-462.643	-35.902
		1.057	0.816198	-115.972	25.394	-266.888	-28.964
	Min: A E D F G L AI AL			Max: A C D E I AK AM			
86	0	0.543500	2.767	139.629	-2.75E-13	-429.182	-35.971
		0.666805	2.279	112.061	-2.02E-13	-256.080	-29.629
	Min: A B D F G L AK			Max: A C D E I AI AL AM			
86	1.300	0.543500	2.767	118.274	-2.75E-13	-261.544	-32.374
		0.133104	3.255	121.756	-50.400	-119.671	-38.081
	Min: A B D F G L AK			Max: A C D E N AI AL AM			
87	0	0.543500	2.767	118.274	-6.58E-14	-261.544	-32.374
		0.133104	3.255	121.756	-50.400	-119.671	-38.081
	Min: A B D F G L AK			Max: A C D E N AI AL AM			
87	1.300	0.608438	2.767	87.927	-8.58E-14	-131.739	-28.777
		-0.144540	3.255	95.449	-25.200	32.458	-33.850
	Min: A B D F L AK			Max: A C D E G N AI AL AM			
88	0	0.608438	2.767	87.927	8.24E-14	-131.739	-28.777
		-0.144540	3.255	95.449	-25.200	32.458	-33.850
	Min: A E D F L AK			Max: A C D E G N AI AL AM			
88	1.300	0.608434	2.767	67.882	8.24E-14	-30.290	-25.180
		-0.412549	3.255	94.729	-75.600	143.655	-29.619
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
89	0	0.608434	2.767	67.882	3.29E-13	-30.290	-25.180
		-0.412549	3.255	94.729	-75.600	143.655	-29.619
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
89	1.300	0.608434	2.767	49.383	3.29E-13	45.933	-21.583
		-0.625255	3.255	56.575	-50.400	249.562	-25.388
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
90	0	0.608434	2.767	49.383	1.88E-13	45.933	-21.583
		-0.625255	3.255	56.575	-50.400	249.562	-25.388
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
90	1.300	0.608434	2.767	30.883	1.88E-13	98.105	-17.985
		-0.837961	3.255	35.220	-50.400	309.229	-21.156
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
91	0	0.608434	2.767	30.883	-2.66E-15	98.105	-17.985
		-0.837961	3.255	18.420	-25.200	309.229	-21.156
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
91	1.300	0.608434	2.767	12.383	-2.66E-15	126.228	-14.388
		-1.051	3.255	-2.935	-25.200	319.294	-16.925
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
92	0	0.608434	2.767	12.383	1.45E-13	126.228	-14.388
		-1.051	3.255	-2.935	-25.200	319.294	-16.925
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
92	1.300	0.608434	2.767	-6.117	1.45E-13	130.301	-10.791
		-1.263	3.255	-41.089	1.07E-14	283.119	-12.694
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
93	0	0.608434	2.767	-6.117	9.70E-14	130.301	-10.791
		-1.263	3.255	-41.089	1.37E-13	283.119	-12.694
	Min: A C D F L AK			Max: A E D E G O AI AL AM			
93	1.300	0.608434	2.767	-24.617	9.70E-14	110.324	-7.194
		-1.376	3.255	-47.318	-50.400	230.255	-8.463
	Min: A C D F L AK			Max: A E D E G P AI AL AM			
94	0	0.608434	2.767	-24.617	1.51E-13	110.324	-7.194
		-1.376	3.255	-47.318	-50.400	230.255	-8.463
	Min: A C D F L AK			Max: A E D E G P AI AL AM			
94	1.300	0.608434	2.767	-43.116	1.51E-13	66.297	-3.597
		-1.589	3.255	-85.472	-25.200	137.221	-4.231
	Min: A C D F L AK			Max: A E D E G P AI AL AM			
95	0	0.608434	2.767	-43.116	2.98E-13	66.297	-3.597
		-1.589	3.255	-85.472	-25.200	137.221	-4.231
	Min: A C D F L AK			Max: A E D E G P AI AL AM			
95	1.300	0.543500	2.767	-73.917	2.98E-13	-2.053	-3.76E-08
		-1.736	3.255	-111.326	5.76E-13	-1.779	-4.41E-08
	Min: A B D F G L AK			Max: A C D E P AI AL AM			
96	0	0.081810	3.91E-09	8.213	6.19E-13	-2.053	1.06E-11

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [cm]
		5.92E-14	3.96E-09	7.115	-1.35E-13	-1.779	-3.08E-10
		Min: A E D E G O AI AL			Max: A C D F L AK AM		
96	0.500	8.11E-10	4.00E-09	8.21E-08	4.67E-13	-1.52E-12	1.99E-09
		5.99E-14	3.96E-09	7.12E-08	-1.35E-13	3.88E-14	1.67E-09
		Min: A E D E G P AI AL AM			Max: A C D F L AK		
290	0	-255.453	0.576378	-4.439	-0.739005	-7.455	-1.902
		-255.453	0.576378	3.646	0.757716	16.175	-1.902
		Min: AN AO AQ AS BR			Max: AN AO AQ AR AZ BV		
290	13.200	-271.302	0.522081	-7.047	0.453014	-90.862	4.176
		-271.302	0.522081	6.518	-0.434303	90.862	4.176
		Min: AN AO AQ AS BL			Max: AN AO AQ AR AT BV		
291	0	-255.453	-0.576378	-4.439	0.739005	-7.455	1.902
		-255.453	-0.576378	3.646	-0.757716	16.175	1.902
		Min: AN AO AQ AS BN			Max: AN AO AQ AR AV BV		
291	13.200	-304.883	-0.310567	-7.047	-0.453014	-90.862	-2.100
		-304.883	-0.310567	6.518	0.434303	90.862	-2.100
		Min: AN AO AQ AS BR			Max: AN AO AQ AR AZ BV		

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL CENTRO DE VANO
Fecha: 23/5/01 18.28.28

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 420 cm Alto = 90 cm Canto útil = 84.90 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 233.23 cm2
Diámetro equivalente = 32.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 384.14 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0065408
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 14.48 cm
Area de hormigón eficaz, Ac,eficaz = 9450.00 cm2
Resistencia a tracción del hormigón, fct,m = .4 Kp/cm2
Momento de fisuración, Mfis = 160.95 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 890.0 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2124.2 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 16.38 cm
Alargamiento medio de las fisuras, Esm = 0.000968898
Apertura de fisura, Wk = 0.270 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.270 mm
Apertura de fisura máxima, Wmax = 0.300 mm

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL CENTRO DE VANO
Fecha: 23/5/01 18.31.17

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 420 cm Alto = 90 cm Canto útil = 85.25 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 176.71 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 319.3 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0049355
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 11.67 cm
Area de hormigón eficaz, Ac,eficaz = 9450.00 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 160.95 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 1157.3 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2295.9 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 16.02 cm
Alargamiento medio de las fisuras, Esm = 0.001002137
Apertura de fisura, Wk = 0.273 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.273 mm
Apertura de fisura máxima, Wmax = 0.300 mm

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: VERIFICACION DE LA ARMADURA DEL APOYO
Fecha: 23/5/01 18.36.07

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 460 cm Alto = 90 cm Canto útil = 85.25 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 276.12 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 462.64 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0070411
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 8.18 cm
Area de hormigón eficaz, Ac,eficaz = 10350.00 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 176.27 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 822.5 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2158.6 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 13.32 cm
Alargamiento medio de las fisuras, Esm = .001000968
Apertura de fisura, Wk = 0.227 mm

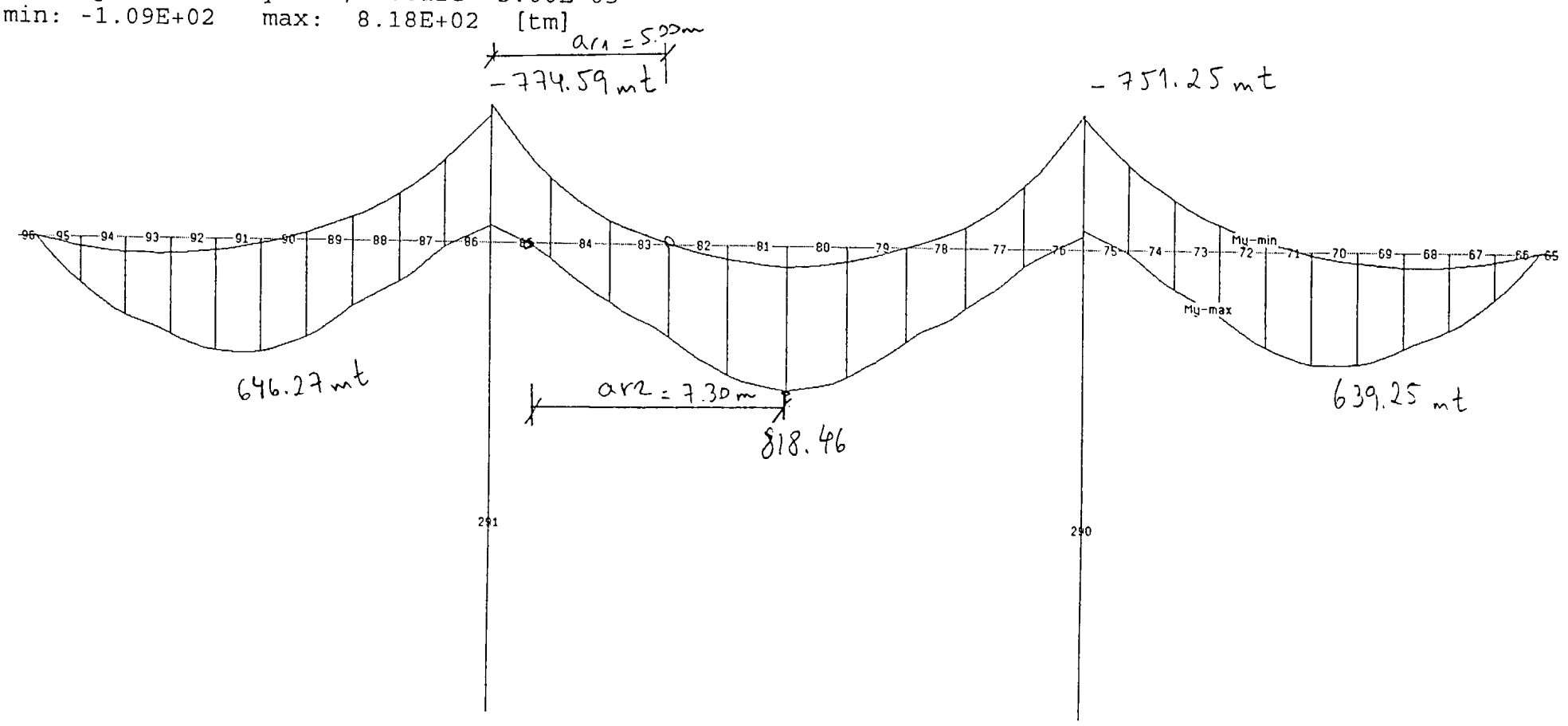
Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.227 mm
Apertura de fisura máxima, Wmax = 0.300 mm

2.4.1.2. Comprobación de estados límites últimos por flexión longitudinal

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Scale 1 : 173.7
Int. Forces envelope My, GWSP ER (COMBINACION FZAS EXTERIORES), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -7.75E+02 max: 1.18E+02 [tm]
- Envelope Moment My-max, Scale 5.00E-03
  min: -1.09E+02 max: 8.18E+02 [tm]



ENVELOPE SPECIFIC.: ER 'COMBINACION FZAS EXTERIORES'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	2	2.025		PESO PAVIMENTO
D	OR	2	1.000		PESO PAVIMENTO
E	PL.PERM	3	1.350		PESO BARRERAS
F	OR	3	1.000		PESO BARRERAS
G	PL.PERM	5	1.350		RETRACCION
H	OR	5	1.000		RETRACCION
I	PLUS	6	1.500		SOB UNIF 1
J	PLUS	7	1.500		SOBRECARGA UNIF 2
K	PLUS	8	1.500		SOB UNIF 3
L	PLUS	11	2.100		VEHICULO HIPOTESIS 11
M	OR	12	2.100		VEHICULO HIPOTESIS 12
N	OR	13	2.100		VEHICULO HIPOTESIS 13
O	OR	14	2.100		VEHICULO HIPOTESIS 14
P	OR	15	2.100		VEHICULO HIPOTESIS 15
Q	OR	16	2.100		VEHICULO HIPOTESIS 16
R	OR	17	2.100		VEHICULO HIPOTESIS 17
S	OR	18	2.100		VEHICULO HIPOTESIS 18
T	OR	19	2.100		VEHICULO HIPOTESIS 19
U	OR	20	2.100		VEHICULO HIPOTESIS 20
V	OR	21	2.100		VEHICULO HIPOTESIS 21
W	OR	22	2.100		VEHICULO HIPOTESIS 22
X	OR	23	2.100		VEHICULO HIPOTESIS 23
Y	OR	24	2.100		VEHICULO HIPOTESIS 24
Z	OR	25	2.100		VEHICULO POSICION 25
AA	OR	26	2.100		VEHICULO POSICION 26
AE	OR	27	2.100		VEHICULO POSICION 27
AC	OR	28	2.100		VEHICULO POSICION 28
AD	OR	29	2.100		VEHICULO POSICION 29
AE	OR	30	2.100		VEHICULO POSICION 30
AF	OR	31	2.100		VEHICULO POSICION 31
AG	OR	32	2.100		VEHICULO POSICION 32
AH	OR	33	2.100		VEHICULO POSICION 33
AI	OR	34	2.100		VEHICULO POSICION 34
AJ	OR	35	2.100		VEHICULO POSICION 35
AK	OR	36	2.100		VEHICULO POSICION 36
AL	OR	37	2.100		VEHICULO HIPOTESIS 37
AM	PLUS	60	1.500		FRENADO
AN	PLUS	63	0.450000		VIENTO TRANSV CON SOE
AO	PLUS	64	0.900000		TEMPERATURA (-)
AP	OR	65	0.900000		TEMPERATURA (+)
AQ	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AR	PERM.	1	1.350	PESO PROPIO
AS	OR	1	1.000	PESO PROPIO
AT	PL.PERM	2	2.025	PESO PAVIMENTO
AU	OR	2	1.000	PESO PAVIMENTO
AV	PL.PERM	3	1.350	PESO BARRERAS
AW	OR	3	1.000	PESO BARRERAS
AX	PL.PERM	5	1.350	RETRACCION

AY	OR	5	1.000	RETRACCION
AZ	PLUS	9	1.500	SOB UNIF EXC
BA	PLUS	10	1.500	SOB UNIF EXC
BE	PLUS	11	2.100	VEHICULO HIPOTESIS 11
BC	OR	12	2.100	VEHICULO HIPOTESIS 12
BD	OR	13	2.100	VEHICULO HIPOTESIS 13
BE	OR	14	2.100	VEHICULO HIPOTESIS 14
BF	OR	15	2.100	VEHICULO HIPOTESIS 15
BG	OR	16	2.100	VEHICULO HIPOTESIS 16
BH	OR	17	2.100	VEHICULO HIPOTESIS 17
BI	OR	18	2.100	VEHICULO HIPOTESIS 18
BJ	OR	19	2.100	VEHICULO HIPOTESIS 19
BK	OR	20	2.100	VEHICULO HIPOTESIS 20
BL	OR	21	2.100	VEHICULO HIPOTESIS 21
BM	OR	22	2.100	VEHICULO HIPOTESIS 22
BN	OR	23	2.100	VEHICULO HIPOTESIS 23
BO	OR	24	2.100	VEHICULO HIPOTESIS 24
BP	OR	25	2.100	VEHICULO POSICION 25
BQ	OR	26	2.100	VEHICULO POSICION 26
BR	OR	27	2.100	VEHICULO POSICION 27
BS	OR	28	2.100	VEHICULO POSICION 28
BT	OR	29	2.100	VEHICULO POSICION 29
BU	OR	30	2.100	VEHICULO POSICION 30
BV	OR	31	2.100	VEHICULO POSICION 31
BW	OR	32	2.100	VEHICULO POSICION 32
BX	OR	33	2.100	VEHICULO POSICION 33
BY	OR	34	2.100	VEHICULO POSICION 34
BZ	OR	35	2.100	VEHICULO POSICION 35
CA	OR	36	2.100	VEHICULO POSICION 36
CE	OR	37	2.100	VEHICULO HIPOTESIS 37
CC	PLUS	60	1.500	FRENADO
CD	PLUS	63	0.450000	VIENTO TRANSV CON SOE
CE	PLUS	64	0.900000	TEMPERATURA (-)
CF	OR	65	0.900000	TEMPERATURA (+)
CG	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0.500	-8.88E-12	8.66E-09	-5.336	-4.75E-13	-1.001	2.00E-09
		-0.204525	8.57E-09	-12.192	4.43E-13	-3.048	3.05E-09
		-8.88E-12	8.66E-09	-7.115	-4.75E-13	-1.779	3.08E-09
	Min:	AR AT AV AY AZ BA BE...		Max:	B D F G K M AO		
66	0	8.630	-6.917	102.359	8.71E-14	-3.048	-9.49E-08
		-0.353668	-8.137	180.260	-6.69E-14	-1.779	-1.11E-07
	Min:	A C E G I J P AM AO		Max:	B D F H K L AP AQ		
66	0.325	8.660	-6.917	44.589	8.71E-14	13.464	-2.248
		-0.515936	-8.137	225.480	-6.69E-14	71.521	-2.645
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
66	0.650	8.527	-6.917	39.964	8.71E-14	27.204	-4.496
		-0.515936	-8.137	217.556	-6.69E-14	143.514	-5.289
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
66	0.975	8.394	-6.917	35.339	8.71E-14	39.441	-6.745
		-0.515936	-8.137	167.631	63.000	207.682	-7.934
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
66	1.300	8.261	-6.917	30.714	8.71E-14	50.175	-8.993
		-0.515936	-8.137	159.706	63.000	260.874	-10.578
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
67	0	8.261	-6.917	30.714	8.71E-14	50.175	-8.993
		-0.515936	-8.137	159.706	63.000	260.874	-10.578
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
67	0.325	8.128	-6.917	26.089	8.71E-14	59.405	-11.241
		-0.515936	-8.137	151.781	63.000	311.491	-13.223
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
67	0.650	7.995	-6.917	21.464	8.71E-14	67.133	-13.489
		-0.515936	-8.137	143.856	63.000	359.532	-15.867
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
67	0.975	7.862	-6.917	16.839	8.71E-14	73.357	-15.737
		-0.515936	-8.137	135.932	63.000	404.998	-18.512
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
67	1.300	7.729	-6.917	12.214	8.71E-14	78.078	-17.985
		-0.515936	-8.137	86.007	126.000	437.388	-21.156
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
68	0	7.729	-6.917	12.214	8.71E-14	78.078	-17.985
		-0.515936	-8.137	86.007	126.000	437.388	-21.156
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
68	0.325	7.596	-6.917	7.590	8.71E-14	81.296	-20.234
		-0.515936	-8.137	78.082	126.000	464.052	-23.801
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
68	0.650	7.463	-6.917	2.965	8.71E-14	83.011	-22.482
		-0.515936	-8.137	70.157	126.000	488.141	-26.445
	Min:	B D F G J P AM AO		Max:	A C E H I K L AP AQ		
68	0.975	7.330	-6.917	-1.660	8.71E-14	83.223	-24.730
		-0.766575	-8.137	100.048	1.01E-13	510.444	-29.090
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
68	1.300	7.197	-6.917	-6.285	8.71E-14	81.932	-26.978
		-0.766575	-8.137	92.123	1.01E-13	541.671	-31.734
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
69	0	7.197	-6.917	-6.285	5.88E-13	81.932	-26.978
		-0.766575	-8.137	92.123	7.95E-13	541.671	-31.734
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
69	0.325	7.064	-6.917	-10.910	5.88E-13	79.138	-29.226
		-0.766575	-8.137	84.198	7.95E-13	570.324	-34.379
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
69	0.650	6.931	-6.917	-15.535	5.88E-13	74.840	-31.475
		-0.766575	-8.137	76.273	7.95E-13	596.400	-37.024
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
69	0.975	6.799	-6.917	-20.160	5.88E-13	69.040	-33.723
		-0.766575	-8.137	68.349	7.95E-13	619.901	-39.668
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
69	1.300	6.666	-6.917	-24.785	5.88E-13	61.736	-35.971
		-0.766575	-8.137	18.424	63.000	632.427	-42.313
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
70	0	6.666	-6.917	-24.785	5.99E-13	61.736	-35.971
		-0.766575	-8.137	18.424	63.000	632.427	-42.313
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
70	0.325	6.533	-6.917	-29.410	5.99E-13	52.930	-38.219
		-0.766575	-8.137	10.499	63.000	637.127	-44.957
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
70	0.650	6.400	-6.917	-34.035	5.99E-13	42.620	-40.467
		-0.766575	-8.137	2.574	63.000	639.251	-47.602
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
70	0.975	6.267	-6.917	-38.660	5.99E-13	30.807	-42.715
		-0.766575	-8.137	-5.351	63.000	638.800	-50.246
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
70	1.300	6.134	-6.917	-43.285	5.99E-13	17.491	-44.964
		-0.766575	-8.137	-13.275	63.000	635.773	-52.891
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
71	0	6.134	-6.917	-43.285	8.07E-14	17.491	-44.964
		-0.766575	-8.137	-55.275	126.000	635.773	-52.891
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
71	0.325	6.001	-6.917	-47.910	8.07E-14	2.672	-47.212
		-0.766575	-8.137	-63.200	126.000	616.521	-55.535
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
71	0.650	5.868	-6.917	-52.535	8.07E-14	-13.651	-49.460
		-0.766575	-8.137	-71.125	126.000	594.693	-58.180
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
71	0.975	5.735	-6.917	-57.160	8.07E-14	-31.476	-51.708
		-0.766575	-8.137	-79.050	126.000	570.290	-60.824
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
71	1.300	5.602	-6.917	-61.785	8.07E-14	-50.805	-53.956
		-0.766575	-8.137	-86.974	126.000	543.311	-63.469

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0	5.602	-6.917	-61.785	-5.51E-13	-50.805	-53.956
		-0.766575	-8.137	-86.974	126.000	543.311	-63.469
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0.325	5.469	-6.917	-66.410	-5.51E-13	-71.636	-56.205
		-0.766575	-8.137	-136.899	189.000	508.507	-66.113
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0.650	5.336	-6.917	-71.035	-5.51E-13	-93.971	-58.453
		-0.766575	-8.137	-144.824	189.000	462.727	-68.758
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0.975	5.203	-6.917	-75.660	-5.51E-13	-117.809	-60.701
		-0.766575	-8.137	-152.749	189.000	414.371	-71.402
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	1.300	5.070	-6.917	-80.285	-5.51E-13	-143.150	-62.949
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
73	0	5.070	-6.917	-80.285	-9.06E-13	-143.150	-62.949
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
	Min:	B D F G J P AM AO		Max:	A C E H I K N AP AQ		
73	0.325	4.937	-6.917	-84.910	-9.06E-13	-169.994	-65.197
		-0.628307	-8.137	-120.874	63.000	325.038	-76.692
	Min:	B D F G J P AM AO		Max:	A C E H I K N AP AQ		
73	0.650	4.804	-6.917	-116.023	-9.06E-13	-202.824	-67.445
		-0.628383	-8.137	-102.310	63.000	288.950	-79.336
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
73	0.975	4.672	-6.917	-122.388	-9.06E-13	-241.566	-69.694
		-0.628383	-8.137	-108.495	63.000	254.694	-81.981
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
73	1.300	4.539	-6.917	-128.753	-9.06E-13	-262.376	-71.942
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0	4.539	-6.917	-128.753	-1.56E-12	-282.376	-71.942
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0.325	4.406	-6.917	-135.117	-1.56E-12	-325.255	-74.190
		-0.628383	-8.137	-162.865	126.000	177.002	-87.270
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0.650	4.273	-6.917	-141.482	-1.56E-12	-370.203	-76.438
		-0.628383	-8.137	-169.050	126.000	123.066	-89.914
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0.975	4.140	-6.917	-147.847	-1.56E-12	-417.219	-78.686
		-0.628383	-8.137	-175.235	126.000	67.120	-92.559
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	1.300	3.844	-6.917	-182.933	-1.56E-12	-474.409	-80.935
		-0.466039	-8.137	-152.698	126.000	17.269	-95.203
	Min:	A C E G I J F AM AO		Max:	E D F H K N AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0	5.602	-6.917	-61.785	-5.51E-13	-50.805	-53.956
		-0.766575	-8.137	-86.974	126.000	543.311	-63.469
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0.325	5.469	-6.917	-66.410	-5.51E-13	-71.636	-56.205
		-0.766575	-8.137	-136.899	189.000	508.507	-66.113
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0.650	5.336	-6.917	-71.035	-5.51E-13	-93.971	-58.453
		-0.766575	-8.137	-144.824	189.000	462.727	-68.758
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	0.975	5.203	-6.917	-75.660	-5.51E-13	-117.809	-60.701
		-0.766575	-8.137	-152.749	189.000	414.371	-71.402
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
72	1.300	5.070	-6.917	-80.285	-5.51E-13	-143.150	-62.949
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
	Min:	B D F G J P AM AO		Max:	A C E H I K M AP AQ		
73	0	5.070	-6.917	-80.285	-9.06E-13	-143.150	-62.949
		-0.766575	-8.137	-160.674	189.000	363.440	-74.047
	Min:	B D F G J P AM AO		Max:	A C E H I K N AP AQ		
73	0.325	4.937	-6.917	-84.910	-9.06E-13	-169.994	-65.197
		-0.628307	-8.137	-120.874	63.000	325.038	-76.692
	Min:	B D F G J P AM AO		Max:	A C E H I K N AP AQ		
73	0.650	4.804	-6.917	-116.023	-9.06E-13	-202.824	-67.445
		-0.628383	-8.137	-102.310	63.000	288.950	-79.336
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
73	0.975	4.672	-6.917	-122.388	-9.06E-13	-241.566	-69.694
		-0.628383	-8.137	-108.495	63.000	254.694	-81.981
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
73	1.300	4.539	-6.917	-128.753	-9.06E-13	-262.376	-71.942
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0	4.539	-6.917	-128.753	-1.56E-12	-282.376	-71.942
		-0.628383	-8.137	-114.680	63.000	218.428	-84.625
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0.325	4.406	-6.917	-135.117	-1.56E-12	-325.255	-74.190
		-0.628383	-8.137	-162.865	126.000	177.002	-87.270
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0.650	4.273	-6.917	-141.482	-1.56E-12	-370.203	-76.438
		-0.628383	-8.137	-169.050	126.000	123.066	-89.914
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	0.975	4.140	-6.917	-147.847	-1.56E-12	-417.219	-78.686
		-0.628383	-8.137	-175.235	126.000	67.120	-92.559
	Min:	A C E G J P AM AO		Max:	B D F H I K N AP AQ		
74	1.300	3.844	-6.917	-182.933	-1.56E-12	-474.409	-80.935
		-0.466039	-8.137	-152.698	126.000	17.269	-95.203
	Min:	A C E G I J F AM AO		Max:	E D F H K N AP AQ		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
75	0	3.844	-6.917	-182.933	-1.93E-12	-474.409	-80.935
		-0.466039	-8.137	-152.698	126.000	17.269	-95.203
	Min:	A C E G I J P AM AO		Max:	B D F H K N AP AQ		
75	0.325	3.712	-6.917	-190.858	-1.93E-12	-535.150	-83.183
		0.336450	-5.698	-86.835	-1.53E-12	-17.089	-68.518
	Min:	A C E G I J P AM AO		Max:	E D F H K S AP AQ		
75	0.650	3.579	-6.917	-198.783	-1.93E-12	-598.467	-85.431
		0.336450	-5.698	-91.460	-1.53E-12	-46.062	-70.369
	Min:	A C E G I J P AM AO		Max:	B D F H K S AP AQ		
75	0.975	3.446	-6.917	-206.708	-1.93E-12	-664.359	-87.679
		0.336450	-5.698	-96.085	-1.53E-12	-76.538	-72.221
	Min:	A C E G I J P AM AO		Max:	B D F H K S AP AQ		
75	1.300	3.313	-6.917	-214.632	-1.93E-12	-732.827	-89.927
		0.336450	-5.698	-100.710	-1.53E-12	-108.517	-74.073
	Min:	A C E G I J P AM AO		Max:	B D F H K S AP AQ		
76	0	-6.805	2.89E-09	273.382	-94.500	-751.251	-89.755
		15.042	-2.040	105.743	-63.486	-76.899	-72.411
	Min:	A C E H I J P AP		Max:	B D F G K S AM AO AQ		
76	0.425	-6.805	2.89E-09	263.019	-94.500	-637.266	-89.755
		14.868	-2.040	99.695	-63.486	-33.244	-73.278
	Min:	A C E H I J P AP		Max:	B D F G K S AM AO AQ		
76	0.850	-6.805	2.89E-09	252.656	-94.500	-527.685	-89.755
		14.694	-2.040	93.647	-63.486	7.841	-74.145
	Min:	A C E H I J P AP		Max:	B D F G K S AM AO AQ		
76	1.275	-0.708267	2.040	188.646	63.486	-429.741	-104.498
		14.520	-2.040	87.599	-63.486	46.356	-75.012
	Min:	A C E H I J M AP		Max:	B D F G K S AM AO AQ		
76	1.700	-0.708267	2.040	178.283	63.486	-351.769	-103.630
		10.323	1.476	160.662	-53.940	104.148	-99.794
	Min:	A C E H I J M AP		Max:	B D F G K O AM AO AQ		
77	0	-0.708267	2.040	178.283	63.486	-351.769	-103.630
		10.323	1.476	160.662	-53.940	104.149	-99.794
	Min:	A C E H I J M AP		Max:	B D F G K O AM AO AQ		
77	0.425	-0.708267	2.040	167.919	63.486	-278.201	-102.763
		10.150	1.476	154.614	-53.940	171.145	-99.167
	Min:	A C E H I J M AP		Max:	B D F G K O AM AO AQ		
77	0.850	1.054	2.040	128.996	63.486	-216.988	-101.896
		8.214	1.476	135.126	9.060	235.121	-98.535
	Min:	A C E H I M AP		Max:	B D F G J K O AM AO AQ		
77	1.275	1.054	2.040	120.673	63.486	-163.934	-101.029
		8.040	1.476	127.038	9.060	290.831	-97.912
	Min:	A C E H I M AP		Max:	B D F G J K O AM AO AQ		
77	1.700	1.404	2.040	85.048	63.486	-116.253	-100.162
		7.515	1.476	146.252	9.060	344.940	-97.284
	Min:	B D F H I M AP		Max:	A C E G J K O AM AO AQ		
78	0	1.404	2.040	85.048	63.486	-116.253	-100.162
		7.515	1.476	146.252	9.060	344.940	-97.284

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: B D F H I M AP		Max: A C E G J K O AM AO AQ			
78	0.425	1.404	2.040	79.000	63.486	-81.392	-99.294
		7.342	1.476	135.889	9.060	404.894	-96.657
		Min: B D F H I M AP		Max: A C E G J K O AM AO AQ			
78	0.850	2.128	2.040	69.833	63.486	-50.272	-98.427
		6.444	1.476	86.644	72.060	444.815	-96.030
		Min: B D F H I K M AP		Max: A C E G J O AM AO AQ			
78	1.275	2.128	2.040	63.785	63.486	-21.878	-97.560
		6.270	1.476	76.281	72.060	479.436	-95.402
		Min: B D F H I K M AP		Max: A C E G J O AM AO AQ			
78	1.700	2.128	2.040	57.737	63.486	3.945	-96.693
		4.022	2.30E-09	143.160	-94.500	535.656	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	0	2.128	2.040	57.737	63.486	3.945	-96.693
		4.022	2.05E-09	143.160	-94.500	535.656	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	0.425	2.128	2.040	51.689	63.486	27.198	-95.825
		3.848	2.05E-09	132.797	-94.500	594.297	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	0.850	2.128	2.040	45.641	63.486	47.881	-94.958
		3.674	2.05E-09	122.433	-94.500	648.533	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	1.275	2.128	2.040	39.593	63.486	65.994	-94.091
		3.501	2.05E-09	112.070	-94.500	698.365	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
79	1.700	2.128	2.040	33.545	63.486	81.536	-93.224
		3.327	2.05E-09	101.707	-94.500	743.793	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	0	2.128	2.040	33.545	63.486	81.536	-93.224
		3.327	1.96E-09	101.707	-94.500	743.793	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	0.425	2.128	2.040	27.497	63.486	94.507	-92.357
		3.153	1.96E-09	49.344	-31.500	775.366	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	0.850	2.128	2.040	21.449	63.486	104.908	-91.489
		2.979	1.96E-09	38.981	-31.500	794.135	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	1.275	2.128	2.040	15.401	63.486	112.739	-90.622
		2.805	1.96E-09	28.617	-31.500	808.500	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
80	1.700	2.128	2.040	9.353	63.486	117.999	-89.755
		2.631	1.96E-09	18.254	-31.500	818.460	-89.755
		Min: B D F H I K M AP		Max: A C E G J P AM AO AQ			
81	0	2.128	-2.040	-12.099	-63.486	117.999	-89.755
		2.631	1.80E-09	-21.000	31.500	818.460	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	0.425	1.954	-2.040	-18.147	-63.486	111.572	-90.622

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		2.631	1.80E-09	-31.363	31.500	807.333	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	0.850	1.780	-2.040	-24.195	-63.486	102.574	-91.489
		2.631	1.80E-09	-41.726	31.500	791.801	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	1.275	1.607	-2.040	-30.243	-63.486	91.006	-92.357
		2.631	1.80E-09	-52.090	31.500	771.866	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
81	1.700	1.433	-2.040	-36.291	-63.486	76.868	-93.224
		2.631	1.80E-09	-104.453	94.500	739.125	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	0	1.433	-2.040	-36.291	-63.486	76.868	-93.224
		2.631	1.74E-09	-104.453	94.500	739.125	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	0.425	1.259	-2.040	-42.339	-63.486	60.159	-94.091
		2.631	1.74E-09	-114.816	94.500	692.531	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	0.850	1.085	-2.040	-48.387	-63.486	40.880	-94.958
		2.631	1.74E-09	-125.179	94.500	641.532	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	1.275	0.911158	-2.040	-54.435	-63.486	19.030	-95.825
		2.631	1.74E-09	-135.542	94.500	586.129	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
82	1.700	0.737312	-2.040	-60.483	-63.486	-5.390	-96.693
		2.631	1.74E-09	-145.905	94.500	526.321	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
83	0	0.737312	-2.040	-60.483	-63.486	-5.390	-96.693
		2.631	1.77E-09	-145.905	94.500	526.321	-89.755
		Min: B D F H I K S AM AP		Max: A C E G J P AO AQ			
83	0.425	0.563466	-2.040	-66.531	-63.486	-32.381	-97.560
		4.706	-1.476	-79.026	-72.060	468.934	-95.402
		Min: B D F H I K S AM AP		Max: A C E G J Q AO AQ			
83	0.850	0.389619	-2.040	-72.579	-63.486	-61.942	-98.427
		4.706	-1.476	-89.390	-72.060	433.145	-96.030
		Min: B D F H I K S AM AP		Max: A C E G J Q AO AQ			
83	1.275	-0.507851	-2.040	-81.746	-63.486	-94.229	-99.294
		5.429	-1.476	-138.634	-9.060	392.058	-96.657
		Min: B D F H K S AM AP		Max: A C E G I Q AO AQ			
83	1.700	-0.681697	-2.040	-87.794	-63.486	-130.256	-100.162
		5.429	-1.476	-148.998	-9.060	330.936	-97.284
		Min: B D F H K S AM AP		Max: A C E G I J Q AO AQ			
84	0	-0.681697	-2.040	-87.794	-63.486	-130.256	-100.162
		5.429	-1.476	-148.998	-9.060	330.936	-97.284
		Min: B D F H K S AM AP		Max: A C E G I J Q AO AQ			
84	0.425	-1.206	-2.040	-123.419	-63.486	-179.104	-101.029
		5.780	-1.476	-129.784	-9.060	275.661	-97.912
		Min: A C E H K S AM AP		Max: B D F G I J Q AO AQ			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
84	0.850	-1.380	-2.040	-131.742	-63.486	-233.325	-101.896
		5.780	-1.476	-137.872	-9.060	218.784	-98.539
		Min: A C E H K S AM AP		Max: B D F G I J Q AO AQ			
84	1.275	-3.316	-2.040	-170.665	-63.486	-295.705	-102.763
		7.542	-1.476	-157.360	53.940	153.641	-99.167
		Min: A C E H J K S AM AP		Max: B D F G I Q AO AQ			
84	1.700	-3.490	-2.040	-181.028	-63.486	-370.440	-103.630
		7.542	-1.476	-163.408	53.940	85.478	-99.794
		Min: A C E H J K S AM AP		Max: B D F G I Q AO AQ			
85	0	-3.490	-2.040	-181.028	-63.486	-370.440	-103.630
		7.542	-1.476	-163.408	53.940	85.478	-99.794
		Min: A C E H J K S AM AP		Max: B D F G I Q AO AQ			
85	0.425	-3.664	-2.040	-191.391	-63.486	-449.579	-104.498
		11.565	2.040	-90.345	63.486	26.518	-75.012
		Min: A C E H J K S AM AP		Max: B D F G I M AO AQ			
85	0.850	-9.934	1.54E-09	-255.401	94.500	-548.690	-89.755
		11.565	2.040	-96.393	63.486	-13.163	-74.145
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
85	1.275	-10.108	1.54E-09	-265.764	94.500	-659.438	-89.755
		11.565	2.040	-102.441	63.486	-55.415	-73.278
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
85	1.700	-10.262	1.54E-09	-276.128	94.500	-774.590	-89.755
		11.565	2.040	-108.489	63.486	-100.238	-72.411
		Min: A C E H J K P AM AP		Max: B D F G I M AO AQ			
86	0	5.867	6.917	213.433	-6.87E-13	-717.233	-89.927
		2.890	5.698	99.510	-5.05E-13	-92.923	-74.073
		Min: A C E G J K P AO		Max: B D F H I M AM AP AQ			
86	0.325	5.867	6.917	205.508	-6.87E-13	-649.155	-87.679
		2.757	5.698	94.885	-5.05E-13	-61.334	-72.221
		Min: A C E G J K F AO		Max: B D F H I M AM AP AQ			
86	0.650	5.867	6.917	197.583	-6.87E-13	-583.653	-85.431
		2.624	5.698	90.260	-5.05E-13	-31.248	-70.369
		Min: A C E G J K F AO		Max: B D F H I M AM AP AQ			
86	0.975	5.867	6.917	189.659	-6.87E-13	-520.726	-83.183
		2.491	5.698	85.635	-5.05E-13	-2.665	-68.518
		Min: A C E G J K F AO		Max: B D F H I M AM AP AQ			
86	1.300	5.867	6.917	181.734	-6.87E-13	-460.375	-80.935
		1.556	8.137	151.499	-126.000	31.303	-95.203
		Min: A C E G J K F AO		Max: B D F H I R AM AP AQ			
87	0	5.867	6.917	181.734	-2.14E-13	-460.375	-80.935
		1.556	8.137	151.499	-126.000	31.303	-95.203
		Min: A C E G J K P AO		Max: B D F H I R AM AP AQ			
87	0.325	6.029	6.917	146.648	-2.14E-13	-403.574	-78.686
		1.261	8.137	174.035	-126.000	80.764	-92.559
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
87	0.650	6.029	6.917	140.283	-2.14E-13	-356.948	-76.438
		1.128	8.137	167.850	-126.000	136.321	-89.914

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
87	0.975	6.029	6.917	133.918	-2.14E-13	-312.391	-74.190
		0.994810	8.137	161.665	-126.000	189.867	-87.270
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
87	1.300	6.029	6.917	127.553	-2.14E-13	-269.902	-71.942
		0.861869	8.137	113.480	-63.000	230.903	-84.625
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0	6.029	6.917	127.553	2.06E-13	-269.902	-71.942
		0.861869	8.137	113.480	-63.000	230.903	-84.625
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0.325	6.029	6.917	121.188	2.06E-13	-229.481	-69.694
		0.728928	8.137	107.295	-63.000	266.779	-81.981
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0.650	6.029	6.917	114.824	2.06E-13	-191.129	-67.445
		0.595986	8.137	101.110	-63.000	300.645	-79.336
		Min: A C E G J P AO		Max: B D F H I K R AM AP AQ			
88	0.975	6.029	6.917	83.710	2.06E-13	-158.688	-65.197
		0.463121	8.137	119.674	-63.000	336.343	-76.692
		Min: B D F G J P AO		Max: A C E H I K R AM AP AQ			
88	1.300	6.029	6.917	79.085	2.06E-13	-132.234	-62.949
		0.191911	8.137	159.474	-189.000	374.355	-74.047
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0	6.029	6.917	79.085	8.23E-13	-132.234	-62.949
		0.191911	8.137	159.474	-189.000	374.355	-74.047
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0.325	6.029	6.917	74.460	8.23E-13	-107.283	-60.701
		0.058970	8.137	151.549	-189.000	424.697	-71.402
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0.650	6.029	6.917	69.835	8.23E-13	-83.835	-58.453
		-0.073971	8.137	143.624	-189.000	472.862	-68.758
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	0.975	6.029	6.917	65.210	8.23E-13	-61.890	-56.205
		-0.206912	8.137	135.700	-189.000	518.253	-66.113
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
89	1.300	6.029	6.917	60.585	8.23E-13	-41.448	-53.956
		-0.339854	8.137	85.775	-126.000	552.667	-63.469
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	0	6.029	6.917	60.585	4.71E-13	-41.448	-53.956
		-0.339854	8.137	85.775	-126.000	552.667	-63.469
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	0.325	6.029	6.917	55.960	4.71E-13	-22.510	-51.708
		-0.472795	8.137	77.850	-126.000	579.256	-60.824
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	0.650	6.029	6.917	51.335	4.71E-13	-5.074	-49.460
		-0.605736	8.137	69.925	-126.000	603.270	-58.180
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	0.975	6.029	6.917	46.710	4.71E-13	10.858	-47.212

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.738677	8.137	62.001	-126.000	624.708	-55.535
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
90	1.300	6.029	6.917	42.085	4.71E-13	25.288	-44.964
		-0.871619	8.137	54.076	-126.000	643.570	-52.891
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0	6.029	6.917	42.085	-6.64E-15	25.288	-44.964
		-0.871619	8.137	12.076	-63.000	643.570	-52.891
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0.325	6.029	6.917	37.461	-6.64E-15	38.214	-42.715
		-1.005	8.137	4.151	-63.000	646.207	-50.246
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0.650	6.029	6.917	32.836	-6.64E-15	49.637	-40.467
		-1.138	8.137	-3.774	-63.000	646.268	-47.602
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	0.975	6.029	6.917	28.211	-6.64E-15	59.557	-38.219
		-1.270	8.137	-11.699	-63.000	643.754	-44.957
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
91	1.300	6.029	6.917	23.586	-6.64E-15	67.974	-35.971
		-1.403	8.137	-19.623	-63.000	638.664	-42.313
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0	6.029	6.917	23.586	3.61E-13	67.974	-35.971
		-1.403	8.137	-19.623	-63.000	638.664	-42.313
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0.325	6.029	6.917	18.961	3.61E-13	74.888	-33.723
		-1.536	8.137	-69.548	2.13E-14	625.749	-39.666
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0.650	6.029	6.917	14.336	3.61E-13	80.298	-31.475
		-1.669	8.137	-77.473	2.13E-14	601.858	-37.024
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	0.975	6.029	6.917	9.711	3.61E-13	84.206	-29.226
		-1.802	8.137	-85.398	2.13E-14	575.392	-34.379
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
92	1.300	6.029	6.917	5.086	3.61E-13	86.610	-26.978
		-1.935	8.137	-93.322	2.13E-14	546.350	-31.734
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
93	0	6.029	6.917	5.086	2.43E-13	86.610	-26.978
		-1.935	8.137	-93.322	3.44E-13	546.350	-31.734
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
93	0.325	6.029	6.917	0.460898	2.43E-13	87.512	-24.730
		-2.068	8.137	-101.247	3.44E-13	514.732	-29.090
		Min: B D F G J P AO		Max: A C E H I K S AM AP AQ			
93	0.650	6.029	6.917	-4.164	2.43E-13	86.910	-22.482
		-1.950	8.137	-71.357	-126.000	492.039	-26.445
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
93	0.975	6.029	6.917	-8.789	2.43E-13	84.805	-20.234
		-2.083	8.137	-79.282	-126.000	467.561	-23.801
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
93	1.300	6.029	6.917	-13.414	2.43E-13	81.197	-17.985
		-2.216	8.137	-87.206	-126.000	440.506	-21.156
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0	6.029	6.917	-13.414	3.77E-13	81.197	-17.985
		-2.216	8.137	-87.206	-126.000	440.506	-21.156
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0.325	6.029	6.917	-18.039	3.77E-13	76.086	-15.737
		-2.349	8.137	-137.131	-63.000	407.726	-18.512
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0.650	6.029	6.917	-22.664	3.77E-13	69.472	-13.489
		-2.482	8.137	-145.056	-63.000	361.871	-15.867
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	0.975	6.029	6.917	-27.289	3.77E-13	61.354	-11.241
		-2.615	8.137	-152.981	-63.000	313.440	-13.223
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
94	1.300	6.029	6.917	-31.914	3.77E-13	51.734	-8.993
		-2.748	8.137	-160.906	-63.000	262.434	-10.578
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0	6.029	6.917	-31.914	7.46E-13	51.734	-8.993
		-2.748	8.137	-160.906	-63.000	262.434	-10.578
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0.325	6.029	6.917	-36.539	7.46E-13	40.610	-6.745
		-2.881	8.137	-168.830	-63.000	208.852	-7.934
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0.650	6.029	6.917	-41.164	7.46E-13	27.984	-4.496
		-3.014	8.137	-218.755	1.44E-12	144.294	-5.289
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	0.975	6.029	6.917	-45.789	7.46E-13	13.854	-2.248
		-3.147	8.137	-226.680	1.44E-12	71.911	-2.645
		Min: B D F G J P AO		Max: A C E H I K T AM AP AQ			
95	1.300	5.867	6.917	-103.558	7.46E-13	-3.048	-9.41E-08
		-3.118	8.137	-181.460	1.44E-12	-1.779	-1.10E-07
		Min: A C E G J K P AO		Max: B D F H I T AM AP AQ			
96	0	0.204525	9.77E-09	12.192	1.55E-12	-3.048	2.66E-11
		-1.43E-11	9.89E-09	7.115	-3.37E-13	-1.779	-7.69E-10
		Min: A C E H I K S AM AP		Max: B D F G J P AO AQ			
96	0.125	0.153394	9.77E-09	9.144	1.55E-12	-1.714	1.25E-09
		-1.43E-11	9.89E-09	5.336	-3.37E-13	-1.001	4.68E-10
		Min: A C E H I K S AM AP		Max: B D F G J P AO AQ			
96	0.250	0.102262	9.99E-09	6.096	1.17E-12	-0.761998	2.48E-09
		-1.43E-11	9.89E-09	3.558	-3.37E-13	-0.444707	1.70E-09
		Min: A C E H I K T AM AP		Max: B D F G J P AO AQ			
96	0.375	0.051131	9.99E-09	3.048	1.17E-12	-0.190500	3.73E-09
		-1.43E-11	9.89E-09	1.779	-3.37E-13	-0.111177	2.94E-09
		Min: A C E H I K T AM AP		Max: B D F G J P AO AQ			
96	0.500	2.02E-09	9.99E-09	1.22E-07	1.17E-12	-3.54E-12	4.97E-09
		-1.43E-11	9.89E-09	7.12E-08	-3.37E-13	4.28E-13	4.18E-09

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E H I K T AM AP AQ			Max: E D F G J P AO		
290	0	-360.888	-2.195	-11.098	-1.848	-18.638	17.438
		-360.888	-2.195	7.531	1.932	57.877	17.438
		Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ BH CD		
290	3.300	-360.888	-2.195	-11.098	-1.848	-55.260	10.195
		-360.888	-2.195	7.828	1.932	83.219	10.195
		Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ EH CD		
290	6.600	-484.462	-2.859	-17.618	1.133	-110.878	-1.675
		-484.462	-2.859	14.645	-1.048	128.537	-1.675
		Min: AR AT AV AX BA BV			Max: AR AT AV AX AZ BD CD		
290	9.900	-400.509	-2.330	-17.618	1.133	-169.016	-7.667
		-400.509	-2.330	14.942	-1.048	177.355	-7.667
		Min: AR AT AV AX BA BT			Max: AR AT AV AX AZ EE CD		
290	13.200	-400.509	-2.330	-17.618	1.133	-227.154	-15.358
		-400.509	-2.330	15.239	-1.048	227.154	-15.358
		Min: AR AT AV AX BA ET			Max: AR AT AV AX AZ ES CD		
291	0	-360.888	2.195	-11.098	1.848	-18.638	-17.438
		-360.888	2.195	7.531	-1.932	57.877	-17.438
		Min: AR AT AV AX BA BV			Max: AR AT AV AX AZ BD CD		
291	3.300	-360.888	2.195	-11.098	1.848	-55.260	-10.195
		-360.888	2.195	7.828	-1.932	83.219	-10.195
		Min: AR AT AV AX BA BV			Max: AR AT AV AX AZ BD CD		
291	6.600	-484.462	2.859	-17.618	-1.133	-110.878	1.675
		-484.462	2.859	14.645	1.048	128.537	1.675
		Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ EH CD		
291	9.900	-484.462	2.859	-17.618	-1.133	-169.016	11.111
		-484.462	2.859	14.942	1.048	177.355	11.111
		Min: AR AT AV AX BA BZ			Max: AR AT AV AX AZ EH CD		
291	13.200	-484.462	2.859	-17.618	-1.133	-227.154	20.546
		-484.462	2.859	15.239	1.048	227.154	20.546
		Min: AR AT AV AX BA EZ			Max: AR AT AV AX AZ BH CD		

Características mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

Area	Ax = 46.53E3 cm2		
Momento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4
Const. de torsión			Ix = 50.83E6 cm4
Momento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3	
Baricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad
Dist. al borde	yl = -3.8500 m	yr = 3.8500 m	
	zo = 0.4014 m	zu = -0.4986 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = 0.0000 m z = 0.4986 m

Contorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

Armadura "B1" As-tot =2.0000 cm2 (0.00 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
AR 2 / CS 1	AEH500	1.0	2	1.0000	-3.7500	0.7800
					3.7500	0.7800
AR 1 / CS 1	AEH500	1.0	2	1.0000	-1.8000	0.0600
					1.8000	0.0600

Dimensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	646.2700	0.0000	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

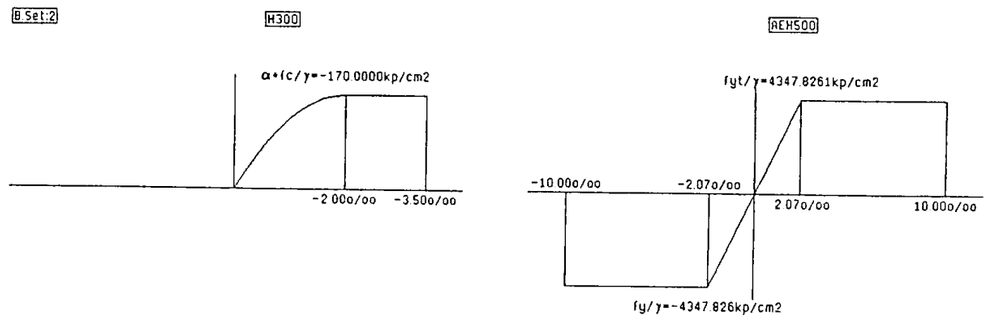
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	----	1.0000
1 AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	194.1145	194.1145

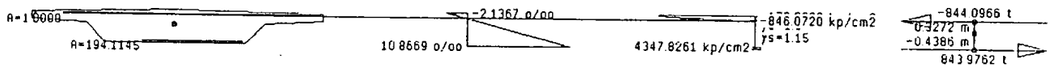
Mix.x/h = 0.18 As-top/bot = 1.0000/194.1145 As = 0.42 % = 195.1145

18 ϕ 25 + 18 ϕ 32 (233.10 cm²)

Material acorde a la sección: "TABVANOL"



Dimensionamiento, Sección "TABVANOL"



madura "B1" As-tot =195.1145 cm2 (0.42 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 2 / CS 1	AEH500	1.0	2	1.0000	-3.7500	0.7800
					3.7500	0.7800
LR 1 / CS 1	AEH500	1.0	2	194.1145	-1.8000	0.0600
					1.8000	0.0600

Dimensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	-774.5900	0.0000	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

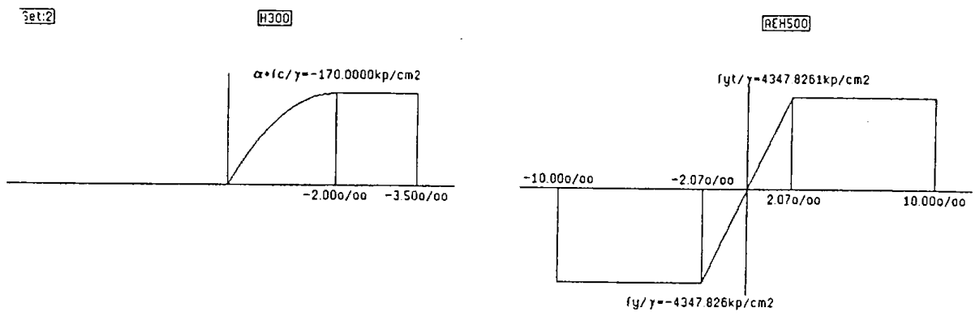
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No	Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
1	AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	257.6408	257.6408
	AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	----	1.0000

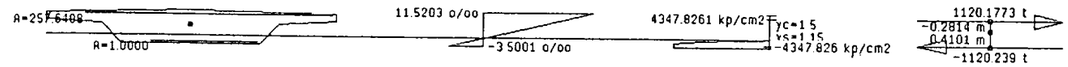
Max.x/h = 0.27 As-top/bot = 257.6408/1.0000 As = 0.56 % = 258.6408

φ20/0.20 x 7.60m +
23 φ 25 + 14 φ 20 (276.21cm²)

Material acorde a la sección: "TABVANOL"



Dimensionamiento,Sección "TABVANOL"



Características mecánicas Sección "TABVANOL" (sin coef. homogeneiz.)

Area	Ax = 46.53E3 cm2			
Momento de inercia	Iy = 28.62E6 cm4	Iz = 1.372E9 cm4	Ip = 1.400E9 cm4	
Const. de torsión			Ix = 50.83E6 cm4	
Momento estático	Zy =998.79E3 cm3	Zz = 6.642E6 cm3		
Baricentro	ys = 0.0000 m	zs = 0.4986 m	Angulo= 0.0 Grad	
Dist. al borde	yl = -3.8500 m	yr = 3.8500 m		
	zo = 0.4014 m	zu = -0.4986 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = 0.0000 m z = 0.4986 m

Contorno de sección parcial, Sección "TABVANOL" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	46530.5	1625.531	5.08E+07	3)

Puntos de contorno [m]:

1	-1.8500	0.0000	2	1.8500	0.0000	3	2.3500	0.5230
4	3.8500	0.6230	5	3.8500	0.8230	6	0.0000	0.9000
7	-3.8500	0.8230	8	-3.8500	0.6230	9	-2.3500	0.5230
10	-1.8500	0.0000						

Armadura "B1" As-tot =258.6408 cm2 (0.56 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 2 / CS 1	AEH500	1.0	2	257.6408	-3.7500	0.7800
					3.7500	0.7800
LR 1 / CS 1	AEH500	1.0	2	1.0000	-1.8000	0.0600
					1.8000	0.0600

Dimensionamiento a flexión: Viga Sección "TABVANOL"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-0.0000	818.4600	0.0000	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

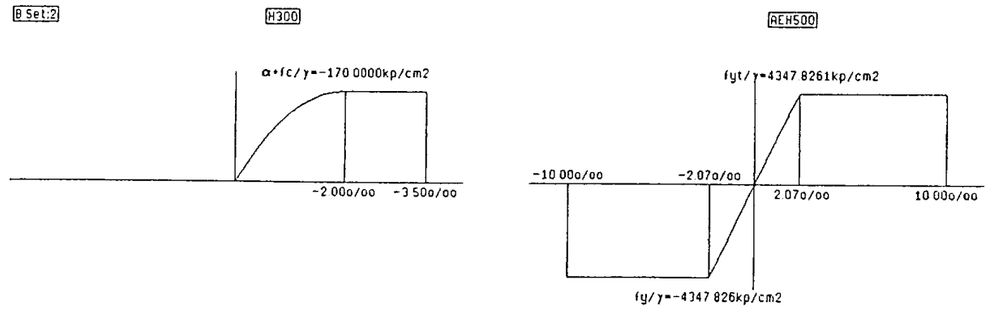
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No	Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
	AEH500	-3.7500	0.7800	3.7500	0.7800	1.0000	----	1.0000
1	AEH500	-1.8000	0.0600	1.8000	0.0600	1.0000	248.5995	248.5995

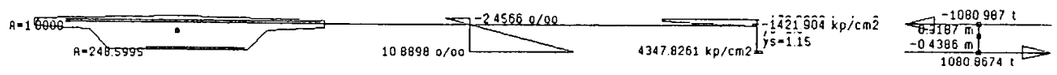
Max.x/h = 0.20 As-top/bot = 1.0000/248.5995 As = 0.54 % = 249.5995

18 ϕ 25 + 18 ϕ 32 + 4 ϕ 25.
(252,74 cm²)

Material acorde a la sección: "TABVANOL"

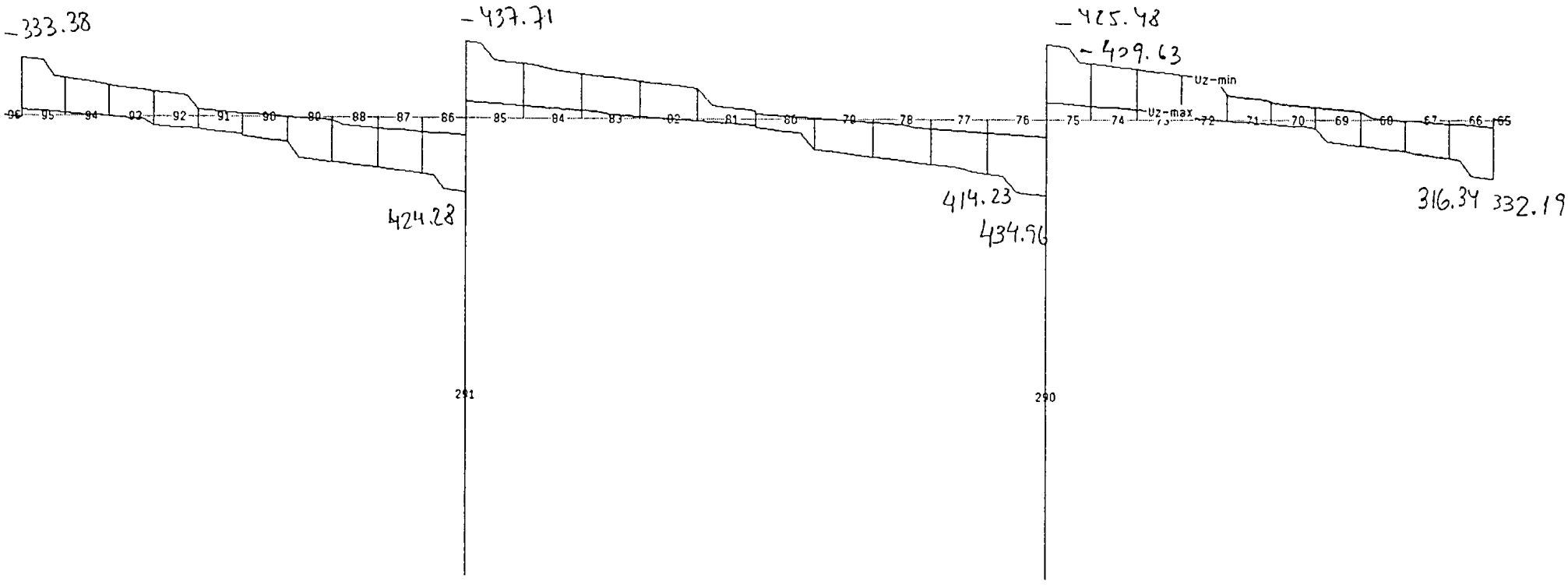


Dimensionamiento, Sección "TABVANOL"



2.4.1.3. Verificación de las secciones a esfuerzos de cortante (E.L.U.)

Scale 1 : 173.7
Int. Forces envelope Vz, GWSP ES (COMBINACION FZAS EXTERIORES), Subsys. "LIST"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 5.00E-03
  min: -4.38E+02 max: 9.76E+01 [t]
- Envelope Shear force Vz-max, Scale 5.00E-03
  min: -9.90E+01 max: 4.35E+02 [t]



ENVELOPE SPECIFIC.: ES 'COMBINACION FZAS EXTERIORES'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	2	2.025		PESO PAVIMENTO
D	OR	2	1.000		PESO PAVIMENTO
E	PL.PERM	3	1.350		PESO BARRERAS
F	OR	3	1.000		PESO BARRERAS
G	PL.PERM	5	1.350		RETRACCION
H	OR	5	1.000		RETRACCION
I	PLUS	6	1.500		SOB UNIF 1
J	PLUS	7	1.500		SOBRECARGA UNIF 2
K	PLUS	8	1.500		SOB UNIF 3
L	PLUS	11	4.220		VEHICULO HIPOTESIS 11
M	OR	12	4.220		VEHICULO HIPOTESIS 12
N	OR	13	4.220		VEHICULO HIPOTESIS 13
O	OR	14	4.220		VEHICULO HIPOTESIS 14
P	OR	15	4.220		VEHICULO HIPOTESIS 15
Q	OR	16	4.220		VEHICULO HIPOTESIS 16
R	OR	17	4.220		VEHICULO HIPOTESIS 17
S	OR	18	4.220		VEHICULO HIPOTESIS 18
T	OR	19	4.220		VEHICULO HIPOTESIS 19
U	OR	20	4.220		VEHICULO HIPOTESIS 20
V	OR	21	4.220		VEHICULO HIPOTESIS 21
W	OR	22	4.220		VEHICULO HIPOTESIS 22
X	OR	23	4.220		VEHICULO HIPOTESIS 23
Y	OR	24	4.220		VEHICULO HIPOTESIS 24
Z	OR	25	4.220		VEHICULO POSICION 25
AA	OR	26	4.220		VEHICULO POSICION 26
AE	OR	27	4.220		VEHICULO POSICION 27
AC	OR	28	4.220		VEHICULO POSICION 28
AD	OR	29	4.220		VEHICULO POSICION 29
AE	OR	30	4.220		VEHICULO POSICION 30
AF	OR	31	4.220		VEHICULO POSICION 31
AG	OR	32	4.220		VEHICULO POSICION 32
AH	OR	33	4.220		VEHICULO POSICION 33
AI	OR	34	4.220		VEHICULO POSICION 34
AJ	OR	35	4.220		VEHICULO POSICION 35
AK	OR	36	4.220		VEHICULO POSICION 36
AL	OR	37	4.220		VEHICULO HIPOTESIS 37
AM	PLUS	60	1.500		FRENADO
AN	PLUS	63	0.450000		VIENTO TRANSV CON SOE
AO	PLUS	64	0.900000		TEMPERATURA (-)
AP	OR	65	0.900000		TEMPERATURA (+)
AQ	PLUS	66	0.900000		GRADIENTE

ALTERNATIVE ENVELOPE :

AR	PERM.	1	1.350	PESO PROPIO
AS	OR	1	1.000	PESO PROPIO
AT	PL.PERM	2	2.025	PESO PAVIMENTO
AU	OR	2	1.000	PESO PAVIMENTO
AV	PL.PERM	3	1.350	PESO BARRERAS
AW	OR	3	1.000	PESO BARRERAS
AX	PL.PERM	5	1.350	RETRACCION
AY	OR	5	1.000	RETRACCION
AZ	PLUS	9	1.500	SOB UNIF EXC
BA	PLUS	10	1.500	SOB UNIF EXC
BB	PLUS	11	4.220	VEHICULO HIPOTESIS 11
BC	OR	12	4.220	VEHICULO HIPOTESIS 12
BD	OR	13	4.220	VEHICULO HIPOTESIS 13
BE	OR	14	4.220	VEHICULO HIPOTESIS 14
BF	OR	15	4.220	VEHICULO HIPOTESIS 15
BG	OR	16	4.220	VEHICULO HIPOTESIS 16
BH	OR	17	4.220	VEHICULO HIPOTESIS 17
BI	OR	18	4.220	VEHICULO HIPOTESIS 18
BJ	OR	19	4.220	VEHICULO HIPOTESIS 19
BK	OR	20	4.220	VEHICULO HIPOTESIS 20
BL	OR	21	4.220	VEHICULO HIPOTESIS 21
BM	OR	22	4.220	VEHICULO HIPOTESIS 22
BN	OR	23	4.220	VEHICULO HIPOTESIS 23
BO	OR	24	4.220	VEHICULO HIPOTESIS 24
BP	OR	25	4.220	VEHICULO POSICION 25
BQ	OR	26	4.220	VEHICULO POSICION 26
BR	OR	27	4.220	VEHICULO POSICION 27
BS	OR	28	4.220	VEHICULO POSICION 28
BT	OR	29	4.220	VEHICULO POSICION 29
BU	OR	30	4.220	VEHICULO POSICION 30
BV	OR	31	4.220	VEHICULO POSICION 31
BW	OR	32	4.220	VEHICULO POSICION 32
BX	OR	33	4.220	VEHICULO POSICION 33
BY	OR	34	4.220	VEHICULO POSICION 34
BZ	OR	35	4.220	VEHICULO POSICION 35
CA	OR	36	4.220	VEHICULO POSICION 36
CB	OR	37	4.220	VEHICULO HIPOTESIS 37
CC	PLUS	60	1.500	FRENADO
CD	PLUS	63	0.450000	VIENTO TRANSV CON SOE
CE	PLUS	64	0.900000	TEMPERATURA (-)
CF	OR	65	0.900000	TEMPERATURA (+)
CG	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-8.21E-12	1.74E-08	-1.22E-07	-9.54E-13	6.01E-13	-2.51E-09
		-2.05E-09	-4.99E-10	-7.12E-08	4.98E-13	-1.24E-12	2.66E-09
		Min: AR AT AV AX AZ BA BC...				Max: B D F H P AM AO AQ	
65	0.125	-8.21E-12	1.74E-08	-3.048	-9.54E-13	-0.190500	-3.35E-10
		-0.051131	-4.99E-10	-1.779	4.98E-13	-0.111177	2.60E-09
		Min: AR AT AV AX AZ BA BC...				Max: B D F H P AM AO AQ	
65	0.250	-8.21E-12	1.74E-08	-6.096	-9.54E-13	-0.761898	1.84E-09
		-0.102263	-4.99E-10	-3.558	4.98E-13	-0.444707	2.54E-09
		Min: AR AT AV AX AZ BA BC...				Max: B D F H P AM AO AQ	
65	0.375	-8.21E-12	1.74E-08	-9.144	-9.54E-13	-1.714	4.02E-09

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.153394	-4.99E-10	-5.336	4.98E-13	-1.001	2.47E-09
		Min: AR AT AV AX AZ BA BC...				Max: B D F H P AM AO AQ	
65	0.500	-8.21E-12	1.74E-08	-12.192	-9.54E-13	-3.048	6.19E-09
		-0.204525	-4.99E-10	-7.115	4.98E-13	-1.779	2.41E-09
		Min: AR AT AV AX AZ BA BC...				Max: B D F H P AM AO AQ	
66	0	8.794	-13.901	37.688	1.75E-13	-1.779	-1.91E-07
		-0.738234	-16.352	332.190	-1.34E-13	-3.048	-2.23E-07
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
66	0.325	8.661	-13.901	33.063	1.75E-13	9.718	-4.518
		-0.738234	-16.352	324.265	-1.34E-13	103.626	-5.314
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
66	0.650	8.528	-13.901	28.438	1.75E-13	19.712	-9.036
		-0.738234	-16.352	316.340	-1.34E-13	207.724	-10.629
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
66	0.975	8.395	-13.901	23.813	1.75E-13	28.203	-13.553
		-0.738234	-16.352	224.015	126.600	298.697	-15.943
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
66	1.300	8.262	-13.901	19.188	1.75E-13	35.190	-18.071
		-0.738234	-16.352	216.091	126.600	370.214	-21.257
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
67	0	8.262	-13.901	19.188	1.75E-13	35.190	-18.071
		-0.738234	-16.352	216.091	126.600	370.214	-21.257
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
67	0.325	8.129	-13.901	14.563	1.75E-13	40.675	-22.589
		-0.738234	-16.352	208.166	126.600	439.156	-26.571
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
67	0.650	7.996	-13.901	9.938	1.75E-13	44.656	-27.107
		-0.736234	-16.352	200.241	126.600	505.522	-31.886
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
67	0.975	7.863	-13.901	5.313	1.75E-13	47.134	-31.624
		-0.738234	-16.352	192.316	126.600	569.313	-37.200
		Min: B D F G J P AM AO				Max: A C E H I K L AP AQ	
67	1.300	7.730	-13.901	0.687888	1.75E-13	48.109	-36.142
		-1.242	-16.352	175.982	2.03E-13	536.923	-42.514
		Min: B D F G J P AM AO				Max: A C E H I K M AP AQ	
68	0	7.730	-13.901	0.687888	1.75E-13	48.109	-36.142
		-1.242	-16.352	175.982	2.03E-13	536.923	-42.514
		Min: B D F G J P AM AO				Max: A C E H I K M AP AQ	
68	0.325	7.597	-13.901	-3.937	1.75E-13	47.581	-40.660
		-1.242	-16.352	168.057	2.03E-13	592.830	-47.826
		Min: B D F G J P AM AO				Max: A C E H I K M AP AQ	
68	0.650	7.464	-13.901	-8.562	1.75E-13	45.550	-45.178
		-1.242	-16.352	160.133	2.03E-13	646.161	-53.143
		Min: B D F G J P AM AO				Max: A C E H I K M AP AQ	
68	0.975	7.331	-13.901	-13.187	1.75E-13	42.016	-49.696
		-1.242	-16.352	152.208	2.03E-13	696.916	-58.457
		Min: B D F G J P AM AO				Max: A C E H I K M AP AQ	

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0	4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-6.12E-13	449.374	-127.542
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0.325	4.360	-16.352	-233.715	379.800	548.679	-132.856
		-0.801778	-16.352	-2.284	-6.12E-13	449.383	-132.856
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0.650	4.227	-16.352	-241.640	379.800	471.434	-138.171
		-0.801778	-16.352	-6.909	-6.12E-13	447.889	-138.171
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0.975	4.094	-16.352	-249.564	379.800	391.614	-143.485
		-0.801778	-16.352	-11.534	-6.12E-13	444.892	-143.485
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	1.300	3.961	-16.352	-257.489	379.800	309.218	-148.799
		-0.801778	-16.352	-16.159	-6.12E-13	440.392	-148.799
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
73	0	3.961	-16.352	-257.489	379.800	309.217	-148.799
		-0.801778	-16.352	-16.159	-2.89E-12	440.392	-148.799
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
73	0.325	3.826	-16.352	-265.414	379.800	224.246	-154.113
		0.810842	-11.450	-47.936	-1.53E-12	178.478	-107.917
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
73	0.650	3.695	-16.352	-273.339	379.800	136.698	-159.428
		0.810842	-11.450	-52.561	-1.53E-12	162.147	-111.639
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
73	0.975	3.562	-16.352	-281.264	379.800	46.576	-164.742
		0.810842	-11.450	-57.186	-1.53E-12	144.313	-115.360
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
73	1.300	3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-1.53E-12	124.976	-119.081
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0	3.429	-16.352	-289.186	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-2.52E-12	124.976	-119.081
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0.325	3.296	-16.352	-297.113	379.800	-141.397	-175.371
		0.810842	-11.450	-66.436	-2.52E-12	104.135	-122.803
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0.650	3.163	-16.352	-305.038	379.800	-239.246	-180.685
		0.810842	-11.450	-71.061	-2.52E-12	81.792	-126.524
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0.975	3.030	-16.352	-312.963	379.800	-339.671	-185.999
		0.810842	-11.450	-75.686	-2.52E-12	57.945	-130.245
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	1.300	2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-2.52E-12	32.596	-133.966
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
68	1.300	6.754	-16.352	-51.430	379.800	500.888	-63.771
		-1.242	-16.352	144.283	2.03E-13	745.096	-63.771
		Min: B D F G J L AM AO				Max: A C E H I K M AP AQ	
69	0	6.754	-16.352	-51.430	379.800	500.888	-63.771
		-1.242	-16.352	144.283	1.60E-12	745.096	-63.771
		Min: B D F G J L AM AO				Max: A C E H I K M AP AQ	
69	0.325	6.621	-16.352	-56.055	379.800	483.422	-69.085
		-1.242	-16.352	136.358	1.60E-12	790.700	-69.085
		Min: B D F G J L AM AO				Max: A C E H I K M AP AQ	
69	0.650	6.488	-16.352	-60.680	379.800	464.452	-74.400
		-1.242	-16.352	128.433	1.60E-12	833.729	-74.400
		Min: B D F G J L AM AO				Max: A C E H I K M AP AQ	
69	0.975	6.355	-16.352	-65.696	379.800	505.016	-79.714
		-1.242	-16.352	120.900	1.60E-12	813.145	-79.714
		Min: A C E G J L AM AO				Max: B D F H I K M AP AQ	
69	1.300	6.222	-16.352	-72.061	379.800	482.630	-85.028
		-0.964122	-16.352	41.819	6.01E-13	472.373	-85.028
		Min: A C E G J L AM AO				Max: B D F H I K N AP AQ	
70	0	6.222	-16.352	-72.061	379.800	482.630	-85.028
		-0.964122	-16.352	41.819	6.22E-13	472.373	-85.028
		Min: A C E G J L AM AO				Max: B D F H I K N AP AQ	
70	0.325	6.089	-16.352	-78.426	379.800	458.176	-90.342
		-0.964122	-16.352	35.634	6.22E-13	484.959	-90.342
		Min: A C E G J L AM AO				Max: B D F H I K N AP AQ	
70	0.650	5.794	-16.352	-85.432	379.800	509.435	-95.657
		-0.801778	-16.352	30.090	6.22E-13	417.753	-95.657
		Min: A C E G I J L AM AO				Max: B D F H K N AP AQ	
70	0.975	5.661	-16.352	-93.357	379.800	480.382	-100.971
		-0.801778	-16.352	25.465	6.22E-13	426.781	-100.971
		Min: A C E G I J L AM AO				Max: B D F H K N AP AQ	
70	1.300	5.528	-16.352	-101.282	379.800	448.753	-106.285
		-0.801778	-16.352	20.840	6.22E-13	434.306	-106.285
		Min: A C E G I J L AM AO				Max: B D F H K N AP AQ	
71	0	5.025	-16.352	-109.691	253.200	769.672	-106.285
		-0.801778	-16.352	20.840	-3.88E-13	434.306	-106.285
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
71	0.325	4.892	-16.352	-117.616	253.200	732.734	-111.599
		-0.801778	-16.352	16.215	-3.88E-13	440.327	-111.599
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
71	0.650	4.759	-16.352	-125.541	253.200	693.221	-116.914
		-0.801778	-16.352	11.591	-3.88E-13	444.846	-116.914
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
71	0.975	4.626	-16.352	-133.465	253.200	651.133	-122.228
		-0.801778	-16.352	6.966	-3.88E-13	447.861	-122.228
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
71	1.300	4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-3.88E-13	449.374	-127.542

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0	4.493	-16.352	-141.390	253.200	606.469	-127.542
		-0.801778	-16.352	2.341	-6.12E-13	449.374	-127.542
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0.325	4.360	-16.352	-233.715	379.800	548.679	-132.856
		-0.801778	-16.352	-2.284	-6.12E-13	449.383	-132.856
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0.650	4.227	-16.352	-241.640	379.800	471.434	-138.171
		-0.801778	-16.352	-6.909	-6.12E-13	447.889	-138.171
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	0.975	4.094	-16.352	-249.564	379.800	391.614	-143.485
		-0.801778	-16.352	-11.534	-6.12E-13	444.892	-143.485
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
72	1.300	3.961	-16.352	-257.489	379.800	309.218	-148.799
		-0.801778	-16.352	-16.159	-6.12E-13	440.392	-148.799
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
73	0	3.961	-16.352	-257.489	379.800	309.217	-148.799
		-0.801778	-16.352	-16.159	-2.89E-12	440.392	-148.799
		Min: A C E G I J M AM AO				Max: B D F H K N AP AQ	
73	0.325	3.826	-16.352	-265.414	379.800	224.246	-154.113
		0.810842	-11.450	-47.936	-1.53E-12	178.478	-107.917
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
73	0.650	3.695	-16.352	-273.339	379.800	136.698	-159.428
		0.810842	-11.450	-52.561	-1.53E-12	162.147	-111.639
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
73	0.975	3.562	-16.352	-281.264	379.800	46.576	-164.742
		0.810842	-11.450	-57.186	-1.53E-12	144.313	-115.360
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
73	1.300	3.429	-16.352	-289.188	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-1.53E-12	124.976	-119.081
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0	3.429	-16.352	-289.186	379.800	-46.123	-170.056
		0.810842	-11.450	-61.811	-2.52E-12	124.976	-119.081
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0.325	3.296	-16.352	-297.113	379.800	-141.397	-175.371
		0.810842	-11.450	-66.436	-2.52E-12	104.135	-122.803
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0.650	3.163	-16.352	-305.038	379.800	-239.246	-180.685
		0.810842	-11.450	-71.061	-2.52E-12	81.792	-126.524
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	0.975	3.030	-16.352	-312.963	379.800	-339.671	-185.999
		0.810842	-11.450	-75.686	-2.52E-12	57.945	-130.245
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
74	1.300	2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-2.52E-12	32.596	-133.966
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
75	0	2.897	-16.352	-320.887	379.800	-442.672	-191.313
		0.810842	-11.450	-80.311	-3.08E-12	32.596	-133.966
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
75	0.325	2.765	-16.352	-328.812	379.800	-548.248	-196.628
		0.810842	-11.450	-84.936	-3.08E-12	5.743	-137.688
		Min: A C E G I J M AM AO				Max: B D F H K S AP AQ	
75	0.650	2.909	-16.352	-409.633	379.800	-505.888	-201.942
		0.810842	-11.450	-89.561	-3.08E-12	-22.613	-141.409
		Min: A C E G I J N AM AO				Max: B D F H K S AP AQ	
75	0.975	2.776	-16.352	-417.558	379.800	-640.307	-207.256
		0.810842	-11.450	-94.186	-3.08E-12	-52.471	-145.130
		Min: A C E G I J N AM AO				Max: B D F H K S AP AQ	
75	1.300	2.644	-16.352	-425.483	379.800	-777.301	-212.570
		0.810842	-11.450	-98.811	-3.08E-12	-83.833	-148.852
		Min: A C E G I J N AM AO				Max: B D F H K S AP AQ	
76	0	7.040	-4.100	96.301	-127.576	-215.069	-145.511
		3.526	2.967	434.962	-234.993	-616.520	-205.582
		Min: B D F H K S AM AP				Max: A C E G I J O AO AQ	
76	0.425	6.866	-4.100	90.253	-127.576	-175.427	-147.254
		3.526	2.967	424.599	-234.993	-433.863	-204.322
		Min: B D F H K S AM AP				Max: A C E G I J O AO AQ	
76	0.850	6.692	-4.100	84.205	-127.576	-138.355	-148.997
		3.526	2.967	414.236	-234.993	-255.611	-203.061
		Min: B D F H K S AM AP				Max: A C E G I J O AO AQ	
76	1.275	6.518	-4.100	78.156	-127.576	-103.853	-150.739
		3.526	2.967	319.473	-108.393	-117.633	-201.800
		Min: B D F H K S AM AP				Max: A C E G I J O AO AQ	
76	1.700	6.344	-4.100	72.108	-127.576	-71.922	-152.482
		3.526	2.967	309.109	-108.393	15.941	-200.539
		Min: B D F H K S AM AP				Max: A C E G I J O AO AQ	
77	0	6.344	-4.100	72.108	-127.576	-71.922	-152.482
		3.526	2.967	309.109	-108.393	15.941	-200.539
		Min: B D F H K S AM AP				Max: A C E G I J O AO AQ	
77	0.425	6.170	-4.100	66.060	-127.576	-42.561	-154.225
		3.526	2.967	298.746	-108.393	145.110	-199.278
		Min: B D F H K S AM AP				Max: A C E G I J O AO AQ	
77	0.850	5.997	-4.100	60.012	-127.576	-15.770	-155.967
		-0.641686	5.23E-09	274.803	-189.900	19.158	-180.365
		Min: B D F H K S AM AP				Max: A C E G I J P AO AQ	
77	1.275	5.823	-4.100	53.964	-127.576	8.450	-157.710
		-0.641686	5.23E-09	264.440	-189.900	133.747	-180.365
		Min: B D F H K S AM AP				Max: A C E G I J P AO AQ	
77	1.700	5.649	-4.100	47.916	-127.576	30.100	-159.453
		-0.641686	5.23E-09	254.077	-189.900	243.932	-180.365
		Min: B D F H K S AM AP				Max: A C E G I J P AO AQ	
78	0	5.649	-4.100	47.916	-127.576	30.100	-159.453
		-0.641686	4.63E-09	254.077	-189.900	243.932	-180.365

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min: B D F H K S AM AP			Max: A C E G I J P AO AQ			
78	0.425	5.475	-4.100	41.868	-127.576	49.179	-161.195
		-0.641686	4.63E-09	243.713	-189.900	349.712	-180.365
	Min: B D F H K S AM AP			Max: A C E G I J P AO AQ			
78	0.850	-2.783	2.967	25.996	144.807	320.860	-192.974
		-0.641686	4.63E-09	233.350	-189.900	451.088	-180.365
	Min: B D F H K O AM AP			Max: A C E G I J P AO AQ			
78	1.275	-2.956	2.967	19.948	144.807	330.623	-191.713
		-0.641686	4.63E-09	222.987	-189.900	548.060	-180.365
	Min: B D F H K O AM AP			Max: A C E G I J P AO AQ			
78	1.700	-3.130	2.967	13.900	144.807	337.816	-190.452
		-0.641686	4.63E-09	212.624	-189.900	640.627	-180.365
	Min: B D F H K O AM AP			Max: A C E G I J P AO AQ			
79	0	-4.175	2.967	13.900	144.807	502.695	-190.452
		0.403304	4.11E-09	212.624	-189.900	475.748	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
79	0.425	-4.345	2.967	7.852	144.807	507.318	-189.191
		0.403304	4.11E-09	202.261	-189.900	563.911	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
79	0.850	-4.523	2.967	1.804	144.807	509.370	-187.930
		0.403304	4.11E-09	191.897	-189.900	647.670	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
79	1.275	-4.697	2.967	-4.244	144.807	508.851	-186.669
		0.403304	4.11E-09	181.534	-189.900	727.024	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
79	1.700	-4.871	2.967	-10.292	144.807	505.762	-185.408
		0.403304	4.11E-09	171.171	-189.900	801.974	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
80	0	-4.871	2.967	-10.292	144.807	505.762	-185.408
		0.403304	3.94E-09	171.171	-189.900	801.974	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
80	0.425	-5.044	2.967	-16.340	144.807	500.103	-184.147
		0.403304	3.94E-09	76.408	-63.300	853.529	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
80	0.850	-5.218	2.967	-22.388	144.807	491.873	-182.887
		0.403304	3.94E-09	66.045	-63.300	883.800	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
80	1.275	-5.392	2.967	-28.436	144.807	481.073	-181.626
		0.403304	3.94E-09	55.682	-63.300	909.667	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
80	1.700	-5.566	2.967	-34.484	144.807	467.703	-180.365
		0.403304	3.94E-09	45.318	-63.300	931.130	-180.365
	Min: B D F H K O AM AP AQ			Max: A C E G I J P AO			
81	0	-11.847	3.62E-09	-48.064	63.300	1085.477	-180.365
		6.684	-2.967	31.738	-144.807	313.356	-180.365
	Min: A C E H J K P AM AP AQ			Max: B D F G I Q AO			
81	0.425	-12.021	3.62E-09	-58.427	63.300	1062.847	-180.365

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
84	0.850	-13.236	3.51E-09	-277.549	189.900	-172.590	-180.365
		13.723	4.100	-62.758	127.576	143.305	-155.967
	Min: A C E H J K P AM AP			Max: B D F G I M AO AQ			
84	1.275	-9.241	-2.967	-301.492	108.393	-47.805	-199.278
		13.723	4.100	-68.806	127.576	115.347	-154.225
	Min: A C E H J K Q AM AP			Max: B D F G I M AO AQ			
84	1.700	-9.415	-2.967	-311.855	108.393	-178.142	-200.539
		13.723	4.100	-74.854	127.576	84.819	-152.482
	Min: A C E H J K Q AM AP			Max: B D F G I M AO AQ			
85	0	-9.415	-2.967	-311.855	108.393	-178.142	-200.539
		13.723	4.100	-74.854	127.576	84.819	-152.482
	Min: A C E H J K Q AM AP			Max: B D F G I M AO AQ			
85	0.425	-9.585	-2.967	-322.218	108.393	-312.882	-201.800
		13.723	4.100	-80.902	127.576	51.721	-150.739
	Min: A C E H J K Q AM AP			Max: B D F G I M AO AQ			
85	0.850	-9.763	-2.967	-332.581	108.393	-452.027	-203.061
		13.723	4.100	-86.950	127.576	16.052	-148.997
	Min: A C E H J K Q AM AP			Max: B D F G I M AO AQ			
85	1.275	-9.937	-2.967	-427.345	234.993	-631.446	-204.322
		13.723	4.100	-92.998	127.576	-22.187	-147.254
	Min: A C E H J K Q AM AP			Max: B D F G I M AO AQ			
85	1.700	-10.111	-2.967	-437.708	234.993	-815.270	-205.582
		13.723	4.100	-99.046	127.576	-62.996	-145.511
	Min: A C E H J K Q AM AP			Max: B D F G I M AO AQ			
86	0	3.365	11.450	97.611	-1.01E-12	-68.240	-148.852
		5.197	16.352	424.283	-379.800	-761.707	-212.570
	Min: B D F H I M AM AP AQ			Max: A C E G J K R AO			
86	0.325	3.232	11.450	92.986	-1.01E-12	-37.266	-145.130
		5.197	16.352	416.358	-379.800	-625.103	-207.256
	Min: B D F H I M AM AP AQ			Max: A C E G J K R AO			
86	0.650	3.099	11.450	88.362	-1.01E-12	-7.799	-141.409
		5.197	16.352	408.434	-379.800	-491.074	-201.942
	Min: B D F H I M AM AP AQ			Max: A C E G J K R AO			
86	0.975	2.966	11.450	83.737	-1.01E-12	20.167	-137.688
		4.919	16.352	327.613	-379.800	-533.824	-196.628
	Min: B D F H I M AM AP AQ			Max: A C E G J K S AO			
86	1.300	2.833	11.450	79.112	-1.01E-12	46.630	-133.966
		4.919	16.352	319.688	-379.800	-428.638	-191.313
	Min: B D F H I M AM AP AQ			Max: A C E G J K S AO			
87	0	2.833	11.450	79.112	-5.45E-13	46.630	-133.966
		4.919	16.352	319.688	-379.800	-428.638	-191.313
	Min: B D F H I M AM AP AQ			Max: A C E G J K S AO			
87	0.325	2.700	11.450	74.487	-5.45E-13	71.590	-130.245
		4.919	16.352	311.763	-379.800	-326.027	-185.999
	Min: B D F H I M AM AP AQ			Max: A C E G J K S AO			
87	0.650	2.567	11.450	69.862	-5.45E-13	95.046	-126.524
		4.919	16.352	303.838	-379.800	-225.992	-180.685

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		4.919	16.352	116.416	-253.200	740.921	-111.599
	Min: B D F H I R AM AP AQ			Max: A C E G J K S AO			
90	1.300	-0.906822	16.352	-22.040	1.29E-12	442.103	-106.285
		4.919	16.352	108.491	-253.200	777.468	-106.285
	Min: B D F H I R AM AP AQ			Max: A C E G J K S AO			
91	0	-0.906822	16.352	-22.040	2.29E-12	442.103	-106.285
		5.423	16.352	100.082	-379.800	456.550	-106.285
	Min: B D F H I R AM AP AQ			Max: A C E G J K T AO			
91	0.325	-1.040	16.352	-26.665	2.29E-12	434.188	-100.971
		5.423	16.352	92.157	-379.800	487.789	-100.971
	Min: B D F H I R AM AP AQ			Max: A C E G J K T AO			
91	0.650	-1.173	16.352	-31.290	2.29E-12	424.770	-95.657
		5.423	16.352	84.232	-379.800	516.452	-95.657
	Min: B D F H I R AM AP AQ			Max: A C E G J K T AO			
91	0.975	-1.468	16.352	-36.833	2.29E-12	491.586	-90.342
		5.585	16.352	77.226	-379.800	464.803	-90.342
	Min: B D F H I K R AM AP AQ			Max: A C E G J T AO			
91	1.300	-1.601	16.352	-43.018	2.29E-12	478.610	-85.028
		5.585	16.352	70.861	-379.800	488.868	-85.028
	Min: B D F H I K R AM AP AQ			Max: A C E G J T AO			
92	0	-1.601	16.352	-43.018	5.94E-13	478.610	-85.028
		5.585	16.352	70.861	-379.800	488.868	-85.028
	Min: B D F H I K R AM AP AQ			Max: A C E G J T AO			
92	0.325	-2.012	16.352	-122.099	4.26E-14	818.993	-79.714
		5.585	16.352	64.497	-379.800	510.862	-79.714
	Min: B D F H I K S AM AP AQ			Max: A C E G J T AO			
92	0.650	-2.145	16.352	-129.633	4.26E-14	839.186	-74.400
		5.585	16.352	59.480	-379.800	469.910	-74.400
	Min: A C E H I K S AM AP AQ			Max: B D F G J T AO			
92	0.975	-2.278	16.352	-137.558	4.26E-14	795.768	-69.085
		5.585	16.352	54.855	-379.800	488.489	-69.085
	Min: A C E H I K S AM AP AQ			Max: B D F G J T AO			
92	1.300	-2.410	16.352	-145.483	4.26E-14	749.774	-63.771
		5.585	16.352	50.231	-379.800	505.566	-63.771
	Min: A C E H I K S AM AP AQ			Max: B D F G J T AO			
93	0	-2.410	16.352	-145.483	6.91E-13	749.774	-63.771
		5.585	16.352	50.231	-379.800	505.566	-63.771
	Min: A C E H I K S AM AP AQ			Max: B D F G J T AO			
93	0.325	-2.543	16.352	-153.407	6.91E-13	701.204	-58.457
		6.030	13.901	11.987	4.87E-13	46.304	-49.696
	Min: A C E H I K S AM AP AQ			Max: B D F G J P AO			
93	0.650	-2.676	16.352	-161.332	6.91E-13	650.059	-53.143
		6.030	13.901	7.363	4.87E-13	49.448	-45.178
	Min: A C E H I K S AM AP AQ			Max: B D F G J P AO			
93	0.975	-2.809	16.352	-169.257	6.91E-13	596.336	-47.828
		6.030	13.901	2.738	4.87E-13	51.090	-40.660
	Min: A C E H I K S AM AP AQ			Max: B D F G J P AO			

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
93	1.300	-2.942	16.352	-177.182	6.91E-13	540.042	-42.514
		6.030	13.901	-1.887	4.87E-13	51.228	-36.142
	Min: A C E H I K S AM AP AQ			Max: B D F G J P AO			
94	0	-2.942	16.352	-177.182	1.05E-12	540.042	-42.514
		6.030	13.901	-1.887	7.58E-13	51.228	-36.142
	Min: A C E H I K S AM AP AQ			Max: B D F G J P AO			
94	0.325	-2.572	16.352	-193.516	-126.600	572.042	-37.200
		6.030	13.901	-6.512	7.58E-13	49.863	-31.624
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
94	0.650	-2.704	16.352	-201.441	-126.600	507.861	-31.886
		6.030	13.901	-11.137	7.58E-13	46.995	-27.107
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
94	0.975	-2.837	16.352	-209.365	-126.600	441.105	-26.571
		6.030	13.901	-15.762	7.58E-13	42.624	-22.589
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
94	1.300	-2.970	16.352	-217.290	-126.600	371.774	-21.257
		6.030	13.901	-20.387	7.58E-13	36.749	-18.071
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
95	0	-2.970	16.352	-217.290	-126.600	371.774	-21.257
		6.030	13.901	-20.387	1.50E-12	36.749	-18.071
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
95	0.325	-3.103	16.352	-225.215	-126.600	299.867	-15.943
		6.030	13.901	-25.012	1.50E-12	29.372	-13.553
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
95	0.650	-3.236	16.352	-317.540	2.90E-12	208.504	-10.629
		6.030	13.901	-29.637	1.50E-12	20.492	-9.036
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
95	0.975	-3.369	16.352	-325.465	2.90E-12	104.016	-5.314
		6.030	13.901	-34.262	1.50E-12	10.108	-4.518
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
95	1.300	-3.502	16.352	-333.389	2.90E-12	-3.048	-2.22E-07
		6.030	13.901	-38.887	1.50E-12	-1.779	-1.89E-07
	Min: A C E H I K T AM AP AQ			Max: B D F G J P AO			
96	0	0.204525	2.01E-08	7.115	2.35E-12	-1.779	-4.15E-11
		-6.55E-12	1.96E-08	12.192	3.11E-12	-3.048	5.34E-11
	Min: B D F G T AM AO AQ			Max: AR AT AV AY AZ BA BI...			
96	0.125	0.153394	2.01E-08	5.336	2.35E-12	-1.001	2.47E-09
		-6.55E-12	1.96E-08	9.144	3.11E-12	-1.714	2.51E-09
	Min: B D F G T AM AO AQ			Max: AR AT AV AY AZ BA BI...			
96	0.250	0.102262	2.01E-08	3.558	2.35E-12	-0.444707	4.98E-09
		-6.55E-12	1.96E-08	6.096	3.11E-12	-0.761998	4.96E-09
	Min: B D F G T AM AO AQ			Max: AR AT AV AY AZ BA BI...			
96	0.375	0.051131	2.01E-08	1.779	2.35E-12	-0.111177	7.49E-09
		-6.55E-12	1.96E-08	3.048	3.11E-12	-0.190500	7.42E-09
	Min: B D F G T AM AO AQ			Max: AR AT AV AY AZ BA BI...			
96	0.500	2.01E-09	2.01E-08	7.11E-08	2.35E-12	-4.60E-12	1.00E-08
		-6.55E-12	1.96E-08	1.22E-07	3.11E-12	-1.43E-12	9.87E-09

ENVELOPE for < Vz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min: B D F G T AM AO AQ			Max: AR AT AV AY AZ BA BI...			
290	0	-433.416	-3.572	-31.459	2.547	53.551	19.808
		-433.416	-3.572	27.892	-2.463	-14.312	19.808
	Min: AR AT AV AX BA BT CD			Max: AR AT AV AX AZ BE			
290	3.300	-433.416	-3.572	-31.162	2.547	-49.773	8.020
		-433.416	-3.572	27.892	-2.463	77.732	8.020
	Min: AR AT AV AX BA BT CD			Max: AR AT AV AX AZ BE			
290	6.600	-433.416	-3.572	-30.865	2.547	-152.116	-3.767
		-433.416	-3.572	27.892	-2.463	169.776	-3.767
	Min: AR AT AV AX BA BT CD			Max: AR AT AV AX AZ BB			
290	9.900	-433.416	-3.572	-30.568	2.547	-253.480	-15.554
		-433.416	-3.572	27.892	-2.463	261.820	-15.554
	Min: AR AT AV AX BA BT CD			Max: AR AT AV AX AZ BE			
290	13.200	-433.416	-3.572	-30.271	2.547	-353.864	-27.341
		-433.416	-3.572	27.892	-2.463	353.864	-27.341
	Min: AR AT AV AX BA BT CD			Max: AR AT AV AX AZ BE			
291	0	-602.123	4.634	-31.459	-2.547	53.551	-23.407
		-602.123	4.634	27.892	2.463	-14.312	-23.407
	Min: AR AT AV AX BA BZ CD			Max: AR AT AV AX AZ BH			
291	3.300	-602.123	4.634	-31.162	-2.547	-49.773	-8.113
		-602.123	4.634	27.892	2.463	77.732	-8.113
	Min: AR AT AV AX BA BZ CD			Max: AR AT AV AX AZ BH			
291	6.600	-602.123	4.634	-30.865	-2.547	-152.116	7.180
		-602.123	4.634	27.892	2.463	169.776	7.180
	Min: AR AT AV AX BA BZ CD			Max: AR AT AV AX AZ BH			
291	9.900	-602.123	4.634	-30.568	-2.547	-253.480	22.474
		-602.123	4.634	27.892	2.463	261.820	22.474
	Min: AR AT AV AX BA BZ CD			Max: AR AT AV AX AZ BH			
291	13.200	-602.123	4.634	-30.271	-2.547	-353.864	37.768
		-602.123	4.634	27.892	2.463	353.864	37.768
	Min: AR AT AV AX BA BZ CD			Max: AR AT AV AX AZ BH			

CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título:
Fecha: 24/5/01 13.42.42

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 370 cm, alto 90 cm y canto 87 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 437 T
Cortante reducido a un canto útil del borde del apoyo = 417 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 229 cm2 lo que implica una cuantía geométrica igual a 0.00711
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 437 T < Vu1 = 1931.40 T
Es necesario disponer armadura a cortante al ser Vrd = 417.00 T > Vu2 = 161.76 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°

Vcu = 134.80 T. Vsu= 282.20 T.
As cálculo = 90.10 cm2/m. As mínima = 37.00 cm2/m
Mínimo de armadura a disponer = 90.10 cm2/m

2.4.2. Comprobación del punzonamiento del tablero

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
E	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
AT	PL.PERM	5	1.000	RETRACCION
AU	PLUS	6	1.000	SOB UNIF 1
AV	PLUS	7	1.000	SOB UNIF 2
AW	PLUS	8	1.000	SOB UNIF 3
AX	PLUS	9	1.000	SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOE
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OF	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	20.036			
	1.761	1.141	100.469			
	Min: AP AR AS AT AX AY BU...			Max: A B D E F G J AL AN AO		
10	2.283	-3.686	16.626			
	-0.568555	1.138	97.227			
	Min: AP AR AS AT AU AV BC...			Max: A B D G H I AE AN AC		
156	-1.091	2.568	20.407			
	1.761	-2.257	100.840			
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.		
160	2.283	2.571	16.997			
	-0.568596	-2.254	97.599			
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...		
166	3.374	-1.935	218.118	15.604	23.708	-0.028301
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09
	Min: CF CH CI CL DC DN DO...			Max: DS DT DV DW DX DY EM...		
167	3.374	-1.829	219.077	9.951	23.708	0.028301
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...		

Articulo 46 EHE

Dimensiones del soporte

Ancho (m)	0.89
Canto (m)	1.20
Canto útil (m)	1.15

u1 (m)	18.64

Losa sin armadura de punzonamiento

Nd (t)	568.50
β	1.15
Fsd,ef	653.78
τsd (t/m2)	***30.49***

ξ	1.417
ϕ (pm)	25
nº (pm)	5.71428
As (cm2)	28.05
ρ	2.439E-03
fck (Mpa)	25
τrd (MPa)	0.311
τrd (t/m2)	***31.07***

τsd (t/m2)	***< τrd (t/m2)***

2.4.3. Refuerzo de armaduras bajo apoyos

2.4.4. Refuerzo de armadura bajo apoyos

Estribos : Nmaxd = 151.68 Mp (en cada apoyo)

$$As = \frac{0.25 \times Nmaxd}{4.20\ Mp/cm^2}$$

$As = 9.10\ cm^2$

Adoptamos 6 x Φ 16 en cada dirección.

2.4.4. Verificación de las armaduras del voladizo

3. Cálculo de la subestructura

3.1. Acciones

Loadcase Factor Stage Init.def Title
1 1.0000 PESO PROPIO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-8.77E-07	-9.44E-05	30.731			
10	8.77E-07	-9.44E-05	30.731			
156	-8.77E-07	9.44E-05	30.731			
160	8.77E-07	9.44E-05	30.731			
166	1.29E-10	0.739549	193.743	-3.253	1.02E-09	-1.01E-09
167	1.31E-10	-0.739549	193.743	3.253	1.04E-09	1.01E-09
Sums :	4.25E-12	-3.55E-15	510.411			
min:	-8.77E-07	-0.739549	30.731	-3.253	1.02E-09	-1.01E-09
max:	8.77E-07	0.739549	193.743	3.253	1.04E-09	1.01E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	4.63E-06	0.000410	0.337475	-0.000675	0.000150	1.63E-09
2	2.58E-06	0.000412	0.156680	-0.000622	0.000111	1.25E-09
3	1.54E-10	0.000412	0.048380	-0.000586	1.18E-16	4.69E-13
4	-2.56E-06	0.000412	0.156680	-0.000622	-0.000111	-1.25E-09
5	-4.63E-06	0.000410	0.337475	-0.000675	-0.000150	-1.63E-09
6	3.81E-06	0.000410	-3.07E-96	-0.000675	0.000150	1.68E-09
7	1.95E-06	0.000412	-0.154471	-0.000622	0.000111	1.25E-09
8	-8.06E-11	0.000412	-0.244623	-0.000586	1.18E-16	4.69E-13
9	-1.95E-06	0.000412	-0.154471	-0.000622	-0.000111	-1.25E-09
10	-3.81E-06	0.000410	-3.07E-96	-0.000675	-0.000150	-1.68E-09
11	-3.13E-07	0.000411	-0.869963	-0.000623	6.78E-05	1.35E-09
12	1.76E-08	0.000412	-0.940651	-0.000577	5.45E-05	9.42E-10
13	-8.18E-10	0.000412	-0.984826	-0.000546	4.76E-16	4.78E-13
14	-1.92E-08	0.000412	-0.940651	-0.000577	-5.45E-05	-9.41E-10
15	3.11E-07	0.000411	-0.869963	-0.000623	-6.78E-05	-1.34E-09
16	-1.57E-06	0.000411	-1.596	-0.000477	2.02E-05	-3.78E-11
17	-8.41E-07	0.000412	-1.618	-0.000456	1.73E-05	3.54E-10
18	-1.48E-09	0.000412	-1.631	-0.000440	5.35E-16	3.85E-13
19	8.38E-07	0.000412	-1.618	-0.000456	-1.73E-05	-3.54E-10
20	1.57E-06	0.000411	-1.596	-0.000477	-2.02E-05	-3.85E-11
21	-1.54E-06	0.000412	-2.103	-0.000295	7.15E-07	-2.33E-10
22	-9.27E-07	0.000412	-2.103	-0.000287	1.06E-06	-1.58E-11
23	-1.92E-09	0.000412	-2.104	-0.000281	5.45E-17	2.21E-13
24	9.23E-07	0.000412	-2.103	-0.000287	-1.06E-06	1.62E-11
25	1.54E-06	0.000412	-2.103	-0.000295	-7.15E-07	2.33E-10
26	-1.31E-06	0.000412	-2.361	-0.000101	-6.04E-06	-2.91E-10
27	-7.58E-07	0.000412	-2.354	-9.89E-05	-4.60E-06	-2.06E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	D2 [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-2.09E-09	0.000411	-2.351	-9.71E-05	-1.04E-15	4.71E-14
29	7.54E-07	0.000412	-2.354	-9.89E-05	4.60E-06	2.06E-10
30	1.30E-06	0.000412	-2.361	-0.000101	6.04E-06	2.91E-10
31	-7.38E-07	0.000412	-2.373	7.86E-05	-8.57E-06	-7.52E-10
32	-2.95E-07	0.000411	-2.364	8.02E-05	-6.74E-06	-5.00E-10
33	-2.00E-09	0.000411	-2.359	8.12E-05	-2.73E-15	-1.11E-13
34	2.91E-07	0.000411	-2.364	8.02E-05	6.74E-06	5.00E-10
35	7.34E-07	0.000412	-2.373	7.86E-05	8.57E-06	7.51E-10
36	9.23E-07	0.000412	-2.174	0.000218	-1.20E-05	-1.88E-09
37	9.68E-07	0.000411	-2.162	0.000222	-9.63E-06	-9.44E-10
38	-1.69E-09	0.000412	-2.154	0.000225	-4.95E-15	-2.37E-13
39	-9.72E-07	0.000411	-2.162	0.000222	9.63E-06	9.44E-10
40	-9.27E-07	0.000412	-2.174	0.000218	1.20E-05	1.88E-09
41	4.59E-06	0.000412	-1.838	0.000287	-2.25E-05	-3.34E-09
42	3.66E-06	0.000410	-1.814	0.000299	-1.82E-05	-1.01E-09
43	-1.21E-09	0.000413	-1.800	0.000308	-7.49E-15	-2.99E-13
44	-3.66E-06	0.000410	-1.814	0.000299	1.82E-05	1.01E-09
45	-4.60E-06	0.000412	-1.838	0.000287	2.25E-05	3.34E-09
46	9.78E-06	0.000407	-1.476	0.000254	-5.00E-05	-2.83E-09
47	7.69E-06	0.000410	-1.424	0.000282	-4.07E-05	9.61E-10
48	-6.93E-10	0.000419	-1.391	0.000304	-1.01E-14	-2.60E-13
49	-7.69E-06	0.000410	-1.424	0.000282	4.07E-05	-9.61E-10
50	-9.78E-06	0.000407	-1.476	0.000254	5.00E-05	2.83E-09
51	1.13E-05	0.000395	-1.239	0.000101	-9.86E-05	4.16E-09
52	1.04E-05	0.000408	-1.133	0.000139	-8.54E-05	8.99E-09
53	-3.11E-10	0.000434	-1.056	0.000185	-1.23E-14	-1.16E-13
54	-1.04E-05	0.000408	-1.133	0.000139	8.54E-05	-8.99E-09
55	-1.13E-05	0.000395	-1.239	0.000101	9.86E-05	-4.16E-09
56	1.53E-06	0.000368	-1.266	-0.000143	-0.000131	1.42E-08
57	-5.75E-07	0.000400	-1.120	-0.000141	-0.000128	3.73E-08
58	-2.45E-10	0.000472	-0.989274	-0.000133	-1.40E-14	9.96E-14
59	5.75E-07	0.000400	-1.120	-0.000141	0.000128	-3.73E-08
60	-1.53E-06	0.000368	-1.266	-0.000143	0.000131	1.42E-08
61	-7.30E-06	0.000316	-1.771	-0.000448	-8.44E-05	6.55E-09
62	-7.14E-06	0.000328	-1.681	-0.000481	-7.24E-05	9.59E-09
63	-7.16E-10	0.000345	-1.617	-0.000521	-1.31E-14	2.85E-13
64	7.14E-06	0.000328	-1.681	-0.000481	7.24E-05	-9.59E-09
65	7.30E-06	0.000316	-1.771	-0.000448	8.44E-05	-6.54E-09
66	-6.66E-06	0.000245	-2.656	-0.000568	-3.23E-05	-6.78E-11
67	-4.92E-06	0.000246	-2.622	-0.000585	-2.61E-05	1.51E-09
68	-1.66E-09	0.000250	-2.601	-0.000598	-1.08E-14	4.03E-13
69	4.91E-06	0.000246	-2.622	-0.000585	2.61E-05	-1.51E-09
70	6.65E-06	0.000245	-2.656	-0.000568	3.23E-05	6.91E-11
71	-3.62E-06	0.000165	-3.577	-0.000491	-1.32E-05	-1.03E-09
72	-2.44E-06	0.000164	-3.563	-0.000495	-1.06E-05	-2.20E-10
73	-2.64E-09	0.000165	-3.555	-0.000498	-8.52E-15	3.65E-13
74	2.44E-06	0.000164	-3.563	-0.000495	1.06E-05	2.20E-10
75	3.61E-06	0.000165	-3.577	-0.000491	1.32E-05	1.03E-09
76	-1.86E-06	8.26E-05	-4.244	-0.000278	-8.80E-06	-5.19E-10
77	-1.17E-06	8.22E-05	-4.235	-0.000279	-6.94E-06	-2.58E-10
78	-3.32E-09	8.22E-05	-4.229	-0.000280	-6.96E-15	2.09E-13
79	1.16E-06	8.22E-05	-4.235	-0.000279	6.94E-06	2.59E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	1.86E-06	8.26E-05	-4.244	-0.000278	8.80E-06	5.20E-10
81	-1.39E-06	-1.18E-13	-4.485	5.44E-17	-8.14E-06	1.40E-16
82	-8.29E-07	3.80E-14	-4.477	4.93E-17	-6.38E-06	1.39E-16
83	-3.56E-09	2.47E-13	-4.471	4.10E-17	-6.42E-15	1.39E-16
84	8.22E-07	4.56E-13	-4.477	3.56E-17	6.38E-06	1.39E-16
85	1.38E-06	6.12E-13	-4.485	3.61E-17	8.14E-06	1.39E-16
86	-1.86E-06	-8.26E-05	-4.244	0.000278	-8.80E-06	5.19E-10
87	-1.17E-06	-8.22E-05	-4.235	0.000279	-6.94E-06	2.58E-10
88	-3.32E-09	-8.22E-05	-4.229	0.000280	-6.94E-15	-2.08E-13
89	1.16E-06	-8.22E-05	-4.235	0.000279	6.94E-06	-2.59E-10
90	1.86E-06	-8.26E-05	-4.244	0.000278	8.80E-06	-5.20E-10
91	-3.62E-06	-0.000165	-3.577	0.000491	-1.32E-05	1.03E-09
92	-2.44E-06	-0.000164	-3.563	0.000495	-1.06E-05	2.20E-10
93	-2.64E-09	-0.000165	-3.555	0.000498	-8.49E-15	-3.65E-13
94	2.44E-06	-0.000164	-3.563	0.000495	1.06E-05	-2.20E-10
95	3.61E-06	-0.000165	-3.577	0.000491	1.32E-05	-1.03E-09
96	-6.66E-06	-0.000245	-2.656	0.000568	-3.23E-05	6.78E-11
97	-4.92E-06	-0.000246	-2.622	0.000585	-2.61E-05	-1.51E-09
98	-1.66E-09	-0.000250	-2.601	0.000598	-1.08E-14	-4.03E-13
99	4.91E-06	-0.000246	-2.622	0.000585	2.61E-05	1.51E-09
100	6.65E-06	-0.000245	-2.656	0.000568	3.23E-05	-6.91E-11
101	-7.30E-06	-0.000316	-1.771	0.000448	-8.44E-05	-6.55E-09
102	-7.14E-06	-0.000328	-1.681	0.000481	-7.24E-05	-9.59E-09
103	-7.18E-10	-0.000345	-1.617	0.000521	-1.30E-14	-2.85E-13
104	7.14E-06	-0.000328	-1.681	0.000481	7.24E-05	9.59E-09
105	7.30E-06	-0.000316	-1.771	0.000448	8.44E-05	6.54E-09
106	1.53E-06	-0.000368	-1.266	0.000143	-0.000131	-1.42E-08
107	-5.75E-07	-0.000400	-1.120	0.000141	-0.000128	-3.73E-08
108	-2.48E-10	-0.000472	-0.989274	0.000133	-1.40E-14	-9.93E-14
109	5.75E-07	-0.000400	-1.120	0.000141	0.000128	3.73E-08
110	-1.53E-06	-0.000368	-1.266	0.000143	0.000131	1.42E-08
111	1.13E-05	-0.000395	-1.239	-0.000101	-9.86E-05	-4.16E-09
112	1.04E-05	-0.000408	-1.133	-0.000139	-8.54E-05	-8.99E-09
113	-3.14E-10	-0.000434	-1.056	-0.000185	-1.23E-14	1.16E-13
114	-1.04E-05	-0.000408	-1.133	-0.000139	8.54E-05	8.99E-09
115	-1.13E-05	-0.000395	-1.239	-0.000101	9.86E-05	4.16E-09
116	9.78E-06	-0.000407	-1.476	-0.000254	-5.00E-05	2.83E-09
117	7.69E-06	-0.000410	-1.424	-0.000282	-4.07E-05	-9.61E-10
118	-6.96E-10	-0.000419	-1.391	-0.000304	-1.00E-14	2.60E-13
119	-7.69E-06	-0.000410	-1.424	-0.000282	4.07E-05	9.61E-10
120	-9.78E-06	-0.000407	-1.476	-0.000254	5.00E-05	-2.83E-09
121	4.59E-06	-0.000412	-1.838	-0.000287	-2.25E-05	3.34E-09
122	3.66E-06	-0.000410	-1.814	-0.000299	-1.82E-05	1.01E-09
123	-1.22E-09	-0.000413	-1.800	-0.000308	-7.41E-15	2.99E-13
124	-3.66E-06	-0.000410	-1.814	-0.000299	1.82E-05	-1.01E-09
125	-4.60E-06	-0.000412	-1.838	-0.000287	2.25E-05	-3.34E-09
126	9.23E-07	-0.000412	-2.174	-0.000218	-1.20E-05	1.88E-09
127	9.68E-07	-0.000411	-2.162	-0.000222	-9.63E-06	9.44E-10
128	-1.70E-09	-0.000412	-2.154	-0.000225	-4.86E-15	2.38E-13
129	-9.72E-07	-0.000411	-2.162	-0.000222	9.63E-06	-9.44E-10
130	-9.27E-07	-0.000412	-2.174	-0.000218	1.20E-05	-1.88E-09
131	-7.38E-07	-0.000412	-2.373	-7.86E-05	-8.57E-06	7.52E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-2.95E-07	-0.000411	-2.364	-8.02E-05	-6.74E-06	5.00E-10
133	-2.01E-09	-0.000411	-2.359	-8.12E-05	-2.66E-15	1.12E-13
134	2.91E-07	-0.000411	-2.364	-8.02E-05	6.74E-06	-5.00E-10
135	7.34E-07	-0.000412	-2.373	-7.86E-05	8.57E-06	-7.51E-10
136	-1.31E-06	-0.000412	-2.361	0.000101	-6.04E-06	2.91E-10
137	-7.58E-07	-0.000412	-2.354	9.89E-05	-4.60E-06	2.06E-10
138	-2.09E-09	-0.000411	-2.351	9.71E-05	-9.83E-16	-4.68E-14
139	7.54E-07	-0.000412	-2.354	9.89E-05	4.60E-06	-2.06E-10
140	1.30E-06	-0.000412	-2.361	0.000101	6.04E-06	-2.91E-10
141	-1.54E-06	-0.000412	-2.103	0.000295	7.15E-07	2.33E-10
142	-9.27E-07	-0.000412	-2.103	0.000287	1.06E-06	1.58E-11
143	-1.92E-09	-0.000412	-2.104	0.000281	1.02E-16	-2.20E-13
144	9.23E-07	-0.000412	-2.103	0.000287	-1.06E-06	-1.62E-11
145	1.54E-06	-0.000412	-2.103	0.000295	-7.15E-07	-2.33E-10
146	-1.57E-06	-0.000411	-1.596	0.000477	2.02E-05	3.78E-11
147	-8.41E-07	-0.000412	-1.618	0.000456	1.73E-05	-3.54E-10
148	-1.49E-09	-0.000412	-1.631	0.000440	5.70E-16	-3.84E-13
149	8.38E-07	-0.000412	-1.618	0.000456	-1.73E-05	3.54E-10
150	1.57E-06	-0.000411	-1.596	0.000477	-2.02E-05	-3.85E-11
151	-3.13E-07	-0.000411	-0.869963	0.000623	6.78E-05	-1.35E-09
152	1.76E-08	-0.000412	-0.940651	0.000577	5.45E-05	-9.42E-10
153	-8.24E-10	-0.000412	-0.984826	0.000546	4.92E-16	-4.77E-13
154	-1.92E-08	-0.000412	-0.940651	0.000577	-5.45E-05	9.41E-10
155	3.11E-07	-0.000411	-0.869963	0.000623	-6.78E-05	1.34E-09
156	3.81E-06	-0.000410	-3.07E-96	0.000675	0.000150	-1.68E-09
157	1.95E-06	-0.000412	-0.154471	0.000622	0.000111	-1.25E-09
158	-8.65E-11	-0.000412	-0.244623	0.000586	1.22E-16	-4.69E-13
159	-1.95E-06	-0.000412	-0.154471	0.000622	-0.000111	1.25E-09
160	-3.81E-06	-0.000410	-3.07E-96	0.000675	-0.000150	1.68E-09
161	4.63E-06	-0.000410	0.337475	0.000675	0.000150	-1.63E-09
162	2.58E-06	-0.000412	0.156680	0.000622	0.000111	-1.25E-09
163	1.48E-10	-0.000412	0.048380	0.000586	1.22E-16	-4.69E-13
164	-2.58E-06	-0.000412	0.156680	0.000622	-0.000111	1.25E-09
165	-4.63E-06	-0.000410	0.337475	0.000675	-0.000150	1.63E-09
166	-0	-7.40E-98	-1.94E-95	+0	-0	+0
167	-0	7.40E-98	-1.94E-95	-0	-0	-0
min:	-1.13E-05	-0.000472	-4.485	-0.000675	-0.000150	-3.73E-08
max:	1.13E-05	0.000472	0.337475	0.000675	0.000150	3.73E-08

Loadcase Factor Stage Init.def Title
2 1.0000 PESO PAVIMENTO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-4.17E-08	-4.50E-06	1.462			
10	4.17E-08	-4.50E-06	1.462			
156	-4.17E-08	4.50E-06	1.462			
160	4.17E-08	4.50E-06	1.462			
166	6.23E-12	0.035307	9.219	-0.155311	4.94E-11	-4.84E-11
167	6.34E-12	-0.035307	9.219	0.155311	5.01E-11	4.83E-11
Sums :	2.03E-13	-5.34E-16	24.288			
min:	-4.17E-08	-0.035307	1.462	-0.155311	4.94E-11	-4.84E-11
max:	4.17E-08	0.035307	9.219	0.155311	5.01E-11	4.83E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	2.20E-07	1.96E-05	0.016083	-3.22E-05	6.83E-06	7.68E-11
2	1.23E-07	1.97E-05	0.007812	-2.97E-05	5.05E-06	5.96E-11
3	7.54E-12	1.97E-05	0.002860	-2.79E-05	5.51E-18	2.24E-14
4	-1.23E-07	1.97E-05	0.007812	-2.97E-05	-5.05E-06	-5.96E-11
5	-2.20E-07	1.96E-05	0.016083	-3.22E-05	-6.83E-06	-7.68E-11
6	1.81E-07	1.96E-05	-1.46E-97	-3.22E-05	6.83E-06	8.01E-11
7	9.29E-08	1.97E-05	-0.007019	-2.97E-05	5.05E-06	5.96E-11
8	-3.64E-12	1.97E-05	-0.011107	-2.79E-05	5.51E-18	2.24E-14
9	-9.29E-08	1.97E-05	-0.007019	-2.97E-05	-5.05E-06	-5.96E-11
10	-1.81E-07	1.96E-05	-1.46E-97	-3.22E-05	-6.83E-06	-8.00E-11
11	-1.49E-08	1.96E-05	-0.041463	-2.97E-05	2.90E-06	6.40E-11
12	8.38E-10	1.97E-05	-0.044494	-2.75E-05	2.34E-06	4.48E-11
13	-3.88E-11	1.97E-05	-0.046393	-2.60E-05	2.19E-17	2.28E-14
14	-9.10E-10	1.97E-05	-0.044494	-2.75E-05	-2.34E-06	-4.48E-11
15	1.48E-08	1.96E-05	-0.041463	-2.97E-05	-2.90E-06	-6.40E-11
16	-7.48E-08	1.96E-05	-0.076084	-2.28E-05	6.40E-07	-1.80E-12
17	-4.00E-08	1.96E-05	-0.076767	-2.17E-05	5.72E-07	1.69E-11
18	-7.03E-11	1.97E-05	-0.077218	-2.10E-05	2.41E-17	1.83E-14
19	3.99E-08	1.96E-05	-0.076767	-2.17E-05	-5.72E-07	-1.68E-11
20	7.47E-08	1.96E-05	-0.076084	-2.28E-05	-6.40E-07	1.84E-12
21	-7.34E-08	1.97E-05	-0.100242	-1.41E-05	-2.87E-07	-1.11E-11
22	-4.41E-08	1.96E-05	-0.099950	-1.37E-05	-2.00E-07	-7.60E-13
23	-9.11E-11	1.97E-05	-0.099770	-1.34E-05	2.65E-19	1.05E-14
24	4.39E-08	1.96E-05	-0.099950	-1.37E-05	2.00E-07	7.80E-13
25	7.32E-08	1.97E-05	-0.100242	-1.41E-05	2.87E-07	1.11E-11
26	-6.22E-08	1.88E-05	-0.112589	-4.87E-06	-6.08E-07	-1.39E-11
27	-3.61E-08	1.96E-05	-0.111958	-4.75E-06	-4.69E-07	-9.82E-12

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	D2 [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-9.93E-11	1.96E-05	-0.111569	-4.67E-06	-5.28E-17	2.27E-15
29	3.59E-08	1.96E-05	-0.111958	-4.75E-06	4.69E-07	9.82E-12
30	6.20E-08	1.96E-05	-0.112589	-4.87E-06	6.08E-07	1.39E-11
31	-3.50E-08	1.97E-05	-0.113230	3.70E-06	-7.28E-07	-3.59E-11
32	-1.40E-08	1.96E-05	-0.112473	3.77E-06	-5.71E-07	-2.39E-11
33	-9.54E-11	1.96E-05	-0.112011	3.82E-06	-1.34E-16	-5.28E-15
34	1.38E-08	1.96E-05	-0.112473	3.77E-06	5.71E-07	2.39E-11
35	3.48E-08	1.97E-05	-0.113230	3.70E-06	7.28E-07	3.59E-11
36	4.43E-08	1.97E-05	-0.103835	1.03E-05	8.91E-07	8.97E-11
37	4.25E-08	1.96E-05	-0.102906	1.05E-05	7.08E-07	4.50E-11
38	-8.06E-11	1.97E-05	-0.102342	1.07E-05	-2.40E-16	-1.13E-14
39	-4.65E-08	1.96E-05	-0.102906	1.05E-05	7.08E-07	4.50E-11
40	-4.45E-08	1.97E-05	-0.103835	1.03E-05	8.93E-07	8.97E-11
41	2.19E-07	1.97E-05	-0.087853	1.36E-05	-1.39E-06	-1.59E-10
42	1.75E-07	1.96E-05	-0.086403	1.42E-05	-1.11E-06	-4.79E-11
43	-5.79E-11	1.97E-05	-0.085524	1.46E-05	-3.62E-16	-1.42E-14
44	-1.75E-07	1.96E-05	-0.086403	1.42E-05	1.11E-06	4.79E-11
45	-2.20E-07	1.97E-05	-0.087853	1.36E-05	1.39E-06	1.59E-10
46	4.67E-07	1.95E-05	-0.070693	1.21E-05	-2.70E-06	-1.35E-10
47	3.67E-07	1.96E-05	-0.067867	1.34E-05	-2.19E-06	4.60E-11
48	-3.31E-11	2.00E-05	-0.066108	1.44E-05	-4.86E-16	-1.23E-14
49	-3.67E-07	1.96E-05	-0.067867	1.34E-05	2.19E-06	-4.60E-11
50	-4.67E-07	1.95E-05	-0.070693	1.21E-05	2.70E-06	1.35E-10
51	5.41E-07	1.89E-05	-0.059433	4.76E-06	-5.01E-06	1.99E-10
52	4.98E-07	1.95E-05	-0.054079	6.60E-06	-4.31E-06	4.29E-10
53	-1.49E-11	2.07E-05	-0.050235	8.77E-06	-5.94E-16	-5.50E-15
54	-4.98E-07	1.95E-05	-0.054079	6.60E-06	4.31E-06	-4.29E-10
55	-5.41E-07	1.89E-05	-0.059433	4.76E-06	5.01E-06	-1.99E-10
56	7.25E-08	1.76E-05	-0.060797	-6.82E-06	-6.58E-06	6.81E-10
57	-2.77E-08	1.91E-05	-0.053507	-6.74E-06	-6.32E-06	1.78E-09
58	-1.18E-11	2.26E-05	-0.047073	-6.35E-06	-6.75E-16	4.75E-15
59	2.77E-08	1.91E-05	-0.053507	-6.74E-06	6.32E-06	-1.78E-09
60	-7.25E-08	1.76E-05	-0.060797	-6.82E-06	6.58E-06	-6.81E-10
61	-3.49E-07	1.51E-05	-0.084864	-2.13E-05	-4.34E-06	3.12E-10
62	-3.41E-07	1.57E-05	-0.080242	-2.29E-05	-3.70E-06	4.58E-10
63	-3.42E-11	1.65E-05	-0.076998	-2.48E-05	-6.29E-16	1.36E-14
64	3.41E-07	1.57E-05	-0.080242	-2.29E-05	3.70E-06	-4.58E-10
65	3.49E-07	1.51E-05	-0.084864	-2.13E-05	4.34E-06	-3.12E-10
66	-3.18E-07	1.17E-05	-0.126965	-2.71E-05	-1.86E-06	-3.44E-12
67	-2.35E-07	1.18E-05	-0.125025	-2.79E-05	-1.49E-06	7.20E-11
68	-7.90E-11	1.20E-05	-0.123845	-2.85E-05	-5.24E-16	1.92E-14
69	2.35E-07	1.18E-05	-0.125025	-2.79E-05	1.49E-06	-7.19E-11
70	3.18E-07	1.17E-05	-0.126965	-2.71E-05	1.86E-06	3.50E-12
71	-1.72E-07	7.87E-06	-0.170824	-2.34E-05	-9.48E-07	-4.94E-11
72	-1.16E-07	7.85E-06	-0.169837	-2.36E-05	-7.54E-07	-1.05E-11
73	-1.26E-10	7.88E-06	-0.169238	-2.37E-05	-4.13E-16	1.74E-14
74	1.16E-07	7.85E-06	-0.169837	-2.36E-05	7.54E-07	1.06E-11
75	1.72E-07	7.87E-06	-0.170824	-2.34E-05	9.48E-07	4.94E-11
76	-8.88E-08	3.94E-06	-0.202580	-1.32E-05	-7.39E-07	-2.48E-11
77	-5.57E-08	3.93E-06	-0.201812	-1.33E-05	-5.80E-07	-1.23E-11
78	-1.58E-10	3.92E-06	-0.201345	-1.33E-05	-3.39E-16	9.94E-15
79	5.54E-08	3.93E-06	-0.201812	-1.33E-05	5.80E-07	1.24E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	8.84E-08	3.94E-06	-0.202580	-1.32E-05	7.39E-07	2.48E-11
81	-6.60E-08	-5.64E-15	-0.214053	2.62E-18	-7.08E-07	6.66E-18
82	-3.94E-08	1.81E-15	-0.213318	2.35E-18	-5.54E-07	6.65E-18
83	-1.70E-10	1.18E-14	-0.212870	1.92E-18	-3.13E-16	6.65E-18
84	3.91E-08	2.18E-14	-0.213318	1.66E-18	5.54E-07	6.65E-18
85	6.56E-08	2.92E-14	-0.214053	1.72E-18	7.08E-07	6.64E-18
86	-8.88E-08	-3.94E-06	-0.202580	1.32E-05	-7.39E-07	2.48E-11
87	-5.57E-08	-3.93E-06	-0.201812	1.33E-05	-5.80E-07	1.23E-11
88	-1.58E-10	-3.92E-06	-0.201345	1.33E-05	-3.38E-16	-9.92E-15
89	5.54E-08	-3.93E-06	-0.201812	1.33E-05	5.80E-07	-1.24E-11
90	8.84E-08	-3.94E-06	-0.202580	1.32E-05	7.39E-07	-2.48E-11
91	-1.72E-07	-7.87E-06	-0.170824	2.34E-05	-9.48E-07	4.94E-11
92	-1.16E-07	-7.85E-06	-0.169837	2.36E-05	-7.54E-07	1.05E-11
93	-1.26E-10	-7.88E-06	-0.169238	2.37E-05	-4.11E-16	-1.74E-14
94	1.16E-07	-7.85E-06	-0.169837	2.36E-05	7.54E-07	-1.06E-11
95	1.72E-07	-7.87E-06	-0.170824	2.34E-05	9.48E-07	-4.94E-11
96	-3.18E-07	-1.17E-05	-0.126965	2.71E-05	-1.86E-06	3.44E-12
97	-2.35E-07	-1.18E-05	-0.125025	2.79E-05	-1.49E-06	-7.20E-11
98	-7.91E-11	-1.20E-05	-0.123845	2.85E-05	-5.21E-16	-1.92E-14
99	2.35E-07	-1.18E-05	-0.125025	2.79E-05	1.49E-06	7.19E-11
100	3.18E-07	-1.17E-05	-0.126965	2.71E-05	1.86E-06	-3.50E-12
101	-3.49E-07	-1.51E-05	-0.084664	2.13E-05	-4.34E-06	-3.12E-10
102	-3.41E-07	-1.57E-05	-0.080242	2.29E-05	-3.70E-06	-4.58E-10
103	-3.43E-11	-1.65E-05	-0.076998	2.48E-05	-6.26E-16	-1.36E-14
104	3.41E-07	-1.57E-05	-0.080242	2.29E-05	3.70E-06	4.58E-10
105	3.49E-07	-1.51E-05	-0.084864	2.13E-05	4.34E-06	3.12E-10
106	7.25E-08	-1.76E-05	-0.060797	6.82E-06	-6.58E-06	-6.81E-10
107	-2.77E-08	-1.91E-05	-0.053507	6.74E-06	-6.32E-06	-1.78E-09
108	-1.19E-11	-2.26E-05	-0.047073	6.35E-06	-6.72E-16	-4.74E-15
109	2.77E-08	-1.91E-05	-0.053507	6.74E-06	6.32E-06	1.78E-09
110	-7.25E-08	-1.76E-05	-0.060797	6.82E-06	6.58E-06	6.81E-10
111	5.41E-07	-1.89E-05	-0.059433	-4.76E-06	-5.01E-06	-1.99E-10
112	4.98E-07	-1.95E-05	-0.054079	-6.60E-06	-4.31E-06	-4.29E-10
113	-1.51E-11	-2.07E-05	-0.050235	-8.77E-06	-5.91E-16	5.52E-15
114	-4.98E-07	-1.95E-05	-0.054079	-6.60E-06	4.31E-06	4.29E-10
115	-5.41E-07	-1.89E-05	-0.059433	-4.76E-06	5.01E-06	1.99E-10
116	4.67E-07	-1.95E-05	-0.070693	-1.21E-05	-2.70E-06	1.35E-10
117	3.67E-07	-1.96E-05	-0.067867	-1.34E-05	-2.19E-06	-4.60E-11
118	-3.32E-11	-2.00E-05	-0.066108	-1.44E-05	-4.82E-16	1.24E-14
119	-3.67E-07	-1.96E-05	-0.067867	-1.34E-05	2.19E-06	4.60E-11
120	-4.67E-07	-1.95E-05	-0.070693	-1.21E-05	2.70E-06	-1.35E-10
121	2.19E-07	-1.97E-05	-0.087853	-1.36E-05	-1.39E-06	1.59E-10
122	1.75E-07	-1.96E-05	-0.086403	-1.42E-05	-1.11E-06	4.79E-11
123	-5.80E-11	-1.97E-05	-0.087524	-1.46E-05	-3.58E-16	1.42E-14
124	-1.75E-07	-1.96E-05	-0.086403	-1.42E-05	1.11E-06	-4.79E-11
125	-2.20E-07	-1.97E-05	-0.087853	-1.36E-05	1.39E-06	-1.59E-10
126	4.43E-08	-1.97E-05	-0.103835	-1.03E-05	-8.91E-07	8.97E-11
127	4.63E-08	-1.96E-05	-0.102906	-1.05E-05	-7.08E-07	4.50E-11
128	-8.08E-11	-1.97E-05	-0.102342	-1.07E-05	-2.36E-16	1.13E-14
129	-4.65E-08	-1.96E-05	-0.102906	-1.05E-05	7.08E-07	-4.50E-11
130	-4.45E-08	-1.97E-05	-0.103835	-1.03E-05	8.91E-07	-8.97E-11
131	-3.50E-08	-1.97E-05	-0.113230	-3.70E-06	-7.28E-07	3.59E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-1.40E-08	-1.96E-05	-0.112473	-3.77E-06	-5.71E-07	2.39E-11
133	-9.56E-11	-1.96E-05	-0.112011	-3.82E-06	-1.30E-16	5.29E-15
134	1.38E-08	-1.96E-05	-0.112473	-3.77E-06	5.71E-07	-2.39E-11
135	3.48E-08	-1.97E-05	-0.113230	-3.70E-06	7.28E-07	-3.59E-11
136	-6.22E-08	-1.97E-05	-0.112589	4.87E-06	-6.08E-07	1.39E-11
137	-3.61E-08	-1.96E-05	-0.111958	4.75E-06	-4.69E-07	9.82E-12
138	-9.96E-11	-1.96E-05	-0.111569	4.67E-06	-4.98E-17	-2.26E-15
139	3.59E-08	-1.96E-05	-0.111958	4.75E-06	4.69E-07	-9.82E-12
140	6.20E-08	-1.97E-05	-0.112589	4.87E-06	6.08E-07	-1.39E-11
141	-7.34E-08	-1.97E-05	-0.100242	1.41E-05	-2.87E-07	1.11E-11
142	-4.41E-08	-1.96E-05	-0.099950	1.37E-05	-2.00E-07	7.80E-13
143	-9.14E-11	-1.97E-05	-0.099770	1.34E-05	2.60E-18	-1.05E-14
144	4.39E-08	-1.96E-05	-0.099950	1.37E-05	2.00E-07	-7.80E-13
145	7.32E-08	-1.97E-05	-0.100242	1.41E-05	2.87E-07	-1.11E-11
146	-7.48E-08	-1.96E-05	-0.076084	2.28E-05	6.40E-07	1.80E-12
147	-4.00E-08	-1.96E-05	-0.076767	2.17E-05	5.72E-07	-1.69E-11
148	-7.06E-11	-1.97E-05	-0.077215	2.10E-05	2.56E-17	-1.83E-14
149	3.99E-08	-1.96E-05	-0.076767	2.17E-05	-5.72E-07	1.68E-11
150	7.47E-08	-1.96E-05	-0.076084	2.28E-05	-6.40E-07	-1.84E-12
151	-1.49E-08	-1.96E-05	-0.041463	2.97E-05	2.90E-06	-6.40E-11
152	8.30E-10	-1.97E-05	-0.044494	2.75E-05	2.34E-06	-4.48E-11
153	-3.91E-11	-1.97E-05	-0.046393	2.60E-05	2.26E-17	-2.28E-14
154	-9.10E-10	-1.97E-05	-0.044494	2.75E-05	-2.34E-06	4.48E-11
155	1.48E-08	-1.96E-05	-0.041463	2.97E-05	-2.90E-06	6.40E-11
156	1.81E-07	-1.96E-05	-1.46E-97	3.22E-05	6.83E-06	-8.01E-11
157	9.29E-08	-1.97E-05	-0.007019	2.97E-05	5.05E-06	5.96E-11
158	-3.93E-12	-1.97E-05	-0.011107	2.79E-05	5.72E-18	-2.23E-14
159	-9.29E-08	-1.97E-05	-0.007019	2.97E-05	-5.05E-06	5.96E-11
160	-1.81E-07	-1.96E-05	-1.46E-97	3.22E-05	-6.83E-06	8.00E-11
161	2.20E-07	-1.96E-05	0.016083	3.22E-05	6.83E-06	-7.68E-11
162	1.23E-07	-1.97E-05	0.007812	2.97E-05	5.05E-06	-5.96E-11
163	7.25E-12	-1.97E-05	0.002860	2.79E-05	5.71E-18	-2.23E-14
164	-1.23E-07	-1.97E-05	0.007812	2.97E-05	-5.05E-06	5.96E-11
165	-2.20E-07	-1.96E-05	0.016083	3.22E-05	-6.83E-06	7.68E-11
166	-0	-3.53E-99	-9.22E-97	+0	-0	+0
167	-0	3.53E-99	-9.22E-97	-0	-0	-0
min:	-5.41E-07	-2.26E-05	-0.214053	-3.22E-05	-6.83E-06	-1.78E-09
max:	5.41E-07	2.26E-05	0.016083	3.22E-05	6.83E-06	1.78E-09

Loadcase Factor Stage Init.def Title
3 1.0000 PESO BARRERAS

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-1.52E-07	-1.72E-05	5.307			
10	1.52E-07	-1.72E-05	5.307			
156	-1.52E-07	1.72E-05	5.307			
160	1.52E-07	1.72E-05	5.307			
166	2.78E-11	0.134950	33.386	-0.593620	2.19E-10	-1.83E-10
167	2.82E-11	-0.134950	33.386	0.593620	2.21E-10	1.83E-10
Sums :	7.93E-13	-6.38E-16	88.000			
min:	-1.52E-07	-0.134950	5.307	-0.593620	2.19E-10	-1.83E-10
max:	1.52E-07	0.134950	33.386	0.593620	2.21E-10	1.83E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	7.94E-07	7.49E-05	0.059667	-0.000119	-7.99E-06	2.63E-10
2	4.46E-07	7.51E-05	0.049601	-0.000110	4.58E-06	2.17E-10
3	3.94E-11	7.53E-05	0.042284	-0.000104	1.41E-17	8.28E-14
4	-4.46E-07	7.51E-05	0.049601	-0.000110	-4.58E-06	-2.17E-10
5	-7.94E-07	7.49E-05	0.059667	-0.000119	7.99E-06	-2.63E-10
6	6.59E-07	7.48E-05	-5.31E-97	-0.000120	3.64E-06	2.94E-10
7	3.38E-07	7.51E-05	-0.005565	-0.000110	4.58E-06	2.17E-10
8	-2.04E-12	7.53E-05	-0.009738	-0.000104	1.42E-17	8.28E-14
9	-3.38E-07	7.51E-05	-0.005565	-0.000110	-4.58E-06	-2.17E-10
10	-6.59E-07	7.49E-05	-5.31E-97	-0.000120	-3.64E-06	-2.93E-10
11	-5.45E-08	7.49E-05	-0.153959	-0.000111	-1.07E-05	2.32E-10
12	2.86E-09	7.51E-05	-0.145023	-0.000102	-5.29E-06	1.63E-10
13	-1.32E-10	7.52E-05	-0.141238	-9.71E-05	3.55E-17	8.44E-14
14	-3.13E-09	7.51E-05	-0.145023	-0.000102	5.29E-06	-1.63E-10
15	5.42E-08	7.49E-05	-0.153959	-0.000111	1.07E-05	-2.32E-10
16	-2.72E-07	7.50E-05	-0.283052	-8.52E-05	-1.89E-05	-6.52E-12
17	-1.45E-07	7.51E-05	-0.265596	-8.15E-05	-1.17E-05	6.11E-11
18	-2.49E-10	7.52E-05	-0.256559	-7.88E-05	2.67E-19	6.83E-14
19	1.45E-07	7.51E-05	-0.265596	-8.15E-05	1.17E-05	-6.10E-11
20	2.71E-07	7.50E-05	-0.283052	-8.52E-05	1.89E-05	6.64E-12
21	-2.66E-07	7.51E-05	-0.374148	-5.37E-05	-2.22E-05	-4.05E-11
22	-1.60E-07	7.51E-05	-0.353156	-5.23E-05	-1.45E-05	-3.23E-12
23	-3.26E-10	7.51E-05	-0.341828	-5.13E-05	-1.31E-16	3.99E-14
24	1.60E-07	7.51E-05	-0.353156	-5.23E-05	1.45E-05	3.31E-12
25	2.66E-07	7.51E-05	-0.374148	-5.37E-05	2.22E-05	4.06E-11
26	-2.25E-07	7.51E-05	-0.422331	-2.03E-05	-2.34E-05	-5.24E-11
27	-1.30E-07	7.51E-05	-0.400115	-1.98E-05	-1.55E-05	-3.73E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-3.58E-10	7.51E-05	-0.388029	-1.95E-05	-3.69E-16	9.96E-15
29	1.29E-07	7.51E-05	-0.400115	-1.98E-05	1.55E-05	3.73E-11
30	2.24E-07	7.51E-05	-0.422331	-2.03E-05	2.34E-05	5.24E-11
31	-1.21E-07	7.52E-05	-0.427948	1.09E-05	-2.38E-05	-1.37E-10
32	-4.57E-08	7.51E-05	-0.405277	1.12E-05	-1.58E-05	-9.05E-11
33	-3.46E-10	7.51E-05	-0.392927	1.14E-05	-7.08E-16	-1.75E-14
34	4.50E-08	7.51E-05	-0.405277	1.12E-05	1.58E-05	9.05E-11
35	1.20E-07	7.52E-05	-0.427948	1.09E-05	2.38E-05	1.37E-10
36	1.81E-07	7.52E-05	-0.397006	3.52E-05	-2.44E-05	-3.40E-10
37	1.84E-07	7.50E-05	-0.373715	3.59E-05	-1.63E-05	-1.70E-10
38	-2.95E-10	7.50E-05	-0.361000	3.63E-05	-1.14E-15	-3.93E-14
39	-1.84E-07	7.50E-05	-0.373715	3.59E-05	1.63E-05	1.70E-10
40	-1.82E-07	7.52E-05	-0.397006	3.52E-05	2.44E-05	3.40E-10
41	8.44E-07	7.51E-05	-0.341958	4.73E-05	-2.62E-05	-6.00E-10
42	6.71E-07	7.49E-05	-0.316793	4.94E-05	-1.78E-05	-1.79E-10
43	-2.14E-10	7.54E-05	-0.302947	5.08E-05	-1.62E-15	-5.00E-14
44	-6.71E-07	7.49E-05	-0.316793	4.94E-05	1.78E-05	1.79E-10
45	-8.45E-07	7.51E-05	-0.341958	4.73E-05	2.62E-05	6.00E-10
46	1.78E-06	7.43E-05	-0.282356	4.18E-05	3.09E-05	-4.98E-10
47	1.40E-06	7.47E-05	-0.252236	4.67E-05	-2.17E-05	1.81E-10
48	-1.26E-10	7.65E-05	-0.235219	5.04E-05	-2.11E-15	-4.35E-14
49	-1.40E-06	7.47E-05	-0.252236	4.67E-05	2.17E-05	-1.81E-10
50	-1.78E-06	7.43E-05	-0.282356	4.18E-05	3.09E-05	4.98E-10
51	2.05E-06	7.21E-05	-0.243820	1.56E-05	-3.93E-05	7.74E-10
52	1.89E-06	7.44E-05	-0.204574	2.23E-05	-2.93E-05	1.65E-09
53	-6.20E-11	7.93E-05	-0.180024	3.02E-05	-2.55E-15	-1.89E-14
54	-1.89E-06	7.44E-05	-0.204574	2.23E-05	2.93E-05	-1.65E-09
55	-2.05E-06	7.21E-05	-0.243820	1.56E-05	3.93E-05	-7.74E-10
56	2.49E-07	6.72E-05	-0.250783	-2.62E-05	-4.50E-05	2.61E-09
57	-1.22E-07	7.30E-05	-0.204451	-2.58E-05	-3.67E-05	6.80E-09
58	-5.20E-11	8.62E-05	-0.170475	-2.43E-05	-2.89E-15	1.80E-14
59	1.22E-07	7.30E-05	-0.204451	-2.58E-05	3.67E-05	-6.80E-09
60	-2.49E-07	6.72E-05	-0.250783	-2.62E-05	4.50E-05	-2.61E-09
61	-1.35E-06	5.77E-05	-0.340131	-7.84E-05	-3.70E-05	1.17E-09
62	-1.31E-06	5.98E-05	-0.303392	-8.40E-05	-2.72E-05	1.75E-09
63	-1.34E-10	6.29E-05	-0.280925	-9.11E-05	-2.72E-15	4.99E-14
64	1.31E-06	5.98E-05	-0.303392	-8.40E-05	2.72E-05	-1.75E-09
65	1.35E-06	5.77E-05	-0.340131	-7.84E-05	3.70E-05	-1.17E-09
66	-1.21E-06	4.46E-05	-0.494245	-9.88E-05	-2.79E-05	-2.60E-11
67	-8.97E-07	4.50E-05	-0.467265	-0.000102	-1.92E-05	2.70E-10
68	-2.98E-10	4.57E-05	-0.452256	-0.000104	-2.34E-15	7.00E-14
69	8.96E-07	4.50E-05	-0.467265	-0.000102	1.92E-05	-2.70E-10
70	1.21E-06	4.46E-05	-0.494245	-9.88E-05	2.79E-05	2.62E-11
71	-6.47E-07	3.01E-05	-0.654286	-8.52E-05	-2.46E-05	-1.93E-10
72	-4.39E-07	3.00E-05	-0.630777	-8.60E-05	-1.65E-05	-4.27E-11
73	-4.67E-10	3.01E-05	-0.617931	-8.65E-05	-1.94E-15	6.33E-14
74	4.38E-07	3.00E-05	-0.630777	-8.60E-05	1.65E-05	4.29E-11
75	6.46E-07	3.01E-05	-0.654286	-8.52E-05	2.46E-05	1.93E-10
76	-3.26E-07	1.51E-05	-0.770030	-4.83E-05	-2.39E-05	-9.51E-11
77	-2.05E-07	1.50E-05	-0.747321	-4.84E-05	-1.59E-05	-4.78E-11
78	-5.86E-10	1.50E-05	-0.734954	-4.85E-05	-1.67E-15	3.62E-14
79	2.04E-07	1.50E-05	-0.747321	-4.84E-05	1.59E-05	4.79E-11

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	3.25E-07	1.51E-05	-0.770030	-4.83E-05	2.39E-05	9.52E-11
81	-2.39E-07	-2.18E-14	-0.811829	9.93E-18	-2.37E-05	2.51E-17
82	-1.43E-07	6.18E-15	-0.789241	8.99E-18	-1.58E-05	2.50E-17
83	-6.28E-10	4.37E-14	-0.776945	7.09E-18	-1.58E-15	2.50E-17
84	1.42E-07	8.13E-14	-0.789241	6.29E-18	1.58E-05	2.50E-17
85	2.38E-07	1.09E-13	-0.811829	6.44E-18	2.37E-05	2.50E-17
86	-3.26E-07	-1.51E-05	-0.770030	4.83E-05	-2.39E-05	9.51E-11
87	-2.05E-07	-1.50E-05	-0.747321	4.84E-05	-1.59E-05	4.78E-11
88	-5.86E-10	-1.50E-05	-0.734954	4.85E-05	-1.67E-15	-3.61E-14
89	2.04E-07	-1.50E-05	-0.747321	4.84E-05	1.59E-05	-4.79E-11
90	3.25E-07	-1.51E-05	-0.770030	4.83E-05	2.39E-05	-9.52E-11
91	-6.47E-07	-3.01E-05	-0.654286	8.52E-05	-2.46E-05	1.93E-10
92	-4.39E-07	-3.00E-05	-0.630777	8.60E-05	-1.65E-05	4.27E-11
93	-4.67E-10	-3.01E-05	-0.617931	8.65E-05	-1.93E-15	-6.33E-14
94	4.38E-07	-3.00E-05	-0.630777	8.60E-05	1.65E-05	-4.29E-11
95	6.46E-07	-3.01E-05	-0.654286	8.52E-05	2.46E-05	-1.93E-10
96	-1.21E-06	-4.46E-05	-0.494245	9.88E-05	-2.79E-05	2.60E-11
97	-8.97E-07	-4.50E-05	-0.467265	0.000102	-1.92E-05	2.70E-10
98	-2.98E-10	-4.57E-05	-0.452296	0.000104	-2.33E-15	-7.00E-14
99	8.96E-07	-4.50E-05	-0.467265	0.000102	1.92E-05	2.70E-10
100	1.21E-06	-4.46E-05	-0.494245	9.88E-05	2.79E-05	-2.62E-11
101	-1.35E-06	-5.77E-05	-0.340131	7.84E-05	-3.70E-05	-1.17E-09
102	-1.31E-06	-5.98E-05	-0.303392	8.40E-05	-2.72E-05	-1.75E-09
103	-1.35E-10	-6.29E-05	-0.280925	9.11E-05	-2.71E-15	-4.99E-14
104	1.31E-06	-5.98E-05	-0.303392	8.40E-05	2.72E-05	1.75E-09
105	1.35E-06	-5.77E-05	-0.340131	7.84E-05	3.70E-05	1.17E-09
106	2.49E-07	-6.72E-05	-0.250783	2.62E-05	-4.50E-05	-2.61E-09
107	-1.22E-07	-7.30E-05	-0.204451	2.58E-05	-3.67E-05	-6.80E-09
108	-5.24E-11	-8.62E-05	-0.170475	2.43E-05	-2.88E-15	-1.79E-14
109	1.22E-07	-7.30E-05	-0.204451	2.58E-05	3.67E-05	6.80E-09
110	-2.49E-07	-6.72E-05	-0.250783	2.62E-05	4.50E-05	2.61E-09
111	2.05E-06	-7.21E-05	-0.243820	1.56E-05	-3.93E-05	-7.74E-10
112	1.89E-06	-7.44E-05	-0.204574	2.23E-05	2.93E-05	-1.65E-09
113	-6.25E-11	-7.93E-05	-0.180024	-3.02E-05	-2.54E-15	1.89E-14
114	-1.89E-06	-7.44E-05	-0.204574	-2.23E-05	2.93E-05	1.65E-09
115	-2.05E-06	-7.21E-05	-0.243820	-1.56E-05	3.93E-05	7.74E-10
116	1.78E-06	-7.43E-05	-0.282356	-4.18E-05	-3.09E-05	4.98E-10
117	1.40E-06	-7.47E-05	-0.252236	-4.67E-05	-2.17E-05	-1.81E-10
118	-1.27E-10	-7.65E-05	-0.235219	-5.04E-05	-2.11E-15	4.36E-14
119	-1.40E-06	-7.47E-05	-0.252236	-4.67E-05	2.17E-05	1.81E-10
120	-1.78E-06	-7.43E-05	-0.282356	-4.18E-05	3.09E-05	-4.98E-10
121	8.44E-07	-7.51E-05	-0.341958	-4.73E-05	-2.62E-05	6.00E-10
122	6.71E-07	-7.49E-05	-0.316793	-4.94E-05	-1.78E-05	1.79E-10
123	-2.15E-10	-7.54E-05	-0.302947	-5.08E-05	-1.61E-15	5.01E-14
124	-6.71E-07	-7.49E-05	-0.316793	-4.94E-05	1.78E-05	-1.79E-10
125	-8.45E-07	-7.51E-05	-0.341958	-4.73E-05	2.62E-05	-6.00E-10
126	1.81E-07	-7.52E-05	-0.397006	-3.52E-05	-2.44E-05	3.40E-10
127	1.84E-07	-7.50E-05	-0.373715	-3.59E-05	-1.63E-05	1.70E-10
128	-2.96E-10	-7.51E-05	-0.361000	-3.63E-05	-1.12E-15	3.93E-14
129	-1.84E-07	-7.50E-05	-0.373715	-3.59E-05	1.63E-05	-1.70E-10
130	-1.82E-07	-7.52E-05	-0.397006	-3.52E-05	2.44E-05	-3.40E-10
131	-1.21E-07	-7.52E-05	-0.427948	-1.09E-05	-2.38E-05	1.37E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-4.57E-08	-7.51E-05	-0.405277	-1.12E-05	-1.58E-05	9.05E-11
133	-3.47E-10	-7.51E-05	-0.392927	-1.14E-05	-6.95E-16	1.75E-14
134	4.50E-08	-7.51E-05	-0.405277	-1.12E-05	1.58E-05	-9.05E-11
135	1.20E-07	-7.52E-05	-0.427948	-1.09E-05	2.38E-05	-1.37E-10
136	-2.25E-07	-7.51E-05	-0.422331	2.03E-05	-2.34E-05	5.24E-11
137	-1.30E-07	-7.51E-05	-0.400115	1.98E-05	-1.55E-05	3.73E-11
138	-3.59E-10	-7.51E-05	-0.388029	1.95E-05	-3.58E-16	-9.91E-15
139	1.29E-07	-7.51E-05	-0.400115	1.98E-05	1.55E-05	-3.73E-11
140	2.24E-07	-7.51E-05	-0.422331	2.03E-05	2.34E-05	-5.24E-11
141	-2.66E-07	-7.51E-05	-0.374148	5.37E-05	-2.22E-05	4.05E-11
142	-1.60E-07	-7.51E-05	-0.353156	5.23E-05	-1.45E-05	3.23E-12
143	-3.27E-10	-7.51E-05	-0.341828	5.13E-05	-1.22E-16	-3.99E-14
144	1.60E-07	-7.51E-05	-0.353156	5.23E-05	1.45E-05	-3.31E-12
145	2.66E-07	-7.51E-05	-0.374148	5.37E-05	2.22E-05	-4.06E-11
146	-2.72E-07	-7.50E-05	-0.283052	8.52E-05	-1.89E-05	6.52E-12
147	-1.45E-07	-7.51E-05	-0.265596	8.15E-05	-1.17E-05	-6.11E-11
148	-2.50E-10	-7.52E-05	-0.256559	7.88E-05	5.72E-18	-6.82E-14
149	1.45E-07	-7.51E-05	-0.265596	8.15E-05	1.17E-05	6.10E-11
150	2.71E-07	-7.50E-05	-0.283052	8.52E-05	1.89E-05	-6.64E-12
151	-5.45E-08	-7.49E-05	-0.153959	0.000111	-1.07E-05	-2.32E-10
152	2.86E-09	-7.51E-05	-0.145023	0.000102	-5.29E-06	-1.63E-10
153	-1.33E-10	-7.52E-05	-0.141238	9.71E-05	3.81E-17	-8.43E-14
154	-3.13E-09	-7.51E-05	-0.145023	0.000102	5.29E-06	1.63E-10
155	5.42E-08	-7.49E-05	-0.153959	0.000111	1.07E-05	2.32E-10
156	6.59E-07	-7.49E-05	-5.31E-97	0.000120	3.64E-06	-2.94E-10
157	3.38E-07	-7.51E-05	-0.005565	0.000110	4.58E-06	-2.17E-10
158	-3.12E-12	-7.53E-05	-0.009738	0.000104	1.52E-17	-8.28E-14
159	-3.38E-07	-7.51E-05	-0.005565	0.000110	-4.58E-06	2.17E-10
160	-6.59E-07	-7.49E-05	-5.31E-97	0.000120	-3.64E-06	2.93E-10
161	7.94E-07	-7.49E-05	0.059667	0.000119	-7.99E-06	-2.63E-10
162	4.46E-07	-7.51E-05	0.049601	0.000110	4.58E-06	-2.17E-10
163	3.83E-11	-7.

Loadcase Factor Stage Init.def Title
5 1.0000 RETRACCION

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-5.69E-05	-1.441	-0.295944			
10	5.69E-05	-1.441	-0.295944			
156	-5.69E-05	1.441	-0.295944			
160	5.69E-05	1.441	-0.295944			
166	3.22E-12	-1.846	0.591887	12.714	-2.36E-11	-2.24E-10
167	4.16E-12	1.846	0.591887	-12.714	-1.70E-11	2.22E-10
Sums :	-1.12E-12	1.41E-11	-1.20E-12			
min:	-5.69E-05	-1.846	-0.295944	-12.714	-2.36E-11	-2.24E-10
max:	5.69E-05	1.846	0.591887	12.714	-1.70E-11	2.22E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000436	6.411	-0.009271	1.85E-05	-1.53E-06	3.76E-07
2	0.000369	6.412	-0.007449	1.80E-05	-1.13E-06	3.64E-07
3	9.19E-12	6.412	-0.006357	1.77E-05	6.53E-17	-1.27E-14
4	-0.000369	6.412	-0.007449	1.80E-05	1.13E-06	-3.64E-07
5	-0.000436	6.411	-0.009271	1.85E-05	1.53E-06	-3.76E-07
6	0.000247	6.265	2.96E-98	1.85E-05	-1.53E-06	3.76E-07
7	0.000167	6.266	0.001568	1.80E-05	-1.13E-06	3.64E-07
8	1.55E-11	6.266	0.002486	1.77E-05	6.53E-17	-1.27E-14
9	-0.000167	6.266	0.001568	1.80E-05	1.13E-06	-3.64E-07
10	-0.000247	6.265	2.96E-98	1.85E-05	1.53E-06	-3.76E-07
11	-4.00E-05	5.887	0.023979	1.79E-05	-7.30E-07	1.30E-07
12	-3.41E-05	5.887	0.024740	1.75E-05	-5.85E-07	1.29E-07
13	3.37E-11	5.887	0.025214	1.72E-05	-1.63E-15	-1.30E-14
14	3.41E-05	5.887	0.024740	1.75E-05	5.85E-07	-1.29E-07
15	4.00E-05	5.887	0.023979	1.79E-05	7.30E-07	-1.30E-07
16	-8.92E-05	5.508	0.046209	1.60E-05	-2.70E-07	3.20E-09
17	-6.46E-05	5.508	0.046493	1.58E-05	-2.26E-07	2.74E-08
18	5.18E-11	5.508	0.046674	1.57E-05	-1.58E-16	-1.21E-14
19	6.46E-05	5.508	0.046493	1.58E-05	2.26E-07	-2.74E-08
20	8.92E-05	5.508	0.046209	1.60E-05	2.70E-07	-3.20E-09
21	-5.77E-05	5.129	0.065289	1.31E-05	-8.34E-08	-2.38E-08
22	-4.20E-05	5.129	0.065377	1.31E-05	-7.01E-08	-4.01E-09
23	6.79E-11	5.129	0.065430	1.30E-05	2.53E-15	-1.02E-14
24	4.20E-05	5.129	0.065377	1.31E-05	7.01E-08	4.01E-09
25	5.77E-05	5.129	0.065288	1.31E-05	8.34E-08	2.38E-08
26	-2.53E-05	4.750	0.079923	9.20E-06	-3.10E-08	-1.71E-08
27	-1.90E-05	4.750	0.079955	9.19E-06	-2.65E-08	-7.69E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	8.11E-11	4.750	0.079973	9.19E-06	4.30E-15	-7.61E-15
29	1.90E-05	4.750	0.079955	9.19E-06	2.65E-08	7.69E-09
30	2.53E-05	4.750	0.079923	9.20E-06	3.10E-08	1.71E-08
31	-9.08E-06	4.371	0.088724	4.16E-06	-6.89E-08	-6.42E-09
32	-7.15E-06	4.371	0.088796	4.22E-06	-5.83E-08	-3.95E-09
33	9.05E-11	4.371	0.088838	4.27E-06	4.95E-15	-4.27E-15
34	7.15E-06	4.371	0.088796	4.22E-06	5.83E-08	3.95E-09
35	9.08E-06	4.371	0.088724	4.16E-06	6.89E-08	6.42E-09
36	-6.35E-06	3.992	0.090196	-2.07E-06	-2.58E-07	1.31E-09
37	-5.03E-06	3.992	0.090466	-1.85E-06	-2.13E-07	-2.58E-10
38	9.50E-11	3.992	0.090628	-1.70E-06	4.92E-15	2.66E-16
39	5.03E-06	3.992	0.090466	-1.85E-06	2.13E-07	2.58E-10
40	6.35E-06	3.992	0.090196	-2.07E-06	2.58E-07	-1.31E-09
41	-1.24E-05	3.613	0.082702	-9.59E-06	-7.92E-07	5.57E-09
42	-9.51E-06	3.613	0.083528	-9.03E-06	-6.39E-07	8.06E-10
43	9.23E-11	3.613	0.084029	-8.64E-06	4.54E-15	6.49E-15
44	9.51E-06	3.613	0.083528	-9.03E-06	6.39E-07	-8.06E-10
45	1.24E-05	3.613	0.082702	-9.59E-06	7.92E-07	-5.57E-09
46	-2.19E-05	3.234	0.064570	-1.83E-05	-1.81E-06	2.93E-09
47	-1.76E-05	3.234	0.066492	-1.74E-05	-1.53E-06	-3.91E-09
48	7.92E-11	3.234	0.067823	-1.65E-05	4.03E-15	1.40E-14
49	1.76E-05	3.234	0.066492	-1.74E-05	1.53E-06	3.91E-09
50	2.19E-05	3.234	0.064570	-1.83E-05	1.81E-06	-2.93E-09
51	-2.19E-05	2.856	0.035029	-2.67E-05	-2.29E-06	-1.42E-08
52	-2.25E-05	2.855	0.037677	-2.71E-05	-2.47E-06	-2.33E-08
53	5.39E-11	2.855	0.040520	-2.60E-05	3.71E-15	2.05E-14
54	2.25E-05	2.855	0.037677	-2.71E-05	2.47E-06	2.33E-08
55	2.19E-05	2.856	0.035029	-2.67E-05	2.29E-06	1.42E-08
56	3.43E-06	2.477	-0.003629	-3.24E-05	-4.21E-07	-3.53E-08
57	5.56E-06	2.477	-0.003204	-3.47E-05	-2.97E-07	-9.29E-08
58	2.04E-11	2.476	-0.003022	-4.32E-05	3.66E-15	2.20E-14
59	-5.56E-06	2.477	-0.003204	-3.47E-05	2.97E-07	9.29E-08
60	-3.43E-06	2.477	-0.003629	-3.24E-05	4.21E-07	3.53E-08
61	2.34E-05	1.981	-0.057496	-3.01E-05	2.00E-06	-1.12E-08
62	2.07E-05	1.981	-0.059751	-3.02E-05	2.01E-06	-2.26E-08
63	-3.04E-11	1.981	-0.061933	-2.89E-05	3.66E-15	2.15E-14
64	-2.07E-05	1.981	-0.059751	-3.02E-05	-2.01E-06	2.26E-08
65	-2.34E-05	1.981	-0.057496	-3.01E-05	-2.00E-06	1.12E-08
66	1.63E-05	1.486	-0.103145	-2.29E-05	1.03E-06	3.66E-09
67	1.22E-05	1.486	-0.104227	-2.23E-05	8.35E-07	-2.35E-09
68	-6.95E-11	1.486	-0.104901	-2.18E-05	3.17E-15	1.69E-14
69	-1.22E-05	1.486	-0.104227	-2.23E-05	-8.35E-07	2.35E-09
70	-1.63E-05	1.486	-0.103145	-2.29E-05	-1.03E-06	-3.66E-09
71	5.94E-06	0.990624	-0.135527	-1.51E-05	2.69E-07	3.65E-09
72	4.36E-06	0.990626	-0.135808	-1.49E-05	2.20E-07	1.23E-09
73	-9.34E-11	0.990625	-0.135977	-1.47E-05	2.75E-15	1.06E-14
74	-4.36E-06	0.990626	-0.135808	-1.49E-05	-2.20E-07	-1.23E-09
75	-5.94E-06	0.990624	-0.135527	-1.51E-05	-2.69E-07	-3.65E-09
76	1.11E-06	0.495312	-0.154698	-7.48E-06	4.94E-08	1.42E-09
77	8.57E-07	0.495313	-0.154750	-7.43E-06	4.20E-08	8.18E-10
78	-1.06E-10	0.495313	-0.154781	-7.40E-06	2.60E-15	5.02E-15
79	-8.58E-07	0.495313	-0.154750	-7.43E-06	-4.20E-08	-8.18E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-1.11E-06	0.495312	-0.154698	-7.48E-06	-4.94E-08	-1.42E-09
81	-3.47E-08	-5.90E-12	-0.161052	-2.98E-17	1.10E-08	7.78E-17
82	1.91E-08	-5.81E-12	-0.161064	-2.81E-17	9.65E-09	7.79E-17
83	-1.10E-10	-5.69E-12	-0.161070	-2.54E-17	2.57E-15	7.78E-17
84	-1.94E-08	-5.58E-12	-0.161064	-2.24E-17	-9.65E-09	7.77E-17
85	3.45E-08	-5.49E-12	-0.161052	-2.04E-17	-1.10E-08	7.74E-17
86	1.11E-06	-0.495312	-0.154698	7.48E-06	4.94E-08	-1.42E-09
87	8.57E-07	-0.495313	-0.154750	7.43E-06	4.20E-08	-8.18E-10
88	-1.06E-10	-0.495313	-0.154781	7.40E-06	2.59E-15	-4.86E-15
89	-8.58E-07	-0.495313	-0.154750	7.43E-06	-4.20E-08	8.18E-10
90	-1.11E-06	-0.495312	-0.154698	7.48E-06	-4.94E-08	1.42E-09
91	5.94E-06	-0.990624	-0.135527	1.51E-05	2.69E-07	-3.65E-09
92	4.36E-06	-0.990626	-0.135808	1.49E-05	2.20E-07	-1.23E-09
93	-9.39E-11	-0.990625	-0.135977	1.47E-05	2.74E-15	-1.04E-14
94	-4.36E-06	-0.990626	-0.135808	1.49E-05	-2.20E-07	1.23E-09
95	-5.94E-06	-0.990624	-0.135527	1.51E-05	-2.69E-07	3.65E-09
96	1.63E-05	-1.486	-0.103145	2.29E-05	1.03E-06	-3.66E-09
97	1.22E-05	-1.486	-0.104227	2.23E-05	8.35E-07	2.35E-09
98	-7.03E-11	-1.486	-0.104901	2.18E-05	3.15E-15	-1.67E-14
99	-1.22E-05	-1.486	-0.104227	2.23E-05	-8.35E-07	-2.35E-09
100	-1.63E-05	-1.486	-0.103145	2.29E-05	-1.03E-06	3.66E-09
101	2.34E-05	-1.981	-0.057496	3.01E-05	2.00E-06	1.12E-08
102	2.07E-05	-1.981	-0.059751	3.02E-05	2.01E-06	2.26E-08
103	-3.15E-11	-1.981	-0.061933	2.89E-05	3.63E-15	-2.13E-14
104	-2.07E-05	-1.981	-0.059751	3.02E-05	-2.01E-06	-2.26E-08
105	-2.34E-05	-1.981	-0.057496	3.01E-05	-2.00E-06	-1.12E-08
106	3.43E-06	-2.477	-0.003629	3.24E-05	-4.21E-07	3.53E-08
107	5.56E-06	-2.477	-0.003204	3.47E-05	-2.97E-07	9.29E-08
108	1.90E-11	-2.476	-0.003022	4.32E-05	3.63E-15	-2.18E-14
109	-5.56E-06	-2.477	-0.003204	3.47E-05	2.97E-07	-9.29E-08
110	-3.43E-06	-2.477	-0.003629	3.24E-05	4.21E-07	-3.53E-08
111	-2.19E-05	-2.856	0.035029	2.67E-05	-2.29E-06	1.42E-08
112	-2.25E-05	-2.855	0.037677	2.71E-05	-2.47E-06	2.33E-08
113	5.23E-11	-2.855	0.040520	2.60E-05	3.68E-15	-2.04E-14
114	2.25E-05	-2.855	0.037677	2.71E-05	2.47E-06	-2.33E-08
115	2.19E-05	-2.856	0.035029	2.67E-05	2.29E-06	-1.42E-08
116	-2.19E-05	-3.234	0.064570	1.83E-05	-1.81E-06	-2.93E-09
117	-1.76E-05	-3.234	0.066492	1.74E-05	-1.53E-06	3.91E-09
118	7.74E-11	-3.234	0.067823	1.65E-05	4.00E-15	-1.38E-14
119	1.76E-05	-3.234	0.066492	1.74E-05	1.53E-06	-3.91E-09
120	2.19E-05	-3.234	0.064570	1.83E-05	1.81E-06	2.93E-09
121	-1.24E-05	-3.613	0.082702	9.59E-06	-7.92E-07	-5.57E-09
122	-9.51E-06	-3.613	0.083528	9.03E-06	-6.39E-07	-8.06E-10
123	9.03E-11	-3.613	0.084029	8.64E-06	4.52E-15	-6.33E-15
124	9.51E-06	-3.613	0.083528	9.03E-06	6.39E-07	8.06E-10
125	1.24E-05	-3.613	0.082702	9.59E-06	7.92E-07	5.57E-09
126	-6.35E-06	-3.992	0.090196	2.07E-06	-2.58E-07	-1.31E-09
127	-5.03E-06	-3.992	0.090466	1.85E-06	-2.13E-07	2.58E-10
128	9.28E-11	-3.992	0.090628	1.70E-06	4.90E-15	-9.90E-17
129	5.03E-06	-3.992	0.090466	1.85E-06	2.13E-07	-2.58E-10
130	6.35E-06	-3.992	0.090196	2.07E-06	2.58E-07	1.31E-09
131	-9.08E-06	-4.371	0.088724	-4.16E-06	-6.89E-08	6.42E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-7.15E-06	-4.371	0.088796	-4.22E-06	-5.83E-08	3.95E-09
133	8.81E-11	-4.371	0.088838	-4.27E-06	4.93E-15	4.43E-15
134	7.15E-06	-4.371	0.088796	-4.22E-06	5.83E-08	-3.95E-09
135	9.08E-06	-4.371	0.088724	-4.16E-06	6.89E-08	-6.42E-09
136	-2.53E-05	-4.750	0.079923	-9.20E-06	-3.10E-08	1.71E-08
137	-1.90E-05	-4.750	0.079955	-9.19E-06	-2.65E-08	7.69E-09
138	7.84E-11	-4.750	0.079973	-9.19E-06	4.29E-15	7.78E-15
139	1.90E-05	-4.750	0.079955	-9.19E-06	2.65E-08	-7.69E-09
140	2.53E-05	-4.750	0.079923	-9.20E-06	3.10E-08	-1.71E-08
141	-5.77E-05	-5.129	0.065289	-1.31E-05	-8.34E-08	2.38E-08
142	-4.20E-05	-5.129	0.065377	-1.31E-05	-7.01E-08	4.01E-09
143	6.51E-11	-5.129	0.065430	-1.30E-05	2.52E-15	1.04E-14
144	4.20E-05	-5.129	0.065377	-1.31E-05	7.01E-08	-4.01E-09
145	5.77E-05	-5.129	0.065289	-1.31E-05	8.34E-08	-2.38E-08
146	-8.92E-05	-5.508	0.046209	-1.60E-05	-2.70E-07	-3.20E-09
147	-6.46E-05	-5.508	0.046493	-1.58E-05	-2.26E-07	-2.74E-08
148	4.87E-11	-5.508	0.046674	-1.57E-05	-1.66E-16	1.23E-14
149	6.46E-05	-5.508	0.046493	-1.58E-05	2.26E-07	2.74E-08
150	8.92E-05	-5.508	0.046209	-1.60E-05	2.70E-07	3.20E-09
151	-4.00E-05	-5.887	0.023979	-1.79E-05	-7.30E-07	-1.30E-07
152	-3.41E-05	-5.887	0.024740	-1.75E-05	-5.85E-07	-1.29E-07
153	3.04E-11	-5.887	0.025214	-1.72E-05	-1.63E-15	1.31E-14
154	3.41E-05	-5.887	0.024740	-1.75E-05	5.85E-07	1.29E-07
155	4.00E-05	-5.887	0.023979	-1.79E-05	7.30E-07	1.30E-07
156	0.000247	-6.265	2.96E-98	-1.85E-05	-1.53E-06	-3.76E-07
157	0.000187	-6.266	0.001568	-1.80E-05	-1.13E-06	-3.64E-07
158	1.20E-11	-6.266	0.002486	-1.77E-05	6.47E-17	1.28E-14
159	-0.000187	-6.266	0.001568	-1.80E-05	1.13E-06	3.64E-07
160	-0.000247	-6.265	2.96E-98	-1.85E-05	1.53E-06	3.76E-07
161	0.000436	-6.411	-0.009271	-1.85E-05	-1.53E-06	-3.76E-07
162	0.000369	-6.412	-0.007449	-1.80E-05	-1.13E-06	-3.64E-07
163	5.59E-12	-6.412	-0.006357	-1.77E-05	6.47E-17	1.28E-14
164	-0.000369	-6.412	-0.007449	-1.80E-05	1.13E-06	3.64E-07
165	-0.000436	-6.411	-0.009271	-1.85E-05	1.53E-06	3.76E-07
166	-0	1.85E-97	-5.92E-98	-1.27E-99	+0	+0
167	-0	-1.85E-97	-5.92E-98	1.27E-99	+0	-0
min:	-0.000436	-6.412	-0.161070	-4.32E-05	-2.47E-06	-3.76E-07
max:	0.000436	6.412	0.090628	4.32E-05	2.47E-06	3.76E-07

Loadcase Factor Stage Init.def Title
60 1.0000 FRENADO

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-4.14E-05	-1.116	-0.371460			
10	4.14E-05	-1.116	-0.371460			
156	-4.14E-05	1.116	0.371460			
160	-4.14E-05	1.116	0.371460			
166	1.47E-11	-3.763	-0.958693	25.552	7.27E-11	-2.38E-10
167	-1.57E-11	3.763	0.958693	-25.552	-8.03E-11	-2.38E-10
Sums :	-1.83E-12	-11.990	6.52E-13			
min:	-4.14E-05	-3.763	-0.958693	25.552	-8.03E-11	-2.38E-10
max:	4.14E-05	-1.116	0.958693	25.552	7.27E-11	-2.38E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000321	4.852	-0.012012	2.40E-05	-1.91E-06	2.82E-07
2	0.000270	4.852	-0.009726	2.34E-05	-1.42E-06	2.70E-07
3	-1.99E-11	4.852	-0.008355	2.29E-05	4.72E-17	-1.70E-14
4	-0.000270	4.852	-0.009726	2.34E-05	1.42E-06	-2.70E-07
5	-0.000321	4.852	-0.012012	2.40E-05	1.91E-06	-2.82E-07
6	0.000180	4.852	3.71E-98	2.40E-05	-1.91E-06	2.82E-07
7	0.000135	4.852	0.001968	2.34E-05	-1.42E-06	2.70E-07
8	-1.14E-11	4.852	0.003119	2.29E-05	4.72E-17	-1.70E-14
9	-0.000135	4.852	0.001968	2.34E-05	1.42E-06	-2.70E-07
10	-0.000180	4.852	3.71E-98	2.40E-05	1.91E-06	-2.82E-07
11	-3.40E-05	4.852	0.031075	2.33E-05	-9.15E-07	9.45E-08
12	-2.86E-05	4.852	0.032029	2.27E-05	-7.33E-07	9.21E-08
13	1.29E-11	4.852	0.032624	2.23E-05	-1.17E-15	-1.74E-14
14	2.86E-05	4.852	0.032029	2.27E-05	7.33E-07	-9.21E-08
15	3.40E-05	4.852	0.031075	2.33E-05	9.15E-07	-9.45E-08
16	-6.87E-05	4.852	0.059953	2.09E-05	-3.38E-07	-4.56E-10
17	-4.97E-05	4.852	0.060309	2.06E-05	-2.83E-07	1.54E-08
18	3.70E-11	4.852	0.060535	2.04E-05	-2.51E-18	-1.63E-14
19	4.97E-05	4.852	0.060309	2.06E-05	2.83E-07	-1.54E-08
20	6.87E-05	4.852	0.059953	2.09E-05	3.38E-07	4.55E-10
21	-4.37E-05	4.853	0.084878	1.72E-05	-1.05E-07	-1.99E-08
22	-3.18E-05	4.853	0.084988	1.71E-05	-8.84E-08	7.87E-09
23	5.86E-11	4.853	0.085054	1.71E-05	2.07E-15	-1.39E-14
24	3.18E-05	4.853	0.084988	1.71E-05	8.84E-08	7.87E-09
25	4.37E-05	4.853	0.084878	1.72E-05	1.05E-07	1.99E-08
26	-1.93E-05	4.853	0.104212	1.23E-05	-4.81E-08	-1.38E-08
27	-1.45E-05	4.853	0.104263	1.23E-05	-4.11E-08	-1.00E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	7.66E-11	4.853	0.104290	1.23E-05	3.45E-15	-1.07E-14
29	1.45E-05	4.853	0.104263	1.23E-05	4.11E-08	1.00E-08
30	1.93E-05	4.853	0.104212	1.23E-05	4.81E-08	1.38E-08
31	-8.82E-06	4.853	0.116197	5.92E-06	-1.32E-07	-4.10E-09
32	-6.97E-06	4.853	0.116336	6.05E-06	-1.12E-07	-6.24E-09
33	9.01E-11	4.853	0.116417	6.14E-06	3.94E-15	-6.43E-15
34	6.97E-06	4.853	0.116336	6.05E-06	1.12E-07	6.24E-09
35	8.82E-06	4.853	0.116197	5.92E-06	1.32E-07	4.10E-09
36	-1.18E-05	4.853	0.118895	-1.99E-06	-4.90E-07	4.58E-09
37	-9.14E-06	4.853	0.119407	-1.57E-06	-4.03E-07	-2.45E-09
38	9.70E-11	4.853	0.119714	-1.29E-06	3.81E-15	-3.40E-16
39	9.14E-06	4.853	0.119407	-1.57E-06	4.03E-07	2.45E-09
40	1.18E-05	4.853	0.118895	-1.99E-06	4.90E-07	-4.58E-09
41	-2.63E-05	4.853	0.110135	-1.16E-05	-1.47E-06	1.04E-08
42	-1.99E-05	4.853	0.111672	-1.06E-05	-1.19E-06	-2.20E-09
43	9.38E-11	4.853	0.112604	-9.88E-06	3.23E-15	8.41E-15
44	1.99E-05	4.853	0.111672	-1.06E-05	1.19E-06	2.20E-09
45	2.63E-05	4.853	0.110135	-1.16E-05	1.47E-06	-1.04E-08
46	-4.55E-05	4.853	0.087747	-2.26E-05	-3.26E-06	4.31E-09
47	-3.64E-05	4.853	0.091219	-2.12E-05	-2.77E-06	-1.25E-08
48	7.52E-11	4.853	0.093654	-1.96E-05	2.42E-15	1.68E-14
49	3.64E-05	4.853	0.091219	-2.12E-05	2.77E-06	1.25E-08
50	4.55E-05	4.853	0.087747	-2.26E-05	3.26E-06	-4.31E-09
51	-4.52E-05	4.853	0.051406	-3.24E-05	-3.71E-06	-3.07E-08
52	-4.62E-05	4.853	0.055775	-3.35E-05	-4.21E-06	-5.22E-08
53	3.94E-11	4.852	0.060838	-3.18E-05	1.96E-15	2.62E-14
54	4.62E-05	4.853	0.055775	-3.35E-05	4.21E-06	5.22E-08
55	4.52E-05	4.853	0.051406	-3.24E-05	3.71E-06	3.07E-08
56	7.24E-06	4.853	0.006608	-3.61E-05	5.20E-07	-7.44E-08
57	1.18E-05	4.852	0.005935	-4.07E-05	7.52E-07	-1.95E-07
58	-4.26E-12	4.852	0.004895	-5.85E-05	2.00E-15	2.33E-14
59	-1.18E-05	4.852	0.005935	-4.07E-05	-7.52E-07	1.95E-07
60	-7.24E-06	4.853	0.006608	-3.61E-05	-5.20E-07	7.44E-08
61	4.75E-05	4.853	-0.044517	-2.27E-05	4.98E-06	-2.59E-08
62	4.21E-05	4.853	-0.050088	-2.25E-05	4.89E-06	-5.26E-08
63	-6.12E-11	4.853	-0.055250	-1.94E-05	2.07E-15	1.69E-14
64	-4.21E-05	4.853	-0.050088	-2.25E-05	-4.89E-06	5.26E-08
65	-4.75E-05	4.853	-0.044517	-2.27E-05	-4.98E-06	2.59E-08
66	3.32E-05	4.853	-0.067773	-3.97E-06	2.40E-06	4.42E-09
67	2.49E-05	4.853	-0.070291	-2.60E-06	1.95E-06	-1.12E-08
68	-8.27E-11	4.853	-0.071855	-1.45E-06	1.12E-15	4.11E-15
69	-2.49E-05	4.853	-0.070291	-2.60E-06	-1.95E-06	1.12E-08
70	-3.32E-05	4.853	-0.067773	-3.97E-06	-2.40E-06	-4.42E-09
71	1.24E-05	4.853	-0.061603	1.06E-05	6.13E-07	4.38E-09
72	9.08E-06	4.853	-0.062244	1.11E-05	5.04E-07	-3.92E-09
73	-6.95E-11	4.853	-0.062629	1.14E-05	2.87E-16	-8.37E-15
74	-9.08E-06	4.853	-0.062244	1.11E-05	-5.04E-07	3.92E-09
75	-1.24E-05	4.853	-0.061603	1.06E-05	-6.13E-07	-4.38E-09
76	2.83E-06	4.853	-0.035615	1.91E-05	1.13E-07	-2.00E-11
77	2.13E-06	4.853	-0.035733	1.92E-05	9.54E-08	-4.52E-09
78	-3.77E-11	4.853	-0.035803	1.93E-05	2.29E-17	-1.52E-14
79	-2.13E-06	4.853	-0.035733	1.92E-05	-9.54E-08	4.52E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-2.83E-06	4.853	-0.035615	1.91E-05	-1.13E-07	2.00E-11
81	8.84E-13	4.853	1.17E-13	2.19E-05	4.32E-17	-1.65E-09
82	8.84E-13	4.853	6.91E-14	2.19E-05	4.32E-17	-5.19E-09
83	8.85E-13	4.853	4.31E-15	2.19E-05	4.32E-17	-1.72E-14
84	8.85E-13	4.853	-6.05E-14	2.19E-05	4.33E-17	5.19E-09
85	8.85E-13	4.853	-1.09E-13	2.19E-05	4.33E-17	1.65E-09
86	-2.83E-06	4.853	0.035615	1.91E-05	-1.13E-07	-2.00E-11
87	-2.11E-06	4.853	0.035733	1.92E-05	-9.54E-08	-4.52E-09
88	3.95E-11	4.853	0.035803	1.93E-05	6.34E-17	-1.52E-14
89	2.13E-06	4.853	0.035733	1.92E-05	9.54E-08	4.52E-09
90	2.83E-06	4.853	0.035615	1.91E-05	1.13E-07	2.00E-11
91	-1.24E-05	4.853	0.061603	1.06E-05	-6.13E-07	4.38E-09
92	-9.08E-06	4.853	0.062244	1.11E-05	-5.04E-07	-3.92E-09
93	7.12E-11	4.853	0.062629	1.14E-05	-2.00E-16	-8.36E-15
94	9.08E-06	4.853	0.062244	1.11E-05	5.04E-07	3.92E-09
95	1.24E-05	4.853	0.061603	1.06E-05	6.13E-07	-4.38E-09
96	-3.32E-05	4.853	0.067773	-3.97E-06	-2.40E-06	4.42E-09
97	-2.49E-05	4.853	0.070291	-2.60E-06	-1.95E-06	-1.12E-08
98	8.45E-11	4.853	0.071855	-1.45E-06	-1.03E-15	4.12E-15
99	2.49E-05	4.853	0.070291	-2.60E-06	1.95E-06	1.12E-08
100	3.32E-05	4.853	0.067773	-3.97E-06	2.40E-06	-4.42E-09
101	-4.98E-06	4.853	0.044517	-2.27E-05	-4.98E-06	-2.59E-08
102	-4.21E-05	4.853	0.050068	-2.25E-05	-4.89E-06	-5.26E-08
103	6.29E-11	4.853	0.055250	-1.94E-05	-1.98E-15	1.69E-14
104	4.21E-05	4.853	0.050088	-2.25E-05	4.89E-06	5.26E-08
105	4.75E-05	4.853	0.044517	-2.27E-05	4.98E-06	2.59E-08
106	-7.24E-06	4.853	-0.006608	-3.61E-05	-5.20E-07	-7.44E-08
107	-1.18E-05	4.852	-0.005935	-4.07E-05	-7.52E-07	-1.95E-07
108	6.01E-12	4.852	-0.004895	-5.85E-05	-1.91E-15	2.33E-14
109	1.18E-05	4.852	-0.003945	-4.07E-05	7.52E-07	1.95E-07
110	7.24E-06	4.853	-0.006608	-3.61E-05	5.20E-07	7.44E-08
111	4.52E-05	4.853	-0.051406	-3.24E-05	3.71E-06	-3.07E-08
112	4.62E-05	4.853	-0.055775	-3.35E-05	4.21E-06	-5.22E-08
113	-3.76E-11	4.852	-0.060838	-3.18E-05	-1.88E-15	2.62E-14
114	-4.62E-05	4.853	-0.055775	-3.35E-05	-4.21E-06	5.22E-08
115	-4.52E-05	4.853	-0.051406	-3.24E-05	-3.71E-06	3.07E-08
116	4.55E-05	4.853	-0.087747	-2.26E-05	3.26E-06	4.31E-09
117	3.64E-05	4.853	-0.091219	-2.12E-05	2.77E-06	-1.25E-08
118	-7.35E-11	4.853	-0.093654	-1.96E-05	-2.35E-15	1.88E-14
119	-3.64E-05	4.853	-0.091219	-2.12E-05	-2.77E-06	1.25E-08
120	-4.55E-05	4.853	-0.087747	-2.26E-05	-3.26E-06	-4.31E-09
121	2.63E-05	4.853	-0.110135	-1.16E-05	1.47E-06	1.04E-08
122	1.99E-05	4.853	-0.111672	-1.06E-05	1.19E-06	-2.20E-09
123	-9.20E-11	4.853	-0.112604	-9.88E-06	-3.17E-15	8.40E-15
124	-1.99E-05	4.853	-0.111672	-1.06E-05	-1.19E-06	2.20E-09
125	-2.63E-05	4.853	-0.110135	-1.16E-05	-1.47E-06	-1.04E-08
126	1.18E-05	4.853	-0.118895	-1.99E-06	4.90E-07	4.58E-09
127	9.14E-06	4.853	-0.119407	-1.57E-06	4.03E-07	-2.45E-09
128	-9.52E-11	4.853	-0.119714	-1.29E-06	-3.76E-15	-3.47E-16
129	-9.14E-06	4.853	-0.119407	-1.57E-06	-4.03E-07	2.45E-09
130	-1.18E-05	4.853	-0.118895	-1.99E-06	-4.90E-07	-4.58E-09
131	8.82E-06	4.853	-0.116197	5.92E-06	1.32E-07	-4.10E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	6.97E-06	4.853	-0.116336	6.05E-06	1.12E-07	-6.24E-09
133	-8.83E-11	4.853	-0.116417	6.14E-06	-3.89E-15	-6.44E-15
134	-6.97E-06	4.853	-0.116336	6.05E-06	-1.12E-07	6.24E-09
135	-8.82E-06	4.853	-0.116197	5.92E-06	-1.32E-07	4.10E-09
136	1.93E-05	4.853	-0.104212	1.23E-05	4.81E-08	-1.38E-08
137	1.45E-05	4.853	-0.104263	1.23E-05	4.11E-08	-1.00E-08
138	-7.49E-11	4.853	-0.104290	1.23E-05	-3.41E-15	-1.07E-14
139	-1.45E-05	4.853	-0.104263	1.23E-05	-4.11E-08	1.00E-08
140	-1.93E-05	4.853	-0.104212	1.23E-05	-4.81E-08	1.38E-08
141	4.37E-05	4.853	-0.084878	1.72E-05	1.05E-07	-1.99E-08
142	3.18E-05	4.853	-0.084988	1.71E-05	8.84E-08	-7.87E-09
143	-5.68E-11	4.853	-0.085054	1.71E-05	-2.05E-15	-1.39E-14
144	-3.18E-05	4.853	-0.084988	1.71E-05	-8.84E-08	7.87E-09
145	-4.37E-05	4.853	-0.084878	1.72E-05	-1.05E-07	1.99E-08
146	6.87E-05	4.852	-0.059953	2.09E-05	3.38E-07	-4.56E-10
147	4.97E-05	4.852	-0.060309	2.06E-05	2.83E-07	1.54E-08
148	-3.52E-11	4.852	-0.060535	2.04E-05	2.05E-17	-1.63E-14
149	-4.97E-05	4.852	-0.060309	2.06E-05	-2.83E-07	-1.54E-08
150	-6.87E-05	4.852	-0.059953	2.09E-05	-3.38E-07	4.55E-10
151	3.40E-05	4.852	-0.031075	2.33E-05	9.15E-07	9.45E-08
152	2.86E-05	4.852	-0.032029	2.27E-05	7.33E-07	9.21E-08
153	-1.10E-11	4.852	-0.032624	2.23E-05	1.18E-15	-1.74E-14
154	-2.86E-05	4.852	-0.032029	2.27E-05	-7.33E-07	-9.21E-08
155	-3.40E-05	4.852	-0.031075	2.33E-05	-9.15E-07	-9.45E-08
156	-0.000180	4.852	-3.71E-98	2.40E-05	1.91E-06	2.82E-07
157	-0.000135	4.852	-0.001968	2.29E-05	-4.59E-17	-1.70E-14
158	1.33E-11	4.852	-0.003119	2.29E-05	-4.59E-17	-1.70E-14
159	0.000135	4.852	-0.001968	2.34E-05	-1.42E-06	-2.70E-07
160	0.000180	4.852	-3.71E-98	2.40E-05	-1.91E-06	-2.82E-07
161	-0.000321	4.852	0.012012	2.40E-05	1.91E-06	2.82E-07
162	-0.000270	4.852	0.009726	2.34E-05	1.42E-06	2.70E-07
163	2.18E-11	4.852	0.008355	2.29E-05	-4.59E-17	-1.70E-14
164	0.000270	4.852	0.009726	2.34E-05	-1.42E-06	-2.70E-07
165	0.000321	4.852	0.012012	2.40E-05	-1.91E-06	-2.82E-07
166	-0	3.76E-97	9.59E-98	-2.56E-99	-0	+0
167	+0	3.76E-97	-9.59E-98	-2.56E-99	+0	+0
min:	-0.000321	3.76E-97	-0.119714	-5.85E-05	-4.98E-06	-2.82E-07
max:	0.000321	4.853	0.119714	2.40E-05	4.98E-06	2.82E-07

Loadcase	Factor	Stage	Init.def	Title
62	1.0000			VIENTO TRANSV SIN SOE.

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	1.531	0.004263	3.948			
10	1.531	-0.004262	-4.140			
156	1.531	-0.004263	3.948			
160	1.531	0.004262	-4.140			
166	5.242	0.002368	-0.604205	0.010415	32.670	-0.040211
167	5.242	0.002368	-0.604205	-0.010415	32.670	0.040211
Sums :	16.609	2.71E-12	-1.592			
min:	1.531	-0.004263	-4.140	-0.010415	32.670	-0.040211
max:	5.242	0.004263	3.948	0.010415	32.670	0.040211

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-6.653	-0.018533	0.026975	-5.39E-05	1.91E-06	7.49E-06
2	-6.653	-0.010398	0.014646	-3.21E-05	-7.19E-07	7.16E-06
3	-6.654	-1.59E-06	-0.000444	1.85E-06	-4.09E-06	7.06E-06
4	-6.653	0.010395	-0.016000	3.60E-05	-2.85E-07	7.16E-06
5	-6.653	0.018532	-0.029105	5.82E-05	2.51E-06	7.49E-06
6	-6.657	-0.018533	-3.95E-97	-5.39E-05	1.91E-06	7.49E-06
7	-6.657	-0.010398	-0.001395	-3.21E-05	-7.19E-07	7.16E-06
8	-6.657	-1.59E-06	0.000483	1.85E-06	-4.09E-06	7.06E-06
9	-6.657	0.010395	0.002008	3.60E-05	-2.85E-07	7.16E-06
10	-6.657	0.018532	4.14E-97	5.82E-05	2.51E-06	7.50E-06
11	-6.666	-0.018397	-0.078384	-5.90E-05	-3.02E-05	7.40E-06
12	-6.666	-0.010341	-0.044333	-3.40E-05	-3.09E-05	7.15E-06
13	-6.666	-1.49E-06	0.002825	1.73E-06	-3.20E-05	7.11E-06
14	-6.667	0.010338	0.049918	3.76E-05	-3.08E-05	7.15E-06
15	-6.667	0.018394	0.083881	6.29E-05	-3.01E-05	7.40E-06
16	-6.676	-0.018020	-0.160357	-6.04E-05	-6.30E-05	7.14E-06
17	-6.676	-0.010174	-0.089811	-3.56E-05	-6.30E-05	7.01E-06
18	-6.676	-1.38E-06	0.004875	1.40E-06	-6.33E-05	7.02E-06
19	-6.676	0.010171	0.099686	3.85E-05	-6.32E-05	7.01E-06
20	-6.676	0.018017	0.170451	6.35E-05	-6.32E-05	7.14E-06
21	-6.685	-0.017445	-0.243800	-6.13E-05	-9.55E-05	6.86E-06
22	-6.685	-0.009877	-0.136877	-3.64E-05	-9.55E-05	6.77E-06
23	-6.685	-1.32E-06	0.006382	9.02E-07	-9.56E-05	6.79E-06
24	-6.685	0.009874	0.149849	3.83E-05	-9.57E-05	6.77E-06
25	-6.685	0.017442	0.257119	6.32E-05	-9.58E-05	6.86E-06
26	-6.694	-0.016699	-0.328103	-6.18E-05	-0.000128	6.54E-06
27	-6.694	-0.009471	-0.184819	-3.69E-05	-0.000128	6.46E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-6.694	-1.30E-06	0.007183	3.27E-07	-0.000128	6.48E-06
29	-6.694	0.009468	0.199421	3.76E-05	-0.000128	6.46E-06
30	-6.694	0.016696	0.343096	6.24E-05	-0.000128	6.54E-06
31	-6.702	-0.015809	-0.412739	-6.18E-05	-0.000160	6.17E-06
32	-6.702	-0.008981	-0.233267	-3.72E-05	-0.000160	6.10E-06
33	-6.702	-1.29E-06	0.007238	-2.31E-07	-0.000160	6.12E-06
34	-6.702	0.008978	0.247989	3.67E-05	-0.000161	6.10E-06
35	-6.702	0.015806	0.427869	6.14E-05	-0.000161	6.17E-06
36	-6.710	-0.014805	-0.497063	-6.13E-05	-0.000192	5.75E-06
37	-6.710	-0.008425	-0.281822	-3.71E-05	-0.000192	5.70E-06
38	-6.710	-1.27E-06	0.006630	-6.81E-07	-0.000192	5.71E-06
39	-6.710	0.008422	0.295340	3.57E-05	-0.000193	5.70E-06
40	-6.710	0.014803	0.511011	6.00E-05	-0.000193	5.75E-06
41	-6.717	-0.013719	-0.579960	-5.96E-05	-0.000223	5.30E-06
42	-6.717	-0.007819	-0.329813	-3.63E-05	-0.000223	5.27E-06
43	-6.717	-1.26E-06	0.005550	-9.40E-07	-0.000224	5.28E-06
44	-6.717	0.007817	0.341213	3.44E-05	-0.000224	5.27E-06
45	-6.717	0.013716	0.591859	5.79E-05	-0.000224	5.30E-06
46	-6.724	-0.012582	-0.659056	-5.54E-05	-0.000253	4.84E-06
47	-6.724	-0.007176	-0.376080	-3.43E-05	-0.000253	4.82E-06
48	-6.724	-1.35E-06	0.004299	-9.30E-07	-0.000254	4.81E-06
49	-6.724	0.007174	0.385093	3.26E-05	-0.000253	4.82E-06
50	-6.724	0.012580	0.668746	5.39E-05	-0.000253	4.84E-06
51	-6.730	-0.011431	-0.729023	-4.58E-05	-0.000277	4.41E-06
52	-6.730	-0.006504	-0.418531	-2.99E-05	-0.000278	4.39E-06
53	-6.730	-1.64E-06	0.003277	-5.62E-07	-0.000283	4.29E-06
54	-6.730	0.006502	0.425773	2.91E-05	-0.000279	4.39E-06
55	-6.730	0.011429	0.737272	4.52E-05	-0.000278	4.41E-06
56	-6.735	-0.010273	-0.780684	-2.93E-05	-0.000293	4.02E-06
57	-6.735	-0.005832	-0.451527	-1.80E-05	-0.000295	3.96E-06
58	-6.735	-2.01E-06	0.003085	4.26E-07	-0.000316	3.95E-06
59	-6.735	0.005828	0.458725	1.89E-05	-0.000296	3.96E-06
60	-6.735	0.010273	0.789146	3.02E-05	-0.000294	4.03E-06
61	-6.742	-0.008625	-0.817406	-1.08E-05	-0.000312	3.42E-06
62	-6.742	-0.004886	-0.467607	-4.42E-06	-0.000313	3.32E-06
63	-6.742	-1.23E-06	0.005063	1.64E-06	-0.000316	3.35E-06
64	-6.742	0.004884	0.478344	7.44E-06	-0.000314	3.32E-06
65	-6.742	0.008623	0.829060	1.36E-05	-0.000313	3.42E-06
66	-6.747	-0.006714	-0.829054	-2.74E-06	-0.000319	2.68E-06
67	-6.747	-0.003788	-0.471430	-7.32E-07	-0.000319	2.59E-06
68	-6.747	-7.29E-07	0.008147	1.87E-06	-0.000320	2.60E-06
69	-6.747	0.003787	0.488065	4.40E-06	-0.000320	2.59E-06
70	-6.747	0.006712	0.846252	6.30E-06	-0.000320	2.68E-06
71	-6.751	-0.004590	-0.831749	-3.45E-07	-0.000322	1.83E-06
72	-6.751	-0.002588	-0.471515	4.06E-07	-0.000322	1.77E-06
73	-6.751	-4.71E-07	0.011133	1.56E-06	-0.000322	1.78E-06
74	-6.751	0.002587	0.494044	2.69E-06	-0.000322	1.77E-06
75	-6.751	0.004589	0.854715	3.42E-06	-0.000322	1.83E-06
76	-6.753	-0.002329	-0.831989	1.35E-07	-0.000323	9.30E-07
77	-6.753	-0.001313	-0.470729	4.22E-07	-0.000323	9.00E-07
78	-6.753	-2.43E-07	0.013243	8.75E-07	-0.000323	9.02E-07
79	-6.753	0.001313	0.497461	1.32E-06	-0.000323	8.99E-07

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-6.753	0.002328	0.859129	1.61E-06	-0.000323	9.30E-07
81	-6.754	-2.46E-11	-0.831895	-5.18E-16	-0.000323	9.00E-15
82	-6.754	-1.45E-11	-0.470347	-3.19E-16	-0.000323	9.00E-15
83	-6.754	-9.92E-13	0.014000	7.67E-18	-0.000323	9.00E-15
84	-6.754	1.25E-11	0.498591	3.34E-16	-0.000323	9.00E-15
85	-6.754	2.26E-11	0.860544	5.31E-16	-0.000323	9.00E-15
86	-6.753	0.002329	-0.831989	-1.35E-07	-0.000323	-9.30E-07
87	-6.753	0.001313	-0.470729	-4.22E-07	-0.000323	-9.00E-07
88	-6.753	2.43E-07	0.013243	-8.75E-07	-0.000323	-9.02E-07
89	-6.753	-0.001313	0.497461	-1.32E-06	-0.000323	-8.99E-07
90	-6.753	-0.002328	0.859129	-1.61E-06	-0.000323	-9.30E-07
91	-6.751	0.004590	-0.831749	3.45E-07	-0.000322	-1.83E-06
92	-6.751	0.002588	-0.471515	-4.06E-07	-0.000322	-1.77E-06
93	-6.751	4.71E-07	0.011133	-1.56E-06	-0.000322	-1.78E-06
94	-6.751	-0.002587	0.494044	-2.69E-06	-0.000322	-1.77E-06
95	-6.751	-0.004589	0.854715	-3.42E-06	-0.000322	-1.83E-06
96	-6.747	0.006714	-0.829054	2.74E-06	-0.000319	-2.68E-06
97	-6.747	0.003788	-0.471430	7.32E-07	-0.000319	-2.59E-06
98	-6.747	7.29E-07	0.008147	-1.87E-06	-0.000320	-2.60E-06
99	-6.747	-0.003787	0.488065	-4.40E-06	-0.000320	-2.59E-06
100	-6.747	0.006712	0.846252	-6.30E-06	-0.000320	-2.68E-06
101	-6.742	0.008625	-0.817406	1.08E-05	-0.000312	-3.42E-06
102	-6.742	0.004886	-0.467607	4.42E-06	-0.000313	-3.32E-06
103	-6.742	1.23E-06	0.005063	-1.64E-06	-0.000316	-3.39E-06
104	-6.742	-0.004884	0.478344	-7.44E-06	-0.000314	-3.32E-06
105	-6.742	-0.008623	0.829060	-1.36E-05	-0.000313	-3.42E-06
106	-6.735	0.010273	-0.780684	2.93E-05	-0.000293	-4.02E-06
107	-6.735	0.005832	-0.451527	1.80E-05	-0.000295	-3.96E-06
108	-6.735	2.01E-06	0.003085	-4.26E-07	-0.000316	-3.95E-06
109	-6.735	-0.005828	0.458725	-1.89E-05	-0.000296	-3.96E-06
110	-6.735	-0.010273	0.789146	-3.02E-05	-0.000294	-4.03E-06
111	-6.730	0.011431	-0.729023	4.58E-05	-0.000277	-4.41E-06
112	-6.730	0.006504	-0.418531	2.99E-05	-0.000278	-4.39E-06
113	-6.730	1.64E-06	0.003277	5.62E-07	-0.000283	-4.29E-06
114	-6.730	-0.006502	0.425773	-2.91E-05	-0.000279	-4.39E-06
115	-6.730	-0.011429	0.737272	-4.52E-05	-0.000278	-4.41E-06
116	-6.724	0.012582	-0.659056	5.54E-05	-0.000253	-4.84E-06
117	-6.724	0.007176	-0.376080	3.43E-05	-0.000253	-4.82E-06
118	-6.724	1.35E-06	0.004299	9.30E-07	-0.000254	-4.81E-06
119	-6.724	-0.007174	0.385093	-3.26E-05	-0.000253	-4.82E-06
120	-6.724	-0.012580	0.668746	-5.39E-05	-0.000253	-4.84E-06
121	-6.717	0.013719	-0.579960	5.96E-05	-0.000223	-5.30E-06
122	-6.717	0.007819	-0.329813	3.63E-05	-0.000223	-5.27E-06
123	-6.717	1.26E-06	0.005550	9.40E-07	-0.000224	-5.28E-06
124	-6.717	-0.007817	0.341213	-3.44E-05	-0.000224	-5.27E-06
125	-6.717	-0.013716	0.591859	-5.79E-05	-0.000224	-5.30E-06
126	-6.710	0.014805	-0.497063	6.13E-05	-0.000192	-5.75E-06
127	-6.710	0.008425	-0.281822	3.71E-05	-0.000192	-5.70E-06
128	-6.710	1.27E-06	0.006630	6.81E-07	-0.000192	-5.71E-06
129	-6.710	-0.008422	0.295340	-3.57E-05	-0.000193	-5.70E-06
130	-6.710	-0.014803	0.511011	-6.00E-05	-0.000193	-5.75E-06
131	-6.702	0.015809	-0.412739	6.18E-05	-0.000160	-6.17E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-6.702	0.008981	-0.233267	3.72E-05	-0.000160	-6.10E-06
133	-6.702	1.29E-06	0.007238	2.31E-07	-0.000160	-6.12E-06
134	-6.702	-0.008978	0.247989	-3.67E-05	-0.000161	-6.10E-06
135	-6.702	-0.015806	0.427869	-6.14E-05	-0.000161	-6.17E-06
136	-6.694	0.016699	-0.328103	6.18E-05	-0.000128	-6.54E-06
137	-6.694	0.009471	-0.184819	3.69E-05	-0.000128	-6.46E-06
138	-6.694	1.30E-06	0.007183	-3.27E-07	-0.000128	-6.48E-06
139	-6.694	-0.009468	0.199421	-3.76E-05	-0.000128	-6.46E-06
140	-6.694	-0.016696	0.343096	-6.24E-05	-0.000128	-6.54E-06
141	-6.685	0.017445	-0.243800	6.13E-05	-9.55E-05	-6.86E-06
142	-6.685	0.009877	-0.136877	3.64E-05	-9.55E-05	-6.77E-06
143	-6.685	1.32E-06	0.006382	-9.02E-07	-9.56E-05	-6.79E-06
144	-6.685	-0.009874	0.149849	-3.83E-05	-9.57E-05	-6.77E-06
145	-6.685	-0.017442	0.257119	-6.32E-05	-9.58E-05	-6.86E-06
146	-6.676	0.018020	-0.160357	6.04E-05	-6.30E-05	-7.14E-06
147	-6.676	0.010174	-0.089811	3.56E-05	-6.30E-05	-7.01E-06
148	-6.676	1.38E-06	0.004875	-1.40E-06	-6.33E-05	-7.02E-06
149	-6.676	-0.010171	0.099686	-3.85E-05	-6.32E-05	-7.01E-06
150	-6.676	-0.018017	0.170451	-6.35E-05	-6.32E-05	-7.14E-06
151	-6.666	0.018397	-0.078384	5.90E-05	-3.02E-05	-7.40E-06
152	-6.666	0.010341	-0.044333	3.40E-05	-3.09E-05	-7.15E-06
153	-6.666	1.49E-06	0.002825	-1.73E-06	-3.20E-05	-7.11E-06
154	-6.667	-0.010338	0.049918	-3.76E-05	-3.08E-05	-7.15E-06
155	-6.667	-0.018394	0.083881	-6.29E-05	-3.01E-05	-7.40E-06
156	-6.657	0.018533	-3.95E-97	5.39E-05	1.91E-06	-7.49E-06
157	-6.657	0.010398	-0.001395	3.21E-05	-7.19E-07	-7.16E-06
158	-6.657	1.59E-06	0.000483	-1.85E-06	-4.09E-06	-7.06E-06
159	-6.657	-0.010395	0.002008	-3.60E-05	-2.85E-07	-7.16E-06
160	-6.657	-0.018532	4.14E-97	-5.82E-05	2.51E-06	-7.50E-06
161	-6.653	0.018533	0.026975	5.39E-05	1.91E-06	-7.49E-06
162	-6.653	0.010398	0.014646	3.21E-05	-7.19E-07	-7.16E-06
163	-6.654	1.59E-06	-0.000444	-1.85E-06	-4.09E-06	-7.06E-06
164	-6.653	-0.010395	-0.016000	-3.60E-05	-2.85E-07	-7.16E-06
165	-6.653	-0.018532	-0.029105	-5.82E-05	2.51E-06	-7.49E-06
166	-5.24E-97	+0	6.04E-98	-0	-3.27E-99	+0
167	-5.24E-97	-0	6.04E-98	+0	-3.27E-99	-0
min:	-6.754	-0.018533	-0.831989	-6.35E-05	-0.000323	-7.50E-06
max:	-5.24E-97	0.018533	0.860544	6.35E-05	2.51E-06	7.50E-06

3.2. Combinación de acciones

ENVELOPE SPECIFIC.: CY 'COMBINACION CARACTERISTICA'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000		SOB UNIF 5
AZ	PLUS	11	1.000		VEHICULO HIPOTESIS 11
BA	OR	12	1.000		VEHICULO HIPOTESIS 12
BB	OR	13	1.000		VEHICULO HIPOTESIS 13
BC	OR	14	1.000		VEHICULO HIPOTESIS 14
BD	OR	15	1.000		VEHICULO HIPOTESIS 15
BE	OR	16	1.000		VEHICULO HIPOTESIS 16
BF	OR	17	1.000		VEHICULO HIPOTESIS 17
BG	OR	18	1.000		VEHICULO HIPOTESIS 18
BH	OR	19	1.000		VEHICULO HIPOTESIS 19
BI	OR	20	1.000		VEHICULO HIPOTESIS 20
BJ	OR	21	1.000		VEHICULO HIPOTESIS 21
BK	OR	22	1.000		VEHICULO HIPOTESIS 22
BL	OR	23	1.000		VEHICULO HIPOTESIS 23
BM	OR	24	1.000		VEHICULO HIPOTESIS 24
BN	OR	25	1.000		VEHICULO POSICION 25
BO	OR	26	1.000		VEHICULO POSICION 26
BP	OR	27	1.000		VEHICULO POSICION 27
BQ	OR	28	1.000		VEHICULO POSICION 28
BR	OR	29	1.000		VEHICULO POSICION 29
BS	OR	30	1.000		VEHICULO POSICION 30
BT	OR	31	1.000		VEHICULO POSICION 31
BU	OR	32	1.000		VEHICULO POSICION 32
BV	OR	33	1.000		VEHICULO POSICION 33
BW	OR	34	1.000		VEHICULO POSICION 34
BX	OR	35	1.000		VEHICULO POSICION 35
BY	OR	36	1.000		VEHICULO POSICION 36
BZ	OR	37	1.000		VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000		FRENADO
CB	PLUS	63	0.300000		VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000		TEMPERATURA (-)
CD	OR	65	0.600000		TEMPERATURA (+)
CE	PLUS	66	0.600000		GRADIENTE
ALTERNATIVE ENVELOPE :					
CF	PERM.	1	1.000		PESO PROPIO
CG	PL.PERM	2	1.500		PESO PAVIMENTO
CH	OR	2	1.000		PESO PAVIMENTO
CI	PL.PERM	3	1.000		PESO BARRERAS
CJ	PLUS	46	1.000		SOB UNIF VANO 1
CK	PLUS	47	1.000		SOB UNIF VANO 2
CL	PLUS	48	1.000		SOB UNIF VANO 3
CM	PLUS	11	1.000		VEHICULO HIPOTESIS 11
CN	OR	12	1.000		VEHICULO HIPOTESIS 12
CO	OR	13	1.000		VEHICULO HIPOTESIS 13
CP	OR	14	1.000		VEHICULO HIPOTESIS 14
CQ	OR	15	1.000		VEHICULO HIPOTESIS 15
CR	OR	16	1.000		VEHICULO HIPOTESIS 16
CS	OR	17	1.000		VEHICULO HIPOTESIS 17
CT	OR	18	1.000		VEHICULO HIPOTESIS 18
CU	OR	19	1.000		VEHICULO HIPOTESIS 19
CV	OR	20	1.000		VEHICULO HIPOTESIS 20
CW	OR	21	1.000		VEHICULO HIPOTESIS 21
CX	OR	22	1.000		VEHICULO HIPOTESIS 22
CY	OR	23	1.000		VEHICULO HIPOTESIS 23
CZ	OR	24	1.000		VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOE
DP	PLUS	64	0.600000	TEMPERATURA (-)
DQ	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE
ALTERNATIVE ENVELOPE :				
DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
EH	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
FA	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOE
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	20.036			
	1.761	1.141	100.469			
	Min: AP AR AS AT AX AY BU...			Max: A B D E F G J AL AN AO		
10	2.283	-3.686	16.626			
	-0.568555	1.138	97.227			
	Min: AP AR AS AT AU AV BC...			Max: A B D G H I AE AN AO		
156	-1.091	2.568	20.407			
	1.761	-2.257	100.840			
	Min: AP AR AS AT AX AY BW...			Max: A B D E F G R AK AL AN.		
160	2.283	2.571	16.997			
	-0.568596	-2.254	97.599			
	Min: AP AR AS AT AU AV BE...			Max: A B D G H I AJ AK AN...		
166	3.374	-1.935	218.118	15.604	23.708	-0.028301
	2.90E-10	-0.710816	352.379	11.174	2.13E-09	-3.88E-09
	Min: CF CH CI CL DC DN DQ...			Max: DS DT DV DW DX DY EM...		
167	3.374	-1.829	219.077	9.951	23.708	0.028301
	2.78E-10	-3.053	353.338	14.381	2.08E-09	3.63E-09
	Min: CF CH CI CJ CW DO DQ...			Max: DS DT DV DW DY DZ EO...		

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-1.091	-3.683	26.641			
	2.283	1.009	60.789			
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F M AL AN		
10	-1.090	1.006	57.547			
	2.284	-3.686	23.231			
	Min: A C D H I AE AN			Max: AP AQ AS AT AU AV AW...		
156	-1.091	2.567	27.013			
	2.283	-2.125	61.160			
	Min: AP AQ AS AT AW AX AY...			Max: A C D E F O AK AL AN		
160	-1.091	-2.122	57.919			
	2.284	2.570	23.603			
	Min: A C D H I AG AK AN			Max: AP AQ AS AT AU AV AW...		
166	-2.615	3.395	313.122	-17.884	-3.159	0.221212
	5.989	-4.252	319.171	36.214	26.867	-0.249513
	Min: A C D E F M AN			Max: AP AQ AS AT AW AX AY...		
167	-2.615	-7.158	314.081	43.438	-3.159	-0.221212

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
	5.989	0.488287	320.130	-10.660	26.867	0.249513
	Min: A C D E F O AK AN			Max: AP AQ AS AT AW AX AY...		

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-0.167731	-3.836	34.496			
	0.835704	1.280	53.022			
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DO DQ...		
10	1.360	-3.839	31.088			
	0.356995	1.277	49.781			
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR		
156	0.635745	-2.396	53.394			
	-0.167690	2.720	34.870			
	Min: CF CH CI CL DL DN DQ...			Max: DS DT DV DW DX DY ET...		
160	0.356954	-2.393	50.152			
	1.360	2.723	31.460			
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EE...		
166	3.374	-8.324	297.858	52.598	23.708	-0.028301
	5.36E-05	6.034	296.749	-29.975	2.74E-08	-1.18E-08
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
167	5.35E-05	-9.797	297.708	55.530	2.73E-08	1.16E-08
	3.374	4.560	296.816	-27.044	23.708	0.028301
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

DEFORMATIONS: ""
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-9.927	-4.388	-1.45E-06	-0.001116	0.000178	-1.26E-05
		4.745	16.012	-2.36E-09	-0.000181	0.000186	2.63E-05
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...		
2	1.300	-9.912	15.434	-1.030	-0.000782	-7.75E-05	-1.13E-05
		4.718	-4.186	-0.728517	-0.000510	0.000186	1.76E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
31	0	-9.912	-10.583	-1.061	0.000805	-7.66E-05	1.14E-05
		4.716	9.037	-0.759594	0.000534	0.000189	-1.75E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		
31	1.300	-9.927	9.235	-1.74E-08	0.001141	0.000180	1.29E-05
		4.745	-11.161	-3.23E-09	0.000205	0.000188	-2.61E-05
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...		

DEFORMATIONS: ""
ENVELOPE for < DX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
75	0	-9.759	-1.872	-1.330	-2.92E-05	-0.001310	-1.79E-05
		4.522	10.104	-1.311	5.37E-06	0.001078	2.09E-05
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...		
75	1.300	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...		
76	0	-9.735	-1.589	-1.627	-0.000500	-0.001410	-1.89E-05
		4.495	9.441	-1.601	-0.000536	0.001150	2.17E-05
		Min: A B D E F G M AL AN AO			Max: AP AR AS AT AX AY BU...		
76	1.700	-9.702	8.576	-3.304	-0.001163	-0.001535	-2.04E-05
		4.457	-1.219	-2.834	-0.000935	0.001276	2.28E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
85	0	-9.702	-3.725	-3.248	0.001143	-0.001535	2.04E-05
		4.457	6.071	-2.779	0.000916	0.001276	-2.28E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		
85	1.700	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05
		Min: A B D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...		
86	0	-9.735	1.589	-1.627	0.000500	-0.001410	1.89E-05
		4.495	0.261506	-1.611	0.000419	0.001150	-2.17E-05
		Min: A B D E F G O AL AN AO			Max: AP AR AS AT AX AY BW...		
86	1.300	-9.759	6.724	-1.391	-2.60E-06	-0.001310	1.79E-05
		4.522	-5.252	-1.371	-3.72E-05	0.001078	-2.09E-05
		Min: A B D E F G O AK AL AN.			Max: AP AR AS AT AX AY BW...		
130	0	-9.931	16.026	-1.74E-09	-0.000134	-0.000184	-2.10E-05
		4.741	-4.375	-1.39E-08	-0.001072	-0.000176	1.79E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AE AN		
130	1.300	-9.911	-4.173	-0.659427	-0.000459	-0.000213	-1.24E-05
		4.719	15.447	-0.965400	-0.000733	5.27E-05	1.65E-05
		Min: A C D E F M AL AN			Max: AP AQ AS AT AW AX AY...		
159	0	-9.911	9.024	-0.690504	0.000482	-0.000214	1.23E-05
		4.719	-10.596	-0.996477	0.000756	5.17E-05	-1.66E-05
		Min: A C D E F O AK AL AN			Max: AP AQ AS AT AW AX AY...		
159	1.300	-9.931	-11.174	-2.41E-09	0.000158	-0.000186	2.07E-05
		4.741	9.226	-1.66E-08	0.001096	-0.000178	-1.82E-05
		Min: AP AQ AS AT AU AV AW...			Max: A C D H I AG AK AN		

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-3.633	-5.566	-1.43E-08	-0.001098	0.000283	2.93E-05
		0.729265	16.677	-9.22E-09	-0.000709	0.000154	-2.00E-05
		Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...			
2	1.300	-3.666	-5.281	-1.474	-0.001105	0.000194	2.26E-05
		0.755751	16.016	-0.908772	-0.000646	7.11E-05	-2.06E-05
		Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...			
31	0	0.755785	-11.165	-0.939849	0.000669	7.20E-05	2.07E-05
		-3.666	10.132	-1.505	0.001128	0.000195	-2.25E-05
		Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DO...			
31	1.300	0.729085	-11.826	-1.07E-08	0.000733	0.000156	2.02E-05
		-3.634	10.417	-1.63E-08	0.001122	0.000285	-2.91E-05
		Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DO...			
75	0	-5.237	-2.959	-2.341	0.000825	-0.000232	2.96E-06
		-1.03E-09	10.666	-0.931812	-8.42E-05	7.32E-13	7.37E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
75	1.300	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
76	0	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
76	1.700	-5.245	-2.305	-1.599	-0.000298	-0.000260	2.44E-06
		-4.04E-09	9.138	-2.679	-0.000971	6.64E-13	1.02E-12
		Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...			
85	0	-3.98E-09	-4.286	-2.623	0.000951	6.61E-13	-1.01E-12
		-5.245	7.157	-1.544	0.000279	-0.000260	-2.44E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...			
85	1.700	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...			
86	0	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...			
86	1.300	-1.08E-09	-5.814	-0.992653	5.24E-05	7.30E-13	-7.10E-13
		-5.237	7.810	-2.402	-0.000856	-0.000232	-2.96E-06
		Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...			
130	0	-1.552	-5.553	-1.37E-08	-0.001054	-0.000282	-2.40E-05
		-5.915	16.691	-8.59E-09	-0.000661	-0.000152	2.53E-05
		Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...			
130	1.300	-1.526	-5.268	-1.409	-0.001057	-0.000219	-1.74E-05
		-5.949	16.029	-0.839662	-0.000594	-9.58E-05	2.59E-05
		Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...			

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
159	0	-5.949	-11.178	-0.870759	0.000617	-9.68E-05	-2.60E-05
		-1.526	10.119	-1.440	0.001080	-0.000220	1.73E-05
		Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...			
159	1.300	-5.915	-11.839	-9.85E-09	0.000685	-0.000154	-2.56E-05
		-1.552	10.404	-1.55E-08	0.001078	-0.000284	2.37E-05
		Min: DS DT DV DW DX DY EE...		Max: CF CH CI CL CT DN DQ...			

ENVELOPE for < N > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-352.379	-0.710816	-2.90E-10	3.88E-09	2.13E-09	11.174
		-218.118	-1.935	-3.374	0.028301	23.708	15.604
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...			
290	13.200	-352.379	-0.710816	-2.90E-10	3.88E-09	-1.70E-09	1.791
		-218.118	-1.935	-2.582	0.028301	-15.598	-9.938
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...			
291	0	-353.338	-3.053	-2.78E-10	-3.63E-09	2.08E-09	14.381
		-219.077	-1.829	-3.374	-0.028301	23.708	9.951
		Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...			
291	13.200	-353.338	-3.053	-2.78E-10	-3.63E-09	-1.59E-09	-25.914
		-219.077	-1.829	-2.582	-0.028301	-15.598	-14.186
		Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-313.535	-3.098	2.525	-0.264263	-3.487	20.929
		-316.630	-1.529	-5.898	0.292564	27.196	11.566
		Min: AP AR AS AT AU AV BE...		Max: A B D G H I AD AK AL...			
290	13.200	-319.171	-4.252	-5.197	0.249513	-46.963	-19.909
		-313.122	3.395	2.615	-0.221212	31.365	26.929
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F M AN			
291	0	-314.494	-0.665613	2.525	0.264263	-3.487	4.626
		-317.589	-2.234	-5.898	-0.292564	27.196	13.988
		Min: AP AR AS AT AU AV EF...		Max: A B D G H I AH AL AN...			

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
291	13.200	-320.130	0.488287	-5.197	-0.249513	-46.963	-4.214
		-314.081	-7.156	2.615	0.221212	31.365	-51.052
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F O AK AN			

ENVELOPE for < Mz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.749	6.034	-5.36E-09	1.18E-08	2.74E-08	-29.975
		-297.858	-8.324	-3.374	0.028301	23.708	52.598
		Min: CF CG CI CK CZ DQ DR		Max: DS DU DV DW DX DZ EK...			
290	13.200	-297.858	-8.324	-2.582	0.028301	-15.598	-57.273
		-296.749	6.034	-5.36E-09	1.18E-08	-4.34E-08	49.670
		Min: DS DU DV DW DX DZ EK...		Max: CF CG CI CK CZ DQ DR			
291	0	-298.816	4.560	-3.374	-0.028301	23.708	-27.044
		-297.708	-9.797	-5.35E-09	-1.16E-08	2.73E-08	55.530
		Min: DS DU DV DW DX DZ EQ...		Max: CF CG CI CK CZ DN DQ...			
291	13.200	-297.708	-9.797	-5.35E-09	-1.16E-08	-4.33E-08	-73.793
		-298.816	4.560	-2.582	-0.028301	-15.598	33.150
		Min: CF CG CI CK CZ DN DQ...		Max: DS DU DV DW DX DZ EQ...			

Introducción

Del cálculo del tablero como emparrillado espacial se han obtenido para las distintas hipótesis los valores de las reacciones del tablero, tanto verticales como horizontales.

Con dichos valores se han obtenido las reacciones para las distintas hipótesis de carga, que responden a lo dispuesto por la "Instrucción sobre a las acciones a considerar en el proyecto de puentes de carretera" (IAP).

La pila se ha calculado en segundo orden, considerando la longitud de pandeo real de las mismas, que se obtiene del cálculo de los autovalores estáticos del modelo con sus rigideces resultantes mediante el programa STATIK·3. Con estos valores se ha utilizado la fórmula de la EHE para esbelteces medias.

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	-3.633	-5.566	-1.43E-08	-0.001098	0.000283	2.93E-05
		0.729265	16.677	-9.22E-09	-0.000709	0.000154	-2.00E-05
	Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...				
2	1.300	-3.666	-5.281	-1.474	-0.001105	0.000194	2.26E-05
		0.755751	16.016	-0.908772	-0.000646	7.11E-05	-2.06E-05
	Min: CF CH CI CJ DF DO DQ...		Max: DS DT DV DW DY DZ EZ...				
31	0	0.755785	-11.165	-0.939849	0.000669	7.20E-05	2.07E-05
		-3.666	10.132	-1.505	0.001128	0.000195	-2.25E-05
	Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...				
31	1.300	0.729085	-11.826	-1.07E-08	0.000733	0.000156	2.02E-05
		-3.634	10.417	-1.63E-08	0.001122	0.000285	-2.91E-05
	Min: DS DT DV DW DX DY ET...		Max: CF CH CI CL DL DN DQ...				
75	0	-5.237	-2.959	-2.341	0.000825	-0.000232	2.96E-06
		-1.03E-09	10.666	-0.931812	-8.42E-05	7.32E-13	7.37E-13
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
75	1.300	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
76	0	-5.241	-2.675	-1.530	0.000333	-0.000260	2.78E-06
		-2.09E-09	10.004	-1.297	-0.000548	6.59E-13	9.23E-13
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
76	1.700	-5.245	-2.308	-1.599	-0.000298	-0.000260	2.44E-06
		-4.04E-09	9.138	-2.675	-0.000971	6.64E-13	1.02E-12
	Min: CF CH CI CJ CW DO DQ		Max: DS DT DV DW DY DZ EQ...				
85	0	-3.98E-09	-4.286	-2.623	0.000951	6.61E-13	-1.01E-12
		-5.245	7.157	-1.544	0.000279	-0.000260	-2.44E-06
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...				
85	1.700	-2.05E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...				
86	0	-2.09E-09	-5.152	-1.302	0.000490	6.56E-13	-8.99E-13
		-5.241	7.527	-1.535	-0.000392	-0.000260	-2.78E-06
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...				
86	1.300	-1.08E-09	-5.814	-0.992653	5.24E-05	7.30E-13	-7.10E-13
		-5.237	7.810	-2.402	-0.000856	-0.000232	-2.96E-06
	Min: DS DT DV DW DX DY EK...		Max: CF CH CI CL DC DN DO...				
130	0	-1.552	-5.553	-1.37E-08	-0.001054	-0.000282	-2.40E-05
		-5.915	16.691	-8.59E-09	-0.000661	-0.000152	2.53E-05
	Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...				
130	1.300	-1.526	-5.268	-1.409	-0.001057	-0.000219	-1.74E-05
		-5.949	16.029	-0.839682	-0.000594	-9.58E-05	2.59E-05
	Min: CF CH CI CJ CN DQ DR		Max: DS DT DV DW DY DZ EH...				

DEFORMATIONS: **
ENVELOPE for < DY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
159	0	-5.949	-11.178	-0.870759	0.000617	-9.68E-05	-2.60E-05
		-1.526	10.119	-1.440	0.001080	-0.000220	1.73E-05
	Min: DS DT DV DW DX DY EB...		Max: CF CH CI CL CT DN DQ...				
159	1.300	-5.915	-11.839	-9.85E-09	0.000685	-0.000154	-2.56E-05
		-1.552	10.404	-1.55E-08	0.001078	-0.000284	2.37E-05
	Min: DS DT DV DW DX DY EB...		Max: CF CH CI CL CT DN DQ...				

ENVELOPE for < N > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-352.379	-0.710816	-2.90E-10	3.88E-09	2.13E-09	11.174
		-218.118	-1.935	-3.374	0.028301	23.708	15.604
	Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...				
290	13.200	-352.379	-0.710816	-2.90E-10	3.88E-09	-1.70E-09	1.791
		-218.118	-1.935	-2.582	0.028301	-15.598	-9.938
	Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...				
291	0	-353.338	-3.053	-2.78E-10	-3.63E-09	2.08E-09	14.381
		-219.077	-1.829	-3.374	-0.028301	23.708	9.951
	Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...				
291	13.200	-353.338	-3.053	-2.78E-10	-3.63E-09	-1.59E-09	-25.914
		-219.077	-1.829	-2.582	-0.028301	-15.598	-14.186
	Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...				

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-313.535	-3.098	2.525	-0.264263	-3.487	20.929
		-316.630	-1.529	-5.898	0.292564	27.196	11.566
	Min: AP AR AS AT AU AV BB...		Max: A B D G H I AD AK AL...				
290	13.200	-319.171	-4.252	-5.197	0.249513	-46.963	-19.909
		-313.122	3.395	2.615	-0.221212	31.365	26.929
	Min: AP AQ AS AT AW AX AY...		Max: A C D E F M AN				
291	0	-314.494	-0.665613	2.525	0.264263	-3.487	4.626
		-317.589	-2.234	-5.898	-0.292564	27.196	13.988
	Min: AP AR AS AT AU AV BF...		Max: A B D G H I AH AL AN...				

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
291	13.200	-320.130	0.488287	-5.197	-0.249513	-46.963	-4.214
		-314.081	-7.158	2.615	0.221212	31.365	-51.052
	Min: AP AQ AS AT AW AX AY...		Max: A C D E F O AK AN				

ENVELOPE for < Mz > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.749	6.034	-5.36E-09	1.18E-08	2.74E-08	-29.975
		-297.858	-8.324	-3.374	0.028301	23.708	52.598
	Min: CF CG CI CK CZ DQ DR		Max: DS DU DV DW DX DZ EK...				
290	13.200	-297.858	-8.324	-2.582	0.028301	-15.598	-57.273
		-296.749	6.034	-5.36E-09	1.18E-08	-4.34E-08	49.670
	Min: DS DU DV DW DX DZ EK...		Max: CF CG CI CK CZ DQ DR				
291	0	-298.816	4.560	-3.374	-0.028301	23.708	-27.044
		-297.708	-9.797	-5.35E-09	-1.16E-08	2.73E-08	55.530
	Min: DS DU DV DW DX DZ EQ...		Max: CF CG CI CK CZ DN DQ...				
291	13.200	-297.708	-9.797	-5.35E-09	-1.16E-08	-4.33E-08	-73.793
		-298.816	4.560	-2.582	-0.028301	-15.598	33.150
	Min: CF CG CI CK CZ DN DQ...		Max: DS DU DV DW DX DZ EQ...				

ENVELOPE SPECIFIC.: CZ 'COMBINACION ELU'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	PL.PERM	2	2.025		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.350		PESO BARRERAS
E	PLUS	6	1.500		SOB UNIF 1
F	PLUS	7	1.500		SOB UNIF 2
G	PLUS	8	1.500		SOB UNIF 3
H	PLUS	9	1.500		SOB UNIF 4
I	PLUS	10	1.500		SOB UNIF 5
J	PLUS	11	1.500		VEHICULO HIPOTESIS 11
K	OR	12	1.500		VEHICULO HIPOTESIS 12
L	OR	13	1.500		VEHICULO HIPOTESIS 13
M	OR	14	1.500		VEHICULO HIPOTESIS 14
N	OR	15	1.500		VEHICULO HIPOTESIS 15
O	OR	16	1.500		VEHICULO HIPOTESIS 16
P	OR	17	1.500		VEHICULO HIPOTESIS 17
Q	OR	18	1.500		VEHICULO HIPOTESIS 18
R	OR	19	1.500		VEHICULO HIPOTESIS 19
S	OR	20	1.500		VEHICULO HIPOTESIS 20
T	OR	21	1.500		VEHICULO HIPOTESIS 21
U	OR	22	1.500		VEHICULO HIPOTESIS 22
V	OR	23	1.500		VEHICULO HIPOTESIS 23
W	OR	24	1.500		VEHICULO HIPOTESIS 24
X	OR	25	1.500		VEHICULO POSICION 25
Y	OR	26	1.500		VEHICULO POSICION 26
Z	OR	27	1.500		VEHICULO POSICION 27
AA	OR	28	1.500		VEHICULO POSICION 28
AB	OR	29	1.500		VEHICULO POSICION 29
AC	OR	30	1.500		VEHICULO POSICION 30
AD	OR	31	1.500		VEHICULO POSICION 31
AE	OR	32	1.500		VEHICULO POSICION 32
AF	OR	33	1.500		VEHICULO POSICION 33
AG	OR	34	1.500		VEHICULO POSICION 34
AH	OR	35	1.500		VEHICULO POSICION 35
AI	OR	36	1.500		VEHICULO POSICION 36
AJ	OR	37	1.500		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.500		FRENADO
AL	PLUS	63	0.750000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.900000		TEMPERATURA (-)
AN	OR	65	0.900000		TEMPERATURA (+)
AO	PLUS	66	0.900000		GRADIENTE

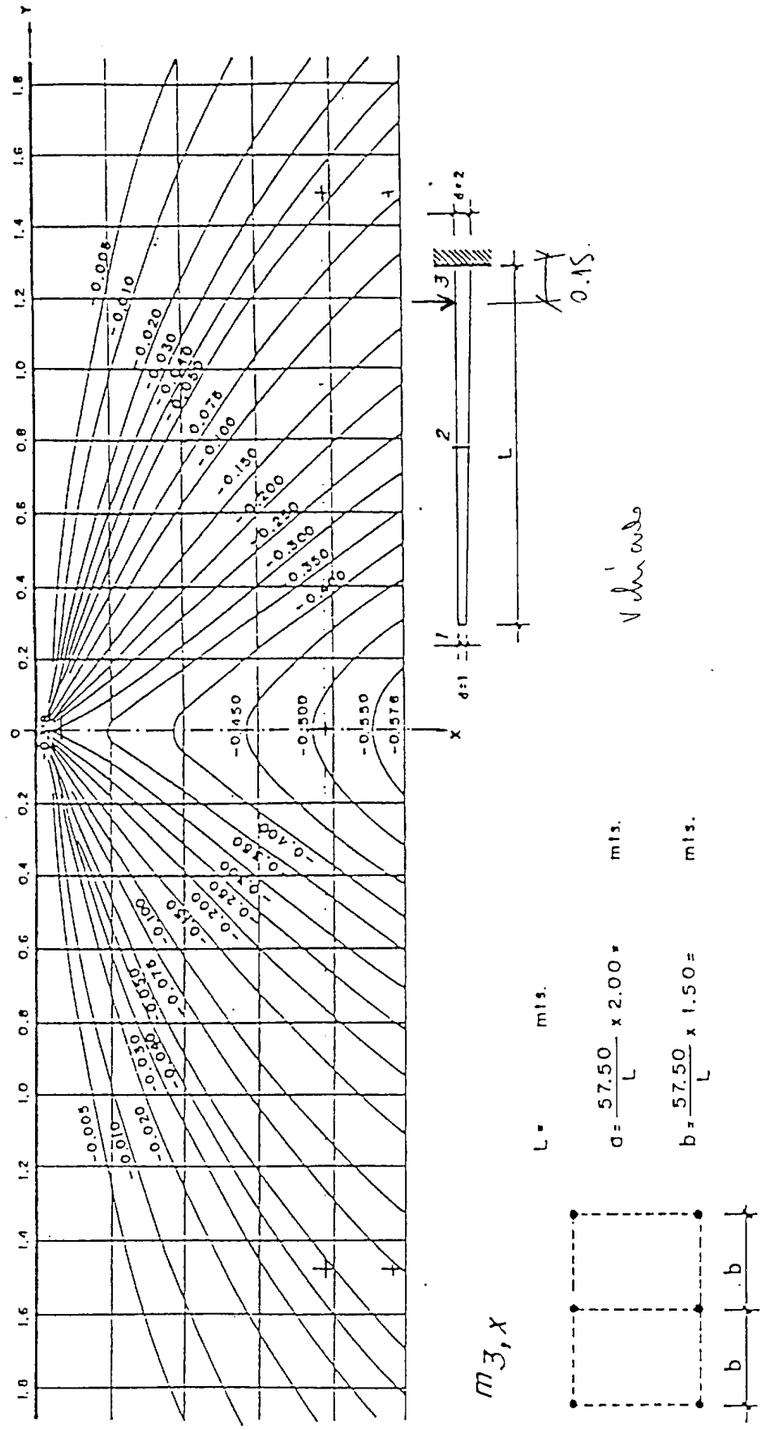
ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.500		SOB UNIF 1
AV	PLUS	7	1.500		SOB UNIF 2
AW	PLUS	8	1.500		SOB UNIF 3
AX	PLUS	9	1.500		SOB UNIF 4

AY	PLUS	10	1.500	SOB UNIF 5
AZ	PLUS	11	1.500	VEHICULO HIPOTESIS 11
BA	OR	12	1.500	VEHICULO HIPOTESIS 12
BB	OR	13	1.500	VEHICULO HIPOTESIS 13
BC	OR	14	1.500	VEHICULO HIPOTESIS 14
BD	OR	15	1.500	VEHICULO HIPOTESIS 15
BE	OR	16	1.500	VEHICULO HIPOTESIS 16
BF	OR	17	1.500	VEHICULO HIPOTESIS 17
BG	OR	18	1.500	VEHICULO HIPOTESIS 18
BH	OR	19	1.500	VEHICULO HIPOTESIS 19
BI	OR	20	1.500	VEHICULO HIPOTESIS 20
BJ	OR	21	1.500	VEHICULO HIPOTESIS 21
BK	OR	22	1.500	VEHICULO HIPOTESIS 22
BL	OR	23	1.500	VEHICULO HIPOTESIS 23
BM	OR	24	1.500	VEHICULO HIPOTESIS 24
BN	OR	25	1.500	VEHICULO POSICION 25
BO	OR	26	1.500	VEHICULO POSICION 26
BP	OR	27	1.500	VEHICULO POSICION 27
BQ	OR	28	1.500	VEHICULO POSICION 28
BR	OR	29	1.500	VEHICULO POSICION 29
BS	OR	30	1.500	VEHICULO POSICION 30
BT	OR	31	1.500	VEHICULO POSICION 31
BU	OR	32	1.500	VEHICULO POSICION 32
BV	OR	33	1.500	VEHICULO POSICION 33
BW	OR	34	1.500	VEHICULO POSICION 34
BX	OR	35	1.500	VEHICULO POSICION 35
BY	OR	36	1.500	VEHICULO POSICION 36
BZ	OR	37	1.500	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.500	FRENADO
CB	PLUS	63	0.750000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.900000	TEMPERATURA (-)
CD	OR	65	0.900000	TEMPERATURA (+)
CE	PLUS	66	0.900000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.350	PESO PROPIO
CG	PL.PERM	2	2.025	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.350	PESO BARRERAS
CJ	PLUS	46	1.500	SOB UNIF VANO 1
CK	PLUS	47	1.500	SOB UNIF VANO 2
CL	PLUS	48	1.500	SOB UNIF VANO 3
CM	PLUS	11	1.500	VEHICULO HIPOTESIS 11
CN	OR	12	1.500	VEHICULO HIPOTESIS 12
CO	OR	13	1.500	VEHICULO HIPOTESIS 13
CP	OR	14	1.500	VEHICULO HIPOTESIS 14
CQ	OR	15	1.500	VEHICULO HIPOTESIS 15
CR	OR	16	1.500	VEHICULO HIPOTESIS 16
CS	OR	17	1.500	VEHICULO HIPOTESIS 17
CT	OR	18	1.500	VEHICULO HIPOTESIS 18
CU	OR	19	1.500	VEHICULO HIPOTESIS 19
CV	OR	20	1.500	VEHICULO HIPOTESIS 20
CW	OR	21	1.500	VEHICULO HIPOTESIS 21
CX	OR	22	1.500	VEHICULO HIPOTESIS 22
CY	OR	23	1.500	VEHICULO HIPOTESIS 23
CZ	OR	24	1.500	VEHICULO HIPOTESIS 24



Cálculo de la armadura del voladizo

Datos :

Longitud del voladizo (m) = **1.50**

Canto mínimo (m) = **0.20**
Canto máximo (m) = **0.30**
Canto util (m) = **0.27**

Carga acera (t/m)= **1.00**

Ancho Acera (m) = **0.85**

Distancia G acera (m) = **1.33**

Peso Propio:

Mpp (mt/m) = -2.615625 V (t/m) = 0.87

Carga muerta :

Mcm (mt/m) = -1.325 V (t/m) = 1.00

Sobrecarga uniforme :

Msu (mt/m) = -0.45 V (t/m) = 0.60

Vehículo 60 t : Coeficientes bajo carga = 0.15
Coeficientes a 1.50 m = 0

Mveh (mt/m) = -1.5 V (t/m) = 10

Momento total diseño : Md (mt/m) = -8.24

As (cm^2/m) = 8.98 ϕ 16 / 20

Cortante total de diseño : Vd (t/m) = 3.43 a un canto útil

Vcu (t/m) = 13.35 verifica

Loadcase 63 — Factor 1.0000 — Stage — Init.def Title: VIENTO TRANSV CON SOB

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	3.976	0.010057	10.805			
10	3.976	-0.010056	-11.366			
156	3.976	-0.010057	10.805			
160	3.976	0.010056	-11.366			
166	11.245	-0.006921	-1.766	0.030443	79.020	-0.094356
167	11.245	0.006921	-1.766	-0.030443	79.020	0.094356
Sums :	38.395	7.08E-12	-4.654			
min:	3.976	-0.010057	-11.366	-0.030443	79.020	-0.094356
max:	11.245	0.010057	10.805	0.030443	79.020	0.094356

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-17.278	-0.043724	0.073702	-0.000147	5.17E-06	1.78E-05
2	-17.280	-0.024489	0.039996	-8.75E-05	-2.01E-06	1.69E-05
3	-17.280	-4.64E-06	-0.001299	5.42E-06	-1.12E-05	1.67E-05
4	-17.280	0.024460	-0.043555	9.90E-05	-7.41E-07	1.69E-05
5	-17.279	0.043720	-0.079930	0.000160	6.93E-06	1.78E-05
6	-17.287	-0.043724	-1.08E-96	-0.000147	5.17E-06	1.78E-05
7	-17.288	-0.024489	-0.003766	-8.75E-05	-2.01E-06	1.69E-05
8	-17.289	-4.64E-06	0.001411	5.42E-06	-1.12E-05	1.67E-05
9	-17.288	0.024480	0.005559	9.90E-05	-7.41E-07	1.69E-05
10	-17.288	0.043720	1.14E-96	0.000160	6.93E-06	1.78E-05
11	-17.310	-0.043373	-0.214224	-0.000161	-8.27E-05	1.75E-05
12	-17.311	-0.024344	-0.120932	-9.27E-05	-8.46E-05	1.69E-05
13	-17.311	-4.36E-06	0.008257	5.05E-06	-8.76E-05	1.68E-05
14	-17.311	0.024336	0.137259	0.000103	-8.43E-05	1.69E-05
15	-17.311	0.043367	0.230291	0.000173	-8.24E-05	1.75E-05
16	-17.333	-0.042412	-0.438312	-0.000165	-0.000172	1.68E-05
17	-17.333	-0.023925	-0.245094	-9.71E-05	-0.000173	1.65E-05
18	-17.333	-4.02E-06	0.014249	4.09E-06	-0.000173	1.65E-05
19	-17.333	0.023918	0.273960	0.000106	-0.000173	1.65E-05
20	-17.333	0.042404	0.467818	0.000174	-0.000173	1.68E-05
21	-17.354	-0.040957	-0.666482	-0.000168	-0.000261	1.61E-05
22	-17.354	-0.023182	-0.373674	-9.95E-05	-0.000261	1.59E-05
23	-17.354	-3.86E-06	0.018654	2.64E-06	-0.000262	1.59E-05
24	-17.355	0.023175	0.411593	0.000105	-0.000262	1.59E-05
25	-17.355	0.040950	0.705414	0.000173	-0.000262	1.61E-05
26	-17.375	-0.039093	-0.897068	-0.000169	-0.000350	1.53E-05
27	-17.375	-0.022177	-0.504742	-0.000101	-0.000350	1.51E-05

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-17.375	-3.80E-06	0.020996	9.56E-07	-0.000351	1.52E-05
29	-17.375	0.022170	0.547425	0.000103	-0.000351	1.51E-05
30	-17.376	0.039086	0.940894	0.000171	-0.000351	1.53E-05
31	-17.394	-0.036900	-1.129	-0.000169	-0.000439	1.44E-05
32	-17.394	-0.020977	-0.617285	-0.000102	-0.000439	1.42E-05
33	-17.394	-3.76E-06	0.021159	-6.74E-07	-0.000439	1.43E-05
34	-17.395	0.020969	0.680320	0.000100	-0.000440	1.42E-05
35	-17.395	0.036892	1.173	0.000168	-0.000440	1.44E-05
36	-17.412	-0.034463	-1.359	-0.000168	-0.000526	1.33E-05
37	-17.412	-0.019637	-0.770197	-0.000102	-0.000526	1.32E-05
38	-17.412	-3.70E-06	0.019379	-1.99E-06	-0.000527	1.33E-05
39	-17.413	0.019629	0.809712	9.76E-05	-0.000527	1.32E-05
40	-17.413	0.034455	1.400	0.000164	-0.000527	1.33E-05
41	-17.429	-0.031875	-1.586	-0.000163	-0.000611	1.22E-05
42	-17.429	-0.018202	-0.901608	-9.93E-05	-0.000611	1.22E-05
43	-17.429	-3.68E-06	0.016225	-2.75E-06	-0.000612	1.22E-05
44	-17.429	0.018195	0.934933	9.40E-05	-0.000612	1.22E-05
45	-17.430	0.031867	1.621	0.000158	-0.000613	1.22E-05
46	-17.444	-0.029234	-1.803	-0.000152	-0.000691	1.12E-05
47	-17.444	-0.016707	-1.028	-9.39E-05	-0.000692	1.12E-05
48	-17.444	-3.94E-06	0.012566	-2.72E-06	-0.000695	1.11E-05
49	-17.445	0.016699	1.055	8.89E-05	-0.000693	1.12E-05
50	-17.445	0.029226	1.831	0.000147	-0.000693	1.12E-05
51	-17.458	-0.026642	-1.994	-0.000125	-0.000757	1.02E-05
52	-17.458	-0.015173	-1.144	-8.19E-05	-0.000762	1.02E-05
53	-17.458	-4.78E-06	0.009580	-1.64E-06	-0.000775	9.87E-06
54	-17.458	0.015165	1.166	7.94E-05	-0.000764	1.02E-05
55	-17.459	0.026636	2.018	0.000124	-0.000760	1.02E-05
56	-17.471	-0.024118	-2.135	-8.01E-05	-0.000802	9.45E-06
57	-17.471	-0.013684	-1.235	-4.91E-05	-0.000807	9.29E-06
58	-17.470	-5.87E-06	0.009018	1.25E-06	-0.000866	9.26E-06
59	-17.471	0.013674	1.256	5.18E-05	-0.000810	9.29E-06
60	-17.472	0.024118	2.160	8.28E-05	-0.000806	9.47E-06
61	-17.486	-0.020482	-2.156	-7.94E-05	-0.000853	8.17E-06
62	-17.486	-0.011586	-1.279	-1.20E-05	-0.000857	7.89E-06
63	-17.486	-3.58E-06	0.014799	4.78E-06	-0.000866	8.12E-06
64	-17.487	0.011580	1.310	2.08E-05	-0.000859	7.89E-06
65	-17.487	0.020476	2.270	3.77E-05	-0.000856	8.17E-06
66	-17.499	-0.016081	-2.267	-7.37E-06	-0.000874	6.48E-06
67	-17.499	-0.009046	-1.289	-1.79E-06	-0.000874	6.23E-06
68	-17.499	-2.13E-06	0.021315	5.47E-06	-0.000875	6.26E-06
69	-17.499	0.009041	1.337	1.25E-05	-0.000875	6.23E-06
70	-17.500	0.016075	2.318	1.78E-05	-0.000875	6.48E-06
71	-17.508	-0.011055	-2.275	-8.06E-07	-0.000880	4.46E-06
72	-17.508	-0.006213	-1.289	1.31E-06	-0.000880	4.28E-06
73	-17.509	-1.38E-06	0.032541	4.56E-06	-0.000881	4.29E-06
74	-17.509	0.006210	1.354	7.75E-06	-0.000881	4.28E-06
75	-17.509	0.011052	2.342	9.79E-06	-0.000882	4.46E-06
76	-17.514	-0.005627	-2.275	4.56E-07	-0.000883	2.27E-06
77	-17.514	-0.003163	-1.286	1.27E-06	-0.000883	2.18E-06
78	-17.514	-7.10E-07	0.038710	2.56E-06	-0.000883	2.18E-06
79	-17.515	0.003162	1.364	3.83E-06	-0.000884	2.18E-06

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-17.515	0.005625	2.354	4.63E-06	-0.000884	2.27E-06
81	-17.516	-6.38E-11	-2.275	-1.34E-15	-0.000884	2.34E-14
82	-17.516	-3.77E-11	-1.285	-8.28E-16	-0.000884	2.34E-14
83	-17.516	-2.59E-12	0.040924	2.00E-17	-0.000884	2.34E-14
84	-17.517	3.25E-11	1.368	8.66E-16	-0.000885	2.34E-14
85	-17.517	5.87E-11	2.358	1.38E-15	-0.000885	2.34E-14
86	-17.514	0.005627	-2.275	-4.56E-07	-0.000883	-2.27E-06
87	-17.514	0.003163	-1.286	-1.27E-06	-0.000883	-2.18E-06
88	-17.514	7.10E-07	0.038710	-2.56E-06	-0.000883	-2.18E-06
89	-17.515	-0.003162	1.364	-3.83E-06	-0.000884	-2.18E-06
90	-17.515	-0.005625	2.354	-4.63E-06	-0.000884	-2.27E-06
91	-17.508	0.011055	-2.275	8.06E-07	-0.000880	-4.46E-06
92	-17.508	0.006213	-1.289	-1.31E-06	-0.000880	-4.28E-06
93	-17.509	1.38E-06	0.032541	-4.56E-06	-0.000881	-4.29E-06
94	-17.509	-0.006210	1.354	-7.75E-06	-0.000881	-4.28E-06
95	-17.509	-0.011052	2.342	-9.79E-06	-0.000882	-4.46E-06
96	-17.499	0.016081	-2.267	7.37E-06	-0.000874	-6.48E-06
97	-17.499	0.009046	-1.289	1.79E-06	-0.000874	-6.23E-06
98	-17.499	2.13E-06	0.021315	-5.47E-06	-0.000875	-6.26E-06
99	-17.499	-0.009041	1.337	-1.25E-05	-0.000875	-6.23E-06
100	-17.500	-0.016075	2.318	-1.78E-05	-0.000875	-6.48E-06
101	-17.486	0.020482	-2.236	2.95E-05	-0.000853	-8.17E-06
102	-17.486	0.011586	-1.279	1.20E-05	-0.000857	-7.89E-06
103	-17.486	3.58E-06	0.014799	-4.78E-06	-0.000866	-8.12E-06
104	-17.487	-0.011580	1.310	-2.08E-05	-0.000859	-7.89E-06
105	-17.487	-0.020476	2.270	-3.77E-05	-0.000856	-8.17E-06
106	-17.471	0.024118	-2.135	8.01E-05	-0.000802	-9.45E-06
107	-17.471	0.013684	-1.235	4.91E-05	-0.000807	-9.29E-06
108	-17.470	5.87E-06	0.009018	-1.25E-06	-0.000866	-9.26E-06
109	-17.471	-0.013674	1.256	-5.18E-05	-0.000810	-9.29E-06
110	-17.472	-0.024118	2.160	-8.28E-05	-0.000806	-9.47E-06
111	-17.458	0.026642	-1.994	0.000125	-0.000757	-1.02E-05
112	-17.458	0.015173	-1.144	8.19E-05	-0.000762	-1.02E-05
113	-17.458	4.78E-06	0.009580	1.64E-06	-0.000775	-9.87E-06
114	-17.458	-0.015165	1.166	-7.94E-05	-0.000764	-1.02E-05
115	-17.459	-0.026636	2.018	-0.000124	-0.000760	-1.02E-05
116	-17.444	0.029234	-1.803	0.000152	-0.000691	-1.12E-05
117	-17.444	0.016707	-1.028	9.39E-05	-0.000692	-1.12E-05
118	-17.444	3.94E-06	0.012566	2.72E-06	-0.000695	-1.11E-05
119	-17.445	-0.016699	1.055	-8.89E-05	-0.000693	-1.12E-05
120	-17.445	-0.029226	1.831	-0.000147	-0.000693	-1.12E-05
121	-17.429	0.031875	-1.586	0.000163	-0.000611	-1.22E-05
122	-17.429	0.018202	-0.901608	9.93E-05	-0.000611	-1.22E-05
123	-17.429	3.68E-06	0.016225	2.75E-06	-0.000612	-1.22E-05
124	-17.429	-0.018195	0.934933	-9.40E-05	-0.000612	-1.22E-05
125	-17.430	-0.031867	1.621	-0.000158	-0.000613	-1.22E-05
126	-17.412	0.034463	-1.359	0.000168	-0.000526	-1.33E-05
127	-17.412	0.019637	-0.770197	0.000102	-0.000526	-1.32E-05
128	-17.412	3.70E-06	0.019379	1.99E-06	-0.000527	-1.33E-05
129	-17.413	-0.019629	0.809712	-9.76E-05	-0.000527	-1.32E-05
130	-17.413	-0.034455	1.400	-0.000164	-0.000527	-1.33E-05
131	-17.394	0.036900	-1.129	0.000169	-0.000439	-1.44E-05

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-17.394	0.020977	-0.617285	0.000102	-0.000439	-1.42E-05
133	-17.394	3.76E-06	0.021159	6.74E-07	-0.000439	-1.43E-05
134	-17.395	-0.020969	0.680320	-0.000100	-0.000440	-1.42E-05
135	-17.395	-0.036892	1.173	-0.000168	-0.000440	-1.44E-05
136	-17.375	0.039093	-0.897068	0.000169	-0.000350	-1.53E-05
137	-17.375	0.022177	-0.504742	0.000101	-0.000350	-1.51E-05
138	-17.375	3.80E-06	0.020996	-9.56E-07	-0.000351	-1.52E-05
139	-17.375	-0.022170	0.547425	-0.000103	-0.000351	-1.51E-05
140	-17.376	-0.039086	0.940894	-0.000171	-0.000351	-1.53E-05
141	-17.354	0.040957	-0.666482	0.000168	-0.000261	-1.61E-05
142	-17.354	0.023182	-0.373674	9.95E-05	-0.000261	-1.59E-05
143	-17.354	3.86E-06	0.018654	-2.64E-06	-0.000262	-1.59E-05
144	-17.355	-0.023175	0.411593	-0.000105	-0.000262	-1.59E-05
145	-17.355	-0.040950	0.705414	-0.000173	-0.000262	-1.61E-05
146	-17.333	0.042412	-0.438312	0.000165	-0.000172	-1.68E-05
147	-17.333	0.023925	-0.245094	9.71E-05	-0.000173	-1.65E-05
148	-17.333	4.02E-06	0.014249	-4.09E-06	-0.000173	-1.65E-05
149	-17.333	-0.023918	0.273960	-0.000106	-0.000173	-1.65E-05
150	-17.333	-0.042404	0.467818	-0.000174	-0.000173	-1.68E-05
151	-17.310	0.043373	-0.214224	0.000161	-8.27E-05	-1.75E-05
152	-17.311	0.024344	-0.120932	9.27E-05	-8.46E-05	-1.69E-05
153	-17.311	4.36E-06	0.008257	-5.05E-06	-8.76E-05	-1.68E-05
154	-17.311	-0.024336	0.137259	-0.000103	-8.43E-05	-1.69E-05
155	-17.311	-0.043367	0.230291	-0.000173	-8.24E-05	-1.75E-05
156	-17.287	0.043724	-1.08E-96	0.000147	5.17E-06	-1.78E-05
157	-17.288	0.024489	-0.003766	8.75E-05	-2.01E-06	-1.69E-05
158	-17.289	4.64E-06	0.001411	-5.42E-06	-1.12E-05	-1.67E-05
159	-17.288	-0.024480	0.005559	-9.90E-05	-7.41E-07	-1.69E-05
160	-17.288	-0.043720	1.14E-96	-0.000160	6.93E-06	-1.78E-05
161	-17.278	0.043724	0.073702	0.000147	5.17E-06	-1.78E-05
162	-17.280	0.024489	0.039996	8.75E-05	-2.01E-06	-1.69E-05
163	-17.280	4.64E-06	-0.001299	-5.42E-06	-1.12E-05	-1.67E-05
164	-17.280	-0.024480	-0.043955	-9.90E-05	-7.41E-07	-1.69E-05
165	-17.279	-0.043720	-0.079930	-0.000160	6.93E-06	-1.78E-05
166	-1.12E-96	+0	1.77E-97	-0	-7.90E-99	+0
167	-1.12E-96	-0	1.77E-97	+0	-7.90E-99	-0
min:	-17.517	-0.043724	-2.275	-0.000174	-0.000885	-1.78E-05
max:	-1.12E-96	0.043724	2.358	0.000174	6.93E-06	1.78E-05

Loadcase 64 — Factor 1.0000 — Stage — Init.def Title: TEMPERATURA (-)

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-7.09E-05	-1.795	-0.368725			
10	7.09E-05	-1.795	-0.368725			
156	-7.09E-05	1.795	-0.368725			
160	7.09E-05	1.795	-0.368725			
166	3.69E-12	-2.300	0.737449	15.841	-3.18E-11	-2.79E-10
167	5.11E-12	2.300	0.737449	-15.841	-2.18E-11	2.76E-10
Sums :	-2.06E-12	1.30E-11	-1.43E-12			
min:	-7.09E-05	-2.300	-0.368725	-15.841	-3.18E-11	-2.79E-10
max:	7.09E-05	2.300	0.737449	15.841	-2.18E-11	2.76E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.000543	7.988	-0.011551	2.31E-05	-1.90E-06	4.69E-07
2	0.000455	7.989	-0.009281	2.25E-05	-1.41E-06	4.53E-07
3	1.22E-11	7.989	-0.007920	2.20E-05	8.16E-17	-1.57E-14
4	-0.000459	7.989	-0.009281	2.25E-05	1.41E-06	-4.53E-07
5	-0.000543	7.988	-0.011551	2.31E-05	1.90E-06	-4.69E-07
6	0.000308	7.806	3.69E-98	2.31E-05	1.90E-06	4.69E-07
7	0.000233	7.807	0.001954	2.25E-05	-1.41E-06	4.53E-07
8	2.01E-11	7.807	0.003097	2.20E-05	8.16E-17	-1.57E-14
9	-0.000233	7.807	0.001954	2.25E-05	1.41E-06	-4.53E-07
10	-0.000308	7.806	3.69E-98	2.31E-05	1.90E-06	-4.69E-07
11	-4.98E-05	7.334	0.029877	2.23E-05	-9.09E-07	1.62E-07
12	-4.25E-05	7.335	0.030824	2.18E-05	-7.28E-07	1.61E-07
13	4.28E-11	7.335	0.031415	2.14E-05	-2.02E-15	-1.61E-14
14	4.25E-05	7.335	0.030824	2.18E-05	7.28E-07	-1.61E-07
15	4.98E-05	7.334	0.029877	2.23E-05	9.09E-07	-1.62E-07
16	-0.000111	6.862	0.057573	2.00E-05	-3.37E-07	3.98E-09
17	-8.04E-05	6.863	0.057927	1.97E-05	-2.81E-07	3.42E-08
18	6.53E-11	6.863	0.058152	1.95E-05	-1.93E-16	-1.51E-14
19	8.04E-05	6.863	0.057927	1.97E-05	2.81E-07	-3.42E-08
20	0.000111	6.862	0.057573	2.00E-05	3.37E-07	-3.98E-09
21	-7.19E-05	6.390	0.081346	1.64E-05	-1.04E-07	-2.97E-08
22	-5.23E-05	6.390	0.081455	1.63E-05	-8.74E-08	-4.99E-09
23	8.53E-11	6.390	0.081521	1.62E-05	3.16E-15	-1.27E-14
24	5.23E-05	6.390	0.081455	1.63E-05	8.74E-08	4.99E-09
25	7.19E-05	6.390	0.081346	1.64E-05	1.04E-07	2.97E-08
26	-3.15E-05	5.918	0.099578	1.15E-05	-3.87E-08	-2.13E-08
27	-2.36E-05	5.918	0.099619	1.15E-05	-3.30E-08	-9.58E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	1.02E-10	5.918	0.099641	1.14E-05	5.37E-15	-9.46E-15
29	2.36E-05	5.918	0.099619	1.15E-05	3.30E-08	9.58E-09
30	3.15E-05	5.918	0.099578	1.15E-05	3.87E-08	2.13E-08
31	-1.13E-05	5.446	0.110544	5.18E-06	-8.58E-08	-8.00E-09
32	-8.90E-06	5.446	0.110634	5.26E-06	-7.26E-08	-4.92E-09
33	1.13E-10	5.446	0.110686	5.32E-06	6.18E-15	-5.30E-15
34	8.90E-06	5.446	0.110634	5.26E-06	7.26E-08	4.92E-09
35	1.13E-05	5.446	0.110544	5.18E-06	8.58E-08	8.00E-09
36	-7.91E-06	4.974	0.112378	-2.58E-06	-3.21E-07	1.63E-09
37	-6.27E-06	4.974	0.112714	-2.30E-06	-2.65E-07	-3.22E-10
38	1.19E-10	4.974	0.112916	-2.11E-06	6.15E-15	3.49E-16
39	6.27E-06	4.974	0.112714	-2.30E-06	2.65E-07	3.22E-10
40	7.91E-06	4.974	0.112378	-2.58E-06	3.21E-07	-1.63E-09
41	-1.55E-05	4.502	0.103041	-1.20E-05	-9.86E-07	6.95E-09
42	-1.18E-05	4.502	0.104070	-1.13E-05	-7.96E-07	1.00E-09
43	1.16E-10	4.502	0.104694	-1.08E-05	5.67E-15	8.11E-15
44	1.18E-05	4.502	0.104070	-1.13E-05	7.96E-07	-1.00E-09
45	1.55E-05	4.502	0.103041	-1.20E-05	9.86E-07	-6.95E-09
46	-2.73E-05	4.030	0.080449	-2.27E-05	-2.25E-06	3.65E-09
47	-2.19E-05	4.030	0.082845	-2.17E-05	-1.90E-06	-4.88E-09
48	9.92E-11	4.030	0.084503	-2.06E-05	5.04E-15	1.75E-14
49	2.19E-05	4.030	0.082845	-2.17E-05	1.90E-06	4.88E-09
50	2.73E-05	4.030	0.080449	-2.27E-05	2.25E-06	-3.65E-09
51	-2.73E-05	3.558	0.043644	-3.33E-05	-2.85E-06	-1.77E-08
52	-2.80E-05	3.558	0.046942	-3.38E-05	-3.08E-06	-2.91E-08
53	6.77E-11	3.558	0.050485	-3.24E-05	4.65E-15	2.56E-14
54	2.80E-05	3.558	0.046942	-3.38E-05	3.08E-06	2.91E-08
55	2.73E-05	3.558	0.043644	-3.33E-05	2.85E-06	1.77E-08
56	4.27E-06	3.086	-0.004522	-4.04E-05	-5.24E-07	-4.40E-08
57	6.92E-06	3.086	-0.003992	-4.32E-05	-3.70E-07	-1.16E-07
58	2.59E-11	3.085	-0.003765	-5.38E-05	4.58E-15	2.74E-14
59	-6.92E-06	3.086	-0.003992	-4.32E-05	3.70E-07	1.16E-07
60	-4.27E-06	3.086	-0.004522	-4.04E-05	5.24E-07	4.40E-08
61	2.91E-05	2.469	-0.071635	-3.75E-05	2.49E-06	-1.40E-08
62	2.58E-05	2.469	-0.074445	-3.76E-05	2.51E-06	-2.82E-08
63	-3.74E-11	2.468	-0.077164	-3.60E-05	4.57E-15	2.68E-14
64	-2.58E-05	2.469	-0.074445	-3.76E-05	-2.51E-06	2.82E-08
65	-2.91E-05	2.469	-0.071635	-3.75E-05	-2.49E-06	1.40E-08
66	2.03E-05	1.851	-0.128511	-2.85E-05	1.29E-06	4.56E-09
67	1.52E-05	1.851	-0.129860	-2.78E-05	1.04E-06	-2.92E-09
68	-8.62E-11	1.851	-0.130700	-2.72E-05	3.97E-15	2.11E-14
69	-1.52E-05	1.851	-0.129860	-2.78E-05	-1.04E-06	2.92E-09
70	-2.03E-05	1.851	-0.128511	-2.85E-05	-1.29E-06	-4.56E-09
71	7.40E-06	1.234	-0.168857	-1.88E-05	3.35E-07	4.55E-09
72	5.43E-06	1.234	-0.169207	-1.85E-05	2.74E-07	1.53E-09
73	-1.16E-10	1.234	-0.169417	-1.83E-05	3.44E-15	1.32E-14
74	-5.43E-06	1.234	-0.169207	-1.85E-05	-2.74E-07	-1.53E-09
75	-7.40E-06	1.234	-0.168857	-1.88E-05	-3.35E-07	-4.55E-09
76	1.38E-06	0.617123	-0.192743	-9.31E-06	6.16E-08	1.77E-09
77	1.07E-06	0.617124	-0.192807	-9.26E-06	5.23E-08	1.02E-09
78	-1.32E-10	0.617125	-0.192845	-9.22E-06	3.25E-15	6.28E-15
79	-1.07E-06	0.617124	-0.192807	-9.26E-06	-5.23E-08	-1.02E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	-1.38E-06	0.617123	-0.192743	-9.31E-06	-6.16E-08	-1.77E-09
81	-4.32E-08	-5.58E-12	-0.200660	-3.02E-17	1.37E-08	1.18E-16
82	2.38E-08	-5.45E-12	-0.200674	-2.76E-17	1.20E-08	1.18E-16
83	-1.37E-10	-5.27E-12	-0.200681	-2.33E-17	3.22E-15	1.18E-16
84	-2.41E-08	-5.09E-12	-0.200674	-1.88E-17	-1.20E-08	1.18E-16
85	4.30E-08	-4.96E-12	-0.200660	-1.59E-17	-1.37E-08	1.18E-16
86	1.38E-06	-0.617123	-0.192743	9.31E-06	6.16E-08	-1.77E-09
87	1.07E-06	-0.617124	-0.192807	9.26E-06	5.23E-08	-1.02E-09
88	-1.32E-10	-0.617125	-0.192845	9.22E-06	3.24E-15	-6.04E-15
89	-1.07E-06	-0.617124	-0.192807	9.26E-06	-5.23E-08	1.02E-09
90	-1.38E-06	-0.617123	-0.192743	9.31E-06	-6.16E-08	1.77E-09
91	7.40E-06	-1.234	-0.168857	1.88E-05	3.35E-07	-4.55E-09
92	5.43E-06	-1.234	-0.169207	1.85E-05	2.74E-07	-1.53E-09
93	-1.17E-10	-1.234	-0.169417	1.83E-05	3.42E-15	-1.29E-14
94	-5.43E-06	-1.234	-0.169207	1.85E-05	-2.74E-07	1.53E-09
95	-7.40E-06	-1.234	-0.168857	1.88E-05	-3.35E-07	4.55E-09
96	2.03E-05	-1.851	-0.128511	2.85E-05	1.29E-06	-4.56E-09
97	1.52E-05	-1.851	-0.129860	2.78E-05	1.04E-06	2.92E-09
98	-8.74E-11	-1.851	-0.130700	2.72E-05	3.94E-15	-2.08E-14
99	-1.52E-05	-1.851	-0.129860	2.78E-05	-1.04E-06	-2.92E-09
100	-2.03E-05	-1.851	-0.128511	2.85E-05	-1.29E-06	4.56E-09
101	2.91E-05	-2.469	-0.071635	3.75E-05	2.49E-06	1.40E-08
102	2.58E-05	-2.469	-0.074445	3.76E-05	2.51E-06	2.82E-08
103	-3.90E-11	-2.468	-0.077164	3.60E-05	4.53E-15	-2.66E-14
104	-2.58E-05	-2.469	-0.074445	3.76E-05	-2.51E-06	-2.82E-08
105	-2.91E-05	-2.469	-0.071635	3.75E-05	-2.49E-06	-1.40E-08
106	4.27E-06	-3.086	-0.004522	4.04E-05	-5.24E-07	4.40E-08
107	6.92E-06	-3.086	-0.003992	4.32E-05	-3.70E-07	1.16E-07
108	2.39E-11	-3.085	-0.003765	5.38E-05	4.53E-15	-2.71E-14
109	-6.92E-06	-3.086	-0.003992	4.32E-05	3.70E-07	-1.16E-07
110	-4.27E-06	-3.086	-0.004522	4.04E-05	5.24E-07	-4.40E-08
111	-2.73E-05	-3.558	0.043644	3.33E-05	-2.85E-06	1.77E-08
112	-2.80E-05	-3.558	0.046942	3.38E-05	-3.08E-06	2.91E-08
113	6.53E-11	-3.558	0.050485	3.24E-05	4.60E-15	-2.53E-14
114	2.80E-05	-3.558	0.046942	3.38E-05	3.08E-06	-2.91E-08
115	2.73E-05	-3.558	0.043644	3.33E-05	2.85E-06	-1.77E-08
116	-2.73E-05	-4.030	0.080449	2.27E-05	-2.25E-06	-3.65E-09
117	-2.19E-05	-4.030	0.082845	2.17E-05	-1.90E-06	4.88E-09
118	9.66E-11	-4.030	0.084503	2.06E-05	5.00E-15	-1.72E-14
119	2.19E-05	-4.030	0.082845	2.17E-05	1.90E-06	-4.88E-09
120	2.73E-05	-4.030	0.080449	2.27E-05	2.25E-06	3.65E-09
121	-1.55E-05	-4.502	0.103041	1.20E-05	-9.86E-07	-6.95E-09
122	-1.18E-05	-4.502	0.104070	1.13E-05	-7.96E-07	-1.00E-09
123	1.13E-10	-4.502	0.104694	1.08E-05	5.64E-15	-7.86E-15
124	1.18E-05	-4.502	0.104070	1.13E-05	7.96E-07	1.00E-09
125	1.55E-05	-4.502	0.103041	1.20E-05	9.86E-07	6.95E-09
126	-7.91E-06	-4.974	0.112378	2.58E-06	-3.21E-07	-1.63E-09
127	-6.27E-06	-4.974	0.112714	2.30E-06	-2.65E-07	3.22E-10
128	1.16E-10	-4.974	0.112916	2.11E-06	6.11E-15	-9.80E-17
129	6.27E-06	-4.974	0.112714	2.30E-06	2.65E-07	-3.22E-10
130	7.91E-06	-4.974	0.112378	2.58E-06	3.21E-07	1.63E-09
131	-1.13E-05	-5.446	0.110544	-5.18E-06	-8.58E-08	8.00E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-8.90E-06	-5.446	0.110634	-5.26E-06	-7.26E-08	4.92E-09
133	1.10E-10	-5.446	0.110686	-5.32E-06	6.15E-15	5.55E-15
134	8.90E-06	-5.446	0.110634	-5.26E-06	7.26E-08	-4.92E-09
135	1.13E-05	-5.446	0.110544	-5.18E-06	8.58E-08	-8.00E-09
136	-3.15E-05	-5.918	0.099578	-1.15E-05	-3.87E-08	2.13E-08
137	-2.36E-05	-5.918	0.099619	-1.15E-05	-3.30E-08	9.58E-09
138	9.77E-11	-5.918	0.099641	-1.14E-05	5.35E-15	9.71E-15
139	2.36E-05	-5.918	0.099619	-1.15E-05	3.30E-08	-9.58E-09
140	3.15E-05	-5.918	0.099578	-1.15E-05	3.87E-08	-2.13E-08
141	-7.19E-05	-6.390	0.081346	-1.64E-05	-1.04E-07	2.97E-08
142	-5.23E-05	-6.390	0.081455	-1.63E-05	-8.74E-08	4.99E-09
143	8.10E-11	-6.390	0.081521	-1.62E-05	3.14E-15	1.29E-14
144	5.23E-05	-6.390	0.081455	-1.63E-05	8.74E-08	-4.99E-09
145	7.19E-05	-6.390	0.081346	-1.64E-05	1.04E-07	-2.97E-08
146	-0.000111	-6.862	0.057573	-2.00E-05	-3.37E-07	-3.98E-09
147	-8.04E-05	-6.863	0.057927	-1.97E-05	-2.81E-07	-3.42E-08
148	6.06E-11	-6.863	0.058152	-1.95E-05	-2.04E-16	1.54E-14
149	8.04E-05	-6.863	0.057927	-1.97E-05	2.81E-07	3.42E-08
150	0.000111	-6.862	0.057573	-2.00E-05	3.37E-07	3.98E-09
151	-4.98E-05	-7.334	0.029877	-2.23E-05	-9.09E-07	-1.62E-07
152	-4.25E-05	-7.335	0.030824	-2.18E-05	-7.28E-07	-1.61E-07
153	3.78E-11	-7.335	0.031415	-2.14E-05	-2.03E-15	1.64E-14
154	4.25E-05	-7.335	0.030824	-2.18E-05	7.28E-07	1.61E-07
155	4.98E-05	-7.334	0.029877	-2.23E-05	9.09E-07	1.62E-07
156	0.000308	-7.806	3.69E-98	-2.31E-05	-1.90E-06	-4.69E-07
157	0.000233	-7.807	0.001954	-2.25E-05	-1.41E-06	-4.53E-07
158	1.48E-11	-7.807	0.003097	-2.20E-05	8.08E-17	1.60E-14
159	-0.000233	-7.807	0.001954	-2.25E-05	1.41E-06	4.53E-07
160	-0.000308	-7.806	3.69E-98	-2.31E-05	1.90E-06	4.69E-07
161	0.000543	-7.988	-0.011551	-2.31E-05	-1.90E-06	-4.69E-07
162	0.000459	-7.989	-0.009281	-2.25E-05	-1.41E-06	-4.53E-07
163	6.80E-12	-7.989	-0.007920	-2.20E-05	8.08E-17	1.60E-14
164	-0.000459	-7.989	-0.009281	-2.25E-05	1.41E-06	4.53E-07
165	-0.000543	-7.988	-0.011551	-2.31E-05	1.90E-06	4.69E-07
166	-0	2.30E-97	-7.37E-98	-1.58E-99	+0	+0
167	-0	-2.30E-97	-7.37E-98	1.58E-99	+0	-0
min:	-0.000543	-7.989	-0.200681	-5.38E-05	-3.08E-06	-4.69E-07
max:	0.000543	7.989	0.112916	5.38E-05	3.08E-06	4.69E-07

Loadcase 65 Factor 1.0000 Stage Init.def Title TEMPERATURA (+)

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	7.09E-05	1.795	0.368725			
10	-7.09E-05	1.795	0.368725			
156	7.09E-05	-1.795	0.368725			
160	-7.09E-05	-1.795	0.368725			
166	-3.69E-12	2.300	-0.737449	-15.841	3.18E-11	2.79E-10
167	-5.11E-12	-2.300	-0.737449	15.841	2.18E-11	-2.76E-10
Sums :	2.06E-12	-1.30E-11	1.43E-12			
min:	-7.09E-05	-2.300	-0.737449	-15.841	2.18E-11	-2.76E-10
max:	7.09E-05	2.300	0.368725	15.841	3.18E-11	2.79E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	-0.000543	-7.988	0.011551	-2.31E-05	1.90E-06	-4.69E-07
2	-0.000459	-7.989	0.009281	-2.25E-05	1.41E-06	-4.53E-07
3	-1.22E-11	-7.989	0.007920	-2.20E-05	-8.16E-17	1.57E-14
4	0.000459	-7.989	0.009281	-2.25E-05	-1.41E-06	4.53E-07
5	0.000543	-7.988	0.011551	-2.31E-05	-1.90E-06	4.69E-07
6	-0.000308	-7.806	-3.69E-98	-2.31E-05	1.90E-06	-4.69E-07
7	-0.000233	-7.807	-0.001954	-2.25E-05	1.41E-06	-4.53E-07
8	2.01E-11	-7.807	-0.003097	-2.20E-05	-8.16E-17	1.57E-14
9	0.000233	-7.807	-0.001954	-2.25E-05	-1.41E-06	4.53E-07
10	0.000308	-7.806	-3.69E-98	-2.31E-05	-1.90E-06	4.69E-07
11	4.98E-05	-7.334	-0.029877	-2.23E-05	9.09E-07	-1.62E-07
12	4.25E-05	-7.335	-0.030824	-2.18E-05	7.28E-07	-1.61E-07
13	-4.28E-11	-7.335	-0.031415	-2.14E-05	2.02E-15	1.61E-14
14	-4.25E-05	-7.335	-0.030824	-2.18E-05	-7.28E-07	1.61E-07
15	-4.98E-05	-7.334	-0.029877	-2.23E-05	-9.09E-07	1.62E-07
16	0.000111	-6.862	-0.057573	-2.00E-05	3.37E-07	-3.98E-09
17	8.04E-05	-6.863	-0.057927	-1.97E-05	2.81E-07	-3.42E-08
18	-6.53E-11	-6.863	-0.058152	-1.95E-05	1.93E-16	1.51E-14
19	-8.04E-05	-6.863	-0.057927	-1.97E-05	-2.81E-07	3.42E-08
20	-0.000111	-6.862	-0.057573	-2.00E-05	-3.37E-07	3.98E-09
21	7.19E-05	-6.390	-0.081346	-1.64E-05	1.04E-07	2.97E-08
22	5.23E-05	-6.390	-0.081455	-1.63E-05	8.74E-08	4.99E-09
23	-8.53E-11	-6.390	-0.081521	-1.62E-05	-3.16E-15	1.27E-14
24	-5.23E-05	-6.390	-0.081455	-1.63E-05	-8.74E-08	-4.99E-09
25	-7.19E-05	-6.390	-0.081346	-1.64E-05	-1.04E-07	-2.97E-08
26	3.15E-05	-5.918	-0.099578	-1.15E-05	3.87E-08	2.13E-08
27	2.36E-05	-5.918	-0.099619	-1.15E-05	3.30E-08	9.58E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	-1.02E-10	-5.918	-0.099641	-1.14E-05	-5.37E-15	9.46E-15
29	-2.36E-05	-5.918	-0.099619	-1.15E-05	-3.30E-08	-9.58E-09
30	-3.15E-05	-5.918	-0.099578	-1.15E-05	-3.87E-08	-2.13E-08
31	1.13E-05	-5.446	-0.110544	-5.18E-06	8.58E-08	8.00E-09
32	8.90E-06	-5.446	-0.110634	-5.26E-06	7.26E-08	4.92E-09
33	-1.13E-10	-5.446	-0.110686	-5.32E-06	-6.18E-15	5.30E-15
34	-8.90E-06	-5.446	-0.110634	-5.26E-06	-7.26E-08	-4.92E-09
35	-1.13E-05	-5.446	-0.110544	-5.18E-06	-8.58E-08	-8.00E-09
36	7.91E-06	-4.974	-0.112378	2.58E-06	3.21E-07	-1.63E-09
37	6.27E-06	-4.974	-0.112714	2.30E-06	2.65E-07	3.22E-10
38	-1.19E-10	-4.974	-0.112916	2.11E-06	-6.15E-15	-3.49E-16
39	-6.27E-06	-4.974	-0.112714	2.30E-06	-2.65E-07	-3.22E-10
40	-7.91E-06	-4.974	-0.112378	2.58E-06	-3.21E-07	1.63E-09
41	1.55E-05	-4.502	-0.103041	1.20E-05	9.86E-07	-6.95E-09
42	1.18E-05	-4.502	-0.104070	1.13E-05	7.96E-07	-1.00E-09
43	-1.16E-10	-4.502	-0.104694	1.08E-05	-5.67E-15	-8.11E-15
44	-1.18E-05	-4.502	-0.104070	1.13E-05	-7.96E-07	1.00E-09
45	-1.55E-05	-4.502	-0.103041	1.20E-05	-9.86E-07	6.95E-09
46	2.73E-05	-4.030	-0.080449	2.27E-05	2.25E-06	-3.65E-09
47	2.19E-05	-4.030	-0.082845	2.17E-05	1.90E-06	4.88E-09
48	-9.92E-11	-4.030	-0.084503	2.06E-05	-5.04E-15	-1.75E-14
49	-2.19E-05	-4.030	-0.082845	2.17E-05	-1.90E-06	-4.88E-09
50	-2.73E-05	-4.030	-0.080449	2.27E-05	-2.25E-06	3.65E-09
51	2.73E-05	-3.558	-0.043644	3.33E-05	2.85E-06	1.77E-08
52	2.80E-05	-3.558	-0.046942	3.38E-05	3.08E-06	2.91E-08
53	-6.77E-11	-3.558	-0.050485	3.24E-05	-4.65E-15	-2.56E-14
54	-2.80E-05	-3.558	-0.046942	3.38E-05	-3.08E-06	-2.91E-08
55	-2.73E-05	-3.558	-0.043644	3.33E-05	-2.85E-06	-1.77E-08
56	-4.27E-06	-3.086	0.004522	4.04E-05	5.24E-07	4.40E-08
57	-6.92E-06	-3.086	0.003992	4.32E-05	3.70E-07	1.16E-07
58	-2.59E-11	-3.085	0.003765	5.38E-05	-4.58E-15	-2.74E-14
59	6.92E-06	-3.086	0.003992	4.32E-05	-3.70E-07	-1.16E-07
60	4.27E-06	-3.086	0.004522	4.04E-05	-5.24E-07	-4.40E-08
61	-2.91E-05	-2.469	0.071635	3.75E-05	-2.49E-06	1.40E-08
62	-2.58E-05	-2.469	0.074445	3.76E-05	-2.51E-06	2.82E-08
63	3.74E-11	-2.468	0.077164	3.60E-05	-4.57E-15	-2.68E-14
64	2.58E-05	-2.469	0.074445	3.76E-05	2.51E-06	-2.82E-08
65	2.91E-05	-2.469	0.071635	3.75E-05	2.49E-06	-1.40E-08
66	-2.03E-05	-1.851	0.128511	2.85E-05	-1.29E-06	-4.56E-09
67	-1.52E-05	-1.851	0.129860	2.78E-05	-1.04E-06	2.92E-09
68	8.62E-11	-1.851	0.130700	2.72E-05	-3.97E-15	-2.11E-14
69	1.52E-05	-1.851	0.129860	2.78E-05	1.04E-06	-2.92E-09
70	2.03E-05	-1.851	0.128511	2.85E-05	1.29E-06	4.56E-09
71	-7.40E-06	-1.234	0.168857	1.88E-05	-3.35E-07	-4.55E-09
72	-5.43E-06	-1.234	0.169207	1.85E-05	-2.74E-07	-1.53E-09
73	1.16E-10	-1.234	0.169417	1.83E-05	-3.44E-15	-1.32E-14
74	5.43E-06	-1.234	0.169207	1.85E-05	2.74E-07	1.53E-09
75	7.40E-06	-1.234	0.168857	1.88E-05	3.35E-07	4.55E-09
76	-1.38E-06	-0.617123	0.192743	9.31E-06	-6.16E-08	-1.77E-09
77	-1.07E-06	-0.617124	0.192807	9.26E-06	-5.23E-08	-1.02E-09
78	1.32E-10	-0.617125	0.192845	9.22E-06	-3.25E-15	-6.28E-15
79	1.07E-06	-0.617124	0.192807	9.26E-06	5.23E-08	1.02E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	1.38E-06	-0.617123	0.192743	9.31E-06	6.16E-08	1.77E-09
81	4.32E-08	5.58E-12	0.200660	3.02E-17	-1.37E-08	-1.18E-16
82	-2.38E-08	5.45E-12	0.200674	2.76E-17	-1.20E-08	-1.18E-16
83	1.37E-10	5.27E-12	0.200681	2.33E-17	-3.22E-15	-1.18E-16
84	2.41E-08	5.09E-12	0.200674	1.88E-17	1.20E-08	-1.18E-16
85	-4.30E-08	4.96E-12	0.200660	1.59E-17	1.37E-08	-1.18E-16
86	-1.38E-06	0.617123	0.192743	-9.31E-06	-6.16E-08	1.77E-09
87	-1.07E-06	0.617124	0.192807	-9.26E-06	-5.23E-08	1.02E-09
88	1.32E-10	0.617125	0.192845	-9.22E-06	-3.24E-15	6.04E-15
89	1.07E-06	0.617124	0.192807	-9.26E-06	5.23E-08	-1.02E-09
90	1.38E-06	0.617123	0.192743	-9.31E-06	6.16E-08	-1.77E-09
91	-7.40E-06	1.234	0.168857	-1.88E-05	-3.35E-07	4.55E-09
92	-5.43E-06	1.234	0.169207	-1.85E-05	-2.74E-07	1.53E-09
93	1.17E-10	1.234	0.169417	-1.83E-05	-3.42E-15	1.29E-14
94	5.43E-06	1.234	0.169207	-1.85E-05	2.74E-07	-1.53E-09
95	7.40E-06	1.234	0.168857	-1.88E-05	3.35E-07	-4.55E-09
96	-2.03E-05	1.851	0.128511	-2.85E-05	-1.29E-06	4.56E-09
97	-1.52E-05	1.851	0.129860	-2.78E-05	-1.04E-06	-2.92E-09
98	8.74E-11	1.851	0.130700	-2.72E-05	-3.94E-15	2.08E-14
99	1.52E-05	1.851	0.129860	-2.78E-05	1.04E-06	2.92E-09
100	2.03E-05	1.851	0.128511	-2.85E-05	1.29E-06	-4.56E-09
101	-2.91E-05	2.469	0.071635	-3.75E-05	-2.49E-06	-1.40E-08
102	-2.58E-05	2.469	0.074445	-3.76E-05	-2.51E-06	-2.82E-08
103	3.90E-11	2.468	0.077164	-3.60E-05	-4.53E-15	2.66E-14
104	2.58E-05	2.469	0.074445	-3.76E-05	2.51E-06	2.82E-08
105	2.91E-05	2.469	0.071635	-3.75E-05	2.49E-06	1.40E-08
106	-4.27E-06	3.086	0.004522	-4.04E-05	5.24E-07	-4.40E-08
107	-6.92E-06	3.086	0.003992	-4.32E-05	3.70E-07	-1.16E-07
108	-2.39E-11	3.085	0.003765	-5.38E-05	-4.53E-15	2.71E-14
109	6.92E-06	3.086	0.003992	-4.32E-05	-3.70E-07	1.16E-07
110	4.27E-06	3.086	0.004522	-4.04E-05	-5.24E-07	4.40E-08
111	2.73E-05	3.55E	-0.043644	-3.33E-05	2.85E-06	-1.77E-08
112	2.80E-05	3.55E	-0.046942	-3.38E-05	3.08E-06	-2.91E-08
113	-6.53E-11	3.55E	-0.050485	-3.24E-05	4.65E-15	2.53E-14
114	-2.80E-05	3.55E	-0.046942	-3.38E-05	-3.08E-06	2.91E-08
115	-2.73E-05	3.55E	-0.043644	-3.33E-05	-2.85E-06	1.77E-08
116	2.73E-05	4.030	-0.080449	-2.27E-05	2.25E-06	3.65E-09
117	2.19E-05	4.030	-0.082845	-2.17E-05	1.90E-06	-4.88E-09
118	-9.66E-11	4.030	-0.084503	-2.06E-05	-5.00E-15	1.72E-14
119	-2.19E-05	4.030	-0.082845	-2.17E-05	-1.90E-06	4.88E-09
120	-2.73E-05	4.030	-0.080449	-2.27E-05	-2.25E-06	-3.65E-09
121	1.55E-05	4.502	-0.103041	-1.20E-05	9.86E-07	6.95E-09
122	1.18E-05	4.502	-0.104070	-1.13E-05	7.96E-07	1.00E-09
123	-1.13E-10	4.502	-0.104694	-1.08E-05	5.64E-15	7.86E-15
124	-1.18E-05	4.502	-0.104070	-1.13E-05	-7.96E-07	-1.00E-09
125	-1.55E-05	4.502	-0.103041	-1.20E-05	-9.86E-07	-6.95E-09
126	7.91E-06	4.974	-0.112378	-2.58E-06	3.21E-07	1.63E-09
127	6.27E-06	4.974	-0.112714	-2.30E-06	2.65E-07	-3.22E-10
128	-1.16E-10	4.974	-0.112916	-2.11E-06	-6.11E-15	9.80E-17
129	-6.27E-06	4.974	-0.112714	-2.30E-06	-2.65E-07	3.22E-10
130	-7.91E-06	4.974	-0.112378	-2.58E-06	-3.21E-07	-1.63E-09
131	1.13E-05	5.446	-0.110544	5.18E-06	8.58E-08	-8.00E-09

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	8.90E-06	5.446	-0.110634	5.26E-06	7.26E-08	-4.92E-09
133	-1.10E-10	5.446	-0.110686	5.32E-06	-6.15E-15	-5.55E-15
134	-8.90E-06	5.446	-0.110634	5.26E-06	-7.26E-08	4.92E-09
135	-1.13E-05	5.446	-0.110544	5.18E-06	-8.58E-08	8.00E-09
136	3.15E-05	5.918	-0.099578	1.15E-05	3.87E-08	-2.13E-08
137	2.36E-05	5.918	-0.099619	1.15E-05	3.30E-08	-9.58E-09
138	-9.77E-11	5.918	-0.099641	1.14E-05	-5.35E-15	-9.71E-15
139	-2.36E-05	5.918	-0.099619	1.15E-05	-3.30E-08	9.58E-09
140	-3.15E-05	5.918	-0.099578	1.15E-05	-3.87E-08	2.13E-08
141	7.19E-05	6.390	-0.081346	1.64E-05	1.04E-07	-2.97E-08
142	5.23E-05	6.390	-0.081455	1.63E-05	8.74E-08	-4.99E-09
143	-8.10E-11	6.390	-0.081521	1.62E-05	-3.14E-15	-1.29E-14
144	-5.23E-05	6.390	-0.081455	1.63E-05	-8.74E-08	4.99E-09
145	-7.19E-05	6.390	-0.081346	1.64E-05	-1.04E-07	2.97E-08
146	0.000111	6.862	-0.057573	2.00E-05	3.37E-07	3.98E-09
147	8.04E-05	6.863	-0.057927	1.97E-05	2.81E-07	3.42E-08
148	-6.06E-11	6.863	-0.058152	1.95E-05	2.04E-16	-1.54E-14
149	-8.04E-05	6.863	-0.057927	1.97E-05	-2.81E-07	-3.42E-08
150	-0.000111	6.862	-0.057573	2.00E-05	-3.37E-07	-3.98E-09
151	4.98E-05	7.334	-0.029877	2.23E-05	9.09E-07	1.62E-07
152	4.25E-05	7.335	-0.030824	2.18E-05	7.28E-07	1.61E-07
153	-3.78E-11	7.335	-0.031415	2.14E-05	2.03E-15	-1.64E-14
154	-4.25E-05	7.335	-0.030824	2.18E-05	-7.28E-07	-1.61E-07
155	-4.98E-05	7.334	-0.029877	2.23E-05	-9.09E-07	-1.62E-07
156	-0.000308	7.806	-3.69E-98	2.31E-05	1.90E-06	4.69E-07
157	-0.000233	7.807	-0.001954	2.25E-05	1.41E-06	4.53E-07
158	-1.48E-11	7.807	-0.003097	2.20E-05	-8.08E-17	-1.60E-14
159	0.000233	7.807	-0.001954	2.25E-05	-1.41E-06	-4.53E-07
160	0.000308	7.806	-3.69E-98	2.31E-05	-1.90E-06	-4.69E-07
161	-0.000543	7.988	0.011551	2.31E-05	1.90E-06	4.69E-07
162	-0.000459	7.989	0.009281	2.25E-05	1.41E-06	4.53E-07
163	-6.80E-12	7.989	0.007920	2.20E-05	-8.08E-17	-1.60E-14
164	0.000459	7.989	0.009281	2.25E-05	-1.41E-06	-4.53E-07
165	0.000543	7.988	0.011551	2.31E-05	-1.90E-06	-4.69E-07
166	+0	-2.30E-97	7.37E-98	1.58E-99	-0	-0
167	+0	2.30E-97	7.37E-98	-1.58E-99	-0	+0
min:	-0.000543	-7.989	-0.112916	-5.38E-05	-3.08E-06	-4.69E-07
max:	0.000543	7.989	0.200681	5.38E-05	3.08E-06	4.69E-07

Loadcase	Factor	Stage	Init.def	Title
66	1.0000			GRADIENTE

SUPPORT REACTIONS :

Node	FX [t]	FY [t]	FZ [t]	T [tm]	MY [tm]	MZ [tm]
6	-0.001262	0.001005	7.143			
10	0.001262	0.001005	7.143			
156	-0.001262	-0.001005	7.143			
160	0.001262	-0.001005	7.143			
166	8.72E-09	1.119	-14.286	-4.921	4.38E-08	-1.08E-08
167	8.72E-09	-1.119	-14.286	4.921	4.38E-08	1.08E-08
Sums :	-2.51E-12	1.24E-14	-8.01E-12			
min:	-0.001262	-1.119	-14.286	-4.921	4.38E-08	-1.08E-08
max:	0.001262	1.119	7.143	4.921	4.38E-08	1.08E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	0.014881	-0.004368	-0.348553	0.000739	3.71E-05	2.47E-05
2	0.003935	0.002525	-0.393333	0.000753	2.76E-05	2.25E-06
3	1.98E-08	0.003102	-0.419966	0.000762	1.63E-13	1.92E-12
4	-0.003935	0.002525	-0.393333	0.000753	-2.76E-05	-2.25E-06
5	-0.014881	-0.004368	-0.348553	0.000739	-3.71E-05	-2.47E-05
6	0.005487	-0.004368	-7.14E-97	0.000655	3.71E-05	1.29E-05
7	0.002811	0.002525	-0.038120	0.000668	2.76E-05	2.25E-06
8	1.88E-08	0.003102	-0.060421	0.000677	1.63E-13	1.92E-12
9	-0.002811	0.002525	-0.038120	0.000668	-2.76E-05	-2.25E-06
10	-0.005487	-0.004368	-7.14E-97	0.000655	-3.71E-05	-1.29E-05
11	-0.001962	-0.001357	0.711610	0.000450	1.75E-05	1.42E-06
12	-0.000546	0.000966	0.693319	0.000461	1.41E-05	1.79E-06
13	1.63E-08	0.002190	0.681895	0.000468	9.18E-13	1.93E-12
14	0.000546	0.000966	0.693319	0.000461	-1.41E-05	-1.79E-06
15	0.001962	-0.001357	0.711610	0.000450	-1.75E-05	-1.42E-06
16	-0.001782	0.000280	1.179	0.000275	6.49E-06	-5.63E-07
17	-0.001114	0.000509	1.172	0.000280	5.42E-06	1.80E-07
18	1.38E-08	0.001145	1.168	0.000284	1.44E-12	1.91E-12
19	0.001114	0.000509	1.172	0.000280	-5.42E-06	-1.80E-07
20	0.001782	0.000280	1.179	0.000275	-6.49E-06	5.63E-07
21	-0.000845	0.000754	1.436	0.000124	1.99E-06	-5.39E-07
22	-0.000613	0.000502	1.434	0.000126	1.67E-06	-2.16E-07
23	1.13E-08	0.000666	1.432	0.000128	1.65E-12	1.86E-12
24	0.000613	0.000502	1.434	0.000126	-1.67E-06	2.16E-07
25	0.000845	0.000754	1.436	0.000124	-1.99E-06	5.39E-07
26	-0.000276	0.000777	1.513	-1.54E-06	4.76E-07	-2.75E-07
27	-0.000212	0.000565	1.512	-1.02E-06	4.03E-07	-1.65E-07

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
28	8.87E-09	0.000553	1.512	-6.65E-07	1.68E-12	1.80E-12
29	0.000212	0.000565	1.512	-1.02E-06	-4.03E-07	1.65E-07
30	0.000276	0.000777	1.513	-1.54E-06	-4.76E-07	2.75E-07
31	-4.29E-05	0.000709	1.443	-0.000102	1.61E-07	-9.84E-08
32	-3.75E-05	0.000606	1.443	-0.000102	1.39E-07	-7.46E-08
33	6.54E-09	0.000566	1.443	-0.000102	1.63E-12	1.73E-12
34	3.75E-05	0.000606	1.443	-0.000102	-1.39E-07	7.46E-08
35	4.29E-05	0.000709	1.443	-0.000102	-1.61E-07	9.84E-08
36	2.15E-05	0.000657	1.260	-0.000175	4.79E-07	-2.19E-08
37	1.33E-05	0.000622	1.259	-0.000176	4.00E-07	-2.38E-08
38	4.31E-09	0.000596	1.259	-0.000176	1.54E-12	1.63E-12
39	-1.33E-05	0.000622	1.259	-0.000176	-4.00E-07	2.38E-08
40	-2.15E-05	0.000657	1.260	-0.000175	-4.79E-07	2.19E-08
41	2.84E-05	0.000631	0.998538	-0.000222	1.70E-06	3.12E-11
42	2.03E-05	0.000625	0.996761	-0.000223	1.39E-06	-3.68E-09
43	2.22E-09	0.000618	0.995693	-0.000224	1.44E-12	1.52E-12
44	-2.03E-05	0.000625	0.996761	-0.000223	-1.39E-06	3.68E-09
45	-2.84E-05	0.000631	0.998538	-0.000222	-1.70E-06	-2.81E-11
46	2.46E-05	0.000616	0.694735	-0.000241	4.56E-06	4.42E-09
47	1.89E-05	0.000623	0.689920	-0.000244	3.78E-06	4.38E-09
48	2.99E-10	0.000634	0.686792	-0.000246	1.34E-12	1.39E-12
49	-1.89E-05	0.000623	0.689920	-0.000244	-3.78E-06	-4.38E-09
50	-2.46E-05	0.000616	0.694735	-0.000241	-4.56E-06	-4.42E-09
51	1.73E-05	0.000596	0.383001	-0.000235	8.45E-06	1.24E-08
52	1.67E-05	0.000619	0.373760	-0.000238	7.80E-06	1.61E-08
53	-1.43E-09	0.000660	0.366175	-0.000242	1.24E-12	1.23E-12
54	-1.67E-05	0.000619	0.373760	-0.000238	-7.80E-06	-1.61E-08
55	-1.73E-05	0.000596	0.383001	-0.000235	-8.45E-06	-1.24E-08
56	-1.39E-06	0.000557	0.092200	-0.000210	9.13E-06	2.28E-08
57	-2.74E-06	0.000607	0.082040	-0.000208	8.88E-06	5.72E-08
58	-2.95E-09	0.000717	0.072945	-0.000201	1.12E-12	1.06E-12
59	2.74E-06	0.000607	0.082040	-0.000208	-8.88E-06	-5.72E-08
60	1.38E-06	0.000557	0.092200	-0.000210	-9.13E-06	-2.28E-08
61	-1.45E-05	0.000481	-0.230820	-0.000168	3.65E-06	6.91E-09
62	-1.27E-05	0.000496	-0.234622	-0.000165	2.91E-06	1.39E-08
63	-4.59E-09	0.000522	-0.236859	-0.000163	1.12E-12	8.51E-13
64	1.27E-05	0.000496	-0.234622	-0.000165	-2.91E-06	-1.39E-08
65	1.45E-05	0.000481	-0.230820	-0.000168	-3.65E-06	-6.91E-09
66	-1.01E-05	0.000372	-0.479242	-0.000124	8.04E-07	-2.33E-09
67	-7.54E-06	0.000373	-0.480081	-0.000124	6.63E-07	1.42E-09
68	-5.85E-09	0.000379	-0.480575	-0.000123	1.12E-12	6.34E-13
69	7.53E-06	0.000373	-0.480081	-0.000124	-6.63E-07	-1.42E-09
70	1.01E-05	0.000372	-0.479242	-0.000124	-8.04E-07	2.33E-09
71	-3.66E-06	0.000250	-0.655278	-8.26E-05	1.22E-07	-2.27E-09
72	-2.69E-06	0.000249	-0.655407	-8.25E-05	1.05E-07	-7.75E-10
73	-6.75E-09	0.000250	-0.655481	-8.24E-05	1.11E-12	4.21E-13
74	2.68E-06	0.000249	-0.655407	-8.25E-05	-1.05E-07	7.76E-10
75	3.65E-06	0.000250	-0.655278	-8.26E-05	-1.22E-07	2.28E-09
76	-6.79E-07	0.000125	-0.760597	-4.13E-05	4.15E-09	-8.77E-10
77	-5.28E-07	0.000125	-0.760601	-4.13E-05	4.35E-09	-5.08E-10
78	-7.28E-09	0.000124	-0.760602	-4.12E-05	1.11E-12	2.10E-13
79	5.13E-07	0.000125	-0.760601	-4.13E-05	-4.34E-09	5.09E-10

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
80	6.65E-07	0.000125	-0.760597	-4.13E-05	-4.15E-09	8.78E-10
81	2.49E-08	4.31E-14	-0.795675	-3.82E-18	-8.51E-09	-6.74E-17
82	-1.19E-08	-3.24E-14	-0.795666	-4.69E-18	-6.71E-09	-6.74E-17
83	-7.46E-09	-1.33E-13	-0.795659	-6.19E-18	1.11E-12	-6.74E-17
84	-3.05E-09	-2.35E-13	-0.795666	-7.21E-18	6.71E-09	-6.74E-17
85	-3.98E-08	-3.10E-13	-0.795675	-6.76E-18	8.51E-09	-6.74E-17
86	-6.79E-07	-0.000125	-0.760597	4.13E-05	4.15E-09	8.77E-10
87	-5.28E-07	-0.000125	-0.760601	4.13E-05	4.35E-09	5.08E-10
88	-7.28E-09	-0.000124	-0.760602	4.12E-05	1.11E-12	-2.11E-13
89	5.13E-07	-0.000125	-0.760601	4.13E-05	-4.34E-09	-5.09E-10
90	6.65E-07	-0.000125	-0.760597	4.13E-05	-4.15E-09	-8.78E-10
91	-3.66E-06	-0.000250	-0.655278	8.26E-05	1.22E-07	2.27E-09
92	-2.69E-06	-0.000249	-0.655407	8.25E-05	1.05E-07	7.75E-10
93	-6.75E-09	-0.000250	-0.655481	8.24E-05	1.11E-12	-4.21E-13
94	2.68E-06	-0.000249	-0.655407	8.25E-05	-1.05E-07	-7.76E-10
95	3.65E-06	-0.000250	-0.655278	8.26E-05	-1.22E-07	-2.28E-09
96	-1.01E-05	-0.000372	-0.479242	0.000124	8.04E-07	2.33E-09
97	-7.54E-06	-0.000373	-0.480081	0.000124	6.63E-07	-1.42E-09
98	-5.85E-09	-0.000379	-0.480575	0.000123	1.12E-12	-6.34E-13
99	7.53E-06	-0.000373	-0.480081	0.000124	-6.63E-07	1.42E-09
100	1.01E-05	-0.000372	-0.479242	0.000124	-8.04E-07	-2.33E-09
101	-1.45E-05	-0.000481	-0.230820	0.000168	3.65E-06	-6.91E-09
102	-1.27E-05	-0.000496	-0.234622	0.000165	2.91E-06	-1.39E-08
103	-4.59E-09	-0.000522	-0.236859	0.000163	1.12E-12	-8.51E-13
104	1.27E-05	-0.000496	-0.234622	0.000165	-2.91E-06	1.39E-08
105	1.45E-05	-0.000481	-0.230820	0.000168	-3.65E-06	6.91E-09
106	-1.39E-06	-0.000557	0.092200	0.000210	9.13E-06	-2.28E-08
107	-2.74E-06	-0.000607	0.082040	0.000208	8.88E-06	-5.72E-08
108	-2.95E-09	-0.000717	0.072945	0.000201	1.12E-12	-1.06E-12
109	2.74E-06	-0.000607	0.082040	0.000208	-8.88E-06	5.72E-08
110	1.38E-06	-0.000557	0.092200	0.000210	-9.13E-06	2.28E-08
111	1.73E-05	-0.000596	0.383001	0.000235	8.45E-06	-1.24E-08
112	1.67E-05	-0.000619	0.373760	0.000238	7.80E-06	-1.61E-08
113	-1.43E-09	-0.000660	0.366175	0.000242	1.24E-12	-1.23E-12
114	-1.67E-05	-0.000619	0.373760	0.000238	-7.80E-06	1.61E-08
115	-1.73E-05	-0.000596	0.383001	0.000235	-8.45E-06	1.24E-08
116	2.46E-05	-0.000616	0.694735	0.000241	4.56E-06	-4.42E-09
117	1.89E-05	-0.000623	0.689920	0.000244	3.78E-06	-4.38E-09
118	3.01E-10	-0.000634	0.686792	0.000246	1.34E-12	-1.39E-12
119	-1.89E-05	-0.000623	0.689920	0.000244	-3.78E-06	4.38E-09
120	-2.46E-05	-0.000616	0.694735	0.000241	-4.56E-06	4.42E-09
121	2.84E-05	-0.000631	0.998538	0.000222	1.70E-06	-3.12E-11
122	2.03E-05	-0.000625	0.996761	0.000223	1.39E-06	3.68E-09
123	2.23E-09	-0.000618	0.995693	0.000224	1.44E-12	-1.52E-12
124	-2.03E-05	-0.000625	0.996761	0.000223	-1.39E-06	-3.68E-09
125	-2.84E-05	-0.000631	0.998538	0.000222	-1.70E-06	2.81E-11
126	2.15E-05	-0.000657	1.260	0.000175	4.79E-07	2.19E-08
127	1.33E-05	-0.000622	1.259	0.000176	4.00E-07	2.38E-08
128	4.32E-09	-0.000596	1.259	0.000176	1.54E-12	-1.63E-12
129	-1.33E-05	-0.000622	1.259	0.000176	-4.00E-07	-2.38E-08
130	-2.15E-05	-0.000657	1.260	0.000175	-4.79E-07	-2.19E-08
131	-4.29E-05	-0.000709	1.443	0.000102	1.61E-07	9.84E-08

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
132	-3.75E-05	-0.000606	1.443	0.000102	1.39E-07	7.46E-08
133	6.54E-09	-0.000566	1.443	0.000102	1.63E-12	-1.73E-12
134	3.75E-05	-0.000606	1.443	0.000102	-1.39E-07	-7.46E-08
135	4.29E-05	-0.000709	1.443	0.000102	-1.61E-07	-9.84E-08
136	-0.000276	-0.000777	1.513	1.54E-06	4.76E-07	2.75E-07
137	-0.000212	-0.000565	1.512	1.02E-06	4.03E-07	1.65E-07
138	8.87E-09	-0.000553	1.512	6.65E-07	1.68E-12	-1.80E-12
139	0.000212	-0.000565	1.512	1.02E-06	-4.03E-07	-1.65E-07
140	0.000276	-0.000777	1.513	1.54E-06	-4.76E-07	-2.75E-07
141	-0.000845	-0.000754	1.436	-0.000124	1.99E-06	5.39E-07
142	-0.000613	-0.000502	1.434	-0.000126	1.67E-06	2.16E-07
143	1.13E-08	-0.000666	1.432	-0.000128	1.65E-12	-1.86E-12
144	0.000613	-0.000502	1.434	-0.000126	-1.67E-06	-2.16E-07
145	0.000845	-0.000754	1.436	-0.000124	-1.99E-06	-5.39E-07
146	-0.001782	-0.000280	1.179	-0.000275	6.49E-06	5.63E-07
147	-0.001114	-0.000509	1.172	-0.000280	5.42E-06	-1.80E-07
148	1.38E-08	-0.001145	1.168	-0.000284	1.44E-12	-1.91E-12
149	0.001114	-0.000509	1.172	-0.000280	-5.42E-06	1.80E-07
150	0.001782	-0.000280	1.179	-0.000275	-6.49E-06	-5.63E-07
151	-0.001962	0.001357	0.711610	-0.000450	1.75E-05	-1.42E-06
152	-0.000546	-0.000966	0.693319	-0.000461	1.41E-05	-1.79E-06
153	1.63E-08	-0.002190	0.681895	-0.000468	9.18E-13	-1.93E-12
154	0.000546	-0.000966	0.693319	-0.000461	-1.41E-05	1.79E-06
155	0.001962	0.001357	0.711610	-0.000450	-1.75E-05	1.42E-06
156	0.005487	0.004368	-7.14E-97	-0.000655	3.71E-05	-1.29E-05
157	0.002811	-0.002525	-0.038120	-0.000668	2.76E-05	-2.25E-06
158	1.89E-08	-0.003102	-0.060421	-0.000677	1.63E-13	-1.92E-12
159	-0.002811	-0.002525	-0.038120	-0.000668	-2.76E-05	2.25E-06
160	-0.005487	0.004368	-7.14E-97	-0.000655	-3.71E-05	1.29E-05
161	0.014881	0.004368	-0.348553	-0.000739	3.71E-05	-2.47E-05
162	0.003935	-0.002525	-0.393333	-0.000753	2.76E-05	-2.25E-06
163	1.98E-08	-0.003102	-0.419966	-0.000762	1.63E-13	-1.92E-12
164	-0.003935	-0.002525	-0.393333	-0.000753	-2.76E-05	2.25E-06
165	-0.014881	0.004368	-0.348553	-0.000738	-3.71E-05	2.47E-05
166	-0	-1.12E-97	1.43E-96	+0	-0	+0
167	-0	1.12E-97	1.43E-96	-0	-0	-0
min:	-0.014881	-0.004368	-0.795675	-0.000762	-3.71E-05	-2.47E-05
max:	0.014881	0.004368	1.513	0.000762	3.71E-05	2.47E-05

DA	OR	25	1.500	VEHICULO POSICION 25
DB	OR	26	1.500	VEHICULO POSICION 26
DC	OR	27	1.500	VEHICULO POSICION 27
DD	OR	28	1.500	VEHICULO POSICION 28
DE	OR	29	1.500	VEHICULO POSICION 29
DF	OR	30	1.500	VEHICULO POSICION 30
DG	OR	31	1.500	VEHICULO POSICION 31
DH	OR	32	1.500	VEHICULO POSICION 32
DI	OR	33	1.500	VEHICULO POSICION 33
DJ	OR	34	1.500	VEHICULO POSICION 34
DK	OR	35	1.500	VEHICULO POSICION 35
DL	OR	36	1.500	VEHICULO POSICION 36
DM	OR	37	1.500	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.500	FRENADO
DO	PLUS	63	0.750000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.900000	TEMPERATURA (-)
DQ	OR	65	0.900000	TEMPERATURA (+)
DR	PLUS	66	0.900000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.500	SOB UNIF VANO 1
DY	PLUS	47	1.500	SOB UNIF VANO 2
DZ	PLUS	48	1.500	SOB UNIF VANO 3
EA	PLUS	11	1.500	VEHICULO HIPOTESIS 11
EB	OR	12	1.500	VEHICULO HIPOTESIS 12
EC	OR	13	1.500	VEHICULO HIPOTESIS 13
ED	OR	14	1.500	VEHICULO HIPOTESIS 14
EE	OR	15	1.500	VEHICULO HIPOTESIS 15
EF	OR	16	1.500	VEHICULO HIPOTESIS 16
EG	OR	17	1.500	VEHICULO HIPOTESIS 17
EH	OR	18	1.500	VEHICULO HIPOTESIS 18
EI	OR	19	1.500	VEHICULO HIPOTESIS 19
EJ	OR	20	1.500	VEHICULO HIPOTESIS 20
EK	OR	21	1.500	VEHICULO HIPOTESIS 21
EL	OR	22	1.500	VEHICULO HIPOTESIS 22
EM	OR	23	1.500	VEHICULO HIPOTESIS 23
EN	OR	24	1.500	VEHICULO HIPOTESIS 24
EO	OR	25	1.500	VEHICULO POSICION 25
EP	OR	26	1.500	VEHICULO POSICION 26
EQ	OR	27	1.500	VEHICULO POSICION 27
ER	OR	28	1.500	VEHICULO POSICION 28
ES	OR	29	1.500	VEHICULO POSICION 29
ET	OR	30	1.500	VEHICULO POSICION 30
EU	OR	31	1.500	VEHICULO POSICION 31
EV	OR	32	1.500	VEHICULO POSICION 32
EW	OR	33	1.500	VEHICULO POSICION 33
EX	OR	34	1.500	VEHICULO POSICION 34
EY	OR	35	1.500	VEHICULO POSICION 35
EZ	OR	36	1.500	VEHICULO POSICION 36
FA	OR	37	1.500	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.500	FRENADO

FC	PLUS	63	0.750000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.900000	TEMPERATURA (-)
FE	OR	65	0.900000	TEMPERATURA (+)
FF	PLUS	66	0.900000	GRADIENTE

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-491.897	1.493	-4.19E-10	6.10E-09	2.71E-09	1.461
		[-208.997]	-6.154	-9.523	0.045376	[59.749]	[39.020]
		Min: CF CG CI CJ CK CY DP			Max: DS DU DV DW DZ EQ FB...		
290	11.300	-491.897	1.493	-4.19E-10	6.10E-09	-2.02E-09	18.332
		[-208.997]	-6.154	-7.828	0.045376	[-38.279]	[-30.525]
		Min: CF CG CI CJ CK CY DP			Max: DS DU DV DW DZ EQ FB...		
291	0	[-493.319]	-8.024	-3.99E-10	-5.68E-09	[2.64E-09]	[36.674]
		-210.420	-0.376457	-9.523	-0.045376	59.749	-0.885525
		Min: CF CG CI CK CL DA DN...			Max: DS DU DV DW DX EK FC...		
291	11.300	[-493.319]	-8.024	-3.99E-10	-5.68E-09	[-1.86E-09]	[-53.996]
		-210.420	-0.376457	-7.828	-0.045376	-38.279	-5.139
		Min: CF CG CI CK CL DA DN...			Max: DS DU DV DW DX EK FC...		

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-264.115	-5.924	-1.134	-0.701718	-8.941	37.051
		-349.885	-1.245	-8.388	0.747094	68.689	12.659
		Min: AP AR AS AT AX AY BX...			Max: A B D E F G P AK AL AN.		
290	11.300	-441.481	-4.651	-11.904	0.520733	-85.960	-13.484
		-352.179	3.629	4.077	-0.475357	47.681	27.574
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
291	0	-265.537	-0.606722	-1.134	0.701718	-8.941	1.083
		[-351.308]	-5.286	-8.388	-0.747094	[68.689]	[25.476]
		Min: AP AR AS AT AX AY BT...			Max: A B D E F G L AL AN AO		
291	11.300	[-442.904]	-1.880	-11.904	-0.520733	[-85.960]	[-22.181]
		-353.601	-10.160	4.077	0.475357	47.681	-63.239
		Min: A B D G H I AG AL AM...			Max: AP AR AS AT AU AV BE...		

$\Delta G_{pile} = 1.35 \times 22.2 = 30\,t$

N = 209.00
M = 49.00

N = 239.00
M = 71.36

N = 493.30
M = 54.00

N = 523.30
M = 36.67

N = 442.904
M = 88.77

N = 472.904
M = 73.28

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-408.499	12.240	-8.85E-09	2.01E-08	3.58E-08	-53.110
		-260.485	-15.098	-9.523	0.045376	59.749	85.777
		Min: CF CG CI CK CZ DQ DR			Max: DS DU DV DW DX DZ EQ...		
290	11.300	-328.577	-15.859	-7.828	0.045376	-38.279	-94.753
		-408.499	12.240	-8.85E-09	2.01E-08	-6.43E-08	85.198
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
291	0	-261.908	8.567	-9.523	-0.045376	59.749	-47.643
		-409.922	-18.771	-8.83E-09	-1.97E-08	3.57E-08	91.245
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DN DQ...		
	11.300	-409.922	-18.771	-8.83E-09	-1.97E-08	-6.41E-08	-120.863
		-330.000	9.328	-7.828	-0.045376	-38.279	59.088
		Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

N = 328.60
M = 102.19

N = 358.60
M = 104.53

N = 409.92
M = 120.86

N = 439.92
M = 91.24

ENVELOPE for < Vz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-439.715	1.829	-13.599	0.520733	58.134	0.618926
		-353.945	-2.850	4.077	-0.475357	1.615	25.011
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
290	11.300	-439.715	1.829	-11.904	0.520733	-85.960	21.284
		-353.945	-2.850	4.077	-0.475357	47.681	-7.194
		Min: A B D G H I AE AK AL...			Max: AP AR AS AT AU AV BC...		
291	0	-441.138	-8.360	-13.599	-0.520733	58.134	37.516
		-355.367	-3.681	4.077	0.475357	1.615	13.123
		Min: A B D G H I AG AL AN...			Max: AP AR AS AT AU AV BE...		
291	11.300	-441.138	-8.360	-11.904	-0.520733	-85.960	-56.949
		-355.367	-3.681	4.077	0.475357	47.681	-28.471
		Min: A B D G H I AG AL AN...			Max: AP AR AS AT AU AV BE...		

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 1 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **49.0** Md (KNm) = 480.2
Nd (T) = **-209.0** Nd (KN) = -2048.2

Pie de pórtico

Md (Tm) = **71.4** Md (KNm) = 699.3
Nd (T) = **-239.0** Nd (KN) = -2342.2

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L dintel = 0.0000

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.299 Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

β = 1.50

e_a = 0.139

e_{tot} (m) = 0.437

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 91.35
Nd (t) = -209.00

Md (KNm) = 895.3
Nd (KN) = -2048.2

Pie de pórtico

Md (tm) = 104.47
Nd (t) = -239.00

Md (KNm) = 1023.8
Nd (KN) = -2342.2

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 2 :

Solicitaciones : Cabeza de pórtico

Md (Tm) = **54.0** Md (KNm) = 529.2
Nd (T) = **-493.3** Nd (KN) = -4834.3

Pie de pórtico

Md (Tm) = **36.7** Md (KNm) = 359.4
Nd (T) = **-523.3** Nd (KN) = -5128.3

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A * \Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

e_e = 0.109 Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

β = 1.50

e_a = 0.121

e_{tot} (m) = 0.230

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 113.49
Nd (t) = -493.30

Md (KNm) = 1112.2
Nd (KN) = -4834.3

Pie de pórtico

Md (tm) = 120.39
Nd (t) = -523.30

Md (KNm) = 1179.8
Nd (KN) = -5128.3

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 3 :

Solicitaciones :

Cabeza de pórtico

Md (Tm) = **88.8** Md (KNm) = 869.9
Nd (T) = **-442.9** Nd (KN) = -4340.4

Pie de pórtico

Md (Tm) = **73.3** Md (KNm) = 718.1
Nd (T) = **-472.9** Nd (KN) = -4634.4

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A *\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

$e_e = 0.200$ Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

$\varepsilon y =$ fyd / Es = 0.002070

$\varepsilon = 0.0045$ Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

$\beta = 1.50$

$e_a = 0.132$

e_{tot} (m) = 0.332

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 147.25
Nd (t) = -442.90

Md (KNm) = 1443.0
Nd (KN) = -4340.4

Pie de pórtico

Md (tm) = 157.22
Nd (t) = -472.90

Md (KNm) = 1540.8
Nd (KN) = -4634.4

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 4 :

Solicitaciones :

Cabeza de pórtico

Md (Tm) = **102.2** Md (KNm) = 1001.6
Nd (T) = **-328.6** Nd (KN) = -3220.3

Pie de pórtico

Md (Tm) = **104.5** Md (KNm) = 1024.4
Nd (T) = **-358.6** Nd (KN) = -3514.3

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7{,}5+4*(\Psi A + \Psi B)+1{,}6*\Psi A *\Psi B) / (7{,}5+(\Psi A+\Psi B)))^{0{,}5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0{,}12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$

e_e = 0.311 Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

β = 1.50

e_a = 0.139

e_{tot} (m) = 0.450

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 147.92 **Md (KNm) = 1449.6**
Nd (t) = -328.60 **Nd (KN) = -3220.3**

Pie de pórtico

Md (tm) = 161.42 **Md (KNm) = 1581.9**
Nd (t) = -358.60 **Nd (KN) = -3514.3**

Estado límite de Inestabilidad : Pórtico traslacional

HIPOTESIS 5 :

Solicitaciones :

Cabeza de pórtico

Md (Tm) = **120.9** Md (KNm) = 1184.4
Nd (T) = **-409.9** Nd (KN) = -4017.2

Pie de pórtico

Md (Tm) = **91.2** Md (KNm) = 894.2
Nd (T) = **-439.9** Nd (KN) = -4311.2

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A * \Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20**

$35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$e_{tot} = e_e + e_a > e_2$

$e_a = (1 + 0,12\ \beta)(\varepsilon y+\varepsilon)\ \frac{(h+20e_e)}{(h+10ee)}\ \frac{Lo^2}{50\ ic}$

e_e = 0.295 Máxima excentricidad de cálculo de 1er orden

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\ is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$

β = 1.50

e_a = 0.138

e_{tot} (m) = 0.433

Solicitaciones de cálculo :

Cabeza de pórtico

Md (tm) = 177.57
Nd (t) = -409.92

Md (KNm) = 1740.2
Nd (KN) = -4017.2

Pie de pórtico

Md (tm) = 190.56
Nd (t) = -439.92

Md (KNm) = 1867.5
Nd (KN) = -4311.2

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 3 :
Dirección transversal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **31.8** Mk (KNm) = 311.6
Nk (t) = **-314.1** Nk (KN) = -3078.0

Pie de pórtico
Mk (tm) = **29.9** Mk (KNm) = 293.0
Nk (t) = **-336.3** Nk (KN) = -3295.7

Dirección longitudinal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **55.4** Mk (KNm) = 542.9
Nk (t) = **-314.1** Nk (KN) = -3078.2

Pie de pórtico
Mk (tm) = **17.4** Mk (KNm) = 170.8
Nk (t) = **-336.3** Nk (KN) = -3295.7

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ **= 45.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\frac{(h+20e_e)}{(h+10ee)}\frac{Lo^2}{50\,ic}$$

$e_e = 0.101$ Máxima excentricidad de cálculo de 1er orden transversal
$e_e = 0.176$ Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ $\beta = 1.50$

Solicitaciones de cálculo transversales :
$e_a = 0.119$

e_{tot} (m) = 0.220

Pie de pórtico

Mk (tm) = 74.08
Nk (t) = -336.30

Mk (KNm) = 726.0
Nk (KN) = -3295.7

Solicitaciones de cálculo longitudinales :
$e_a = 0.130$

e_{tot} (m) = 0.306

Pie de pórtico

Mk (tm) = 102.95
Nk (t) = -336.30

Mk (KNm) = 1008.9
Nk (KN) = -3295.7

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 1 :
Dirección transversal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **15.3** Mk (KNm) = 150.0
Nk (t) = **-218.0** Nk (KN) = -2136.4

Pie de pórtico
Mk (tm) = **23.9** Mk (KNm) = 234.2
Nk (t) = **-240.2** Nk (KN) = -2354.0

Dirección longitudinal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **7.1** Mk (KNm) = 69.6
Nk (t) = **-218.0** Nk (KN) = -2136.4

Pie de pórtico
Mk (tm) = **13.1** Mk (KNm) = 128.6
Nk (t) = **-240.2** Nk (KN) = -2354.0

Hormigón : **HA - 30**
fck (N/mm²)= **30**
γ c = **1.50**
fcd (N/mm²)= 20.0
Ec (KN/mm²) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm²)= **500**
γ s = **1.15**
fyd (N/mm²)= 434.8
Es (KN/mm²) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m⁴) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m⁴) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\frac{(h+20e_e)}{(h+10ee)}\frac{Lo^2}{50\,ic}$$

$e_e = 0.100$ Máxima excentricidad de cálculo de 1er orden transversal
$e_e = 0.055$ Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ $\beta = 1.50$

Solicitaciones de cálculo transversales :

$e_a = 0.119$

e_{tot} (m) = 0.218

Pie de pórtico

Mk (tm) = 52.41
Nk (t) = -240.20

Mk (KNm) = 513.6
Nk (KN) = -2354.0

Solicitaciones de cálculo longitudinales :

$e_a = 0.107$

e_{tot} (m) = 0.162

Pie de pórtico

Mk (tm) = 38.86
Nk (t) = -240.20

Mk (KNm) = 380.9
Nk (KN) = -2354.0

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 2 :
Dirección transversal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-353.8** Nk (KN) = -3467.2

Pie de pórtico
Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-376.0** Nk (KN) = -3684.8

Dirección longitudinal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = **21.4** Mk (KNm) = 209.7
Nk (t) = **-353.3** Nk (KN) = -3462.3

Pie de pórtico
Mk (tm) = **7.8** Mk (KNm) = 76.4
Nk (t) = **-379.3** Nk (KN) = -3717.1

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ **= 45.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

$e_e = 0.000$ Máxima excentricidad de cálculo de 1er orden transversal
$e_e = 0.061$ Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ $\beta = 1.50$

Solicitaciones de cálculo transversales :
$e_a = 0.079$

e_{tot} (m) = 0.079

Pie de pórtico

Mk (tm) = 29.78 **Mk (KNm) = 291.8**
Nk (t) = -379.30 **Nk (KN) = -3684.8**

Solicitaciones de cálculo longitudinales :
$e_a = 0.109$

e_{tot} (m) = 0.170

Pie de pórtico

Mk (tm) = 64.35 **Mk (KNm) = 630.6**
Nk (t) = -379.30 **Nk (KN) = -3717.1**

Características mecánicas Sección "PILAS" (sin coef. homogeneiz.)

Area	Ax = 7.858E3 cm2		
Momento de inercia	Iy = 4.918E6 cm4	Iz = 4.909E6 cm4	Ip = 9.827E6 cm4
Const. de torsión			Ix = 9.817E6 cm4
Momento estático	Zy =166.73E3 cm3	Zz = 166.73E3 cm3	
Baricentro	ys = -0.0000 m	zs = 0.0000 m	Angulo= 0.0 Grad
Dist. al borde	yl = -0.5000 m	yr = 0.5000 m	
	zo = 0.5000 m	zu = -0.5000 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.0000 m z = 0.0000 m

Sección parcial circular:

Nombre	Material	w	ym[m]	zm[m]	r[m]	ix[cm4]
C1	H300	1.0	0.0000	0.0000	0.5000	9.82E+06

Armadura "B1" As-tot =74.3302 cm2 (0.95 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
CR 6 / C1	AEH500	1.0	1	5.3093	-0.1001	0.4387
CR 5 / C1	AEH500	1.0	1	5.3093	0.1001	0.4387
CR 7 / C1	AEH500	1.0	1	5.3093	-0.2806	0.3518
CR 4 / C1	AEH500	1.0	1	5.3093	0.2806	0.3518
CR 8 / C1	AEH500	1.0	1	5.3093	-0.4054	0.1952
CR 3 / C1	AEH500	1.0	1	5.3093	0.4054	0.1952
CR 9 / C1	AEH500	1.0	1	5.3093	-0.4500	0.0000
CR 2 / C1	AEH500	1.0	1	5.3093	0.4500	0.0000
CR 15 / C1	AEH500	1.0	1	5.3093	0.4054	-0.1952
CR 10 / C1	AEH500	1.0	1	5.3093	-0.4054	-0.1952
CR 14 / C1	AEH500	1.0	1	5.3093	0.2806	-0.3518
CR 11 / C1	AEH500	1.0	1	5.3093	-0.2806	-0.3518
CR 13 / C1	AEH500	1.0	1	5.3093	0.1001	-0.4387
CR / C1	AEH500	1.0	1	5.3093	-0.1001	-0.4387

Dimensionamiento a flexión: Viga Sección "PILAS"/"B1"

No	Set	N [t]]	My [tm]]	Mz [tm]]	Notas:
1	2	-239.0000	104.4700	0.0000	
2	2	-523.3000	120.3900	0.0000	
3	2	-472.9000	157.2200	0.0000	
4	2	-358.6000	161.4200	0.0000	
5	2	-439.9200	190.5600	0.0000	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

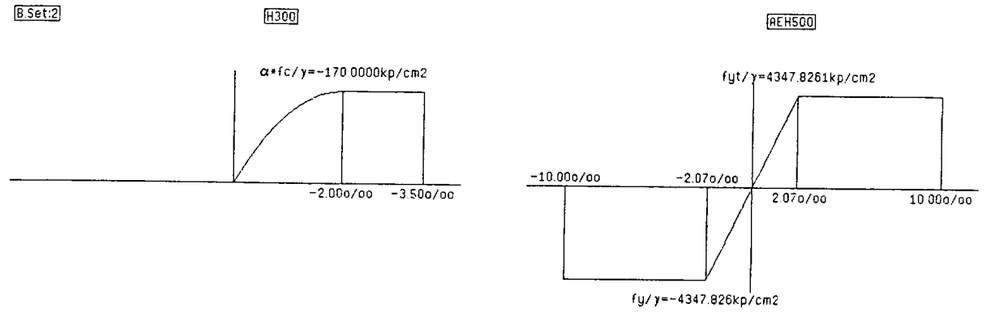
No Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
5 AEH500	-0.1001	0.4387			0.5000	4.0981	4.0981
5 AEH500	0.1001	0.4387			0.5000	4.0981	4.0981
5 AEH500	-0.2806	0.3518			0.5000	4.0981	4.0981
5 AEH500	0.2806	0.3518			0.5000	4.0981	4.0981
5 AEH500	-0.4054	0.1952			0.5000	4.0981	4.0981
5 AEH500	0.4054	0.1952			0.5000	4.0981	4.0981
5 AEH500	-0.4500	0.0000			0.5000	4.0981	4.0981
5 AEH500	0.4500	0.0000			0.5000	4.0981	4.0981
5 AEH500	0.4054	-0.1952			0.5000	4.0981	4.0981
5 AEH500	-0.4054	-0.1952			0.5000	4.0981	4.0981
5 AEH500	0.2806	-0.3518			0.5000	4.0981	4.0981
5 AEH500	-0.2806	-0.3518			0.5000	4.0981	4.0981
5 AEH500	0.1001	-0.4387			0.5000	4.0981	4.0981
5 AEH500	-0.1001	-0.4387			0.5000	4.0981	4.0981

Max.x/h = 0.67 As-top/bot = 24.5884/32.7845 As = 0.73 % = 57.3729

14 ϕ 25

Nota: Es necesaria armadura de compresión

Material acorde a la sección: "PILAS"



ENVELOPE SPECIFIC.: DA 'COMBINACION FRECUENTE'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	0.500000		SOB UNIF 1
F	PLUS	7	0.500000		SOB UNIF 2
G	PLUS	8	0.500000		SOB UNIF 3
H	PLUS	9	0.500000		SOB UNIF 4
I	PLUS	10	0.500000		SOB UNIF 5
J	PLUS	11	0.500000		VEHICULO HIPOTESIS 11
K	OR	12	0.500000		VEHICULO HIPOTESIS 12
	OR	13	0.500000		VEHICULO HIPOTESIS 13
	OR	14	0.500000		VEHICULO HIPOTESIS 14
N	OR	15	0.500000		VEHICULO HIPOTESIS 15
O	OR	16	0.500000		VEHICULO HIPOTESIS 16
P	OR	17	0.500000		VEHICULO HIPOTESIS 17
Q	OR	18	0.500000		VEHICULO HIPOTESIS 18
R	OR	19	0.500000		VEHICULO HIPOTESIS 19
S	OR	20	0.500000		VEHICULO HIPOTESIS 20
T	OR	21	0.500000		VEHICULO HIPOTESIS 21
U	OR	22	0.500000		VEHICULO HIPOTESIS 22
V	OR	23	0.500000		VEHICULO HIPOTESIS 23
W	OR	24	0.500000		VEHICULO HIPOTESIS 24
X	OR	25	0.500000		VEHICULO POSICION 25
Y	OR	26	0.500000		VEHICULO POSICION 26
Z	OR	27	0.500000		VEHICULO POSICION 27
AA	OR	28	0.500000		VEHICULO POSICION 28
AB	OR	29	0.500000		VEHICULO POSICION 29
AC	OR	30	0.500000		VEHICULO POSICION 30
AD	OR	31	0.500000		VEHICULO POSICION 31
AE	OR	32	0.500000		VEHICULO POSICION 32
AF	OR	33	0.500000		VEHICULO POSICION 33
AG	OR	34	0.500000		VEHICULO POSICION 34
AH	OR	35	0.500000		VEHICULO POSICION 35
AI	OR	36	0.500000		VEHICULO POSICION 36
AJ	OR	37	0.500000		VEHICULO HIPOTESIS 37
AK	PLUS	60	0.500000		FRENADO
AL	PLUS	63	0.100000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.200000		TEMPERATURA (-)
AN	OR	65	0.200000		TEMPERATURA (+)
AO	PLUS	66	0.200000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
AT	PLUS	46	0.500000	SOB UNIF VANO 1
AU	PLUS	47	0.500000	SOB UNIF VANO 2
AV	PLUS	48	0.500000	SOB UNIF VANO 3
AW	PLUS	11	0.500000	VEHICULO HIPOTESIS 11
AX	OR	12	0.500000	VEHICULO HIPOTESIS 12
AY	OR	13	0.500000	VEHICULO HIPOTESIS 13
AZ	OR	14	0.500000	VEHICULO HIPOTESIS 14
BA	OR	15	0.500000	VEHICULO HIPOTESIS 15
BB	OR	16	0.500000	VEHICULO HIPOTESIS 16
BC	OR	17	0.500000	VEHICULO HIPOTESIS 17
BD	OR	18	0.500000	VEHICULO HIPOTESIS 18
BE	OR	19	0.500000	VEHICULO HIPOTESIS 19
BF	OR	20	0.500000	VEHICULO HIPOTESIS 20
BG	OR	21	0.500000	VEHICULO HIPOTESIS 21
BH	OR	22	0.500000	VEHICULO HIPOTESIS 22
BI	OR	23	0.500000	VEHICULO HIPOTESIS 23
BJ	OR	24	0.500000	VEHICULO HIPOTESIS 24
BK	OR	25	0.500000	VEHICULO POSICION 25
BL	OR	26	0.500000	VEHICULO POSICION 26
BM	OR	27	0.500000	VEHICULO POSICION 27
BN	OR	28	0.500000	VEHICULO POSICION 28
BO	OR	29	0.500000	VEHICULO POSICION 29
BP	OR	30	0.500000	VEHICULO POSICION 30
BQ	OR	31	0.500000	VEHICULO POSICION 31
BR	OR	32	0.500000	VEHICULO POSICION 32
BS	OR	33	0.500000	VEHICULO POSICION 33
BT	OR	34	0.500000	VEHICULO POSICION 34
BU	OR	35	0.500000	VEHICULO POSICION 35
BV	OR	36	0.500000	VEHICULO POSICION 36
BW	OR	37	0.500000	VEHICULO HIPOTESIS 37
BX	PLUS	60	0.500000	FRENADO
BY	PLUS	63	0.100000	VIENTO TRANSV CON SOB
BZ	PLUS	64	0.200000	TEMPERATURA (-)
CA	OR	65	0.200000	TEMPERATURA (+)
CB	PLUS	66	0.200000	GRADIENTE

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.416	1.505	-2.29E-10	2.76E-09	1.53E-09	-4.087
		-228.793	-0.826379	-1.270	0.006050	7.966	7.086
		Min: AP AQ AS AT AU BI BZ			Max: AP AR AS AV BM BX BY...		
290	11.300	-296.416	1.505	-2.29E-10	2.76E-09	-1.05E-09	12.920
		-228.793	-0.826379	-1.044	0.006050	-5.104	-2.252
		Min: AP AQ AS AT AU BI BZ			Max: AP AR AS AV BM BX BY...		
291	0	-296.890	-3.682	-2.23E-10	-2.62E-09	1.52E-09	16.798
		-229.267	-1.351	-1.270	-0.006050	7.966	5.626
		Min: AP AQ AS AU AV BK BX...			Max: AP AR AS AT BG BY CA...		
291	11.300	-296.890	-3.682	-2.23E-10	-2.62E-09	-1.01E-09	-24.809
		-229.267	-1.351	-1.044	-0.006050	-5.104	-9.636
		Min: AP AQ AS AU AV BK BX...			Max: AP AR AS AT BG BY CA...		

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-245.268	0.118116	-0.378103	-0.233906	-2.980	1.601
		-250.976	-0.275479	-0.891571	0.239956	10.947	4.475
		Min: A C D H I AH AM			Max: A B D E F G P AK AL AN.		
290	11.300	-281.311	-0.690654	-2.403	0.164502	-20.997	1.202
		-274.819	2.583	1.359	-0.158452	15.894	18.228
		Min: A B D G H I AE AK AL...			Max: A C D E F M AN		
291	0	-245.742	-2.295	-0.378103	0.233906	-2.980	11.111
		-251.450	-1.901	-0.891571	-0.239956	10.947	8.237
		Min: A C D H I AD AK AM			Max: A B D E F G L AL AN AO		
291	11.300	-281.785	-1.486	-2.403	-0.164502	-20.997	-13.090
		-275.293	-4.760	1.359	0.158452	15.894	-30.116
		Min: A B D G H I AG AL AM...			Max: A C D E F O AK AN		

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-270.249	4.218	-2.07E-09	6.24E-09	8.69E-09	-17.443
		-244.324	-2.938	-1.270	0.006050	7.966	17.838
		Min: AP AQ AS AU BJ CA CB			Max: AP AR AS AT AV BM BX...		
290	11.300	-267.021	-3.192	-1.044	0.006050	-5.104	-18.675
		-270.249	4.218	-2.07E-09	6.24E-09	-1.47E-08	30.222
		Min: AP AR AS AT AV BG BX...			Max: AP AQ AS AU BJ CA CB		
291	0	-244.798	0.761432	-1.270	-0.006050	7.966	-5.127
		-270.723	-6.395	-2.07E-09	-6.10E-09	8.66E-09	30.155
		Min: AP AR AS AT AV BG BY...			Max: AP AQ AS AU BJ BX CA...		
291	11.300	-270.723	-6.395	-2.07E-09	-6.10E-09	-1.47E-08	-42.111
		-267.495	1.015	-1.044	-0.006050	-5.104	6.786
		Min: AP AQ AS AU BJ BX CA...			Max: AP AR AS AT AV BM BY...		

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: Verificación fisuracion pila PS 313+500
Fecha: 7/5/01 10.18.11

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 88.6 cm Alto = 88.6 cm Canto útil = 83.85 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 24.54 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 42.11 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0033037
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 17.72 cm
Area de hormigón eficaz, Ac,eficaz = 1962.49 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 32.90 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 1708.9 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2187.0 Kp/cm2

RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 20.54 cm
Alargamiento medio de las fisuras, Esm = 0.000759679
Apertura de fisura, Wk = 0.265 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.265 mm
Apertura de fisura máxima, Wmax = 0.300 mm

4.2. Cálculo de la cimentación

ENVELOPE SPECIFIC.: DE 'COMBINACION CARACTERISTICA' ELS

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	2	1.500		PESO PAVIMENTO
C	OR	2	1.000		PESO PAVIMENTO
D	PL.PERM	3	1.000		PESO BARRERAS
E	PLUS	6	1.000		SOB UNIF 1
F	PLUS	7	1.000		SOB UNIF 2
G	PLUS	8	1.000		SOB UNIF 3
H	PLUS	9	1.000		SOB UNIF 4
I	PLUS	10	1.000		SOB UNIF 5
J	PLUS	11	1.000		VEHICULO HIPOTESIS 11
K	OR	12	1.000		VEHICULO HIPOTESIS 12
L	OR	13	1.000		VEHICULO HIPOTESIS 13
M	OR	14	1.000		VEHICULO HIPOTESIS 14
N	OR	15	1.000		VEHICULO HIPOTESIS 15
O	OR	16	1.000		VEHICULO HIPOTESIS 16
P	OR	17	1.000		VEHICULO HIPOTESIS 17
Q	OR	18	1.000		VEHICULO HIPOTESIS 18
R	OR	19	1.000		VEHICULO HIPOTESIS 19
S	OR	20	1.000		VEHICULO HIPOTESIS 20
T	OR	21	1.000		VEHICULO HIPOTESIS 21
U	OR	22	1.000		VEHICULO HIPOTESIS 22
V	OR	23	1.000		VEHICULO HIPOTESIS 23
W	OR	24	1.000		VEHICULO HIPOTESIS 24
X	OR	25	1.000		VEHICULO POSICION 25
Y	OR	26	1.000		VEHICULO POSICION 26
Z	OR	27	1.000		VEHICULO POSICION 27
AA	OR	28	1.000		VEHICULO POSICION 28
AB	OR	29	1.000		VEHICULO POSICION 29
AC	OR	30	1.000		VEHICULO POSICION 30
AD	OR	31	1.000		VEHICULO POSICION 31
AE	OR	32	1.000		VEHICULO POSICION 32
AF	OR	33	1.000		VEHICULO POSICION 33
AG	OR	34	1.000		VEHICULO POSICION 34
AH	OR	35	1.000		VEHICULO POSICION 35
AI	OR	36	1.000		VEHICULO POSICION 36
AJ	OR	37	1.000		VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000		FRENADO
AL	PLUS	63	0.300000		VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000		TEMPERATURA (-)
AN	OR	65	0.600000		TEMPERATURA (+)
AO	PLUS	66	0.600000		GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000		PESO PROPIO
AQ	PL.PERM	2	1.500		PESO PAVIMENTO
AR	OR	2	1.000		PESO PAVIMENTO
AS	PL.PERM	3	1.000		PESO BARRERAS
AT	PL.PERM	5	1.000		RETRACCION
AU	PLUS	6	1.000		SOB UNIF 1
AV	PLUS	7	1.000		SOB UNIF 2
AW	PLUS	8	1.000		SOB UNIF 3
AX	PLUS	9	1.000		SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOB
DP	PLUS	64	0.600000	TEMPERATURA (-)
[illegible]	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
EG	OR	17	1.000	VEHICULO HIPOTESIS 17
[illegible]	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
EZ	OR	36	1.000	VEHICULO POSICION 36
[illegible]	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

$\Delta G = 22,20$ t

ENVELOPE for < N > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy (LONG) [t]	Vz (TRANSV.) [t]	T [tm]	My (TRANSV) [tm]	Mz (LONG) [tm]
290	0	-352.818	-1.776	-2.94E-10	4.55E-09	1.87E-09	17.676
		-217.955	-1.790	-3.809	0.018150	23.899	13.128
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...			
290	11.300	-352.818	-1.776	-2.94E-10	4.55E-09	-1.46E-09	-2.395
		-217.955	-1.790	-3.131	0.018150	-15.312	-7.101
		Min: DS DT DV DW DX DY EM...		Max: CF CH CI CL DC DN DO...			
291	0	-353.767	-2.578	-2.83E-10	-4.27E-09	1.83E-09	7.747
		-218.904	-2.564	-3.809	-0.018150	23.899	12.295
		Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...			
291	11.300	-353.767	-2.578	-2.83E-10	-4.27E-09	-1.36E-09	-21.382
		-218.904	-2.564	-3.131	-0.018150	-15.312	-16.675
		Min: DS DT DV DW DY DZ EO...		Max: CF CH CI CJ CW DO DQ...			

ENVELOPE for < My > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-255.134	-4.528	-0.756206	-0.467812	-5.960	28.967
		-257.710	-0.710774	-3.053	0.485962	29.860	7.989
		Min: AP AR AS AT AX AY BX...		Max: A B D E F G P AK AL AN.			
290	11.300	-319.561	-5.870	-5.849	0.335055	-47.099	-23.592
		-313.056	4.731	2.718	-0.316905	31.787	31.618
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F M AN			
291	0	-256.082	0.173680	-0.756206	0.467812	-5.960	-3.544
		-258.658	-3.643	-3.053	-0.485962	29.860	17.434
		Min: AP AR AS AT AX AY BT...		Max: A B D E F G L AL AN AO			
291	11.300	-320.509	1.516	-5.849	-0.335055	-47.099	-0.184579
		-314.004	-9.085	2.718	0.316905	31.787	-55.395
		Min: AP AQ AS AT AW AX AY...		Max: A C D E F O AK AN			

ENVELOPE for < Mz > (and accomp. values) ""
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
290	0	-296.433	8.278	-5.92E-09	1.35E-08	2.40E-08	-35.850
		-253.068	-10.642	-3.809	0.018150	23.899	61.444
		Min: CF CG CI CK CZ DQ DR			Max: DS DU DV DW DX DZ EQ...		
290	11.300	-298.463	-11.149	-3.131	0.018150	-15.312	-65.423
		-296.433	8.278	-5.92E-09	1.35E-08	-4.29E-08	57.686
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
291	0	-254.016	6.288	-3.809	-0.018150	23.899	-36.021
		-297.381	-12.631	-5.90E-09	-1.33E-08	2.39E-08	61.273
		Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DN DQ...		
291	11.300	-297.381	-12.631	-5.90E-09	-1.33E-08	-4.28E-08	-81.462
		-299.411	6.795	-3.131	-0.018150	-15.312	41.646
		Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

ENVELOPE SPECIFIC.: DE 'COMBINACION CARACTERISTICA' REACCIONES

Group	Spec.	Loadcase	Factor Stage	Title
A	PERM.	1	1.000	PESO PROPIO
B	PL.PERM	2	1.500	PESO PAVIMENTO
C	OR	2	1.000	PESO PAVIMENTO
D	PL.PERM	3	1.000	PESO BARRERAS
E	PLUS	6	1.000	SOB UNIF 1
F	PLUS	7	1.000	SOB UNIF 2
G	PLUS	8	1.000	SOB UNIF 3
H	PLUS	9	1.000	SOB UNIF 4
I	PLUS	10	1.000	SOB UNIF 5
J	PLUS	11	1.000	VEHICULO HIPOTESIS 11
K	OR	12	1.000	VEHICULO HIPOTESIS 12
L	OR	13	1.000	VEHICULO HIPOTESIS 13
	OR	14	1.000	VEHICULO HIPOTESIS 14
N	OR	15	1.000	VEHICULO HIPOTESIS 15
O	OR	16	1.000	VEHICULO HIPOTESIS 16
P	OR	17	1.000	VEHICULO HIPOTESIS 17
Q	OR	18	1.000	VEHICULO HIPOTESIS 18
R	OR	19	1.000	VEHICULO HIPOTESIS 19
S	OR	20	1.000	VEHICULO HIPOTESIS 20
T	OR	21	1.000	VEHICULO HIPOTESIS 21
U	OR	22	1.000	VEHICULO HIPOTESIS 22
V	OR	23	1.000	VEHICULO HIPOTESIS 23
W	OR	24	1.000	VEHICULO HIPOTESIS 24
X	OR	25	1.000	VEHICULO POSICION 25
Y	OR	26	1.000	VEHICULO POSICION 26
Z	OR	27	1.000	VEHICULO POSICION 27
AA	OR	28	1.000	VEHICULO POSICION 28
AB	OR	29	1.000	VEHICULO POSICION 29
AC	OR	30	1.000	VEHICULO POSICION 30
AD	OR	31	1.000	VEHICULO POSICION 31
AE	OR	32	1.000	VEHICULO POSICION 32
	OR	33	1.000	VEHICULO POSICION 33
AG	OR	34	1.000	VEHICULO POSICION 34
AH	OR	35	1.000	VEHICULO POSICION 35
AI	OR	36	1.000	VEHICULO POSICION 36
AJ	OR	37	1.000	VEHICULO HIPOTESIS 37
AK	PLUS	60	1.000	FRENADO
AL	PLUS	63	0.300000	VIENTO TRANSV CON SOB
AM	PLUS	64	0.600000	TEMPERATURA (-)
AN	OR	65	0.600000	TEMPERATURA (+)
AO	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

AP	PERM.	1	1.000	PESO PROPIO
AQ	PL.PERM	2	1.500	PESO PAVIMENTO
AR	OR	2	1.000	PESO PAVIMENTO
AS	PL.PERM	3	1.000	PESO BARRERAS
AT	PL.PERM	5	1.000	RETRACCION
AU	PLUS	6	1.000	SOB UNIF 1
AV	PLUS	7	1.000	SOB UNIF 2
A	PLUS	8	1.000	SOB UNIF 3
AX	PLUS	9	1.000	SOB UNIF 4

AY	PLUS	10	1.000	SOB UNIF 5
AZ	PLUS	11	1.000	VEHICULO HIPOTESIS 11
BA	OR	12	1.000	VEHICULO HIPOTESIS 12
BB	OR	13	1.000	VEHICULO HIPOTESIS 13
BC	OR	14	1.000	VEHICULO HIPOTESIS 14
BD	OR	15	1.000	VEHICULO HIPOTESIS 15
BE	OR	16	1.000	VEHICULO HIPOTESIS 16
BF	OR	17	1.000	VEHICULO HIPOTESIS 17
BG	OR	18	1.000	VEHICULO HIPOTESIS 18
BH	OR	19	1.000	VEHICULO HIPOTESIS 19
BI	OR	20	1.000	VEHICULO HIPOTESIS 20
BJ	OR	21	1.000	VEHICULO HIPOTESIS 21
BK	OR	22	1.000	VEHICULO HIPOTESIS 22
BL	OR	23	1.000	VEHICULO HIPOTESIS 23
BM	OR	24	1.000	VEHICULO HIPOTESIS 24
BN	OR	25	1.000	VEHICULO POSICION 25
BO	OR	26	1.000	VEHICULO POSICION 26
BP	OR	27	1.000	VEHICULO POSICION 27
BQ	OR	28	1.000	VEHICULO POSICION 28
BR	OR	29	1.000	VEHICULO POSICION 29
BS	OR	30	1.000	VEHICULO POSICION 30
BT	OR	31	1.000	VEHICULO POSICION 31
BU	OR	32	1.000	VEHICULO POSICION 32
BV	OR	33	1.000	VEHICULO POSICION 33
BW	OR	34	1.000	VEHICULO POSICION 34
BX	OR	35	1.000	VEHICULO POSICION 35
BY	OR	36	1.000	VEHICULO POSICION 36
BZ	OR	37	1.000	VEHICULO HIPOTESIS 37
CA	PLUS	60	1.000	FRENADO
CB	PLUS	63	0.300000	VIENTO TRANSV CON SOB
CC	PLUS	64	0.600000	TEMPERATURA (-)
CD	OR	65	0.600000	TEMPERATURA (+)
CE	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

CF	PERM.	1	1.000	PESO PROPIO
CG	PL.PERM	2	1.500	PESO PAVIMENTO
CH	OR	2	1.000	PESO PAVIMENTO
CI	PL.PERM	3	1.000	PESO BARRERAS
CJ	PLUS	46	1.000	SOB UNIF VANO 1
CK	PLUS	47	1.000	SOB UNIF VANO 2
CL	PLUS	48	1.000	SOB UNIF VANO 3
CM	PLUS	11	1.000	VEHICULO HIPOTESIS 11
CN	OR	12	1.000	VEHICULO HIPOTESIS 12
CO	OR	13	1.000	VEHICULO HIPOTESIS 13
CP	OR	14	1.000	VEHICULO HIPOTESIS 14
CQ	OR	15	1.000	VEHICULO HIPOTESIS 15
CR	OR	16	1.000	VEHICULO HIPOTESIS 16
CS	OR	17	1.000	VEHICULO HIPOTESIS 17
CT	OR	18	1.000	VEHICULO HIPOTESIS 18
CU	OR	19	1.000	VEHICULO HIPOTESIS 19
CV	OR	20	1.000	VEHICULO HIPOTESIS 20
CW	OR	21	1.000	VEHICULO HIPOTESIS 21
CX	OR	22	1.000	VEHICULO HIPOTESIS 22
CY	OR	23	1.000	VEHICULO HIPOTESIS 23
CZ	OR	24	1.000	VEHICULO HIPOTESIS 24

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 4 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-297.4** Nk (KN) = -2914.5

Pie de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-319.6** Nk (KN) = -3132.1

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **81.5** Mk (KNm) = 798.3
Nk (t) = **-297.4** Nk (KN) = -2914.5

Pie de pórtico

Mk (tm) = **61.3** Mk (KNm) = 600.7
Nk (t) = **-319.6** Nk (KN) = -3132.1

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos del dintel :

Canto H (m): **0.00**
Ancho B(m): **0.00**
Long. L(m) : **0.00**
Mto. Inercia I (m^4) : 0.0000

Σ E * I / L dintel = 0.0000

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **11.30**
Mto. Inercia I (m^4) : 0.0491

Σ E * I / L soportes = 0.1241

Relación de rigideces $\Psi = (\Sigma E * I / L \text{ soportes}) / (\Sigma E * I / L \text{ dintel})$

Cabeza del pórtico $\Psi B = 0.00$

En el pie del pórtico $\Psi A = 0.00$

Para pórticos traslacionales se obtiene : $\alpha = ((7,5+4*(\Psi A + \Psi B)+1,6*\Psi A *\Psi B) / (7,5+(\Psi A+\Psi B)))^{0,5}$

$\alpha = 1.000$

Longitud transversal de pandeo : Lo (m) = 11.30

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **45.20** $35 < \lambda <$ **100** Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0,12\,\beta)(\varepsilon y+\varepsilon)\frac{(h+20e_e)}{(h+10ee)}\frac{Lo^2}{50\,ic}$$

e_e = 0.000 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.274 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 11.30

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :
e_a = 0.079

e_{tot} (m) = 0.079

Pie de pórtico

Mk (tm) = 25.31
Nk (t) = -319.60

Mk (KNm) = 248.1
Nk (KN) = -3132.1

Solicitaciones de cálculo longitudinales :
e_a = 0.137

e_{tot} (m) = 0.411

Pie de pórtico

Mk (tm) = 131.40
Nk (t) = -319.60

Mk (KNm) = 1287.7
Nk (KN) = -3132.1

Comprobación de punzonamiento
Articulo 46 EHE

Dimensiones del soporte

Ancho (m)	0.89
Canto (m)	1.20
Canto útil (m)	1.15

u1 (m)	18.64

Losa sin armadura de punzonamiento

Nd (t)	523.30
β	1.15
Fsd,ef	601.80
τsd (t/m2)	***28.07***

ξ	1.417
ϕ (pm)	25
nº (pm)	5.71428
As (cm2)	28.05
ρ	2.439E-03
fck (Mpa)	25
τrd (MPa)	0.311
τrd (t/m2)	***31.07***

τsd (t/m2)	***< τrd (t/m2)***

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
	6.527	-2.803	319.332	8.315	22.823	0.335055
	Min: A C D E F O AK AM			Max: AP AQ AS AT AW AX AY...		

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]
6	-0.145770	-3.539	34.296			
	0.547958	1.277	52.991			
	Min: DS DT DV DW DY DZ EZ...			Max: CF CH CI CJ DF DO DQ...		
10	1.064	-3.540	30.941			
	0.370101	1.275	49.804			
	Min: DS DT DV DW DY DZ EH...			Max: CF CH CI CJ CN DQ DR		
156	0.547988	-2.098	53.357			
	-0.145741	2.718	34.661			
	Min: CF CH CI CL DL DN DO...			Max: DS DT DV DW DX DY ET...		
160	0.370071	-2.096	50.170			
	1.064	2.720	31.306			
	Min: CF CH CI CL CT DN DQ...			Max: DS DT DV DW DX DY EB...		
166	3.809	-11.149	298.463	60.563	23.899	-0.018150
	5.92E-09	8.278	296.433	-35.850	2.40E-08	-1.35E-08
	Min: DS DU DV DW DX DZ EK...			Max: CF CG CI CK CZ DQ DR		
167	5.90E-09	-12.631	297.381	61.273	2.39E-08	1.33E-08
	3.809	6.795	299.411	-35.140	23.899	0.018150
	Min: CF CG CI CK CZ DN DQ...			Max: DS DU DV DW DX DZ EQ...		

DA	OR	25	1.000	VEHICULO POSICION 25
DB	OR	26	1.000	VEHICULO POSICION 26
DC	OR	27	1.000	VEHICULO POSICION 27
DD	OR	28	1.000	VEHICULO POSICION 28
DE	OR	29	1.000	VEHICULO POSICION 29
DF	OR	30	1.000	VEHICULO POSICION 30
DG	OR	31	1.000	VEHICULO POSICION 31
DH	OR	32	1.000	VEHICULO POSICION 32
DI	OR	33	1.000	VEHICULO POSICION 33
DJ	OR	34	1.000	VEHICULO POSICION 34
DK	OR	35	1.000	VEHICULO POSICION 35
DL	OR	36	1.000	VEHICULO POSICION 36
DM	OR	37	1.000	VEHICULO HIPOTESIS 37
DN	PLUS	60	1.000	FRENADO
DO	PLUS	63	0.300000	VIENTO TRANSV CON SOB
[illegible]	PLUS	64	0.600000	TEMPERATURA (-)
[illegible]	OR	65	0.600000	TEMPERATURA (+)
DR	PLUS	66	0.600000	GRADIENTE

ALTERNATIVE ENVELOPE :

DS	PERM.	1	1.000	PESO PROPIO
DT	PL.PERM	2	1.500	PESO PAVIMENTO
DU	OR	2	1.000	PESO PAVIMENTO
DV	PL.PERM	3	1.000	PESO BARRERAS
DW	PL.PERM	5	1.000	RETRACCION
DX	PLUS	46	1.000	SOB UNIF VANO 1
DY	PLUS	47	1.000	SOB UNIF VANO 2
DZ	PLUS	48	1.000	SOB UNIF VANO 3
EA	PLUS	11	1.000	VEHICULO HIPOTESIS 11
EB	OR	12	1.000	VEHICULO HIPOTESIS 12
EC	OR	13	1.000	VEHICULO HIPOTESIS 13
ED	OR	14	1.000	VEHICULO HIPOTESIS 14
EE	OR	15	1.000	VEHICULO HIPOTESIS 15
EF	OR	16	1.000	VEHICULO HIPOTESIS 16
[illegible]	OR	17	1.000	VEHICULO HIPOTESIS 17
[illegible]	OR	18	1.000	VEHICULO HIPOTESIS 18
EI	OR	19	1.000	VEHICULO HIPOTESIS 19
EJ	OR	20	1.000	VEHICULO HIPOTESIS 20
EK	OR	21	1.000	VEHICULO HIPOTESIS 21
EL	OR	22	1.000	VEHICULO HIPOTESIS 22
EM	OR	23	1.000	VEHICULO HIPOTESIS 23
EN	OR	24	1.000	VEHICULO HIPOTESIS 24
EO	OR	25	1.000	VEHICULO POSICION 25
EP	OR	26	1.000	VEHICULO POSICION 26
EQ	OR	27	1.000	VEHICULO POSICION 27
ER	OR	28	1.000	VEHICULO POSICION 28
ES	OR	29	1.000	VEHICULO POSICION 29
ET	OR	30	1.000	VEHICULO POSICION 30
EU	OR	31	1.000	VEHICULO POSICION 31
EV	OR	32	1.000	VEHICULO POSICION 32
EW	OR	33	1.000	VEHICULO POSICION 33
EX	OR	34	1.000	VEHICULO POSICION 34
EY	OR	35	1.000	VEHICULO POSICION 35
[illegible]	OR	36	1.000	VEHICULO POSICION 36
[illegible]	OR	37	1.000	VEHICULO HIPOTESIS 37
FB	PLUS	60	1.000	FRENADO

FC	PLUS	63	0.300000	VIENTO TRANSV CON SOB
FD	PLUS	64	0.600000	TEMPERATURA (-)
FE	OR	65	0.600000	TEMPERATURA (+)
FF	PLUS	66	0.600000	GRADIENTE

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.098	-3.385	19.890				
	1.484	1.137	100.455				
	Min: AP AR AS AT AX AY BU...						Max: A B D E F G J AL AN AO
10	2.016	-3.387	16.535				
	-0.565750	1.136	97.268				
	Min: AP AR AS AT AU AV BC...						Max: A B D G H I AB AN AO
156	-1.098	2.564	20.256				
	1.484	-1.958	100.821				
	Min: AP AR AS AT AX AY BW...						Max: A B D E F G R AK AL AN.
160	2.016	2.566	16.901				
	-0.565780	-1.956	97.634				
	Min: AP AR AS AT AU AV BE...						Max: A B D G H I AJ AK AN...
166	3.809	-1.790	217.955	13.128	23.899	-0.018150	
	2.94E-10	-1.776	352.818	17.676	1.87E-09	-4.55E-09	
	Min: CF CH CI CL DC DN DO...						Max: DS DT DV DW DX DY EM...
167	3.809	-2.564	218.904	12.295	23.899	0.018150	
	2.83E-10	-2.578	353.767	7.747	1.83E-09	4.27E-09	
	Min: CF CH CI CJ CW DO DQ...						Max: DS DT DV DW DY DZ EO...

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

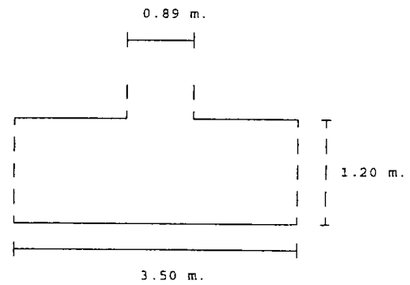
Node	FX [t]	FY [t]	FZ [t]	MX [tm]	MY [tm]	MZ [tm]	
6	-1.099	-3.384	26.517				
	2.016	1.005	60.759				
	Min: AP AQ AS AT AW AX AY...						Max: A C D E F M AL AN
10	-1.098	1.003	57.572				
	2.017	-3.386	23.162				
	Min: A C D H I AE AN						Max: AP AQ AS AT AU AV AW...
156	-1.099	2.564	26.883				
	2.016	-1.825	61.124				
	Min: AP AQ AS AT AW AX AY...						Max: A C D E F O AK AL AN
160	-1.098	-1.824	57.937				
	2.017	2.565	23.527				
	Min: A C D H I AG AK AN						Max: AP AQ AS AT AU AV AW...
166	-2.718	-2.478	315.021	20.940	1.077	0.316905	
	6.527	1.339	317.596	-0.037189	22.823	-0.335055	
	Min: AP AR AS AT AU AV BC...						Max: A B D G H I AE AK AL...
167	-2.718	-4.765	315.182	21.628	1.077	-0.316905	

ructura .....:Cami de les Codines

Pila Nº : 1

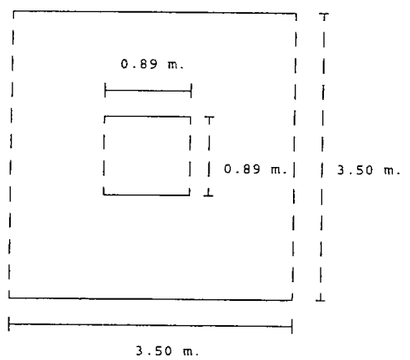
©DIBUJO

* dibujo sin escala



ALZADO

Dirección del eje del tablero



PLANTA

CARACTERISTICAS DE LOS MATERIALES Y CIMENTACION

Fck (Kg/cm²) ..... 250 rcd ... 1.50

Fyk (Kg/cm²) ..... 5100 ryd ... 1.15

Recubrimiento de armaduras ..... 4.0 cms

Tensión admisible del terreno ..... 5.00 Kg/cm²

Coeficiente de rozamiento en cimentación ... 0.55

Coeficiente de seguridad al deslizamiento... 1.50

Coeficiente de seguridad al vuelco 1.50

©ESFUERZOS CONSIDERADOS

* Longitudinal y transversal según la dirección del eje del tablero
* Esfuerzos en t y m.t

Hipótesis	Axil	F.Long	F.Trans	M.Long	M.Trans	rf
1	240.20	1.80	3.81	38.86	52.41	1.50
2	379.30	2.60	0.00	64.35	29.78	1.50
3	336.30	3.64	3.05	102.95	74.08	1.50
4	319.60	12.63	0.00	131.40	25.31	1.50

RESULTADOS DE CALCULO

©Tensiones sobre el Terreno en Kg/cm² y coeficientes de seguridad

Hipótesis	σ1	σ2	σ3	σ4	σcob	Cd	Cv
1	3.63	2.04	2.48	0.89	2.80	39.98	8.51
2	4.76	3.92	2.87	2.04	3.90	88.01	10.79
3	5.64	3.46	2.63	0.46	4.14	56.37	6.08
4	5.31	4.61	1.21	0.50	3.96	15.52	4.26

Tensión cobaricéntrica Máxima 4.14 Kg/cm² para la Hipótesis 3

©Esfuerzos de cálculo

* Esfuerzos en m.t/m y t/m Armaduras en cm²/m

Recubrimiento de armaduras= 4.0 cms

Uc= 1933 t/m

Vcu long..= 149.76 t/m
Vcu trans.= 149.76 t/m

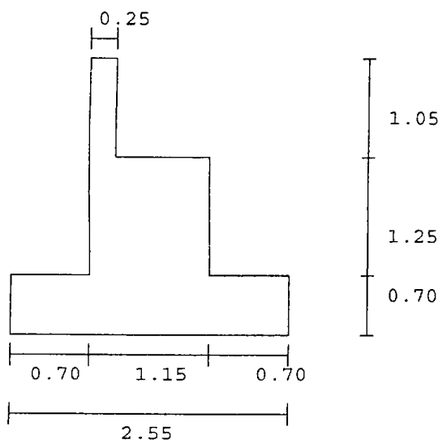
Hipótesis	M.long	M.trans	Ar.long	Ar.trans	Vd long.	Vd Trans.
1	49.37	48.42	9.70	9.52	1.72	1.72
2	65.28	67.53	12.88	13.33	2.43	2.42
3	76.55	78.32	15.14	15.50	2.97	2.96
4	69.22	76.46	13.67	15.12	2.79	2.74

Estructura ....: Cami de les Codines

Estribo .....:E-1 y E-2

DATOS GEOMETRICOS (sin escala)

* Cotas en mtrs.



Area de la sección 3.49 m²

MATERIALES

Hormigón en zapata y alzado ..... 250 Kg/cm²

Coeficiente de seguridad del hormigón 1.50

Acero en armaduras, zapata y alzado ..... 5100 Kg/cm²

Coeficiente de seguridad del acero 1.15

CARACTERISTICAS DEL TERRENO

Densidad de las tierras (t/m3) 2.00

Coeficiente de empuje activo horizontal 0.33

Tensión admisible del terreno en cimentación (Kg/cm²) 2.5

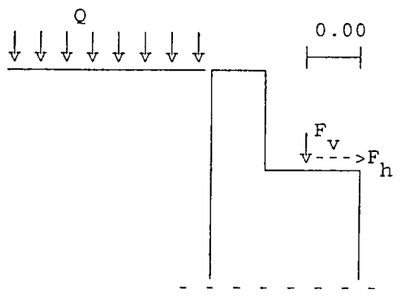
Coeficiente de rozamiento en cota de cimentación 0.55

Coeficiente de seguridad al deslizamiento (Cd) 1.50

Coeficiente de seguridad al vuelco (Cv) 1.80

Altura considerada de empuje de tierras (mtrs.) 3.00

CARGAS ACTUANTES



Reacciones Verticales (Fv t/m)

Cargas Permanentes : 9.95

Sobrecargas Máximas: 12.55
Sobrecargas Mínimas: 0.00
Sobrecarga q (t/m²): 1.00

Reacciones Horizontales (Fh t/m)

Reológicas : 0.38
Temperatura : 0.47
Frenado : 0.40

COMBINACIONES

A) 1.35*(Peso Propio)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

B) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)

C) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Máximas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

D) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Mínimas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

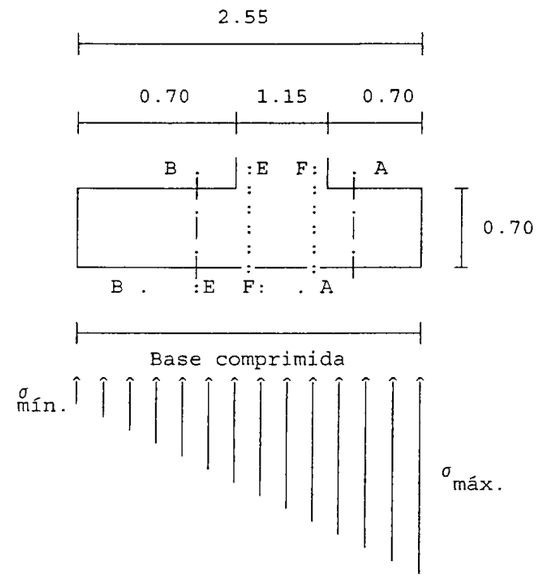
ESFUERZOS DE COMBINACIONES

Combinación	Fv(t/m)	Fh(t/m)	Q(t/m²)
A	0.00 0.00	0.00 0.00	1.00 1.25
B	9.95 13.43	0.85 1.22	1.00 1.50
C	22.50 32.26	1.25 1.31	1.00 1.50
D	9.95 13.43	1.25 1.82	1.00 1.50

COMPROBACION DE ESTABILIDAD:

Hipótesis	ΣFv(t/m)	ΣFh(t/m)	Cd	ΣMe(mt/m)	ΣMv(mt/m)	Cv
A	12.63	3.96	1.75	20.03	4.46	4.50
B	22.58	4.81	2.58	26.99	6.11	4.42
C	35.13	5.21	3.71	35.78	6.89	5.19
D	22.58	5.21	2.38	26.99	6.89	3.92

TENSIONES EN CIMIENTOS



COMPROBACION DE TENSIONES:

Hipótesis	σmáx. (t/m²)	σmín. (t/m²)	σcob. (t/m²)	Base comprimida
A	5.45	4.46	5.12	2.55
B	16.16	1.55	12.21	2.55
C	28.49	0.00	21.37	2.47
D	16.88	0.84	12.69	2.55

ARMADURAS:

ZAPATA

CORTANTE: fcv= 64.55 t/m² (EH-91)

Sección A-A | d = 0.56 m.
Vcu= 72.62 t/m (EH-91)

Sección B-B | d = 0.56 m.
Vcu= 72.62 t/m (EH-91)

FLEXION: | d = 0.65 m.
Uc = 921 t/m

ZAPATA DELANTERA:

Hipót.	Vd(A-A) (t/m)	Vcu t/m (EHE)	Md(F-F) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	2.08	17.63	2.07	3.18	8.31	2.53
B	7.05	17.63	6.82	10.56	8.31	2.53
C	13.08	17.63	12.63	19.64	8.31	2.53
D	7.39	17.63	7.14	11.05	8.31	2.53

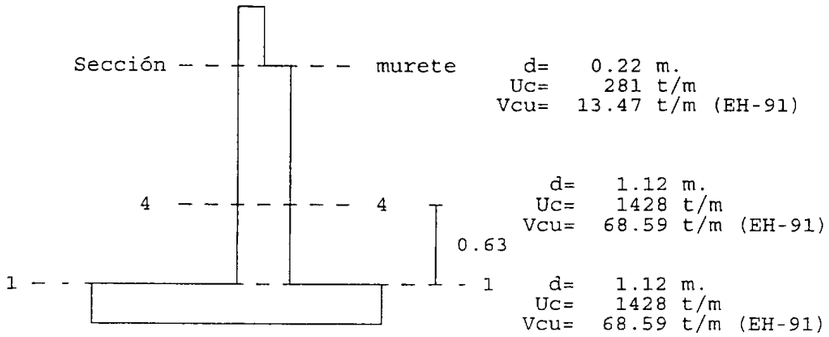
ZAPATA TRASERA:

Hipót.	Vd(B-B) (t/m)	Vcu t/m (EHE)	Md(E-E) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	-1.91	17.63	-1.77	2.73	8.31	2.53
B	-2.97	17.63	-2.56	3.95	8.31	2.53
C	-3.41	17.63	-2.70	4.17	8.31	2.53
D	-3.32	17.63	-2.88	4.44	8.31	2.53

φ16/20

ALZADO

fcv= 61.24 t/m²



SECCION 1-1:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	3.57	27.92	5.74	2.70	2.41	12.88	18.40
B	4.98	29.88	19.17	12.16	10.90	12.88	18.40
C	5.06	32.63	38.00	23.10	20.77	12.88	18.40
D	5.58	29.88	19.17	12.91	11.58	12.88	18.40

φ20/20

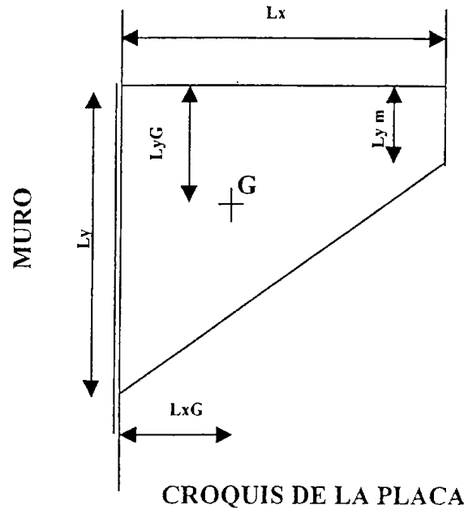
SECCION 4-4:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	2.08	27.56	3.31	0.96	0.85	12.88	18.40
B	3.44	29.53	16.74	9.56	8.56	12.88	18.40
C	3.52	32.28	35.57	20.43	18.36	12.88	18.40
D	4.04	29.53	16.74	9.93	8.89	12.88	18.40

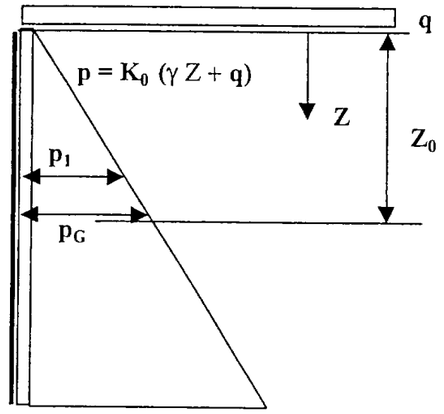
SECCION MURETE:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm^2/m)	Reparto (cm^2/m)
A	0.98	7.23	0.89	0.42	1.91	2.53	4.00
B	1.07	7.23	0.89	0.46	2.12	2.53	4.00
C	1.07	7.23	0.89	0.46	2.12	2.53	4.00
D	1.07	7.23	0.89	0.46	2.12	2.53	4.00

ALETAS MURO DE ESTRIBOS



CROQUIS DE LA PLACA



PRESIONES SOBRE LA PLACA

1, DATOS

GEOMETRIA

Ly_m =	0.500 m
L_Y =	2.600 m
L_X =	2.100 m
L_{YG} =	0.894 m
L_{XG} =	0.813 m
h =	0.300 m
r =	0.035 m
d_x =	0.265 m
d_y =	0.245 m
b = b_w =	1.000 m

EMPUJES

q =	1.80 tm^{-2}
γ =	2.00 tm^{-3}
Φ =	33 º
K_0 =	0.5
$p_1 = K_0 ((L_{y\,m}) \gamma + q)$ =	1.4 tm^{-2}
$p_G = K_0 ((L_{yG})^* \gamma + q)$ =	1.8 tm^{-2}
γ_f =	1.5

MATERIALES

H-30

f_{ck} =	3000 tm^{-2}
γ_c =	1.5
f_{cd} =	2000 tm^{-2}
f_{cv} =	70.7 tm^{-2}

BS500

f_{yk} =	51000 tm^{-2}
γ_y =	1.15
f_{yd} =	44348 tm^{-2}
$f_{y\alpha d}$ =	42000 tm^{-2}

2. DETERMINACIÓN DE LAS SOLICITACIO

$M_{xGd} = \gamma_f \times A \times p_G \times L_{xG} / L_y$ = 2.7

$M_{x1d} = \gamma_f \times p_1 \times L_x^{\,2} / 2$ = 4.6

$V_{xd} = \gamma_f \times A \times p_G / L_y$ = 3.4

3. DIMENSIONAMIENTO

3,1, FLEXIÓN

ARMADURAS MÍNIMAS :

DIRECCIÓN X : $A_{s\,total} = 1{,}6 / 1000 \times h \times b$ =
$A_{s\,min\,c/cara} = 0{,}53 / 1000 \times h$ ›

DIRECCIÓN Y : $A_{s\,total} = 0{,}9 / 1000 \times h \times b$ =
$A_{s\,min\,c/cara} = 0{,}3 / 1000 \times h$ x

DIRECCIÓN X $U_{cx} = 0.85 \times f_{cd} \times d_x \times b$ =
CARA INTERIOR (TIERRAS)

M_d = 4.6
$U_{s1} = U_c \times (1 - (1 - 2 \times M_d /$
$A_{s1} = U_{s1} / f_{yd}$ =

3.2. CORTANTE

DIRECCIÓN X :

$V_{u1x} = 0{,}30 \times b_w \times d_x f_{cd}$ = 159 t

$Vcu = (0.12\ \xi\ (100\ \rho l\ fck)^{1/3})\ bo\ d$ = 12.4

Vd_x = 3.4 t

$Vd_x < V_{u1x}$
$Vd_x < V_{cux}$ No requiere armaduras de cortante

Prueba de carga de la Estructura E-14

OBJETO DE LA PRUEBA

El objeto de esta prueba consiste en comprobar que la estructura en estudio presenta un comportamiento satisfactorio frente a las sobrecargas de cálculo. Dichas sobrecargas son las definidas en la "Instrucción sobre las acciones a considerar en el Proyecto de Puentes de Carreteras: I.A.P.", dada por Orden Ministerial del 12 de Febrero de 1998.

El tren tipo, definido en dicha Instrucción, ha sido sustituido por camiones, cuyas características se indican mas adelante, que, de acuerdo con las "Recomendaciones para el Proyecto y Ejecución de Pruebas de Carga en Puentes de Carretera" del M.O.P.U., originen esfuerzos "**no mas desfavorables que los del tren de cargas de la Instrucción, estimándose como suficientes si tales esfuerzos oscilan en torno al 60 % de los valores teóricos producidos por el tren de carga de la IAP" (Artículo 6.1 de las Recomendaciones).**

DESCRIPCIÓN DEL ENSAYO Y PLAN DE CARGAS

La estructura a ensayar consiste en un tablero continuo tipo losa maciza, con tres vanos de 13.00m – 17.00 m – 13.00 m , con un ancho total de 7.70 m, y un ancho de plataforma de 6.00 m.

El tablero está formado por una losa maciza de hormigón armado de canto constante 0.90 m y un ancho total de 7.70 m, medidos perpendiculares al eje de replanteo de la estructura. El apoyo de la losa sobre los estribos, se realiza mediante dos aparatos de neopreno, y sobre las pilas se empotra el tablero.

El estudio de los momentos máximos flectores positivos se va a realizar en las situaciones siguientes:

El estudio de los momentos flectores positivos vano 1 en el estado de carga 1.

El estudio de los momentos flectores positivos vano 2 en el estado de carga 2.

Los camiones adoptados corresponden a un vehículo con una carga total de 25.0 toneladas, correspondiendo 7.0 t. al eje delantero y 9 t. a cada uno de los dos ejes traseros, siendo las dimensiones del vehículo:

Ancho total . . . . . 2,50 m.

Ancho de la vía anterior. . . . . .2.00 m.

Ancho de las vías posteriores . . . . 2.00 m.

Longitud total. . . . . 8.40 m.

Voladizo posterior. . . . . 1.85 m.

Distancia eje 1° al 2°. . . . . 3,80 m.

Distancia eje 2° al 3°. . . . . 1,35 m.

La disposición de los vehículos durante la realización de la prueba de carga será la siguiente:

Para obtener el máximo momento flector positivo en el vano 1 se colocarán 2 filas de dos camiones en paralelo (cuatro camiones en total situados en el centro del vano 1.

Para obtener el máximo momento flector positivo en el vano 2 se colocarán 2 filas de dos camiones en paralelo (cuatro camiones en total), situados en el centro del vano 2.

El Plan de Carga constará de dos estados de carga, compuestos de los siguientes escalones de carga:

Estado de carga nº 1:

Escalón - 0 : Puente descargado

Escalón - 1 : Carga de la primera fila de camiones en vano 1

Escalón - 2 : Carga de la segunda fila de camiones (máxima flexión positiva en centro de vano)

Estado de carga nº 2:

Escalón - 3 : Paso del primer escalón a la posición sobre el vano 2.

Escalón - 4 : Paso del segundo escalón a la posición sobre el vano 2.(máxima flexión positiva)

Estado de carga nº 3:

Escalón - 7 : Descarga del primer escalón

Escalón - 8 : Descarga del segundo escalón

Escalón - 9 : Puente descargado

Cumpliendo este plan de carga, no se pasará al escalón siguiente hasta que los aparatos de medida no acusen la estabilización de las lecturas, lo que se supondrá ha ocurrido cuando la diferencia entre dos lecturas efectuadas en un intervalo no inferior a 10 minutos, sea inferior al 5% de la flecha correspondiente a la última lectura.

MEDIDAS A REALIZAR

Se determinarán, mediante el uso de flexímetros si el tráfico inferior lo permite, o bien nivelación de alta precisión en caso contrario, los descensos producidos en los apoyos de la losa sobre estribos, pilas y en la sección central de cada vano. El número de unidades de medida será catorce (14), cuatro (4) para los apoyos de los estribos, cuatro (4) para los apoyos en las pilas y seis (6) en el centro de vano

La media de los valores medidos en los apoyos se restará al valor obtenido en las secciones centrales, para determinar la flecha de la losa. Se registrarán en cada escalón todos los valores obtenidos.

Durante la ejecución de las pruebas se medirá la temperatura ambiente en la zona del puente. Deberán elegirse las horas adecuadas para que las condiciones climatológicas perturben lo menos posible el comportamiento de la estructura.

CONCLUSIONES

Estado de carga nº 1:

Máxima flexión positiva en el centro del vano 1 :

Los máximos momentos flectores positivos de sobrecargas, en mT, previstos en el cálculo del tablero, para las secciones más cargadas del centro de vano 1 son:

Barras	S.Unif.+ Carro	Prueba de carga	Porcentaje
70	183.46	109.67	60 %

Las flechas que se esperan para este estado de carga son las siguientes:

Punto de la sección central vano 1	2.03 mm.
Punto de la sección central vano 2	-0.63 mm.
Punto de la sección central vano 3	0.10 mm.

Estado de carga nº 2

Máxima flexión positiva en el centro del vano 2 :

Los máximos momentos flectores positivos de sobrecargas, en mT, previstos en el cálculo del tablero, para las secciones más cargadas del vano 2 son:

Barras	S.Unif.+ Carro	Prueba de carga	Porcentaje
80	199.67	117.406	59 %

Las flechas que se esperan para este estado de carga son las siguientes:

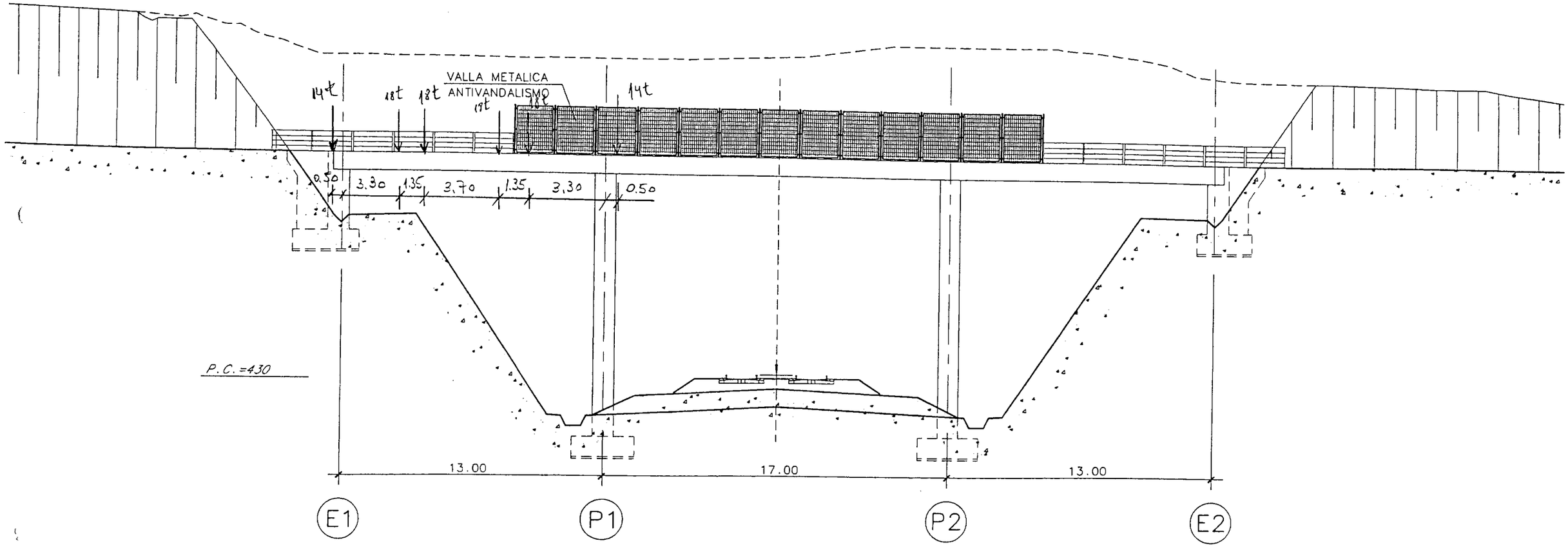
Punto de la sección central vano 1	-0.81 mm.
Punto de la sección central vano 2	3.60 mm.
Punto de la sección central vano 3	-0.81 mm.

En todas ellas, se considera positivo el movimiento descendente y negativo el ascendente. Estas flechas corresponden a la deformación de la estructura sin incluir la correspondiente al descenso de apoyos, por lo que, en el ensayo, se obtendrán deduciendo del valor medido en la sección central el correspondiente a la media de registros efectuados en las proximidades de los apoyos, y que representa el descenso de los mismos.

El módulo de elasticidad supuesto para el cálculo de las flechas ha sido:$\mathbf{E = 3{,}55 \cdot 10^6\ T/m^2}$. por lo que las flechas indicadas deberán modificarse con la relación entre este módulo supuesto y el correspondiente al hormigón realmente colocado en obra, el cual, podrá evaluarse a partir de las indicaciones dadas en el art 39.6 dela EH

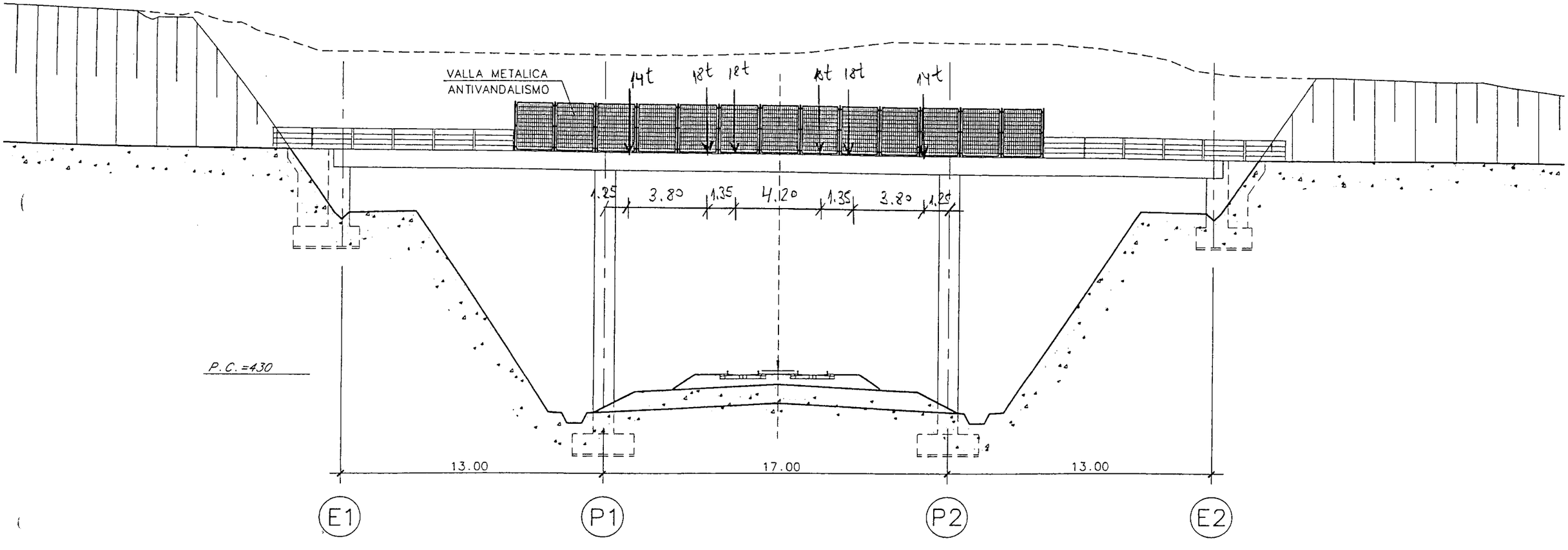
Esquemas

ESTADO DE CARGA 1



ALZADO
ESCALA 1:200

ESTADO DE CARGA 2



ALZADO
ESCALA 1:200

Listados de ordenador

LOADING: 'Y'
Loadcase Factor Stage Init.def Title
70 1.0000 prueba de carga 1

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-1.08E-12	0	-14.000	0	-7.00E-08	0
65	0.500	-1.08E-12	0	-14.000	0	-7.000	0
66	0	-0.221654	0	30.917	0	-7.000	0
66	1.300	-0.221654	0	30.917	0	33.192	0
67	0	-0.221654	0	30.917	0	33.192	0
67	1.300	-0.221654	0	30.917	0	73.383	0
68	0	-0.221654	0	30.917	0	73.383	0
68	0.700	-0.221654	0	30.917	0	95.021	0
68	0.700	-0.221654	0	12.917	0	95.027	0
68	1.300	-0.221654	0	12.917	0	102.775	0
69	0	-0.221654	0	12.917	0	102.775	0
69	0.750	-0.221654	0	12.917	0	112.461	0
69	0.750	-0.221654	0	-5.083	0	112.462	0
69	1.300	-0.221654	0	-5.083	0	109.667	0
70	0	-0.221654	0	-5.083	0	109.667	0
70	1.300	-0.221654	0	-5.083	0	103.058	0
71	0	-0.221654	0	-5.083	0	103.058	0
71	1.300	-0.221654	0	-5.083	0	96.450	0
72	0	-0.221654	0	-5.083	0	96.450	0
72	0.550	-0.221654	0	-5.083	0	93.655	0
72	0.550	-0.221654	0	-23.083	0	93.651	0
72	1.300	-0.221654	0	-23.083	0	76.341	0
73	0	-0.221654	0	-23.083	0	76.341	0
73	0.600	-0.221654	0	-23.083	0	62.494	0
73	0.600	-0.221654	0	-41.083	0	62.486	0
73	1.300	-0.221654	0	-41.083	0	33.733	0
74	0	-0.221654	0	-41.083	0	33.733	0
74	1.300	-0.221654	0	-41.083	0	-19.675	0
75	0	-0.221654	0	-41.083	0	-19.675	0
75	1.300	-0.221654	0	-41.083	0	-73.084	0
76	0	0.974456	0	18.139	0	-61.502	0
76	0.500	0.974456	0	18.139	0	-52.435	0
76	0.500	0.974456	0	4.139	0	-52.432	0
76	1.700	0.974456	0	4.139	0	-47.465	0

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
77	0	0.974456	0	4.139	0	-47.465	0
77	1.700	0.974456	0	4.139	0	-40.429	0
78	0	0.974456	0	4.139	0	-40.429	0
78	1.700	0.974456	0	4.139	0	-33.392	0
79	0	0.974456	0	4.139	0	-33.392	0
79	1.700	0.974456	0	4.139	0	-26.356	0
80	0	0.974456	0	4.139	0	-26.356	0
80	1.700	0.974456	0	4.139	0	-19.319	0
81	0	0.974456	0	4.139	0	-19.319	0
81	1.700	0.974456	0	4.139	0	-12.283	0
82	0	0.974456	0	4.139	0	-12.283	0
82	1.700	0.974456	0	4.139	0	-5.247	0
83	0	0.974456	0	4.139	0	-5.247	0
83	1.700	0.974456	0	4.139	0	1.790	0
84	0	0.974456	0	4.139	0	1.790	0
84	1.700	0.974456	0	4.139	0	8.826	0
85	0	0.974456	0	4.139	0	8.826	0
85	1.700	0.974456	0	4.139	0	15.863	0
86	0	0.221233	0	-0.791433	0	10.289	0
86	1.300	0.221233	0	-0.791433	0	9.260	0
87	0	0.221233	0	-0.791433	0	9.260	0
87	1.300	0.221233	0	-0.791433	0	8.231	0
88	0	0.221233	0	-0.791433	0	8.231	0
88	1.300	0.221233	0	-0.791433	0	7.202	0
89	0	0.221233	0	-0.791433	0	7.202	0
89	1.300	0.221233	0	-0.791433	0	6.173	0
90	0	0.221233	0	-0.791433	0	6.173	0
90	1.300	0.221233	0	-0.791433	0	5.144	0
91	0	0.221233	0	-0.791433	0	5.144	0
91	1.300	0.221233	0	-0.791433	0	4.115	0
92	0	0.221233	0	-0.791433	0	4.115	0
92	1.300	0.221233	0	-0.791433	0	3.087	0
93	0	0.221233	0	-0.791433	0	3.087	0
93	1.300	0.221233	0	-0.791433	0	2.058	0

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
94	0	0.221233	0	-0.791433	0	2.058	0
94	1.300	0.221233	0	-0.791433	0	1.029	0
95	0	0.221233	0	-0.791433	0	1.029	0
95	1.300	0.221233	0	-0.791433	0	1.03E-08	0
96	0	1.20E-12	0	3.24E-14	0	-4.26E-14	0
96	0.500	1.20E-12	0	3.24E-14	0	-2.64E-14	0
290	0	-59.222	-1.196	0	0	0	4.207
290	13.200	-59.222	-1.196	0	0	0	-11.582
291	0	4.931	0.753222	0	0	0	-4.368
291	13.200	4.931	0.753222	0	0	0	5.574
	min:	-59.222	-1.196	-41.083	0	-73.084	-11.582
	max:	4.931	0.753222	30.917	0	112.462	5.574

Loadcase Factor Stage Init.def Title
71 1.0000 prueba de carga 2

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-5.76E-16	0	2.08E-13	0	-6.69E-14	0
65	0.500	-5.76E-16	0	2.08E-13	0	3.70E-14	0
66	0	-0.000904	0	-6.559	0	-8.53E-08	0
66	1.300	-0.000904	0	-6.559	0	-8.527	0
67	0	-0.000904	0	-6.559	0	-8.527	0
67	1.300	-0.000904	0	-6.559	0	-17.053	0
68	0	-0.000904	0	-6.559	0	-17.053	0
68	1.300	-0.000904	0	-6.559	0	-25.580	0
69	0	-0.000904	0	-6.559	0	-25.580	0
69	1.300	-0.000904	0	-6.559	0	-34.106	0
70	0	-0.000904	0	-6.559	0	-34.106	0
70	1.300	-0.000904	0	-6.559	0	-42.633	0
71	0	-0.000904	0	-6.559	0	-42.633	0
71	1.300	-0.000904	0	-6.559	0	-51.160	0

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
72	0	-0.000904	0	-6.559	0	-51.160	0
72	1.300	-0.000904	0	-6.559	0	-59.686	0
73	0	-0.000904	0	-6.559	0	-59.686	0
73	1.300	-0.000904	0	-6.559	0	-68.213	0
74	0	-0.000904	0	-6.559	0	-68.213	0
74	1.300	-0.000904	0	-6.559	0	-76.740	0
75	0	-0.000904	0	-6.559	0	-76.740	0
75	1.300	-0.000904	0	-6.559	0	-85.266	0
76	0	-2.308	0	49.820	0	-105.568	0
76	1.250	-2.308	0	49.820	0	-43.301	0
76	1.250	-2.308	0	35.820	0	-43.286	0
76	1.700	-2.308	0	35.820	0	-27.173	0
77	0	-2.308	0	35.820	0	-27.173	0
77	1.700	-2.308	0	35.820	0	33.722	0
78	0	-2.308	0	35.820	0	33.722	0
78	1.650	-2.308	0	35.820	0	92.819	0
78	1.650	-2.308	0	17.820	0	92.828	0
78	1.700	-2.308	0	17.820	0	93.716	0
79	0	-2.308	0	17.820	0	93.716	0
79	1.350	-2.308	0	17.820	0	117.771	0
79	1.350	-2.308	0	-0.179549	0	117.774	0
79	1.700	-2.308	0	-0.179549	0	117.711	0
80	0	-2.308	0	-0.179549	0	117.711	0
80	1.700	-2.308	0	-0.179549	0	117.406	0
81	0	-2.308	0	-0.179549	0	117.406	0
81	1.700	-2.308	0	-0.179549	0	117.101	0
82	0	-2.308	0	-0.179549	0	117.101	0
82	0.450	-2.308	0	-0.179549	0	117.020	0
82	0.450	-2.308	0	-18.180	0	117.017	0
82	1.700	-2.308	0	-18.180	0	94.295	0
83	0	-2.308	0	-18.180	0	94.295	0
83	0.0998	-2.308	0	-18.180	0	92.480	0
83	0.100	-2.308	0	-36.180	0	92.471	0
83	1.700	-2.308	0	-36.180	0	34.590	0
84	0	-2.308	0	-36.180	0	34.590	0
84	1.700	-2.308	0	-36.180	0	-26.915	0
85	0	-2.308	0	-36.180	0	-26.915	0
85	0.450	-2.308	0	-36.180	0	-43.150	0

SECTION FORCES: *ALL*

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
85	0.450	-2.308	0	-50.180	0	-43.204	0
85	1.700	-2.308	0	-50.180	0	-105.920	0
86	0	0.001901	0	6.583	0	-85.581	0
86	1.300	0.001901	0	6.583	0	-77.022	0
87	0	0.001901	0	6.583	0	-77.022	0
87	1.300	0.001901	0	6.583	0	-68.464	0
88	0	0.001901	0	6.583	0	-68.464	0
88	1.300	0.001901	0	6.583	0	-59.906	0
89	0	0.001901	0	6.583	0	-59.906	0
89	1.300	0.001901	0	6.583	0	-51.348	0
90	0	0.001901	0	6.583	0	-51.348	0
90	1.300	0.001901	0	6.583	0	-42.790	0
91	0	0.001901	0	6.583	0	-42.790	0
91	1.300	0.001901	0	6.583	0	-34.232	0
92	0	0.001901	0	6.583	0	-34.232	0
92	1.300	0.001901	0	6.583	0	-25.674	0
93	0	0.001901	0	6.583	0	-25.674	0
93	1.300	0.001901	0	6.583	0	-17.116	0
94	0	0.001901	0	6.583	0	-17.116	0
94	1.300	0.001901	0	6.583	0	-8.558	0
95	0	0.001901	0	6.583	0	-8.558	0
95	1.300	0.001901	0	6.583	0	-8.56E-08	0
96	0	1.33E-14	0	1.27E-13	0	2.77E-13	0
96	0.500	1.33E-14	0	1.27E-13	0	3.40E-13	0
290	0	-56.379	2.308	0	0	0	-10.157
290	13.200	-56.379	2.308	0	0	0	20.302
291	0	-56.763	-2.310	0	0	0	10.156
291	13.200	-56.763	-2.310	0	0	0	-20.340
	min:	-56.763	-2.310	-50.180	0	-105.920	-20.340
	max:	0.001901	2.308	49.820	0	117.774	20.302

ENVELOPE SPECIFIC.: EU 'COMBINACION SOBRECARGAS'

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	0		PESO PROPIO
B	PLUS	6	1.000		SOB UNIF 1
C	PLUS	7	1.000		SOBRECARGA UNIF 2
D	PLUS	8	1.000		SOB UNIF 3
E	PLUS	11	1.000		VEHICULO HIPOTESIS 11
F	OR	12	1.000		VEHICULO HIPOTESIS 12
G	OR	13	1.000		VEHICULO HIPOTESIS 13
H	OR	14	1.000		VEHICULO HIPOTESIS 14
I	OR	15	1.000		VEHICULO HIPOTESIS 15
J	OR	16	1.000		VEHICULO HIPOTESIS 16
K	OR	17	1.000		VEHICULO HIPOTESIS 17
L	OR	18	1.000		VEHICULO HIPOTESIS 18
M	OR	19	1.000		VEHICULO HIPOTESIS 19
N	OR	20	1.000		VEHICULO HIPOTESIS 20
O	OR	21	1.000		VEHICULO HIPOTESIS 21
P	OR	22	1.000		VEHICULO HIPOTESIS 22
Q	OR	23	1.000		VEHICULO HIPOTESIS 23
R	OR	24	1.000		VEHICULO HIPOTESIS 24
S	OR	25	1.000		VEHICULO POSICION 25
T	OR	26	1.000		VEHICULO POSICION 26
U	OR	27	1.000		VEHICULO POSICION 27
V	OR	28	1.000		VEHICULO POSICION 28
W	OR	29	1.000		VEHICULO POSICION 29
X	OR	30	1.000		VEHICULO POSICION 30
Y	OR	31	1.000		VEHICULO POSICION 31
Z	OR	32	1.000		VEHICULO POSICION 32
AA	OR	33	1.000		VEHICULO POSICION 33
AB	OR	34	1.000		VEHICULO POSICION 34
AC	OR	35	1.000		VEHICULO POSICION 35
AD	OR	36	1.000		VEHICULO POSICION 36
AE	OR	37	1.000		VEHICULO HIPOTESIS 37

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
65	0	-2.54E-15	-1.18E-10	6.15E-14	1.18E-13	-4.34E-14	6.30E-10
		1.15E-12	4.13E-09	-1.60E-08	-2.26E-13	6.50E-13	-5.95E-10
		Min: A C I			Max: A E D F		
65	0.500	-2.78E-13	4.08E-05	-1.600	2.11E-13	-0.400000	1.45E-09
		1.54E-12	4.13E-09	-5.15E-13	-2.26E-13	6.97E-14	1.47E-09
		Min: A E C E			Max: A D F		
66	0	-0.107568	-3.294	9.523	4.15E-14	-0.400000	-4.52E-08
		0.003162	-3.875	47.002	-3.19E-14	6.11E-07	-5.28E-08
		Min: A E C I			Max: A D E		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
66	1.300	0.000661	-3.294	-8.769	4.15E-14	-11.400	-4.282
		-0.105066	-3.875	41.135	30.000	72.779	-5.037
	Min: A C I				Max: A E D E		
67	0	0.000661	-3.294	-8.769	4.15E-14	-11.400	-4.282
		-0.105066	-3.875	41.135	30.000	72.779	-5.037
	Min: A C I				Max: A E D E		
67	1.300	0.000661	-3.294	-8.769	4.15E-14	-22.800	-8.565
		-0.105066	-3.875	16.975	60.000	118.550	-10.074
	Min: A C I				Max: A E D E		
68	0	0.000661	-3.294	-8.769	4.15E-14	-22.800	-8.565
		-0.105066	-3.875	16.975	60.000	118.550	-10.074
	Min: A C I				Max: A E D E		
68	1.300	0.000661	-3.294	-8.769	4.15E-14	-34.199	-12.847
		-0.224418	-3.875	30.822	4.82E-14	144.142	-15.112
	Min: A C I				Max: A E D F		
69	0	0.000661	-3.294	-8.769	2.80E-13	-34.199	-12.847
		-0.224418	-3.875	30.822	3.79E-13	144.142	-15.112
	Min: A C I				Max: A E D F		
69	1.300	0.000661	-3.294	-8.769	2.80E-13	-45.599	-17.129
		-0.224418	-3.875	6.662	30.000	177.506	-20.149
	Min: A C I				Max: A E D F		
70	0	0.000661	-3.294	-8.769	2.85E-13	-45.599	-17.129
		-0.224418	-3.875	6.662	30.000	177.506	-20.149
	Min: A C I				Max: A E D F		
70	1.300	0.000661	-3.294	-8.769	2.85E-13	-56.999	-21.411
		-0.224418	-3.875	2.502	30.000	183.463	-25.186
	Min: A C I				Max: A E D F		
71	0	0.000661	-3.294	-8.769	3.84E-14	-56.999	-21.411
		-0.224418	-3.875	-17.498	60.000	183.463	-25.186
	Min: A C I				Max: A E D F		
71	1.300	0.000661	-3.294	-8.769	3.84E-14	-68.399	-25.694
		-0.224418	-3.875	-21.658	60.000	158.011	-30.223
	Min: A C I				Max: A E D F		
72	0	0.000661	-3.294	-8.769	-2.62E-13	-68.399	-25.694
		-0.224418	-3.875	-21.658	60.000	158.011	-30.223
	Min: A C I				Max: A E D F		
72	1.300	0.000661	-3.294	-8.769	-2.62E-13	-79.798	-29.976
		-0.224418	-3.875	-45.818	90.000	105.152	-35.260
	Min: A C I				Max: A E D F		
73	0	0.000661	-3.294	-8.769	-4.31E-13	-79.798	-29.976
		-0.224418	-3.875	-45.818	90.000	105.152	-35.260
	Min: A C I				Max: A E D F		
73	1.300	0.000661	-3.294	-8.769	-4.31E-13	-91.198	-34.258

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
		-0.158576	-3.875	-27.252	30.000	72.235	-40.298
	Min: A C I				Max: A E D G		
74	0	0.000661	-3.294	-8.769	-7.42E-13	-91.198	-34.258
		-0.158576	-3.875	-27.252	30.000	72.235	-40.298
	Min: A C I				Max: A E D G		
74	1.300	-0.107568	-3.294	-27.917	-7.42E-13	-108.002	-38.540
		-0.050347	-3.875	-32.264	60.000	18.507	-45.335
	Min: A E C I				Max: A D G		
75	0	-0.107568	-3.294	-27.917	-9.21E-13	-108.002	-38.540
		-0.050347	-3.875	-32.264	60.000	18.507	-45.335
	Min: A E C I				Max: A D G		
75	1.300	-0.107568	-3.294	-32.077	-9.21E-13	-146.998	-42.823
		0.331790	-2.713	1.301	-7.30E-13	16.919	-35.273
	Min: A B C I				Max: A D L		
76	0	-2.577	1.37E-09	59.279	-45.000	-168.219	-42.740
		1.500	-0.971664	-6.533	-30.231	25.623	-34.481
	Min: A B C I				Max: A D L		
76	1.700	0.325916	0.971664	28.293	30.231	-86.370	-49.348
		-0.415103	0.703027	31.139	-25.686	24.920	-47.521
	Min: A E C F				Max: A D H		
77	0	0.325916	0.971664	28.293	30.231	-86.370	-49.348
		-0.415103	0.703027	31.139	-25.686	24.920	-47.521
	Min: A E C F				Max: A D H		
77	1.700	1.500	0.971664	6.533	30.231	-63.225	-47.696
		-1.590	0.703027	27.459	4.314	77.185	-46.326
	Min: A E F				Max: A C D H		
78	0	1.500	0.971664	6.533	30.231	-63.225	-47.696
		-1.590	0.703027	27.459	4.314	77.185	-46.326
	Min: A E F				Max: A C D H		
78	1.700	1.983	0.971664	4.454	30.231	-54.666	-46.044
		-3.060	1.10E-09	40.880	-45.000	109.171	-42.740
	Min: A B D F				Max: A C I		
79	0	1.983	0.971664	4.454	30.231	-54.666	-46.044
		-3.060	9.75E-10	40.880	-45.000	109.171	-42.740
	Min: A E D F				Max: A C I		
79	1.700	1.983	0.971664	4.454	30.231	-47.094	-44.392
		-3.060	9.75E-10	35.440	-45.000	174.043	-42.740
	Min: A E D F				Max: A C I		
80	0	1.983	0.971664	4.454	30.231	-47.094	-44.392
		-3.060	9.34E-10	35.440	-45.000	174.043	-42.740
	Min: A E D F				Max: A C I		
80	1.700	1.983	0.971664	4.454	30.231	-39.522	-42.740
		-3.060	9.34E-10	10.000	-15.000	199.667	-42.740

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
	Min: A E D F			Max: A C I			

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
81	0	1.983	-0.971664	-4.454	-30.231	-39.522	-42.740
		-3.060	8.59E-10	-10.000	15.000	199.667	-42.740
	Min: A E D L				Max: A C I		
81	1.700	1.983	-0.971664	-4.454	-30.231	-47.094	-44.392
		-3.060	8.59E-10	-35.440	45.000	174.043	-42.740
	Min: A E D L				Max: A C I		
82	0	1.983	-0.971664	-4.454	-30.231	-47.094	-44.392
		-3.060	8.28E-10	-35.440	45.000	174.043	-42.740
	Min: A E D L				Max: A C I		
82	1.700	1.983	-0.971664	-4.454	-30.231	-54.666	-46.044
		-3.060	8.28E-10	-40.880	45.000	109.171	-42.740
	Min: A E D L				Max: A C I		
83	0	1.983	-0.971664	-4.454	-30.231	-54.666	-46.044
		-3.060	8.43E-10	-40.880	45.000	109.171	-42.740
	Min: A B D L				Max: A C I		
83	1.700	1.500	-0.971664	-6.533	-30.231	-63.225	-47.696
		-1.590	-0.703027	-27.459	-4.314	77.185	-46.326
	Min: A D L				Max: A E C J		
84	0	1.500	-0.971664	-6.533	-30.231	-63.225	-47.696
		-1.590	-0.703027	-27.459	-4.314	77.185	-46.326
	Min: A D L				Max: A E C J		
84	1.700	0.325916	-0.971664	-28.293	-30.231	-86.370	-49.348
		-0.415103	-0.703027	-31.139	25.686	24.920	-47.521
	Min: A C D L				Max: A E J		
85	0	0.325916	-0.971664	-28.293	-30.231	-86.370	-49.348
		-0.415103	-0.703027	-31.139	25.686	24.920	-47.521
	Min: A C D L				Max: A E J		
85	1.700	-2.577	7.33E-10	-59.279	45.000	-168.219	-42.740
		1.500	0.971664	6.533	30.231	25.623	-34.481
	Min: A C D I				Max: A E F		
86	0	-0.107568	3.294	32.077	-3.27E-13	-146.998	-42.823
		0.331790	2.713	-1.301	-2.40E-13	16.919	-35.273
	Min: A C D I				Max: A E F		
86	1.300	-0.107568	3.294	27.917	-3.27E-13	-108.002	-38.540
		-0.050347	3.875	32.264	-60.000	18.507	-45.335
	Min: A C D I				Max: A E K		
87	0	-0.107568	3.294	27.917	-1.02E-13	-108.002	-38.540
		-0.050347	3.875	32.264	-60.000	18.507	-45.335
	Min: A C D I				Max: A E K		
87	1.300	0.000661	3.294	8.769	-1.02E-13	-91.198	-34.258
		-0.158576	3.875	27.252	-30.000	72.235	-40.298
	Min: A C I				Max: A E D K		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
88	0	0.000661	3.294	8.769	9.81E-14	-91.198	-34.258
		-0.158576	3.875	27.252	-30.000	72.235	-40.298
	Min: A C I				Max: A E D K		
88	1.300	0.000661	3.294	8.769	9.81E-14	-79.798	-29.976
		-0.224418	3.875	45.818	-90.000	105.152	-35.260
	Min: A C I				Max: A E D L		
89	0	0.000661	3.294	8.769	3.92E-13	-79.798	-29.976
		-0.224418	3.875	45.818	-90.000	105.152	-35.260
	Min: A C I				Max: A E D L		
89	1.300	0.000661	3.294	8.769	3.92E-13	-68.399	-25.694
		-0.224418	3.875	21.658	-60.000	158.011	-30.223
	Min: A C I				Max: A E D L		
90	0	0.000661	3.294	8.769	2.24E-13	-68.399	-25.694
		-0.224418	3.875	21.658	-60.000	158.011	-30.223
	Min: A C I				Max: A E D L		
90	1.300	0.000661	3.294	8.769	2.24E-13	-56.999	-21.411
		-0.224418	3.875	17.498	-60.000	183.463	-25.186
	Min: A C I				Max: A E D L		
91	0	0.000661	3.294	8.769	-3.16E-15	-56.999	-21.411
		-0.224418	3.875	-2.502	-30.000	183.463	-25.186
	Min: A C I				Max: A E D L		
91	1.300	0.000661	3.294	8.769	-3.16E-15	-45.599	-17.129
		-0.224418	3.875	-6.662	-30.000	177.506	-20.149
	Min: A C I				Max: A E D L		
92	0	0.000661	3.294	8.769	1.72E-13	-45.599	-17.129
		-0.224418	3.875	-6.662	-30.000	177.506	-20.149
	Min: A C I				Max: A E D L		
92	1.300	0.000661	3.294	8.769	1.72E-13	-34.199	-12.847
		-0.224418	3.875	-30.822	1.07E-14	144.142	-15.112
	Min: A C I				Max: A E D L		
93	0	0.000661	3.294	8.769	1.16E-13	-34.199	-12.847
		-0.224418	3.875	-30.822	1.64E-13	144.142	-15.112
	Min: A C I				Max: A E D L		
93	1.300	0.000661	3.294	8.769	1.16E-13	-22.800	-8.565
		-0.105066	3.875	-16.975	-60.000	118.550	-10.074
	Min: A C I				Max: A E D M		
94	0	0.000661	3.294	8.769	1.80E-13	-22.800	-8.565
		-0.105066	3.875	-16.975	-60.000	118.550	-10.074
	Min: A C I				Max: A E D M		
94	1.300	0.000661	3.294	8.769	1.80E-13	-11.400	-4.282
		-0.105066	3.875	-41.135	-30.000	72.779	-5.037
	Min: A C I				Max: A E D M		

ENVELOPE for < My > (and accomp. values) **
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
95	0	0.000661	3.294	8.769	3.55E-13	-11.400	-4.282
		-0.105066	3.875	-41.135	-30.000	72.779	-5.037
	Min: A C I				Max: A E D M		
95	1.300	-0.107568	3.294	-9.523	3.55E-13	-0.400000	-4.48E-08
		0.003163	3.875	-47.002	6.86E-13	6.11E-07	-5.25E-08
	Min: A C D I				Max: A B M		

Memb.	Distance [m]	N [t]	Vy [t]	Vz [t]	T [tm]	My [tm]	Mz [tm]
96	0	3.03E-12	4.65E-09	1.600	7.37E-13	-0.400000	1.27E-11
		9.19E-16	4.71E-09	2.08E-13	-1.61E-13	2.07E-13	-3.66E-10
	Min: A E D L				Max: A C I		
96	0.500	1.22E-12	4.76E-09	1.60E-08	5.56E-13	-1.64E-12	2.37E-09
		9.19E-16	4.71E-09	2.08E-13	-1.61E-13	3.11E-13	1.99E-09
	Min: A B D M				Max: A C I		
290	0	3.345	-0.520912	-1.742	-0.791553	-7.242	3.045
		3.345	-0.520912	1.742	0.791553	7.242	3.045
	Min: A AC				Max: A K		
290	13.200	-15.522	-0.585552	-4.846	0.627517	-59.769	-5.652
		-15.522	-0.585552	4.846	-0.627517	59.769	-5.652
	Min: A W				Max: A E		
291	0	3.345	0.520912	-1.742	0.791553	-7.242	-3.045
		3.345	0.520912	1.742	-0.791553	7.242	-3.045
	Min: A Y				Max: A G		
291	13.200	-55.500	0.837354	-4.846	-0.627517	-59.769	8.123
		-55.500	0.837354	4.846	0.627517	59.769	8.123
	Min: A AC				Max: A K		

LOADING: 'Y'

Loadcase	Factor	Stage	Init.def	Title
70	1.0000			prueba de carga 1

Displacements (in global coordinate directions): "ALL"

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
65	0	0	-5.70E-4	2.49E-4	-4.98E-4	0	0
65	0.500	0	-5.70E-4	2.5E-12	-5.00E-4	0	0
66	0	0	-5.70E-4	-6.5E-12	-5.00E-4	0	0
66	1.300	0	-5.70E-4	-6.44E-4	-4.82E-4	0	0
67	0	0	-5.70E-4	-6.44E-4	-4.82E-4	0	0
67	1.300	0	-5.70E-4	-0.00123	-4.02E-4	0	0
68	0	0	-5.70E-4	-0.00123	-4.02E-4	0	0
68	1.300	0	-5.70E-4	-0.00168	-2.83E-4	0	0
69	0	0	-5.70E-4	-0.00168	-2.83E-4	0	0
69	1.300	0	-5.70E-4	-0.00195	-1.32E-4	0	0
70	0	0	-5.70E-4	-0.00195	-1.32E-4	0	0
70	1.300	0	-5.70E-4	-0.00203	1.48E-5	0	0
71	0	0	-5.70E-4	-0.00203	1.48E-5	0	0
71	1.300	0	-5.70E-4	-0.00192	1.52E-4	0	0
72	0	0	-5.70E-4	-0.00192	1.52E-4	0	0
72	1.300	0	-5.70E-4	-0.00164	2.76E-4	0	0
73	0	0	-5.70E-4	-0.00164	2.76E-4	0	0
73	1.300	0	-5.70E-4	-0.00122	3.56E-4	0	0
74	0	0	-5.70E-4	-0.00122	3.56E-4	0	0
74	1.300	0	-5.70E-4	-7.44E-4	3.65E-4	0	0
75	0	0	-5.70E-4	-7.44E-4	3.65E-4	0	0
75	1.300	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
76	0	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
76	1.700	0	-5.70E-4	1.27E-4	2.07E-4	0	0
77	0	0	-5.70E-4	1.27E-4	2.07E-4	0	0
77	1.700	0	-5.69E-4	4.11E-4	1.28E-4	0	0
78	0	0	-5.69E-4	4.11E-4	1.28E-4	0	0
78	1.700	0	-5.69E-4	5.70E-4	6.15E-5	0	0
79	0	0	-5.69E-4	5.70E-4	6.15E-5	0	0
79	1.700	0	-5.69E-4	6.27E-4	7.55E-6	0	0

Displacements (in global coordinate directions): "ALL"

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
80	0	0	-5.69E-4	6.27E-4	7.55E-6	0	0
80	1.700	0	-5.69E-4	6.03E-4	-3.37E-5	0	0
81	0	0	-5.69E-4	6.03E-4	-3.37E-5	0	0
81	1.700	0	-5.69E-4	5.19E-4	-6.22E-5	0	0
82	0	0	-5.69E-4	5.19E-4	-6.22E-5	0	0
82	1.700	0	-5.69E-4	3.98E-4	-7.80E-5	0	0
83	0	0	-5.69E-4	3.98E-4	-7.80E-5	0	0
83	1.700	0	-5.69E-4	2.61E-4	-8.12E-5	0	0
84	0	0	-5.69E-4	2.61E-4	-8.12E-5	0	0
84	1.700	0	-5.69E-4	1.30E-4	-7.16E-5	0	0
85	0	0	-5.69E-4	1.30E-4	-7.16E-5	0	0
85	1.700	0	-5.69E-4	2.52E-5	-4.93E-5	0	0
86	0	0	-5.69E-4	2.52E-5	-4.93E-5	0	0
86	1.300	0	-5.69E-4	-3.00E-5	-3.58E-5	0	0
87	0	0	-5.69E-4	-3.00E-5	-3.58E-5	0	0
87	1.300	0	-5.69E-4	-6.85E-5	-2.37E-5	0	0
88	0	0	-5.69E-4	-6.85E-5	-2.37E-5	0	0
88	1.300	0	-5.69E-4	-9.23E-5	-1.31E-5	0	0
89	0	0	-5.69E-4	-9.23E-5	-1.31E-5	0	0
89	1.300	0	-5.69E-4	-1.03E-4	-3.83E-6	0	0
90	0	0	-5.69E-4	-1.03E-4	-3.83E-6	0	0
90	1.300	0	-5.69E-4	-1.03E-4	3.98E-6	0	0
91	0	0	-5.69E-4	-1.03E-4	3.98E-6	0	0
91	1.300	0	-5.69E-4	-9.34E-5	1.04E-5	0	0
92	0	0	-5.69E-4	-9.34E-5	1.04E-5	0	0
92	1.300	0	-5.68E-4	-7.65E-5	1.53E-5	0	0
93	0	0	-5.68E-4	-7.65E-5	1.53E-5	0	0
93	1.300	0	-5.68E-4	-5.41E-5	1.89E-5	0	0
94	0	0	-5.68E-4	-5.41E-5	1.89E-5	0	0
94	1.300	0	-5.68E-4	-2.80E-5	2.10E-5	0	0
95	0	0	-5.68E-4	-2.80E-5	2.10E-5	0	0
95	1.300	0	-5.68E-4	-2.9E-13	2.17E-5	0	0
96	0	0	-5.68E-4	1.1E-13	2.17E-5	0	0
96	0.500	0	-5.68E-4	1.05E-5	2.17E-5	0	0

Displacements (in global coordinate directions): "ALL"

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
290	0	0	2.3E-19	-3.0E-12	-3.4E-12	0	0
290	13.200	0	-5.70E-4	-3.02E-4	3.01E-4	0	0
291	0	0	-2.4E-19	2.5E-13	3.6E-12	0	0
291	13.200	0	-5.69E-4	2.52E-5	-4.93E-5	0	0
	min:	0	-0.000570	-0.002029	-0.000500	0	0
	max:	0	2.27E-19	0.000627	0.000365	0	0

Loadcase 71 — Factor 1.0000 — Stage — Init.def — Title: prueba de carga 2

Displacements (in global coordinate directions): "ALL"

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
65	0	0	-2.32E-6	-8.70E-5	1.74E-4	0	0
65	0.500	0	-2.32E-6	-8.7E-13	1.74E-4	0	0
66	0	0	-2.32E-6	2.3E-12	1.74E-4	0	0
66	1.300	0	-2.32E-6	1.24E-4	1.68E-4	0	0
67	0	0	-2.32E-6	1.24E-4	1.68E-4	0	0
67	1.300	0	-2.32E-6	4.32E-4	1.51E-4	0	0
68	0	0	-2.32E-6	4.32E-4	1.51E-4	0	0
68	1.300	0	-2.32E-6	6.10E-4	1.21E-4	0	0
69	0	0	-2.32E-6	6.10E-4	1.21E-4	0	0
69	1.300	0	-2.32E-6	7.42E-4	7.99E-5	0	0
70	0	0	-2.32E-6	7.42E-4	7.99E-5	0	0
70	1.300	0	-2.32E-6	8.13E-4	2.69E-5	0	0
71	0	0	-2.32E-6	8.13E-4	2.69E-5	0	0
71	1.300	0	-2.32E-6	8.07E-4	-3.78E-5	0	0
72	0	0	-2.32E-6	8.07E-4	-3.78E-5	0	0
72	1.300	0	-2.32E-6	7.09E-4	-1.14E-4	0	0
73	0	0	-2.32E-6	7.09E-4	-1.14E-4	0	0
73	1.300	0	-2.32E-6	5.04E-4	-2.03E-4	0	0
74	0	0	-2.32E-6	5.04E-4	-2.03E-4	0	0
74	1.300	0	-2.32E-6	1.77E-4	-3.03E-4	0	0

Displacements (in global coordinate directions): "ALL"

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
75	0	0	-2.32E-6	1.77E-4	-3.03E-4	0	0
75	1.300	0	-2.32E-6	-2.88E-4	-4.15E-4	0	0
76	0	0	-2.32E-6	-2.88E-4	-4.15E-4	0	0
76	1.700	0	-2.58E-6	-0.00111	-5.30E-4	0	0
77	0	0	-2.58E-6	-0.00111	-5.30E-4	0	0
77	1.700	0	-2.84E-6	-0.00202	-5.24E-4	0	0
78	0	0	-2.84E-6	-0.00202	-5.24E-4	0	0
78	1.700	0	-3.09E-6	-0.00293	-4.08E-4	0	0
79	0	0	-3.09E-6	-0.00293	-4.08E-4	0	0
79	1.700	0	-3.35E-6	-0.00337	-2.11E-4	0	0
80	0	0	-3.35E-6	-0.00337	-2.11E-4	0	0
80	1.700	0	-3.61E-6	-0.00355	-8.32E-7	0	0
81	0	0	-3.61E-6	-0.00355	-8.32E-7	0	0
81	1.700	0	-3.86E-6	-0.00337	2.11E-4	0	0
82	0	0	-3.86E-6	-0.00337	2.11E-4	0	0
82	1.700	0	-4.12E-6	-0.00284	4.07E-4	0	0
83	0	0	-4.12E-6	-0.00284	4.07E-4	0	0
83	1.700	0	-4.37E-6	-0.00203	5.25E-4	0	0
84	0	0	-4.37E-6	-0.00203	5.25E-4	0	0
84	1.700	0	-4.63E-6	-0.00112	5.32E-4	0	0
85	0	0	-4.63E-6	-0.00112	5.32E-4	0	0
85	1.700	0	-4.89E-6	-2.90E-4	4.16E-4	0	0
86	0	0	-4.89E-6	-2.90E-4	4.16E-4	0	0
86	1.300	0	-4.89E-6	1.77E-4	3.04E-4	0	0
87	0	0	-4.89E-6	1.77E-4	3.04E-4	0	0
87	1.300	0	-4.89E-6	5.05E-4	2.03E-4	0	0
88	0	0	-4.89E-6	5.05E-4	2.03E-4	0	0
88	1.300	0	-4.89E-6	7.11E-4	1.15E-4	0	0
89	0	0	-4.89E-6	7.11E-4	1.15E-4	0	0
89	1.300	0	-4.89E-6	8.09E-4	3.81E-5	0	0
90	0	0	-4.89E-6	8.09E-4	3.81E-5	0	0
90	1.300	0	-4.89E-6	8.15E-4	-2.69E-5	0	0
91	0	0	-4.89E-6	8.15E-4	-2.69E-5	0	0
91	1.300	0	-4.89E-6	7.44E-4	-8.01E-5	0	0

Displacements (in global coordinate directions): "ALL"

Memb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
91	0	0	-4.89E-6	7.44E-4	-8.01E-5	0	0
92	1.300	0	-4.89E-6	6.12E-4	-1.21E-4	0	0
93	0	0	-4.89E-6	6.12E-4	-1.21E-4	0	0
93	1.300	0	-4.89E-6	4.34E-4	-1.51E-4	0	0
94	0	0	-4.89E-6	4.34E-4	-1.51E-4	0	0
94	1.300	0	-4.89E-6	2.24E-4	-1.69E-4	0	0
95	0	0	-4.89E-6	2.24E-4	-1.69E-4	0	0
95	1.300	0	-4.89E-6	2.3E-12	-1.75E-4	0	0
96	0	0	-4.89E-6	-8.7E-13	-1.75E-4	0	0
96	0.500	0	-4.89E-6	-8.73E-5	-1.75E-4	0	0
290	0	0	-5.5E-19	-2.9E-12	8.3E-12	0	0
290	13.200	0	-2.32E-6	-2.88E-4	-4.15E-4	0	0
291	0	0	5.5E-19	-2.9E-12	-8.3E-12	0	0
291	13.200	0	-4.89E-6	-2.90E-4	4.16E-4	0	0
	min:	0	-4.89E-06	-0.003549	-0.000530	0	0
	max:	0	5.48E-19	0.000815	0.000532	0	0

CÁLCULOS ESTRUCTURALES

FDO. JOSÉ ANGEL HIDALGO GONZÁLEZ
COL. Nº 9.859

Estructura E-15. (PK 316+080)

ESTRUCTURA E-15 (PK 316+080)

ÍNDICE

CÁLCULOS ESTRUCTURALES

1. INTRODUCCIÓN
   - 1.1 DESCRIPCIÓN DE LA SOLUCIÓN ADOPTADA
   - 1.2 INSTRUCCIONES Y NORMAS EMPLEADAS
   - 1.3 CARACTERÍSTICAS DE LOS MATERIALES
   - 1.4 NIVELES DE CONTROL Y COEFICIENTES DE SEGURIDAD
   - 1.5 CARACTERÍSTICAS DE LA CIMENTACIÓN
   - 1.6 PROCEDIMIENTO DE CÁLCULO Y DESCRIPCIÓN DE LOS PROGRAMAS UTILIZADOS
2. TABLERO
   - 2.1 DEFINICIÓN GEOMÉTRICA DEL TABLERO
   - 2.2 CÁLCULO DE LAS ACCIONES
     - 2.2.1. ACCIONES PERMANENTES
       - 2.2.1.1 PESO PROPIO
     - 2.2.2. ACCIONES PERMANENTES DE VALOR NO CONSTANTE
       - 2.2.2.1 REOLÓGICAS: RETRACCIÓN
       - 2.2.2.2 SOBRECARGAS DEL TERRENO
     - 2.2.3. ACCIONES VARIABLES
       - 2.2.3.1. AGUA
       - 2.2.3.2. ACCIONES CLIMÁTICAS
     - 2.2.4. ACCIONES ACCIDENTALES
       - 2.2.4.1. ACCIONES SÍSMICAS
   - 2.3. CÁLCULO TRANSVERSAL DEL TABLERO
     - 2.3.1. MODELO DE CÁLCULO DE LA SECCIÓN TRANSVERSAL
     - 2.3.2. MODELO DE CÁLCULO DE LA SECCIÓN TRANSVERSAL ARRIOSTRADA
   - 2.4. COMPROBACIÓN LONGITUDINAL DEL TABLERO
     - 2.4.1. VERIFICACIÓN DE LAS SECCIONES
       - 2.4.1.1. COMPROBACIÓN DE LOS ESTADOS LÍMITES SERVICIO (ELS)
       - 2.4.1.2. COMPROBACIÓN DE ESTADOS LÍMITES ÚLTIMOS POR FLEXIÓN LONGITUDINAL
       - 2.4.1.3. VERIFICACIÓN DE LAS SECCIONES A ESFUERZOS DE CORTANTE (ELU)
       - 2.4.1.4. VERIFICACIÓN DE LAS SECCIONES A ESFUERZOS DE RASANTE (ELU)
     - 2.4.2. REACCIONES Y CÁLCULOS DE NEOPRENOS
     - 2.4.3. REFUERZO DE ARMADURAS BAJO APOYOS
3. CÁLCULO DE LA SUBESTRUCTURA
   - 3.1. ACCIONES
   - 3.2. COMBINACIÓN DE ACCIONES
4. PILAS
   - 4.1. CÁLCULO DEL FUSTE
   - 4.2. CÁLCULO DE LA CIMENTACIÓN
5. ESTRIBOS
   - 5.1. CÁLCULO Y DIMENSIONAMIENTO
   - 5.2. MUROS

1.1. Descripción de la solución adoptada

El acueducto PK 316+080 de la obra "Línea de Alta Velocidad Madrid-Barcelona-Frontera Francesa. Tramo: Lleida-Martorell. Subtramo III-B " consta de tres vanos, con luces de 13.00 m, 17.00 m y 13.00 m, con una longitud total de 48.80 m. Está apoyada en los extremos en estribos del tipo cerrado y en los puntos intermedios en pilas con un único fuste de sección circular con diámetro de 1.00 m, la cimentación es del tipo superficial.

El tablero es una sección en U continua de 3.20 m de ancho, con alas de 1.80 m de altura y 0.35 m de canto.

Ambos estribos son cerrados y están cimentados mediante zapatas directamente en el terreno.

Las pilas tienen un único fuste circular de 1.00 m de diámetro y están cimentadas mediante zapatas.

La ejecución del tablero se realizará en una sola fase, con hormigonado completo de la losa sobre cimbra.

1.2. Instrucciones y normas empleadas

Para el cálculo de las acciones que actúan sobre los diversos elementos de la estructura, se ha utilizado la "Instrucción sobre las acciones a considerar en el proyecto de puentes de carreteras (IAP)", aprobada el 12 de febrero de 1998.

Se ha tenido en cuenta la "Norma de Construcción Sismorresistente (Parte General y Edificación) NCS-94", aprobada por Real Decreto 2543/1994 de 29 de Diciembre.

Para el dimensionamiento y comprobación de los elementos de hormigón armado y de hormigón pretensado se ha seguido la "Instrucción de Hormigón Estructural" EHE, aprobada por Real Decreto 2661/1998 de 11 de Diciembre.

- Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.

La aceleración sísmica básica de la zona es a_b =0.04 g y el coeficiente de contribución K=1.0.

La aceleración sísmica de cálculo será entonces:

$\alpha_\chi = \rho\ \alpha_\beta$

$\rho = (\tau/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04$ g

$a_c = 0.052$ g < 0.06 g

Conforme con lo prescrito en la NCS-94, como la aceleración de cálculo es $a_c = 0.052$ g < 0.06 g no se deberán tener en cuenta las acciones sísmicas.

1.3. Características de los materiales

Hormigones - Resistencia Característica

Hormigón en capas de regularización	$\phi_{\chi\kappa} \geq 150$ kp/cm²
Hormigón en zapatas	$\phi_{\chi\kappa} \geq 250$ kp/cm²
Hormigón en alzados estribos	$\phi_{\chi\kappa} \geq 300$ kp/cm²
Hormigón en pilas	$\phi_{\chi\kappa} \geq 300$ kp/cm²
Hormigón en tablero	$\phi_{\chi\kappa} \geq 300$ kp/cm²

Aceros

Armaduras pasivas	AEH-500N (límite elástico f yk ≥5100 kp/cm²

1.4. Niveles de control y coeficientes de seguridad

Hormigones	:	Nivel de control normal	$\gamma_\chi = 1.50$
Aceros :		Nivel de control normal	$\gamma_\psi = 1.15$
Acciones	:		
		Nivel de control intenso	$\gamma_F = 1.50$ (acciones variables)
		Conforme a la IAP	$\gamma_{G^*} = 1.50$ (acción del terreno)
			$\gamma_G = 1.35$ (acciones permanentes y reológicas

1.5. Características de la cimentación

Se han considerado las siguientes tensiones admisibles en la cimentación:

Estructura	Profundidad de cimentación	Tensión admisible del terreno	Observaciones
Estribo 1	2.30 m	2.50 kp/cm²	
Pila 1	2.00 m	3.00 kp/cm²	
Pila 2	2.00 m	3.00 kp/cm²	
Estribo 2	2.50 m	2.50 kp/cm²	

1.6. Procedimiento de cálculo y descripción de los programas utilizados

El cálculo del tablero se realiza mediante programas de ordenador en modelos estructurales de viga continua, basados en la matriz de rigidez y equilibrio de los nudos, donde se suponen las hipótesis básicas de la Resistencia de Materiales es decir, de linealidad geométrica y del material, despreciando la deformación por esfuerzo cortante.

Se ejecuta el cálculo con un modelo de pórtico plano mediante el programa STATIK-3, del que se obtienen los esfuerzos transversales y los esfuerzos longitudinales.

Considerando los esfuerzos obtenidos se realizan las comprobaciones de fisuración y el cálculo a rotura del tablero mediante el programa FAGUS-3

Se completa el cálculo con el dimensionamiento de la armadura de la losa en sentido transversal mediante el programa FAGUS-3 y los cálculos de esfuerzos locales, como por ejemplo los de apoyo.

Los estribos y las pilas, tanto en alzado como en fundaciones, se calcularon y dimensionaron en hormigón armado.

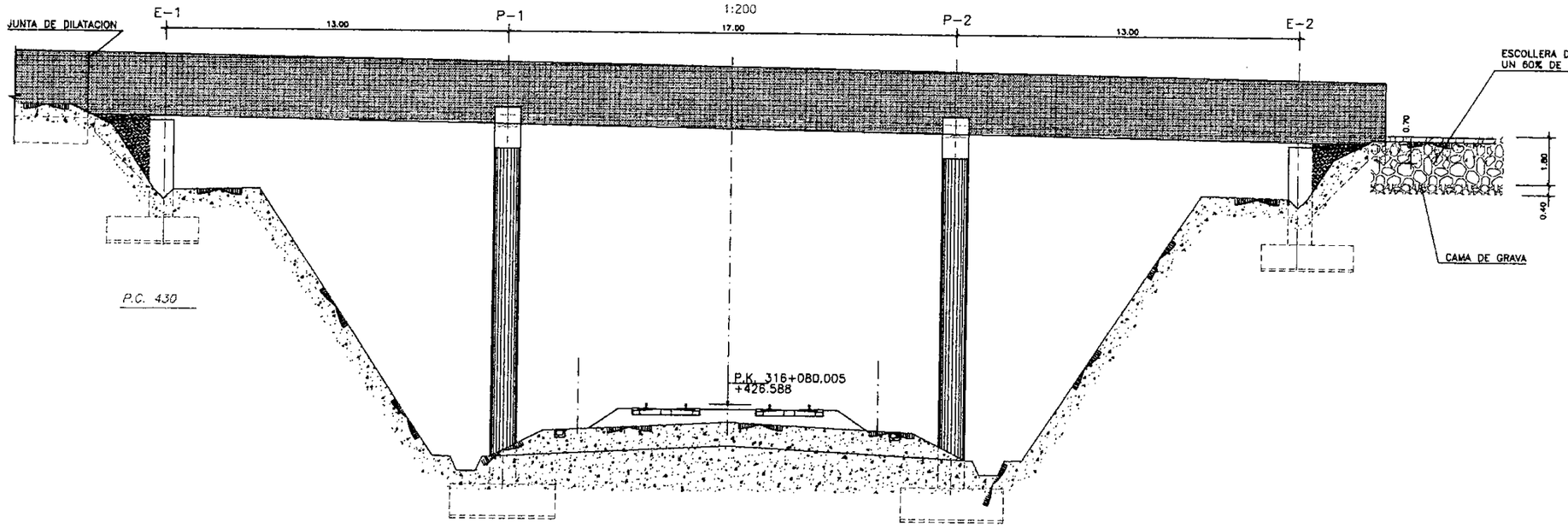
Para el desarrollo de los cálculos resueltos por ordenador se han utilizado los siguientes programas:

- STATIK-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10, 1997) .
- FAGUS-3: Desarrollado para el análisis y dimensionamiento de secciones de hormigón armado y pretensado, por CUBUS A.G. Zurich. (Versión 1.10 1997) .

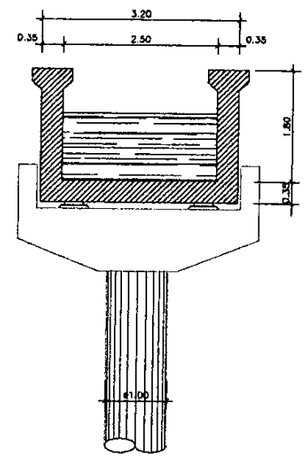
2. Tablero

2.1. Geometría (Ver planos)

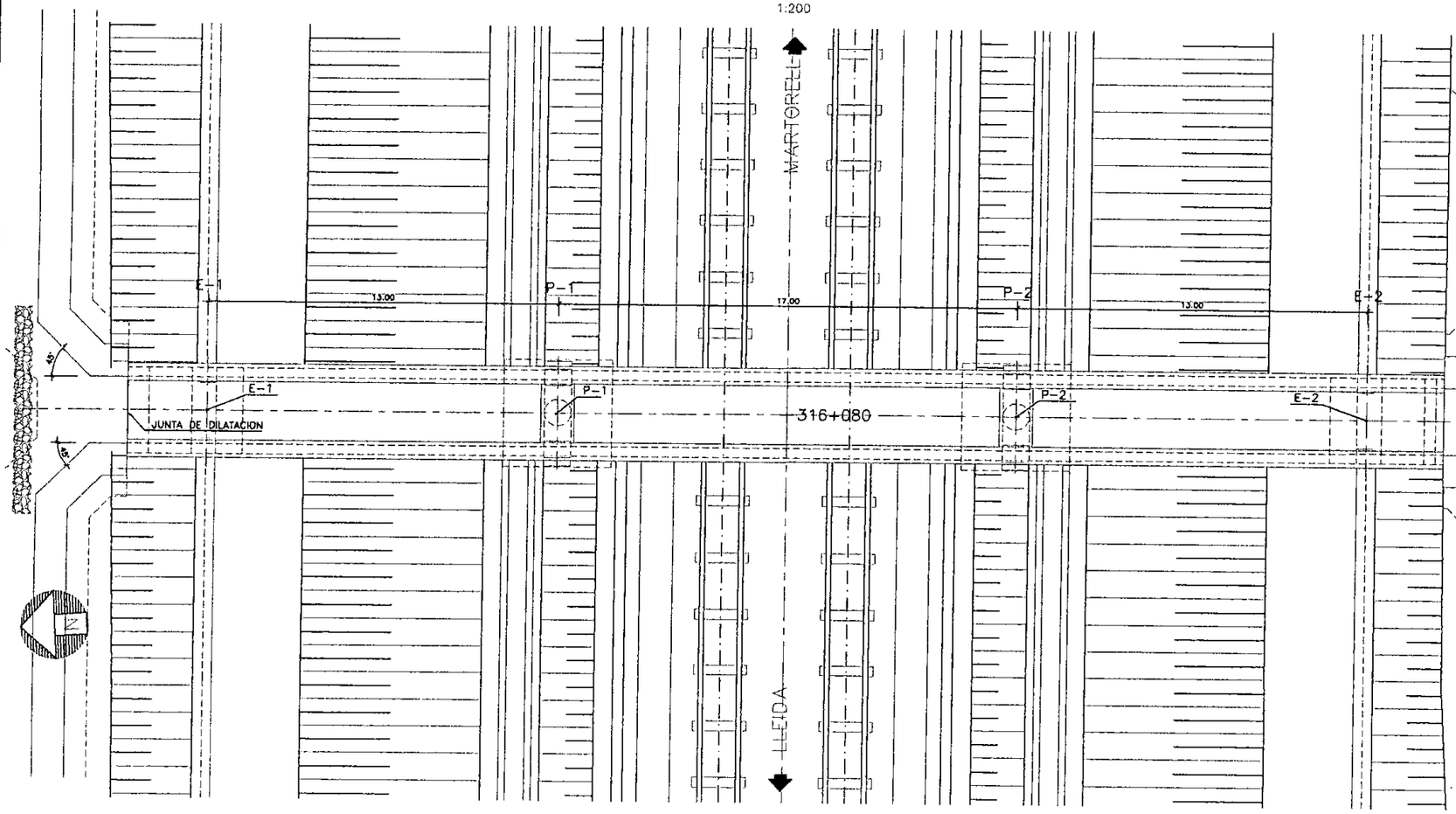
ALZADO
1:200

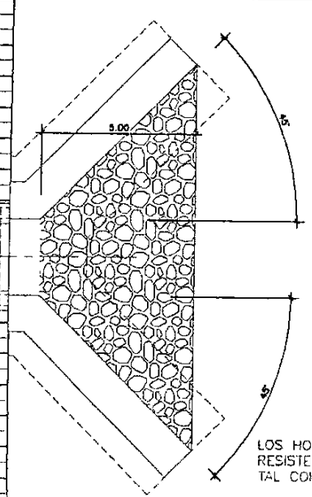


SECCION
1:100



PLANTA
1:200





CUADRO DE REPLANTEO				
ESTRIBOS Y PILAS	X	Y	Az	COTA RASANTE
E-1	340.517,219	4.585.706,207	103,7521	437,637
P-1	340.516,453	4.585.693,229	103,7521	437,442
P-2	340.515,455	4.585.676,258	103,7521	437,187
E-2	340.514,686	4.585.663,281	103,7521	436,992

LOS HORMIGONES ESTARAN ELABORADOS CON CEMENTO DE RESISTENCIA A LOS SULFATOS SEGUN LA UNE 80303:96 TAL COMO REFIERE LA NORMA EHE EN EL ARTICULO 37.3.4

CONTROL DE CALIDAD					
MATERIALES	DEFINICION	RESISTENCIA	NIVEL	COEF.	RECUB.
HORMIGON LOSA	HA-30/B/20/IIb-H	fck= 300 kp/cm²	ESTADISTICO	γ_c = 1,5	4.0
ACERO PASIVO LOSA	B500S	fyk= 5 100 kp/cm²	NORMAL	γ = 1,15	

EJECUCION DE LA OBRA

CONTROL: INTENSO

COEFICIENTE DE MAYORACION DE LAS ACCIONES: γ_f = 1,35 C.P. ; γ_f = 1,50 S.C.

GIF Gestor de Infraestructuras Ferroviarias

TITULO: MODIFICACION Nº1 DEL PROYECTO CONSTRUCTIVO DE LA LINEA DE ALTA VELOCIDAD. MADRID-ZARAGOZA-BARCELONA-FRONTERA FRANCESA. TRAMO: LLEIDA-MARTORELL. SUBTRAMO III-B PLATAFORMA

EL INGENIERO DE C.C. Y P. AUTOR DE LA MODIFICACION: FDO: D. RAFAEL RODRIGUEZ GUTIERREZ

CONFORME: Sacyr EL CONTRATISTA

ESCALA 1:100 1:200

FECHA MARZO 2.002

TITULO DEL PLANO: PASO SUPERIOR E-15 P.K. 316+080 O.D.T.E. 14 PLANTA Y ALZADO

Nº DEL PLANO 2.9.12-1. Hoja 1 de 1

2.2. Cálculo de las acciones

2.2.1. Acciones permanentes

2.2.1.1. Peso propio

El peso propio de la estructura de hormigón se calcula con un peso específico

$$\gamma = 2.50 Mp/m^3.$$

2.2.2. Acciones permanentes de valor no constante

2.2.2.1. Reológicas: Retracción

Se han calculado en el punto 2.3 considerando una humedad relativa del 60%, y un espesor medio de 337 mm. La edad del hormigón al entrar en carga es de 28 días, y el mismo es de endurecimiento normal. Los valores utilizados son:

ε retracción =-0.0004314

Cálculo de la retracción del hormigón del canal

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\, \beta s\, (t - t_s)$

Edad del hormigón al comienzo de la retracción (días)	ts = **28.0**
Edad del hormigón en el instante de evaluación (días)	t = **10000.0**
Coeficiente básico de retracción	$\varepsilon_{cso} = \varepsilon_s\, \beta_{HR}$
Resistencia característica del hormigón	f ck (N / mm2) = **30**
	ε_s = 0.00042
Humedad relativa en tanto por ciento	HR = **60**
	β_{HR} = -1.2152
	ε_{cso} = -0.0005104
Area de la seccion transversal (m^2)	Ac = **2.545**
Perímetro en contacto con la atmósfera (m)	u = **15.150**
Espesor medio (mm)	e = 336
Coeficiente de evolución temporal de la retracción	$\beta s(t - ts)$ = 0.8463

$\varepsilon_{cs}(t, t_s) = \varepsilon_{cso}\, \beta s\, (t - t_s)$ = -0.00043194

2.2.2.2. Sobrecargas del terreno

El relleno de tierras en el trasdós de los estribos se realiza con material del terraplén, que tiene las siguientes características:

Peso específico	:	$\gamma_T = 2.0\ Mp/m^3$
Ángulo de fricción interna	:	$\phi = 30°$
Coeficiente de empuje activo	:	$\lambda_\alpha = 0.33$

2.2.3. Acciones variables

2.2.3.1. Agua

Sobrecarga uniforme: 4.50 Mp/m

2.2.3.2. Acciones climáticas

a.) Viento

CALCULO DE LAS ACCIONES DEBIDAS AL VIENTO CONFORME A LA I.A.P

Proyecto : Acueducto
Estructura : 316+080

Velocidad de referencia : V_{REF} (m/seg) = **28.00**

Velocidad de cálculo : V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

Factor de topografía : C_T = **1.10**

Período de retorno (años) T = **100**

Factor de riesgo : $C_R = (0.562x\{1-0.2x \ln [- \ln (1- 1/T)]\}) 1/2$
C_R = 1.04

Factor de altura : $C_Z = K_Z \times LN (Z/ Zo)$ si $Z > Z_{MIN}$
$C_Z = K_Z \times LN (Z_{MIN}/ Zo)$ si $Z < Z_{MIN}$

Los valores de K_Z , Zo y Z_{MIN} se obtendrán de la tabla adjunta .

Tipo de Entorno	K_Z	Zo (m)	Z_{MIN} (m)
I	0.17	0.01	2.00
II	0.19	0.05	4.00
III	0.22	0.30	8.00
IV	0.24	1.00	16.00

K_Z = **0.22**

Zo = **0.3**

Z_{MIN} = **8.00**

OBTENCIÓN DE LA VELOCIDAD DE CÁLCULO PARA EL TABLERO :

En función de la altura Z considerada se obtendrán los valores de C_Z y C_G y en consecuencia de V_C

V_C (m/seg) = $C_T \times C_R \times C_Z \times C_G \times V_{REF}$

V_{REF} (m/seg) = 28.00

Para el tablero la altura considerada será : Z (m) = **15.00**

C_Z = 0.861

Factor de ráfaga : $C_G = (1 + 7 \times K_Z / C_Z / C_T)^{1/2}$

C_G = 1.621

ACCIÓN DEL VIENTO SOBRE EL TABLERO

El empuje producido sobre cualquier elemento del puente se calculará con la siguiente fórmula :

$$F (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde :

C_D : Coeficiente de arrastre

A : Área expuesta

$1/2\ \rho\ V_C^2$: Presión básica de cálculo (N/m^2)

ρ : masa específica del aire 1.25 kg/m^3

V_C : Velocidad de cálculo (m/seg)

EMPUJE TRANSVERSAL DE VIENTO

Empuje del Viento : $F (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$

TABLERO DE ALMA LLENA

Altura Z del tablero : Z (m) = **15.00**
Ancho del tablero : B (m) = **3.20**
Longitud del tramo : L (m) = **48.80**
Altura de barrera : $h_{BARRERA}$ (m) = **1.80** De tabla se obtiene : η = **0.15**
Altura equivalente : $h_{TABLERO}$ (m) = **0.35**
$h_{BAR.\ OPAC}(m) = h_{BARRERA} + \Sigma\ \eta\ h_{BARRERA}$
$h_{BAR\ OPAC}(m)$ = 2.07
$h_{SOBREC.}$ (m) = **2.00**

Sin sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{BARRERA\ OPACA}$
h_{eq} (m) = 2.42

Con sobrecarga : h_{eq} (m) = $h_{TABLERO} + h_{SOBRECARGA} + h_{BARRERA}$
h_{eq} (m) = 2.62

Área expuesta : A (m^2) = $L \times h_{eq}$

Sin sobrecarga : A (m^2) = 118.1
Con sobrecarga : A (m^2) = 127.9
Coeficiente de arrastre : $C_D = 2.50 - 0.3 \times (B / h_{eq})$
$1.30 < C_D < 2.40$
Sin sobrecarga : C_D = 2.10
Con sobrecarga : C_D = 2.13

Cálculo del empuje transversal del viento sobre el tablero :

$$F\ (Mp) = C_D \times A \times (1/2 \times \rho \times V_C^2) \times 10^{-4}$$

Donde : V_C (m/seg) = 44.63

ρ (kg/m^3) = 1.25

Empuje sin la sobrecarga en el tablero : F (Mp) = 30.92

Longitud tramo L_T (m) = 48.80 F (Mp/m) = 0.63

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : d (m) = 1.29

Empuje con la sobrecarga en el tablero : F (Mp) = 33.96

Longitud tramo L_T (m) = 48.80 F (Mp/m) = 0.70

Distancia de aplicación del empuje transversal horizontal respecto de la base del tablero : d (m) = 1.41

2.2.3.2.b) Nieve

La estructura está en Zona II.

$q = 0.80 \times S_K$

$q = 0.80 \times 40\ Kp/m^2 = 0.032\ Mp/m^2$

Es despreciable.

2.2.3.2.c) Térmicas

De acuerdo con la I.A.P. se ha considerado un incremento uniforme de temperatura que es función de los siguientes parámetros:

- La estructura está ubicada en la región climática denominada zona IV (Z = 4) .
- La sección del tablero está formada por una losa maciza de hormigón (S = 1), con un canto total de 0.35 m (h = 0.35).

$$\Delta T = K\ z^a\ h^b\ s^c = 23.89 \times 4^{-.292} \times 0.35^{-0.139}$$

Sobre la base de estos datos se obtiene que el rango anual de la temperatura media es de 41.44 °C, y por lo tanto consideraremos un incremento uniforme de temperatura de

$$\Delta T = \pm 41.44\ °C$$

$$\varepsilon_t = \pm 41.44 \times 10^{-5}$$

El incremento de temperatura entre caras superior e inferior del tablero, gradiente térmico vertical, será:

- Gradiente térmico vertical positivo °C/m

Losa maciza de hormigón:

$\Delta T_{SI} = K\ \Delta T_{SI}$, ref.

$K = K_1 \cdot K_2$ $K_1 = 1.32$

$K_2 = 1.00$

ΔT_{SI}, ref = 11.50°C

$\Delta T_{SI} = 1.32 \times 11.50°C/m$

$\Delta T_{SI} = 15.18\ °C/m$

- Gradiente térmico vertical inverso

Tableros de hormigón: sin pavimento bituminoso –3.0 °C

2.2.4. Acciones accidentales

2.2.4.1. Acciones sísmicas

De acuerdo a la Norma NCS-94 esta estructura se clasifica como de especial importancia.

La aceleración sísmica básica de la zona es ab≤ 0.04 g.

$a_c = \rho\ a_b$

$\rho = (t/50)^{0.37}$

t = 100 años, $\rho = 1.30$

$a_c = 1.30 \times 0.04\ g = 0.052\ g \leq 0.06\ g$ No se consideran las acciones sísmicas.

2.3. Cálculo transversal del tablero

Se ha generado el modelo de pórtico plano mediante el programa STATIK3, y se han introducido todas las cargas, incluido el viento, lo que nos permitirá obtener los esfuerzos transversales con la influencia de la posición de las cargas, el ancho del tablero, y el apoyo puntual en las pilas.

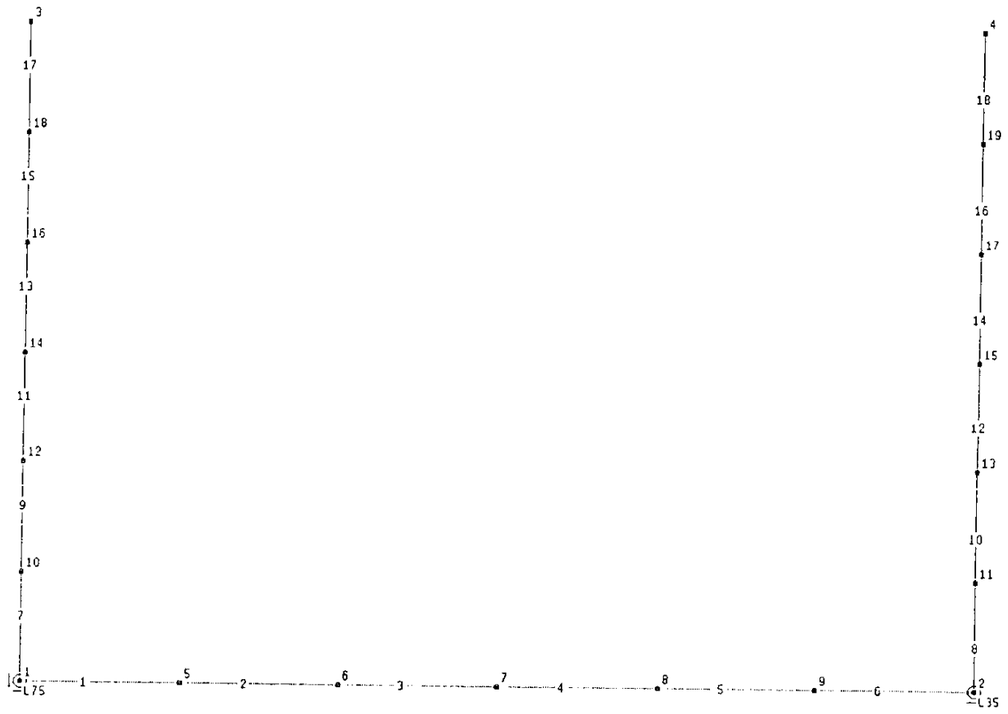
Se han introducido las acciones individuales, correspondientes a cada hipótesis básica de cálculo.

Posteriormente se ha calculado la envolvente pésima de esfuerzos para cada acción, con los diferentes coeficientes de ponderación de la Instrucción.

Mediante el programa FAGUS·3 con dichos esfuerzos de cálculo se obtienen las armaduras transversales necesarias.

2.3.1. Modelo de cálculo de la sección transversal libre

Scale 1 : 18.6
Int. Forces envelope My, GWSP AO, Subsys. "ALL"
- Structure: Elmnts.



Plane (2-D) frame -analysis

****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (19 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000	B B	F	
2	2.850000	0.000000	0.000000	F B	F	
3	0.000000	0.000000	1.980000			
4	2.850000	0.000000	1.980000			
5	0.475000	0.000000	0.000000			
6	0.950000	0.000000	0.000000			
7	1.425000	0.000000	0.000000			
8	1.900000	0.000000	0.000000			
9	2.375000	0.000000	0.000000			
10	0.000000	0.000000	0.330000			
11	2.850000	0.000000	0.330000			
12	0.000000	0.000000	0.666000			
13	2.850000	0.000000	0.666000			
14	0.000000	0.000000	0.990000			
15	2.850000	0.000000	0.990000			
16	0.000000	0.000000	1.320000			
17	2.850000	0.000000	1.320000			
18	0.000000	0.000000	1.650000			
19	2.850000	0.000000	1.650000			

B A R D A T A : (18 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	5	0.475000	LOSA35			oS
2	5	6	0.475000	LOSA35			oS
3	6	7	0.475000	LOSA35			oS
4	7	8	0.475000	LOSA35			oS
5	8	9	0.475000	LOSA35			oS
6	9	2	0.475000	LOSA35			oS
7*	10	1	0.330000	ALA35			oS
8*	2	11	0.330000	ALA35			oS
9*	12	10	0.336000	ALA35			oS
10*	11	13	0.336000	ALA35			oS
11*	14	12	0.324000	ALA35			oS
12*	13	15	0.324000	ALA35			oS
13*	16	14	0.330000	ALA35			oS
14*	15	17	0.330000	ALA35			oS

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
15*	18	16	0.330000	ALA35			oS
16*	17	19	0.330000	ALA35			oS
17*	3	18	0.330000	ALA35			oS
18*	19	4	0.330000	ALA35			oS

Bars marked with "*" are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2] / zl [M]	Iy [M4] / zu [M]	Fz [M2]
ALA35	3.5000E-01 / -0.1750	3.5729E-03 / 0.1750	2.9167E-01
LOSA35	3.5000E-01 / -0.1750	3.5729E-03 / 0.1750	2.9167E-01

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [KN/ M2]	Shear-M [KN/ M2]
1 .. 18	3.3000E+07	1.3000E+07

STS-Run ok

Load case 1:

Loadtype		Value(a)	Distanc Value(b)	Joint -/member numb	
Mas.forc2	gl const.	-25.000		Stab	1 .. 18

Load case 2: AGUA

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl trapez.	0	-3.000		
		from...to	0	0.330000	Stab	17
Force	X	gl trapez.	-3.000	-6.000		
		from...to	0	0.330000	Stab	15
Force	X	gl trapez.	-6.000	-9.000		
		from...to	0	0.330000	Stab	13
Force	X	gl trapez.	-9.000	-11.945		
		from...to	0	0.324000	Stab	11
Force	X	gl trapez.	-11.945	-15.000		
		from...to	0	0.336000	Stab	9
Force	X	gl trapez.	-15.000	-18.000		
		from...to	0	0.330000	Stab	7
Force	X	gl trapez.	18.000	15.000		
		from...to	0	0.330000	Stab	8
Force	X	gl trapez.	15.000	11.945		
		from...to	0	0.336000	Stab	10
Force	X	gl trapez.	11.945	9.000		
		from...to	0	0.324000	Stab	12
Force	X	gl trapez.	9.000	6.000		
		from...to	0	0.330000	Stab	14
Force	X	gl trapez.	6.000	3.000		
		from...to	0	0.330000	Stab	16
Force	X	gl trapez.	3.000	9.5E-0007		
		from...to	0	0.330000	Stab	18
Force	Z	pj const.	-18.000		Stab	1 .. 6

Load case 3: gradiente

Loadtype		Value(a)	Distanc Value(b)	Joint -/member numb	
Curvat. Y	lo const.	0.000434		Stab	1 .. 18

Load case 4: gradiente

Loadtype		Value(a)	Distanc Value(b)	Joint -/member numb	
Curvat. Y	lo const.	-0.000434		Stab	1 .. 18

Load case 5: viento

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl const.	-1.510		Stab	8 10 12 14 16 18

ENVELOPE SPECIFIC.: AN ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		
B	PLUS	2	1.500		AGUA
C	PLUS	3	1.500		gradiente
D	OR	4	1.500		gradiente
E	PLUS	5	0.450000		viento
F	OR	5	-0.450000		viento

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
1	0	1.345	16.365	7.77E-08	A C F
		25.385	55.775	-17.642	A B D E
1	0.119	1.345	14.963	1.860	A C F
		25.385	51.166	-11.292	A B D E
1	0.237	1.345	13.560	3.554	A C F
		25.385	46.557	-5.490	A B D E
1	0.356	1.345	12.157	5.081	A C F
		25.385	41.948	-0.234824	A B D E
1	0.475	1.345	10.755	6.441	A C F
		25.385	37.339	4.473	A B D E
2	0	1.345	10.755	6.441	A C F
		25.385	37.339	4.473	A B D E
2	0.119	1.345	9.352	7.635	A C F
		25.385	32.730	8.633	A B D E
2	0.237	1.345	7.949	8.662	A C F
		25.385	28.121	12.246	A B D E
2	0.356	1.345	6.546	9.523	A C F
		25.385	23.512	15.312	A B D E
2	0.475	1.345	5.144	10.217	A C F
		25.385	18.903	17.830	A B D E
3	0	1.345	5.144	10.217	A C F
		25.385	18.903	17.830	A B D E
3	0.119	1.345	3.741	10.744	A C F
		25.385	14.294	19.802	A B D E
3	0.238	1.345	2.338	11.105	A C F
		25.385	9.685	21.225	A B D E
3	0.356	1.345	0.935381	11.300	A C F
		25.385	5.076	22.102	A B D E
3	0.475	28.075	-0.467353	21.099	A B C F
		-1.345	0.467353	12.659	A D E
4	0	28.075	-0.467354	21.099	A B C F
		-1.345	0.467353	12.659	A D E
4	0.119	28.075	-5.076	20.770	A B C F

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-1.345	-0.935381	12.632	A D E
4	0.237	28.075	-9.685	19.893	A B C F
		-1.345	-2.338	12.437	A D E
4	0.356	28.075	-14.294	18.470	A B C F
		-1.345	-3.741	12.076	A D E
4	0.475	28.075	-18.903	16.499	A B C F
		-1.345	-5.144	11.549	A D E
5	0	28.075	-18.903	16.499	A B C F
		-1.345	-5.144	11.549	A D E
5	0.119	28.075	-23.512	13.980	A B C F
		-1.345	-6.546	10.855	A D E
5	0.238	28.075	-28.121	10.914	A B C F
		-1.345	-7.949	9.994	A D E
5	0.356	28.075	-32.730	7.301	A B C F
		-1.345	-9.352	8.967	A D E
5	0.475	28.075	-37.339	3.141	A B C F
		-1.345	-10.755	7.773	A D E
6	0	28.075	-37.339	3.141	A B C F
		-1.345	-10.755	7.773	A D E
6	0.119	28.075	-41.948	-1.567	A B C F
		-1.345	-12.157	6.413	A D E
6	0.238	28.075	-46.557	-6.822	A B C F
		-1.345	-13.560	4.886	A D E
6	0.356	28.075	-51.166	-12.624	A B C F
		-1.345	-14.963	3.192	A D E
6	0.475	28.075	-55.775	-18.974	A B C F
		-1.345	-16.365	1.332	A D E
7	0	-19.491	-18.563	-10.209	A B C F
		-19.491	2.79E-11	3.86E-11	A D E
7	0.0825	-20.465	-20.465	-11.819	A B C F
		-20.465	2.79E-11	4.09E-11	A D E
7	0.165	-21.440	-22.461	-13.589	A B C F
		-21.440	2.79E-11	4.32E-11	A D E
7	0.247	-22.414	-24.549	-15.527	A B C F
		-22.414	2.79E-11	4.55E-11	A D E
7	0.330	-23.389	-26.730	-17.642	A B C F
		-23.389	2.79E-11	4.78E-11	A D E
8	0	-23.389	-1.345	1.332	A D E
		-23.389	28.075	-18.974	A B C F
8	0.0825	-22.414	-1.289	1.223	A D E
		-22.414	25.838	-16.750	A B C F
8	0.165	-21.440	-1.233	1.119	A D E
		-21.440	23.694	-14.708	A B C F
8	0.247	-20.465	-1.177	1.020	A D E
		-20.465	21.842	-12.838	A B C F
8	0.330	-19.491	-1.121	0.924969	A D E
		-19.491	19.684	-11.114	A B C F

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
9	0	-15.522	-11.772	-5.156	A B C F
		-15.522	3.06E-11	2.76E-11	A D E
9	0.0840	-16.514	-13.325	-6.210	A B C F
		-16.514	3.06E-11	3.01E-11	A D E
9	0.168	-17.506	-14.975	-7.398	A B C F
		-17.506	3.06E-11	3.27E-11	A D E
9	0.252	-18.498	-16.721	-8.728	A B C F
		-18.498	3.06E-11	3.53E-11	A D E
9	0.336	-19.491	-18.562	-10.209	A B C F
		-19.491	3.06E-11	3.79E-11	A D E
10	0	-19.491	-1.121	0.924969	A D E
		-19.491	19.684	-11.134	A B C F
10	0.0840	-18.498	-1.064	0.833188	A D E
		-18.498	17.785	-9.561	A B C F
10	0.168	-17.506	-1.007	0.746201	A D E
		-17.506	15.982	-8.144	A B C F
10	0.252	-16.514	-0.949941	0.664009	A D E
		-16.514	14.275	-6.874	A B C F
10	0.336	-15.522	-0.892863	0.586611	A D E
		-15.522	12.665	-5.743	A B C F
11	0	-11.694	-6.683	-2.205	A B C F
		-11.694	2.94E-11	1.53E-11	A D E
11	0.0810	-12.651	-7.821	-2.792	A B C F
		-12.651	2.94E-11	1.77E-11	A D E
11	0.162	-13.608	-9.048	-3.475	A B C F
		-13.608	2.94E-11	2.01E-11	A D E
11	0.243	-14.565	-10.366	-4.260	A B C F
		-14.565	2.94E-11	2.25E-11	A D E
11	0.324	-15.522	-11.772	-5.156	A B C F
		-15.522	2.94E-11	2.49E-11	A D E
12	0	-15.522	-0.892863	0.586611	A D E
		-15.522	12.665	-5.743	A B C F
12	0.0810	-14.565	-0.837824	0.516518	A D E
		-14.565	11.203	-4.777	A B C F
12	0.162	-13.608	-0.782784	0.450884	A D E
		-13.608	9.831	-3.925	A B C F
12	0.243	-12.651	-0.727745	0.389707	A D E
		-12.651	8.548	-3.182	A B C F
12	0.324	-11.694	-0.672705	0.332989	A D E
		-11.694	7.355	-2.538	A B C F
13	0	-7.796	-2.970	-0.653400	A B C F
		-7.796	3.67E-11	5.34E-12	A D E
13	0.0825	-8.771	-3.759	-0.930329	A B C F
		-8.771	3.67E-11	8.37E-12	A D E
13	0.165	-9.745	-4.641	-1.276	A B C F
		-9.745	3.67E-11	1.14E-11	A D E

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
13	0.248	-10.720	-5.615	-1.699	A B C F
		-10.720	3.67E-11	1.44E-11	A D E
13	0.330	-11.694	-6.682	-2.205	A B C F
		-11.694	3.67E-11	1.75E-11	A D E
14	0	-11.694	-0.672705	0.332989	A D E
		-11.694	7.355	-2.538	A B C F
14	0.0825	-10.720	-0.616646	0.279803	A D E
		-10.720	6.232	-1.978	A B C F
14	0.165	-9.745	-0.560588	0.231242	A D E
		-9.745	5.201	-1.507	A B C F
14	0.248	-8.771	-0.504529	0.187306	A D E
		-8.771	4.263	-1.118	A B C F
14	0.330	-7.796	-0.448470	0.147995	A D E
		-7.796	3.418	-0.801395	A B C F
15	0	-3.898	-0.742500	-0.081675	A B C F
		-3.898	1.65E-11	-6.17E-12	A D E
15	0.0825	-4.873	-1.160	-0.159521	A B C F
		-4.873	1.65E-11	-4.81E-12	A D E
15	0.165	-5.847	-1.671	-0.275653	A B C F
		-5.847	1.65E-11	-3.44E-12	A D E
15	0.247	-6.822	-2.274	-0.437727	A B C F
		-6.822	1.65E-11	-2.08E-12	A D E
15	0.330	-7.796	-2.970	-0.653400	A B C F
		-7.796	1.65E-11	-7.12E-13	A D E
16	0	-7.796	-0.448470	0.147995	A D E
		-7.796	3.418	-0.801395	A B C F
16	0.0825	-6.822	-0.392411	0.111309	A D E
		-6.822	2.666	-0.551036	A B C F
16	0.165	-5.847	-0.336353	0.083247	A D E
		-5.847	2.007	-0.358901	A B C F
16	0.247	-4.873	-0.280294	0.057811	A D E
		-4.873	1.440	-0.217332	A B C F
16	0.330	-3.898	-0.224235	0.036999	A D E
		-3.898	0.966735	-0.118674	A B C F
17	0	-3.90E-08	-5.96E-12	1.89E-12	A B D E
		-3.90E-08	4.35E-12	-2.07E-12	A C F
17	0.0825	-0.974531	-0.046406	-0.001276	A B D E
		-0.974531	4.35E-12	-1.71E-12	A C F
17	0.165	-1.949	-0.185625	-0.010209	A B D E
		-1.949	4.35E-12	-1.35E-12	A C F
17	0.248	-2.924	-0.417656	-0.034457	A B D E
		-2.924	4.35E-12	-9.94E-13	A C F
17	0.330	-3.898	-0.742500	-0.081675	A B D E
		-3.898	4.35E-12	-6.35E-13	A C F
18	0	-3.898	-0.224235	0.036999	A D E
		-3.898	0.966735	-0.118674	A B C F

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
18	0.0825	-2.924	-0.168176	0.020812	A D E
		-2.924	0.585833	-0.055268	A B C F
18	0.165	-1.949	-0.112118	0.009250	A D E
		-1.949	0.297743	-0.019459	A B C F
18	0.248	-0.974531	-0.056059	0.002312	A D E
		-0.974531	0.102465	-0.001589	A B C F
18	0.330	-3.90E-08	-2.25E-09	4.78E-12	A D E
		-3.90E-08	2.25E-09	-3.35E-12	A B C F

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
1	0	28.075	54.840	-17.642	A B C F
		-1.345	17.300	8.22E-08	A D E
1	0.119	28.075	50.231	-11.403	A B C F
		-1.345	15.897	1.971	A D E
1	0.237	28.075	45.622	-5.712	A B C F
		-1.345	14.495	3.776	A D E
1	0.356	28.075	41.014	-0.567811	A B C F
		-1.345	13.092	5.414	A D E
1	0.475	28.075	36.405	4.029	A B C F
		-1.345	11.689	6.885	A D E
2	0	28.075	36.405	4.029	A B C F
		-1.345	11.689	6.885	A D E
2	0.119	1.345	9.352	7.635	A C F
		25.385	32.730	8.633	A B D E
2	0.237	1.345	7.949	8.662	A C F
		25.385	28.121	12.246	A B D E
2	0.356	1.345	6.546	9.523	A C F
		25.385	23.512	15.312	A B D E
2	0.475	1.345	5.144	10.217	A C F
		25.385	18.903	17.830	A B D E
3	0	1.345	5.144	10.217	A C F
		25.385	18.903	17.830	A B D E
3	0.119	1.345	3.741	10.744	A C F
		25.385	14.294	19.802	A B D E
3	0.238	1.345	2.338	11.105	A C F
		25.385	9.685	21.225	A B D E
3	0.356	1.345	0.935381	11.300	A C F
		25.385	5.076	22.102	A B D E
3	0.475	1.345	-0.467353	11.327	A C F
		25.385	0.467352	22.431	A B D E

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
4	0	1.345	-0.467353	11.327	A C F
		25.385	0.467352	22.431	A B D E
4	0.119	1.345	-1.870	11.189	A C F
		25.385	-4.142	22.213	A B D E
4	0.237	1.345	-3.273	10.883	A C F
		25.385	-8.751	21.447	A B D E
4	0.356	1.345	-4.676	10.411	A C F
		25.385	-13.360	20.135	A B D E
4	0.475	1.345	-6.078	9.773	A C F
		25.385	-17.969	18.274	A B D E
5	0	1.345	-6.078	9.773	A C F
		25.385	-17.969	18.274	A B D E
5	0.119	1.345	-7.481	8.968	A C F
		25.385	-22.578	15.867	A B D E
5	0.238	1.345	-8.884	7.998	A C F
		25.385	-27.187	12.912	A B D E
5	0.356	1.345	-10.286	6.858	A C F
		25.385	-31.796	9.410	A B D E
5	0.475	28.075	-37.339	3.141	A B C F
		-1.345	-10.755	7.773	A D E
6	0	28.075	-37.339	3.141	A B C F
		-1.345	-10.755	7.773	A D E
6	0.119	28.075	-41.948	-1.567	A B C F
		-1.345	-12.157	6.413	A D E
6	0.238	28.075	-46.557	-6.822	A B C F
		-1.345	-13.560	4.886	A D E
6	0.356	28.075	-51.166	-12.624	A B C F
		-1.345	-14.963	3.192	A D E
6	0.475	28.075	-55.775	-18.974	A B C F
		-1.345	-16.365	1.332	A D E
7	0	-19.491	-18.563	-10.209	A B C F
		-19.491	2.79E-11	3.86E-11	A D E
7	0.0825	-20.465	-20.465	-11.819	A B C F
		-20.465	2.79E-11	4.09E-11	A D E
7	0.165	-21.440	-22.461	-13.589	A B C F
		-21.440	2.79E-11	4.32E-11	A D E
7	0.247	-22.414	-24.549	-15.527	A B C F
		-22.414	2.79E-11	4.55E-11	A D E
7	0.330	-23.389	-26.730	-17.642	A B C F
		-23.389	2.79E-11	4.78E-11	A D E
8	0	-23.389	28.075	-18.974	A B C F
		-23.389	-1.345	1.332	A D E
8	0.0825	-22.414	25.838	-16.750	A B C F
		-22.414	-1.289	1.223	A D E
8	0.165	-21.440	23.694	-14.708	A B C F
		-21.440	-1.233	1.119	A D E
8	0.247	-20.465	21.642	-12.838	A B C F

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-20.465	-1.177	1.030	A D E
8	0.330	-19.491	19.684	-11.134	A B C F
		-19.491	-1.121	0.924969	A D E
9	0	-15.522	-11.772	-5.156	A B C F
		-15.522	3.06E-11	2.76E-11	A D E
9	0.0840	-16.514	-13.325	-6.210	A B C F
		-16.514	3.06E-11	3.01E-11	A D E
9	0.168	-17.506	-14.975	-7.398	A B C F
		-17.506	3.06E-11	3.27E-11	A D E
9	0.252	-18.498	-16.721	-8.728	A B C F
		-18.498	3.06E-11	3.53E-11	A D E
9	0.336	-19.491	-18.562	-10.209	A B C F
		-19.491	3.06E-11	3.79E-11	A D E
10	0	-19.491	19.684	-11.134	A B C F
		-19.491	-1.121	0.924969	A D E
10	0.0840	-18.498	17.785	-9.561	A B C F
		-18.498	-1.064	0.833188	A D E
10	0.168	-17.506	15.982	-8.144	A B C F
		-17.506	-1.007	0.746201	A D E
10	0.252	-16.514	14.275	-6.874	A B C F
		-16.514	-0.949941	0.664009	A D E
10	0.336	-15.522	12.665	-5.743	A B C F
		-15.522	-0.892863	0.586611	A D E
11	0	-11.694	-6.683	-2.205	A B C F
		-11.694	2.94E-11	1.53E-11	A D E
11	0.0810	-12.651	-7.821	-2.792	A B C F
		-12.651	2.94E-11	1.77E-11	A D E
11	0.162	-13.608	-9.048	-3.475	A B C F
		-13.608	2.94E-11	2.01E-11	A D E
11	0.243	-14.565	-10.366	-4.260	A B C F
		-14.565	2.94E-11	2.25E-11	A D E
11	0.324	-15.522	-11.772	-5.156	A B C F
		-15.522	2.94E-11	2.49E-11	A D E
12	0	-15.522	12.665	-5.743	A B C F
		-15.522	-0.892863	0.586611	A D E
12	0.0810	-14.565	11.203	-4.777	A B C F
		-14.565	-0.837824	0.516518	A D E
12	0.162	-13.608	9.831	-3.925	A B C F
		-13.608	-0.782784	0.450884	A D E
12	0.243	-12.651	8.548	-3.182	A B C F
		-12.651	-0.727745	0.389707	A D E
12	0.324	-11.694	7.355	-2.538	A B C F
		-11.694	-0.672705	0.332989	A D E
13	0	-7.796	-2.970	-0.653400	A B C F
		-7.796	3.67E-11	5.34E-12	A D E
13	0.0825	-8.771	-3.759	-0.930329	A B C F

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-8.771	3.67E-11	8.37E-12	A D E
13	0.165	-9.745	-4.641	-1.276	A B C F
		-9.745	3.67E-11	1.14E-11	A D E
13	0.248	-10.720	-5.615	-1.699	A B C F
		-10.720	3.67E-11	1.44E-11	A D E
13	0.330	-11.694	-6.682	-2.205	A B C F
		-11.694	3.67E-11	1.75E-11	A D E
14	0	-11.694	7.355	-2.538	A B C F
		-11.694	-0.672705	0.332989	A D E
14	0.0825	-10.720	6.232	-1.978	A B C F
		-10.720	-0.616646	0.279803	A D E
14	0.165	-9.745	5.201	-1.507	A B C F
		-9.745	-0.560588	0.231242	A D E
14	0.248	-8.771	4.263	-1.118	A B C F
		-8.771	-0.504529	0.187306	A D E
14	0.330	-7.796	3.418	-0.801395	A B C F
		-7.796	-0.448470	0.147995	A D E
15	0	-3.898	-0.742500	-0.081675	A B D E
		-3.898	-1.49E-11	5.67E-12	A C F
15	0.0825	-4.873	-1.160	-0.159521	A B D E
		-4.873	-1.49E-11	4.44E-12	A C F
15	0.165	-5.847	-1.671	-0.275653	A B D E
		-5.847	-1.49E-11	3.20E-12	A C F
15	0.247	-6.822	-2.274	-0.437727	A B D F
		-6.822	-1.47E-11	1.98E-12	A C E
15	0.330	-7.796	-2.970	-0.653400	A B D F
		-7.796	-1.47E-11	7.73E-13	A C E
16	0	-7.796	3.418	-0.801395	A B C F
		-7.796	-0.448470	0.147995	A D E
16	0.0825	-6.822	2.666	-0.551036	A B C F
		-6.822	-0.392411	0.111309	A D E
16	0.165	-5.847	2.007	-0.358901	A B C F
		-5.847	-0.336353	0.083247	A D E
16	0.247	-4.873	1.440	-0.217332	A B C F
		-4.873	-0.280294	0.057811	A D E
16	0.330	-3.898	0.966735	-0.118674	A B C F
		-3.898	-0.224235	0.036999	A D E
17	0	-3.90E-08	3.71E-12	-2.11E-12	A B C F
		-3.90E-08	-5.32E-12	1.92E-12	A D E
17	0.0825	-0.974531	-0.046406	-0.001276	A B C E
		-0.974531	-5.30E-12	1.45E-12	A D F
17	0.165	-1.949	-0.185625	-0.010209	A B C E
		-1.949	-5.30E-12	1.05E-12	A D F
17	0.248	-2.924	-0.417656	-0.034457	A B C E
		-2.924	-5.30E-12	6.11E-13	A D F
17	0.330	-3.898	-0.742500	-0.081675	A B C E
		-3.898	-5.30E-12	1.74E-13	A D F

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
18	0	-3.898	0.966735	-0.118674	A B C F
		-3.898	-0.224235	0.030999	A D E
18	0.0825	-2.924	0.585833	-0.055268	A B C F
		-2.924	-0.168176	0.020812	A D E
18	0.165	-1.949	0.297743	-0.019459	A B C F
		-1.949	-0.112118	0.009250	A D E
18	0.248	-0.974531	0.102465	-0.003589	A B C F
		-0.974531	-0.056059	0.002312	A D E
18	0.330	-3.90E-08	2.25E-09	-3.40E-12	A C F
		-3.90E-08	-2.24E-09	4.82E-12	A B D E

ENVELOPE SPECIFIC.: AO ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		
B	PLUS	2	1.000		AGUA
C	PLUS	3	0.600000		gradiente
D	OR	4	0.600000		gradiente

ENVELOPE for < Vz > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
1	0	1.53E-11	12.469	5.92E-08	A C
		17.820	38.119	-11.761	A B D
1	0.119	1.53E-11	11.430	1.419	A C
		17.820	34.942	-7.423	A B D
1	0.237	1.53E-11	10.391	2.715	A C
		17.820	31.766	-3.462	A B D
1	0.356	1.53E-11	9.352	3.887	A C
		17.820	28.589	0.121129	A B D
1	0.475	1.53E-11	8.313	4.936	A C
		17.820	25.412	3.327	A B D
2	0	1.53E-11	8.312	4.936	A C
		17.820	25.412	3.327	A B D
2	0.119	1.53E-11	7.273	5.861	A C
		17.820	22.236	6.157	A B D
2	0.237	1.53E-11	6.234	6.663	A C

ENVELOPE for < Vz > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		17.820	19.059	8.609	A B D
2	0.356	1.53E-11	5.195	7.342	A C
		17.820	15.883	10.683	A B D
2	0.475	1.53E-11	4.156	7.897	A C
		17.820	12.706	12.381	A B D
3	0	1.53E-11	4.156	7.897	A C
		17.820	12.706	12.381	A B D
3	0.119	1.53E-11	3.117	8.329	A C
		17.820	9.530	13.701	A B D
3	0.238	1.53E-11	2.078	8.637	A C
		17.820	6.353	14.644	A B D
3	0.356	1.53E-11	1.039	8.822	A C
		17.820	3.177	15.210	A B D
3	0.475	17.820	-3.10E-07	15.398	A B C
		-1.95E-11	4.16E-08	8.884	A D
4	0	17.820	-5.64E-07	15.398	A B C
		-1.95E-11	-4.16E-08	8.884	A D
4	0.119	17.820	-3.177	15.210	A B C
		-1.95E-11	-1.039	8.822	A D
4	0.237	17.820	-6.353	14.644	A B C
		-1.95E-11	-2.078	8.637	A D
4	0.356	17.820	-9.530	13.701	A B C
		-1.95E-11	-1.117	8.329	A D
4	0.475	17.820	-12.706	12.381	A B C
		-1.95E-11	-4.156	7.897	A D
5	0	17.820	-12.706	12.381	A B C
		-1.95E-11	-4.156	7.897	A D
5	0.119	17.820	-15.883	10.683	A B C
		-1.95E-11	-5.195	7.342	A D
5	0.238	17.820	-19.059	8.609	A B C
		-1.95E-11	-6.234	6.663	A D
5	0.356	17.820	-22.236	6.157	A B C
		-1.95E-11	-7.273	5.861	A D
5	0.475	17.820	-25.413	3.327	A B C
		-1.95E-11	-8.312	4.936	A D
6	0	17.820	-25.413	3.327	A B C
		-1.95E-11	-8.313	4.936	A D
6	0.119	17.820	-28.589	0.121128	A B C
		-1.95E-11	-9.352	3.887	A D
6	0.238	17.820	-31.766	-3.462	A B C
		-1.95E-11	-10.391	2.715	A D
6	0.356	17.820	-34.942	-7.423	A B C
		-1.95E-11	-11.430	1.419	A D
6	0.475	17.820	-38.119	-11.761	A B C
		-1.95E-11	-12.469	5.93E-08	A D
7	0	-14.438	-12.375	-6.806	A B C

ENVELOPE for < Vz > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-14.438	1.17E-11	1.62E-11	A D
7	0.0825	-15.159	-11.643	-7.879	A B C
		-15.159	1.17E-11	1.72E-11	A D
7	0.165	-15.881	-14.974	-9.059	A B C
		-15.881	1.17E-11	1.82E-11	A D
7	0.247	-16.603	-16.366	-10.351	A B C
		-16.603	1.17E-11	1.92E-11	A D
7	0.330	-17.325	-17.820	-11.761	A B C
		-17.325	1.17E-11	2.01E-11	A D
8	0	-17.325	-1.94E-11	3.21E-11	A D
		-17.325	17.820	-11.761	A B C
8	0.0825	-16.603	-1.94E-11	3.05E-11	A D
		-16.603	16.366	-10.351	A B C
8	0.165	-15.881	-1.94E-11	2.89E-11	A D
		-15.881	14.974	-9.059	A B C
8	0.247	-15.159	-1.94E-11	2.73E-11	A D
		-15.159	13.643	-7.879	A B C
8	0.330	-14.438	-1.94E-11	2.57E-11	A D
		-14.438	12.375	-6.806	A B C
9	0	-11.498	-7.848	-3.437	A B C
		-11.498	1.29E-11	1.16E-11	A D
9	0.0840	-12.232	-8.884	-4.140	A B C
		-12.232	1.29E-11	1.27E-11	A D
9	0.168	-12.967	-9.983	-4.932	A B C
		-12.967	1.29E-11	1.38E-11	A D
9	0.252	-13.702	-11.147	-5.819	A B C
		-13.702	1.29E-11	1.49E-11	A D
9	0.336	-14.437	-12.375	-6.806	A B C
		-14.437	1.29E-11	1.59E-11	A D
10	0	-14.437	-2.00E-11	2.56E-11	A D
		-14.437	12.375	-6.806	A B C
10	0.0840	-13.702	-2.00E-11	2.39E-11	A D
		-13.702	11.147	-5.819	A B C
10	0.168	-12.967	-2.00E-11	2.22E-11	A D
		-12.967	9.983	-4.932	A B C
10	0.252	-12.232	-2.00E-11	2.06E-11	A D
		-12.232	8.884	-4.140	A B C
10	0.336	-11.498	-2.00E-11	1.89E-11	A D
		-11.498	7.848	-3.437	A B C
11	0	-8.663	-4.455	-1.470	A B C
		-8.663	1.25E-11	6.44E-12	A D
11	0.0810	-9.371	-5.214	-1.861	A B C
		-9.371	1.25E-11	7.45E-12	A D
11	0.162	-10.080	-6.032	-2.316	A B C
		-10.080	1.25E-11	8.46E-12	A D
11	0.243	-10.789	-6.910	-2.840	A B C
		-10.789	1.25E-11	9.47E-12	A D

ENVELOPE for < Vz > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
11	0.324	-11.497	-7.848	-3.437	A B C
		-11.497	1.25E-11	1.05E-11	A D
12	0	-11.497	-2.01E-11	1.80E-11	A D
		-11.497	7.848	-3.437	A B C
12	0.0810	-10.789	-2.01E-11	1.63E-11	A D
		-10.789	6.910	-2.840	A B C
12	0.162	-10.080	-2.01E-11	1.47E-11	A D
		-10.080	6.032	-2.316	A B C
12	0.243	-9.371	-2.01E-11	1.31E-11	A D
		-9.371	5.214	-1.861	A B C
12	0.324	-8.663	-2.01E-11	1.15E-11	A D
		-8.663	4.455	-1.470	A B C
13	0	-5.775	-1.980	-0.435600	A B C
		-5.775	1.55E-11	2.23E-12	A D
13	0.0825	-6.497	-2.506	-0.620220	A B C
		-6.497	1.55E-11	3.51E-12	A D
13	0.165	-7.219	-3.094	-0.850781	A B C
		-7.219	1.55E-11	4.79E-12	A D
13	0.248	-7.941	-3.743	-1.132	A B C
		-7.941	1.55E-11	6.07E-12	A D
13	0.330	-8.662	-4.455	-1.470	A B C
		-8.662	1.55E-11	7.35E-12	A D
14	0	-8.662	-2.01E-11	1.12E-11	A D
		-8.662	4.455	-1.470	A B C
14	0.0825	-7.941	-2.01E-11	9.56E-12	A D
		-7.941	3.743	-1.132	A B C
14	0.165	-7.219	-2.01E-11	7.90E-12	A D
		-7.219	3.094	-0.850782	A B C
14	0.248	-6.497	-2.01E-11	6.25E-12	A D
		-6.497	2.506	-0.620220	A B C
14	0.330	-5.775	-2.01E-11	4.59E-12	A D
		-5.775	1.980	-0.435600	A B C
15	0	-2.888	-0.495000	-0.054450	A B C
		-2.888	6.84E-12	-2.54E-12	A D
15	0.0825	-3.609	-0.773438	-0.106348	A B C
		-3.609	6.84E-12	-1.98E-12	A D
15	0.165	-4.331	-1.114	-0.183769	A B C
		-4.331	6.84E-12	-1.42E-12	A D
15	0.247	-5.053	-1.516	-0.291818	A B C
		-5.053	6.84E-12	-8.51E-13	A D
15	0.330	-5.775	-1.980	-0.435600	A B C
		-5.775	6.84E-12	-2.86E-13	A D
16	0	-5.775	-1.07E-11	4.20E-12	A D
		-5.775	1.980	-0.435600	A B C
16	0.0825	-5.053	-1.07E-11	3.31E-12	A D
		-5.053	1.516	-0.291818	A B C

ENVELOPE for < Vz > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
16	0.165	-4.331	-1.07E-11	2.43E-12	A D
		-4.331	1.114	-0.183769	A B C
16	0.247	-3.609	1.07E-11	1.55E-12	A D
		-3.609	0.773438	-0.106348	A B C
16	0.330	-2.888	-1.07E-11	6.65E-13	A D
		-2.888	0.495000	-0.054450	A B C
17	0	-2.89E-08	-2.72E-12	7.20E-13	A B D
		-2.89E-08	1.57E-12	-8.53E-13	A C
17	0.0825	-0.721875	-0.030938	-0.000851	A B D
		-0.721875	1.57E-12	-7.23E-13	A C
17	0.165	-1.444	-0.123750	-0.006806	A B D
		-1.444	1.57E-12	-5.94E-13	A C
17	0.248	-2.166	-0.278438	-0.022971	A B D
		-2.166	1.57E-12	-4.64E-13	A C
17	0.330	-2.887	-0.495000	-0.054450	A B D
		-2.887	1.57E-12	-3.34E-13	A C
18	0	-2.887	-7.58E-13	2.39E-12	A D
		-2.887	0.495000	-0.054450	A B C
18	0.0825	-2.166	-7.58E-13	2.32E-12	A D
		-2.166	0.278438	-0.022971	A B C
18	0.165	-1.444	-7.58E-13	2.26E-12	A D
		-1.444	0.123750	-0.006806	A B C
18	0.248	-0.721875	-7.58E-13	2.20E-12	A D
		-0.721875	0.030938	-0.000851	A B C
18	0.330	-2.89E-08	-7.58E-13	2.14E-12	A D
		-2.89E-08	3.37E-12	-1.09E-12	A B C

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN , 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
1	0	17.820	38.119	-11.761	A B C
		-1.95E-11	12.469	5.92E-08	A D
1	0.119	17.820	34.942	-7.423	A B C
		-1.95E-11	11.430	1.419	A D
1	0.237	17.820	31.766	-3.462	A B C
		-1.95E-11	10.391	2.715	A D
1	0.356	17.820	28.589	0.121129	A B C
		-1.95E-11	9.352	3.887	A D
1	0.475	17.820	25.412	3.327	A B C
		-1.95E-11	8.313	4.936	A D
2	0	17.820	25.412	3.327	A B C
		-1.95E-11	8.312	4.936	A D

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
2	0.119	1.53E-11	7.273	5.861	A C
		17.820	22.236	6.157	A B D
2	0.237	1.53E-11	6.234	6.663	A C
		17.820	19.059	8.609	A B D
2	0.356	1.53E-11	5.195	7.342	A C
		17.820	15.883	10.683	A B D
2	0.475	1.53E-11	4.156	7.897	A C
		17.820	12.706	12.381	A B D
3	0	1.53E-11	4.156	7.897	A C
		17.820	12.706	12.381	A B D
3	0.119	1.53E-11	3.117	8.329	A C
		17.820	9.530	13.701	A B D
3	0.238	1.53E-11	2.078	8.637	A C
		17.820	6.353	14.644	A B D
3	0.356	1.53E-11	1.039	8.822	A C
		17.820	3.177	15.210	A B D
3	0.475	1.53E-11	4.16E-08	8.884	A C
		17.820	-3.10E-07	15.398	A B D
4	0	1.53E-11	-4.16E-08	8.884	A C
		17.820	-5.64E-07	15.398	A B D
4	0.119	1.53E-11	-1.039	8.822	A C
		17.820	-3.177	15.210	A B D
4	0.237	1.53E-11	-2.078	8.637	A C
		17.820	-6.353	14.644	A B D
4	0.356	1.53E-11	-3.117	8.329	A C
		17.820	-9.530	13.701	A B D
4	0.475	1.53E-11	-4.156	7.897	A C
		17.820	-12.706	12.381	A B D
5	0	1.53E-11	-4.156	7.897	A C
		17.820	-12.706	12.381	A B D
5	0.119	1.53E-11	-5.195	7.342	A C
		17.820	-15.883	10.683	A B D
5	0.238	1.53E-11	-6.234	6.663	A C
		17.820	-19.059	8.609	A B D
5	0.356	1.53E-11	-7.273	5.861	A C
		17.820	-22.236	6.157	A B D
5	0.475	17.820	-25.413	3.327	A B C
		-1.95E-11	-8.312	4.936	A D
6	0	17.820	-25.413	3.327	A B C
		-1.95E-11	-8.313	4.936	A D
6	0.119	17.820	-28.589	0.121128	A B C
		-1.95E-11	-9.352	3.887	A D
6	0.238	17.820	-31.766	-3.462	A B C
		-1.95E-11	-10.391	2.715	A D
6	0.356	17.820	-34.942	-7.423	A B C
		-1.95E-11	-11.430	1.419	A D
6	0.475	17.820	-38.119	-11.761	A B C

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-1.95E-11	-12.469	5.93E-08	A D
7	0	-14.438	-12.375	-6.806	A B C
		-14.438	1.17E-11	1.62E-11	A D
7	0.0825	-15.159	-13.643	-7.879	A B C
		-15.159	1.17E-11	1.72E-11	A D
7	0.165	-15.881	-14.974	-9.059	A B C
		-15.881	1.17E-11	1.82E-11	A D
7	0.247	-16.603	-16.366	-10.351	A B C
		-16.603	1.17E-11	1.92E-11	A D
7	0.330	-17.325	-17.820	-11.761	A B C
		-17.325	1.17E-11	2.01E-11	A D
8	0	-17.325	17.820	-11.761	A B C
		-17.325	-1.94E-11	3.21E-11	A D
8	0.0825	-16.603	16.366	-10.351	A B C
		-16.603	-1.94E-11	3.05E-11	A D
8	0.165	-15.881	14.974	-9.059	A B C
		-15.881	-1.94E-11	2.89E-11	A D
8	0.247	-15.159	13.643	-7.879	A B C
		-15.159	-1.94E-11	2.73E-11	A D
8	0.330	-14.438	12.375	-6.806	A B C
		-14.438	-1.94E-11	2.57E-11	A D
9	0	-11.498	-7.848	-3.437	A B C
		-11.498	1.29E-11	1.16E-11	A D
9	0.0840	-12.232	-8.884	-4.140	A B C
		-12.232	1.29E-11	1.27E-11	A D
9	0.168	-12.967	-9.983	-4.932	A B C
		-12.967	1.29E-11	1.38E-11	A D
9	0.252	-13.702	-11.147	-5.819	A B C
		-13.702	1.29E-11	1.49E-11	A D
9	0.336	-14.437	-12.375	-6.806	A B C
		-14.437	1.29E-11	1.59E-11	A D
10	0	-14.437	12.375	-6.806	A B C
		-14.437	-2.00E-11	2.56E-11	A D
10	0.0840	-13.702	11.147	-5.819	A B C
		-13.702	-2.00E-11	2.39E-11	A D
10	0.168	-12.967	9.983	-4.932	A B C
		-12.967	-2.00E-11	2.22E-11	A D
10	0.252	-12.232	8.884	-4.140	A B C
		-12.232	-2.00E-11	2.06E-11	A D
10	0.336	-11.498	7.848	-3.437	A B C
		-11.498	-2.00E-11	1.89E-11	A D
11	0	-8.663	-4.455	-1.470	A B C
		-8.663	1.25E-11	6.44E-12	A D
11	0.0810	-9.371	-5.214	-1.861	A B C
		-9.371	1.25E-11	7.45E-12	A D
11	0.162	-10.080	-6.032	-2.316	A B C

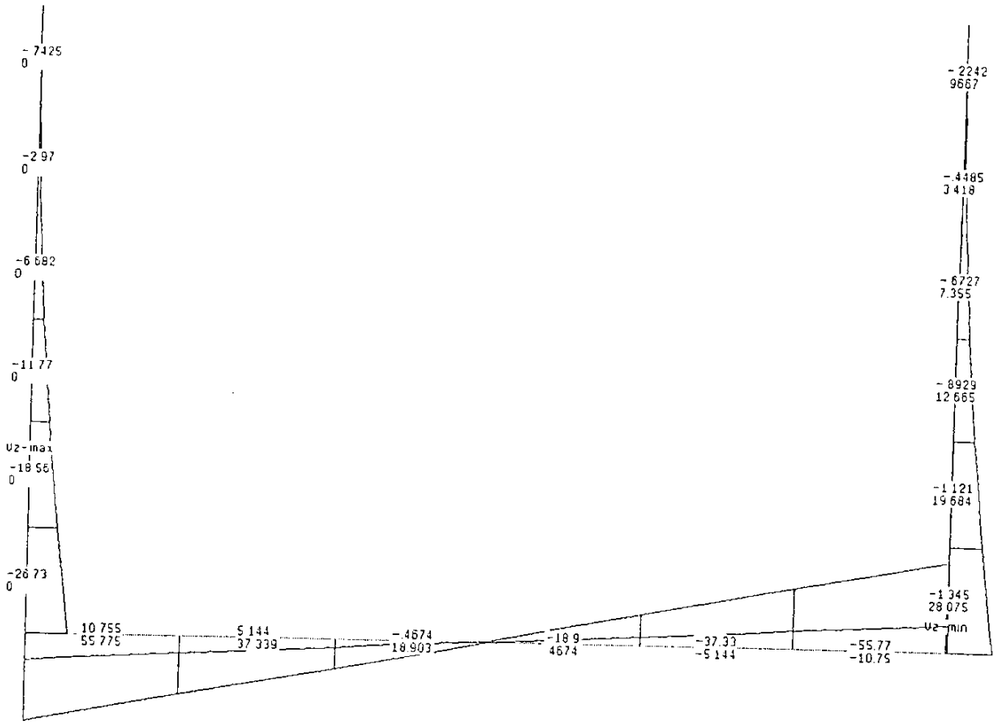
ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-10.080	1.25E-11	8.46E-12	A D
11	0.243	-10.789	-6.910	-2.840	A B C
		-10.789	1.25E-11	9.47E-12	A D
11	0.324	-11.497	-7.848	-3.437	A B C
		-11.497	1.25E-11	1.05E-11	A D
12	0	-11.497	7.848	-3.437	A B C
		-11.497	-2.01E-11	1.80E-11	A D
12	0.0810	-10.789	6.910	-2.840	A B C
		-10.789	-2.01E-11	1.63E-11	A D
12	0.162	-10.080	6.032	-2.316	A B C
		-10.080	-2.01E-11	1.47E-11	A D
12	0.243	-9.371	5.214	-1.861	A B C
		-9.371	-2.01E-11	1.31E-11	A D
12	0.324	-8.663	4.455	-1.470	A B C
		-8.663	-2.01E-11	1.15E-11	A D
13	0	-5.775	-1.980	-0.435600	A B C
		-5.775	1.55E-11	2.23E-12	A D
13	0.0825	-6.497	-2.506	-0.620220	A B C
		-6.497	1.55E-11	3.51E-12	A D
13	0.165	-7.219	-3.094	-0.850781	A B C
		-7.219	1.55E-11	4.79E-12	A D
13	0.248	-7.941	-3.743	-1.132	A B C
		-7.941	1.55E-11	6.07E-12	A D
13	0.330	-8.662	-4.455	-1.470	A B C
		-8.662	1.55E-11	7.35E-12	A D
14	0	-8.662	4.455	-1.470	A B C
		-8.662	-2.01E-11	1.12E-11	A D
14	0.0825	-7.941	3.743	-1.132	A B C
		-7.941	-2.01E-11	9.56E-12	A D
14	0.165	-7.219	3.094	-0.850782	A B C
		-7.219	-2.01E-11	7.90E-12	A D
14	0.248	-6.497	2.506	-0.620220	A B C
		-6.497	-2.01E-11	6.25E-12	A D
14	0.330	-5.775	1.980	-0.435600	A B C
		-5.775	-2.01E-11	4.59E-12	A D
15	0	-2.888	-0.495000	-0.054450	A B D
		-2.888	-5.64E-12	2.17E-12	A C
15	0.0825	-3.609	-0.773437	-0.106348	A B D
		-3.609	-5.64E-12	1.70E-12	A C
15	0.165	-4.331	-1.114	-0.183769	A B D
		-4.331	-5.64E-12	1.24E-12	A C
15	0.247	-5.053	-1.516	-0.291818	A B D
		-5.053	-5.64E-12	7.71E-13	A C
15	0.330	-5.775	-1.980	-0.435600	A B D
		-5.775	-5.64E-12	3.08E-13	A C
16	0	-5.775	1.980	-0.435600	A B C

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-5.775	-1.07E-11	4.20E-12	A D
16	0.0825	-5.053	1.516	-0.291818	A B C
		-5.053	-1.07E-11	3.31E-12	A D
16	0.165	-4.331	1.114	-0.183769	A B C
		-4.331	-1.07E-11	2.43E-12	A D
16	0.247	-3.609	0.773438	-0.106348	A B C
		-3.609	-1.07E-11	1.55E-12	A D
16	0.330	-2.888	0.495000	-0.054450	A B C
		-2.888	-1.07E-11	6.65E-13	A D
17	0	-2.89E-08	1.14E-12	-8.77E-13	A B C
		-2.89E-08	-2.29E-12	7.44E-13	A D
17	0.0825	-0.721875	-0.030937	-0.000851	A B C
		-0.721875	-2.29E-12	5.56E-13	A D
17	0.165	-1.444	-0.123750	-0.006806	A B C
		-1.444	-2.29E-12	3.67E-13	A D
17	0.248	-2.166	-0.278437	-0.022971	A B C
		-2.166	-2.29E-12	1.78E-13	A D
17	0.330	-2.887	-0.495000	-0.054450	A B C
		-2.887	-2.29E-12	-1.04E-14	A D
18	0	-2.887	0.495000	-0.054450	A B C
		-2.887	-7.58E-13	2.39E-12	A D
18	0.0825	-2.166	0.278438	-0.022971	A B C
		-2.166	-7.58E-13	2.32E-12	A D
18	0.165	-1.444	0.123750	-0.006806	A B C
		-1.444	-7.58E-13	2.26E-12	A D
18	0.248	-0.721875	0.030938	-0.000851	A B C
		-0.721875	-7.58E-13	2.20E-12	A D
18	0.330	-2.89E-08	2.87E-12	-1.12E-12	A C
		-2.89E-08	-2.61E-13	2.17E-12	A B D

Scale 1 : 19.5
Int. Forces envelope Vz, GWSP AN, Subsys. "ALL"
Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 5.00E-03
min: -5.58E+01 max: 1.64E+01 [kN]
- Envelope Shear force Vz-max, Scale 5.00E-03
min: -1.64E+01 max: 5.58E+01 [kN]
- Text envelopes [kN]



Verificación de la sección sometida a esfuerzo cortante

Cortante de agotamiento por tracción en el alma es :

Piezas sin armadura de cortante

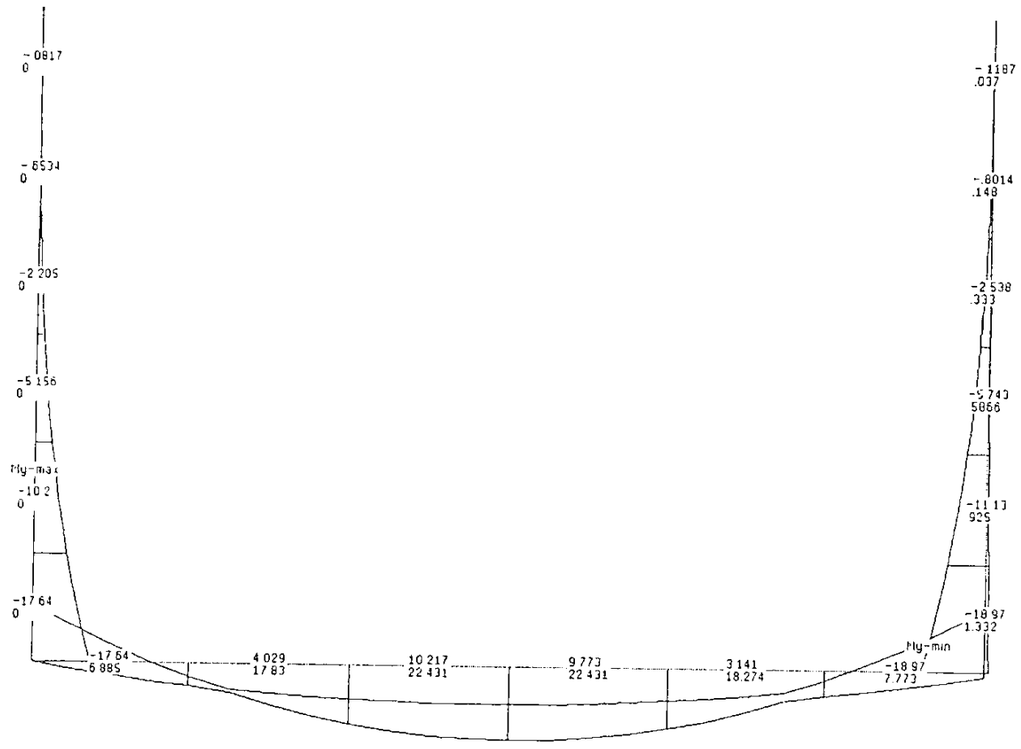
$$Vcu = (0.12\ \xi\ (100\ \rho l\ fck)^{1/3})\ bo\ d$$

bo (m) = 1.00
h (m) = 0.35
recub (m) = 0.04
d (m) = 0.29
ξ = 1.833
As (cm^2) = 13.40
ρ = 0.00465 < 0.02
fck (N/mm^2)= 30

Vcu (KN) = 152.55

Vd (KN) = 55.75 No es necesaria armadura de cortante

Scale 1 : 18.7
Int. Forces envelope My, GWSP AN, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 1.00E-02
  min: -1.90E+01 max: 1.13E+01 [kNm]
- Envelope Moment My-max, Scale 1.00E-02
  min: 1.74E-13 max: 2.24E+01 [kNm]
- Text envelopes [kNm]



Características mecánicas Sección "LOSA35" (sin coef. homogeneiz.)

Area	Ax = 3.500E3 cm2			
Momento de inercia	Iy =357.29E3 cm4	Iz = 2.917E6 cm4	Ip = 3.274E6 cm4	
Consc. de torsión			Ix = 1.114E6 cm4	
Momento estático	Zy = 30.63E3 cm3	Zz = 87.50E3 cm3		
Baricentro	ys = -0.00 cm	zs = 17.50 cm	Angulo= 0.0 Grad	
Dist. al borde	yl = -50.00 cm	yr = 50.00 cm		
	zo = 17.50 cm	zu = -17.50 cm		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "LOSA35" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	3500.000	270.000	1.11E+06	1)

Puntos de contorno [cm]:
1 50.00 0.00 2 50.00 35.00 3 -50.00 35.00
4 -50.00 0.00

Armadura "B1" As-tot =4.48 cm2 (0.13 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.84	-46.00	31.00
					46.00	31.00
BOTTOM / RQS	AEH500	10.0	2	2.64	-46.00	4.00
					46.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	100.00	27.00	0.00	31.00	0.00	4.00
SWY	Vy	35.00	92.00	-46.00	17.50	46.00	17.50
	Torsion	100.00	35.00	0.00	0.00	0.00	35.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			
Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)				

Dimensionamiento a flexión: Viga Sección "LOSA35"/"B1"

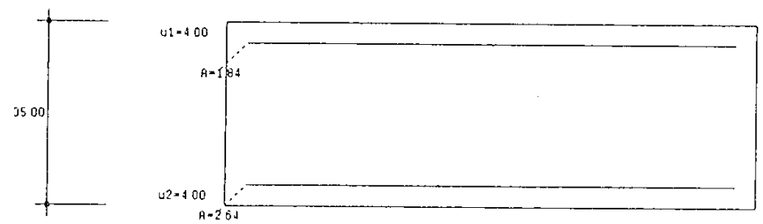
No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-19.00	0.00	
2	2	0.00	22.43	0.00	

Ámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

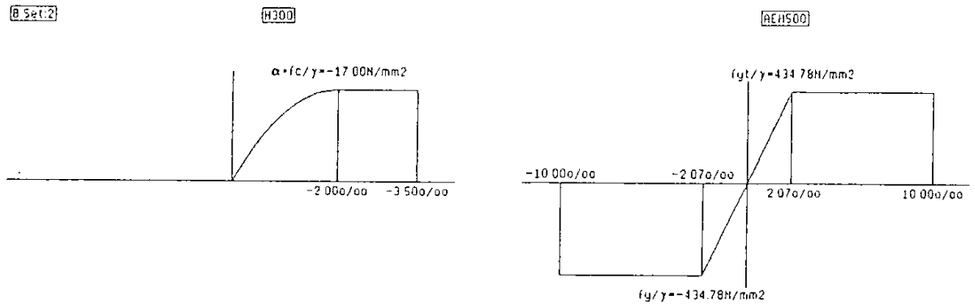
No Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500	-46.00	31.00	46.00	31.00	1.00	1.39	1.39
2 AEH500	-46.00	4.00	46.00	4.00	1.00	1.66	1.66

Max.x/h = 0.07 As-top/bot = 1.39/1.66 As = 0.09 % = 3.05

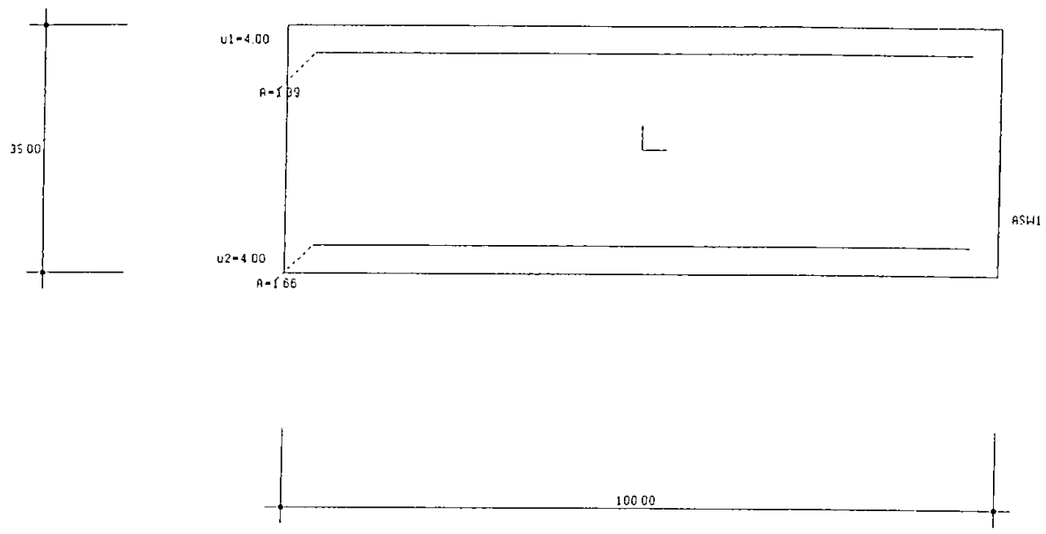
Sección LOSA35



Material acorde a la sección: "LOSA35"



Dimensionamiento, Sección "LOSA35"



Características mecánicas Sección "LOSA35" (sin coef. homogeneiz.)

Area	Ax = 3.500E3 cm2			
Momento de inercia	Iy =357.29E3 cm4	Iz = 2.917E6 cm4	Ip = 3.274E6 cm4	
Const. de torsión			Ix = 1.114E6 cm4	
Momento estático	Zy = 30.63E3 cm3	Zz = 87.50E3 cm3		
Baricentro	ys = -0.00 cm	zs = 17.50 cm	Angulo= 0.0 Grad	
s. al borde	yl = -50.00 cm	yr = 50.00 cm		
	zo = 17.50 cm	zu = -17.50 cm		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "LOSA35" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	3500.000	270.000	1.11E+06	1)

Puntos de contorno [cm]:
1 50.00 0.00 2 50.00 35.00 3 -50.00 35.00
4 -50.00 0.00

Armadura "B1" As-tot =3.05 cm2 (0.09 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.39	-46.00	31.00
					46.00	31.00
BOTTOM / RQS	AEH500	10.0	2	1.66	-46.00	4.00
					46.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	100.00	27.00	0.00	31.00	0.00	4.00
SWY	Vy	35.00	92.00	-46.00	17.50	46.00	17.50
SWT	Torsion	100.00	35.00	0.00	0.00	0.00	35.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "LOSA35"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-19.00	0.00	
2	2	0.00	22.43	0.00	

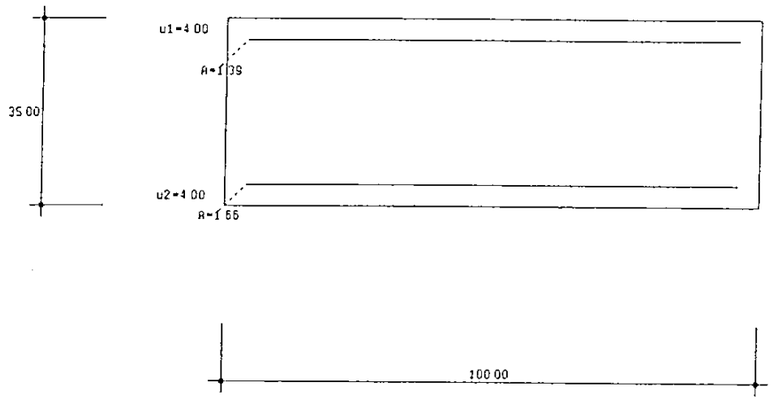
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No	Armad. long.	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1	AEH500	-46.00	31.00	46.00	31.00	1.00	1.39	1.39
2	AEH500	-46.00	4.00	46.00	4.00	1.00	1.66	1.66

Max.x/h = 0.07 As-top/bot = 1.39/1.66 As = 0.09 % = 3.05

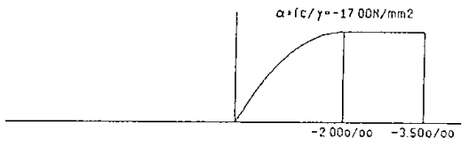
Sección LOSA35



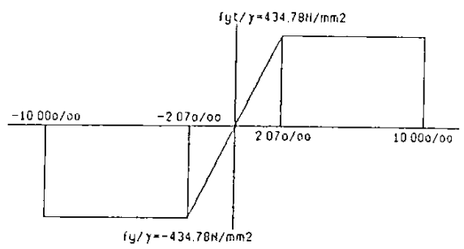
Material acorde a la sección: "LOSA35"

B 5et:2

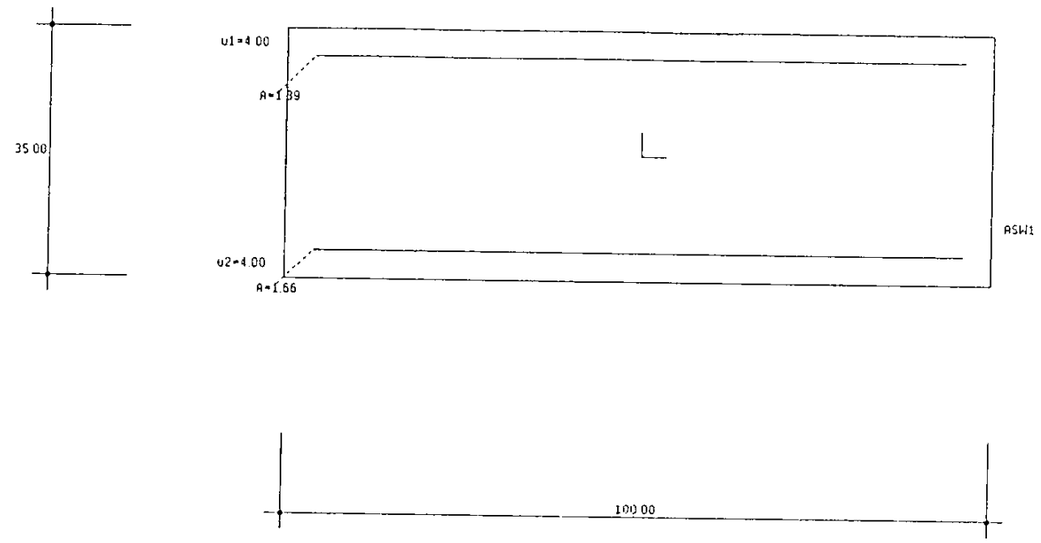
H300



ACHS00



Dimensionamiento,Sección "LOSA35"



Características mecánicas Sección "ALA35" (sin coef. homogeneiz.)

Area	Ax = 3.500E3 cm2			
Momento de inercia	Iy =357.29E3 cm4	Iz = 2.917E6 cm4	Ip = 3.274E6 cm4	
Const. de torsión			Ix = 1.114E6 cm4	
Momento estático	Zy = 30.63E3 cm3	Zz = 87.50E3 cm3		
Baricentro	ys = -0.00 cm	zs = 17.50 cm	Angulo= 0.0 Grad	
Dist. al borde	yl = -50.00 cm	yr = 50.00 cm		
	zo = 17.50 cm	zu = -17.50 cm		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "ALA35" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
	H300	1.00	3500.000	270.000	1.11E+06	1)

Puntos de contorno [cm]:
1 50.00 0.00 2 50.00 35.00 3 -50.00 35.00
4 -50.00 0.00

Armadura "B1" As-tot =6.00 cm2 (0.17 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-46.00	31.00
					46.00	31.00
BOTTOM / RQS	AEH500	10.0	2	5.00	-46.00	4.00
					46.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SW2	Vz	100.00	27.00	0.00	31.00	0.00	4.00
SW3	Vy	35.00	92.00	-46.00	17.50	46.00	17.50
SW4	Torsion	100.00	35.00	0.00	0.00	0.00	35.00

Punto de resultados:

Nombre / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "ALA35"/"B1"

Nr	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-19.00	0.00	

Parámetros de cálculo empleados:

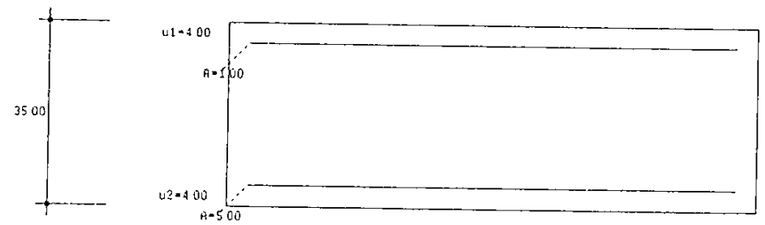
Set-Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

Set 2: EN/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

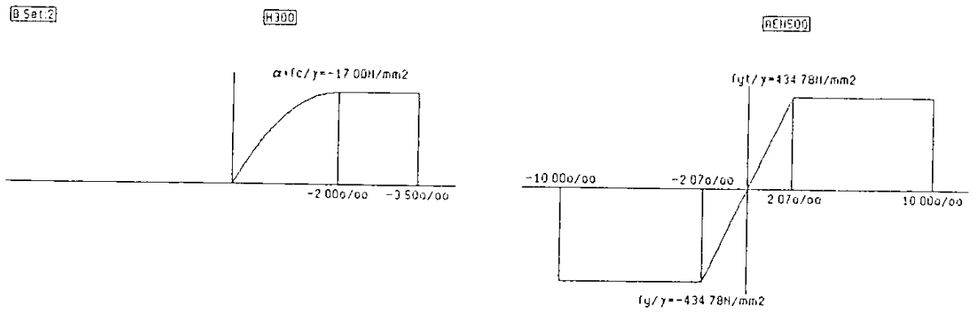
No Armad. long.	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500	-46.00	31.00	46.00	31.00	1.00	1.39	1.39
AEH500	-46.00	4.00	46.00	4.00	1.00	----	1.00

Max.x/h = 0.07 As-top/bot = 1.39/1.00 As = 0.07 % = 2.39

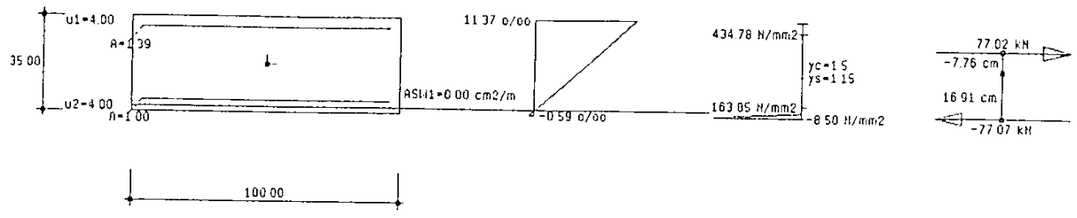
Sección ALA35



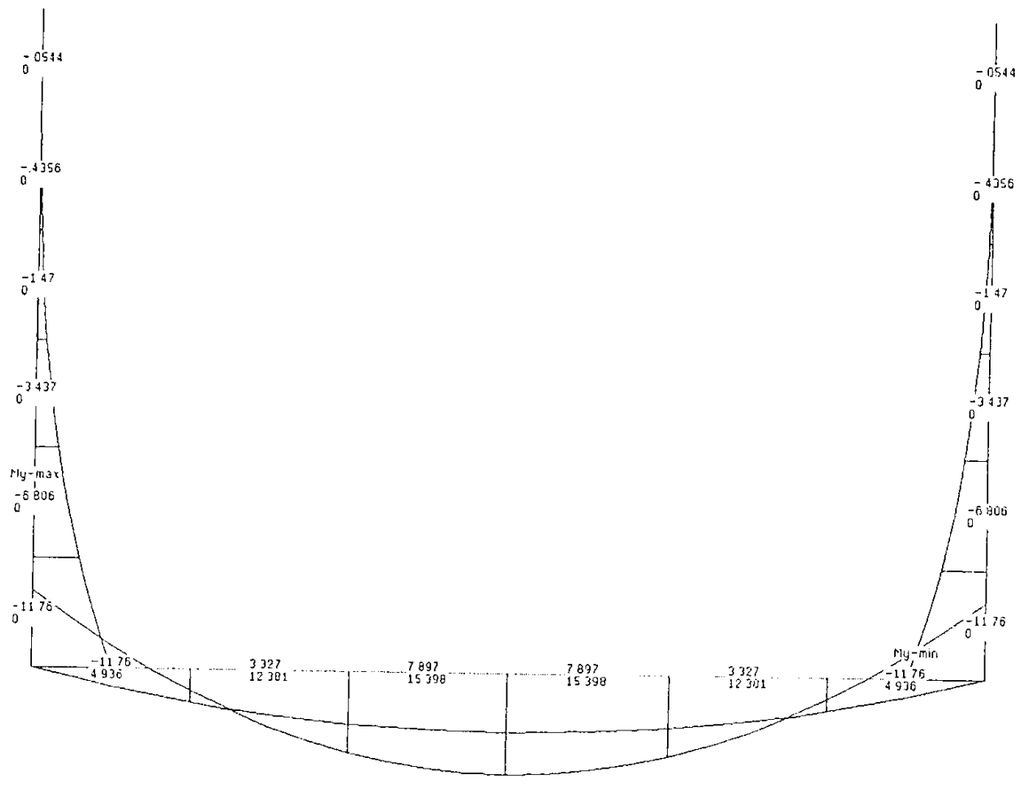
Material acorde a la sección: "ALA35"



Dimensionamiento,Sección "ALA35"

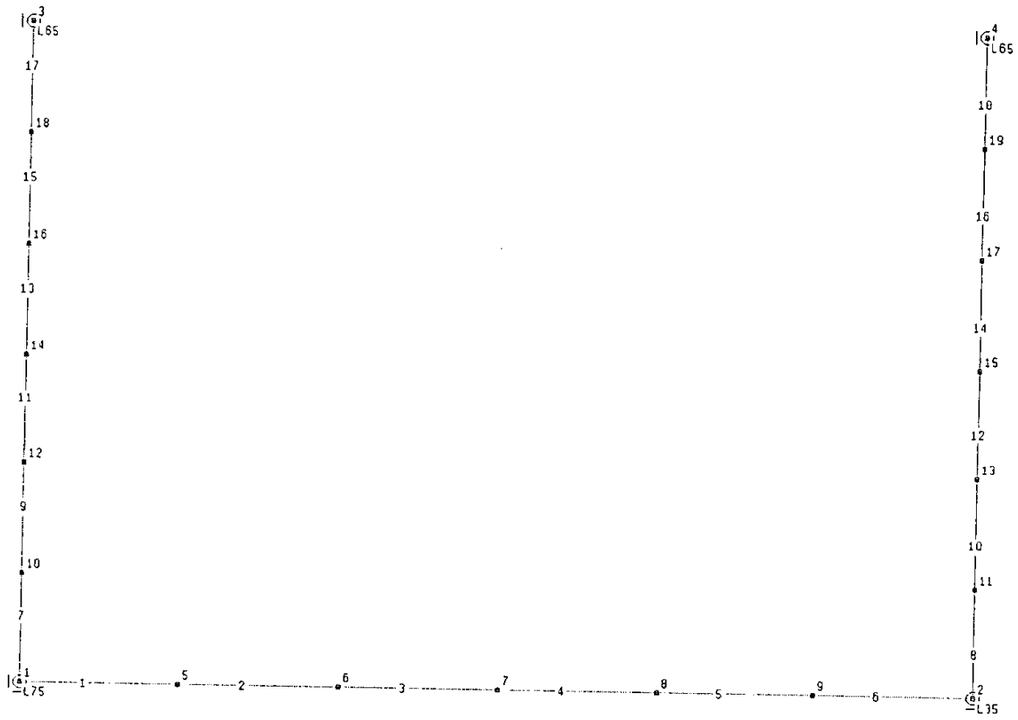


Scale 1 : 18.6
Int. Forces envelope My, GWSP AO, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 2.00E-02
  min: -1.18E+01 max: 8.88E+00 [kNm]
- Envelope Moment My-max, Scale 2.00E-02
  min: -1.04E-14 max: 1.54E+01 [kNm]
- Text envelopes [kNm]



2.3.2. Modelo de cálculo de la sección transversal arriostrada

Scale 1 : 18.6
Int. Forces envelope Vz, GWSP AP, Subsys. "ALL"
- Structure: Elmnts.



Plane (2-D) frame -analysis

****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (19 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	0.000000	0.000000	0.000000	F F	F	
2	2.850000	0.000000	0.000000	F F	F	
3	0.000000	0.000000	1.980000	F F	F	
4	2.850000	0.000000	1.980000	F F	F	
5	0.475000	0.000000	0.000000			
6	0.950000	0.000000	0.000000			
7	1.425000	0.000000	0.000000			
8	1.900000	0.000000	0.000000			
9	2.375000	0.000000	0.000000			
10	0.000000	0.000000	0.330000			
11	2.850000	0.000000	0.330000			
12	0.000000	0.000000	0.666000			
13	2.850000	0.000000	0.666000			
14	0.000000	0.000000	0.990000			
15	2.850000	0.000000	0.990000			
16	0.000000	0.000000	1.320000			
17	2.850000	0.000000	1.320000			
18	0.000000	0.000000	1.650000			
19	2.850000	0.000000	1.650000			

B A R D A T A : (18 bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
1	1	5	0.475000	LOSA35			oS
2	5	6	0.475000	LOSA35			oS
3	6	7	0.475000	LOSA35			oS
4	7	8	0.475000	LOSA35			oS
5	8	9	0.475000	LOSA35			oS
6	9	2	0.475000	LOSA35			oS
7*	10	1	0.330000	ALA35			oS
8*	2	11	0.330000	ALA35			oS
9*	12	10	0.336000	ALA35			oS
10*	11	13	0.336000	ALA35			oS
11*	14	12	0.324000	ALA35			oS
12*	13	15	0.324000	ALA35			oS
13*	16	14	0.330000	ALA35			oS
14*	15	17	0.330000	ALA35			oS

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Hinges start	Hinges end	Specialities
15*	18	16	0.330000	ALA35			oS
16*	17	19	0.330000	ALA35			oS
17*	3	18	0.330000	ALA35			oS
18*	19	4	0.330000	ALA35			oS

Bars marked with *** are vertical (except any excentricities).
The corresponding special definition for the default orientation
of the local coordinate system applies.

oS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2] / zl [M1]	Iy [M4] / zu [M1]	Fz [M2]
ALA35	3.5000E-01 / -0.1750	3.5729E-03 / 0.1750	2.9167E-01
LOSA35	3.5000E-01 / -0.1750	3.5729E-03 / 0.1750	2.9167E-01

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [KN/ M2]	Shear-M [KN/ M2]
1 .. 18	3.3000E+07	1.3000E+07

STS-Run ok

****
Load case 1:
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Mas.forcZ gl const.	-25.000		Stab	1 .. 18

****
Load case 2: AGUA
****

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl trapez.	0	-3.000		
		from...to	0	0.330000	Stab	17
Force	X	gl trapez.	-3.000	-6.000		
		from...to	0	0.330000	Stab	15
Force	X	gl trapez.	-6.000	-9.000		
		from...to	0	0.330000	Stab	13
Force	X	gl trapez.	-9.000	-11.945		
		from...to	0	0.324000	Stab	11
Force	X	gl trapez.	-11.945	-15.000		
		from...to	0	0.336000	Stab	9
Force	X	gl trapez.	-15.000	-18.000		
		from...to	0	0.330000	Stab	7
Force	X	gl trapez.	18.000	15.000		
		from...to	0	0.330000	Stab	8
Force	X	gl trapez.	15.000	11.945		
		from...to	0	0.336000	Stab	10
Force	X	gl trapez.	11.945	9.000		
		from...to	0	0.324000	Stab	12
Force	X	gl trapez.	9.000	6.000		
		from...to	0	0.330000	Stab	14
Force	X	gl trapez.	6.000	3.000		
		from...to	0	0.330000	Stab	16
Force	X	gl trapez.	3.000	9.5E-0007		
		from...to	0	0.330000	Stab	18
Force	Z	pj const.	-18.000		Stab	1 .. 6

****
Load case 3: gradiente
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Curvat. Y lo const.	0.000434		Stab	1 .. 18

****
Load case 4: gradiente
****

Loadtype	Value(a)	Distanc Value(b)	Joint -/member numb	
Curvat. Y lo const.	-0.000434		Stab	1 .. 18

****
Load case 5: viento
****

Loadtype			Value(a)	Distanc Value(b)	Joint -/member numb	
Force	X	gl const.	-1.510		Stab	8 10 12 14 16 18

ENVELOPE SPECIFIC.: AP ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		
B	PLUS	2	1.500		AGUA
C	PLUS	3	1.500		gradiente
D	OR	4	1.500		gradiente
E	PLUS	5	0.450000		viento
F	OR	5	-0.450000		viento

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
1	0	-41.186	16.578	83.606	A C F
		71.807	55.702	-109.350	A B D E
1	0.119	-41.186	15.175	85.492	A C F
		71.807	51.093	-103.009	A B D E
1	0.237	-41.186	13.772	87.211	A C F
		71.807	46.484	-97.216	A B D E
1	0.356	-41.186	12.370	88.763	A C F
		71.807	41.875	-91.969	A B D E
1	0.475	-41.186	10.967	90.148	A C F
		71.807	37.266	-87.270	A B D E
2	0	-41.186	10.967	90.148	A C F
		71.807	37.266	-87.270	A B D E
2	0.119	-41.186	9.564	91.367	A C F
		71.807	32.657	-83.119	A B D E
2	0.237	-41.186	8.161	92.420	A C F
		71.807	28.048	-79.514	A B D E
2	0.356	-41.186	6.759	93.306	A C F
		71.807	23.439	-76.457	A B D E
2	0.475	-41.186	5.356	94.025	A C F
		71.807	18.830	-73.948	A B D E
3	0	-41.186	5.356	94.025	A C F
		71.807	18.830	-73.948	A B D E
3	0.119	-41.186	3.953	94.578	A C F
		71.807	14.221	-71.985	A B D E
3	0.238	-41.186	2.550	94.964	A C F
		71.807	9.612	-70.570	A B D E
3	0.356	-41.186	1.148	95.183	A C F
		71.807	5.003	-69.702	A B D E
3	0.475	-41.186	-0.255026	95.236	A C F
		71.807	0.394125	-69.382	A B D E
4	0	-41.186	-0.255027	95.236	A C F
		71.807	0.394125	-69.382	A B D E
4	0.119	-16.056	-4.750	107.724	A B C F

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		46.678	-1.123	-82.210	A D E
4	0.237	-16.056	-9.359	106.886	A B C F
		46.678	-2.525	-82.426	A D E
4	0.356	-16.056	-13.968	105.501	A B C F
		46.678	-3.928	-82.809	A D E
4	0.475	-16.056	-18.577	103.569	A B C F
		46.678	-5.331	-83.359	A D E
5	0	-16.056	-18.577	103.569	A B C F
		46.678	-5.331	-83.359	A D E
5	0.119	-16.056	-23.186	101.089	A B C F
		46.678	-6.734	-84.075	A D E
5	0.238	-16.056	-27.795	98.062	A B C F
		46.678	-8.136	-84.958	A D E
5	0.356	-16.056	-32.404	94.488	A B C F
		46.678	-9.539	-86.008	A D E
5	0.475	-16.056	-37.013	90.366	A B C F
		46.678	-10.942	-87.224	A D E
6	0	-16.056	-37.013	90.366	A B C F
		46.678	-10.942	-87.224	A D E
6	0.119	-16.056	-41.622	85.697	A B C F
		46.678	-12.345	-88.607	A D E
6	0.238	-16.056	-46.231	80.481	A B C F
		46.678	-13.747	-90.156	A D E
6	0.356	-16.056	-50.840	74.717	A B C F
		46.678	-15.150	-91.872	A D E
6	0.475	-16.056	-55.449	68.407	A B C F
		46.678	-16.553	-93.754	A D E
7	0	-19.491	-64.880	-86.633	A B D E
		-19.491	42.225	69.672	A C F
7	0.0825	-20.465	-66.781	-92.064	A B D E
		-20.465	42.225	73.156	A C F
7	0.165	-21.440	-68.778	-97.655	A B D E
		-21.440	42.225	76.639	A C F
7	0.247	-22.414	-70.866	-103.414	A B D E
		-22.414	42.225	80.123	A C F
7	0.330	-23.389	-73.047	-109.350	A B D E
		-23.389	42.225	83.606	A C F
8	0	-23.389	-42.675	83.164	A C E
		-23.389	73.296	-108.511	A B D F
8	0.0825	-22.414	-42.619	79.645	A C E
		-22.414	71.059	-102.557	A B D F
8	0.165	-21.440	-42.562	76.132	A C E
		-21.440	68.915	-96.784	A B D F
8	0.247	-20.465	-42.506	72.623	A C E
		-20.465	66.863	-91.184	A B D F
8	0.330	-19.491	-42.450	69.118	A C E
		-19.491	64.905	-85.749	A B D F

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
9	0	-15.522	-58.090	-66.017	A B D E
		-15.522	42.225	55.484	A C F
9	0.0840	-16.514	-59.643	-70.961	A B D E
		-16.514	42.225	59.031	A C F
9	0.168	-17.506	-61.292	-76.040	A B D E
		-17.506	42.225	62.578	A C F
9	0.252	-18.498	-63.038	-81.261	A B D E
		-18.498	42.225	66.125	A C F
9	0.336	-19.491	-64.880	-86.633	A B D E
		-19.491	42.225	69.672	A C F
10	0	-19.491	-42.450	69.118	A C E
		-19.491	64.905	-85.749	A B D F
10	0.0840	-18.498	-42.393	65.555	A C E
		-18.498	63.006	-80.377	A B D F
10	0.168	-17.506	-42.336	61.996	A C E
		-17.506	61.203	-75.161	A B D F
10	0.252	-16.514	-42.279	58.442	A C E
		-16.514	59.496	-70.093	A B D F
10	0.336	-15.522	-42.222	54.893	A C E
		-15.522	57.886	-65.163	A B D F
11	0	-11.694	-53.000	-48.059	A B D E
		-11.694	42.225	41.803	A C F
11	0.0810	-12.651	-54.138	-52.398	A B D E
		-12.651	42.225	45.223	A C F
11	0.162	-13.608	-55.366	-56.832	A B D E
		-13.608	42.225	48.644	A C F
11	0.243	-14.565	-56.683	-61.370	A B D E
		-14.565	42.225	52.064	A C F
11	0.324	-15.522	-58.090	-66.017	A B D E
		-15.522	42.225	55.484	A C F
12	0	-15.522	-42.222	54.893	A C E
		-15.522	57.886	-65.163	A B D F
12	0.0810	-14.565	-42.167	51.475	A C E
		-14.565	56.424	-60.534	A B D F
12	0.162	-13.608	-42.112	48.062	A C E
		-13.608	55.052	-56.020	A B D F
12	0.243	-12.651	-42.057	44.653	A C E
		-12.651	53.769	-51.613	A B D F
12	0.324	-11.694	-42.002	41.249	A C E
		-11.694	52.576	-47.307	A B D F
13	0	-7.796	-49.287	-31.223	A B D E
		-7.796	42.225	27.869	A C F
13	0.0825	-8.771	-50.076	-35.321	A B D E
		-8.771	42.225	31.352	A C F
13	0.165	-9.745	-50.958	-39.488	A B D E
		-9.745	42.225	34.836	A C F

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
13	0.248	-10.720	-51.933	-43.732	A B D E
		-10.720	42.225	38.320	A C F
13	0.330	-11.694	-53.000	-48.059	A B D E
		-11.694	42.225	41.803	A C F
14	0	-11.694	-42.002	41.249	A C E
		-11.694	52.576	-47.307	A B D F
14	0.0825	-10.720	-41.946	37.786	A C E
		-10.720	51.453	-43.016	A B D F
14	0.165	-9.745	-41.971	34.657	A C F
		-9.745	50.503	-39.344	A B D E
14	0.248	-8.771	-42.027	31.392	A C F
		-8.771	49.677	-35.212	A B D E
14	0.330	-7.796	-42.083	27.923	A C F
		-7.796	48.944	-31.144	A B D E
15	0	-3.898	-47.753	-15.759	A D E
		-3.898	42.919	14.327	A B C F
15	0.0825	-4.873	-47.753	-19.698	A D E
		-4.873	42.501	17.851	A B C F
15	0.165	-5.847	-47.988	-23.201	A D E
		-5.847	42.225	20.902	A C F
15	0.247	-6.822	-48.591	-27.186	A D E
		-6.822	42.225	24.385	A C F
15	0.330	-7.796	-49.287	-31.223	A D E
		-7.796	42.225	27.869	A C F
16	0	-7.796	-42.083	27.923	A C F
		-7.796	48.944	-31.144	A B D E
16	0.0825	-6.822	-42.139	24.448	A C F
		-6.822	48.304	-27.134	A B D E
16	0.165	-5.847	-42.195	20.970	A C F
		-5.847	47.757	-23.173	A B D E
16	0.247	-4.873	-42.691	17.987	A B C F
		-4.873	47.743	-19.752	A D E
16	0.330	-3.898	-43.165	14.445	A B C F
		-3.898	47.799	-15.811	A D E
17	0	-3.90E-08	-47.753	-1.58E-07	A D E
		-3.90E-08	43.662	1.44E-07	A B C F
17	0.0825	-0.974531	-47.753	-3.940	A D E
		-0.974531	43.615	3.601	A B C F
17	0.165	-1.949	-47.753	-7.879	A D E
		-1.949	43.476	7.194	A B C F
17	0.248	-2.924	-47.753	-11.819	A D E
		-2.924	43.244	10.772	A B C F
17	0.330	-3.898	-47.753	-15.759	A D E
		-3.898	42.919	14.327	A B C F
18	0	-3.898	-43.165	14.445	A B C F
		-3.898	47.799	-15.811	A D E

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
18	0.0825	-2.924	-43.546	10.867	A B C F
		-2.924	47.855	-11.865	A D E
18	0.165	-1.949	-43.834	7.262	A B C F
		-1.949	47.911	-7.915	A D E
18	0.248	-0.974531	-44.029	3.637	A B C F
		-0.974531	47.967	-3.960	A D E
18	0.330	-3.90E-08	-44.131	1.46E-07	A B C F
		-3.90E-08	48.023	-1.58E-07	A D E

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
1	0	71.807	55.702	-109.350	A B D E
		-41.186	16.578	83.606	A C F
1	0.119	71.807	51.093	-103.009	A B D E
		-41.186	15.175	85.492	A C F
1	0.237	71.807	46.484	-97.216	A B D E
		-41.186	13.772	87.211	A C F
1	0.356	71.807	41.875	-91.969	A B D E
		-41.186	12.370	88.763	A C F
1	0.475	46.678	11.502	-87.756	A D E
		-16.056	36.731	90.634	A B C F
2	0	46.678	11.502	-87.756	A D E
		-16.056	36.731	90.634	A B C F
2	0.119	46.678	10.099	-86.473	A D E
		-16.056	32.122	94.722	A B C F
2	0.237	48.167	8.567	-85.366	A D F
		-17.545	27.642	98.271	A B C E
2	0.356	48.167	7.165	-84.431	A D F
		-17.545	23.033	101.280	A B C E
2	0.475	48.167	5.762	-83.664	A D F
		-17.545	18.424	103.741	A B C E
3	0	48.167	5.762	-83.664	A D F
		-17.545	18.424	103.741	A B C E
3	0.119	48.167	4.359	-83.063	A D F
		-17.545	13.815	105.656	A B C E
3	0.238	48.167	2.956	-82.629	A D F
		-17.545	9.206	107.022	A B C E
3	0.356	48.167	1.554	-82.361	A D F
		-17.545	4.597	107.842	A B C E
3	0.475	48.167	0.150855	-82.260	A D F
		-17.545	-0.011756	108.114	A B C E

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
4	0	48.167	0.150855	-82.260	A D F
		-17.545	-0.011757	108.114	A B C E
4	0.119	48.167	-1.252	-82.325	A D F
		-17.545	-4.621	107.839	A B C E
4	0.237	48.167	-2.655	-82.557	A D F
		-17.545	-9.230	107.017	A B C E
4	0.356	48.167	-4.057	-82.956	A D F
		-17.545	-13.839	105.647	A B C E
4	0.475	48.167	-5.460	-83.521	A D F
		-17.545	-18.448	103.730	A B C E
5	0	48.167	-5.460	-83.521	A D F
		-17.545	-18.448	103.730	A B C E
5	0.119	48.167	-6.863	-84.252	A D F
		-17.545	-23.057	101.266	A B C E
5	0.238	48.167	-8.266	-85.151	A D F
		-17.545	-27.666	98.254	A B C E
5	0.356	48.167	-9.668	-86.215	A D F
		-17.545	-32.275	94.695	A B C E
5	0.475	48.167	-11.071	-87.447	A D F
		-17.545	-36.884	90.589	A B C E
6	0	48.167	-11.071	-87.447	A D F
		-17.545	-36.884	90.589	A B C E
6	0.119	73.296	-11.216	-91.365	A E D F
		-42.675	-12.751	88.456	A C E
6	0.238	73.296	-45.825	-96.533	A E D F
		-42.675	-14.153	86.858	A C E
6	0.356	73.296	-50.434	-102.249	A E D F
		-42.675	-15.556	85.094	A C E
6	0.475	73.296	-55.043	-108.511	A E D F
		-42.675	-16.959	83.164	A C E
7	0	-19.491	-64.880	-86.633	A B D E
		-19.491	42.225	69.672	A C F
7	0.0825	-20.465	-66.783	-92.064	A B D E
		-20.465	42.225	73.156	A C F
7	0.165	-21.440	-68.778	-97.655	A B D E
		-21.440	42.225	76.639	A C F
7	0.247	-22.414	-70.866	-103.414	A B D E
		-22.414	42.225	80.123	A C F
7	0.330	-23.389	-73.047	-109.350	A B D E
		-23.389	42.225	83.606	A C F
8	0	-23.389	73.296	-108.511	A B D F
		-23.389	-42.675	83.164	A C E
8	0.0825	-22.414	71.059	-102.557	A B D F
		-22.414	-42.619	79.645	A C E
8	0.165	-21.440	68.915	-96.784	A B D F
		-21.440	-42.562	76.132	A C E
8	0.247	-20.465	65.711	-91.226	A B D E

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-20.465	-41.354	72.605	A C F
8	0.330	-19.491	63.864	-85.882	A B D E
		-19.491	-41.410	69.251	A C F
9	0	-15.522	-58.090	-66.017	A B D E
		-15.522	42.225	55.484	A C F
9	0.0840	-16.514	-59.643	-70.961	A B D E
		-16.514	42.225	59.031	A C F
9	0.168	-17.506	-61.292	-76.040	A B D E
		-17.506	42.225	62.578	A C F
9	0.252	-18.498	-63.038	-81.261	A B D E
		-18.498	42.225	66.125	A C F
9	0.336	-19.491	-64.880	-86.633	A B D E
		-19.491	42.225	69.672	A C F
10	0	-19.491	63.864	-85.882	A B D E
		-19.491	-41.410	69.251	A C F
10	0.0840	-18.498	62.079	-80.593	A B D E
		-18.498	-41.467	65.771	A C F
10	0.168	-17.506	60.391	-75.450	A B D E
		-17.506	-41.524	62.285	A C F
10	0.252	-16.514	58.798	-70.445	A B D E
		-16.514	-41.581	58.794	A C F
10	0.336	-15.522	57.302	-65.565	A B D E
		-15.522	-41.638	55.299	A C F
11	0	-11.694	-53.000	-48.059	A B D E
		-11.694	42.225	41.803	A C F
11	0.0810	-12.651	-54.138	-52.398	A B D E
		-12.651	42.225	45.223	A C F
11	0.162	-13.608	-55.366	-56.832	A B D E
		-13.608	42.225	48.644	A C F
11	0.243	-14.565	-56.683	-61.370	A B D E
		-14.565	42.225	52.064	A C F
11	0.324	-15.522	-58.090	-66.017	A B D E
		-15.522	42.225	55.484	A C F
12	0	-15.522	57.302	-65.569	A B D E
		-15.522	-41.638	55.295	A C F
12	0.0810	-14.565	55.951	-60.983	A B D E
		-14.565	-41.693	51.924	A C F
12	0.162	-13.608	54.688	-56.503	A B D E
		-13.608	-41.748	48.545	A C F
12	0.243	-12.651	53.516	-52.121	A B D E
		-12.651	-41.803	45.161	A C F
12	0.324	-11.694	52.433	-47.831	A B D E
		-11.694	-41.858	41.773	A C F
13	0	-7.796	-47.753	-31.517	A D E
		-7.796	40.692	28.163	A B C F
13	0.0825	-8.771	-47.753	-35.457	A D E

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-8.771	39.903	31.488	A B C F
13	0.165	-9.745	-50.958	-39.488	A B D E
		-9.745	42.225	34.836	A C F
13	0.248	-10.720	-51.933	-43.732	A B D E
		-10.720	42.225	38.320	A C F
13	0.330	-11.694	-53.000	-48.059	A B D E
		-11.694	42.225	41.803	A C F
14	0	-11.694	52.433	-47.831	A B D E
		-11.694	-41.858	41.773	A C F
14	0.0825	-10.720	51.421	-43.547	A B D E
		-10.720	-41.914	38.317	A C F
14	0.165	-9.745	47.463	-39.388	A D E
		-9.745	-38.930	34.901	A B C F
14	0.248	-8.771	47.519	-35.470	A D E
		-8.771	-39.868	31.650	A B C F
14	0.330	-7.796	47.575	-31.547	A D E
		-7.796	-40.713	28.325	A B C F
15	0	-3.898	-47.753	-15.759	A D E
		-3.898	42.919	14.327	A B C F
15	0.0825	-4.873	-47.753	-19.698	A D E
		-4.873	42.501	17.851	A B C F
15	0.165	-5.847	-47.753	-23.638	A D E
		-5.847	41.991	21.337	A B C F
15	0.247	-6.822	-47.753	-27.578	A D E
		-6.822	41.388	24.777	A B C F
15	0.330	-7.796	-47.753	-31.517	A D E
		-7.796	40.692	28.163	A B C F
16	0	-7.796	47.575	-31.547	A D E
		-7.796	-40.713	28.325	A B C F
16	0.0825	-6.822	47.631	-27.620	A D E
		-6.822	-41.465	24.935	A B C F
16	0.165	-5.847	47.687	-23.688	A D E
		-5.847	-42.124	21.486	A B C F
16	0.247	-4.873	47.743	-19.752	A D E
		-4.873	-42.691	17.987	A B C F
16	0.330	-3.898	47.799	-15.811	A D E
		-3.898	-43.165	14.445	A B C F
17	0	-3.90E-08	-47.753	-1.58E-07	A D E
		-3.90E-08	43.662	1.44E-07	A B C F
17	0.0825	-0.974531	-47.753	-3.940	A D E
		-0.974531	43.615	3.601	A B C F
17	0.165	-1.949	-47.753	-7.879	A D E
		-1.949	43.476	7.194	A B C F
17	0.248	-2.924	-47.753	-11.819	A D E
		-2.924	43.244	10.772	A B C F
17	0.330	-3.898	-47.753	-15.759	A D E
		-3.898	42.919	14.327	A B C F

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
18	0	-3.898	47.799	-15.811	A D E
		-3.898	-43.165	14.445	A B C F
18	0.0825	-2.924	47.855	-11.865	A D E
		-2.924	-43.546	10.867	A B C F
18	0.165	-1.949	47.911	-7.915	A D E
		-1.949	-43.834	7.262	A B C F
18	0.248	-0.974531	47.967	-3.960	A D E
		-0.974531	-44.029	3.637	A B C F
18	0.330	-3.90E-08	48.023	-1.58E-07	A D E
		-3.90E-08	-44.131	1.46E-07	A B C F

ENVELOPE SPECIFIC.: AQ ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		
B	PLUS	2	1.000		AGUA
C	PLUS	3	0.600000		gradiente
D	OR	4	0.600000		gradiente

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
1	0	36.658	38.285	-49.534	A B D
		-15.836	12.397	31.561	A C
1	0.119	36.658	35.109	-45.177	A B D
		-15.836	11.358	32.971	A C
1	0.237	36.658	31.932	-41.196	A B D
		-15.836	10.319	34.259	A C
1	0.356	36.658	28.756	-37.593	A B D
		-15.836	9.280	35.422	A C
1	0.475	19.905	8.403	-34.690	A D
		0.916726	25.417	36.786	A B C
2	0	19.905	8.403	-34.690	A D
		0.916726	25.417	36.786	A B C
2	0.119	19.905	7.364	-33.754	A D
		0.916726	22.240	39.616	A B C
2	0.237	19.905	6.325	-32.941	A D

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		0.916726	19.064	42.068	A B C
2	0.356	19.905	5.286	-32.252	A D
		0.916726	15.887	44.143	A B C
2	0.475	19.905	4.247	-31.686	A D
		0.916726	12.710	45.841	A B C
3	0	19.905	4.247	-31.686	A D
		0.916726	12.710	45.841	A B C
3	0.119	19.905	3.208	-31.243	A D
		0.916726	9.534	47.162	A B C
3	0.238	19.905	2.169	-30.924	A D
		0.916726	6.357	48.106	A B C
3	0.356	19.905	1.129	-30.728	A D
		0.916726	3.181	48.672	A B C
3	0.475	19.905	0.090416	-30.656	A D
		0.916726	0.004164	48.861	A B C
4	0	19.905	0.090416	-30.656	A D
		0.916726	0.004164	48.861	A B C
4	0.119	19.905	-0.9386e6	-30.707	A D
		0.916726	-3.172	48.673	A B C
4	0.237	19.905	-1.988	-30.881	A D
		0.916726	-6.349	48.108	A B C
4	0.356	19.905	-3.027	-31.179	A D
		0.916726	-9.526	47.165	A B C
4	0.475	19.905	-4.066	-31.600	A D
		0.916726	-12.702	45.845	A B C
5	0	19.905	-4.066	-31.600	A D
		0.916726	-12.702	45.845	A B C
5	0.119	19.905	-5.105	-32.145	A D
		0.916726	-15.879	44.148	A B C
5	0.238	19.905	-6.144	-32.813	A D
		0.916726	-19.055	42.074	A B C
5	0.356	19.905	-7.183	-33.604	A D
		0.916726	-22.232	39.623	A B C
5	0.475	19.905	-8.222	-34.518	A D
		0.916726	-25.408	36.794	A B C
6	0	19.905	-8.222	-34.518	A D
		0.916726	-25.408	36.794	A B C
6	0.119	36.658	-28.423	-37.237	A B D
		-15.836	-9.423	35.268	A C
6	0.238	36.658	-31.599	-40.801	A B D
		-15.836	-10.461	34.088	A C
6	0.356	36.658	-34.776	-44.742	A B D
		-15.836	-11.502	32.784	A C
6	0.475	36.658	-37.952	-49.060	A B D
		-15.836	-12.541	31.356	A C
7	0	-14.438	-31.452	-38.284	A B D

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
		-14.438	15.940	26.301	A C
7	0.0825	-15.159	-32.721	-40.931	A B D
		-15.159	15.940	27.616	A C
7	0.165	-15.881	-34.051	-43.685	A B D
		-15.881	15.940	28.931	A C
7	0.247	-16.603	-35.443	-46.551	A B D
		-16.603	15.940	30.246	A C
7	0.330	-17.325	-36.897	-49.534	A B D
		-17.325	15.940	31.561	A C
8	0	-17.325	36.658	-49.060	A B D
		-17.325	-15.836	31.356	A C
8	0.0825	-16.603	35.204	-46.096	A B D
		-16.603	-15.836	30.050	A C
8	0.165	-15.881	33.811	-43.250	A B D
		-15.881	-15.836	28.743	A C
8	0.247	-15.159	32.481	-40.515	A B D
		-15.159	-15.836	27.437	A C
8	0.330	-14.438	31.213	-37.888	A B D
		-14.438	-15.836	26.130	A C
9	0	-11.498	-26.926	-28.505	A B D
		-11.498	15.940	20.945	A C
9	0.0840	-12.232	-27.961	-30.810	A B D
		-12.232	15.940	22.284	A C
9	0.168	-12.967	-29.061	-33.204	A B D
		-12.967	15.940	23.623	A C
9	0.252	-13.702	-30.224	-35.694	A B D
		-13.702	15.940	24.962	A C
9	0.336	-14.437	-31.452	-38.284	A B D
		-14.437	15.940	26.301	A C
10	0	-14.437	31.213	-37.888	A B D
		-14.437	-15.836	26.130	A C
10	0.0840	-13.702	29.985	-35.319	A B D
		-13.702	-15.836	24.800	A C
10	0.168	-12.967	28.821	-32.849	A B D
		-12.967	-15.836	23.470	A C
10	0.252	-12.232	27.721	-30.475	A B D
		-12.232	-15.836	22.139	A C
10	0.336	-11.498	26.686	-28.190	A B D
		-11.498	-15.836	20.809	A C
11	0	-8.663	-23.532	-20.357	A B D
		-8.663	15.940	15.781	A C
11	0.0810	-9.371	-24.291	-22.293	A B D
		-9.371	15.940	17.072	A C
11	0.162	-10.080	-25.110	-24.284	A B D
		-10.080	15.940	18.363	A C
11	0.243	-10.789	-25.988	-26.363	A B D
		-10.789	15.940	19.654	A C

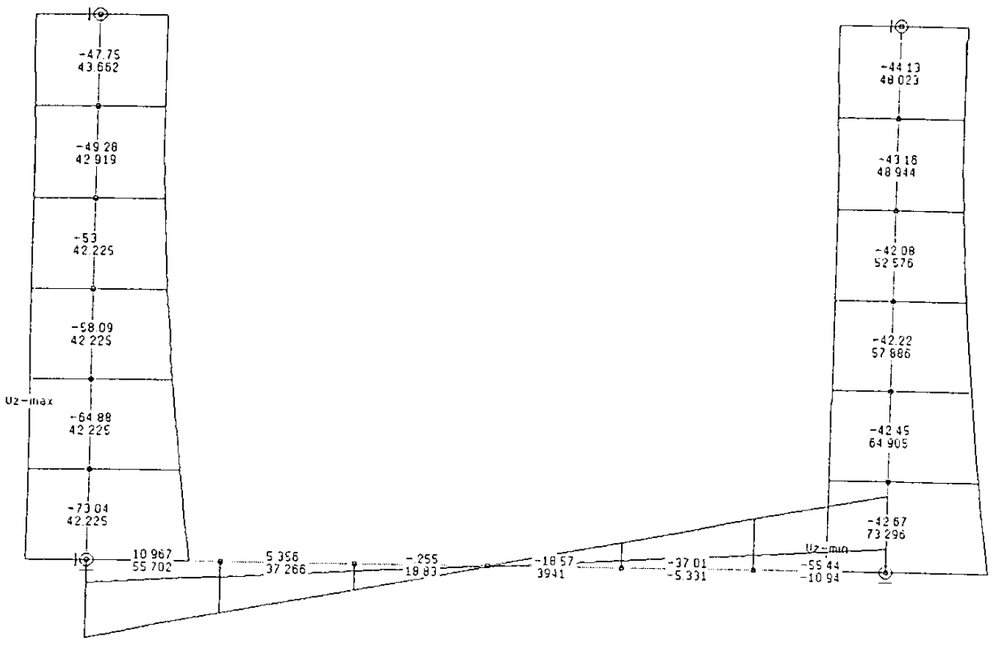
ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
11	0.324	-11.497	-26.926	-28.505	A B D
		-11.497	15.940	20.945	A C
12	0	-11.497	26.686	-28.190	A B D
		-11.497	-15.836	20.809	A C
12	0.0810	-10.789	25.748	-26.067	A B D
		-10.789	-15.836	19.526	A C
12	0.162	-10.080	24.870	-24.017	A B D
		-10.080	-15.836	18.244	A C
12	0.243	-9.371	24.052	-22.036	A B D
		-9.371	-15.836	16.961	A C
12	0.324	-8.663	23.293	-20.119	A B D
		-8.663	-15.836	15.678	A C
13	0	-5.775	-20.035	-13.223	A D
		-5.775	14.917	10.717	A B C
13	0.0825	-6.497	-20.035	-14.876	A D
		-6.497	14.391	11.926	A B C
13	0.165	-7.219	-22.171	-16.590	A B D
		-7.219	15.940	13.150	A C
13	0.248	-7.941	-22.821	-18.445	A B D
		-7.941	15.940	14.465	A C
13	0.330	-8.662	-23.532	-20.357	A B D
		-8.662	15.940	15.781	A C
14	0	-8.662	23.293	-20.119	A B D
		-8.662	-15.836	15.678	A C
14	0.0825	-7.941	22.581	-18.228	A B D
		-7.941	-15.836	14.392	A C
14	0.165	-7.219	19.905	-16.421	A D
		-7.219	-13.810	13.094	A B C
14	0.248	-6.497	19.905	-14.779	A D
		-6.497	-14.397	11.930	A B C
14	0.330	-5.775	19.905	-13.137	A D
		-5.775	-14.923	10.721	A B C
15	0	-2.888	-20.035	-6.611	A D
		-2.888	16.402	5.522	A B C
15	0.0825	-3.609	-20.035	-8.264	A D
		-3.609	16.124	6.864	A B C
15	0.165	-4.331	-20.035	-9.917	A D
		-4.331	15.784	8.180	A B C
15	0.247	-5.053	-20.035	-11.570	A D
		-5.053	15.381	9.466	A B C
15	0.330	-5.775	-20.035	-13.223	A D
		-5.775	14.917	10.717	A B C
16	0	-5.775	19.905	-13.137	A D
		-5.775	-14.923	10.721	A B C
16	0.0825	-5.053	19.905	-11.495	A D
		-5.053	-15.387	9.470	A B C

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX.)

Memb.	Distance [m]	N [kN]	Vz [kN]	My [kNm]	Crit. load groups
16	0.165	-4.331	19.905	-9.853	A D
		-4.331	-15.790	8.183	A B C
16	0.247	-3.609	19.905	-8.211	A D
		-3.609	-16.130	6.866	A B C
16	0.330	-2.888	19.905	-6.569	A D
		-2.888	-16.408	5.524	A B C
17	0	-2.89E-08	-20.035	-6.61E-08	A D
		-2.89E-08	16.897	5.58E-08	A B C
17	0.0825	-0.721875	-20.035	-1.653	A D
		-0.721875	16.866	1.393	A B C
17	0.165	-1.444	-20.035	-3.306	A D
		-1.444	16.774	2.781	A B C
17	0.248	-2.166	-20.035	-4.959	A D
		-2.166	16.619	4.159	A B C
17	0.330	-2.887	-20.035	-6.611	A D
		-2.887	16.402	5.522	A B C
18	0	-2.887	19.905	-6.569	A D
		-2.887	-16.408	5.524	A B C
18	0.0825	-2.166	19.905	-4.926	A D
		-2.166	-16.625	4.161	A B C
18	0.165	-1.444	19.905	-3.284	A D
		-1.444	-16.780	2.782	A B C
18	0.248	-0.721875	19.905	-1.642	A D
		-0.721875	-16.872	1.394	A B C
18	0.330	-2.89E-08	19.905	-6.57E-08	A D
		-2.89E-08	-16.903	5.58E-08	A B C

Scale 1 : 22.4
Int. Forces envelope Vz, GWSP AP, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 5.00E-03
  min: -7.30E+01 max: 1.66E+01 [kN]
- Envelope Shear force Vz-max, Scale 5.00E-03
  min: -1.66E+01 max: 7.33E+01 [kN]
- Text envelopes [kN]



Envolvante Cortante

Verificación de la sección sometida a esfuerzo cortante

Cortante de agotamiento por tracción en el alma es :

Piezas sin armadura de cortante

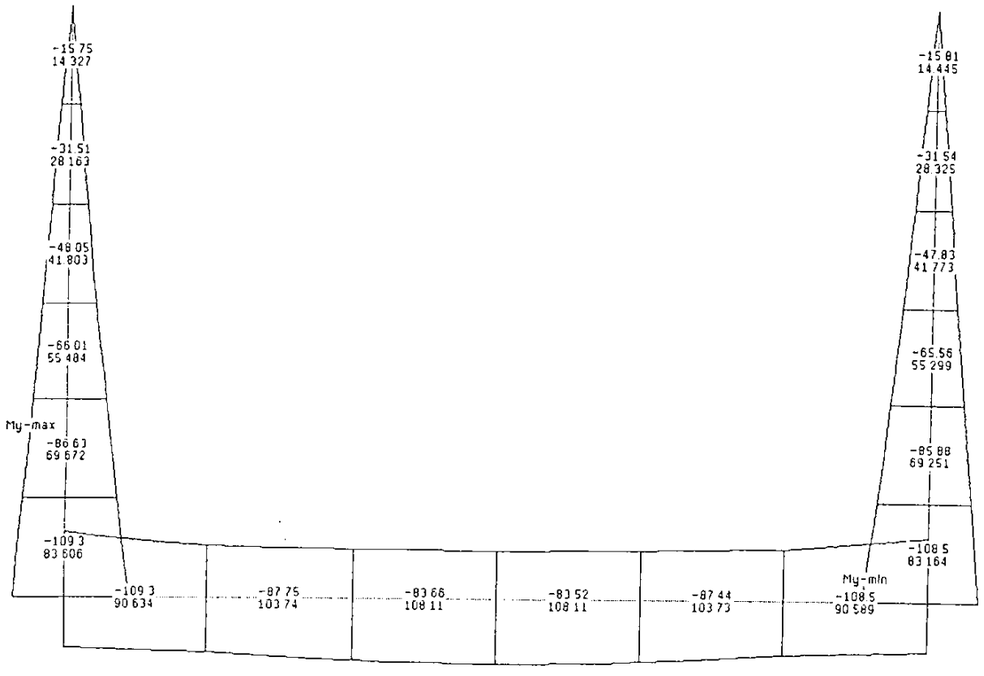
$$Vcu = (0.12\ \xi\ (100\ \rho l\ \ fck\ )^{1/3}\ )\ bo\ d$$

bo (m) = 1.00
h (m) = 0.35
recub (m) = 0.04
d (m) = 0.29
ξ = 1.833
As (cm^2) = 13.40
ρ = 0.00465 < 0.02
fck (N/mm^2)= 30

Vcu (KN) = 152.55

Vd (KN) = 73.30 No es necesaria armadura de cortante

Scale 1 : 20.8
Int. Forces envelope My, GWSP AP, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 2.00E-03
  min: -1.09E+02 max: -1.58E-07 [kNm]
- Envelope Moment My-max, Scale 2.00E-03
  min: 1.44E-07 max: 1.08E+02 [kNm]
- Text envelopes [kNm]



Envolvente Momentos flectores

Características mecánicas Sección "LOSA35" (sin coef. homogeneiz.)

Area	Ax = 3.500E3 cm2			
Momento de inercia	Iy =357.29E3 cm4	Iz = 2.917E6 cm4	Ip = 3.274E6 cm4	
Const. de torsión			Ix = 1.114E6 cm4	
Momento estático	Zy = 30.63E3 cm3	Zz = 87.50E3 cm3		
Baricentro	ys = -0.00 cm	zs = 17.50 cm	Angulo= 0.0 Grad	
Dist. al borde	yl = -50.00 cm	yr = 50.00 cm		
	zo = 17.50 cm	zu = -17.50 cm		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "LOSA35" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	3500.000	270.000	1.11E+06	1)

Puntos de contorno [cm]:
1 50.00 0.00 2 50.00 35.00 3 -50.00 35.00
4 -50.00 0.00

Armadura "B1" As-tot =4.48 cm2 (0.13 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.84	-46.00	31.00
					46.00	31.00
BOTTOM / RQS	AEH500	10.0	2	2.64	-46.00	4.00
					46.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SWZ	Vz	100.00	27.00	0.00	31.00	0.00	4.00
SWY	Vy	35.00	92.00	-46.00	17.50	46.00	17.50
SWT	Torsion	100.00	35.00	0.00	0.00	0.00	35.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "LOSA35"/"B1"

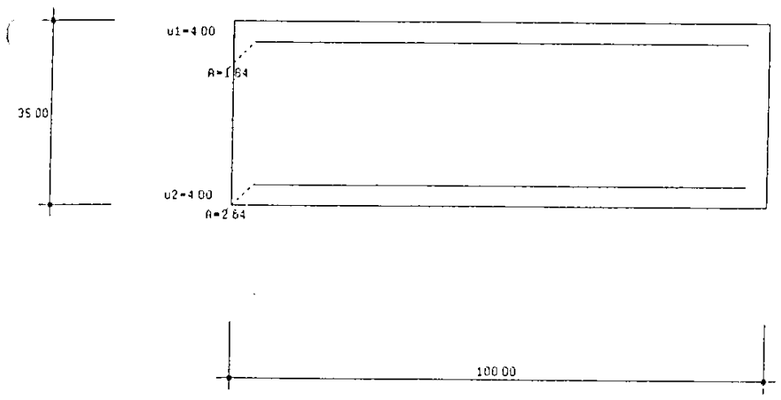
No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-109.30	0.00	
2	2	0.00	108.11	0.00	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

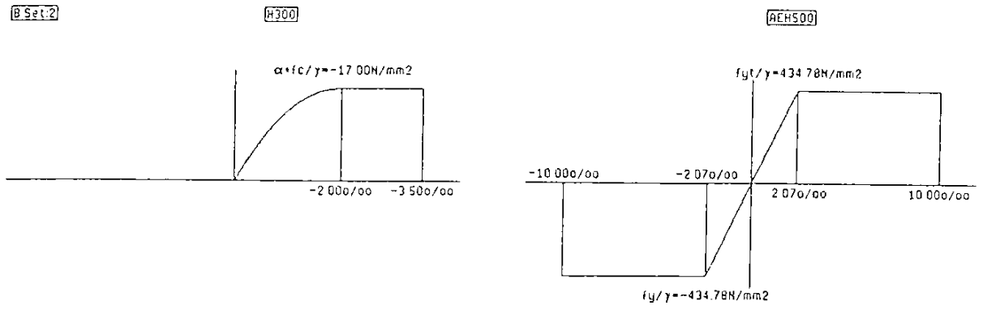
No Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500	-46.00	31.00	46.00	31.00	1.00	8.50	8.50
2 AEH500	-46.00	4.00	46.00	4.00	1.00	8.40	8.40

Max.x/h = 0.13 As-top/bot = 8.50/8.40 As = 0.48 % = 16.90

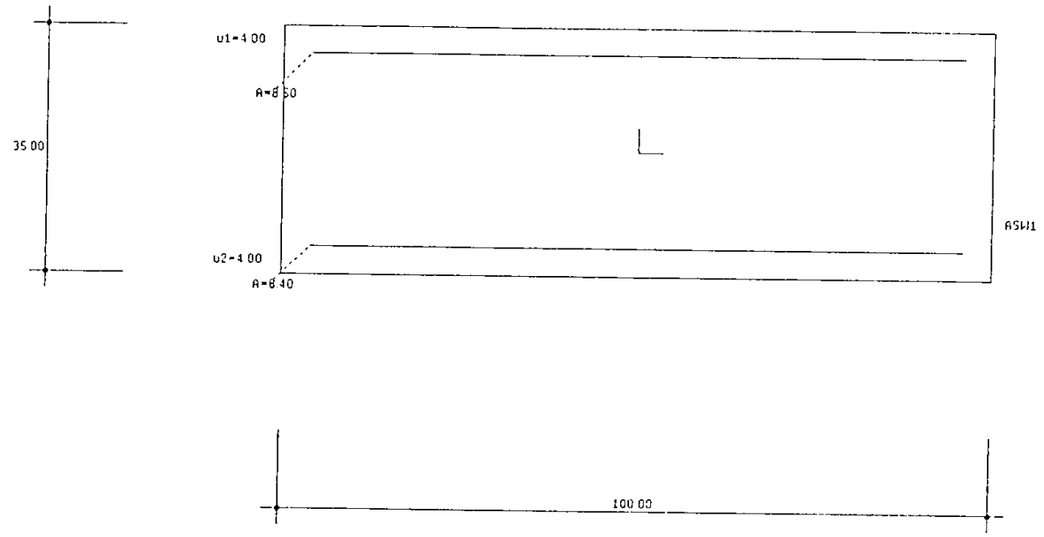
Sección LOSA35



Material acorde a la sección: "LOSA35"



Dimensionamiento,Sección "LOSA35"



Características mecánicas Sección "ALA35" (sin coef. homogeneiz.)

Area	Ax = 3.500E3 cm2		
Momento de inercia	Iy =357.29E3 cm4	Iz = 2.917E6 cm4	Ip = 3.274E6 cm4
Const. de torsión			Ix = 1.114E6 cm4
Momento estático	Zy = 30.63E3 cm3	Zz = 87.50E3 cm3	
Baricentro	ys = -0.00 cm	zs = 17.50 cm	Angulo= 0.0 Grad
Dist. al borde	yl = -50.00 cm	yr = 50.00 cm	
	zo = 17.50 cm	zu = -17.50 cm	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección

Contorno de sección parcial, Sección "ALA35" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
RQS	H300	1.00	3500.000	270.000	1.11E+06	1)

Puntos de contorno [cm]:
1 50.00 0.00 2 50.00 35.00 3 -50.00 35.00
4 -50.00 0.00

Armadura "B1" As-tot =6.00 cm2 (0.17 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[cm]	z [cm]
TOP / RQS	AEH500	10.0	2	1.00	-46.00	31.00
					46.00	31.00
BOTTOM / RQS	AEH500	10.0	2	5.00	-46.00	4.00
					46.00	4.00

Pared	Solicit.	Ancho	Alt.	y1	z1	y2	z2
SW1	Vz	100.00	27.00	0.00	31.00	0.00	4.00
SW1	Vy	35.00	92.00	-46.00	17.50	46.00	17.50
	Torsion	100.00	35.00	0.00	0.00	0.00	35.00

Punto de resultados:

Nomb / Sección parcial	Resultado	Unidad	y[cm]	z [cm]
ASW1	Res.Kmb.			

Fórmula: ASWMIN(SWZ) | ASW(SWZ)+ASW(SWT)

Dimensionamiento a flexión: Viga Sección "ALA35"/"B1"

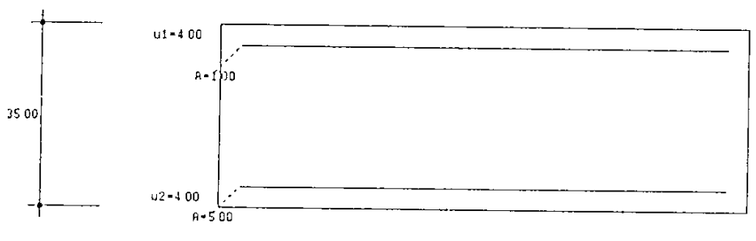
No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-109.30	0.00	
2	2	0.00	83.16	0.00	

( )metros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

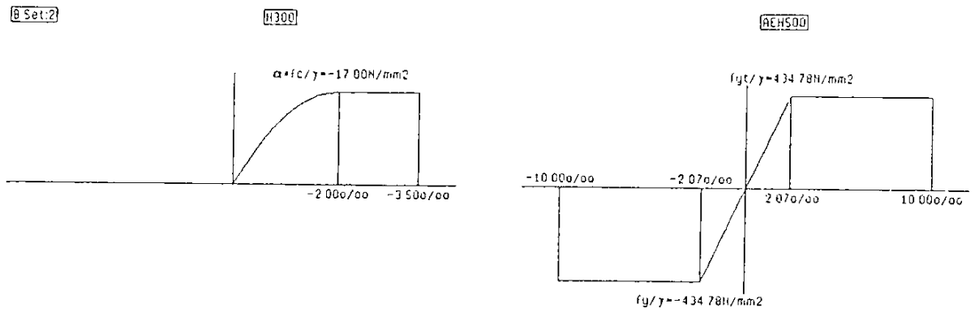
No Armad. long. :	y1 [cm]	z1 [cm]	y2 [cm]	z2 [cm]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500	-46.00	31.00	46.00	31.00	1.00	8.50	8.50
2 AEH500	-46.00	4.00	46.00	4.00	1.00	6.41	6.41

Max.x/h = 0.13 As-top/bot = 8.50/6.41 As = 0.43 % = 14.91

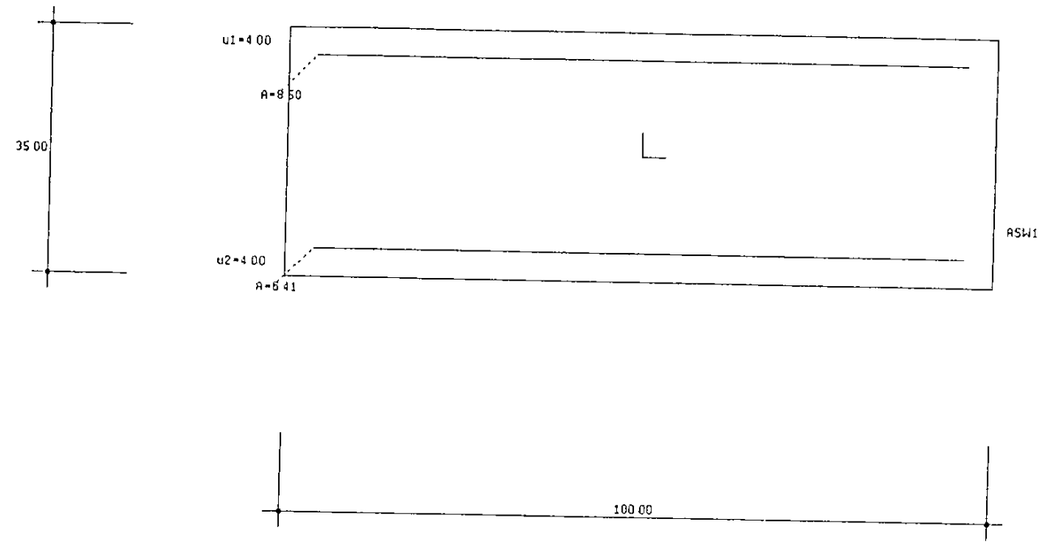
Sección ALA35



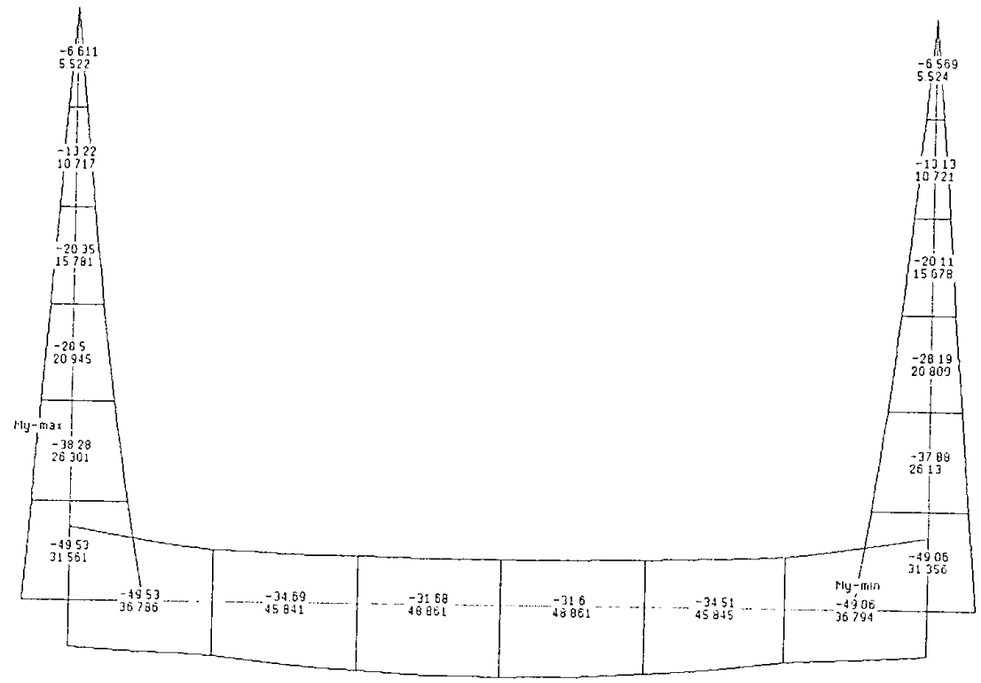
Material acorde a la sección: "ALA35"



Dimensionamiento,Sección "ALA35"



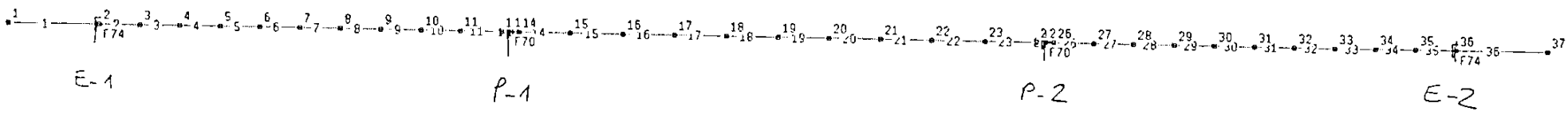
Scale 1 : 20.6
Int. Forces envelope My, GWSP AQ, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-03
  min: -4.95E+01 max: -6.57E-08 [kNm]
- Envelope Moment My-max, Scale 5.00E-03
  min: 5.58E-08 max: 4.89E+01 [kNm]
- Text envelopes [kNm]



ENVOLVENTE MOMENTOS FISURACIÓN

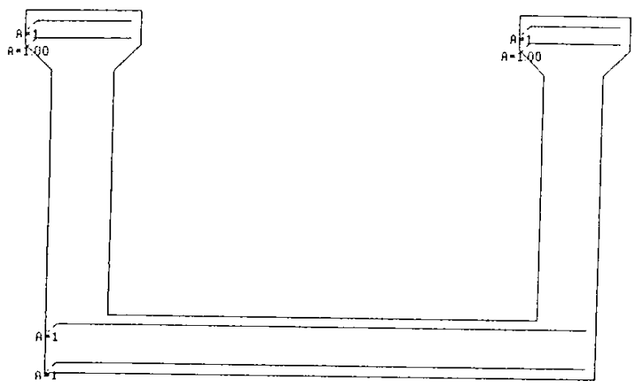
2.4. Comprobación Longitudinal del tablero

Scale 1 : 192.6
Int. Force, Loadcomb. CO, Subsys. "LIST"
- Structure: Elmnts.



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Sección CANAL320



Características mecánicas Sección "CANAL320" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2			
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip = 5.157 m4
Const. de torsión					Ix = 0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3	
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo= 0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m	
	zo =	1.32 m	zu =	-0.83 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL320" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.853	9.58E+06	3)

Puntos de contorno [m]:

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =6.00 cm2 (0.02 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	1.00	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	1.00	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	1.00	1.16	1.99

				1.69	1.99
LR 5 / CS 1	AEH500	1.0	2 1.00	-1.69	1.99
				-1.16	1.99
LR 2 / CS 1	AEH500	1.0	2 1.00	-1.54	0.29
				1.54	0.29
LR 1 / CS 1	AEH500	1.0	2 1.00	-1.54	0.06
				1.54	0.06

2.4.1. Verificación de las secciones

2.4.1.1. Comprobación de estados límites servicio (ELS)

ENVELOPE SPECIFIC.: CR ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	3	1.000		REOLOGICAS
C	PLUS	4	1.000		SOBRECARGA AGUA
D	PLUS	5	0.600000		TEMPERATURA(+)
E	OR	6	0.600000		TEMPERATURA(-)
F	PLUS	7	0.600000		GRADIENTE(+)
G	OR	8	0.600000		GRADIENTE(-)
H	PLUS	9	0.300000		VIENTO

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A B G		Max: A B C F			
1	0	6.66E-12	0	-1.85E-06	0	-3.72E-13	0
		6.66E-12	0	-3.15E-06	0	3.52E-13	0
		Min: A B G		Max: A B C F			
1	0.725	6.66E-12	0	-78.753	0	-28.548	0
		6.66E-12	0	-46.128	0	-16.721	0
		Min: A B C G		Max: A B F			
1	1.450	6.66E-12	0	-157.506	0	-114.192	0
		6.66E-12	0	-92.256	0	-66.886	0
		Min: A B C G		Max: A B F			
1	2.175	6.66E-12	0	-236.259	0	-256.932	0
		6.66E-12	0	-138.384	0	-150.493	0
		Min: A B C F		Max: A B G			
1	2.900	6.66E-12	0	-315.012	0	-456.768	0
		6.66E-12	0	-184.512	0	-267.543	0
		Min: A B C F		Max: A B G			
2	0	27.347	0	407.427	0	-456.768	0
		27.347	0	471.452	0	-267.543	0
		Min: A B C G		Max: A B F			
2	0.318	27.347	0	372.871	0	-332.652	0
		27.347	0	451.212	0	-120.782	0
		Min: A B C G		Max: A B F			
2	0.636	27.347	0	338.314	0	-219.529	0
		27.347	0	430.971	0	19.540	0
		Min: A B C G		Max: A B F			
2	0.954	27.347	0	117.099	0	-126.811	0
		27.347	0	597.389	0	162.835	0
		Min: A B G		Max: A B C F			
2	1.272	27.347	0	96.858	0	-92.778	0
		27.347	0	562.833	0	347.382	0
		Min: A B G		Max: A B C F			
3	0	27.347	0	96.858	0	-92.778	0
		27.347	0	562.833	0	347.382	0

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A B G		Max: A B C F			
3	0.318	27.347	0	76.618	0	-65.185	0
		27.347	0	528.276	0	520.937	0
		Min: A B G		Max: A B C F			
3	0.636	27.347	0	56.377	0	-44.030	0
		27.347	0	493.720	0	683.498	0
		Min: A B G		Max: A B C F			
3	0.954	27.347	0	36.136	0	-29.315	0
		27.347	0	459.164	0	835.067	0
		Min: A B G		Max: A B C F			
3	1.272	27.347	0	15.896	0	-21.038	0
		27.347	0	424.608	0	975.641	0
		Min: A B G		Max: A B C F			
4	0	27.347	0	15.896	0	-21.038	0
		27.347	0	424.608	0	975.641	0
		Min: A B G		Max: A B C F			
4	0.318	27.347	0	-4.345	0	-19.201	0
		27.347	0	390.051	0	1105.223	0
		Min: A B G		Max: A B C F			
4	0.636	27.347	0	-24.586	0	-23.803	0
		27.347	0	355.495	0	1223.811	0
		Min: A B G		Max: A B C F			
4	0.954	27.347	0	-44.826	0	-34.844	0
		27.347	0	320.939	0	1331.407	0
		Min: A B G		Max: A B C F			
4	1.272	27.347	0	-65.067	0	-52.324	0
		27.347	0	286.382	0	1428.009	0
		Min: A B G		Max: A B C F			
5	0	27.347	0	-65.067	0	-52.324	0
		27.347	0	286.382	0	1428.009	0
		Min: A B G		Max: A B C F			
5	0.318	27.347	0	-85.308	0	-76.243	0
		27.347	0	251.826	0	1513.617	0
		Min: A B G		Max: A B C F			
5	0.636	27.347	0	-105.549	0	-106.601	0
		27.347	0	217.270	0	1588.233	0
		Min: A B G		Max: A B C F			
5	0.954	27.347	0	-125.789	0	-143.398	0
		27.347	0	182.713	0	1651.855	0
		Min: A B G		Max: A B C F			
5	1.272	27.347	0	-146.030	0	-186.634	0
		27.347	0	148.157	0	1704.484	0
		Min: A B G		Max: A B C F			
6	0	27.347	0	-146.030	0	-186.634	0
		27.347	0	148.157	0	1704.484	0
		Min: A B G		Max: A B C F			
6	0.318	27.347	0	-166.271	0	-236.310	0
		27.347	0	113.601	0	1746.120	0

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A B G		Max: A B C F			
6	0.636	27.347	0	-186.511	0	-292.424	0
		27.347	0	79.044	0	1776.762	0
		Min: A B G		Max: A B C F			
6	0.954	27.347	0	-206.752	0	-354.978	0
		27.347	0	44.488	0	1796.412	0
		Min: A B G		Max: A B C F			
6	1.272	27.347	0	-226.993	0	-423.970	0
		27.347	0	9.932	0	1805.068	0
		Min: A B G		Max: A B C F			
7	0	27.347	0	-226.993	0	-423.970	0
		27.347	0	9.932	0	1805.068	0
		Min: A B G		Max: A B C F			
7	0.318	27.347	0	-247.234	0	-499.402	0
		27.347	0	-24.625	0	1802.731	0
		Min: A B G		Max: A B C F			
7	0.636	27.347	0	-267.474	0	-581.272	0
		27.347	0	-59.181	0	1789.400	0
		Min: A B G		Max: A B C F			
7	0.954	27.347	0	-287.715	0	-669.582	0
		27.347	0	-93.737	0	1765.077	0
		Min: A B G		Max: A B C F			
7	1.272	27.347	0	-307.956	0	-764.331	0
		27.347	0	-128.294	0	1729.760	0
		Min: A B G		Max: A B C F			
8	0	27.347	0	-307.956	0	-764.331	0
		27.347	0	-128.294	0	1729.760	0
		Min: A B G		Max: A B C F			
8	0.318	27.347	0	-328.196	0	-865.519	0
		27.347	0	-162.850	0	1683.450	0
		Min: A B G		Max: A B C F			
8	0.636	27.347	0	-348.437	0	-973.146	0
		27.347	0	-197.406	0	1626.147	0
		Min: A B G		Max: A B C F			
8	0.954	27.347	0	-368.678	0	-1087.212	0
		27.347	0	-231.963	0	1557.850	0
		Min: A B G		Max: A B C F			
8	1.272	27.347	0	-388.918	0	-1207.717	0
		27.347	0	-266.519	0	1478.560	0
		Min: A B G		Max: A B C F			
9	0	27.347	0	-388.918	0	-1207.717	0
		27.347	0	266.519	0	1478.560	0
		Min: A B G		Max: A B C F			
9	0.318	27.347	0	-409.159	0	-1334.661	0
		27.347	0	-301.075	0	1388.277	0
		Min: A B G		Max: A B C F			
9	0.636	27.347	0	-429.263	0	-1515.342	0
		27.347	0	-135.769	0	1334.298	0

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A B C G		Max: A B F			
9	0.954	27.347	0	-663.819	0	-1721.023	0
		27.347	0	-156.009	0	1287.887	0
		Min: A B C G		Max: A B F			
9	1.272	27.347	0	-698.376	0	-1937.697	0
		27.347	0	-176.250	0	1235.037	0
		Min: A B C G		Max: A B F			
10	0	27.347	0	-698.376	0	-1937.697	0
		27.347	0	-176.250	0	1235.037	0
		Min: A B C G		Max: A B F			
10	0.318	27.347	0	-732.932	0	-2165.364	0
		27.347	0	-196.491	0	1175.748	0
		Min: A B C G		Max: A B F			
10	0.636	27.347	0	-767.488	0	-2404.025	0
		27.347	0	-216.731	0	1110.020	0
		Min: A B C G		Max: A B F			
10	0.954	27.347	0	-802.045	0	-2653.679	0
		27.347	0	-236.972	0	1037.853	0
		Min: A B C G		Max: A B F			
10	1.272	27.347	0	-836.601	0	-2914.326	0
		27.347	0	-257.213	0	959.247	0
		Min: A B C G		Max: A B F			
11	0	27.347	0	-836.601	0	-2914.326	0
		27.347	0	-257.213	0	959.247	0
		Min: A B C G		Max: A B F			
11	0.318	27.347	0	-871.157	0	-3185.966	0
		27.347	0	-277.454	0	874.201	0
		Min: A B C G		Max: A B F			
11	0.636	27.347	0	-905.714	0	-3468.600	0
		27.347	0	-297.694	0	782.717	0
		Min: A B C G		Max: A B F			
11	0.954	27.347	0	-940.270	0	-3762.226	0
		27.347	0	-317.935	0	684.793	0
		Min: A B C G		Max: A B F			
11	1.272	27.347	0	-974.826	0	-4066.846	0
		27.347	0	-338.176	0	580.431	0
		Min: A B C G		Max: A B F			
12	0	27.347	0	-974.826	0	-4066.846	0
		27.347	0	-338.176	0	580.431	0
		Min: A B C G		Max: A B F			
12	0.0688	27.347	0	-982.294	0	-4134.122	0
		27.347	0	-342.550	0	557.031	0
		Min: A B C G		Max: A B F			
12	0.138	27.347	0	-989.762	0	-4201.912	0
		27.347	0	-346.924	0	533.330	0
		Min: A B C G		Max: A B F			
12	0.206	27.347	0	-997.230	0	-4270.215	0
		27.347	0	-351.298	0	509.329	0

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A B C G		Max: A B F			
12	0.275	27.347	0	-1004.698	0	-4339.031	0
		27.347	0	-355.673	0	485.027	0
		Min: A B C G		Max: A B F			
13	0	34.235	0	923.312	0	-4339.031	0
		34.235	0	540.812	0	485.027	0
		Min: A B C G		Max: A B F			
13	0.0688	34.235	0	915.845	0	-4275.810	0
		34.235	0	536.438	0	522.057	0
		Min: A B C G		Max: A B F			
13	0.138	34.235	0	908.377	0	-4213.102	0
		34.235	0	532.064	0	558.787	0
		Min: A B C G		Max: A B F			
13	0.206	34.235	0	900.909	0	-4150.908	0
		34.235	0	527.690	0	595.216	0
		Min: A B C G		Max: A B F			
13	0.275	34.235	0	893.441	0	-4089.227	0
		34.235	0	523.316	0	631.344	0
		Min: A B C G		Max: A B F			
14	0	34.235	0	893.441	0	-4089.227	0
		34.235	0	523.316	0	631.344	0
		Min: A B C G		Max: A B F			
14	0.411	34.235	0	848.769	0	-3730.986	0
		34.235	0	497.150	0	841.177	0
		Min: A B C G		Max: A B F			
14	0.822	34.235	0	804.097	0	-3391.115	0
		34.235	0	470.984	0	1040.250	0
		Min: A B C G		Max: A B F			
14	1.234	34.235	0	759.425	0	-3069.616	0
		34.235	0	444.818	0	1228.562	0
		Min: A B C G		Max: A B F			
14	1.645	34.235	0	714.753	0	-2766.489	0
		34.235	0	418.653	0	1406.113	0
		Min: A B C G		Max: A B F			
15	0	34.235	0	714.752	0	-2766.489	0
		34.235	0	418.652	0	1406.113	0
		Min: A B C G		Max: A B F			
15	0.411	34.235	0	670.080	0	-2481.732	0
		34.235	0	392.487	0	1572.904	0
		Min: A B C G		Max: A B F			
15	0.823	34.235	0	625.408	0	-2215.347	0
		34.235	0	366.321	0	1728.933	0
		Min: A B C G		Max: A B F			
15	1.234	34.235	0	580.736	0	-1967.334	0
		34.235	0	340.155	0	1874.203	0
		Min: A B C G		Max: A B F			
15	1.645	34.235	0	313.989	0	-1808.495	0
		34.235	0	536.064	0	2079.514	0

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A B C		Max: A B C F			
16	0	34.235	0	313.989	0	-1808.495	0
		34.235	0	536.064	0	2079.514	0
		Min: A B G		Max: A B C F			
16	0.411	34.235	0	287.824	0	-1684.747	0
		34.235	0	491.392	0	2290.785	0
		Min: A B G		Max: A B C F			
16	0.822	34.235	0	261.658	0	-1571.760	0
		34.235	0	446.720	0	2483.685	0
		Min: A B G		Max: A B C F			
16	1.234	34.235	0	235.492	0	-1469.534	0
		34.235	0	402.048	0	2658.213	0
		Min: A B G		Max: A B C F			
16	1.645	34.235	0	209.326	0	-1378.068	0
		34.235	0	357.376	0	2814.369	0
		Min: A B G		Max: A B C F			
17	0	34.235	0	209.326	0	-1378.068	0
		34.235	0	357.376	0	2814.369	0
		Min: A B G		Max: A B C F			
17	0.411	34.235	0	183.160	0	-1297.363	0
		34.235	0	312.704	0	2952.155	0
		Min: A B G		Max: A B C F			
17	0.822	34.235	0	156.995	0	-1227.418	0
		34.235	0	268.032	0	3071.568	0
		Min: A B G		Max: A B C F			
17	1.234	34.235	0	130.829	0	-1168.235	0
		34.235	0	223.360	0	3172.611	0
		Min: A B G		Max: A B C F			
17	1.645	34.235	0	104.663	0	-1119.812	0
		34.235	0	178.688	0	3255.282	0
		Min: A B G		Max: A B C F			
18	0	34.235	0	104.663	0	-1119.812	0
		34.235	0	178.688	0	3255.282	0
		Min: A B G		Max: A B C F			
18	0.411	34.235	0	78.497	0	-1082.149	0
		34.235	0	134.016	0	3319.582	0
		Min: A B G		Max: A B C F			
18	0.822	34.235	0	52.332	0	-1055.248	0
		34.235	0	89.344	0	3365.510	0
		Min: A B G		Max: A B C F			
18	1.234	34.235	0	26.166	0	-1039.107	0
		34.235	0	44.672	0	3393.067	0
		Min: A B G		Max: A B C F			
18	1.645	34.235	0	1.05E-06	0	-1033.726	0
		34.235	0	1.79E-06	0	3402.253	0
		Min: A B G		Max: A B C F			
19	0	34.235	0	-1.05E-06	0	-1033.726	0

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		34.235	0	-1.79E-06	0	3402.253	0
	Min:	A B G		Max: A B C F			
19	0.411	34.235	0	-26.166	0	-1039.107	0
		34.235	0	-44.672	0	3393.067	0
	Min:	A B G		Max: A B C F			
19	0.822	34.235	0	-52.332	0	-1055.248	0
		34.235	0	-89.344	0	3365.510	0
	Min:	A B G		Max: A B C F			
19	1.234	34.235	0	-78.497	0	-1082.149	0
		34.235	0	-134.016	0	3319.582	0
	Min:	A B G		Max: A B C F			
19	1.645	34.235	0	-104.663	0	-1119.812	0
		34.235	0	-178.688	0	3255.282	0
	Min:	A B G		Max: A B C F			
20	0	34.235	0	-104.663	0	-1119.812	0
		34.235	0	-178.688	0	3255.282	0
	Min:	A B G		Max: A B C F			
20	0.411	34.235	0	-130.829	0	-1168.235	0
		34.235	0	-223.360	0	3172.611	0
	Min:	A B G		Max: A B C F			
20	0.822	34.235	0	-156.995	0	-1227.418	0
		34.235	0	-268.032	0	3071.568	0
	Min:	A B G		Max: A B C F			
20	1.234	34.235	0	-183.160	0	-1297.363	0
		34.235	0	-312.704	0	2952.155	0
	Min:	A B G		Max: A B C F			
20	1.645	34.235	0	-209.326	0	-1378.068	0
		34.235	0	-357.376	0	2814.369	0
	Min:	A B G		Max: A B C F			
21	0	34.235	0	-209.326	0	-1378.068	0
		34.235	0	-357.376	0	2814.369	0
	Min:	A B G		Max: A B C F			
21	0.411	34.235	0	-235.492	0	-1469.534	0
		34.235	0	-402.048	0	2658.213	0
	Min:	A B G		Max: A B C F			
21	0.822	34.235	0	-261.658	0	-1571.760	0
		34.235	0	-446.720	0	2483.685	0
	Min:	A B G		Max: A B C F			
21	1.234	34.235	0	-287.824	0	-1684.747	0
		34.235	0	-491.392	0	2290.785	0
	Min:	A B G		Max: A B C F			
21	1.645	34.235	0	-313.989	0	-1808.495	0
		34.235	0	-536.064	0	2079.514	0
	Min:	A B G		Max: A B C F			
22	0	34.235	0	-313.989	0	-1808.495	0
		34.235	0	-536.064	0	2079.514	0
	Min:	A B G		Max: A B C F			
22	0.411	34.235	0	-580.736	0	-1967.334	0

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		34.235	0	-340.155	0	1874.203	0
	Min:	A B C G		Max: A B F			
22	0.822	34.235	0	-625.408	0	-2215.347	0
		34.235	0	-366.321	0	1728.933	0
	Min:	A B C G		Max: A B F			
22	1.234	34.235	0	-670.080	0	-2481.732	0
		34.235	0	-392.487	0	1572.904	0
	Min:	A B C G		Max: A B F			
22	1.645	34.235	0	-714.752	0	-2766.489	0
		34.235	0	-418.652	0	1406.113	0
	Min:	A B C G		Max: A B F			
23	0	34.235	0	-714.753	0	-2766.489	0
		34.235	0	-418.653	0	1406.113	0
	Min:	A B C G		Max: A B F			
23	0.411	34.235	0	-759.425	0	-3069.616	0
		34.235	0	-444.818	0	1228.562	0
	Min:	A B C G		Max: A B F			
23	0.823	34.235	0	-804.097	0	-3391.115	0
		34.235	0	-470.984	0	1040.250	0
	Min:	A B C G		Max: A B F			
23	1.234	34.235	0	-848.769	0	-3730.986	0
		34.235	0	-497.150	0	841.177	0
	Min:	A B C G		Max: A B F			
23	1.645	34.235	0	-893.441	0	-4089.227	0
		34.235	0	-523.316	0	631.344	0
	Min:	A B C G		Max: A B F			
24	0	34.235	0	-893.441	0	-4089.227	0
		34.235	0	-523.316	0	631.344	0
	Min:	A B C G		Max: A B F			
24	0.0687	34.235	0	-900.909	0	-4150.908	0
		34.235	0	-527.690	0	595.216	0
	Min:	A B C G		Max: A B F			
24	0.137	34.235	0	-908.377	0	-4213.102	0
		34.235	0	-532.064	0	558.787	0
	Min:	A B C G		Max: A B F			
24	0.206	34.235	0	-915.845	0	-4275.810	0
		34.235	0	-536.438	0	522.057	0
	Min:	A B C G		Max: A B F			
24	0.275	34.235	0	-923.312	0	-4339.031	0
		34.235	0	-540.812	0	485.027	0
	Min:	A B C G		Max: A B F			
25	0	27.347	0	1004.698	0	-4339.031	0
		27.347	0	355.673	0	485.027	0
	Min:	A B C G		Max: A B F			
25	0.0687	27.347	0	997.210	0	-4270.215	0
		27.347	0	351.298	0	509.329	0
	Min:	A B C G		Max: A B F			
25	0.137	27.347	0	989.742	0	-4201.912	0

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		27.347	0	346.924	0	533.330	0
	Min:	A B C G		Max: A B F			
25	0.206	27.347	0	982.294	0	-4134.122	0
		27.347	0	342.550	0	557.031	0
	Min:	A B C G		Max: A B F			
25	0.275	27.347	0	974.826	0	-4066.846	0
		27.347	0	338.176	0	580.431	0
	Min:	A B C G		Max: A B F			
26	0	27.347	0	974.826	0	-4066.846	0
		27.347	0	338.176	0	580.431	0
	Min:	A B C G		Max: A B F			
26	0.318	27.347	0	940.270	0	-3762.236	0
		27.347	0	317.935	0	684.793	0
	Min:	A B C G		Max: A B F			
26	0.636	27.347	0	905.714	0	-3468.600	0
		27.347	0	297.694	0	782.717	0
	Min:	A B C G		Max: A B F			
26	0.954	27.347	0	871.157	0	-3185.966	0
		27.347	0	277.454	0	874.201	0
	Min:	A B C G		Max: A B F			
26	1.272	27.347	0	836.601	0	-2914.326	0
		27.347	0	257.213	0	959.247	0
	Min:	A B C G		Max: A B F			
27	0	27.347	0	836.601	0	-2914.326	0
		27.347	0	257.213	0	959.247	0
	Min:	A B C G		Max: A B F			
27	0.318	27.347	0	802.045	0	-2653.679	0
		27.347	0	236.972	0	1037.853	0
	Min:	A B C G		Max: A B F			
27	0.636	27.347	0	767.488	0	-2404.025	0
		27.347	0	216.731	0	1110.020	0
	Min:	A B C G		Max: A B F			
27	0.954	27.347	0	732.932	0	-2165.364	0
		27.347	0	196.491	0	1175.748	0
	Min:	A B C G		Max: A B F			
27	1.272	27.347	0	698.376	0	-1937.697	0
		27.347	0	176.250	0	1235.037	0
	Min:	A B C G		Max: A B F			
28	0	27.347	0	698.376	0	-1937.697	0
		27.347	0	176.250	0	1235.037	0
	Min:	A B C G		Max: A B F			
28	0.318	27.347	0	661.819	0	-1721.023	0
		27.347	0	156.009	0	1287.887	0
	Min:	A B C G		Max: A B F			
28	0.636	27.347	0	629.263	0	-1515.342	0
		27.347	0	135.769	0	1334.298	0
	Min:	A B C G		Max: A B F			
28	0.954	27.347	0	409.159	0	-1334.661	0

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		27.347	0	301.075	0	1388.277	0
	Min:	A B C G		Max: A B C F			
28	1.272	27.347	0	388.918	0	-1207.717	0
		27.347	0	266.519	0	1478.560	0
	Min:	A B G		Max: A B C F			
29	0	27.347	0	388.918	0	-1207.717	0
		27.347	0	266.519	0	1478.560	0
	Min:	A B G		Max: A B C F			
29	0.318	27.347	0	368.678	0	-1087.212	0
		27.347	0	231.963	0	1557.850	0
	Min:	A B G		Max: A B C F			
29	0.636	27.347	0	348.437	0	-973.146	0
		27.347	0	197.406	0	1626.147	0
	Min:	A B G		Max: A B C F			
29	0.954	27.347	0	328.196	0	-865.519	0
		27.347	0	162.850	0	1683.450	0
	Min:	A B G		Max: A B C F			
29	1.272	27.347	0	307.956	0	-764.331	0
		27.347	0	128.294	0	1729.760	0
	Min:	A B G		Max: A B C F			
30	0	27.347	0	307.956	0	-764.331	0
		27.347	0	128.294	0	1729.760	0
	Min:	A B G		Max: A B C F			
30	0.318	27.347	0	287.715	0	-669.582	0
		27.347	0	93.737	0	1765.077	0
	Min:	A B G		Max: A B C F			
30	0.636	27.347	0	267.474	0	-581.272	0
		27.347	0	59.181	0	1789.400	0
	Min:	A B G		Max: A B C F			
30	0.954	27.347	0	247.234	0	-499.402	0
		27.347	0	24.625	0	1802.731	0
	Min:	A B G		Max: A B C F			
30	1.272	27.347	0	226.993	0	-423.970	0
		27.347	0	-9.932	0	1805.068	0
	Min:	A B G		Max: A B C F			
31	0	27.347	0	226.993	0	-423.970	0
		27.347	0	-9.932	0	1805.068	0
	Min:	A B G		Max: A B C F			
31	0.318	27.347	0	206.752	0	-354.978	0
		27.347	0	-44.488	0	1796.412	0
	Min:	A B G		Max: A B C F			
31	0.636	27.347	0	186.511	0	-292.424	0
		27.347	0	-79.044	0	1776.762	0
	Min:	A B G		Max: A B C F			
31	0.954	27.347	0	166.271	0	-236.310	0
		27.347	0	-113.601	0	1746.120	0
	Min:	A B G		Max: A B C F			
31	1.272	27.347	0	146.030	0	-186.634	0

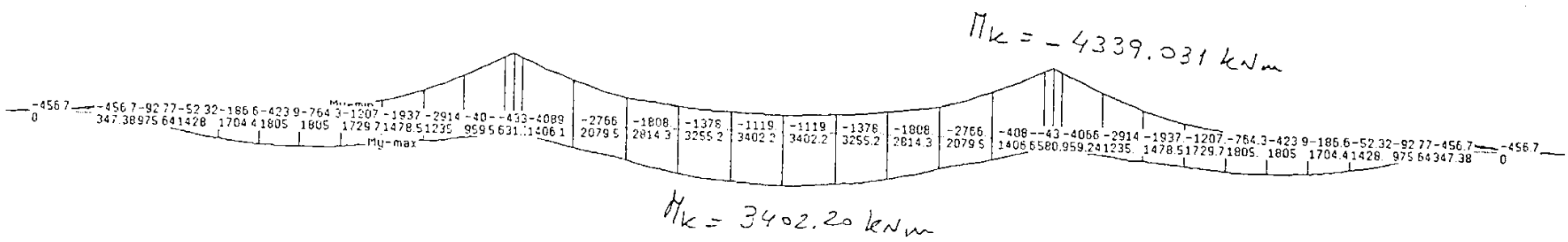
ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		27.347	0	-148.157	0	1704.484	0
	Min:	A B G		Max: A B C F			
32	0	27.347	0	146.030	0	-186.634	0
		27.347	0	-148.157	0	1704.484	0
	Min:	A B G		Max: A B C F			
32	0.318	27.347	0	125.789	0	-143.398	0
		27.347	0	-182.713	0	1651.855	0
	Min:	A B G		Max: A B C F			
32	0.636	27.347	0	105.549	0	-106.601	0
		27.347	0	-217.270	0	1588.233	0
	Min:	A B G		Max: A B C F			
32	0.954	27.347	0	85.308	0	-76.243	0
		27.347	0	-251.826	0	1513.617	0
	Min:	A B G		Max: A B C F			
32	1.272	27.347	0	65.067	0	-52.324	0
		27.347	0	-286.382	0	1428.009	0
	Min:	A B G		Max: A B C F			
33	0	27.347	0	65.067	0	-52.324	0
		27.347	0	-286.382	0	1428.009	0
	Min:	A B G		Max: A B C F			
33	0.318	27.347	0	44.826	0	-34.844	0
		27.347	0	-320.939	0	1331.407	0
	Min:	A B G		Max: A B C F			
33	0.636	27.347	0	24.586	0	-23.803	0
		27.347	0	-355.495	0	1223.811	0
	Min:	A B G		Max: A B C F			
33	0.954	27.347	0	4.345	0	-19.201	0
		27.347	0	-390.051	0	1105.223	0
	Min:	A B G		Max: A B C F			
33	1.272	27.347	0	-15.896	0	-21.038	0
		27.347	0	-424.608	0	975.641	0
	Min:	A B G		Max: A B C F			
34	0	27.347	0	-15.896	0	-21.038	0
		27.347	0	-424.608	0	975.641	0
	Min:	A B G		Max: A B C F			
34	0.318	27.347	0	-36.136	0	-29.315	0
		27.347	0	-459.164	0	835.067	0
	Min:	A B G		Max: A B C F			
34	0.636	27.347	0	-56.377	0	-44.030	0
		27.347	0	-493.720	0	683.498	0
	Min:	A B G		Max: A B C F			
34	0.954	27.347	0	-76.618	0	-65.185	0
		27.347	0	-528.276	0	520.937	0
	Min:	A B G		Max: A B C F			
34	1.272	27.347	0	-96.858	0	-92.778	0
		27.347	0	-562.833	0	347.382	0
	Min:	A B G		Max: A B C F			

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
35	0	27.347	0	-96.858	0	-92.778	0
		27.347	0	-562.833	0	347.382	0
	Min:	A B G		Max: A B C F			
35	0.318	27.347	0	-117.099	0	-126.811	0
		27.347	0	-597.389	0	162.835	0
	Min:	A B G		Max: A B C F			
35	0.636	27.347	0	-138.314	0	-219.529	0
		27.347	0	-630.971	0	19.540	0
	Min:	A B C G		Max: A B F			
35	0.954	27.347	0	-372.871	0	-332.652	0
		27.347	0	-451.212	0	-120.782	0
	Min:	A B C G		Max: A B F			
35	1.272	27.347	0	-407.427	0	-456.768	0
		27.347	0	-471.452	0	-267.543	0
	Min:	A B C G		Max: A B F			
36	0	1.30E-11	0	315.012	0	-456.768	0
		1.30E-11	0	184.512	0	-267.543	0
	Min:	A B C F		Max: A B G			
36	0.725	1.30E-11	0	236.259	0	-256.932	0
		1.30E-11	0	138.384	0	-150.493	0
	Min:	A B C F		Max: A B G			
36	1.450	1.30E-11	0	157.506	0	-114.192	0
		1.30E-11	0	92.256	0	-66.886	0
	Min:	A B C F		Max: A B G			
36	2.175	1.30E-11	0	78.753	0	-28.548	0
		1.30E-11	0	46.128	0	-16.721	0
	Min:	A B C F		Max: A B G			
36	2.900	1.30E-11	0	1.85E-06	0	-1.86E-12	0
		1.30E-11	0	3.15E-06	0	3.57E-12	0
	Min:	A B F		Max: A B C G			

Scale 1 : 192.6
Int. Forces envelope My, GWSP CR, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-04
  min: -4.34E+03 max: -3.72E-13 [kNm]
- Envelope Moment My-max, Scale 5.00E-04
  min: -2.68E+02 max: 3.40E+03 [kNm]
- Text envelopes [kNm]



Características mecánicas Sección "CANAL32T" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL32T" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.853	9.58E+06	3)

Puntos de contorno [m]:

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =276.12 cm2 (1.08 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	24.55	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	24.55	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	24.55	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	24.55	-1.69	1.99
					-1.16	1.99
LR 10 / CS 1	AEH500	1.0	2	10.93	1.31	1.80
					1.31	0.35
LR 9 / CS 1	AEH500	1.0	2	10.93	-1.31	1.80
					-1.31	0.35
LR 8 / CS 1	AEH500	1.0	2	13.56	-1.54	1.80
					-1.54	0.06
LR 7 / CS 1	AEH500	1.0	2	13.56	1.54	1.80
					1.54	0.06
LR 2 / CS 1	AEH500	1.0	2	64.47	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	64.47	-1.54	0.06
					1.54	0.06

Verif. estado de tens.: Viga Sección "CANAL32T"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	1	0.00	3402.20	0.00	

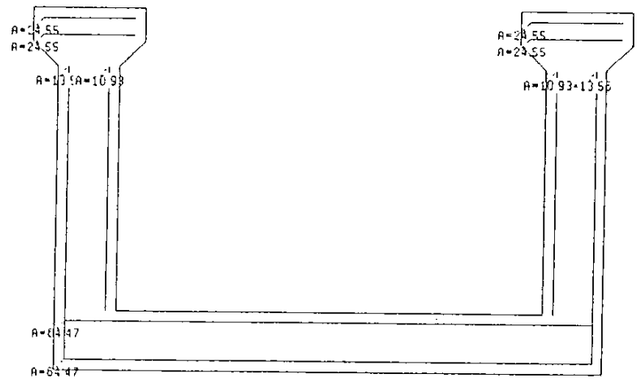
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 1: EH/1/0/Eps=-2.0,-3.5,10.0/Gamma=1,1/Dia=45/Phi=0

Deformaciones y tensiones extremas:

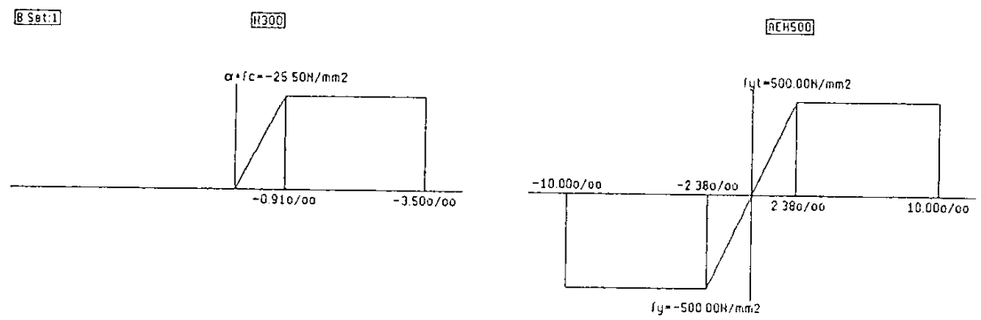
Parte-Sección	Material	Coordenadas y [m]	Coordenadas z [m]	Eps [o/oo]	Sigma/Gamma (N/mm2)	Gamma
CS 1	H300	-1.10	2.15	-0.20	-5.65	1.18
CS 1	H300	1.60	0.00	0.68	0.00	1.18
LR 3	AEH500	-1.69	2.09	-0.18	-37.16	1.00
LR 7	AEH500	1.54	0.06	0.65	137.14	1.00

Sección CANAL32T

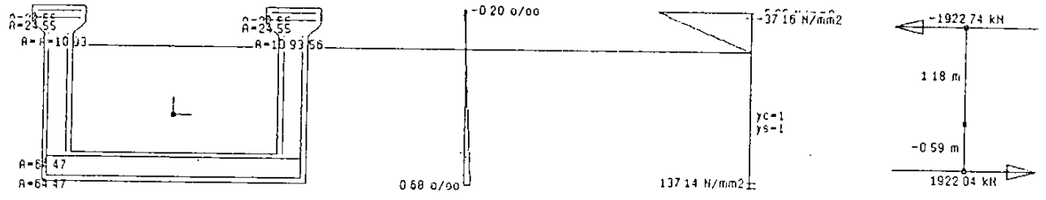
$\sigma_s = 1371.4$ kp/cm²



Material acorde a la sección: "CANAL32T"



Verificación de tensiones con fuerzas, Sección "CANAL32T"



Características mecánicas Sección "CANAL32T" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Características mecánicas Sección "CANAL32T" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL32T" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300T	1.00	25450.0	1514.853	9.58E+06	3)

Puntos de contorno [m]:

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =276.12 cm2 (1.08 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	24.55	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	24.55	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	24.55	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	24.55	-1.69	1.99
					-1.16	1.99
LR 10 / CS 1	AEH500	1.0	2	10.93	1.31	1.80
					1.31	0.35
LR 9 / CS 1	AEH500	1.0	2	10.93	-1.31	1.80
					-1.31	0.35
LR 8 / CS 1	AEH500	1.0	2	13.56	-1.54	1.80
					-1.54	0.06
LR 7 / CS 1	AEH500	1.0	2	13.56	1.54	1.80
					1.54	0.06
LR 2 / CS 1	AEH500	1.0	2	64.47	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	64.47	-1.54	0.06
					1.54	0.06

Verif. estado de tens.: Viga Sección "CANAL32T"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	1	0.00	448.42	0.00	

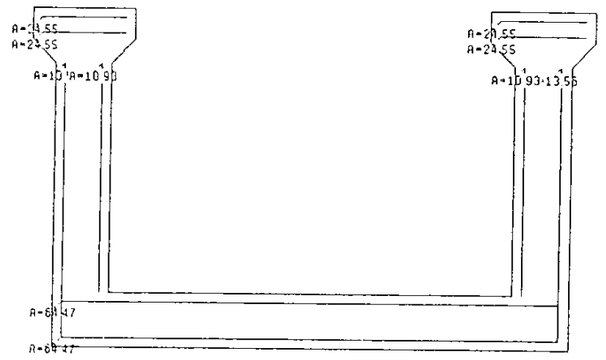
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 1: EH/1/0/Eps=-2.0,-3.5,10.0/Gamma=1,1/Dia=45/Phi=0

Deformaciones y tensiones extremas:

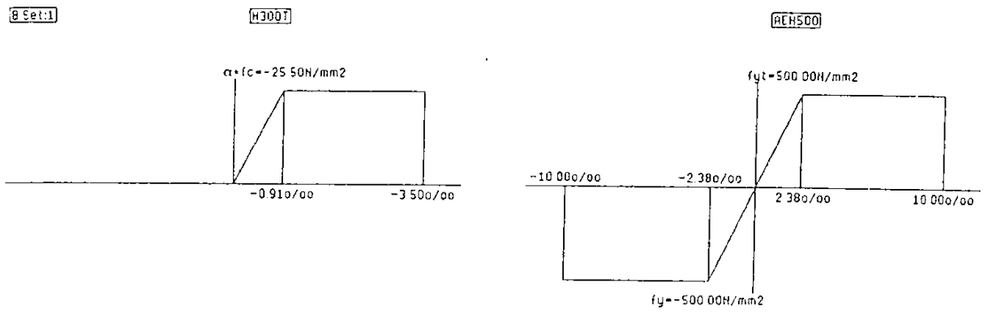
Parte-Sección	Material	Coordenadas y [m]]	Coordenadas z [m]]	Eps [o/oo]	Sigma/Gamma [N/mm2]	Gamma
CS 1	H300T	1.75	2.15	-0.03	-0.74	1.18
CS 1	H300T	-1.60	0.00	0.09	0.00	1.18
LR 4	AEH500	1.16	2.09	-0.02	-4.90	1.00
LR 8	AEH500	-1.54	0.06	0.09	18.07	1.00

$\sigma_{sR} = 180.70$ kp/cm²

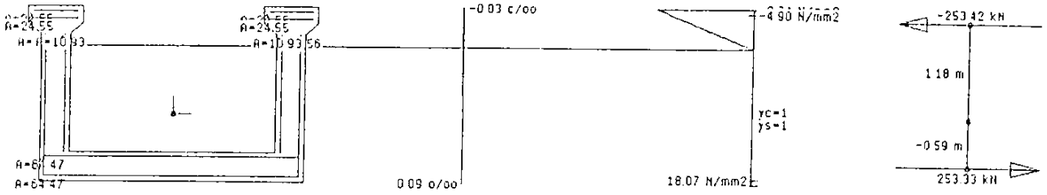
Sección CANAL32T



Material acorde a la sección: "CANAL32T"



Verificación de tensiones con fuerzas,Sección "CANAL32T"



$$\delta_m = 2c + 0.2 \times 5 + 0,40 \times 0.125 \times \frac{1-\rho}{\lambda_s}$$

$$\delta_m = 2 \times 3.50\,cm + 0.20 \times 15\,cm + 0.40 \times 0.125 \times \frac{35/4 \times 15}{3.14}$$

$$\delta_m = 12.08\ cm$$

$$\varepsilon_{sm} = \frac{\sigma_s}{E_s}\left(1 - k_2\left(\frac{\sigma_{sr}}{\sigma_s}\right)^2\right) = \frac{1371.40}{2,10\,10^6}\left(1 - 0.5\left(\frac{180.7}{1371}\right)\right.$$

$$\varepsilon_{sm} = 6.473786\ 10^{-4}$$

$$w_k = 1,70 \times \delta_m \times \varepsilon_{sm}$$

$$w_k = 0,130\ mm < 0,20\ mm$$

2.4.1.2. Comprobación de estados límites últimos por flexión longitudinal

ENVELOPE SPECIFIC.: CQ ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	3	1.350		REOLOGICAS
D	OR	3	1.000		REOLOGICAS
E	PLUS	4	1.500		SOBRECARGA AGUA
F	PLUS	5	1.500		TEMPERATURA(+)
G	OR	6	1.500		TEMPERATURA(-)
H	PLUS	7	1.500		GRADIENTE(+)
I	OR	8	1.500		GRADIENTE(-)
J	PLUS	9	0.450000		VIENTO

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
1	0	9.00E-12	0	-2.49E-06	0	-9.00E-13	0
		9.00E-12	0	-3.80E-06	0	8.86E-13	0
	Min:	A C I		Max:	B C E H		
1	0.725	9.00E-12	0	-111.210	0	-40.314	0
		9.00E-12	0	-46.128	0	-16.721	0
	Min:	A C E I		Max:	B C H		
1	1.450	9.00E-12	0	-222.421	0	-161.255	0
		9.00E-12	0	-92.256	0	-66.886	0
	Min:	A C E I		Max:	B C H		
1	2.175	9.00E-12	0	-333.631	0	-362.824	0
		9.00E-12	0	-138.384	0	-150.493	0
	Min:	A C E H		Max:	B C I		
1	2.900	9.00E-12	0	-444.842	0	-645.021	0
		9.00E-12	0	-184.512	0	-267.543	0
	Min:	A C E H		Max:	B C I		
2	0	36.918	0	415.629	0	-645.021	0
		36.918	0	691.676	0	-267.543	0
	Min:	A C E I		Max:	B C H		
2	0.318	36.918	0	366.831	0	-520.561	0
		36.918	0	671.435	0	-50.723	0
	Min:	A C E I		Max:	B C H		
2	0.636	36.918	0	318.032	0	-411.625	0
		36.918	0	651.194	0	159.658	0
	Min:	A C E I		Max:	B C H		
2	0.954	36.918	0	-103.124	0	-336.987	0
		36.918	0	1003.312	0	382.373	0
	Min:	B C I		Max:	A C E H		
2	1.272	36.918	0	-123.365	0	-373.012	0
		36.918	0	954.514	0	693.790	0
	Min:	B C I		Max:	A C E H		
3	0	36.918	0	-123.365	0	-373.012	0
		36.918	0	954.514	0	693.790	0
	Min:	B C I		Max:	A C E H		
3	0.318	36.918	0	-143.606	0	-415.477	0
		36.918	0	905.715	0	989.683	0
	Min:	B C I		Max:	A C E H		
3	0.636	36.918	0	-163.846	0	-464.382	0
		36.918	0	856.917	0	1270.051	0
	Min:	B C I		Max:	A C E H		
3	0.954	36.918	0	-184.087	0	-519.725	0
		36.918	0	808.119	0	1534.896	0
	Min:	B C I		Max:	A C E H		
3	1.272	36.918	0	-204.328	0	-581.507	0
		36.918	0	759.320	0	1784.217	0
	Min:	B C I		Max:	A C E H		
4	0	36.918	0	-204.328	0	-581.507	0
		36.918	0	759.320	0	1784.217	0
	Min:	B C I		Max:	A C E H		

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
4	0.318	36.918	0	-224.568	0	-649.728	0
		36.918	0	710.522	0	2018.013	0
	Min:	B C I		Max:	A C E H		
4	0.636	36.918	0	-244.809	0	-724.389	0
		36.918	0	661.723	0	2236.286	0
	Min:	B C I		Max:	A C E H		
4	0.954	36.918	0	-265.050	0	-805.488	0
		36.918	0	612.925	0	2439.035	0
	Min:	B C I		Max:	A C E H		
4	1.272	36.918	0	-285.291	0	-893.027	0
		36.918	0	564.127	0	2626.260	0
	Min:	B C I		Max:	A C E H		
5	0	36.918	0	-285.291	0	-893.027	0
		36.918	0	564.127	0	2626.260	0
	Min:	B C I		Max:	A C E H		
5	0.318	36.918	0	-305.531	0	-987.004	0
		36.918	0	515.328	0	2797.961	0
	Min:	B C I		Max:	A C E H		
5	0.636	36.918	0	-325.772	0	-1087.421	0
		36.918	0	466.530	0	2954.137	0
	Min:	B C I		Max:	A C E H		
5	0.954	36.918	0	-346.013	0	-1194.277	0
		36.918	0	417.731	0	3094.790	0
	Min:	B C I		Max:	A C E H		
5	1.272	36.918	0	-366.253	0	-1307.572	0
		36.918	0	368.933	0	3219.919	0
	Min:	B C I		Max:	A C E H		
6	0	36.918	0	-366.253	0	-1307.572	0
		36.918	0	368.933	0	3219.919	0
	Min:	B C I		Max:	A C E H		
6	0.318	36.918	0	-386.494	0	-1427.305	0
		36.918	0	320.135	0	3329.524	0
	Min:	B C I		Max:	A C E H		
6	0.636	36.918	0	-406.735	0	-1553.478	0
		36.918	0	271.336	0	3423.605	0
	Min:	B C I		Max:	A C E H		
6	0.954	36.918	0	-426.976	0	-1686.091	0
		36.918	0	222.538	0	3502.162	0
	Min:	B C I		Max:	A C E H		
6	1.272	36.918	0	-447.216	0	-1825.142	0
		36.918	0	173.740	0	3565.194	0
	Min:	B C I		Max:	A C E H		
7	0	36.918	0	-447.216	0	-1825.142	0
		36.918	0	173.740	0	3565.194	0
	Min:	B C I		Max:	A C E H		
7	0.318	36.918	0	-467.457	0	-1970.632	0
		36.918	0	124.941	0	3612.703	0
	Min:	B C I		Max:	A C E H		

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
7	0.636	36.918	0	-487.698	0	-2122.561	0
		36.918	0	76.143	0	3644.688	0
	Min:	B C I		Max:	A C E H		
7	0.954	36.918	0	-507.933	0	-2280.929	0
		36.918	0	27.344	0	3661.149	0
	Min:	B C I		Max:	A C E H		
7	1.272	36.918	0	-528.179	0	-2445.737	0
		36.918	0	-21.454	0	3662.086	0
	Min:	B C I		Max:	A C E H		
8	0	36.918	0	-528.179	0	-2445.737	0
		36.918	0	-21.454	0	3662.086	0
	Min:	B C I		Max:	A C E H		
8	0.318	36.918	0	-548.420	0	-2616.983	0
		36.918	0	-70.252	0	3647.499	0
	Min:	B C I		Max:	A C E H		
8	0.636	36.918	0	-568.660	0	-2794.669	0
		36.918	0	-119.051	0	3617.388	0
	Min:	B C I		Max:	A C E H		
8	0.954	36.918	0	-588.901	0	-2978.794	0
		36.918	0	-167.849	0	3571.753	0
	Min:	B C I		Max:	A C E H		
8	1.272	36.918	0	-609.142	0	-3169.357	0
		36.918	0	-216.648	0	3510.594	0
	Min:	B C I		Max:	A C E H		
9	0	36.918	0	-609.142	0	-3169.357	0
		36.918	0	-216.648	0	3510.594	0
	Min:	B C I		Max:	A C E H		
9	0.318	36.918	0	-629.383	0	-3366.360	0
		36.918	0	-265.446	0	3433.911	0
	Min:	B C I		Max:	A C E H		
9	0.636	36.918	0	-1048.322	0	-3664.154	0
		36.918	0	84.455	0	3436.056	0
	Min:	A C E I		Max:	B C H		
9	0.954	36.918	0	-1097.121	0	-4005.413	0
		36.918	0	64.214	0	3459.703	0
	Min:	A C E I		Max:	B C H		
9	1.272	36.918	0	-1145.919	0	-4362.197	0
		36.918	0	43.973	0	3476.912	0
	Min:	A C E I		Max:	B C H		
10	0	36.918	0	-1145.919	0	-4362.197	0
		36.918	0	43.973	0	3476.912	0
	Min:	A C E I		Max:	B C H		
10	0.318	36.918	0	-1194.718	0	-4734.504	0
		36.918	0	23.733	0	3487.681	0
	Min:	A C E I		Max:	B C H		
10	0.636	36.918	0	-1243.516	0	-5122.336	0
		36.918	0	3.492	0	3492.012	0
	Min:	A C E I		Max:	B C H		

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
10	0.954	36.918	0	-1292.314	0	-5525.691	0
		36.918	0	-16.749	0	3489.901	0
	Min:	A C E I		Max:	B C H		
10	1.272	36.918	0	-1341.113	0	-5944.571	0
		36.918	0	-36.989	0	3481.355	0
	Min:	A C E I		Max:	B C H		
11	0	36.918	0	-1341.113	0	-5944.571	0
		36.918	0	-36.989	0	3481.355	0
	Min:	A C E I		Max:	B C H		
11	0.318	36.918	0	-1389.911	0	-6378.974	0
		36.918	0	-57.230	0	3466.369	0
	Min:	A C E I		Max:	B C H		
11	0.636	36.918	0	-1438.709	0	-6828.902	0
		36.918	0	-77.471	0	3444.943	0
	Min:	A C E I		Max:	B C H		
11	0.954	36.918	0	-1487.508	0	-7294.353	0
		36.918	0	-97.712	0	3417.078	0
	Min:	A C E I		Max:	B C H		
11	1.272	36.918	0	-1536.306	0	-7775.328	0
		36.918	0	-117.952	0	3382.774	0
	Min:	A C E I		Max:	B C H		
12	0	36.918	0	-1536.306	0	-7775.329	0
		36.918	0	-117.952	0	3382.774	0
	Min:	A C E I		Max:	B C H		
12	0.0688	36.918	0	-1546.852	0	-7881.312	0
		36.918	0	-122.326	0	3374.514	0
	Min:	A C E I		Max:	B C H		
12	0.138	36.918	0	-1557.398	0	-7988.021	0
		36.918	0	-126.701	0	3365.954	0
	Min:	A C E I		Max:	B C H		
12	0.206	36.918	0	-1567.944	0	-8095.454	0
		36.918	0	-131.075	0	3357.093	0
	Min:	A C E I		Max:	B C H		
12	0.275	36.918	0	-1578.490	0	-8203.613	0
		36.918	0	-135.449	0	3347.931	0
	Min:	A C E I		Max:	B C H		
13	0	46.217	0	1303.847	0	-8203.613	0
		46.217	0	540.812	0	3347.931	0
	Min:	A C E I		Max:	B C H		
13	0.0688	46.217	0	1293.301	0	-8114.336	0
		46.217	0	536.438	0	3384.962	0
	Min:	A C E I		Max:	B C H		
13	0.138	46.217	0	1282.755	0	-8025.784	0
		46.217	0	532.064	0	3421.691	0
	Min:	A C E I		Max:	B C H		
13	0.206	46.217	0	1272.209	0	-7937.957	0
		46.217	0	527.690	0	3458.120	0
	Min:	A C E I		Max:	B C H		

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
13	0.275	46.217	0	1261.664	0	-7850.855	0
		46.217	0	523.316	0	3494.249	0
	Min:	A C E I		Max:	B C H		
14	0	46.217	0	1261.664	0	-7850.855	0
		46.217	0	523.316	0	3494.249	0
	Min:	A C E I		Max:	B C H		
14	0.411	46.217	0	1198.580	0	-7344.968	0
		46.217	0	497.150	0	3704.082	0
	Min:	A C E I		Max:	B C H		
14	0.822	46.217	0	1135.497	0	-6865.023	0
		46.217	0	470.984	0	3903.154	0
	Min:	A C E I		Max:	B C H		
14	1.234	46.217	0	1072.414	0	-6411.021	0
		46.217	0	444.818	0	4091.466	0
	Min:	A C E I		Max:	B C H		
14	1.645	46.217	0	1009.331	0	-5982.962	0
		46.217	0	418.653	0	4269.018	0
	Min:	A C E I		Max:	B C H		
15	0	46.217	0	1009.331	0	-5982.962	0
		46.217	0	418.652	0	4269.018	0
	Min:	A C E I		Max:	B C H		
15	0.411	46.217	0	946.248	0	-5580.846	0
		46.217	0	392.487	0	4435.808	0
	Min:	A C E I		Max:	B C H		
15	0.823	46.217	0	883.165	0	-5204.674	0
		46.217	0	366.321	0	4591.838	0
	Min:	A C E I		Max:	B C H		
15	1.234	46.217	0	820.081	0	-4854.444	0
		46.217	0	340.155	0	4737.107	0
	Min:	A C E I		Max:	B C H		
15	1.645	46.217	0	313.989	0	-4671.399	0
		46.217	0	756.998	0	5012.858	0
	Min:	B C I		Max:	A C E H		
16	0	46.217	0	313.989	0	-4671.399	0
		46.217	0	756.998	0	5012.858	0
	Min:	B C I		Max:	A C E H		
16	0.411	46.217	0	287.824	0	-4547.652	0
		46.217	0	693.915	0	5311.202	0
	Min:	B C I		Max:	A C E H		
16	0.822	46.217	0	261.658	0	-4434.665	0
		46.217	0	630.832	0	5583.603	0
	Min:	B C I		Max:	A C E H		
16	1.234	46.217	0	235.492	0	-4332.438	0
		46.217	0	567.749	0	5830.061	0
	Min:	B C I		Max:	A C E H		
16	1.645	46.217	0	209.326	0	-4240.972	0
		46.217	0	504.665	0	6050.577	0
	Min:	B C I		Max:	A C E H		

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: B C I			Max: A C E H		
17	0	46.217	0	209.326	0	-4240.972	0
		46.217	0	504.665	0	6050.577	0
		Min: B C I			Max: A C E H		
17	0.411	46.217	0	183.160	0	-4160.267	0
		46.217	0	441.582	0	6245.149	0
		Min: B C I			Max: A C E H		
17	0.822	46.217	0	156.995	0	-4090.323	0
		46.217	0	378.499	0	6413.778	0
		Min: B C I			Max: A C E H		
17	1.234	46.217	0	130.829	0	-4031.139	0
		46.217	0	315.416	0	6556.464	0
		Min: B C I			Max: A C E H		
17	1.645	46.217	0	104.663	0	-3982.716	0
		46.217	0	252.333	0	6673.208	0
		Min: B C I			Max: A C E H		
18	0	46.217	0	104.663	0	-3982.716	0
		46.217	0	252.333	0	6673.208	0
		Min: B C I			Max: A C E H		
18	0.411	46.217	0	78.497	0	-3945.054	0
		46.217	0	189.250	0	6764.008	0
		Min: B C I			Max: A C E H		
18	0.822	46.217	0	52.332	0	-3918.152	0
		46.217	0	126.166	0	6828.865	0
		Min: B C I			Max: A C E H		
18	1.234	46.217	0	26.166	0	-3902.011	0
		46.217	0	63.083	0	6867.780	0
		Min: B C I			Max: A C E H		
18	1.645	46.217	0	1.05E-06	0	-3896.631	0
		46.217	0	2.52E-06	0	6880.751	0
		Min: B C I			Max: A C E H		
19	0	46.217	0	-1.05E-06	0	-3896.631	0
		46.217	0	-2.52E-06	0	6880.751	0
		Min: B C I			Max: A C E H		
19	0.411	46.217	0	-26.166	0	-3902.011	0
		46.217	0	-63.083	0	6867.780	0
		Min: B C I			Max: A C E H		
19	0.822	46.217	0	-52.332	0	-3918.152	0
		46.217	0	-126.166	0	6828.865	0
		Min: B C I			Max: A C E H		
19	1.234	46.217	0	-78.497	0	-3945.054	0
		46.217	0	-189.250	0	6764.008	0
		Min: B C I			Max: A C E H		
19	1.645	46.217	0	-104.663	0	-3982.716	0
		46.217	0	-252.333	0	6673.208	0
		Min: B C I			Max: A C E H		
20	0	46.217	0	-104.663	0	-3982.716	0
		46.217	0	-252.333	0	6673.208	0
		Min: B C I			Max: A C E H		

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: B C I			Max: A C E H		
20	0.411	46.217	0	-130.829	0	-4031.139	0
		46.217	0	-315.416	0	6556.464	0
		Min: B C I			Max: A C E H		
20	0.822	46.217	0	-156.995	0	-4090.323	0
		46.217	0	-378.499	0	6413.778	0
		Min: B C I			Max: A C E H		
20	1.234	46.217	0	-183.160	0	-4160.267	0
		46.217	0	-441.582	0	6245.149	0
		Min: B C I			Max: A C E H		
20	1.645	46.217	0	-209.326	0	-4240.972	0
		46.217	0	-504.665	0	6050.577	0
		Min: B C I			Max: A C E H		
21	0	46.217	0	-209.326	0	-4240.972	0
		46.217	0	-504.665	0	6050.577	0
		Min: B C I			Max: A C E H		
21	0.411	46.217	0	-235.492	0	-4332.438	0
		46.217	0	-567.749	0	5830.061	0
		Min: B C I			Max: A C E H		
21	0.822	46.217	0	-261.658	0	-4434.665	0
		46.217	0	-630.832	0	5583.603	0
		Min: B C I			Max: A C E H		
21	1.234	46.217	0	-287.824	0	-4547.652	0
		46.217	0	-693.915	0	5311.202	0
		Min: B C I			Max: A C E H		
21	1.645	46.217	0	-313.989	0	-4671.399	0
		46.217	0	-756.998	0	5012.858	0
		Min: B C I			Max: A C E H		
22	0	46.217	0	-313.989	0	-4671.399	0
		46.217	0	-756.998	0	5012.858	0
		Min: B C I			Max: A C E H		
22	0.411	46.217	0	-820.081	0	-4854.444	0
		46.217	0	-340.155	0	4737.107	0
		Min: A C E I			Max: B C H		
22	0.822	46.217	0	-883.165	0	-5204.674	0
		46.217	0	-366.321	0	4591.838	0
		Min: A C E I			Max: B C H		
22	1.234	46.217	0	-946.248	0	-5580.846	0
		46.217	0	-392.487	0	4435.808	0
		Min: A C E I			Max: B C H		
22	1.645	46.217	0	-1009.331	0	-5982.962	0
		46.217	0	-418.652	0	4269.018	0
		Min: A C E I			Max: B C H		
23	0	46.217	0	-1009.331	0	-5982.962	0
		46.217	0	-418.653	0	4269.018	0
		Min: A C E I			Max: B C H		
23	0.411	46.217	0	-1072.414	0	-6411.021	0
		46.217	0	-444.818	0	4091.466	0

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A C E I			Max: B C H		
23	0.823	46.217	0	-1135.497	0	-6865.023	0
		46.217	0	-470.984	0	3903.154	0
		Min: A C E I			Max: B C H		
23	1.234	46.217	0	-1198.580	0	-7344.968	0
		46.217	0	-497.150	0	3704.082	0
		Min: A C E I			Max: B C H		
23	1.645	46.217	0	-1261.664	0	-7850.855	0
		46.217	0	-523.316	0	3494.249	0
		Min: A C E I			Max: B C H		
24	0	46.217	0	-1261.664	0	-7850.855	0
		46.217	0	-523.316	0	3494.249	0
		Min: A C E I			Max: B C H		
24	0.0687	46.217	0	-1272.209	0	-7937.957	0
		46.217	0	-527.690	0	3458.120	0
		Min: A C E I			Max: B C H		
24	0.137	46.217	0	-1282.755	0	-8025.784	0
		46.217	0	-532.064	0	3421.691	0
		Min: A C E I			Max: B C H		
24	0.206	46.217	0	-1293.301	0	-8114.336	0
		46.217	0	-536.438	0	3384.962	0
		Min: A C E I			Max: B C H		
24	0.275	46.217	0	-1303.847	0	-8203.613	0
		46.217	0	-540.812	0	3347.931	0
		Min: A C E I			Max: B C H		
25	0	36.918	0	1578.490	0	-8203.613	0
		36.918	0	135.449	0	3347.931	0
		Min: A C E I			Max: B C H		
25	0.0687	36.918	0	1567.944	0	-8095.454	0
		36.918	0	131.075	0	3357.093	0
		Min: A C E I			Max: B C H		
25	0.137	36.918	0	1557.398	0	-7988.021	0
		36.918	0	126.701	0	3365.954	0
		Min: A C E I			Max: B C H		
25	0.206	36.918	0	1546.852	0	-7881.312	0
		36.918	0	122.326	0	3374.514	0
		Min: A C E I			Max: B C H		
25	0.275	36.918	0	1536.306	0	-7775.329	0
		36.918	0	117.952	0	3382.774	0
		Min: A C E I			Max: B C H		
26	0	36.918	0	1536.306	0	-7775.328	0
		36.918	0	117.952	0	3382.774	0
		Min: A C E I			Max: B C H		
26	0.318	36.918	0	1487.508	0	-7294.353	0
		36.918	0	97.712	0	3417.079	0
		Min: A C E I			Max: B C H		
26	0.636	36.918	0	1438.709	0	-6828.902	0
		36.918	0	77.471	0	3444.943	0

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: A C E I			Max: B C H		
26	0.954	36.918	0	1389.911	0	-6378.974	0
		36.918	0	57.230	0	3466.369	0
		Min: A C E I			Max: B C H		
26	1.272	36.918	0	1341.113	0	-5944.571	0
		36.918	0	36.989	0	3481.355	0
		Min: A C E I			Max: B C H		
27	0	36.918	0	1341.113	0	-5944.571	0
		36.918	0	36.989	0	3481.355	0
		Min: A C E I			Max: B C H		
27	0.318	36.918	0	1292.314	0	-5525.691	0
		36.918	0	16.749	0	3489.903	0
		Min: A C E I			Max: B C H		
27	0.636	36.918	0	1243.516	0	-5122.336	0
		36.918	0	-3.492	0	3492.012	0
		Min: A C E I			Max: B C H		
27	0.954	36.918	0	1194.718	0	-4734.504	0
		36.918	0	-23.733	0	3487.681	0
		Min: A C E I			Max: B C H		
27	1.272	36.918	0	1145.919	0	-4362.197	0
		36.918	0	-43.973	0	3476.912	0
		Min: A C E I			Max: B C H		
28	0	36.918	0	1145.919	0	-4362.197	0
		36.918	0	-43.973	0	3476.912	0
		Min: A C E I			Max: B C H		
28	0.318	36.918	0	1097.121	0	-4005.413	0
		36.918	0	-64.214	0	3459.703	0
		Min: A C E I			Max: B C H		
28	0.636	36.918	0	1048.323	0	-3664.154	0
		36.918	0	-84.455	0	3436.056	0
		Min: A C E I			Max: B C H		
28	0.954	36.918	0	629.383	0	-3366.360	0
		36.918	0	265.446	0	3433.911	0
		Min: B C I			Max: A C E H		
28	1.272	36.918	0	609.142	0	-3169.357	0
		36.918	0	216.648	0	3510.594	0
		Min: B C I			Max: A C E H		
29	0	36.918	0	609.142	0	-3169.357	0
		36.918	0	216.648	0	3510.594	0
		Min: B C I			Max: A C E H		
29	0.318	36.918	0	588.901	0	-2978.794	0
		36.918	0	167.849	0	3571.753	0
		Min: B C I			Max: A C E H		
29	0.636	36.918	0	568.660	0	-2794.669	0
		36.918	0	119.051	0	3617.388	0
		Min: B C I			Max: A C E H		
29	0.954	36.918	0	548.420	0	-2616.983	0
		36.918	0	70.252	0	3647.499	0

ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: B C I			Max: A C E H		
29	1.272	36.918	0	528.179	0	-2445.737	0
		36.918	0	21.454	0	3662.086	0
		Min: B C I			Max: A C E H		
30	0	36.918	0	528.179	0	-2445.737	0
		36.918	0	21.454	0	3662.086	0
		Min: B C I			Max: A C E H		
30	0.318	36.918	0	507.938	0	-2280.929	0
		36.918	0	-27.344	0	3661.149	0
		Min: B C I			Max: A C E H		
30	0.636	36.918	0	487.698	0	-2122.561	0
		36.918	0	-76.143	0	3644.688	0
		Min: B C I			Max: A C E H		
30	0.954	36.918	0	467.457	0	-1970.632	0
		36.918	0	-124.941	0	3612.703	0
		Min: B C I			Max: A C E H		
30	1.272	36.918	0	447.216	0	-1825.142	0
		36.918	0	-173.740	0	3565.194	0
		Min: B C I			Max: A C E H		
31	0	36.918	0	447.216	0	-1825.142	0
		36.918	0	-173.740	0	3565.194	0
		Min: B C I			Max: A C E H		
31	0.318	36.918	0	426.976	0	-1686.091	0
		36.918	0	-222.538	0	3502.162	0
		Min: B C I			Max: A C E H		
31	0.636	36.918	0	406.735	0	-1553.478	0
		36.918	0	-271.336	0	3423.605	0
		Min: B C I			Max: A C E H		
31	0.954	36.918	0	386.494	0	-1427.305	0
		36.918	0	-320.135	0	3329.524	0
		Min: B C I			Max: A C E H		
31	1.272	36.918	0	366.253	0	-1307.572	0
		36.918	0	-368.933	0	3219.919	0
		Min: B C I			Max: A C E H		
32	0	36.918	0	366.253	0	-1307.572	0
		36.918	0	-368.933	0	3219.919	0
		Min: B C I			Max: A C E H		
32	0.318	36.918	0	346.013	0	-1194.277	0
		36.918	0	-417.731	0	3094.790	0
		Min: B C I			Max: A C E H		
32	0.636	36.918	0	325.772	0	-1087.421	0
		36.918	0	-466.530	0	2954.137	0
		Min: B C I			Max: A C E H		
32	0.954	36.918	0	305.531	0	-987.004	0
		36.918	0	-515.328	0	2797.961	0
		Min: B C I			Max: A C E H		
32	1.272	36.918	0	285.291	0	-893.027	0
		36.918	0	-564.127	0	2626.260	0

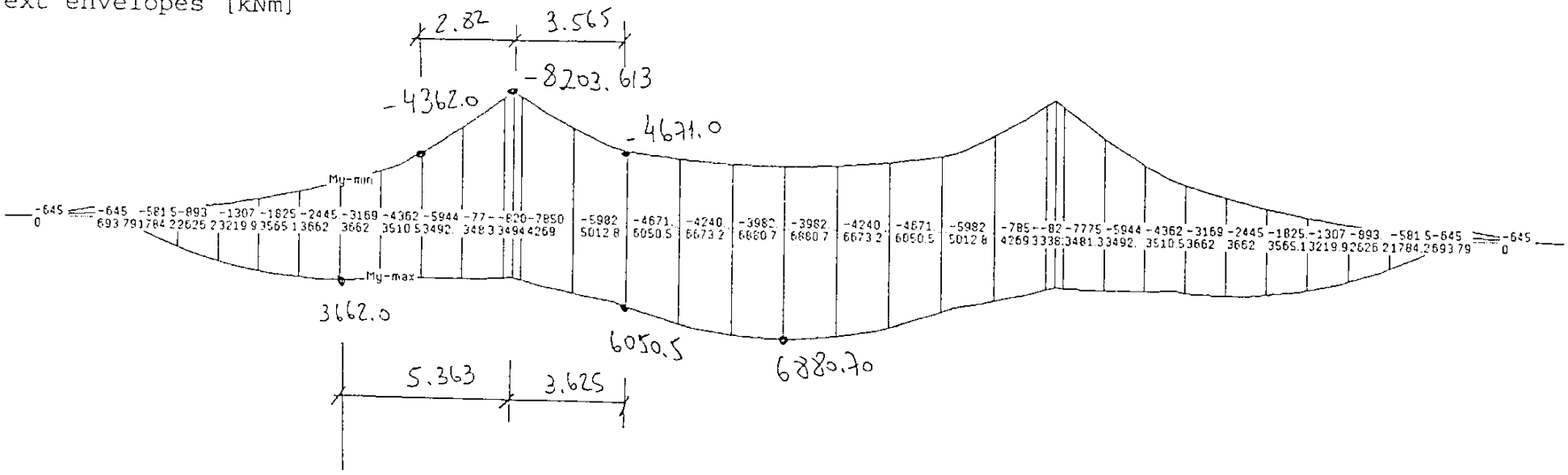
ENVELOPE for < My > (and accomp. values) *ALL*
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: B C I			Max: A C E H		
33	0	36.918	0	285.291	0	-893.027	0
		36.918	0	-564.127	0	2626.260	0
		Min: B C I			Max: A C E H		
33	0.318	36.918	0	265.050	0	-805.488	0
		36.918	0	-612.925	0	2439.035	0
		Min: B C I			Max: A C E H		
33	0.636	36.918	0	244.809	0	-724.189	0
		36.918	0	-661.723	0	2236.286	0
		Min: B C I			Max: A C E H		
33	0.954	36.918	0	224.568	0	-649.728	0
		36.918	0	-710.522	0	2018.013	0
		Min: B C I			Max: A C E H		
33	1.272	36.918	0	204.328	0	-581.507	0
		36.918	0	-759.320	0	1784.217	0
		Min: B C I			Max: A C E H		
34	0	36.918	0	204.328	0	-581.507	0
		36.918	0	-759.320	0	1784.217	0
		Min: B C I			Max: A C E H		
34	0.318	36.918	0	184.087	0	-519.725	0
		36.918	0	-808.119	0	1534.895	0
		Min: B C I			Max: A C E H		
34	0.636	36.918	0	163.846	0	-464.382	0
		36.918	0	-856.917	0	1270.051	0
		Min: B C I			Max: A C E H		
34	0.954	36.918	0	143.606	0	-415.477	0
		36.918	0	-905.715	0	989.683	0
		Min: B C I			Max: A C E H		
34	1.272	36.918	0	123.365	0	-373.012	0
		36.918	0	-954.514	0	693.790	0
		Min: B C I			Max: A C E H		
35	0	36.918	0	123.365	0	-373.012	0
		36.918	0	-954.514	0	693.790	0
		Min: B C I			Max: A C E H		
35	0.318	36.918	0	103.124	0	-336.987	0
		36.918	0	-1003.312	0	382.373	0
		Min: B C I			Max: A C E H		
35	0.636	36.918	0	-318.032	0	-411.625	0
		36.918	0	-651.194	0	159.658	0
		Min: A C E I			Max: B C H		
35	0.954	36.918	0	-366.831	0	-520.561	0
		36.918	0	-671.435	0	-50.723	0
		Min: A C E I			Max: B C H		
35	1.272	36.918	0	-415.629	0	-645.021	0
		36.918	0	-691.676	0	-267.543	0
		Min: A C E I			Max: B C H		
36	0	1.76E-11	0	444.842	0	-645.021	0

ENVELOPE for < My > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		1.76E-11	0	184.512	0	-267.543	0
		Min: A C E H		Max: B C I			
36	0.725	1.76E-11	0	333.631	0	-362.824	0
		1.76E-11	0	138.384	0	-150.493	0
		Min: A C E H		Max: B C I			
36	1.450	1.76E-11	0	222.421	0	-161.255	0
		1.76E-11	0	92.256	0	-66.886	0
		Min: A C E H		Max: B C I			
36	2.175	1.76E-11	0	111.210	0	-40.314	0
		1.76E-11	0	46.128	0	-16.721	0
		Min: A C E H		Max: B C I			
36	2.900	1.76E-11	0	1.85E-06	0	-5.75E-12	0
		1.76E-11	0	4.45E-06	0	7.88E-12	0
		Min: B C H		Max: A C E I			

Scale 1 : 192.6
Int. Forces envelope My, GWSP CQ, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Moment My-min, Scale 5.00E-04
  min: -8.20E+03 max: -9.00E-13 [kNm]
- Envelope Moment My-max, Scale 5.00E-04
  min: -2.68E+02 max: 6.88E+03 [kNm]
- Text envelopes [kNm]



ENVOLVENTE DE MOMENTOS Flectores

Características mecánicas Sección "CANAL320" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL320" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.85	9.58E+06	3

Puntos de contorno [m]:

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =6.00 cm2 (0.02 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	1.00	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	1.00	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	1.00	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	1.00	-1.69	1.99
					-1.16	1.99
LR 2 / CS 1	AEH500	1.0	2	1.00	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	1.00	-1.54	0.06
					1.54	0.06

Dimensionamiento a flexión: Viga Sección "CANAL320"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	3662.00	0.00	

Parámetros de cálculo empleados:

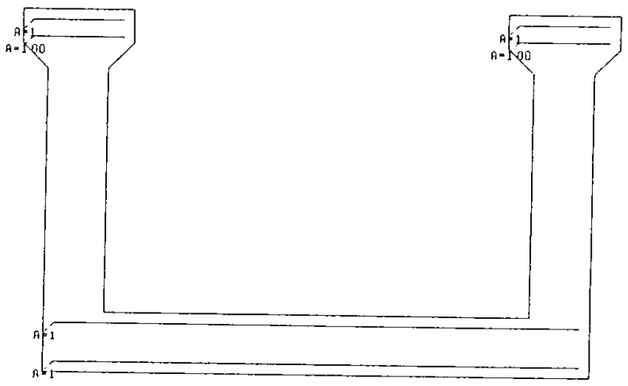
Set Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Norm./Coef.Fluencia

Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

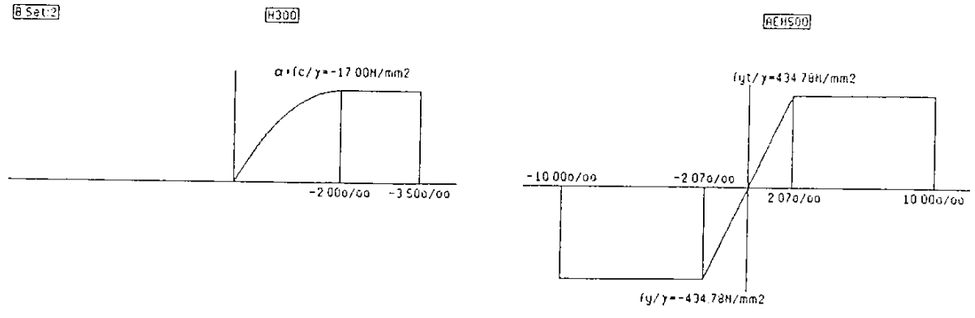
No Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	1.16	2.09	1.69	2.09	1.00	----	1.00
AEH500	-1.69	2.09	-1.16	2.09	1.00	----	1.00
AEH500	1.16	1.99	1.69	1.99	1.00	----	1.00
AEH500	-1.69	1.99	-1.16	1.99	1.00	----	1.00
1 AEH500	-1.54	0.29	1.54	0.29	1.00	22.10	22.10
1 AEH500	-1.54	0.06	1.54	0.06	1.00	22.10	22.10

Max.x/h = 0.10 As-top/bot = 4.00/44.20 As = 0.19 % = 48.20

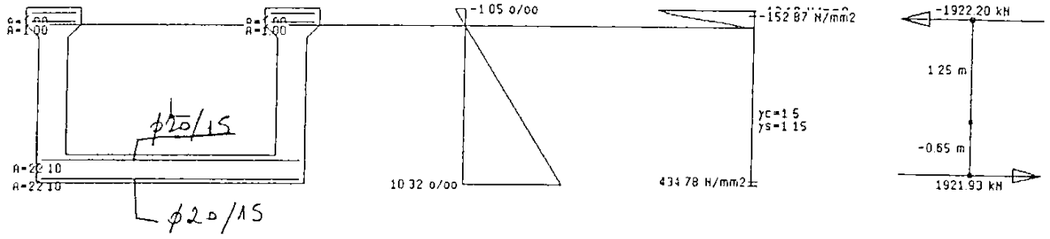
Sección CANAL320



Material acorde a la sección: "CANAL320"



Dimensionamiento,Sección "CANAL320"



Características mecánicas Sección "CANAL320" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL320" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.853	9.58E+06	1)

Puntos de contorno [m]:

(	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
	1.75	1.95	5	1.75	2.15	6	1.10	2.15
	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =48.20 cm2 (0.19 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	1.00	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	1.00	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	1.00	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	1.00	-1.69	1.99
					-1.16	1.99
(2 / CS 1	AEH500	1.0	2	22.10	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	22.10	-1.54	0.06
					1.54	0.06

Dimensionamiento a flexión: Viga Sección "CANAL320"/"B1"

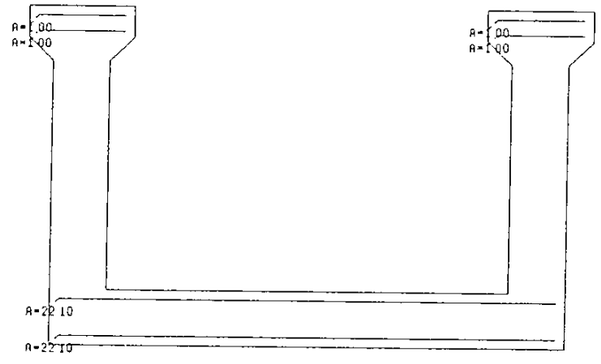
No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-4362.00	0.00	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

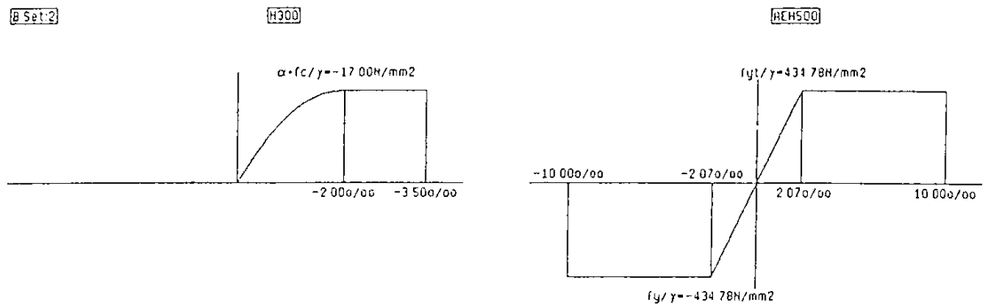
No Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500	1.16	2.09	1.69	2.09	1.00	12.57	12.57
1 AEH500	-1.69	2.09	-1.16	2.09	1.00	12.57	12.57
1 AEH500	1.16	1.99	1.69	1.99	1.00	12.57	12.57
1 AEH500	-1.69	1.99	-1.16	1.99	1.00	12.57	12.57
AEH500	-1.54	0.29	1.54	0.29	1.00	----	1.00
AEH500	-1.54	0.06	1.54	0.06	1.00	----	1.00

Max.x/h = 0.07 As-top/bot = 50.27/2.00 As = 0.21 \ = 52.27

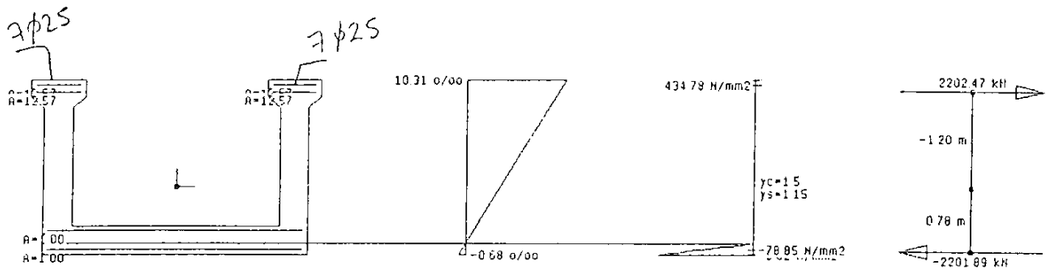
Sección CANAL320



Material acorde a la sección: "CANAL320"



Dimensionamiento, Sección "CANAL320"



Características mecánicas Sección "CANAL320" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL320" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.853	9.58E+06	3)

Puntos de contorno [m]:

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =52.28 cm2 (0.21 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	12.57	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	12.57	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	12.57	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	12.57	-1.69	1.99
					-1.16	1.99
LR 2 / CS 1	AEH500	1.0	2	1.00	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	1.00	-1.54	0.06
					1.54	0.06

Dimensionamiento a flexión: Viga Sección "CANAL320"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-8203.60	0.00	

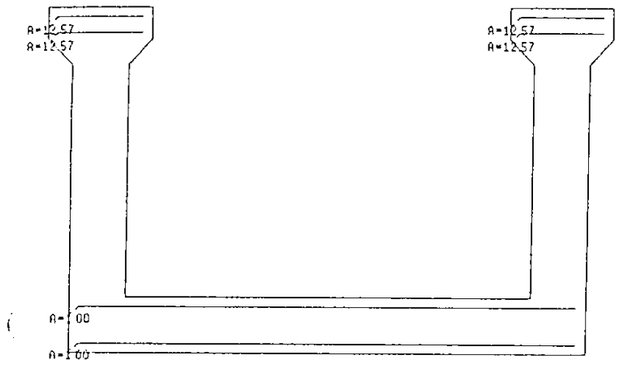
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No Armad. long.	:	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500		1.16	2.09	1.69	2.09	1.00	23.88	23.88
1 AEH500		-1.69	2.09	-1.16	2.09	1.00	23.88	23.88
1 AEH500		1.16	1.99	1.69	1.99	1.00	23.88	23.88
1 AEH500		-1.69	1.99	-1.16	1.99	1.00	23.88	23.88
AEH500		-1.54	0.29	1.54	0.29	1.00	----	1.00
AEH500		-1.54	0.06	1.54	0.06	1.00	----	1.00

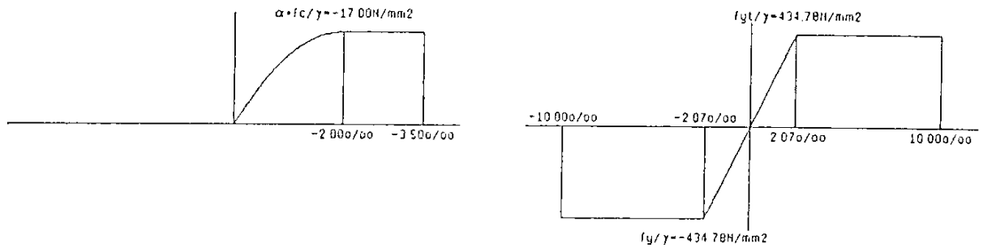
Max.x/h = 0.09 As-top/bot = 95.51/2.00 As = 0.38 % = 97.51

Sección CANAL320

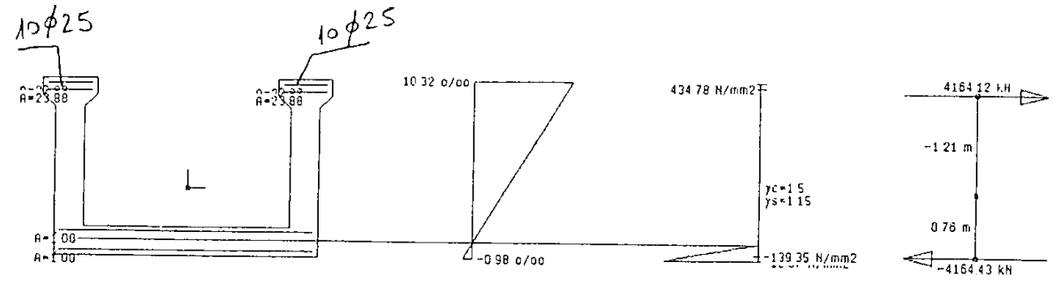


Material acorde a la sección: "CANAL320"

B Set:2 H300 AEH500



Dimensionamiento, Sección "CANAL320"



Características mecánicas Sección "CANAL320" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.63 m

Contorno de sección parcial, Sección "CANAL320" (sin coef. homogeneiz.)

Sección parcial	Material	w	Ax[cm2]	u[cm]	Ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.853	9.58E+06	3)

Puntos de contorno (m):

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =97.52 cm2 (0.38 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	23.88	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	23.88	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	23.88	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	23.88	-1.69	1.99
					-1.16	1.99
LR 2 / CS 1	AEH500	1.0	2	1.00	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	1.00	-1.54	0.06
					1.54	0.06

Dimensionamiento a flexión: Viga Sección "CANAL320"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	-4671.00	0.00	

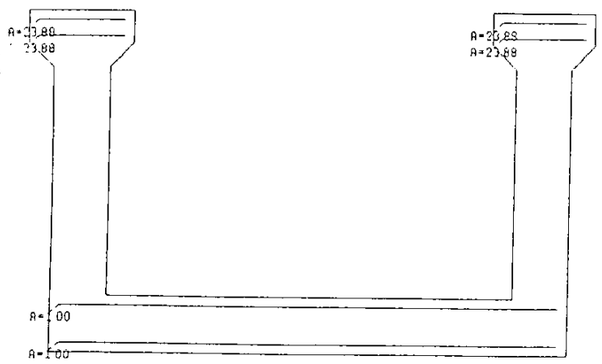
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

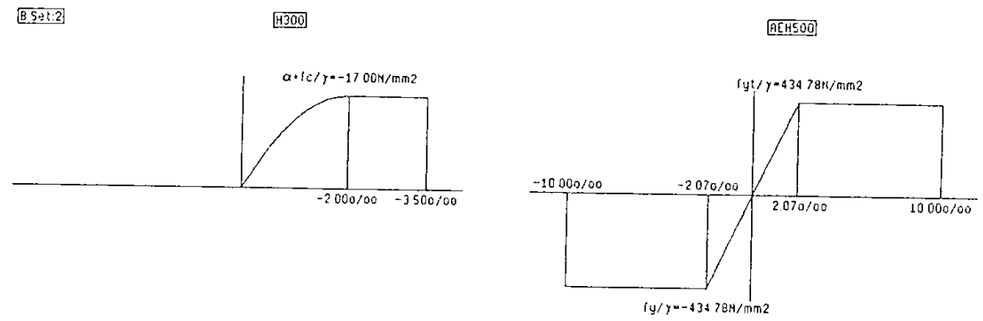
No	Armad. Long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
1	AEH500	1.16	2.09	1.69	2.09	1.00	13.47	13.47
1	AEH500	-1.69	2.09	-1.16	2.09	1.00	13.47	13.47
1	AEH500	1.16	1.99	1.69	1.99	1.00	13.47	13.47
1	AEH500	-1.69	1.99	-1.16	1.99	1.00	13.47	13.47
	AEH500	-1.54	0.29	1.54	0.29	1.00	----	1.00
	AEH500	-1.54	0.06	1.54	0.06	1.00	----	1.00

Max.x/h = 0.07 As-top/bot = 53.88/2.00 As = 0.22 % = 55.88

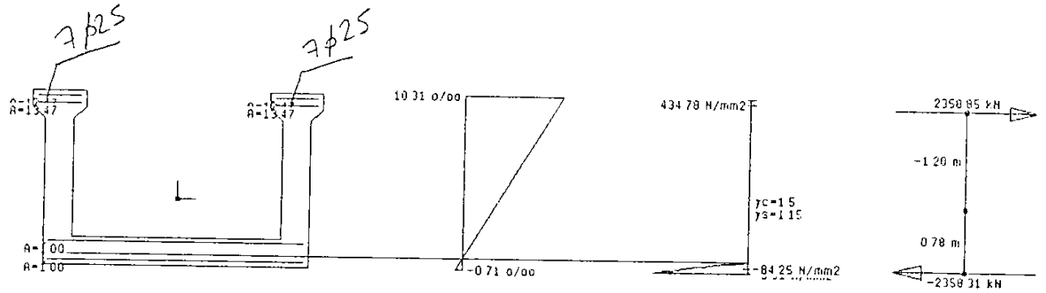
Sección CANAL320



Material acorde a la sección: "CANAL320"



Dimensionamiento, Sección "CANAL320"



Características mecánicas Sección "CANAL320" (sin coef. homogeneiz.)

Area	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL320" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.85	9.58E+06	3

Puntos de contorno (m):

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =55.88 cm2 (0.22 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
/ CS 1	AEH500	1.0	2	13.47	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	13.47	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	13.47	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	13.47	-1.69	1.99
					-1.16	1.99
LR 2 / CS 1	AEH500	1.0	2	1.00	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	1.00	-1.54	0.06
					1.54	0.06

Dimensionamiento a flexión: Viga Sección "CANAL320"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
2		0.00	6050.50	0.00	

Parámetros de cálculo empleados:

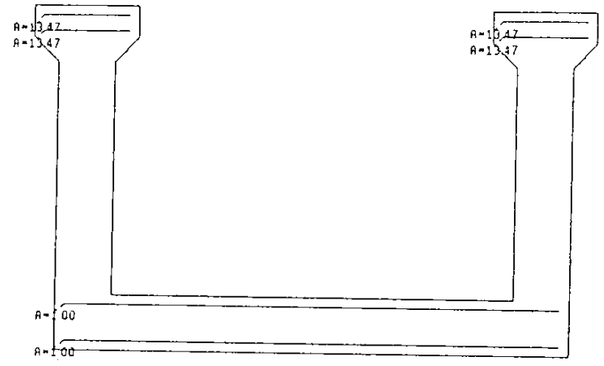
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

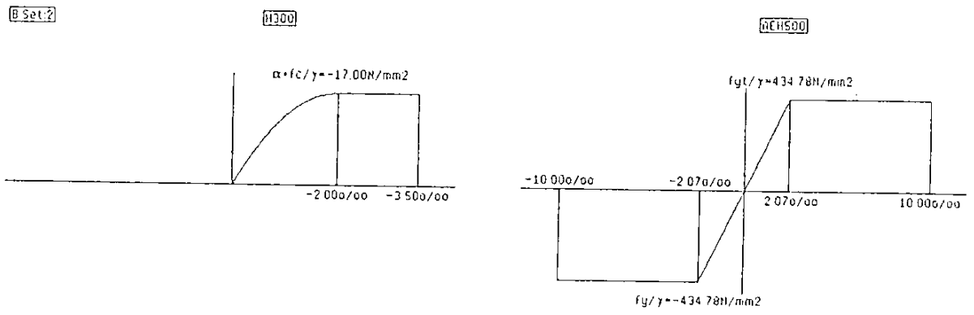
No	Armad. long.	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
	AEH500	1.16	2.09	1.69	2.09	1.00	----	1.00
	AEH500	-1.69	2.09	-1.16	2.09	1.00	----	1.00
	AEH500	1.16	1.99	1.69	1.99	1.00	----	1.00
	AEH500	-1.69	1.99	-1.16	1.99	1.00	----	1.00
1	AEH500	-1.54	0.29	1.54	0.29	1.00	36.99	36.99
1	AEH500	-1.54	0.06	1.54	0.06	1.00	36.99	36.99

Max.x/h = 0.13 As-top/bot = 4.00/73.97 As = 0.31 % = 77.97

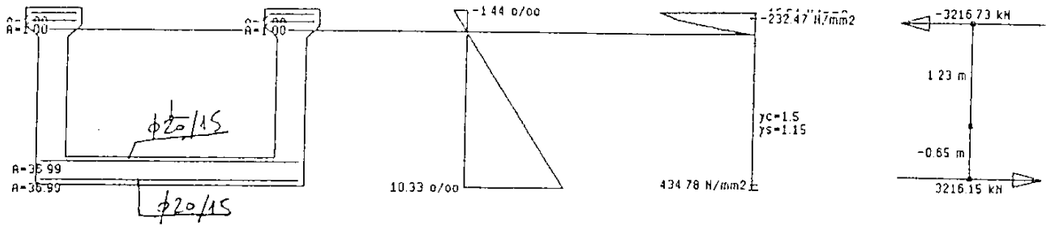
Sección CANAL320



Material acorde a la sección: "CANAL320"



Dimensionamiento,Sección "CANAL320"



Características mecánicas Sección "CANAL320" (sin coef. homogeneiz.)

Área	Ax =	2.545 m2				
Momento de inercia	Iy =	1.285 m4	Iz =	3.872 m4	Ip =	5.157 m4
Const. de torsión					Ix =	0.0958 m4
Momento estático	Zy =	1.617 m3	Zz =	2.927 m3		
Baricentro	ys =	-0.00 m	zs =	0.83 m	Angulo=	0.0 Grad
Dist. al borde	yl =	-1.75 m	yr =	1.75 m		
	zo =	1.32 m	zu =	-0.83 m		

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.83 m

Contorno de sección parcial, Sección "CANAL320" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	25450.0	1514.85	9.58E+06	3)

Puntos de contorno [m]:

1	-1.60	0.00	2	1.60	0.00	3	1.60	1.80
4	1.75	1.95	5	1.75	2.15	6	1.10	2.15
7	1.10	1.95	8	1.25	1.80	9	1.25	0.35
10	-1.25	0.35	11	-1.25	1.80	12	-1.10	1.95
13	-1.10	2.15	14	-1.75	2.15	15	-1.75	1.95
16	-1.60	1.80	17	-1.60	0.00			

Armadura "B1" As-tot =77.98 cm2 (0.31 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 4 / CS 1	AEH500	1.0	2	1.00	1.16	2.09
					1.69	2.09
LR 3 / CS 1	AEH500	1.0	2	1.00	-1.69	2.09
					-1.16	2.09
LR 6 / CS 1	AEH500	1.0	2	1.00	1.16	1.99
					1.69	1.99
LR 5 / CS 1	AEH500	1.0	2	1.00	-1.69	1.99
					-1.16	1.99
LR 7 / CS 1	AEH500	1.0	2	36.99	-1.54	0.29
					1.54	0.29
LR 1 / CS 1	AEH500	1.0	2	36.99	-1.54	0.06
					1.54	0.06

Dimensionamiento a flexión: Viga Sección "CANAL320"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	0.00	6880.70	0.00	

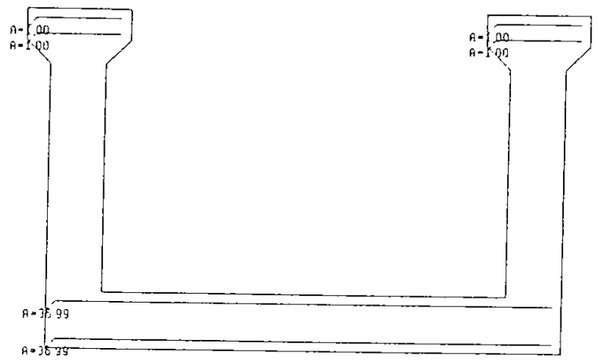
Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

No Armad. long. :	yl [m]	zl [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
AEH500	1.16	2.09	1.69	2.09	1.00	----	1.00
AEH500	-1.69	2.09	-1.16	2.09	1.00	----	1.00
AEH500	1.16	1.99	1.69	1.99	1.00	----	1.00
AEH500	-1.69	1.99	-1.16	1.99	1.00	----	1.00
1 AEH500	-1.54	0.29	1.54	0.29	1.00	42.23	42.23
1 AEH500	-1.54	0.06	1.54	0.06	1.00	42.23	42.23

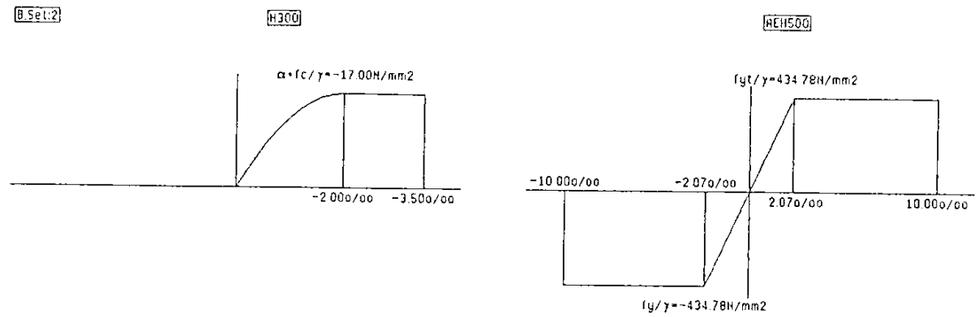
Max.x/h = 0.14 As-top/bot = 4.00/84.47 As = 0.35 % = 88.47

$42.23 / 3.08\,m = 13.71$ $\phi 20/15$

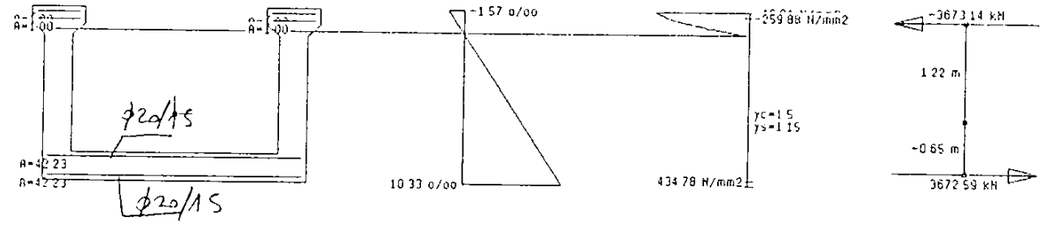
Sección CANAL320



Material acorde a la sección: "CANAL320"



Dimensionamiento, Sección "CANAL320"



2.4.1.3. Verificación de las secciones a esfuerzos de cortante (E.L.U.)

ENVELOPE SPECIFIC.: CQ ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.350		PESO PROPIO
B	OR	1	1.000		PESO PROPIO
C	PL.PERM	3	1.350		REOLOGICAS
D	OR	3	1.000		REOLOGICAS
E	PLUS	4	1.500		SOBRECARGA AGUA
F	PLUS	5	1.500		TEMPERATURA(+)
G	OR	6	1.500		TEMPERATURA(-)
H	PLUS	7	1.500		GRADIENTE(+)
I	OR	8	1.500		GRADIENTE(-)
J	PLUS	9	0.450000		VIENTO

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: B C I		Max: A C E H			
1	0	9.00E-12	0	-4.45E-06	0	8.77E-13	0
		9.00E-12	0	-1.85E-06	0	-8.90E-13	0
		Min: A C E H		Max: B C I			
1	0.725	9.00E-12	0	-111.210	0	-40.314	0
		9.00E-12	0	-46.128	0	-16.721	0
		Min: A C E H		Max: B C I			
1	1.450	9.00E-12	0	-222.421	0	-161.255	0
		9.00E-12	0	-92.256	0	-66.886	0
		Min: A C E H		Max: B C I			
1	2.175	9.00E-12	0	-333.631	0	-362.824	0
		9.00E-12	0	-138.384	0	-150.493	0
		Min: A C E H		Max: B C I			
1	2.900	9.00E-12	0	-444.842	0	-645.021	0
		9.00E-12	0	-184.512	0	-267.543	0
		Min: A C E H		Max: B C I			
2	0	36.918	0	-42.402	0	-267.543	0
		36.918	0	1149.707	0	-645.021	0
		Min: B C I		Max: A C E H			
2	0.318	36.918	0	-62.643	0	-284.252	0
		36.918	0	1100.909	0	-287.032	0
		Min: B C I		Max: A C E H			
2	0.636	36.918	0	-82.884	0	-307.400	0
		36.918	0	1052.111	0	55.433	0
		Min: B C I		Max: A C E H			
2	0.954	36.918	0	-103.124	0	-336.987	0
		36.918	0	1003.312	0	382.373	0

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: B C I		Max: A C E H			
2	1.272	36.918	0	-123.365	0	-373.012	0
		36.918	0	954.514	0	693.790	0
		Min: B C I		Max: A C E H			
3	0	36.918	0	-123.365	0	-373.012	0
		36.918	0	954.514	0	693.790	0
		Min: B C I		Max: A C E H			
3	0.318	36.918	0	-143.606	0	-415.477	0
		36.918	0	905.715	0	989.683	0
		Min: B C I		Max: A C E H			
3	0.636	36.918	0	-163.846	0	-464.382	0
		36.918	0	856.917	0	1270.051	0
		Min: B C I		Max: A C E H			
3	0.954	36.918	0	-184.087	0	-519.725	0
		36.918	0	808.119	0	1534.896	0
		Min: B C I		Max: A C E H			
3	1.272	36.918	0	-204.328	0	-581.507	0
		36.918	0	759.320	0	1784.217	0
		Min: B C I		Max: A C E H			
4	0	36.918	0	-204.328	0	-581.507	0
		36.918	0	759.320	0	1784.217	0
		Min: B C I		Max: A C E H			
4	0.318	36.918	0	-224.568	0	-649.728	0
		36.918	0	710.522	0	2038.013	0
		Min: B C I		Max: A C E H			
4	0.636	36.918	0	-244.809	0	-724.389	0
		36.918	0	661.723	0	2236.286	0
		Min: B C I		Max: A C E H			
4	0.954	36.918	0	-265.050	0	-805.488	0
		36.918	0	612.925	0	2439.035	0
		Min: B C I		Max: A C E H			
4	1.272	36.918	0	-285.291	0	-893.027	0
		36.918	0	564.127	0	2626.260	0
		Min: B C I		Max: A C E H			
5	0	36.918	0	-285.291	0	-893.027	0
		36.918	0	564.127	0	2626.260	0
		Min: B C I		Max: A C E H			
5	0.318	36.918	0	-305.531	0	-987.004	0
		36.918	0	515.328	0	2797.961	0
		Min: B C I		Max: A C E H			
5	0.636	36.918	0	-325.772	0	-1087.421	0
		36.918	0	466.530	0	2954.137	0
		Min: B C I		Max: A C E H			
5	0.954	36.918	0	-346.013	0	-1194.277	0
		36.918	0	417.731	0	3094.790	0
		Min: B C I		Max: A C E H			
5	1.272	36.918	0	-366.253	0	-1307.572	0
		36.918	0	368.933	0	3219.919	0

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		Min: B C I		Max: A C E H			
6	0	36.918	0	-366.253	0	-1307.572	0
		36.918	0	368.933	0	3219.919	0
		Min: B C I		Max: A C E H			
6	0.318	36.918	0	-413.943	0	-640.462	0
		36.918	0	347.584	0	2542.680	0
		Min: A C E I		Max: B C H			
6	0.636	36.918	0	-462.742	0	-779.910	0
		36.918	0	327.343	0	2650.036	0
		Min: A C E I		Max: B C H			
6	0.954	36.918	0	-511.540	0	-934.882	0
		36.918	0	307.103	0	2750.953	0
		Min: A C E I		Max: B C H			
6	1.272	36.918	0	-560.339	0	-1105.377	0
		36.918	0	286.862	0	2845.430	0
		Min: A C E I		Max: B C H			
7	0	36.918	0	-560.339	0	-1105.377	0
		36.918	0	286.862	0	2845.430	0
		Min: A C E I		Max: B C H			
7	0.318	36.918	0	-609.137	0	-1291.397	0
		36.918	0	266.621	0	2933.468	0
		Min: A C E I		Max: B C H			
7	0.636	36.918	0	-657.935	0	-1492.911	0
		36.918	0	246.380	0	3015.068	0
		Min: A C E I		Max: B C H			
7	0.954	36.918	0	-706.734	0	-1710.008	0
		36.918	0	226.140	0	3090.228	0
		Min: A C E I		Max: B C H			
7	1.272	36.918	0	-755.532	0	-1942.600	0
		36.918	0	205.899	0	3158.949	0
		Min: A C E I		Max: B C H			
8	0	36.918	0	-755.532	0	-1942.600	0
		36.918	0	205.899	0	3158.949	0
		Min: A C E I		Max: B C H			
8	0.318	36.918	0	-804.330	0	-2190.716	0
		36.918	0	185.658	0	3221.231	0
		Min: A C E I		Max: B C H			
8	0.636	36.918	0	-853.129	0	-2454.355	0
		36.918	0	165.418	0	3277.074	0
		Min: A C E I		Max: B C H			
8	0.954	36.918	0	-901.927	0	-2733.519	0
		36.918	0	145.177	0	3326.478	0
		Min: A C E I		Max: B C H			
8	1.272	36.918	0	-950.726	0	-3028.206	0
		36.918	0	124.936	0	3369.443	0
		Min: A C E I		Max: B C H			
9	0	36.918	0	-950.726	0	-3028.206	0

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		36.918	0	124.936	0	3369.443	0
		Min: A C E I		Max: B C H			
9	0.318	36.918	0	-999.524	0	-3338.418	0
		36.918	0	104.695	0	3405.969	0
		Min: A C E I		Max: B C H			
9	0.636	36.918	0	-1048.322	0	-3664.154	0
		36.918	0	84.455	0	3436.056	0
		Min: A C E I		Max: B C H			
9	0.954	36.918	0	-1097.121	0	-4005.413	0
		36.918	0	64.214	0	3459.703	0
		Min: A C E I		Max: B C H			
9	1.272	36.918	0	-1145.919	0	-4362.197	0
		36.918	0	43.973	0	3476.912	0
		Min: A C E I		Max: B C H			
10	0	36.918	0	-1145.919	0	-4362.197	0
		36.918	0	43.973	0	3476.912	0
		Min: A C E I		Max: B C H			
10	0.318	36.918	0	-1194.718	0	-4734.504	0
		36.918	0	23.733	0	3487.681	0
		Min: A C E I		Max: B C H			
10	0.636	36.918	0	-1243.516	0	-5122.336	0
		36.918	0	3.492	0	3492.012	0
		Min: A C E I		Max: B C H			
10	0.954	36.918	0	-1292.314	0	-5525.691	0
		36.918	0	-16.749	0	3489.903	0
		Min: A C E I		Max: B C H			
10	1.272	36.918	0	-1341.113	0	-5944.571	0
		36.918	0	-36.989	0	3481.355	0
		Min: A C E I		Max: B C H			
11	0	36.918	0	-1341.113	0	-5944.571	0
		36.918	0	-36.989	0	3481.355	0
		Min: A C E I		Max: B C H			
11	0.318	36.918	0	-1389.911	0	-6378.974	0
		36.918	0	-57.230	0	3466.369	0
		Min: A C E I		Max: B C H			
11	0.636	36.918	0	-1438.709	0	-6828.902	0
		36.918	0	-77.471	0	3444.943	0
		Min: A C E I		Max: B C H			
11	0.954	36.918	0	-1487.508	0	-7294.353	0
		36.918	0	-97.712	0	3417.078	0
		Min: A C E I		Max: B C H			
11	1.272	36.918	0	-1536.306	0	-7775.328	0
		36.918	0	-117.952	0	3382.774	0
		Min: A C E I		Max: B C H			
12	0	36.918	0	-1536.306	0	-7775.329	0
		36.918	0	-117.952	0	3382.774	0
		Min: A C E I		Max: B C H			
12	0.0688	36.918	0	-1546.852	0	-7881.312	0

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		36.918	0	-122.326	0	3374.514	0
		Min: A C E I		Max: B C H			
12	0.138	36.918	0	-1557.398	0	-7988.021	0
		36.918	0	-126.701	0	3365.954	0
		Min: A C E I		Max: B C H			
12	0.206	36.918	0	-1567.944	0	-8095.454	0
		36.918	0	-131.075	0	3357.093	0
		Min: A C E I		Max: B C H			
12	0.275	36.918	0	-1578.490	0	-8203.613	0
		36.918	0	-135.449	0	3347.931	0
		Min: A C E I		Max: B C H			
13	0	46.217	0	540.812	0	-6195.084	0
		46.217	0	1303.847	0	1339.402	0
		Min: B C I		Max: A C E H			
13	0.0668	46.217	0	536.438	0	-6158.053	0
		46.217	0	1293.301	0	1428.679	0
		Min: B C I		Max: A C E H			
13	0.138	46.217	0	532.064	0	-6121.324	0
		46.217	0	1282.755	0	1517.231	0
		Min: B C I		Max: A C E H			
13	0.206	46.217	0	527.690	0	-6084.894	0
		46.217	0	1272.209	0	1605.058	0
		Min: B C I		Max: A C E H			
13	0.275	46.217	0	523.316	0	-6048.766	0
		46.217	0	1261.664	0	1692.160	0
		Min: B C I		Max: A C E H			
14	0	46.217	0	523.316	0	-6048.766	0
		46.217	0	1261.664	0	1692.160	0
		Min: B C I		Max: A C E H			
14	0.411	46.217	0	497.150	0	-5838.933	0
		46.217	0	1198.580	0	2198.047	0
		Min: B C I		Max: A C E H			
14	0.822	46.217	0	470.984	0	-5639.860	0
		46.217	0	1135.497	0	2677.992	0
		Min: B C I		Max: A C E H			
14	1.234	46.217	0	444.818	0	-5451.549	0
		46.217	0	1072.414	0	3131.994	0
		Min: B C I		Max: A C E H			
14	1.645	46.217	0	418.653	0	-5273.997	0
		46.217	0	1009.331	0	3560.053	0
		Min: B C I		Max: A C E H			
15	0	46.217	0	418.652	0	-5273.997	0
		46.217	0	1009.331	0	3560.053	0
		Min: B C I		Max: A C E H			
15	0.411	46.217	0	392.487	0	-5107.267	0
		46.217	0	946.248	0	3962.168	0
		Min: B C I		Max: A C E H			
15	0.823	46.217	0	366.321	0	-4951.177	0

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		46.217	0	883.165	0	4338.341	0
		Min: B C I		Max: A C E H			
15	1.234	46.217	0	340.155	0	-4805.908	0
		46.217	0	820.081	0	4688.571	0
		Min: B C I		Max: A C E H			
15	1.645	46.217	0	313.989	0	-4671.399	0
		46.217	0	756.998	0	5012.858	0
		Min: B C I		Max: A C E H			
16	0	46.217	0	313.989	0	-4671.399	0
		46.217	0	756.998	0	5012.858	0
		Min: B C I		Max: A C E H			
16	0.411	46.217	0	287.824	0	-4547.652	0
		46.217	0	693.915	0	5311.202	0
		Min: B C I		Max: A C E H			
16	0.822	46.217	0	261.658	0	-4434.665	0
		46.217	0	630.832	0	5583.603	0
		Min: B C I		Max: A C E H			
16	1.234	46.217	0	235.492	0	-4332.438	0
		46.217	0	567.749	0	5830.061	0
		Min: B C I		Max: A C E H			
16	1.645	46.217	0	209.326	0	-4240.972	0
		46.217	0	504.665	0	6050.577	0
		Min: B C I		Max: A C E H			
17	0	46.217	0	209.326	0	-4240.972	0
		46.217	0	504.665	0	6050.577	0
		Min: B C I		Max: A C E H			
17	0.411	46.217	0	183.160	0	-4160.267	0
		46.217	0	441.582	0	6245.149	0
		Min: B C I		Max: A C E H			
17	0.822	46.217	0	156.995	0	-4090.323	0
		46.217	0	378.499	0	6413.778	0
		Min: B C I		Max: A C E H			
17	1.234	46.217	0	130.829	0	-4031.139	0
		46.217	0	315.416	0	6556.464	0
		Min: B C I		Max: A C E H			
17	1.645	46.217	0	104.663	0	-3982.716	0
		46.217	0	252.333	0	6671.208	0
		Min: B C I		Max: A C E H			
18	0	46.217	0	104.663	0	-3982.716	0
		46.217	0	252.333	0	6671.208	0
		Min: B C I		Max: A C E H			
18	0.411	46.217	0	78.497	0	-3945.054	0
		46.217	0	189.250	0	6764.008	0
		Min: B C I		Max: A C E H			
18	0.822	46.217	0	52.332	0	-3918.152	0
		46.217	0	126.166	0	6828.865	0
		Min: B C I		Max: A C E H			
18	1.234	46.217	0	26.166	0	-3902.011	0

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		46.217	0	63.083	0	6867.780	0
	Min:	B C I		Max:	A C E H		
18	1.645	46.217	0	1.05E-06	0	-3896.631	0
		46.217	0	2.52E-06	0	6880.751	0
	Min:	B C I		Max:	A C E H		
19	0	46.217	0	-2.52E-06	0	-2662.264	0
		46.217	0	-1.05E-06	0	5646.384	0
	Min:	A C E I		Max:	B C H		
19	0.411	46.217	0	-63.083	0	-2675.235	0
		46.217	0	-26.166	0	5641.004	0
	Min:	A C E I		Max:	B C H		
19	0.822	46.217	0	-126.166	0	-2714.150	0
		46.217	0	-52.332	0	5624.863	0
	Min:	A C E I		Max:	B C H		
19	1.234	46.217	0	-189.250	0	-2779.007	0
		46.217	0	-78.497	0	5597.961	0
	Min:	A C E I		Max:	B C H		
19	1.645	46.217	0	-252.333	0	-2869.807	0
		46.217	0	-104.663	0	5560.299	0
	Min:	A C E I		Max:	B C H		
20	0	46.217	0	-252.333	0	-2869.807	0
		46.217	0	-104.663	0	5560.299	0
	Min:	A C E I		Max:	B C H		
20	0.411	46.217	0	-315.416	0	-2986.551	0
		46.217	0	-130.829	0	5511.876	0
	Min:	A C E I		Max:	B C H		
20	0.822	46.217	0	-378.499	0	-3129.237	0
		46.217	0	-156.995	0	5452.692	0
	Min:	A C E I		Max:	B C H		
20	1.234	46.217	0	-441.582	0	-3297.866	0
		46.217	0	-183.160	0	5382.748	0
	Min:	A C E I		Max:	B C H		
20	1.645	46.217	0	-504.665	0	-3492.438	0
		46.217	0	-209.326	0	5302.043	0
	Min:	A C E I		Max:	B C H		
21	0	46.217	0	-504.665	0	-3492.438	0
		46.217	0	-209.326	0	5302.043	0
	Min:	A C E I		Max:	B C H		
21	0.411	46.217	0	-567.749	0	-3712.953	0
		46.217	0	-235.492	0	5210.577	0
	Min:	A C E I		Max:	B C H		
21	0.822	46.217	0	-630.832	0	-3959.412	0
		46.217	0	-261.658	0	5108.350	0
	Min:	A C E I		Max:	B C H		
21	1.234	46.217	0	-693.915	0	-4231.813	0
		46.217	0	-287.824	0	4995.363	0
	Min:	A C E I		Max:	B C H		
21	1.645	46.217	0	-756.998	0	-4530.157	0

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
		46.217	0	-313.989	0	4871.615	0
	Min:	A C E I		Max:	B C H		
22	0	46.217	0	-756.998	0	-4530.157	0
		46.217	0	-313.989	0	4871.615	0
	Min:	A C E I		Max:	B C H		
22	0.411	46.217	0	-820.081	0	-4854.444	0
		46.217	0	-340.155	0	4737.107	0
	Min:	A C E I		Max:	B C H		
22	0.822	46.217	0	-883.165	0	-5204.674	0
		46.217	0	-366.321	0	4591.838	0
	Min:	A C E I		Max:	B C H		
22	1.234	46.217	0	-946.248	0	-5580.846	0
		46.217	0	-392.487	0	4435.808	0
	Min:	A C E I		Max:	B C H		
22	1.645	46.217	0	-1009.331	0	-5982.962	0
		46.217	0	-418.652	0	4269.018	0
	Min:	A C E I		Max:	B C H		
23	0	46.217	0	-1009.331	0	-5982.962	0
		46.217	0	-418.653	0	4269.018	0
	Min:	A C E I		Max:	B C H		
23	0.411	46.217	0	-1072.414	0	-6411.021	0
		46.217	0	-444.818	0	4091.466	0
	Min:	A C E I		Max:	B C H		
23	0.823	46.217	0	-1135.497	0	-6865.023	0
		46.217	0	-470.984	0	3903.154	0
	Min:	A C E I		Max:	B C H		
23	1.234	46.217	0	-1198.580	0	-7344.968	0
		46.217	0	-497.150	0	3704.082	0
	Min:	A C E I		Max:	B C H		
23	1.645	46.217	0	-1261.664	0	-7850.855	0
		46.217	0	-523.316	0	3494.249	0
	Min:	A C E I		Max:	B C H		
24	0	46.217	0	-1261.664	0	-7850.855	0
		46.217	0	-523.316	0	3494.249	0
	Min:	A C E I		Max:	B C H		
24	0.0687	46.217	0	-1272.209	0	-7937.957	0
		46.217	0	-527.690	0	3458.120	0
	Min:	A C E I		Max:	B C H		
24	0.137	46.217	0	-1282.755	0	-8025.784	0
		46.217	0	-532.064	0	3421.691	0
	Min:	A C E I		Max:	B C H		
24	0.206	46.217	0	-1293.301	0	-8114.336	0
		46.217	0	-536.438	0	3384.962	0
	Min:	A C E I		Max:	B C H		
24	0.275	46.217	0	-1303.847	0	-8203.613	0
		46.217	0	-540.812	0	3347.931	0
	Min:	A C E I		Max:	B C H		

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
25	0	36.918	0	135.449	0	3347.931	0
		36.918	0	1578.490	0	-8203.613	0
	Min:	B C H		Max:	A C E I		
25	0.0687	36.918	0	131.075	0	3357.093	0
		36.918	0	1567.944	0	-8095.454	0
	Min:	B C H		Max:	A C E I		
25	0.137	36.918	0	126.701	0	3365.954	0
		36.918	0	1557.398	0	-7985.021	0
	Min:	B C H		Max:	A C E I		
25	0.206	36.918	0	122.326	0	3374.514	0
		36.918	0	1546.852	0	-7881.312	0
	Min:	B C H		Max:	A C E I		
25	0.275	36.918	0	117.952	0	3382.774	0
		36.918	0	1536.306	0	-7775.329	0
	Min:	B C H		Max:	A C E I		
26	0	36.918	0	117.952	0	3382.774	0
		36.918	0	1536.306	0	-7775.328	0
	Min:	B C H		Max:	A C E I		
26	0.318	36.918	0	97.712	0	3417.078	0
		36.918	0	1487.508	0	-7294.353	0
	Min:	B C H		Max:	A C E I		
26	0.636	36.918	0	77.471	0	3444.943	0
		36.918	0	1438.709	0	-6828.902	0
	Min:	B C H		Max:	A C E I		
26	0.954	36.918	0	57.230	0	3466.369	0
		36.918	0	1389.911	0	-6378.974	0
	Min:	B C H		Max:	A C E I		
26	1.272	36.918	0	36.989	0	3481.355	0
		36.918	0	1341.113	0	-5944.571	0
	Min:	B C H		Max:	A C E I		
27	0	36.918	0	36.989	0	3481.355	0
		36.918	0	1341.113	0	-5944.571	0
	Min:	B C H		Max:	A C E I		
27	0.318	36.918	0	16.749	0	3489.903	0
		36.918	0	1292.314	0	-5525.691	0
	Min:	B C H		Max:	A C E I		
27	0.636	36.918	0	-3.492	0	3492.012	0
		36.918	0	1243.516	0	-5122.336	0
	Min:	B C H		Max:	A C E I		
27	0.954	36.918	0	-23.733	0	3487.681	0
		36.918	0	1194.718	0	-4734.504	0
	Min:	B C H		Max:	A C E I		
27	1.272	36.918	0	-43.973	0	3476.912	0
		36.918	0	1145.919	0	-4362.197	0
	Min:	B C H		Max:	A C E I		
28	0	36.918	0	-43.973	0	3476.912	0
		36.918	0	1145.919	0	-4362.197	0
	Min:	B C H		Max:	A C E I		

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
28	0.318	36.918	0	-64.214	0	3459.703	0
		36.918	0	1097.121	0	-4005.413	0
	Min:	B C H		Max:	A C E I		
28	0.636	36.918	0	-84.455	0	3436.056	0
		36.918	0	1048.322	0	-3664.154	0
	Min:	B C H		Max:	A C E I		
28	0.954	36.918	0	-104.696	0	3405.969	0
		36.918	0	999.524	0	-3338.418	0
	Min:	B C H		Max:	A C E I		
28	1.272	36.918	0	-124.936	0	3369.443	0
		36.918	0	950.726	0	-3028.206	0
	Min:	B C H		Max:	A C E I		
29	0	36.918	0	-124.936	0	3369.443	0
		36.918	0	950.726	0	-3028.206	0
	Min:	B C H		Max:	A C E I		
29	0.318	36.918	0	-145.177	0	3326.478	0
		36.918	0	901.927	0	-2733.519	0
	Min:	B C H		Max:	A C E I		
29	0.636	36.918	0	-165.418	0	3277.074	0
		36.918	0	853.129	0	-2454.355	0
	Min:	B C H		Max:	A C E I		
29	0.954	36.918	0	-185.658	0	3221.231	0
		36.918	0	804.330	0	-2190.716	0
	Min:	B C H		Max:	A C E I		
29	1.272	36.918	0	-205.899	0	3158.949	0
		36.918	0	755.532	0	-1942.600	0
	Min:	B C H		Max:	A C E I		
30	0	36.918	0	-205.899	0	3158.949	0
		36.918	0	755.532	0	-1942.600	0
	Min:	B C H		Max:	A C E I		
30	0.318	36.918	0	-226.140	0	3090.228	0
		36.918	0	706.734	0	-1710.008	0
	Min:	B C H		Max:	A C E I		
30	0.636	36.918	0	-246.380	0	3015.068	0
		36.918	0	657.935	0	-1492.941	0
	Min:	B C H		Max:	A C E I		
30	0.954	36.918	0	-266.621	0	2933.468	0
		36.918	0	609.137	0	-1291.397	0
	Min:	B C H		Max:	A C E I		
30	1.272	36.918	0	-286.862	0	2845.430	0
		36.918	0	560.339	0	-1105.377	0
	Min:	B C H		Max:	A C E I		
31	0	36.918	0	-286.862	0	2845.430	0
		36.918	0	560.339	0	-1105.377	0
	Min:	B C H		Max:	A C E I		
31	0.318	36.918	0	-307.103	0	2750.953	0
		36.918	0	511.540	0	-934.882	0
	Min:	B C H		Max:	A C E I		

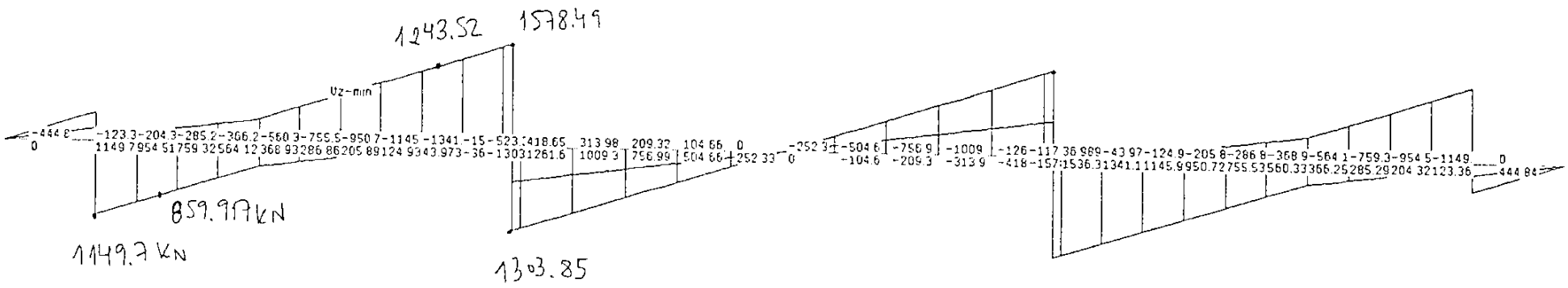
ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
31	0.636	36.918	0	-327.343	0	2650.036	0
		36.918	0	462.742	0	-779.910	0
	Min:	B C H		Max:	A C E I		
31	0.954	36.918	0	-347.584	0	2542.680	0
		36.918	0	413.943	0	-640.462	0
	Min:	B C H		Max:	A C E I		
31	1.272	36.918	0	-368.933	0	3219.919	0
		36.918	0	366.253	0	-1307.572	0
	Min:	A C E H		Max:	B C I		
32	0	36.918	0	-368.933	0	3219.919	0
		36.918	0	366.253	0	-1307.572	0
	Min:	A C E H		Max:	B C I		
32	0.318	36.918	0	-417.731	0	3094.790	0
		36.918	0	346.013	0	-1194.277	0
	Min:	A C E H		Max:	B C I		
32	0.636	36.918	0	-466.530	0	2954.137	0
		36.918	0	325.772	0	-1087.421	0
	Min:	A C E H		Max:	B C I		
32	0.954	36.918	0	-515.328	0	2797.961	0
		36.918	0	305.531	0	-987.004	0
	Min:	A C E H		Max:	B C I		
32	1.272	36.918	0	-564.127	0	2626.260	0
		36.918	0	285.291	0	-893.027	0
	Min:	A C E H		Max:	B C I		
33	0	36.918	0	-564.127	0	2626.260	0
		36.918	0	285.291	0	-893.027	0
	Min:	A C E H		Max:	B C I		
33	0.318	36.918	0	-612.925	0	2439.035	0
		36.918	0	265.050	0	-805.488	0
	Min:	A C E H		Max:	B C I		
33	0.636	36.918	0	-661.723	0	2236.286	0
		36.918	0	244.809	0	-724.389	0
	Min:	A C E H		Max:	B C I		
33	0.954	36.918	0	-710.522	0	2018.013	0
		36.918	0	224.568	0	-649.728	0
	Min:	A C E H		Max:	B C I		
33	1.272	36.918	0	-759.320	0	1784.217	0
		36.918	0	204.328	0	-581.507	0
	Min:	A C E H		Max:	B C I		
34	0	36.918	0	-759.320	0	1784.217	0
		36.918	0	204.328	0	-581.507	0
	Min:	A C E H		Max:	B C I		
34	0.318	36.918	0	-808.119	0	1534.896	0
		36.918	0	184.087	0	-519.725	0
	Min:	A C E H		Max:	B C I		
34	0.636	36.918	0	-856.917	0	1270.051	0
		36.918	0	163.846	0	-464.382	0
	Min:	A C E H		Max:	B C I		

ENVELOPE for < Vz > (and accomp. values) "ALL"
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups)

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
34	0.954	36.918	0	-905.715	0	989.683	0
		36.918	0	143.606	0	-415.477	0
	Min:	A C E H		Max:	B C I		
34	1.272	36.918	0	-954.514	0	693.790	0
		36.918	0	123.365	0	-373.012	0
	Min:	A C E H		Max:	B C I		
35	0	36.918	0	-954.514	0	693.790	0
		36.918	0	123.365	0	-373.012	0
	Min:	A C E H		Max:	B C I		
35	0.318	36.918	0	-1003.312	0	382.373	0
		36.918	0	103.124	0	-336.987	0
	Min:	A C E H		Max:	B C I		
35	0.636	36.918	0	-1052.111	0	55.433	0
		36.918	0	82.884	0	-307.400	0
	Min:	A C E H		Max:	B C I		
35	0.954	36.918	0	-1100.909	0	-287.032	0
		36.918	0	62.643	0	-284.252	0
	Min:	A C E H		Max:	B C I		
35	1.272	36.918	0	-1149.707	0	-645.021	0
		36.918	0	42.402	0	-267.543	0
	Min:	A C E H		Max:	B C I		
36	0	1.76E-11	0	184.512	0	-267.543	0
		1.76E-11	0	444.842	0	-645.021	0
	Min:	B C I		Max:	A C E H		
36	0.725	1.76E-11	0	138.384	0	-150.493	0
		1.76E-11	0	333.631	0	-302.824	0
	Min:	B C I		Max:	A C E H		
36	1.450	1.76E-11	0	92.256	0	-66.886	0
		1.76E-11	0	222.421	0	-161.255	0
	Min:	B C I		Max:	A C E H		
36	2.175	1.76E-11	0	46.128	0	-16.721	0
		1.76E-11	0	111.210	0	-40.314	0
	Min:	B C I		Max:	A C E H		
36	2.900	1.76E-11	0	1.85E-06	0	7.22E-12	0
		1.76E-11	0	4.45E-06	0	-5.09E-12	0
	Min:	B C I		Max:	A C E H		

Scale 1 : 192.6
Int. Forces envelope Vz, GWSP CQ, Subsys. "ALL"
- Structure: Elmnts.
- Envelope Shear force Vz-min, Scale 2.00E-03
  min: -1.58E+03 max: 5.41E+02 [kN]
- Envelope Shear force Vz-max, Scale 2.00E-03
  min: -5.41E+02 max: 1.58E+03 [kN]
- Text envelopes [kN]



CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título:
Fecha: 17/5/01 18.51.33

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 70 cm, alto 215 cm y canto 210 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 157.85 T
Cortante reducido a un canto útil del borde del apoyo = 124.35 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 98.2 cm2 lo que implica una cuantía geométrica igual a 0.00668
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 157.85 T < Vu1 = 882.00 T
Es necesario disponer armadura a cortante al ser Vrd = 124.35 T > Vu2 = 63.98 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°
Vcu = 53.32 T. Vsu= 71.03 T.
As cálculo = 9.40 cm2/m. As mínima = 7.00 cm2/m
Mínimo de armadura a disponer = 9.40 cm2/m

CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título:
Fecha: 17/5/01 18.54.13

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 70 cm, alto 215 cm y canto 210 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 114.97 T
Cortante reducido a un canto útil del borde del apoyo = 85.99 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 49.1 cm2 lo que implica una cuantía geométrica igual a 0.00334
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 114.97 T < Vu1 = 882.00 T
Es necesario disponer armadura a cortante al ser Vrd = 85.99 T > Vu2 = 50.78 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°
Vcu = 42.32 T. Vsu= 43.67 T.
As cálculo = 5.78 cm2/m. As mínima = 7.00 cm2/m
Mínimo de armadura a disponer = 7.00 cm2/m

2 c ϕ 12/30

2.4.1.4. Verificación de las secciones a esfuerzos de rasante (E.L.U.)

LOAD COMBINATION CO: ''

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
3	1.3500			REOLOGICAS
4	1.5000			SOBRECARGA AGUA
8	1.5000			GRADIENTE(-)

DISPLACEMENTS: ''

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	14.217	0	1.915	0	0.000810	0
2	12.526	0	-8.60E-95	0	0.000519	0
3	11.784	0	-0.584985	0	0.000398	0
4	11.043	0	-1.009	0	0.000268	0
5	10.301	0	-1.267	0	0.000137	0
6	9.560	0	-1.361	0	1.29E-05	0
7	8.819	0	-1.306	0	-9.57E-05	0
8	8.077	0	-1.127	0	-0.000181	0
9	7.336	0	-0.859445	0	-0.000234	0
10	6.594	0	-0.548113	0	-0.000248	0
11	5.853	0	-0.249408	0	-0.000213	0
12	5.112	0	-0.029799	0	-0.000122	0
13	4.951	0	-2.88E-94	0	-9.42E-05	0
14	4.791	0	0.021971	0	-6.60E-05	0
15	3.833	0	0.021399	0	5.34E-05	0
16	2.875	0	-0.115024	0	0.000102	0
17	1.916	0	-0.285315	0	9.76E-05	0
18	0.958235	0	-0.416628	0	5.76E-05	0
19	-2.57E-11	0	-0.465255	0	-6.11E-18	0
20	-0.958235	0	-0.416628	0	-5.76E-05	0
21	-1.916	0	-0.285315	0	-9.76E-05	0
22	-2.875	0	-0.115024	0	-0.000102	0
23	-3.833	0	0.021399	0	-5.34E-05	0
24	-4.791	0	0.021971	0	6.60E-05	0
25	-4.951	0	-2.88E-94	0	9.42E-05	0
26	-5.112	0	-0.029799	0	0.000122	0
27	-5.853	0	-0.249408	0	0.000213	0
28	-6.594	0	-0.548113	0	0.000248	0
29	-7.336	0	-0.859445	0	0.000234	0
30	-8.077	0	-1.127	0	0.000181	0
31	-8.819	0	-1.306	0	9.57E-05	0
32	-9.560	0	-1.361	0	-1.29E-05	0
33	-10.301	0	-1.267	0	-0.000137	0
34	-11.043	0	-1.009	0	-0.000268	0
35	-11.784	0	-0.584985	0	-0.000398	0
36	-12.526	0	-8.60E-95	0	-0.000519	0
37	-14.217	0	1.915	0	-0.000810	0
min:	-14.217	0	-1.361	0	-0.000810	0
max:	14.217	0	1.915	0	0.000810	0

SECTION FORCES: ''

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
1	0	9.00E-12	0	-4.45E-06	0	-8.88E-13	0
1	0.725	9.00E-12	0	-111.210	0	-40.314	0
1	1.450	9.00E-12	0	-222.421	0	-161.255	0
1	2.175	9.00E-12	0	-333.631	0	-362.824	0
1	2.900	9.00E-12	0	-444.842	0	-645.021	0
2	0	36.918	0	415.629	0	-645.021	0
2	0.318	36.918	0	366.831	0	-520.561	0
2	0.636	36.918	0	318.032	0	-411.625	0
2	0.954	36.918	0	269.234	0	-318.213	0
2	1.272	36.918	0	220.436	0	-240.324	0
3	0	36.918	0	220.436	0	-240.324	0
3	0.318	36.918	0	171.637	0	-177.960	0
3	0.636	36.918	0	122.839	0	-131.120	0
3	0.954	36.918	0	74.040	0	-99.804	0
3	1.272	36.918	0	25.242	0	-84.012	0
4	0	36.918	0	25.242	0	-84.012	0
4	0.318	36.918	0	-23.556	0	-83.744	0
4	0.636	36.918	0	-72.355	0	-99.000	0
4	0.954	36.918	0	-121.153	0	-129.779	0
4	1.272	36.918	0	-169.951	0	-176.083	0
5	0	36.918	0	-169.951	0	-176.083	0
5	0.318	36.918	0	-218.750	0	-237.911	0
5	0.636	36.918	0	-267.548	0	-315.263	0
5	0.954	36.918	0	-316.347	0	-408.139	0
5	1.272	36.918	0	-365.145	0	-516.538	0
6	0	36.918	0	-365.145	0	-516.538	0
6	0.318	36.918	0	-413.943	0	-640.462	0
6	0.636	36.918	0	-462.742	0	-779.910	0
6	0.954	36.918	0	-511.540	0	-934.882	0
6	1.272	36.918	0	-560.339	0	-1105.377	0
7	0	36.918	0	-560.339	0	-1105.377	0
7	0.318	36.918	0	-609.137	0	-1291.397	0
7	0.636	36.918	0	-657.935	0	-1492.941	0
7	0.954	36.918	0	-706.734	0	-1710.008	0
7	1.272	36.918	0	-755.532	0	-1942.600	0
8	0	36.918	0	-755.532	0	-1942.600	0
8	0.318	36.918	0	-804.330	0	-2190.716	0
8	0.636	36.918	0	-853.129	0	-2454.355	0
8	0.954	36.918	0	-901.927	0	-2733.519	0
8	1.272	36.918	0	-950.726	0	-3028.206	0
9	0	36.918	0	-950.726	0	-3028.206	0
9	0.318	36.918	0	-999.524	0	-3338.418	0
9	0.636	36.918	0	-1048.322	0	-3664.154	0
9	0.954	36.918	0	-1097.121	0	-4005.413	0
9	1.272	36.918	0	-1145.919	0	-4362.197	0

SECTION FORCES: ''

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
10	0	36.918	0	-1145.919	0	-4362.197	0
10	0.318	36.918	0	-1194.718	0	-4734.504	0
10	0.636	36.918	0	-1243.516	0	-5122.336	0
10	0.954	36.918	0	-1292.314	0	-5525.691	0
10	1.272	36.918	0	-1341.113	0	-5944.571	0
11	0	36.918	0	-1341.113	0	-5944.571	0
11	0.318	36.918	0	-1389.911	0	-6378.974	0
11	0.636	36.918	0	-1438.709	0	-6828.902	0
11	0.954	36.918	0	-1487.508	0	-7294.353	0
11	1.272	36.918	0	-1536.306	0	-7775.328	0
12	0	36.918	0	-1536.306	0	-7775.329	0
12	0.0688	36.918	0	-1546.852	0	-7881.312	0
12	0.138	36.918	0	-1557.398	0	-7988.021	0
12	0.206	36.918	0	-1567.944	0	-8095.454	0
12	0.275	36.918	0	-1578.490	0	-8203.613	0
13	0	46.217	0	1303.847	0	-8203.613	0
13	0.0688	46.217	0	1293.301	0	-8114.336	0
13	0.138	46.217	0	1282.755	0	-8025.784	0
13	0.206	46.217	0	1272.209	0	-7937.957	0
13	0.275	46.217	0	1261.664	0	-7850.855	0
14	0	46.217	0	1261.664	0	-7850.855	0
14	0.411	46.217	0	1198.580	0	-7344.968	0
14	0.822	46.217	0	1135.497	0	-6865.023	0
14	1.234	46.217	0	1072.414	0	-6411.021	0
14	1.645	46.217	0	1009.331	0	-5982.962	0
15	0	46.217	0	1009.331	0	-5982.962	0
15	0.411	46.217	0	946.248	0	-5580.846	0
15	0.823	46.217	0	883.165	0	-5204.674	0
15	1.234	46.217	0	820.081	0	-4854.444	0
15	1.645	46.217	0	756.998	0	-4530.157	0
16	0	46.217	0	756.998	0	-4530.157	0
16	0.411	46.217	0	693.915	0	-4231.813	0
16	0.822	46.217	0	630.832	0	-3959.412	0
16	1.234	46.217	0	567.749	0	-3712.953	0
16	1.645	46.217	0	504.665	0	-3492.438	0
17	0	46.217	0	504.665	0	-3492.438	0
17	0.411	46.217	0	441.582	0	-3297.866	0
17	0.822	46.217	0	378.499	0	-3129.237	0
17	1.234	46.217	0	315.416	0	-2986.551	0
17	1.645	46.217	0	252.333	0	-2869.807	0
18	0	46.217	0	252.333	0	-2869.807	0
18	0.411	46.217	0	189.250	0	-2779.007	0
18	0.822	46.217	0	126.166	0	-2714.150	0
18	1.234	46.217	0	63.083	0	-2675.235	0

SECTION FORCES: ''

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
18	1.645	46.217	0	2.52E-06	0	-2662.264	0
19	0	46.217	0	-2.52E-06	0	-2662.264	0
19	0.411	46.217	0	-63.083	0	-2675.235	0
19	0.822	46.217	0	-126.166	0	-2714.150	0
19	1.234	46.217	0	-189.250	0	-2779.007	0
19	1.645	46.217	0	-252.333	0	-2869.807	0
20	0	46.217	0	-252.333	0	-2869.807	0
20	0.411	46.217	0	-315.416	0	-2986.551	0
20	0.822	46.217	0	-378.499	0	-3129.237	0
20	1.234	46.217	0	-441.582	0	-3297.866	0
20	1.645	46.217	0	-504.665	0	-3492.438	0
21	0	46.217	0	-504.665	0	-3492.438	0
21	0.411	46.217	0	-567.749	0	-3712.953	0
21	0.822	46.217	0	-630.832	0	-3959.412	0
21	1.234	46.217	0	-693.915	0	-4231.813	0
21	1.645	46.217	0	-756.998	0	-4530.157	0
22	0	46.217	0	-756.998	0	-4530.157	0
22	0.411	46.217	0	-820.081	0	-4854.444	0
22	0.822	46.217	0	-883.165	0	-5204.674	0
22	1.234	46.217	0	-946.248	0	-5580.846	0
22	1.645	46.217	0	-1009.331	0	-5982.962	0
23	0	46.217	0	-1009.331	0	-5982.962	0
23	0.411	46.217	0	-1072.414	0	-6411.021	0
23	0.823	46.217	0	-1135.497	0	-6865.023	0
23	1.234	46.217	0	-1198.580	0	-7344.968	0
23	1.645	46.217	0	-1261.664	0	-7850.855	0
24	0	46.217	0	-1261.664	0	-7850.855	0
24	0.0687	46.217	0	-1272.209	0	-7937.957	0
24	0.137	46.217	0	-1282.755	0	-8025.784	0
24	0.206	46.217	0	-1293.301	0	-8114.336	0
24	0.275	46.217	0	-1303.847	0	-8203.613	0
25	0	36.918	0	1578.490	0	-8203.613	0
25	0.0687	36.918	0	1567.944	0	-8095.454	0
25	0.137	36.918	0	1557.398	0	-7988.021	0
25	0.206	36.918	0	1546.852	0	-7881.312	0
25	0.275	36.918	0	1536.306	0	-7775.329	0
26	0	36.918	0	1536.306	0	-7775.328	0
26	0.318	36.918	0	1487.508	0	-7294.353	0
26	0.636	36.918	0	1438.709	0	-6828.902	0
26	0.954	36.918	0	1389.911	0	-6378.974	0
26	1.272	36.918	0	1341.113	0	-5944.571	0
27	0	36.918	0	1341.113	0	-5944.571	0
27	0.318	36.918	0	1292.314	0	-5525.691	0
27	0.636	36.918	0	1243.516	0	-5122.336	0

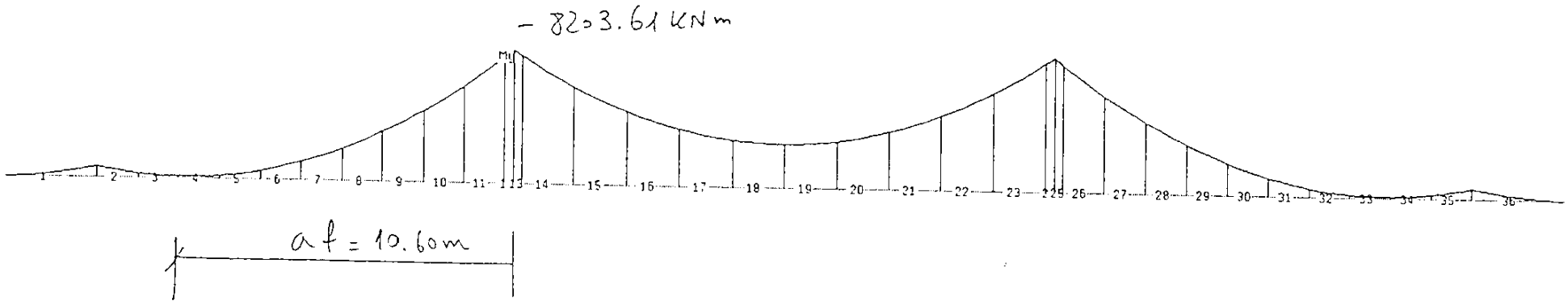
SECTION FORCES: ''

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
27	0.954	36.918	0	1194.718	0	-4734.504	0
27	1.272	36.918	0	1145.919	0	-4362.197	0
28	0	36.918	0	1145.919	0	-4362.197	0
28	0.318	36.918	0	1097.121	0	-4005.413	0
28	0.636	36.918	0	1048.322	0	-3664.154	0
28	0.954	36.918	0	999.524	0	-3338.418	0
28	1.272	36.918	0	950.726	0	-3028.206	0
29	0	36.918	0	950.726	0	-3028.206	0
29	0.318	36.918	0	901.927	0	-2733.519	0
29	0.636	36.918	0	853.129	0	-2454.355	0
29	0.954	36.918	0	804.330	0	-2190.716	0
29	1.272	36.918	0	755.532	0	-1942.600	0
30	0	36.918	0	755.532	0	-1942.600	0
30	0.318	36.918	0	706.734	0	-1710.008	0
30	0.636	36.918	0	657.935	0	-1492.941	0
30	0.954	36.918	0	609.137	0	-1291.397	0
30	1.272	36.918	0	560.339	0	-1105.377	0
31	0	36.918	0	560.339	0	-1105.377	0
31	0.318	36.918	0	511.540	0	-934.882	0
31	0.636	36.918	0	462.742	0	-779.910	0
31	0.954	36.918	0	413.943	0	-640.462	0
31	1.272	36.918	0	365.145	0	-516.538	0
32	0	36.918	0	365.145	0	-516.538	0
32	0.318	36.918	0	316.347	0	-408.139	0
32	0.636	36.918	0	267.548	0	-315.263	0
32	0.954	36.918	0	218.750	0	-237.911	0
32	1.272	36.918	0	169.951	0	-176.083	0
33	0	36.918	0	169.951	0	-176.083	0
33	0.318	36.918	0	121.153	0	-129.779	0
33	0.636	36.918	0	72.355	0	-99.000	0
33	0.954	36.918	0	23.556	0	-83.744	0
33	1.272	36.918	0	-25.242	0	-84.012	0
34	0	36.918	0	-25.242	0	-84.012	0
34	0.318	36.918	0	-74.040	0	-99.804	0
34	0.636	36.918	0	-122.839	0	-131.120	0
34	0.954	36.918	0	-171.637	0	-177.960	0
34	1.272	36.918	0	-220.436	0	-240.324	0
35	0	36.918	0	-220.436	0	-240.324	0
35	0.318	36.918	0	-269.234	0	-318.213	0
35	0.636	36.918	0	-318.032	0	-411.625	0
35	0.954	36.918	0	-366.831	0	-520.561	0
35	1.272	36.918	0	-415.629	0	-645.021	0
36	0	1.76E-11	0	444.842	0	-645.021	0
36	0.725	1.76E-11	0	333.631	0	-362.824	0

SECTION FORCES: ''

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
36	1.450	1.76E-11	0	222.421	0	-161.255	0
36	2.175	1.76E-11	0	111.210	0	40.314	0
36	2.900	1.76E-11	0	4.45E-06	0	7.89E-12	0
min:		9.00E-12	0	-1578.490	0	-8203.613	0
max:		46.217	0	1578.490	0	7.89E-12	0

Scale 1 : 192.6
Int. Force, Loadcomb. CO, Subsys. "LIST"
- Structure: Elmnts.
- Moment My , Scale 5.00E-04
  min: -8.20E+03 max: 7.89E-12 [kNm]



$\Delta M_d = 8203.61\ kN\,m$

$a_f = 10.60\ m$

$z = 2.15m - 0.10m - \frac{0.35m}{2} = 1.875$

$F_d = \frac{\Delta M_d}{z} = 4375.25\ kN$

$S_d = \frac{4375.25\ kN}{10.60\ m} = 412.76\ kN/m$

$\sigma_{bd} = \frac{2\,S_d}{h_o} = \frac{2 \times 412.76\ kN/m}{2 \times 0.35m} = 1179.31\ kN/m^2$

$\sigma_{bd} \leq 0.40\, f_{cd} = 12000\ kN/m^2$ verifica.

$Ast_{total} = \frac{S_d}{f_{zd}} = \frac{412.76}{40} = 10.31\ cm^2$

2.56 cm^2/m en cada cara por cortante
8.40 cm^2/m flexión Transversal } 8.40 cm^2/m en cada cara

Armadura cortante + flexión transversal: 2 C Ø 16/15

LOAD COMBINATION CP: **

Loadcase	Factor	Stage	Init.def	Title
1	1.3500			PESO PROPIO
3	1.3500			REOLOGICAS
4	1.5000			SOBRECARGA AGUA
7	1.5000			GRADIENTE(+)

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
1	14.217	0	-1.412	0	-0.000645	0
2	12.526	0	-1.59E-94	0	-0.000321	0
3	11.784	0	0.319387	0	-0.000188	0
4	11.043	0	0.495569	0	-9.49E-05	0
5	10.301	0	0.574349	0	-3.36E-05	0
6	9.560	0	0.591098	0	4.00E-06	0
7	8.819	0	0.570754	0	2.61E-05	0
8	8.077	0	0.527819	0	4.09E-05	0
9	7.336	0	0.466363	0	5.66E-05	0
10	6.594	0	0.380024	0	8.13E-05	0
11	5.853	0	0.252004	0	0.000123	0
12	5.112	0	0.055072	0	0.000191	0
13	4.951	0	-2.15E-94	0	0.000210	0
14	4.791	0	-0.060262	0	0.000228	0
15	3.833	0	-0.496268	0	0.000289	0
16	2.875	0	-0.971363	0	0.000279	0
17	1.916	0	-1.384	0	0.000215	0
18	0.958235	0	-1.660	0	0.000116	0
19	-2.97E-11	0	-1.757	0	3.46E-18	0
20	-0.958235	0	-1.660	0	-0.000116	0
21	-1.916	0	-1.384	0	-0.000215	0
22	-2.875	0	-0.971363	0	-0.000279	0
23	-3.833	0	-0.496268	0	-0.000289	0
24	-4.791	0	-0.060262	0	-0.000228	0
25	-4.951	0	-2.15E-94	0	-0.000210	0
26	-5.112	0	0.055072	0	-0.000191	0
27	-5.853	0	0.252004	0	-0.000123	0
28	-6.594	0	0.380024	0	-8.13E-05	0

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
29	-7.336	0	0.466363	0	-5.66E-05	0
30	-8.077	0	0.527819	0	-4.09E-05	0
31	-8.819	0	0.570754	0	-2.61E-05	0
32	-9.560	0	0.591098	0	-4.00E-06	0
33	-10.301	0	0.574349	0	3.36E-05	0
34	-11.043	0	0.495569	0	9.49E-05	0
35	-11.784	0	0.319387	0	0.000188	0
36	-12.526	0	-1.59E-94	0	0.000321	0
37	-14.217	0	-1.412	0	0.000645	0
min:	-14.217	0	-1.757	0	-0.000645	0
max:	14.217	0	0.591098	0	0.000645	0

SECTION FORCES: **

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
1	0	9.00E-12	0	-4.45E-06	0	8.77E-13	0
1	0.725	9.00E-12	0	-111.210	0	-40.314	0
1	1.450	9.00E-12	0	-222.421	0	-161.255	0
1	2.175	9.00E-12	0	-333.631	0	-362.824	0
1	2.900	9.00E-12	0	-444.842	0	-645.021	0
2	0	36.918	0	1149.707	0	-645.021	0
2	0.318	36.918	0	1100.909	0	-287.032	0
2	0.636	36.918	0	1052.111	0	55.433	0
2	0.954	36.918	0	1003.312	0	382.373	0
2	1.272	36.918	0	954.514	0	693.790	0
3	0	36.918	0	954.514	0	693.790	0
3	0.318	36.918	0	905.715	0	989.883	0
3	0.636	36.918	0	856.917	0	1270.051	0
3	0.954	36.918	0	808.119	0	1534.896	0
3	1.272	36.918	0	759.320	0	1784.217	0
4	0	36.918	0	759.320	0	1784.217	0
4	0.318	36.918	0	710.522	0	2018.013	0
4	0.636	36.918	0	661.723	0	2236.286	0
4	0.954	36.918	0	612.925	0	2439.035	0
4	1.272	36.918	0	564.127	0	2626.260	0
5	0	36.918	0	564.127	0	2626.260	0
5	0.318	36.918	0	515.328	0	2797.961	0
5	0.636	36.918	0	466.530	0	2954.137	0
5	0.954	36.918	0	417.731	0	3094.790	0
5	1.272	36.918	0	368.933	0	3219.919	0
6	0	36.918	0	368.933	0	3219.919	0
6	0.318	36.918	0	320.135	0	3329.524	0
6	0.636	36.918	0	271.336	0	3423.605	0

SECTION FORCES: **

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
6	0.954	36.918	0	222.538	0	3502.162	0
6	1.272	36.918	0	173.740	0	3565.194	0
7	0	36.918	0	173.740	0	3565.194	0
7	0.318	36.918	0	124.941	0	3612.703	0
7	0.636	36.918	0	76.143	0	3644.688	0
7	0.954	36.918	0	27.344	0	3661.149	0
7	1.272	36.918	0	-21.454	0	3662.086	0
8	0	36.918	0	-21.454	0	3662.086	0
8	0.318	36.918	0	-70.252	0	3647.499	0
8	0.636	36.918	0	-119.051	0	3617.388	0
8	0.954	36.918	0	-167.849	0	3571.753	0
8	1.272	36.918	0	-216.648	0	3510.594	0
9	0	36.918	0	-216.648	0	3510.594	0
9	0.318	36.918	0	-265.446	0	3433.911	0
9	0.636	36.918	0	-314.244	0	3341.704	0
9	0.954	36.918	0	-363.043	0	3233.973	0
9	1.272	36.918	0	-411.841	0	3110.718	0
10	0	36.918	0	-411.841	0	3110.718	0
10	0.318	36.918	0	-460.639	0	2971.939	0
10	0.636	36.918	0	-509.438	0	2817.636	0
10	0.954	36.918	0	-558.236	0	2647.809	0
10	1.272	36.918	0	-607.035	0	2462.458	0
11	0	36.918	0	-607.035	0	2462.458	0
11	0.318	36.918	0	-655.833	0	2261.584	0
11	0.636	36.918	0	-704.631	0	2045.185	0
11	0.954	36.918	0	-753.430	0	1813.262	0
11	1.272	36.918	0	-802.228	0	1565.815	0
12	0	36.918	0	-802.228	0	1565.815	0
12	0.0688	36.918	0	-812.774	0	1510.299	0
12	0.138	36.918	0	-823.320	0	1454.059	0
12	0.206	36.918	0	-833.866	0	1397.093	0
12	0.275	36.918	0	-844.411	0	1339.402	0
13	0	46.217	0	1303.847	0	1339.402	0
13	0.0688	46.217	0	1293.301	0	1428.679	0
13	0.138	46.217	0	1282.755	0	1517.231	0
13	0.206	46.217	0	1272.209	0	1605.058	0
13	0.275	46.217	0	1261.664	0	1692.160	0
14	0	46.217	0	1261.664	0	1692.160	0
14	0.411	46.217	0	1198.580	0	2198.047	0
14	0.822	46.217	0	1135.497	0	2677.992	0
14	1.234	46.217	0	1072.414	0	3131.994	0
14	1.645	46.217	0	1009.331	0	3560.053	0
15	0	46.217	0	1009.331	0	3560.053	0
15	0.411	46.217	0	946.248	0	3962.168	0

SECTION FORCES: **

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
15	0.823	46.217	0	883.165	0	4338.341	0
15	1.234	46.217	0	820.081	0	4688.571	0
15	1.645	46.217	0	756.998	0	5012.858	0
16	0	46.217	0	756.998	0	5012.858	0
16	0.411	46.217	0	693.915	0	5311.202	0
16	0.822	46.217	0	630.832	0	5583.603	0
16	1.234	46.217	0	567.749	0	5830.061	0
16	1.645	46.217	0	504.665	0	6050.577	0
17	0	46.217	0	504.665	0	6050.577	0
17	0.411	46.217	0	441.582	0	6245.149	0
17	0.822	46.217	0	378.499	0	6413.778	0
17	1.234	46.217	0	315.416	0	6556.464	0
17	1.645	46.217	0	252.333	0	6673.208	0
18	0	46.217	0	252.333	0	6673.208	0
18	0.411	46.217	0	189.250	0	6764.008	0
18	0.822	46.217	0	126.166	0	6828.865	0
18	1.234	46.217	0	63.083	0	6867.780	0
18	1.645	46.217	0	2.52E-06	0	6880.751	0
19	0	46.217	0	-2.52E-06	0	6880.751	0
19	0.411	46.217	0	-63.083	0	6867.780	0
19	0.822	46.217	0	-126.166	0	6828.865	0
19	1.234	46.217	0	-189.250	0	6764.008	0
19	1.645	46.217	0	-252.333	0	6673.208	0
20	0	46.217	0	-252.333	0	6673.208	0
20	0.411	46.217	0	-315.416	0	6556.464	0
20	0.822	46.217	0	-378.499	0	6413.778	0
20	1.234	46.217	0	-441.582	0	6245.149	0
20	1.645	46.217	0	-504.665	0	6050.577	0
21	0	46.217	0	-504.665	0	6050.577	0
21	0.411	46.217	0	-567.749	0	5830.061	0
21	0.822	46.217	0	-630.832	0	5583.603	0
21	1.234	46.217	0	-693.915	0	5311.202	0
21	1.645	46.217	0	-756.998	0	5012.858	0
22	0	46.217	0	-756.998	0	5012.858	0
22	0.411	46.217	0	-820.081	0	4688.571	0
22	0.822	46.217	0	-883.165	0	4338.341	0
22	1.234	46.217	0	-946.248	0	3962.168	0
22	1.645	46.217	0	-1009.331	0	3560.053	0
23	0	46.217	0	-1009.331	0	3560.053	0
23	0.411	46.217	0	-1072.414	0	3131.994	0
23	0.823	46.217	0	-1135.497	0	2677.992	0
23	1.234	46.217	0	-1198.580	0	2198.047	0
23	1.645	46.217	0	-1261.664	0	1692.160	0
24	0	46.217	0	-1261.664	0	1692.160	0

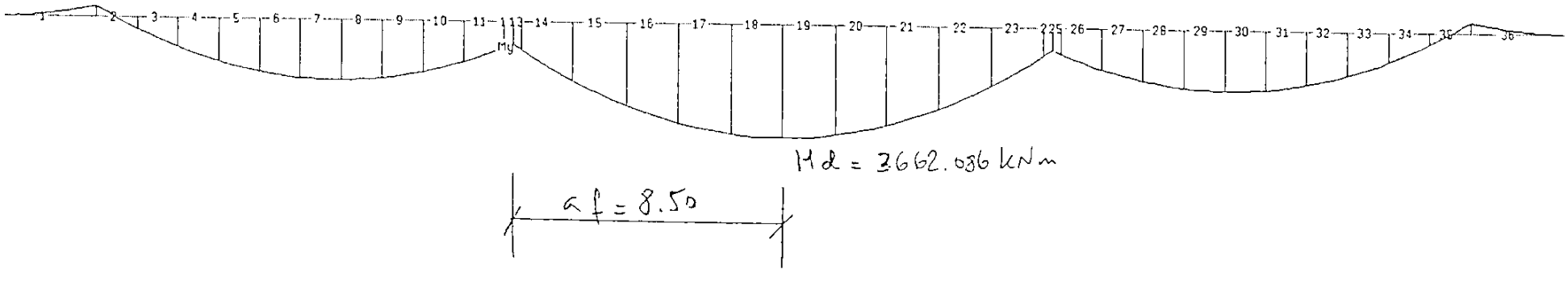
SECTION FORCES: **

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
24	0.0687	46.217	0	-1272.209	0	1605.058	0
24	0.137	46.217	0	-1282.755	0	1517.231	0
24	0.206	46.217	0	-1293.301	0	1428.679	0
24	0.275	46.217	0	-1303.847	0	1339.402	0
25	0	36.918	0	844.411	0	1339.402	0
25	0.0687	36.918	0	833.866	0	1397.093	0
25	0.137	36.918	0	823.320	0	1454.059	0
25	0.206	36.918	0	812.774	0	1510.299	0
25	0.275	36.918	0	802.228	0	1565.815	0
26	0	36.918	0	802.228	0	1565.815	0
26	0.318	36.918	0	753.430	0	1813.262	0
26	0.636	36.918	0	704.631	0	2045.185	0
26	0.954	36.918	0	655.833	0	2261.584	0
26	1.272	36.918	0	607.035	0	2462.458	0
27	0	36.918	0	607.035	0	2462.458	0
27	0.318	36.918	0	558.236	0	2647.809	0
27	0.636	36.918	0	509.438	0	2817.636	0
27	0.954	36.918	0	460.639	0	2971.939	0
27	1.272	36.918	0	411.841	0	3110.718	0
28	0	36.918	0	411.841	0	3110.718	0
28	0.318	36.918	0	363.043	0	3233.973	0
28	0.636	36.918	0	314.244	0	3341.704	0
28	0.954	36.918	0	265.446	0	3433.911	0
28	1.272	36.918	0	216.648	0	3510.594	0
29	0	36.918	0	216.648	0	3510.594	0
29	0.318	36.918	0	167.849	0	3571.753	0
29	0.636	36.918	0	119.051	0	3617.388	0
29	0.954	36.918	0	70.252	0	3647.499	0
29	1.272	36.918	0	21.454	0	3662.086	0
30	0	36.918	0	21.454	0	3662.086	0
30	0.318	36.918	0	-27.344	0	3661.149	0
30	0.636	36.918	0	-76.143	0	3644.688	0
30	0.954	36.918	0	-124.941	0	3612.703	0
30	1.272	36.918	0	-173.740	0	3565.194	0
31	0	36.918	0	-173.740	0	3565.194	0
31	0.318	36.918	0	-222.538	0	3502.162	0
31	0.636	36.918	0	-271.336	0	3423.605	0
31	0.954	36.918	0	-320.135	0	3329.524	0
31	1.272	36.918	0	-368.933	0	3219.919	0
32	0	36.918	0	-368.933	0	3219.919	0
32	0.318	36.918	0	-417.731	0	3094.790	0
32	0.636	36.918	0	-466.530	0	2954.137	0
32	0.954	36.918	0	-515.328	0	2797.961	0
32	1.272	36.918	0	-564.127	0	2626.260	0

SECTION FORCES: **

Memb.	Distance [m]	N [kN]	Vy [kN]	Vz [kN]	T [kNm]	My [kNm]	Mz [kNm]
33	0	36.918	0	-564.127	0	2626.260	0
33	0.318	36.918	0	-612.925	0	2439.035	0
33	0.636	36.918	0	-661.723	0	2236.286	0
33	0.954	36.918	0	-710.522	0	2018.013	0
33	1.272	36.918	0	-759.320	0	1784.217	0
34	0	36.918	0	-759.320	0	1784.217	0
34	0.318	36.918	0	-808.119	0	1534.896	0
34	0.636	36.918	0	-856.917	0	1270.051	0
34	0.954	36.918	0	-905.715	0	989.683	0
34	1.272	36.918	0	-954.514	0	693.790	0
35	0	36.918	0	-954.514	0	693.790	0
35	0.318	36.918	0	-1003.312	0	382.373	0
35	0.636	36.918	0	-1052.111	0	55.433	0
35	0.954	36.918	0	-1100.909	0	-287.032	0
35	1.272	36.918	0	-1149.707	0	-645.021	0
36	0	1.76E-11	0	444.842	0	-645.021	0
36	0.725	1.76E-11	0	333.631	0	-362.824	0
36	1.450	1.76E-11	0	222.421	0	-161.255	0
36	2.175	1.76E-11	0	111.210	0	-40.314	0
36	2.900	1.76E-11	0	4.45E-06	0	-5.08E-12	0
min:		9.00E-12	0	-1303.847	0	-645.021	0
max:		46.217	0	1303.847	0	6880.751	0

Scale 1 : 192.6
Int. Force, Loadcomb. CP, Subsys. "LIST"
- Structure: Elmnts.
- Moment My , Scale 5.00E-04
  min: -6.45E+02 max: 6.88E+03 [kNm]



Hd = 3662.086 kNm

af = 8.50

ΔHd = 3662.086 kNm

af = 8.50m

z = 1.875m

Fd = 430.83 kN verifica

2.4.2. Reacciones y cálculo de neoprenos

Loadcase Factor Stage Init.def Title
1 1.0000 PESO PROPIO

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	509.149	0		
13	0	0	1043.301			
25	0	0	1043.301			
36	0	0	509.149	0		
Sums :	0	0	3104.900			
min:	0	0	509.149	0	Undef	Undef
max:	0	0	1043.301	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	-5.09E-95	0	4.10E-05	0
13	0	0	-1.04E-94	0	2.40E-05	0
25	0	0	-1.04E-94	0	-2.40E-05	0
36	0	0	-5.09E-95	0	-4.10E-05	0
min:	0	0	-1.04E-94	0	-4.10E-05	0
max:	0	0	-5.09E-95	0	4.10E-05	0

Loadcase Factor Stage Init.def Title
3 1.0000 REOLOGICAS

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	-27.347	0	0	0		
13	-6.888	0	0			
25	6.888	0	0			
36	27.347	0	0	0		
Sums :	2.12E-10	0	0			
min:	-27.347	0	0	0	Undef	Undef
max:	27.347	0	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	9.278	0	0	0	0	0
13	3.668	0	0	0	0	0
25	-3.668	0	0	0	0	0
36	-9.278	0	0	0	0	0
min:	-9.278	0	0	0	0	0
max:	9.278	0	0	0	0	0

Loadcase Factor Stage Init.def Title
4 1.0000 SOBRECARGA AGUA

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	360.106	0		
13	0	0	737.894			
25	0	0	737.894			
36	0	0	360.106	0		
Sums :	0	0	2196.000			
min:	0	0	360.106	0	Undef	Undef
max:	0	0	737.894	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	-3.60E-95	0	2.90E-05	0
13	0	0	-7.38E-95	0	1.70E-05	0
25	0	0	-7.38E-95	0	-1.70E-05	0
36	0	0	-3.60E-95	0	-2.90E-05	0
min:	0	0	-7.38E-95	0	-2.90E-05	0
max:	0	0	-3.60E-95	0	2.90E-05	0

Loadcase Factor Stage Init.def Title
5 1.0000 TEMPERATURA(+)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	-26.236	0	0	0		
13	-6.608	0	0			
25	6.608	0	0			
36	26.236	0	0	0		
Sums :	2.10E-10	0	0			
min:	-26.236	0	0	0	Undef	Undef
max:	26.236	0	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	8.901	0	0	0	0	0
13	3.519	0	0	0	0	0
25	-3.519	0	0	0	0	0
36	-8.901	0	0	0	0	0
min:	-8.901	0	0	0	0	0
max:	8.901	0	0	0	0	0

Loadcase Factor Stage Init.def Title
6 1.0000 TEMPERATURA(-)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	26.236	0	0	0		
13	6.608	0	0			
25	-6.608	0	0			
36	-26.236	0	0	0		
Sums :	-2.10E-10	0	0			
min:	-26.236	0	0	0	Undef	Undef
max:	26.236	0	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	-8.901	0	0	0	0	0
13	-3.519	0	0	0	0	0
25	3.519	0	0	0	0	0
36	8.901	0	0	0	0	0
min:	-8.901	0	0	0	0	0
max:	8.901	0	0	0	0	0

Loadcase Factor Stage Init.def Title
7 1.0000 GRADIENTE(+)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	244.693	0		
13	0	0	-244.693			
25	0	0	-244.693			
36	0	0	244.693	0		
Sums :	0	0	5.20E-12			
min:	0	0	-244.693	0	Undef	Undef
max:	0	0	244.693	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	-2.45E-95	0	-0.000280	0
13	0	0	2.45E-95	0	0.000101	0
25	0	0	2.45E-95	0	-0.000101	0
36	0	0	-2.45E-95	0	0.000280	0
min:	0	0	-2.45E-95	0	-0.000280	0
max:	0	0	2.45E-95	0	0.000280	0

Loadcase 9 | Factor 1.0000 | Stage | Init.def | Title GRADIENTE(-)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	-244.693	0		
13	0	0	244.693			
25	0	0	244.693			
36	0	0	-244.693	0		
Sums :	0	0	-5.20E-12			
min:	0	0	-244.693	0	Undef	Undef
max:	0	0	244.693	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	2.45E-95	0	0.000280	0
13	0	0	-2.45E-95	0	-0.000101	0
25	0	0	-2.45E-95	0	0.000101	0
36	0	0	2.45E-95	0	-0.000280	0
min:	0	0	-2.45E-95	0	-0.000280	0
max:	0	0	2.45E-95	0	0.000280	0

Loadcase 9 | Factor 1.0000 | Stage | Init.def | Title VIENTO c/ SOBRECARGAS

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	-103.313	0	0		
13	0	-67.487	0			
25	0	-67.487	0			
36	0	-103.313	0	0		
Sums :	0	-341.600	0			
min:	0	-103.313	0	0	Undef	Undef
max:	0	-67.487	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	35.052	0	0	0	8.09E-05
13	0	35.935	0	0	0	4.59E-05
25	0	35.935	0	0	0	-4.59E-05
36	0	35.052	0	0	0	-8.09E-05
min:	0	35.052	0	0	0	-8.09E-05
max:	0	35.935	0	0	0	8.09E-05

ENVELOPE SPECIFIC.: CS ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	3	1.000		REOLOGICAS
C	PLUS	4	1.000		SOBRECARGA AGUA
D	PLUS	5	1.000		TEMPERATURA(+)
E	OR	6	1.000		TEMPERATURA(-)
F	PLUS	7	1.000		GRADIENTE(+)
G	OR	8	1.000		GRADIENTE(-)
H	PLUS	9	0.500000		VIENTO
ALTERNATIVE ENVELOPE :					
I	PERM.	1	1.000		PESO PROPIO
J	PL.PERM	3	1.000		REOLOGICAS
K	PLUS	4	0.500000		SOBRECARGA AGUA
L	PLUS	5	1.000		TEMPERATURA(+)
M	OR	6	1.000		TEMPERATURA(-)
N	PLUS	7	1.000		GRADIENTE(+)
O	OR	8	1.000		GRADIENTE(-)
P	PLUS	9	1.000		VIENTO

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [kN]	FY [kN]	FZ [kN]	MX [kNm]	MY [kNm]	MZ [kNm]
2	-53.583	0	509.149	0		
	-1.110	0	509.149	0		
	Min: A B D			Max: A B E		
13	-13.496	0	1043.301			
	-0.279700	0	1043.301			
	Min: A B D			Max: A B E		
25	0.279700	0	1043.301			
	13.496	0	1043.301			
	Min: A B E			Max: A B D		
36	1.110	0	509.149	0		
	53.583	0	509.149	0		
	Min: A B E			Max: A B D		

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [kN]	FY [kN]	FZ [kN]	MX [kNm]	MY [kNm]	MZ [kNm]
2	-27.347	-103.311	509.149	0		
	-27.347	0	509.149	0		
	Min: I J P			Max: A B		
13	-6.888	-67.487	1043.301			
	-6.888	0	1043.301			
	Min: I J P			Max: A B		
25	6.888	-67.487	1043.301			
	6.888	0	1043.301			
	Min: I J P			Max: A B		
36	27.347	-103.311	509.149	0		
	27.347	0	509.149	0		
	Min: I J P			Max: A B		

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [kN]	FY [kN]	FZ [kN]	MX [kNm]	MY [kNm]	MZ [kNm]
2	-27.347	0	264.457	0		
	-27.347	0	1113.948	0		
	Min: A B G			Max: A B C F		
13	-6.888	0	798.608			
	-6.888	0	2025.888			
	Min: A B F			Max: A B C G		
25	6.888	0	798.608			
	6.888	0	2025.888			
	Min: A B F			Max: A B C G		
36	27.347	0	264.457	0		
	27.347	0	1113.948	0		
	Min: A B G			Max: A B C F		

Acueducto P.K. 316+080

CARACTERÍSTICAS DE LOS NEOPRENOS

APOYOS	DIMENSIONES	δadm.	OBSERVACION
	mm	mm	
E-1	200 x 250 x 85 (61)	36.3	
P-1	250 x 400 x 41 (29)	20.3	
P-2	250 x 400 x 41 (29)	20.3	
E-2	200 x 250 x 85 (61)	36.3	

RESUMEN DE LOS DESPLAZAMIENTOS DE LOS APARATOS DE APOYO

APOYOS	DESPLAZAMIENTOS (mm)							
	Reológicos	Térmicos	Frenado	F. Centrif.	Viento (s/S.C.)	δ_{III}	$\delta_{HNEOPRENO}$	δadm.
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm	mm
E-1	9.30	8.90	0.00	0.00	31.55	34.78	34.78	36.30
P-1	3.70	3.52	0.00	0.00	32.35	32.87	11.09	20.30
P-2	3.70	3.52	0.00	0.00	32.35	32.87	11.09	20.30
E-2	9.30	8.90	0.00	0.00	31.55	34.78	34.78	36.30

$$\delta_{III} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (1.0 \times \delta_{V\ S/SC})^2)^{0,5}$$

RESUMEN DE LOS DESPLAZAMIENTOS DE LAS JUNTAS DE DILATACION

	DESPLAZAMIENTOS (mm)				
APOYOS	Reológicos+Acort Elas	Térmicos	Frenado	δ_{MAX}	δ_{MIN}
	δ_R	δ_T	δ_F	mm	mm
E-1	9.30	8.90	0.00	18	9
E-2	9.30	8.90	0.00	18	9

J.D. ESTRIBOS DE 20 mm DE RECORRIDO, CON 9 mm DE APERTURA INICIAL

COMPROBACION DE TENSIONES DE LOS APARATOS DE APOYO

ESTRIBO 1 : APOYOS DE DIMENSIONES (mm) = 200 x 250 x 85 (61) Area (m^2)= 0.05

REACCION MAXIMA (t) :	55.7	σ_{max} (tm^{-2}) =	1114 < 1500 tm^{-2}
REACCION MINIMA (t):	13.22	σ_{min} (tm^{-2}) =	264 > 200 tm^{-2}

ESTRIBO 2 : APOYOS DE DIMENSIONES (mm) = 200 x 250 x 85 (61) Area (m^2)= 0.05

REACCION MAXIMA (t) :	55.7	σ_{max} (tm^{-2}) =	1114 < 1500 tm^{-2}
REACCION MINIMA (t):	13.22	σ_{min} (tm^{-2}) =	264 > 200 tm^{-2}

PILA 1 : APOYO DE DIMENSIONES (mm) = 250 x 400 x 41 (29) Area (m^2)= 0.10

REACCION MAXIMA (t) :	101.25	σ_{max} (tm^{-2}) =	1013 < 1500 tm^{-2}
REACCION MINIMA (t):	40	σ_{min} (tm^{-2}) =	400 > 200 tm^{-2}

PILA 2 : APOYO DE DIMENSIONES (mm) = 250 x 400 x 41 (29) Area (m^2)= 0.10

REACCION MAXIMA (t) :	101.25	σ_{max} (tm^{-2}) =	1013 < 1500 tm^{-2}
REACCION MINIMA (t):	40	σ_{min} (tm^{-2}) =	400 > 200 tm^{-2}

RESUMEN DE LAS FUERZAS HORIZONTALES

APOYOS	FUERZAS HORIZONTALES (t)					
	Reológicas	Térmicas	Frenado	Viento (s/S.C.)	Viento (c/S.C.)	Resultante
	F_R	F_T	F_F	$F_{V\ S/SC}$	$F_{V\ C/SC}$	F_{FT}
E-1	2.73	2.62	0.00	10.31	5.16	11.6
P-1	0.70	0.66	0.00	6.75	3.38	6.9
P-2	0.70	0.66	0.00	6.75	3.38	6.9
E-2	2.73	2.62	0.00	10.31	5.16	11.6

CALCULO DE LAS RIGIDECES PARA STATIK3

APOYOS	RIGIDECES HORIZONTALES (t/m)						
	ALTURA PILAR	I PILAR	E PILAR	F APOYO	T APOYO	K LONG	K TRANSV
E-1	2.00	0.3330	3000000.00	0.100	0.061	147.37	147.37
P-1	13.00	0.0491	3000000.00	0.200	0.029	60.49	60.49
P-2	13.00	0.0491	3000000.00	0.200	0.029	60.51	60.51
E-2	2.00	0.3330	3000000.00	0.100	0.061	147.37	147.54

RESUMEN DE LOS DESPLAZAMIENTOS TOTALES (APOYOS+PILARES)

APOYOS	DESPLAZAMIENTOS (mm)						
	Reológicos+Acort. Elas	Térmicos	Frenado	F. Centrif.	Viento (c/S.C.)	δ_{III}	δneopreno
	δ_R	δ_T	δ_F	δ_{FC}	$\delta_{V\ C/SC}$	mm	mm
E-1	9.30	8.90	0.00	0.00	31.55	34.78	34.78
P-1	3.70	3.52	0.00	0.00	32.35	32.87	11.09
P-2	3.70	3.52	0.00	0.00	32.35	32.87	11.09
E-2	9.30	8.90	0.00	0.00	31.55	34.78	34.78

$$\delta_{III} = ((\delta_R + 0.6 \times \delta_T + \delta_F)^2 + (1.0 \times \delta_{V\ C/SC})^2)^{0.5}$$

2.4.3. Refuerzo de armaduras bajo apoyos

2.4.4. Refuerzo de armadura bajo apoyos

Estribos : Nmaxd = 92.25 Mp (en cada apoyo)

$$As = \frac{0.25 \times Nmaxd}{4.20\ Mp/cm^2}$$

$As = 5.55\ cm^2$

Adoptamos 6 x Φ 16 en cada dirección.

Pila : Nmaxd = 184.0 Mp

$$As = \frac{0.25 \times Nmaxd}{4.20\ Mp/cm^2}$$

$As = 11.0\ cm^2$

Adoptamos 6 Φ 16 en cada dirección.

Loadcase Factor Stage Init.def Title
1 1.0000 PESO PROPIO

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	509.149	0		
13	0	0	1043.301			
25	0	0	1043.301			
36	0	0	509.149	0		
Sums :	0	0	3104.900			
min:	0	0	509.149	0	Undef	Undef
max:	0	0	1043.301	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	-5.09E-95	0	4.10E-05	0
13	0	0	-1.04E-94	0	2.40E-05	0
25	0	0	-1.04E-94	0	-2.40E-05	0
36	0	0	-5.09E-95	0	-4.10E-05	0
min:	0	0	-1.04E-94	0	-4.10E-05	0
max:	0	0	-5.09E-95	0	4.10E-05	0

Loadcase Factor Stage Init.def Title
3 1.0000 REOLOGICAS

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	-27.347	0	0	0		
13	-6.888	0	0			
25	6.888	0	0			
36	27.347	0	0	0		
Sums :	2.12E-10	0	0			
min:	-27.347	0	0	0	Undef	Undef
max:	27.347	0	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	9.278	0	0	0	0	0
13	3.668	0	0	0	0	0
25	-3.668	0	0	0	0	0
36	-9.278	0	0	0	0	0
min:	-9.278	0	0	0	0	0
max:	9.278	0	0	0	0	0

Loadcase Factor Stage Init.def Title
4 1.0000 SOBRECARGA AGUA

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	360.106	0		
13	0	0	737.894			
25	0	0	737.894			
36	0	0	360.106	0		
Sums :	0	0	2196.000			
min:	0	0	360.106	0	Undef	Undef
max:	0	0	737.894	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	-1.60E-95	0	2.90E-05	0
13	0	0	-7.38E-95	0	1.70E-05	0
25	0	0	-7.38E-95	0	-1.70E-05	0
36	0	0	-3.60E-95	0	-2.90E-05	0
min:	0	0	-7.38E-95	0	-2.90E-05	0
max:	0	0	-1.60E-95	0	2.90E-05	0

Loadcase Factor Stage Init.def Title
5 1.0000 TEMPERATURA(+)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	-26.236	0	0	0		
13	-6.608	0	0			
25	6.608	0	0			
36	26.236	0	0	0		
Sums :	3.10E-10	0	0			
min:	-26.236	0	0	0	Undef	Undef
max:	26.236	0	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	8.901	0	0	0	0	0
13	3.519	0	0	0	0	0
25	-3.519	0	0	0	0	0
36	-8.901	0	0	0	0	0
min:	-8.901	0	0	0	0	0
max:	8.901	0	0	0	0	0

Loadcase Factor Stage Init.def Title
6 1.0000 TEMPERATURA(-)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	26.236	0	0	0		
13	6.608	0	0			
25	-6.608	0	0			
36	-26.236	0	0	0		
Sums :	-2.10E-10	0	0			
min:	-26.236	0	0	0	Undef	Undef
max:	26.236	0	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	-8.901	0	0	0	0	0
13	-3.519	0	0	0	0	0
25	3.519	0	0	0	0	0
36	8.901	0	0	0	0	0
min:	-8.901	0	0	0	0	0
max:	8.901	0	0	0	0	0

Loadcase Factor Stage Init.def Title
7 1.0000 GRADIENTE(+)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	244.693	0		
13	0	0	-244.693			
25	0	0	-244.693			
36	0	0	244.693	0		
Sums :	0	0	5.20E-12			
min:	0	0	-244.693	0	Undef	Undef
max:	0	0	244.693	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	-2.45E-95	0	-0.000280	0
13	0	0	2.45E-95	0	0.000101	0
25	0	0	2.45E-95	0	-0.000101	0
36	0	0	-2.45E-95	0	0.000280	0
min:	0	0	-2.45E-95	0	-0.000280	0
max:	0	0	2.45E-95	0	0.000280	0

Loadcase 8 | Factor 1.0000 | Stage | Init.def | Title: GRADIENTE(-)

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	0	-244.693	0		
13	0	0	244.693			
25	0	0	244.693			
36	0	0	-244.693	0		
Sums :	0	0	-5.20E-12			
min:	0	0	-244.693	0	Undef	Undef
max:	0	0	244.693	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	0	2.45E-95	0	0.000280	0
13	0	0	-2.45E-95	0	-0.000101	0
25	0	0	-2.45E-95	0	0.000101	0
36	0	0	2.45E-95	0	-0.000280	0
min:	0	0	-2.45E-95	0	-0.000280	0
max:	0	0	2.45E-95	0	0.000280	0

Loadcase 9 | Factor 1.0000 | Stage | Init.def | Title: VIENTO

SUPPORT REACTIONS :

Node	FX [kN]	FY [kN]	FZ [kN]	T [kNm]	MY [kNm]	MZ [kNm]
2	0	-103.313	0	0		
13	0	-67.487	0			
25	0	-67.487	0			
36	0	-103.313	0	0		
Sums :	0	-341.600	0			
min:	0	-103.313	0	0	Undef	Undef
max:	0	-67.487	0	0	Undef	Undef

DISPLACEMENTS: **

Node	DX [mm]	DY [mm]	DZ [mm]	RX [rad]	RY [rad]	RZ [rad]
2	0	35.052	0	0	0	8.09E-05
13	0	35.935	0	0	0	4.59E-05
25	0	35.935	0	0	0	-4.59E-05
36	0	35.052	0	0	0	-8.09E-05
min:	0	35.052	0	0	0	-8.09E-05
max:	0	35.935	0	0	0	8.09E-05

ENVELOPE SPECIFIC.: CS ''

Group	Spec.	Loadcase	Factor	Stage	Title
A	PERM.	1	1.000		PESO PROPIO
B	PL.PERM	3	1.000		REOLOGICAS
C	PLUS	4	1.000		SOBRECARGA AGUA
D	PLUS	5	1.000		TEMPERATURA(+)
E	OR	6	1.000		TEMPERATURA(-)
F	PLUS	7	1.000		GRADIENTE(+)
G	OR	8	1.000		GRADIENTE(-)
H	PLUS	9	0.500000		VIENTO
ALTERNATIVE ENVELOPE :					
I	PERM.	1	1.000		PESO PROPIO
J	PL.PERM	3	1.000		REOLOGICAS
K	PLUS	4	0.500000		SOBRECARGA AGUA
L	PLUS	5	1.000		TEMPERATURA(+)
M	OR	6	1.000		TEMPERATURA(-)
N	PLUS	7	1.000		GRADIENTE(+)
O	OR	8	1.000		GRADIENTE(-)
P	PLUS	9	1.000		VIENTO

SUPPORT REACTIONS: ENVELOPE for < FX > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [kN]	FY [kN]	FZ [kN]	MX [kNm]	MY [kNm]	MZ [kNm]
2	-53.583	0	509.149	0		
	-1.110	0	509.149	0		
	Min: A B D			Max: A B E		
13	-13.496	0	1043.301			
	-0.279700	0	1043.301			
	Min: A B D			Max: A B E		
25	0.279700	0	1043.301			
	13.496	0	1043.301			
	Min: A B E			Max: A B D		
36	1.110	0	509.149	0		
	53.583	0	509.149	0		
	Min: A B E			Max: A B D		

SUPPORT REACTIONS: ENVELOPE for < FY > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [kN]	FY [kN]	FZ [kN]	MX [kNm]	MY [kNm]	MZ [kNm]
2	-27.347	-103.313	509.149	0		
	-27.347	0	509.149	0		
	Min: I J P			Max: A B		
13	-6.888	-67.487	1043.301			
	-6.888	0	1043.301			
	Min: I J P			Max: A B		
25	6.888	-67.487	1043.301			
	6.888	0	1043.301			
	Min: I J P			Max: A B		
36	27.347	-103.313	509.149	0		
	27.347	0	509.149	0		
	Min: I J P			Max: A B		

SUPPORT REACTIONS: ENVELOPE for < FZ > (and accomp. values)
(1. line : MIN., 2. line : MAX., 3. line : accomp.load groups

Node	FX [kN]	FY [kN]	FZ [kN]	MX [kNm]	MY [kNm]	MZ [kNm]
2	-27.347	0	264.457	0		
	-27.347	0	1113.948	0		
	Min: A B G			Max: A B C F		
13	-6.888	0	798.608			
	-6.888	0	2025.888			
	Min: A B F			Max: A B C G		
25	6.888	0	798.608			
	6.888	0	2025.888			
	Min: A B F			Max: A B C G		
36	27.347	0	264.457	0		
	27.347	0	1113.948	0		
	Min: A B G			Max: A B C F		

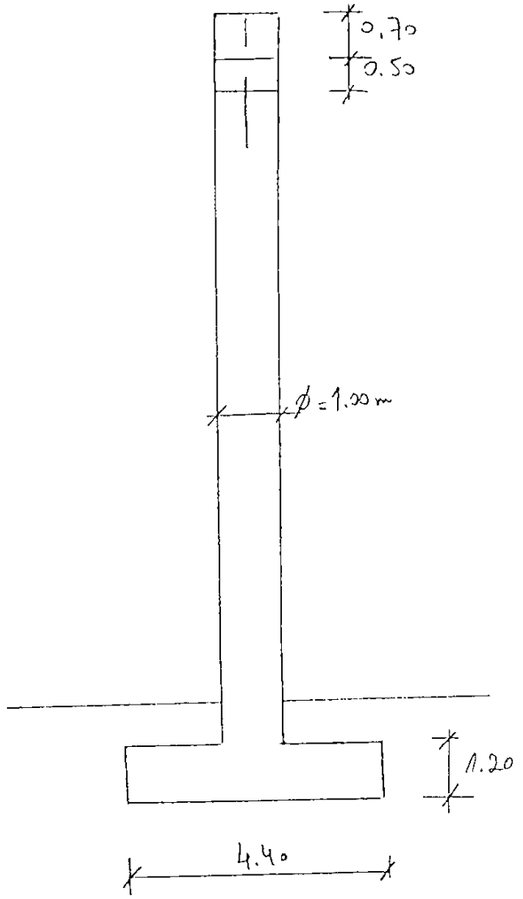
4. Pilas

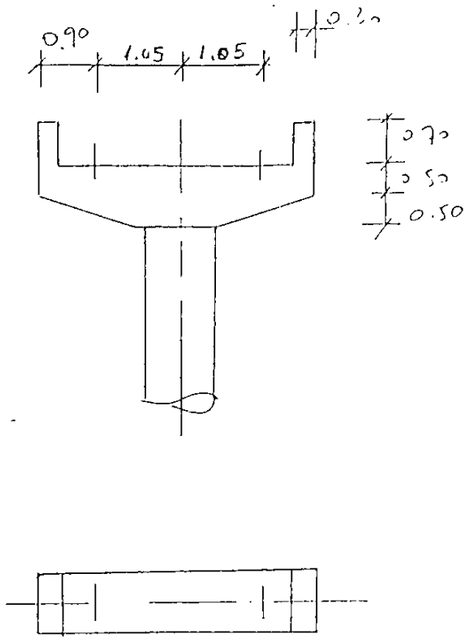
Introducción

Del cálculo del tablero como pórtico espacial se han obtenido para las distintas hipótesis los valores de las reacciones del tablero, tanto verticales como horizontales.

Con dichos valores se han obtenido las reacciones para las distintas hipótesis de carga, que responden a lo dispuesto por la "Instrucción sobre a las acciones a considerar en el proyecto de puentes de carretera" (IAP).

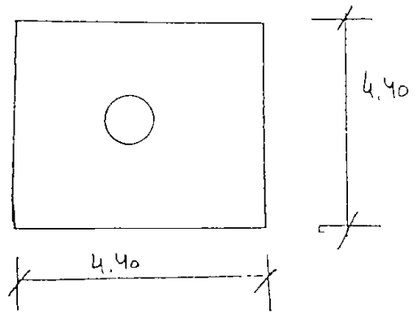
La pila se ha calculado en segundo orden, considerando la longitud de pandeo real de las mismas, que se obtiene del cálculo de los autovalores estáticos del modelo con sus rigideces resultantes mediante el programa STATIK·3. Con estos valores se ha utilizado la fórmula de la EHE para esbelteces medias.

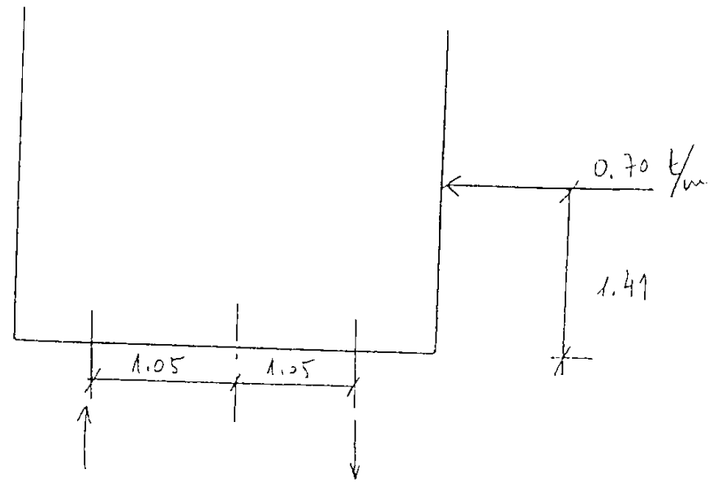




$\sigma_{adm} = 3.00\ kg/cm^2$

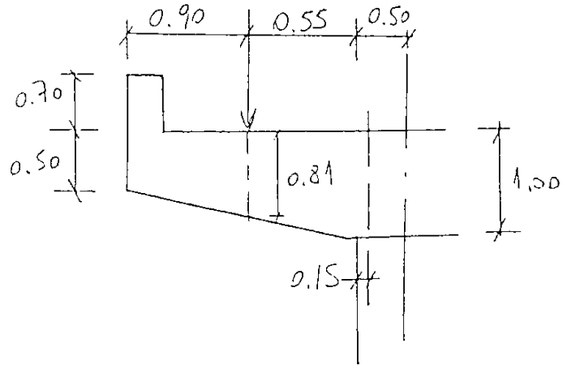
4.40 × 4.40





$$\Delta R_1 = \frac{(13.0 \cdot 117.00)}{2} \times \frac{0.70 \times 1.41}{2.10} = 7.05\ t$$

$$R_{MAX} = 202.50\ t/_2 + 7.05\ t = 108.30\ t$$



$$Md = 1.35 \times \left[0.50 \times 1.45 \times 1.00 \times 2.50\right] \times \left[\frac{1.45}{2} + 0.15\right] +$$
$$+ 1.35 \times \left[0.50 \times 1.45 \times \frac{1.00}{2} \times 2.50\right] \times \left[\frac{1.45}{3} + 0.15\right] +$$
$$+ 1.35 \times \left[0.70 \times 0.30 \times 2.50\right] \times 1.45\,m + 1.50 \times 108.30 \times 0.70\,m$$

$Md = 117.70\ mt$ $\quad M_K = 78.76\ mt$ (fisuración)

Características mecánicas Sección "VOLAPILA" (sin coef. homogeneiz.)

Area Ax = 10.00E3 cm2
Momento de inercia Iy = 8.333E6 cm4 Iz = 8.333E6 cm4 Ip = 16.67E6 cm4
Const. de torsión Ix = 14.07E6 cm4
Momento estático Zy =250.00E3 cm3 Zz = 250.00E3 cm3
Baricentro ys = 0.50 m zs = 0.50 m Angulo= 0.0 Grad
Dist. al borde yl = -0.50 m yr = 0.50 m
zo = 0.50 m zu = -0.50 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = 0.50 m z = 0.50 m

Contorno de sección parcial, Sección "VOLAPILA" (sin coef. homogeneiz.)

Sección parcial	Material	w	*ax[cm2]	*u[cm]	*ix[cm4]	Nr
CS 1	H300	1.00	10000.0	400.000	1.41E+07	1)

Puntos de contorno (m):
1 0.00 0.00 2 1.00 0.00 3 1.00 1.00
4 0.00 1.00 5 0.00 0.00

Armadura "B1" As-tot =50.33 cm2 (0.50 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
LR 1 / CS 1	AEH500	1.0	2	49.33	0.06	0.94
					0.94	0.94
LR 2 / CS 1	AEH500	1.0	2	1.00	0.06	0.06
					0.94	0.06

Dimensionamiento a flexión: Viga Sección "VOLAPILA"/"B1"

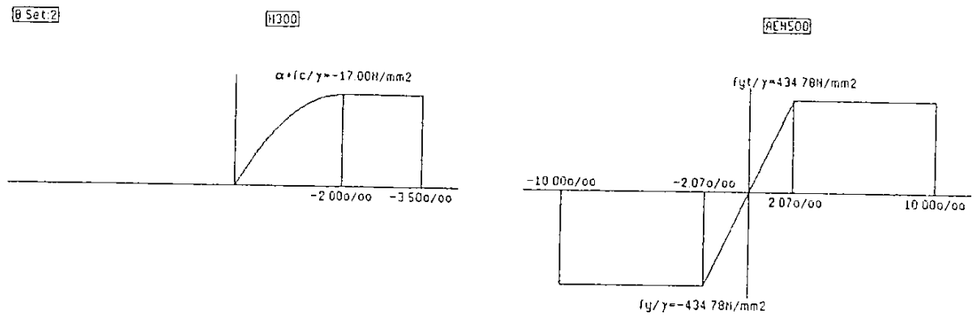
Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
2	0.00	-1177.00	0.00	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

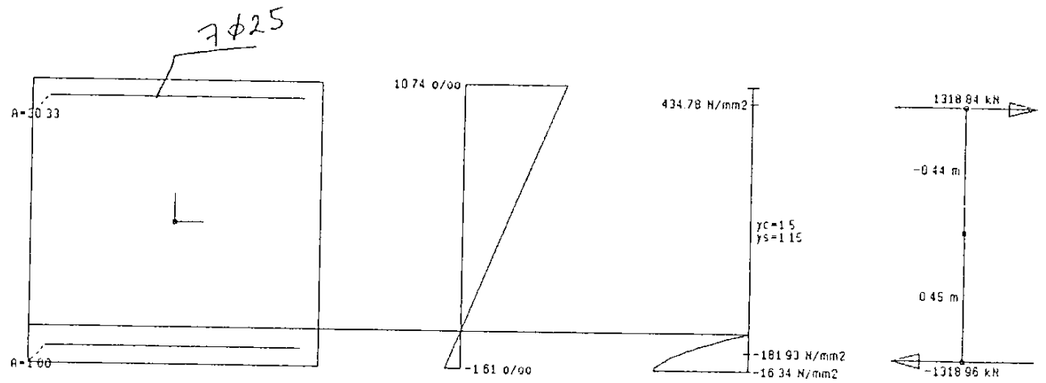
No Armad. Long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
1 AEH500	0.06	0.94	0.94	0.94	1.00	30.33	30.33
AEH500	0.06	0.06	0.94	0.06	1.00	----	1.00

Max x/h = 0.14 As-top/bot = 30.33/1.00 As = 0.31 % = 31.33

Material acorde a la sección: "VOLAPILA"



Dimensionamiento, Sección "VOLAPILA"



CALCULO A CORTANTE SEGÚN EHE
****

Departamento de Estructuras. AEPO, S.A.
Título:
Fecha: 18/5/01 10.18.43

DATOS DE LA SECCIÓN Y Y MATERIALES
Sección rectangular de ancho 100 cm, alto 100 cm y canto 96 cm.

Situación de proyecto Persistente
Resistencia característica del hormigón = 300 Kp/cm2
Acero B 500 S
Resistencia de cálculo del hormigón fcd = 200.00 Kp/cm2
Resistencia de cálculo del acero fyd = 4260.87 Kp/cm2

ACCIONES DE CÁLCULO
Cortante reducido en el borde del apoyo = 168.8 T
Cortante reducido a un canto útil del borde del apoyo = 168.8 T
Axil de cálculo (Tracciones positivas) = 0 T

RESULTADOS DEL CÁLCULO
Se ha considerado una armadura a tracción de 34.37 cm2 lo que implica una cuantía geométrica igual a 0.00358
Inclinación de bielas de compresión 45°
Inclinación de las armaduras con el eje de la pieza 90°
Coeficiente de reducción por efecto del esfuerzo axil, K = 1
La sección no rompe por compresión oblicua del alma al ser Vrd = 168.8 T < Vu1 = 576.00 T
Es necesario disponer armadura a cortante al ser Vrd = 168.80 T > Vu2 = 37.77 T
Valores de las tensiones: Eje X = 0.00 Kp/cm2. Eje Y = 0.00 Kp/cm2
Ángulo de referencia de inclinación de las fisuras = 45.00°
Vcu = 31.48 T. Vsu= 137.32 T.
As cálculo = 39.73 cm2/m. As mínima = 10.00 cm2/m
Mínimo de armadura a disponer = 39.73 cm2/m

****
****** ELS FISURACIÓN HORMIGÓN ARMADO *******
****

Departamento de Estructuras. AEPO, S.A.
Título: FISURACION DINTEL
Fecha: 18/5/01 10.24.24

HIPÓTESIS DE CÁLCULO
Se ha seguido el artículo 49 y el Anejo 9 de EHE.

DATOS DE CÁLCULO
Clase de exposición: IIa, IIb, H -> Apertura máxima de fisura wmax = 0.3 mm
Coeficiente Beta = 1.7
Hormigón HA 30 fck = 30 N/mm2 Ec = 28576.8 N/mm2
Acero B 500 S fyk = 500 N/mm2 Es = 200000 N/mm2

SECCIÓN DE CÁLCULO
Ancho = 100 cm Alto = 100 cm Canto útil = 94.75 cm
Armadura a compresión = 0.00 cm2
Armadura a tracción = 39.27 cm2
Diámetro equivalente = 25.00 mm
Sección tipo losa, muro o viga plana

ACCIONES SOLICITANTES EN SERVICIO
Axil, Nk = 0 T
Momento flector, Mk = 78.76 mT
Coeficiente K2 = 0.5

RESULTADOS INTERMEDIOS DE CALCULO
Cuantía a tracción, ro1 = 0.0041446
Cuantía a compresión, ro2 = 0.0000000
Coeficiente K1 = 0.125
Separación entre armaduras longitudinales, s = 12.50 cm
Area de hormigón eficaz, Ac,eficaz = 2400.00 cm2
Resistencia a tracción del hormigón, fct,m = 28.4 Kp/cm2
Momento de fisuración, Mfis = 47.31 mT
Tensión en armaduras a tracción con la sección fisurada sometida a Mfis, 1368.9 Kp/cm2
Tensión en armaduras a tracción con la sección fisurada sometida a Mk, 2279.0 Kp/cm2

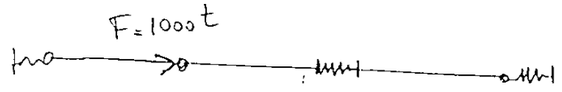
RESULTADOS DE CALCULO
Separación media de fisuras, Sm = 18.14 cm
Alargamiento medio de las fisuras, Esm = 0.000933928
Apertura de fisura, Wk = 0.288 mm

Se cumple el ELS de FISURACIÓN al ser la apertura de fisura menor que la máxima

Apertura de fisura, Wk = 0.288 mm
Apertura de fisura máxima, Wmax = 0.300 mm

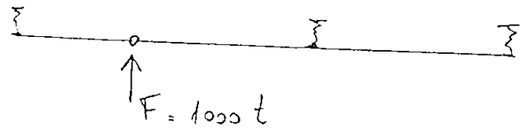
Cálculo de la pila en 2º orden

- Cálculo del muelle equivalente en dirección longitudinal:



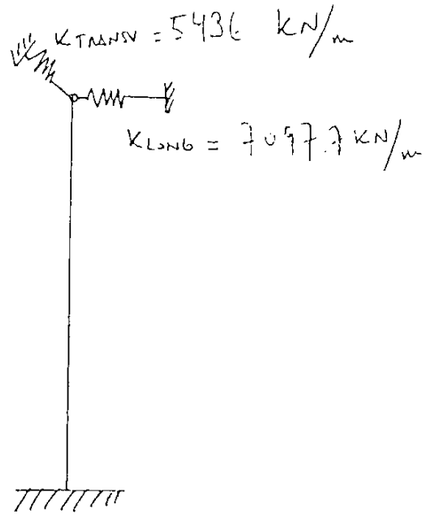
$$K^{LONG}_{equiv} = \frac{1000\ t}{1.4089\ m} = 709.770\ t/m$$

- Cálculo del muelle equivalente en dirección transversal



$$\delta_{pila\,1} = 1.8404\ m \rightarrow K^{TRANSV}_{equiv} = \frac{1000\ t}{1.8404} = 543.36\ t/m$$

PILA 1



****
* STRUCTURAL - DATA *
****

Project title :

J O I N T D A T A : (37 Joints)

Joints	X [M]	Y [M]	Z [M]	Supports V XYZ	Supports R XYZ	Specialities
1	-2.65000	0.00000	0.00000			
2	0.25000	0.00000	0.00000	SSS	BFF	
3	1.52250	0.00000	0.00000			
4	2.79500	0.00000	0.00000			
5	4.06750	0.00000	0.00000			
6	5.34000	0.00000	0.00000			
7	6.61250	0.00000	0.00000			
8	7.88500	0.00000	0.00000			
9	9.15750	0.00000	0.00000			
10	10.43000	0.00000	0.00000			
11	11.70250	0.00000	0.00000			
12	12.97500	0.00000	0.00000			
13	13.25000	0.00000	0.00000			
14	13.52500	0.00000	0.00000			
15	15.17000	0.00000	0.00000			
16	16.81500	0.00000	0.00000			
17	18.46000	0.00000	0.00000			
18	20.10500	0.00000	0.00000			
19	21.75000	0.00000	0.00000			
20	23.39500	0.00000	0.00000			
21	25.04000	0.00000	0.00000			
22	26.68500	0.00000	0.00000			
23	28.33000	0.00000	0.00000			
24	29.97500	0.00000	0.00000			
25	30.25000	0.00000	0.00000	SSS	FFF	
26	30.52500	0.00000	0.00000			
27	31.79750	0.00000	0.00000			
28	33.07000	0.00000	0.00000			
29	34.34250	0.00000	0.00000			
30	35.61500	0.00000	0.00000			
31	36.88750	0.00000	0.00000			
32	38.16000	0.00000	0.00000			
33	39.43250	0.00000	0.00000			
34	40.70500	0.00000	0.00000			
35	41.97750	0.00000	0.00000			
36	43.25000	0.00000	0.00000	SSS	BFF	
37	46.15000	0.00000	0.00000			

ELASTICALLY SUPPORTED JOINTS: ('B'=Fixed 'F'=Free)

Joint	V-X [KN/M]	V-Y [KN/M]	V-Z [KN/M]	R-X [KNM/ARC]	R-Y [KNM/ARC]	R-Z [KNM/ARC]
2	2.947E+03	2.947E+03		B	F	F
25	1.210E+03	1.210E+03		B	F	F
36	2.947E+03	2.947E+03		B	F	F

B A R D A T A : (36 Bars)

Bar	Incidences Start	Incidences End	Length [M]	CS-Name (haunched)	Ranges start	Ranges end	Specialities
1	1	2	2.90000	CANAL320			GS
2	2	3	1.27250	CANAL320			GS
3	3	4	1.27250	CANAL320			GS
4	4	5	1.27250	CANAL320			GS
5	5	6	1.27250	CANAL320			GS
6	6	7	1.27250	CANAL320			GS
7	7	8	1.27250	CANAL320			GS
8	8	9	1.27250	CANAL320			GS
9	9	10	1.27250	CANAL320			GS
10	10	11	1.27250	CANAL320			GS
11	11	12	1.27250	CANAL320			GS
12	12	13	0.27500	CANAL320			GS
13	13	14	0.27500	CANAL320			GS
14	14	15	1.64500	CANAL320			GS
15	15	16	1.64500	CANAL320			GS
16	16	17	1.64500	CANAL320			GS
17	17	18	1.64500	CANAL320			GS
18	18	19	1.64500	CANAL320			GS
19	19	20	1.64500	CANAL320			GS
20	20	21	1.64500	CANAL320			GS
21	21	22	1.64500	CANAL320			GS
22	22	23	1.64500	CANAL320			GS
23	23	24	1.64500	CANAL320			GS
24	24	25	0.27500	CANAL320			GS
25	25	26	0.27500	CANAL320			GS
26	26	27	1.27250	CANAL320			GS
27	27	28	1.27250	CANAL320			GS
28	28	29	1.27250	CANAL320			GS
29	29	30	1.27250	CANAL320			GS
30	30	31	1.27250	CANAL320			GS
31	31	32	1.27250	CANAL320			GS
32	32	33	1.27250	CANAL320			GS
33	33	34	1.27250	CANAL320			GS
34	34	35	1.27250	CANAL320			GS
35	35	36	1.27250	CANAL320			GS
36	36	37	2.90000	CANAL320			GS

GS = Bars without shear deformation

CROSS SECTION VALUES:

CS-Name	Ax [M2]	Iy [M4]	Iz [M4]	Phi [Degr]
	Ix [M4]	Ay [M2]	Az [M2]	
	zl [M1]	zo [M1]	yl [M1]	yr [M1]
CANAL320	2.5450E+00	1.2850E+00	3.8723E+00	0.00
	9.5777E-02	2.5450E+00	2.5450E+00	
	-0.8261	1.0239	-1.7500	1.7500

MATERIAL PROPERT. :

Bar (to bar)	E-Modulus [KN/ M2]	Shear-M [KN/ M2]
1 .. 36	3.0000E+07	1.3700E+07

STS-Run ok

****
load case 1: carga horizontal
****

Loadtype	Value(a)	Distance Value(b)	Joint -/member numb
Force Y	10000.0		Joint 13

****
load case 2: carga long
****

Loadtype	Value(a)	Distance Value(b)	Joint -/member numb
Force X	10000.0		Joint 13

LOADING: 'Y'

Loadcase	Factor	Stage	Init.def	Title
1	1.0000			carga horizontal

Displacements (in global coordinate directions): 'ALL'

Numb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
1	0	0	2.2958	0	0	0	-0.02734
1	0.725	0	2.2960	0	0	0	-0.02734
1	1.450	0	2.2961	0	0	0	-0.02734
1	2.175	0	2.2963	0	0	0	-0.02731
1	2.900	0	2.2165	0	0	0	-0.02734
2	0	0	2.2165	0	0	0	-0.02734
2	0.318	0	2.2078	0	0	0	-0.02735
2	0.636	0	2.1991	0	0	0	-0.02736
2	0.954	0	2.1904	0	0	0	-0.02737
2	1.272	0	2.1817	0	0	0	-0.02739
3	0	0	2.1817	0	0	0	-0.02739
3	0.318	0	2.1730	0	0	0	-0.02742
3	0.636	0	2.1642	0	0	0	-0.02745
3	0.954	0	2.1555	0	0	0	-0.02748
3	1.272	0	2.1467	0	0	0	-0.02751
4	0	0	2.1467	0	0	0	-0.02751
4	0.318	0	2.1380	0	0	0	-0.02754
4	0.636	0	2.1292	0	0	0	-0.02763
4	0.954	0	2.1204	0	0	0	-0.02769
4	1.272	0	2.1116	0	0	0	-0.02775
5	0	0	2.1116	0	0	0	-0.02775
5	0.318	0	2.1027	0	0	0	-0.02783
5	0.636	0	2.0939	0	0	0	-0.02790
5	0.954	0	2.0850	0	0	0	-0.02799
5	1.272	0	2.0761	0	0	0	-0.02807
6	0	0	2.0761	0	0	0	-0.02807
6	0.318	0	2.0671	0	0	0	-0.02817
6	0.636	0	2.0581	0	0	0	-0.02827
6	0.954	0	2.0491	0	0	0	-0.02837
6	1.272	0	2.0401	0	0	0	-0.02848
7	0	0	2.0401	0	0	0	-0.02848
7	0.318	0	2.0310	0	0	0	-0.02860
7	0.636	0	2.0219	0	0	0	-0.02872
7	0.954	0	2.0127	0	0	0	-0.02885
7	1.272	0	2.0035	0	0	0	-0.02898
8	0	0	2.0035	0	0	0	-0.02898
8	0.318	0	1.9943	0	0	0	-0.02912
8	0.636	0	1.9850	0	0	0	-0.02927

Displacements (in global coordinate directions): 'ALL'

Numb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
8	0.954	0	1.9757	0	0	0	-0.02942
8	1.272	0	1.9663	0	0	0	-0.02958
9	0	0	1.9663	0	0	0	-0.02958
9	0.318	0	1.9569	0	0	0	-0.02974
9	0.636	0	1.9474	0	0	0	-0.02991
9	0.954	0	1.9378	0	0	0	-0.03008
9	1.272	0	1.9282	0	0	0	-0.03026
10	0	0	1.9282	0	0	0	-0.03026
10	0.318	0	1.9186	0	0	0	-0.03044
10	0.636	0	1.9089	0	0	0	-0.03063
10	0.954	0	1.8991	0	0	0	-0.03083
10	1.272	0	1.8892	0	0	0	-0.03103
11	0	0	1.8892	0	0	0	-0.03103
11	0.318	0	1.8793	0	0	0	-0.03124
11	0.636	0	1.8694	0	0	0	-0.03145
11	0.954	0	1.8593	0	0	0	-0.03167
11	1.272	0	1.8492	0	0	0	-0.03190
12	0	0	1.8492	0	0	0	-0.03190
12	0.0688	0	1.8470	0	0	0	-0.03195
12	0.138	0	1.8448	0	0	0	-0.03200
12	0.206	0	1.8426	0	0	0	-0.03205
12	0.275	0	1.8404	0	0	0	-0.03210
13	0	0	1.8404	0	0	0	-0.03210
13	0.0688	0	1.8382	0	0	0	-0.03215
13	0.138	0	1.8360	0	0	0	-0.03220
13	0.206	0	1.8338	0	0	0	-0.03225
13	0.275	0	1.8316	0	0	0	-0.03230
14	0	0	1.8316	0	0	0	-0.03230
14	0.411	0	1.8182	0	0	0	-0.03259
14	0.822	0	1.8049	0	0	0	-0.03288
14	1.234	0	1.7912	0	0	0	-0.03317
14	1.645	0	1.7775	0	0	0	-0.03345
15	0	0	1.7775	0	0	0	-0.03345
15	0.411	0	1.7637	0	0	0	-0.03372
15	0.823	0	1.7497	0	0	0	-0.03399
15	1.234	0	1.7357	0	0	0	-0.03425
15	1.645	0	1.7216	0	0	0	-0.03451
16	0	0	1.7216	0	0	0	-0.03451
16	0.411	0	1.7073	0	0	0	-0.03477
16	0.822	0	1.6930	0	0	0	-0.03502
16	1.234	0	1.6785	0	0	0	-0.03526
16	1.645	0	1.6640	0	0	0	-0.03550
17	0	0	1.6640	0	0	0	-0.03550
17	0.411	0	1.6493	0	0	0	-0.03573

Displacements (in global coordinate directions): 'ALL'

Numb.	Distance [m]	DX-g [m]	DY-g [m]	DZ-g [m]	RX-g [rad]	RY-g [rad]	RZ-g [rad]
17	0.823	0	1.6346	0	0	0	-0.03596
17	1.234	0	1.6197	0	0	0	-0.03619
17	1.645	0	1.6048	0	0	0	-0.03641
18	0	0	1.6048	0	0	0	-0.03641
18	0.411	0	1.5898	0	0	0	-0.03662
18	0.822	0	1.5747	0	0	0	-0.03683
18	1.234	0	1.5595	0	0	0	-0.03703
18	1.645	0	1.5443	0	0	0	-0.03723
19	0	0	1.5443	0	0	0	-0.03723
19	0.411	0	1.5289	0	0	0	-0.03743
19	0.822	0	1.5135	0	0	0	-0.03762
19	1.234	0	1.4979	0	0	0	-0.03780
19	1.645	0	1.4824	0	0	0	-0.03798
20	0	0	1.4824	0	0	0	-0.03798
20	0.411	0	1.4667	0	0	0	-0.03815
20	0.822	0	1.4510	0	0	0	-0.03832
20	1.234	0	1.4352	0	0	0	-0.03848
20	1.645	0	1.4193	0	0	0	-0.03864
21	0	0	1.4193	0	0	0	-0.03864
21	0.411	0	1.4034	0	0	0	-0.03880
21	0.822	0	1.3874	0	0	0	-0.03894
21	1.234	0	1.3714	0	0	0	-0.03909
21	1.645	0	1.3553	0	0	0	-0.03923
22	0	0	1.3553	0	0	0	-0.03923
22	0.411	0	1.3391	0	0	0	-0.03936
22	0.822	0	1.3229	0	0	0	-0.03949
22	1.234	0	1.3066	0	0	0	-0.03961
22	1.645	0	1.2903	0	0	0	-0.03973
23	0	0	1.2903	0	0	0	-0.03973
23	0.411	0	1.2740	0	0	0	-0.03984
23	0.823	0	1.2576	0	0	0	-0.03995
23	1.234	0	1.2411	0	0	0	-0.04005
23	1.645	0	1.2246	0	0	0	-0.04015
24	0	0	1.2246	0	0	0	-0.04015
24	0.0687	0	1.2219	0	0	0	-0.04017
24	0.137	0	1.2191	0	0	0	-0.04018
24	0.206	0	1.2163	0	0	0	-0.04020
24	0.275	0	1.2136	0	0	0	-0.04021
25	0	0	1.2136	0	0	0	-0.04021
25	0.0687	0	1.2108	0	0	0	-0.04023
25	0.137	0	1.2080	0	0	0	-0.04024
25	0.206	0	1.2053	0	0	0	-0.04026
25	0.275	0	1.2025	0	0	0	-0.04027
26	0	0	1.2025	0	0	0	-0.04027

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 3 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Md (tm) = 0.0 Mk (KNm) = 0.0
Nd (t) = -303.9 Nk (KN) = -2978.2

Pie de pórtico

Md (tm) = 41.0 Mk (KNm) = 401.3
Nd (t) = -339.7 Nk (KN) = -3328.9

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Md (tm) = 0.0 Mk (KNm) = 0.0
Nd (t) = -303.9 Nk (KN) = -2978.2

Pie de pórtico

Md (tm) = 14.0 Mk (KNm) = 136.7
Nd (t) = -339.7 Nk (KN) = -3328.9

Hormigón : HA - 30 Acero pasivo : B 500 S

fck (N/mm^2)= 30 fyk (N/mm^2)= 500
γ c = 1.50 γ s = 1.15
fcd (N/mm^2)= 20.0 fyd (N/mm^2)= 434.8
Ec (KN/mm^2) = 28.6 Es (KN/mm^2) = 210

Datos de los fustes :

Diámetro Φ (m): 1.00
Nº de fustes : 1
Altura Hp (m): 13.50
Mto. Inercia I (m^4) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$$\lambda = \pi^2 \times E \times I / Lo^2 = 7.96015$$

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = 70.00 $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.121 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.041 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :

e_a = 0.380

e_{tot} (m) = 0.500

Pie de pórtico

Md (tm) = 169.99 Md (KNm) = 1665.9
Nd (t) = -339.68 Nd (KN) = -3328.9

Solicitaciones de cálculo longitudinales :

e_a = 0.380

e_{tot} (m) = 0.421

Pie de pórtico

Md (tm) = 142.99 Md (KNm) = 1401.3
Nd (t) = -339.68 Nd (KN) = -3328.9

Características mecánicas Sección "PILA" (sin coef. homogeneiz.)

Area	Ax = 7.858E3 cm2		
Momento de inercia	Iy = 4.918E6 cm4	Iz = 4.909E6 cm4	Ip = 9.827E6 cm4
Const. de torsión			Ix = 9.817E6 cm4
Momento estático	Zy =166.73E3 cm3	Zz = 166.73E3 cm3	
Baricentro	ys = -0.00 m	zs = 0.00 m	Angulo= 0.0 Grad
Dist. al borde	yl = -0.50 m	yr = 0.50 m	
	zo = 0.50 m	zu = -0.50 m	

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.00 m

(ción parcial circular:

Nombre	Material	w	ym[m]	zm[m]	r[m]	ix[cm4]
Cs 1	H300	1.0	0.00	0.00	0.50	9.82E+06

Armadura "B1" As-tot =113.83 cm2 (1.45 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
CS 1 / CS 1	AEH500	1.0	1	113.83	0.00	0.00 (*)

(* = Armadura de contorno: Radio = 0.45 m

Dimensionamiento a flexión: Viga Sección "PILA"/"B1"

Nº	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	-1883.15	1116.55	982.81	
2	2	-1883.15	852.06	2053.98	
(3	2	-3327.57	1400.74	1665.23	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

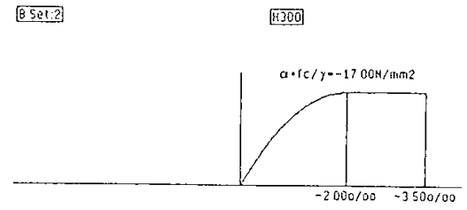
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

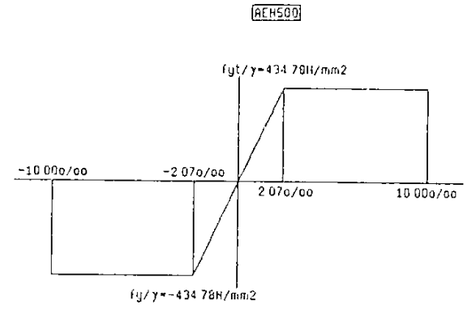
Nº Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
2 AEH500	0.00	0.00	long. perim		1.00	111.10	111.10

Max.x/h = 0.51 As-top/bot = 0.00/111.10 As = 1.41 % = 111.10

23 ϕ25

Material acorde a la sección: "PILA"





Estado limite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 1 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = 0.0 — Mk (KNm) = 0.0
Nk (t) = -104.3 — Nk (KN) = -1022.4

Pie de pórtico

Mk (tm) = 27.3 — Mk (KNm) = 267.5
Nk (t) = -130.8 — Nk (KN) = -1282.1

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = 0.0 — Mk (KNm) = 0.0
Nk (t) = -104.3 — Nk (KN) = -1022.4

Pie de pórtico

Mk (tm) = 18.2 — Mk (KNm) = 178.6
Nk (t) = -130.8 — Nk (KN) = -1282.1

Hormigón : HA - 30 — Acero pasivo : B 500 S
fck (N/mm^2)= 30 — fyk (N/mm^2)= 500
γ c = 1.50 — γ s = 1.15
fcd (N/mm^2)= 20.0 — fyd (N/mm^2)= 434.8
Ec (KN/mm^2) = 28.6 — Es (KN/mm^2) = 210

Datos de los fustes :

Diámetro Φ (m): 1.00
Nº de fustes : 1
Altura Hp (m): 13.50
Mto. Inercia I (m^4) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$$\lambda = \pi^2 \times E \times I / Lo^2 = 7.96015$$

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = 70.00 — $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.209 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.139 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :

e_a = 0.380

e_{tot} (m) = 0.589

Pie de pórtico

Mk (tm) = 77.00 — Mk (KNm) = 754.6
Nk (t) = -130.83 — Nk (KN) = -1282.1

Solicitaciones de cálculo longitudinales :

e_a = 0.380

e_{tot} (m) = 0.519

Pie de pórtico

Mk (tm) = 67.92 — Mk (KNm) = 665.6
Nk (t) = -130.83 — Nk (KN) = -1282.1

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 2 :
Dirección transversal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = 0.0 — Mk (KNm) = 0.0
Nk (t) = -104.3 — Nk (KN) = -1022.4

Pie de pórtico
Mk (tm) = 91.1 — Mk (KNm) = 892.8
Nk (t) = -130.8 — Nk (KN) = -1282.1

Dirección longitudinal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = 0.0 — Mk (KNm) = 0.0
Nk (t) = -104.3 — Nk (KN) = -1022.4

Pie de pórtico
Mk (tm) = 9.3 — Mk (KNm) = 91.1
Nk (t) = -130.8 — Nk (KN) = -1282.1

Hormigón : HA - 30
fck (N/mm²)= 30
γ c = 1.50
fcd (N/mm²)= 20.0
Ec (KN/mm²) = 28.6

Acero pasivo : B 500 S
fyk (N/mm²)= 500
γ s = 1.15
fyd (N/mm²)= 434.8
Es (KN/mm²) = 210

Datos de los fustes :

Diámetro Φ (m): 1.00
Nº de fustes : 1
Altura Hp (m): 13.50
Mto. Inercia I (m⁴) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$\lambda = \pi^2 \times E \times I / Lo^2 =$ 7.96015

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = 70.00 — $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.696 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.071 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

$\varepsilon y = fyd / Es =$ 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :
e_a = 0.380

e_{tot} (m) = 1.076

Pie de pórtico

Mk (tm) = 140.80 — Mk (KNm) = 1379.9
Nk (t) = -130.83 — Nk (KN) = -1282.1

Solicitaciones de cálculo longitudinales :
e_a = 0.380

e_{tot} (m) = 0.451

Pie de pórtico

Mk (tm) = 59.00 — Mk (KNm) = 578.2
Nk (t) = -130.83 — Nk (KN) = -1282.1

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 3 :
Dirección transversal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = 0.0 — Mk (KNm) = 0.0
Nk (t) = -202.6 — Nk (KN) = -1985.5

Pie de pórtico
Mk (tm) = 27.3 — Mk (KNm) = 267.5
Nk (t) = -229.1 — Nk (KN) = -2245.2

Dirección longitudinal
Solicitaciones :

Cabeza de pórtico
Mk (tm) = 0.0 — Mk (KNm) = 0.0
Nk (t) = -202.6 — Nk (KN) = -1985.5

Pie de pórtico
Mk (tm) = 9.3 — Mk (KNm) = 91.1
Nk (t) = -229.1 — Nk (KN) = -2245.2

Hormigón :	HA - 30	Acero pasivo :	B 500 S
	fck (N/mm²)= 30		fyk (N/mm²)= 500
	γ c = 1.50		γ s = 1.15
	fcd (N/mm²)= 20.0		fyd (N/mm²)= 434.8
	Ec (KN/mm²) = 28.6		Es (KN/mm²) = 210

Datos de los fustes :

Diámetro Φ (m):	1.00
Nº de fustes :	1
Altura Hp (m):	13.50
Mto. Inercia I (m⁴) :	0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$$\lambda = \pi^2 \times E \times I / Lo^2 = 7.96015$$

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = 70.00 $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.119 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.041 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :
e_a = 0.380

e_{tot} (m) = 0.499

Pie de pórtico

Mk (tm) = 114.34 — Mk (KNm) = 1120.5
Nk (t) = -229.10 — Nk (KN) = -2245.2

Solicitaciones de cálculo longitudinales :
e_a = 0.380

e_{tot} (m) = 0.420

Pie de pórtico

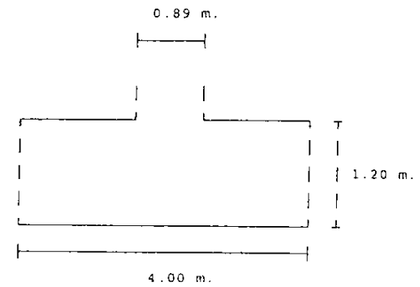
Mk (tm) = 96.34 — Mk (KNm) = 944.1
Nk (t) = -229.10 — Nk (KN) = -2245.2

Estructura .....:ACUEDUCTO PK 315+500

Pila Nº : P1 Y P2

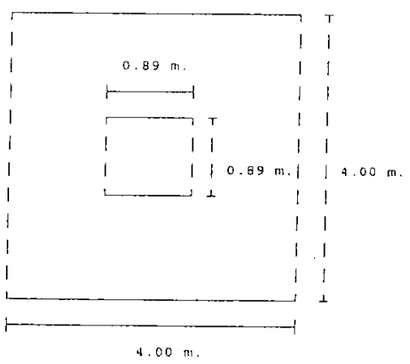
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• dibujo sin escala



ALZADO

Dirección del eje del tablero



PLANTA

CARACTERISTICAS DE LOS MATERIALES Y CIMENTACION

Fck (Kg/cm²) ..... 300 γcd ... 1.50

Fyk (Kg/cm²) ..... 5100 γyd ... 1.15

Recubrimiento de armaduras ..... 4.0 cms

Tensión admisible del terreno ..... 3.00 Kg/cm²

Coeficiente de rozamiento en cimentación ... 0.55

Coeficiente de seguridad al deslizamiento... 1.50

Coeficiente de seguridad al vuelco 1.80

©ESFUERZOS CONSIDERADOS

• Longitudinal y transversal según la dirección del eje del tablero
• Esfuerzos en t y m.t

Hipótesis	Axil	F.Long	F.Trans	M.Long	M.Trans	γf
1	130.83	1.35	2.02	67.92	77.00	1.50
2	130.83	0.69	6.75	59.00	140.80	1.50
3	229.10	0.69	2.02	96.34	114.34	1.50

RESULTADOS DE CALCULO

©Tensiones sobre el Terreno en Kg/cm² y coeficientes de seguridad

Hipótesis	σ1	σ2	σ3	σ4	σcob	Cd	Cv
1	2.51	1.03	1.21	-0.28	1.78	48.69	4.50
2	3.07	0.28	1.95	-0.84	2.30	14.58	2.40
3	3.74	1.55	1.92	-0.27	2.66	75.45	4.75

Tensión cobaricéntrica Máxima 2.66 Kg/cm² para la Hipótesis 3

©Esfuerzos de cálculo

* Esfuerzos en m.t/m y t/m Armaduras en cm²/m

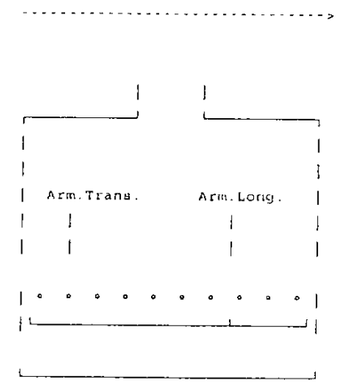
Recubrimiento de armaduras= 4.0 cms

Uc= 2320 t/m

Vcu long..= 164.05 t/m
Vcu trans.= 164.05 t/m

Hipótesis	M.long	M.trans	Ar.long	Ar.trans	Vd long.	Vd Trans.
1	43.49	42.93	8.52	8.41	2.14	2.16
2	56.04	51.00	11.01	10.01	2.88	3.01
3	68.13	67.02	13.42	13.19	3.91	3.94

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ALZADO

Armadura longitudinal Máxima 13.42 cm²/m para la Hipótesis 3

Armadura transversal Máxima 13.19 cm²/m para la Hipótesis 3

5. Estribos

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 1 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-104.3** Nk (KN) = -1022.4

Pie de pórtico

Mk (tm) = **27.3** Mk (KNm) = 267.5
Nk (t) = **-130.8** Nk (KN) = -1282.1

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-104.3** Nk (KN) = -1022.4

Pie de pórtico

Mk (tm) = **18.2** Mk (KNm) = 178.6
Nk (t) = **-130.8** Nk (KN) = -1282.1

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **13.50**
Mto. Inercia I (m^4) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$\lambda = \pi^2 \times E \times I / Lo^2 =$ 7.96015

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **70.00** $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\frac{(h+20e_e)}{(h+10ee)}\frac{Lo^2}{50\,ic}$$

e_e = 0.209 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.139 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

$\varepsilon y = fyd / Es =$ 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :

e_a = 0.380

e_{tot} (m) = 0.589

Pie de pórtico

Mk (tm) = 77.00 Mk (KNm) = 754.6
Nk (t) = -130.83 Nk (KN) = -1282.1

Solicitaciones de cálculo longitudinales :

e_a = 0.380

e_{tot} (m) = 0.519

Pie de pórtico

Mk (tm) = 67.92 Mk (KNm) = 665.6
Nk (t) = -130.83 Nk (KN) = -1282.1

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 2 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-104.3** Nk (KN) = -1022.4

Pie de pórtico

Mk (tm) = **91.1** Mk (KNm) = 892.8
Nk (t) = **-130.8** Nk (KN) = -1282.1

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-104.3** Nk (KN) = -1022.4

Pie de pórtico

Mk (tm) = **9.3** Mk (KNm) = 91.1
Nk (t) = **-130.8** Nk (KN) = -1282.1

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **13.50**
Mto. Inercia I (m^4) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$$\lambda = \pi^2 \times E \times I / Lo^2 = 7.96015$$

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **70.00** $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\frac{(h+20e_e)}{(h+10ee)}\frac{Lo^2}{50\,ic}$$

e_e = 0.696 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.071 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

$\varepsilon y = fyd / Es$ = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :
e_a = 0.380

e_{tot} (m) = 1.076

Pie de pórtico

Mk (tm) = 140.80 Mk (KNm) = 1379.9
Nk (t) = -130.83 Nk (KN) = -1282.1

Solicitaciones de cálculo longitudinales :
e_a = 0.380

e_{tot} (m) = 0.451

Pie de pórtico

Mk (tm) = 59.00 Mk (KNm) = 578.2
Nk (t) = -130.83 Nk (KN) = -1282.1

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 3 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-202.6** Nk (KN) = -1985.5

Pie de pórtico

Mk (tm) = **27.3** Mk (KNm) = 267.5
Nk (t) = **-229.1** Nk (KN) = -2245.2

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Mk (tm) = **0.0** Mk (KNm) = 0.0
Nk (t) = **-202.6** Nk (KN) = -1985.5

Pie de pórtico

Mk (tm) = **9.3** Mk (KNm) = 91.1
Nk (t) = **-229.1** Nk (KN) = -2245.2

Hormigón : **HA - 30**
fck (N/mm^2)= **30**
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : **B 500 S**
fyk (N/mm^2)= **500**
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = **210**

Datos de los fustes :

Diámetro Φ (m): **1.00**
Nº de fustes : **1**
Altura Hp (m): **13.50**
Mto. Inercia I (m^4) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$$\lambda = \pi^2 \times E \times I / Lo^2 = 7.96015$$

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = 70.00 $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_e)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.119 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.041 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$$\beta = \frac{(d - d')^2}{4\,is^2}$$ Factor de armado

De tablas se obtiene :

$$is^2 = \frac{1}{6}(d - d')^2 \qquad \beta = 1.50$$

Solicitaciones de cálculo transversales :
e_a = 0.380

e_{tot} (m) = 0.499

Pie de pórtico

Mk (tm) = 114.34
Nk (t) = -229.10

Mk (KNm) = 1120.5
Nk (KN) = -2245.2

Solicitaciones de cálculo longitudinales :
e_a = 0.380

e_{tot} (m) = 0.420

Pie de pórtico

Mk (tm) = 96.34
Nk (t) = -229.10

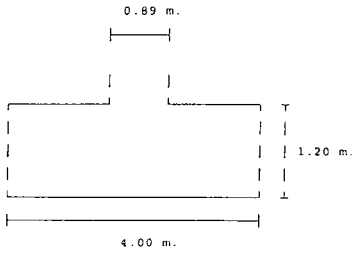
Mk (KNm) = 944.1
Nk (KN) = -2245.2

Estructura ....:ACUEDUCTO PK 315+500

Pila Nº : P1 Y P2

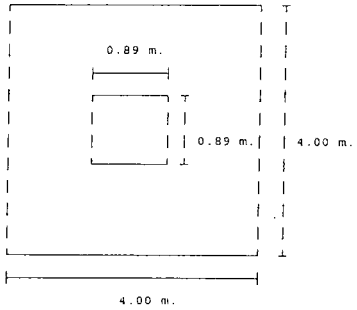
@DIBUJO

• dibujo sin escala



ALZADO

Dirección del eje del tablero



PLANTA

CARACTERISTICAS DE LOS MATERIALES Y CIMENTACION

Fck (Kg/cm²) ..... 300 γcd ... 1.50

Fyk (Kg/cm²) ..... 5100 γyd ... 1.15

Recubrimiento de armaduras ..... 4.0 cms

Tensión admisible del terreno ..... 3.00 Kg/cm²

Coeficiente de rozamiento en cimentación ... 0.55

Coeficiente de seguridad al deslizamiento... 1.50

Coeficiente de seguridad al vuelco 1.80

@ESFUERZOS CONSIDERADOS

• Longitudinal y transversal según la dirección del eje del tablero
• Esfuerzos en t y m.t

Hipótesis	Axil	F.Long	F.Trans	M.Long	M.Trans	γf
1	130.83	1.35	2.02	67.92	77.00	1.50
2	130.83	0.69	6.75	99.00	140.00	1.50
3	229.10	0.69	2.02	96.34	114.34	1.50

RESULTADOS DE CALCULO

©Tensiones sobre el Terreno en Kg/cm² y coeficientes de seguridad

Hipótesis	σ1	σ2	σ3	σ4	σcob	Cd	Cv
1	2.51	1.03	1.21	-0.28	1.78	48.69	4.50
2	3.07	0.28	1.95	-0.84	2.30	14.58	2.40
3	3.74	1.55	1.92	-0.27	2.66	75.45	4.75

Tensión cobaricéntrica Máxima 2.66 Kg/cm² para la Hipótesis 3

©Esfuerzos de cálculo

* Esfuerzos en m.t/m y t/m Armaduras en cm²/m

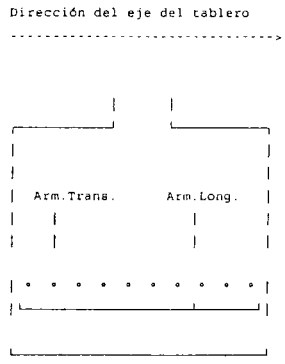
Recubrimiento de armaduras= 4.0 cms

Uc= 2320 t/m

Vcu long..= 164.05 t/m
Vcu trans.= 164.05 t/m

Hipótesis	M.long	M.trans	Ar.long	Ar.trans	Vd long.	Vd Trans.
1	43.49	42.93	8.52	8.41	2.14	2.16
2	56.04	51.00	11.01	10.01	2.88	3.01
3	68.13	67.02	13.42	13.19	3.91	3.94

©DIBUJO DE LA ARMADURA



ALZADO

Armadura longitudinal Máxima 13.42 cm²/m para la Hipótesis 3

Armadura transversal Máxima 13.19 cm²/m para la Hipótesis 3

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 2 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Md (tm) = 0.0 Mk (KNm) = 0.0
Nd (t) = -156.5 Nk (KN) = -1533.2

Pie de pórtico

Md (tm) = 136.7 Mk (KNm) = 1339.2
Nd (t) = -192.2 Nk (KN) = -1883.9

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Md (tm) = 0.0 Mk (KNm) = 0.0
Nd (t) = -156.5 Nk (KN) = -1533.2

Pie de pórtico

Md (tm) = 14.0 Mk (KNm) = 136.7
Nd (t) = -192.2 Nk (KN) = -1883.9

Hormigón : HA - 30 Acero pasivo : B 500 S

fck (N/mm^2)= 30 fyk (N/mm^2)= 500
γ c = 1.50 γ s = 1.15
fcd (N/mm^2)= 20.0 fyd (N/mm^2)= 434.8
Ec (KN/mm^2) = 28.6 Es (KN/mm^2) = 210

Datos de los fustes :

Diámetro Φ (m): 1.00
Nº de fustes : 1
Altura Hp (m): 13.50
Mto. Inercia I (m^4) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$$\lambda = \pi^2 \times E \times I / Lo^2 = 7.96015$$

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : **λ = 70.00** $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\frac{(h+20e_e)}{(h+10ee)}\frac{Lo^2}{50\,ic}$$

$e_e = 0.711$ Máxima excentricidad de cálculo de 1er orden transversal
$e_e = 0.073$ Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

εy = fyd / Es = 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$\beta = \frac{(d - d')^2}{4\,is^2}$ Factor de armado

De tablas se obtiene :

$is^2 = \frac{1}{6}(d - d')^2$ β = 1.50

Solicitaciones de cálculo transversales :

e_a = 0.380

e_{tot} (m) = 1.091

Pie de pórtico

Md (tm) = 209.68 Md (KNm) = 2054.8
Nd (t) = -192.23 Nd (KN) = -1883.9

Solicitaciones de cálculo longitudinales :

e_a = 0.380

e_{tot} (m) = 0.452

Pie de pórtico

Md (tm) = 86.98 Md (KNm) = 852.4
Nd (t) = -192.23 Nd (KN) = -1883.9

Estado límite de Inestabilidad : Pórtico traslacional
Cálculo de solicitaciones de 2º orden en las zapatas ELS
HIPOTESIS 3 :
Dirección transversal
Solicitaciones : Cabeza de pórtico

Md (tm) = **0.0** Mk (KNm) = 0.0
Nd (t) = **-303.9** Nk (KN) = -2978.2

Pie de pórtico

Md (tm) = **41.0** Mk (KNm) = 401.3
Nd (t) = **-339.7** Nk (KN) = -3328.9

Dirección longitudinal
Solicitaciones : Cabeza de pórtico

Md (tm) = **0.0** Mk (KNm) = 0.0
Nd (t) = **-303.9** Nk (KN) = -2978.2

Pie de pórtico

Md (tm) = **14.0** Mk (KNm) = 136.7
Nd (t) = **-339.7** Nk (KN) = -3328.9

Hormigón : HA - 30
fck (N/mm^2)= 30
γ c = **1.50**
fcd (N/mm^2)= 20.0
Ec (KN/mm^2) = 28.6

Acero pasivo : B 500 S
fyk (N/mm^2)= 500
γ s = **1.15**
fyd (N/mm^2)= 434.8
Es (KN/mm^2) = 210

Datos de los fustes :

Diámetro Φ (m): 1.00
Nº de fustes : 1
Altura Hp (m): 13.50
Mto. Inercia I (m^4) : 0.0491

Con el programa STATIK3 se ha calculado el autovalor correspondiente a la pila con las rigideces que corresponden a las reales del conjunto neoprenos - tablero, tanto en sentido transversal como longitudinal. Los cálculos correspondientes se adjuntan a continuación.

Del cálculo de 2º orden obtenemos:

$$\lambda = \pi^2 \times E \times I / Lo^2 = 7.96015$$

Longitud transversal de pandeo : Lo (m) = 17.50

Radio de giro : ic (m) = 0.25

Esbeltez mecánica : λ = **70.00** $35 < \lambda < 100$ Esbeltez moderada

Método aproximado . Flexión compuesta recta

$$e_{tot} = e_e + e_a > e_2$$

$$e_a = (1 + 0{,}12\,\beta)(\varepsilon y + \varepsilon)\,\frac{(h+20e_a)}{(h+10ee)}\,\frac{Lo^2}{50\,ic}$$

e_e = 0.121 Máxima excentricidad de cálculo de 1er orden transversal
e_e = 0.041 Máxima excentricidad de cálculo de 1er orden longitudinal

Lo = 17.50

$\varepsilon y = fyd / Es =$ 0.002070

ε = 0.0045 Axil cuasi permanente > 70% Axil total

$$\beta = \frac{(d - d')^2}{4\,is^2}$$ Factor de armado

De tablas se obtiene :

$$is^2 = \frac{1}{6}(d - d')^2 \qquad \beta = 1.50$$

Solicitaciones de cálculo transversales :
e_a = 0.380

e_{tot} (m) = 0.500

Pie de pórtico

Md (tm) = 169.99
Nd (t) = -339.68

Md (KNm) = 1665.9
Nd (KN) = -3328.9

Solicitaciones de cálculo longitudinales :
e_a = 0.380

e_{tot} (m) = 0.421

Pie de pórtico

Md (tm) = 142.99
Nd (t) = -339.68

Md (KNm) = 1401.3
Nd (KN) = -3328.9

Características mecánicas Sección "PILA" (sin coef. homogeneiz.)

Area Ax = 7.858E3 cm2
Momento de inercia Iy = 4.918E6 cm4 Iz = 4.909E6 cm4 Ip = 9.827E6 cm4
Const. de torsión Ix = 9.817E6 cm4
Momento estático Zy =166.73E3 cm3 Zz = 166.73E3 cm3
Baricentro ys = -0.00 m zs = 0.00 m Angulo= 0.0 Grad
Dist. al borde yl = -0.50 m yr = 0.50 m
zo = 0.50 m zu = -0.50 m

M-N-Punto de aplic. de fuerzas en el baricentro de la sección
V-T-Punto de aplic. de fuerzas en el baricentro de la sección
Schubmittelpunkt y = -0.00 m z = 0.00 m

Sección parcial circular:

Sobre	Material	w	ym[m]	zm[m]	r[m]	ix[cm4]
CS 1	H300	1.0	0.00	0.00	0.50	9.82E+06

Armadura "B1" As-tot =113.83 cm2 (1.45 o/o)

Nombre / Sección	Material	w	Cód.	A[cm2]	y[m]	z [m]
CR 1 / CS 1	AEH500	1.0	1	113.83	0.00	0.00 (*)

(*) = Armadura de contorno: Radio = 0.45 m

Dimensionamiento a flexión: Viga Sección "PILA"/"B1"

No	Set	N [kN]	My [kNm]	Mz [kNm]	Notas:
1	2	-1883.15	1116.55	982.81	
2	2	-1883.15	852.06	2053.98	
3	2	-3327.57	1400.74	1665.23	

Parámetros de cálculo empleados:
Set:Norma/TipoDiag/Máx.Deform./Coef.minor.res./Diag.Horm./Coef.Fluencia

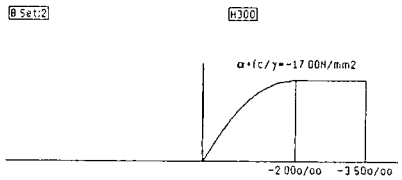
Set 2: EH/2/0/Eps=-2.0,-3.5,10.0/Gamma=1.5,1.15/Dia=45/Phi=0

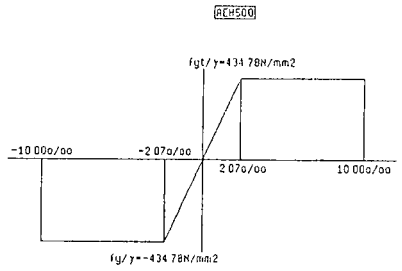
No Armad. long. :	y1 [m]	z1 [m]	y2 [m]	z2 [m]	dados [cm2]	dimens. [cm2]	As [cm2]
2 AEH500	0.00	0.00	long. perim		1.00	111.10	111.10

Max.x/h = 0.51 As-top/bot = 0.00/111.10 As = 1.41 % = 111.10

23 ϕ25

Material acorde a la sección: "PILA"



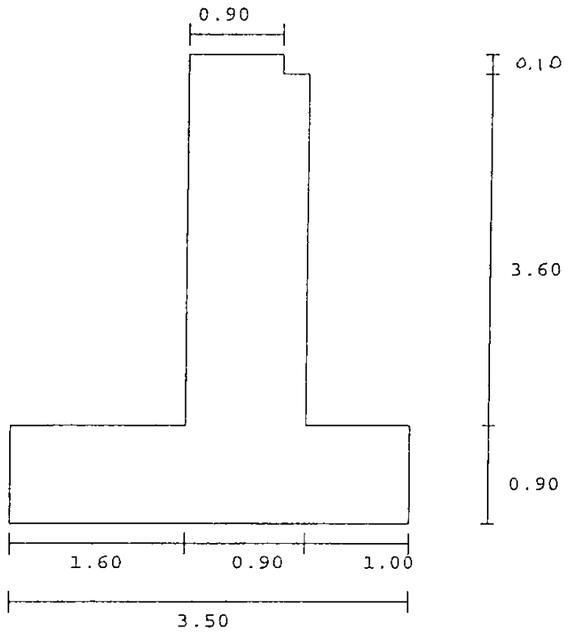


Estructura ....:Acueducto PK 316+080

Estribo .....:E-1 y E-2

DATOS GEOMETRICOS (sin escala)

* Cotas en mtrs.



Area de la sección 6.48 m²

MATERIALES

Hormigón en zapata ..... 250 Kg/cm²

Hormigón en alzados ..... 300 Kg/cm²

Coeficiente de seguridad del hormigón 1.50

Acero en armaduras, zapata y alzado ..... 5100 Kg/cm²

Coeficiente de seguridad del acero 1.15

CARACTERISTICAS DEL TERRENO

Densidad de las tierras (t/m3) 2.00

Coeficiente de empuje activo horizontal 0.33

Tensión admisible del terreno en cimentación (Kg/cm²) 2.5

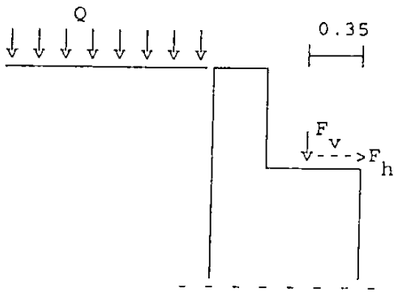
Coeficiente de rozamiento en cota de cimentación 0.55

Coeficiente de seguridad al deslizamiento (Cd) 1.50

Coeficiente de seguridad al vuelco (Cv) 1.80

Altura considerada de empuje de tierras (mtrs.) 4.60

CARGAS ACTUANTES



Reacciones Verticales (Fv t/m)

Cargas Permanentes : 16.00

Sobrecargas Máximas: 18.70
Sobrecargas Mínimas: 0.00
Sobrecarga q (t/m²): 1.80

Reacciones Horizontales (Fh t/m)

Reológicas : 0.80
Temperatura : 0.79
Frenado : 0.00

COMBINACIONES

A) 1.35*(Peso Propio)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

B) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)

C) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Máximas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

D) 1.35*(Peso Propio+ Cargas Permanentes)
1.50*(Sobrecargas Mínimas)
1.50*(Empuje del terreno)
1.50*(Sobrecarga en el trasdós)

1.35*(Reológicas)
1.50*(Temperatura)
1.50*(Frenado)

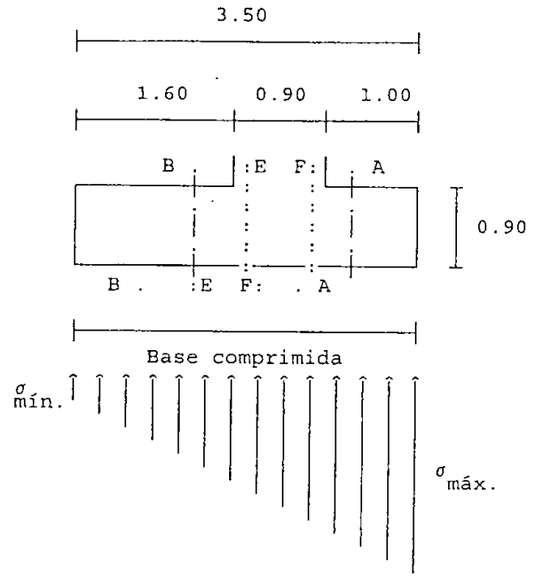
ESFUERZOS DE COMBINACIONES

Combinación	Fv(t/m)	Fh(t/m)	Q(t/m²)
A	0.00 0.00	0.00 0.00	1.80 2.25
B	16.00 21.60	1.59 2.27	1.80 2.70
C	34.70 49.65	1.59 1.19	1.80 2.70
D	16.00 21.60	1.59 2.27	1.80 2.70

COMPROBACION DE ESTABILIDAD:

Hipótesis	ΣFv(t/m)	ΣFh(t/m)	Cd	ΣMe(mt/m)	ΣMv(mt/m)	Cv
A	30.92	9.72	1.75	65.60	16.99	3.86
B	46.92	11.31	2.28	87.20	24.15	3.61
C	65.62	11.31	3.19	112.44	24.15	4.66
D	46.92	11.31	2.28	87.20	24.15	3.61

TENSIONES EN CIMIENTOS



COMPROBACION DE TENSIONES:

Hipótesis	σmáx. (t/m²)	σmín. (t/m²)	σcob. (t/m²)	Base comprimida
A	11.53	6.14	9.83	3.50
B	22.74	4.07	17.46	3.50
C	31.75	5.75	24.38	3.50
D	22.74	4.07	17.46	3.50

ARMADURAS:

ZAPATA

CORTANTE: fcv= 64.55 t/m² (EH-91)

Sección A-A | d = 0.86 m.
Vcu= 110.38 t/m (EH-91)

Sección B-B | d = 0.86 m.
Vcu= 111.03 t/m (EH-91)

FLEXION: | d = 0.86 m.
Uc = 1218 t/m

ZAPATA DELANTERA:

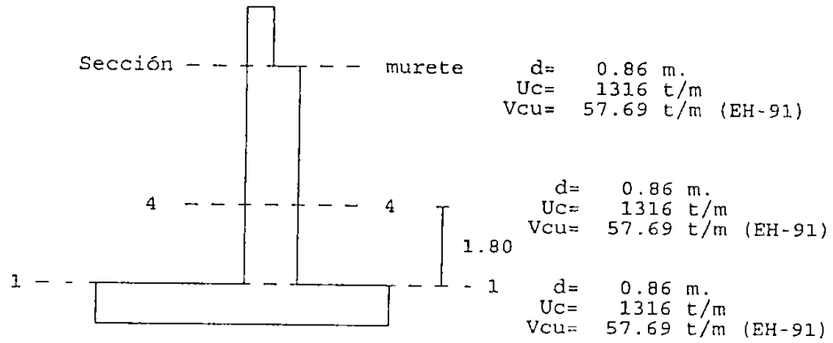
Hipót.	Vd(A-A) (t/m)	Vcu t/m (EHE)	Md(F-F) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	7.54	22.36	8.34	9.73	10.99	3.26
B	15.52	22.36	17.05	19.99	10.99	3.26
C	21.58	22.36	23.78	27.98	10.99	3.26
D	15.52	22.36	17.05	19.99	10.99	3.26

ZAPATA TRASERA:

Hipót.	Vd(B-B) (t/m)	Vcu t/m (EHE)	Md(E-E) (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	-9.43	22.36	-12.04	14.08	10.99	3.26
B	-9.59	22.36	-12.30	14.39	10.99	3.26
C	-2.64	22.36	-3.38	3.93	10.99	3.26
D	-9.59	22.36	-12.30	14.39	10.99	3.26

ALZADO

fcv= 67.08 t/m²



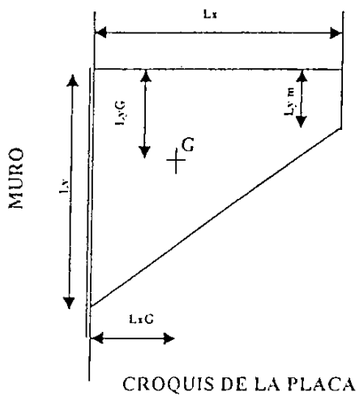
SECCION 1-1:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	9.52	25.99	11.24	13.44	15.72	11.87	14.40
B	12.34	29.09	32.84	24.77	29.13	11.87	14.40
C	11.26	33.11	60.89	23.69	27.84	11.87	14.40
D	12.34	29.09	32.84	24.77	29.13	11.87	14.40

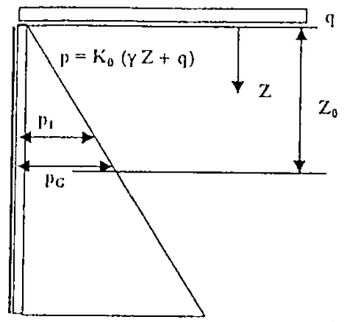
SECCION 4-4:

Hipót.	Vd (t/m)	Vcu t/m (EHE)	Nd (t/m)	Md (mt/m)	Us (t/m)	As (cm²/m)	Reparto (cm²/m)
A	3.20	25.21	5.77	2.47	2.88	11.87	14.40
B	5.74	28.31	27.37	8.98	10.48	11.87	14.40
C	4.66	32.33	55.42	9.84	11.49	11.87	14.40
D	5.74	28.31	27.37	8.98	10.48	11.87	14.40

ALETAS MURO DE ESTRIBOS



CROQUIS DE LA PLACA



PRESIONES SOBRE LA PLACA

1, DATOS

GEOMETRIA		EMPUJES	
$L_{y\,m}$ =	0.500 m	q =	1.80 tm^{-2}
L_Y =	2.600 m	γ =	2.00 tm^{-3}
L_X =	2.100 m	Φ =	33 º
L_{YG} =	0.894 m	K_0 =	0.5
L_{XG} =	0.813 m	$p_1 = K_0 ((L_{y\,m}) \gamma + q)$ =	1.4 tm^{-2}
h =	0.300 m	$p_G = K_0 ((L_{yG})^* \gamma + q)$ =	1.8 tm^{-2}
r =	0.035 m	γ_f =	1.5
d_x =	0.265 m		
d_y =	0.245 m		
$b = b_w$ =	1.000 m		

MATERIALES

H-30		BS500	
f_{ck} =	3000 tm^{-2}	f_{yk} =	51000 tm^{-2}
γ_c =	1.5	γ_y =	1.15
f_{cd} =	2000 tm^{-2}	f_{yd} =	44348 tm^{-2}
f_{cv} =	70.7 tm^{-2}	f_{yred} =	42000 tm^{-2}

2. DETERMINACIÓN DE LAS SOLICITACIONES

$M_{xGd} = \gamma_f \times A \times p_G \times L_{xG} / L_y$ = 2.7 tm

$M_{xld} = \gamma_f \times p_1 \times L_x^{\,2} / 2$ = 4.6 tm

$V_{xd} = \gamma_f \times A \times p_G / L_y$ = 3.4 t

3. DIMENSIONAMIENTO

3,1, FLEXIÓN

ARMADURAS MÍNIMAS :

DIRECCIÓN X : $A_{s\,total} = 1{,}6 / 1000 \times h \times b$ = 4.80 cm^2

$A_{s\,min\,c/cara} = 0{,}53 / 1000 \times h \times b$ = 1.59 cm^2 $\phi 10/20$

DIRECCIÓN Y : $A_{s\,total} = 0{,}9 / 1000 \times h \times b$ = 2.70 cm^2

$A_{s\,min\,c/cara} = 0{,}3 / 1000 \times h \times b$ = 0.90 cm^2

DIRECCIÓN X $U_{cx} = 0.85 \times f_{cd} \times d_x \times b$ = 510 t

CARA INTERIOR (TIERRAS)

M_d = 4.6 tm

$U_{s1} = U_c \times (1 - (1 - 2 \times M_d / (U_c \times d))^{0,5})$ = 17.8 t

$A_{s1} = U_{s1} / f_{yd}$ = 4.01 cm^2 $\phi 12/20$

3.2. CORTANTE

DIRECCIÓN X :

$V_{u1x} = 0{,}30 \times b_w \times d_x \times f_{cd}$ = 159 t

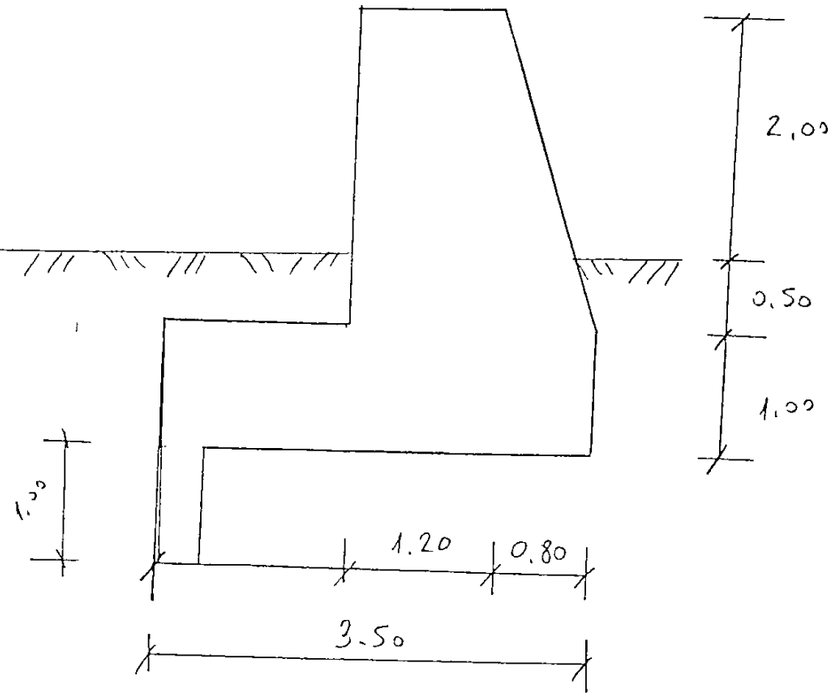
$Vcu = (0.12\ \xi\ (100\ \rho l\ fck)^{1/3})\ bo\ d$ = 12.4 t

Vd_x = 3.4 t

$Vd_x < V_{u1x}$

$Vd_x < V_{cux}$ No requiere armaduras de cortante

Muros



Módulos de 7.50 m

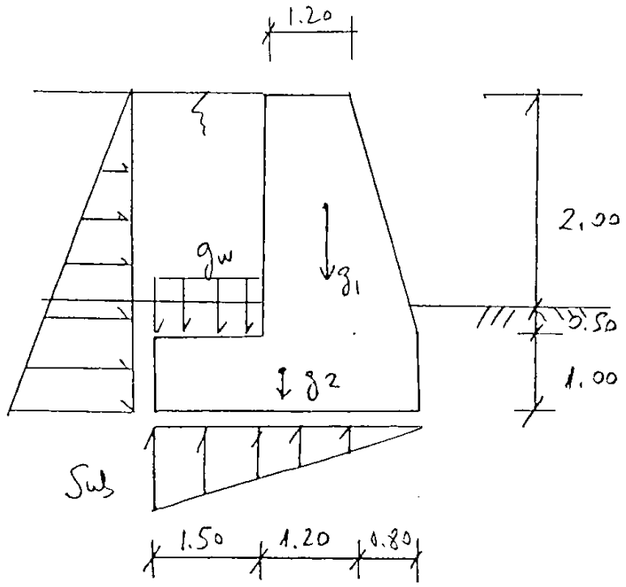
Cargas verticales:

$g_1 = 1.20 \times 2.50 \times 2.50 + 0.80 \times \frac{2.50}{2} \times 2.50 = 10.0\ t/m$

$g_2 = 3.50\ m \times 1.00\ m \times 2.50\ t/m^3 = 8.75\ t/m$

$gw = 2.50m \times 1.50m \times 1.0\ t/m^3 = 3.75\ t/m$

$Sub = -3.50m \times \frac{3.50\ t/m^2}{2} = -6.125\ t/m$



Cargas horizontales.

$E_w = 3.50\ m \times 1.0\ t/m^3 \times \frac{3.50m}{2}$

$E_w = 5.25\ t/m$

Seguridad al deslizamiento:

$C_D = \frac{(g_1 + g_2 + g_w - S_{ub}) \times 0.50}{E_w} = \frac{16.125\ t/m \times 0.50}{5.25\ t/m}$

$C_D = 1.535 > 1.50$ Verifica

Verificación al vuelco.

$$\Sigma M_{VOL} = E_W \times 1.17m + S_{ub} \times \frac{3.50m}{3} \times 2$$

$$\Sigma M_{VOL} = 20.43\ mt/m$$

$$\Sigma M_{EST} = g_2 \times \frac{3.50m}{2} + g_1' \times 1.40m + g_1'' \times 0.53m + g_W \times (0.75m + 2.00m)$$

$$\Sigma M_{EST} = 37.45\ mt/m$$

$$C_V = \frac{\Sigma M_{EST}}{\Sigma M_{VOL}} = 1.833 > 1.80 \quad \text{Verifica}$$

Verificación de Tensiones:

$$\Sigma M^G = E_W \times 1.17m + S_{ub} \times 0.583m + g_1' \times 0.35 + g_1'' \times 1.216m - g_W \times 1.00m$$

$$\Sigma M^G = 11.63\ mt/m$$

$$\Sigma F_V = 16.125\ t/m$$

$$\sigma_{max} = \frac{2 \times 16.125}{3\left(\frac{3.50}{2} - \frac{11.63}{16.125}\right)} = 10.50\ t/m^2 < \sigma_{adm} = 20\ t/m^2$$

$\sigma_{min} = 0.00$ $\quad x = 3.086\ m$

verifica.

Cálculo de la armadura.

Módulos 7.50m

Armadura horizontal: $3.2‰ \times \frac{120}{2} \times 100 = 19.2\ cm^2/m$

$9.60\ cm^2/m$ en cada cara → $\phi 16/20$

Armadura vertical: cara tracción: $0.90‰ \times 160 \times 100 = 14.40\ cm^2/m$ ($\phi 20/2$

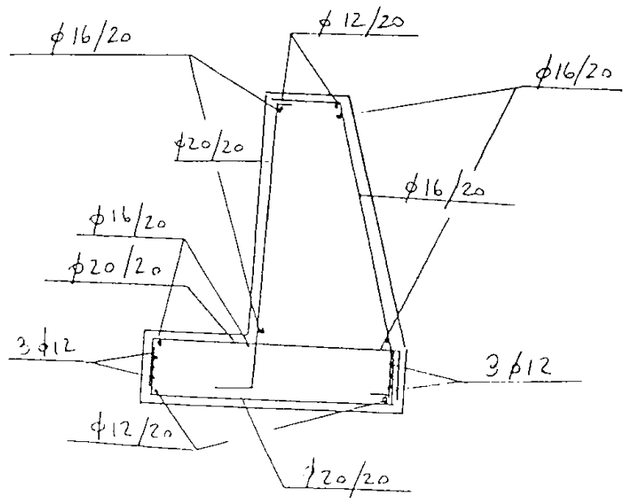
otra cara: $4.32\ cm^2/m$

Zapata:

$M_d = 17.50\ mt$

$A_{s\ min} = 15.0\ cm^2/m$ cuantía geométrica.

$\phi 20/20$



CALCULOS ESTRUCTURALES

FDO JOSÉ ANGEL HIDALGO GONZÁLEZ
COL Nº 9859

5. Proceso constructivo

5. PROCESO CONSTRUCTIVO

La Asistencia Técnica no presentó el proceso constructivo llevado a cabo en la ejecución de las distintas estructuras.
A continuación se presenta el Pliego de Prescripciones Técnicas.

VIGAS, MARCOS Y MUROS PREFABRICADOS

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN.

Esta unidad se refiere a los elementos de vigas, marcos y muros de hormigón, fabricados en instalaciones fijas, y transportados y suministrados posteriormente a pie de obra, para su colocación y montaje in situ.

La ejecución de la unidad de obra incluye las operaciones siguientes:

- Preparación y comprobación de las superficies de apoyo en obra.

- Suministro y transporte a la obra del elemento prefabricado.

- Montaje y perfecta nivelación.

- Relleno y sellado, de fraguado rápido, y alta adherencia tipo "grout" o similar, para la unión de piezas prefabricadas, en su caso.

CONDICIONES GENERALES.

El fabricante ha de garantizar que los elementos cumplan las características exigidas en el Proyecto.

Las formas, cuantías y detalles de los diferentes elementos prefabricados eran los indicados en los planos. No se admitirá, salvo decisión expresa por parte de la Dirección de Obra, ninguna modificación de las formas que afecte en la apariencia externa de la obra tal y como se define en los planos. Cualquier otra modificación de las cuantías, resistencias de los materiales, detalles o proceso constructivo definidos en Proyecto podrá someterse por parte del Contratista a la aprobación de la Dirección de Obra, siempre que esté justificada técnicamente y no suponga menoscabo alguno en la calidad y durabilidad de la obra.

La justificación técnica y económica de estos elementos ha de ser aprobada por la D.0.

El contratista ha de someter a la aprobación de la D.O. el plan de montaje en el que se ha de indicar el método y los medios auxiliares previstos.

El director de las obras podrá ordenar la toma de muestras de materiales para su ensayo, y la inspección de los procesos de fabricación, realizándose las correspondientes visitas a las plantas de prefabricación, siempre que lo considere necesario.

Los elementos prefabricados se almacenarán en obra en su posición normal de trabajo, sobre apoyos de suficiente extensión y evitando el contacto con el terreno o con cualquier producto que las pueda manchar o deteriorar.

Los elementos prefabricados no deben presentar rebabas que sean indicio de pérdidas graves de lechada, ni más de tres coqueras en una zona de diez decímetros cuadrados (0,1 m2) de paramento, ni coquera alguna que deje vistas las armaduras.

Tampoco presentarán superficies des lavadas o aristas descantilladas, señales de discontinuidad en el hormigonado, o armaduras visibles.

Salvo autorización del Director, no se aceptaran vigas con fisuras de más de una décima de milímetro (0,1 mm) de ancho, o con fisuras de retracción de más de dos centímetros
(2 cm) de longitud.

La comba lateral máxima, medida en forma de flecha horizontal, no, será superior al quinientosavo (1/500) de la longitud de la viga.

La contraflecha bajo la acción del peso propio, medida en la viga en condiciones normales de apoyo, no será superior al trescientosavo (1/300) de la luz para vigas de hasta diez metros (10 m), y al quinientosavo (1/500) para luces mayores.

El Director de Obra podrá ordenar la comprobación de las características mecánicas sobre un cierto número de elementos.

Los cálculos estáticos y los planos de construcción correspondientes, deberán ser presentados a la aprobación del Director de Obra con la suficiente antelación al comienzo de los trabajos de fabricación.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

a) Idoneidad de la empresa fabricadora

Los elementos prefabricados de hormigón armado o pretensado serán fabricados por una empresa especializada en suministrar productos y servicios normalmente asociados con la construcción prefabricada estructural pesada. dotada de instalaciones fijas con reconocida experiencia en este tipo de prefabricados.

El fabricante debe evidenciar la realización de trabajos similares y comparables, y demostrar la capacidad de sus equipos técnico, de fabricación y de servicios, para la realización de los trabajos de acuerdo con las presentes especificaciones.

b) Condiciones generales

Se prohíbe el empleo de áridos que contengan piritas u otro tipo de sulfuros. Se emplearán áridos procedentes de roca caliza preferentemente.

Limitación de tamaño: El tamaño máximo del árido utilizado no excederá del menor de los dos Iímites siguientes:

Un medio del espesor mínimo de la pieza que se hormigona.

Los cinco sextos de la distancia horizontal libre entre armaduras independientes o entre éstas y los costeros del molde, si es que dichas aberturas tamizan el vertido del hormigón.

Se admite que el 10% en peso del árido utilizado sea de tamaño superior al anteriormente citado.

Almacenamiento: Con el fin de evitar el empleo de áridos excesivamente calientes durante el verano, o saturados de humedad en invierno o en época de lluvia, se recomienda almacenarlos bajo techado, en recintos convenientemente protegidos y aislados.

Empleo de áridos calientes: Cuando el hormigonado se realice en ambiente frío con riesgos de heladas, podrán utilizarse áridos previamente calentados. En estos casos se tendrá en cuenta lo establecido al hablar del empleo de agua caliente.

Información que debe suministrar el fabricante de las armaduras: para los aceros que posean un distintivo reconocido o un CC-EHE (Art. 1° de la EHE), cada partida de acero acreditará que está en posesión del mismo e irá acompañada de un certificado de garantía con los valores límites de las características indicadas en los Artículos 32.3, 32.4 y 32.5.

En el caso de no poseer un distintivo reconocido o un CC-EHE, cada partida deberá ir acompañada por un certificado Con los ensayos que haya realizado uno de los organismoscitados en el artículo 1° (EHE) y que justifiquen las características indicadas en los Artículos 32.3, 32.4 y 32.5.

c) MATERIALES A EMPLEAR

En particular los materiales empleados en los elementos prefabricados son de aplicación las siguientes especificaciones que recogen básicamente las indicaciones de la Instrucción EHE.

CEMENTO

Cementos utilizables: El conglomerante empleado en la fabricación de los elementos objeto de estas recomendaciones cumplirá las condiciones establecidas en el vigente "Pliego General de Condiciones para la Recepción de Conglomerantes Hidráulicos", y será necesariamente de la clase CEM I 42,52 UNE 80301 :96. No se utilizarán mezclas de cemento de distintas procedencias ni, a ser posible, mezclas de distintas partidas, aunque sean de la misma procedencia.

Suministro y almacenamiento: El cemento no se empleará en fábrica a temperatura superior a setenta grados centígrados, salvo que se compruebe, mediante el ensayo correspondiente, que no tiene tendencia a experimentar el fenómeno de falso fraguado.

El almacenamiento se llevará a cabo en silos, debidamente acondicionados, que aíslen el cemento de la humedad. Si el suministro se realiza en sacos se recibirá el cemento en los
mismos envases cerrados en que fue pedido a origen y se almacenará en sitio ventilado y defendido, tanto de la intemperie como de la humedad del suelo y de las paredes.

AGUA

Aguas utilizables: Como norma general, podrán ser utilizadas, tanto para el amasado, como para el curado del hormigón destinado a la fabricación en taller de todas las aguas que, empleadas en casos análogos, no hayan producido eflorescencias ni originado perturbaciones en el proceso de fraguado y endurecimiento de los hormigones con ellas fabricados.

Expresamente se prohíbe el empleo de agua de mar.

Empleo de agua caliente: Cuando el hormigonado se realice en ambiente frío, con riesgo de heladas podrá utilizarse para el amasado sin necesidad de adoptar precaución especial alguna, agua calentada hasta una temperatura de 40ºC.

Cuando, excepcionalmente, se utilice agua calentada a temperatura superior a la antes indicada, se cuidará que el cemento, durante el amasado, no entre en contacto con ella mientras su temperatura sea superior a los 40ºC.

ARIDOS

Normalmente se emplearán dos tipos de árido, arena y grava. Se entiende por "arena" o "árido fino", el árido o fracción del mismo que pasa por un tamiz de 5 mm de luz de malla (tamiz 5 UNE 7050) y por "grava" o "árido grueso" el que resulte retenido por dicho tamiz.

Condiciones generales: La naturaleza de los áridos y su preparación serán tales que permitan garantizar la adecuada resistencia y durabilidad del hormigón. En elementos estructurales se exige que los áridos provengan del machaqueo de rocas.

ADITIVOS

Podrá autorizarse el empleo de todo tipo de aditivos siempre que se justifique que la sustancia agregada en las proporciones previstas y disuelta en agua, produce el efecto deseado sin perturbar las demás características del hormigón.

En los hormigones destinados a la fabricación de elementos pretensados no podrán utilizarse, como aditivos, el cloruro cálcico, cualquier otro tipo de cloruro ni, en general, acelerantes en cuya composición intervengan dichos cloruros u otros compuestos químicos que puedan ocasionar o favorecer la corrosión de las armaduras.

ARMADURAS PASIVAS

Todas las armaduras pasivas de las piezas prefabricadas presentarán un límite elástico característico igualo superior a 5.000 kg/cm2.

Cumplirán lo especificado para ellas en la "Instrucción de Hormigón Estructural (EHE}, para el acero B-500S.

El fabricante de las armaduras pasivas enviará al de los elementos prefabricados las certificaciones del control realizado sobre aquellas partidas de su producción a la que pertenece el lote enviado. En dicho certificado se mencionarán todas las probetas ensayadas, con indicación del número de colada y rollo de proveniencia, y ser harán constar, para cada probeta, los resultados completos del ensayo.

Se emplearán exclusivamente armaduras pasivas cuyo fabricante esté en posesión de un distintivo reconocido, o un CC-EHE.

Las armaduras destinadas a ser soldadas a chapas serán de acero natural y sufrirán las pruebas de actitud para soldeo fijadas en las normas EHE.

Condiciones de transporte y almacenamiento: Los alambres o cables suministrados, ya sea en forma de rollos, carretes o cortados a medida, deberán ser convenientemente protegidos de la humedad durante el transporte. Los locales de almacenamiento de los mismos, deberán estar secos, bien ventilados y exentos de polvo y/o atmósferas corrosivas.
Se evitará en lo posible el contacto directo de las armaduras con el suelo.

Igual trato deberá darse a las partidas de armaduras pasivas.

ARMADURAS ACTIVAS

Se entiende por armadura activa la de acero de alta resistencia, mediante la cual se introduce la fuerza del pretensado. Sus elementos constituyentes pueden ser alambres, barras y cordones.

Los torones o cordones a emplear seguirán las especificaciones del artículo 32.5 de la EHE.

Se emplearán cordones con designación Y1860S7 de diámetro nominal 15,2 mm y carga unitaria máxima de 1.860 N/mm2.

El límite elástico fv estará comprendido entre el 0,88 y el 0,95 de la carga unitaria máxima fmáx. Esta limitación deberán cumplirla no sólo los valores mínimos garantizados, sino también cada uno de los elementos ensayados.

El alargamiento bajo carga máxima, medido sobre una base de longitud igual o superior a 500 mm, no será jnferior al 3,5 por 100.

La estricción a la rotura será visible a simple vista.

El módulo de elasticidad tendrá el valor garantizado por el fabricante, con un tolerancia de +/- 7 por 100.

La relajación a las 1.000 horas a temperatura de 20º+/-1ºC, y para una tensión inicial igual al 70 por 100 de la carga unitaria máxima garantizada, determinada según la UNE 36422-85, no será superior al 2 por 100.

Los cordones se suministrarán en rollos, bobinas o carretes que, salvo acuerdo en contrario, contendrán una sola longitud de fabricación de cordón; y el diámetro interior del rollo o del núcleo de la bobina o carrete no será inferior a 750 mm.

Los rollos no contendrán soldaduras realizadas después del tratamiento térmico anterior al trefilado.

Se realizarán ensayos de control de calidad del acero, tanto para productos certificados como no certificados, de acuerdo con los artículos 90.1,90.3, 90.3.1 ,90.3.2, 90.4 y 90.5 de la EHE.

d) Instalaciones de fabricación

LOCALES Y ALMACENES

Condiciones generales: El almacenamiento de materias primas se organizará de tal manera que no quepan confusiones entre partidas controladas y pendientes de control.

Almacén de cemento: Se deberá disponer de silos adecuados para almacenar el cemento a granel o locales cubiertos donde se almacene el cemento en las condiciones estipuladas en el apartado correspondiente del presente texto.

Almacén de áridos: Es conveniente almacenar los áridos bajo cobertizos que los defiendan de la intemperie, especialmente cuando no se corrija, diariamente, la dosificación del agua
de amasado, con arreglo a los resultados obtenidos en el ensayo de determinación de la cantidad de agua contenida en los áridos.

Almacén de aceros: En el recinto de almacenamiento y en sus proximidades se prohíbe la realización de operaciones de soldadura o análogas, que pudieran afectar por calentamiento, a las características de los aceros.

Naves de hormigonado y moldeo: Se exige que las instalaciones de hormigonado y moldeo se encuentren protegidas de la intemperie.

INSTALACIÓN DE DOSIFICACIÓN

Instalación de dosificación: La instalación de dosificación que debe existir siempre, para la preparación de las mezclas destinadas a la fabricación del hormigón, suministrará las cantidades necesarias de cada material con una tolerancia máxima en peso, del 2%.

Comprobación de los aparatos de medida: Al menos semanalmente se comprobará que no se han descorregido los aparatos de medida utilizados para dosificar los diversos componentes. Estas comprobaciones deberán intensificarse si se observan anomalías en las resistencias de los hormigones obtenidos.

APARATOS PARA EL AMASADO

Máquinas de amasado: El amasado se efectuará en máquinas adecuadas que proporcionen un mezclado Intimo de la masa, lo más homogéneo posible. La homogeneidad de la masa deberá mantenerse a lo largo de la descarga de la amasadora.

MOLDES

Condiciones generales: Los moldes serán metálicos, fijos o desplazables. Tendrán la rigidez necesaria para evitar que se deformen bajo el empuje del hormigón fresco o los efectos de los vibradores, y estarán perfectamente sujetos y arriostrados entre sí para impedir movimientos relativos durante el vibrado.

En ningún caso los moldes deberán impedir el movimiento longitudinal que se produce al acostarse el hormigón durante la maniobra de destesado de las armaduras activas.

Las juntas entre los diferentes elementos de cada molde serán lo suficientemente estancas para impedir fugas de mortero o papilla de cemento.

Separadores : No se permitirá el empleo de separadores rígidamente unidos entre si de forma permanente. Por el contrario, los dos separadores que forman el cierre de los extremos adyacentes de dos piezas sucesivas, deberán permitir un movimiento relativo entre ambos, para poder aflojar loS alambres, en los espacios libres entre elementos, antes de proceder al destesado gradual, de tal modo que no produzcan variantes bruscas en las tensiones de los alambres.

Medida de los esfuerzos de tesado : Se medirá y limitará el esfuerzo de tesado, en todas y cada una de las sucesivas fases, mediante dispositivos dinamométricos que registren directamente o por comparación, la magnitud de la carga introducida. Paralelamente, se comprobará por medición directa, con precisión no inferior al 7% que los alargamientos obtenidos corresponden a las tensiones aplicadas.

INSTALACIONES DE CURADO

Condiciones que deben cumplir: Se deberá prever las instalaciones necesarias para el curado de los elementos, con objeto de que éstos alcancen, en los plazos previstos las oportunas características resistentes.

e) Proceso de fabricación

DIRECCIÓN TÉCNICA

Técnico de fabricación: En los talleres donde construyan los elementos resistentes de hormigón armado deberá existir, con carácter de permanencia y plena autoridad, un técnico especializado, con titulo expedido por una Escuela Técnica de Grado Superior o Medio, personalmente responsable del exacto cumplimiento, durante todo el proceso de fabricación, tanto de las disposiciones contenidas en estas especificaciones como de las prescripciones adicionales que la Dirección de Obra estime necesarias para la correcta ejecución de los elementos.

COLOCACIÓN DE LAS ARMADURAS ACTIVAS

Uniformidad: Se recomienda que todas las armaduras de acero especial colocadas en una misma línea de moldes sean de la misma procedencia, tipo, grado y diámetro. Esta recomendación adquiere carácter de obligatoriedad en el caso de tesado simultáneo de las armaduras.

Estado de la superficie de las armaduras: Las armaduras se colocarán limpias de grasa, óxido no adherido, o de cualquier otra sustancia que pueda perjudicar su adherencia con el hormigón, debiendo rechazarse todas aquellas en las que se aprecien síntomas de corrosión.
En particular se prohíbe el uso de alambres que presenten jaboncillo de trefilación en su superficie, a menos que utilice un método eficaz de limpieza antes de su colocación.

No se colocarán armaduras en cuya superficie aparezcan defectos de trefilado, tales como rayas longitudinales o grietas transversales.

COLOCACIÓN DE ARMADURAS PASIVAS

Las armaduras pasivas, sin pretensar, se colocarán cumpliendo las prescripciones de la Instrucción EHE. Dejando, en las zonas a rellenar "in situ", la armadura saliente necesaria para el solapado por soldaduras que habrá de realizarse "in situ" al disponer la correspondiente armadura.

TESADO DE LAS ARMADURAS ACTIVAS

Tensión de tesado : Para alcanzar esta tensión se someterán los alambres o cables a un esfuerzo gradualmente creciente de tracción, sin sacudidas ni tirones bruscos.

Con el fin de comprobar la calidad de las armaduras y disminuir las pérdidas de tensión por relajación y eventuales rozamientos del acero, se autoriza a someter al principio los alambres o cables transitoriamente, a una tensión de prueba comprendida entre el 110%

y el 115% de la tensión de tesado definitivo, sin superar los valores fijados en la EHE.

Una vez efectuada esta primera maniobra, se reducirá el esfuerzo, fijándose los alambres en el clavijero cuando se recupere la tensión prescrita.

HORMIGONADO

Las distintas clases de hormigón a utilizar en loS elementos prefabricados se especifican en los planos.

Métodos de dosificación: La dosificación de los distintos materiales que componen el hormigón se hará preferiblemente en peso, admitiéndose también procedimientos automáticos en volumen, siempre que se cumplan las condiciones prescritas en el apartado correspondiente de la norma EHE.

Precauciones que deben adoptarse para el amasado: Antes de iniciar el amasado con una nueva partida de conglomerante, y al finalizar la jornada, deberá limpiarse perfectamente
la mezcladora.

Precauciones que deben adoptarse en el caso de temperaturas extremas: Se adoptarán las precauciones necesarias para evitar que la temperatura de los moldes, por soleamiento u otras causas, sea excesiva en el momento de proceder a su llenado.

Cuando el hormigonado se realice en ambiente frío, con riesgo de heladas, con objeto de favorecer el proceso de fraguado y endurecimiento del hormigón, podrá recurrirse al
calentamiento del agua y/o de los áridos.

Defectos del hormigón fresco: No se permitirá la colocación de masas frescas que acusen un principio de fraguado o disgregación de sus componentes.

Antiadherentes para los moldes: Se recomienda, para facilitar el desmoldeo, pintar los moldes con barnices antiadherentes compuestos de siliconas o preparados a base de aceites solubles en el agua, 0 grasa diluida, evitando el uso del gasoil, grasa corriente o cualquier otro producto análogo.

VIBRADO

Obligatoriedad del vibrado: La consolidación del hormigón se hará utilizando vibradores. Entre ellos se consideran incluidas las mesas vibratorias y las baterías con vibración de todo el conjunto.

Condiciones de vibrado: Salvo aprobación expresa de la
D. Facultativa la vibración será siempre externa aplicada sobre el molde metálico. La vibración interna o de superficie será siempre de complemento de la externa.

Vibradores internos: Cuando se utilicen vibradores internos deberán aplicarse introduciéndolos verticalmente en la masa, con movimiento lento, a una velocidad del orden de 8 cm/segundo y sin que la aguja sufra movimientos horizontales de traslación. En ningún caso deberán vibrarse espesores de hormigón superiores a la longitud de la aguja.

Vibradores de superficie: Cuando se emplean vibradores de superficie (bandeja o patín), éstos se aplicarán también con movimiento lento hasta conseguir, en toda la superficie, una
humectación brillante.

Duración del vibrado: En todo caso, la duración e intensidad del vibrado será la suficiente para que, con su efecto, se consiga una humectación brillante de la superficie.

Con el fin de evitar la separación de los componentes del hormigón, o disgregación de la masa, la operación de vibrado no deberá prolongarse excesivamente.

CURADO

Curado inicial: Se recomienda que, a partir de las primeras horas después del hormigonado, se recubra la cara superior de las piezas con arpilleras humedecidas que no sean de esparto. Pasadas 24 horas se procederá a regar las piezas para impedir la evaporación.

Curado al vapor: Puede comenzarse este proceso a las dos horas de vibrada la masa, elevándose la temperatura, a partir de este momento, de forma gradual hasta alcanzar la temperatura límite. Esta temperatura límite podrá mantenerse constante durante cierto tiempo, finalizado el cual se hará descender la temperatura, de forma continua, hasta llegar a la temperatura ambiente.

La presión del vapor será lo más uniforme posible en todos los puntos, y los orificios para la salida de los chorros de vapor estarán suficientemente próximos unos a otros, con el fin de conseguir una temperatura constante a lo largo de la pieza. Es imprescindible que la atmósfera del recinto curado se mantenga, en todo momento, saturada de humedad.

Curado por calor: Se aconseja el curado por calor, si las temperaturas alcanzadas son aceptables y las piezas se mantienen re cubiertas y en ambiente húmedo, con el fin de impedir la desecación de las mismas. Los procesos más indicados son a base de agua o aceite caliente.

f) Planos de taller v montaje

La realización en taller se llevará a cabo de conformidad con los cálculos. Planos y Pliego de Condiciones del Proyecto. según los cuales la Empresa fabricadora preparará los planos de taller precisos para la ejecución de las piezas.

Estos planos de taller se someterán a la Dirección de Obra para su aprobación definitiva, antes de dar comienzo a la fabricación en taller. La aprobación de los mismos no exime de la responsabilidad que pudieran contraer por errores existentes.

Contendrán de manera inequívoca:

Las dimensiones necesarias para definir exactamente todos los elementos de la estructura.

Las contraflechas de ejecución.

La forma y dimensiones de las uniones entre piezas prefabricadas y con el resto de la estructura.

Las tolerancias de fabricación.

La Empresa fabricadora suministrará asimismo los planos de montaje y ensamblaje en obra, junto a las marcas de identificación de cada una de las piezas, dispuestas en las zonas que queden no vistas una vez terminada la estructura.

Quedará perfectamente clara la forma y secuencia de cada una de las operaciones de montaje.

En aquellas superficies de los elementos prefabricados en las que posteriormente se coloquen hormigones in situ con los que debe garantizarse la adecuada transmisión de tensiones de cizallamiento, se garantizará la adecuada rugosidad del elemento prefabricado mediante el rascado con peine de púas u otro sistema análogo.

Posteriormente, en obra, el Contratista deberá proceder, antes del vertido del hormigón in situ a la adecuada limpieza de la superficie con chorro de agua, o de arena si fuera necesario.

g) Transporte v montaje

La Empresa fabricadora deberá definir los aparatos de sujeción de los elementos prefabricados, tanto durante la fabricación y apilado en taller como durante el transporte

a obra y montaje de las piezas, realizando los planos correspondientes para su completa definición, que se someterán a la Dirección de Obra para su aprobación definitiva. Los elementos prefabricados se sujetarán, durante la fabricación, apilado, transporte y montaje solamente de los aparatos de sujeción que estén señalados en estos planos.

El lanzamiento y la colocación de las vigas prefabricadas se ajustará a lo especificado en el Articulo 693 del P.G-3.

Las operaciones de manejo y transporte de piezas prefabricadas, bien sea en taller o en obra, deberán realizarse con el máximo cuidado posible, manteniendo el alma de las vigas en posición vertical. En ningún caso se producirán impactos ni solicitaciones de torsión.

En general, las vigas se transportarán y almacenarán de forma que los puntos de apoyo y la dirección de los esfuerzos sean aproximadamente los mismos que los que tales elementos tendrán en su posición final en la obra. Si el Contratista estimara necesario transportar o almacenar tales elementos en posiciones distintas a la descrita, deberá requerir la aprobación previa del Director de Obra.

Los vehículos de transporte y los dispositivos de lanzamiento elegidos por el Contratista deberán ser aprobados siempre por el Director de las Obras.

La superficie de apoyo de las vigas sobre los vehículos de transporte, deberá configurarse de tal forma (disponiendo, por e., aparatos de apoyo de material elastomérico) que se excluya con toda seguridad cualquier daño de los elementos prefabricados durante la carga y descarga y durante el transporte

En las operaciones de elevación y descenso de las vigas. para su transporte y colocación, éstas se sujetarán únicamente en los dispositivos previstos a tal fin.

Durante el transporte, almacenamiento, etc, las vigas prefabricadas solo deberán apoyarse en los puntos indicados en los Planos del Proyecto. Cuando vayan sobre vehículos de transporte se asegurarán de tal forma que no puedan volcar o estar expuestas a solicitaciones imprevistas por giro o golpes. Se acondicionarán adecuadamente las vías por donde vayan a circular los transportes para evitar estas circunstancias.

En el momento de colocar las vigas, los lechos de mortero de los aparatos de apoyo deberán haber alcanzado la resistencia a compresión exigida.

Se pondrá especial cuidado en la colocación correcta de las vigas sobre los aparatos de apoyo.

Si en el curso de estos trabajos quedase dañado algún aparato de apoyo, será sustituido inmediatamente por otro en perfectas condiciones, sin que para ello fuesen necesarias órdenes especiales del Director de Obra.

Tanto el transporte como la colocación de las vigas se realizarán solamente a las órdenes y bajo el control de un Ingeniero con experiencia en el lanzamiento de vigas prefabricadas.

El Contratista presentará a la aprobación del Director de las obras un programa detallado para el lanzamiento de las vigas, en el cual figurarán el desarrollo temporal de los trabajos así como el personal y la maquinaria que intervendrán en esta operación. Asimismo, habrá de comunicarse al Director de las obras con la suficiente antelación (como mínimo 24 horas) cualquier transporte o lanzamiento de vigas prefabricadas.

Si el montaje afectase al tráfico de peatones o vehículos, el Contratista presentará con la debida antelación, a la aprobación del Director, el programa de corte, restricción o desvío de tráfico.

En el caso de que sea preciso acopiar elementos en obra, el Contratista general deberá proporcionar los elementos accesorios para el perfecto apilado de las piezas siendo obligación del fabricante definir la forma en que ha de realizarse.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

PG 3/75 “Pliego de Prescripciones Técnicas Generales para Obra de Carreteras y Puentes.
Con las modificaciones aprobadas por las Ordenes del MOPTMA: O.M. del 31.7.86 (BOE n° 213 del 5.9), O.M. del 21.1.88 (BOE n° 29 del 3.2), O.M. del 8.5.89 (BOE n° 118 del 18.5) y O.M. del 28.8.89 (BOE n° 242 del 9.10)".

EHE "Instrucción de Hormigón Estructural" (B.O.E. n° 11 del 13.1.991,

HORMIGONADO DE ESTRUCTURAS Y OBRAS DE FÁBRICA

DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN:

Ejecución del hormigonado en estructuras de hormigón en masa, armado o pretensado, comprendiendo las operaciones de vertido de hormigón para rellenar cualquier estructura, cimiento, muro, losa, etc., en la cual el hormigón quede contenido por el terreno y/o por encofrados.

La ejecución de la unidad de obra incluye las operaciones siguientes:

- Suministro del hormigón.
- Comprobación de la plasticidad del hormigón.
- Preparación de los juntas de hormigonado con los materiales que se hayan de utilizar .
- Vertido y compactación del hormigón.
- Curado del hormigón.

Se entiende por hormigón la mezcla de cemento, agua, árido grueso, árido fino y, eventualmente, productos de adición, que al fraguar y endurecer adquiere la resistencia deseada.

CONDICIONES GENERALES:

Materiales

Cemento

En vigas y elementos pretensados se usará cemento tipo CEM I o CEM II/A-D de la clase 42,5 6 42,5 R. En zapatas, pilotes, cimientos v, en general, elementos enterrados se utilizará cemento puzolánico CEM II/A-P con características sulforresistentes, SR. Los restantes hormigones se realizarán con cemento CEM 132,5632,5 R.

Agua

Si el hormigonado se realizara en ambiente frío, con riesgo de heladas, podrá utilizarse para el amasado, sin necesidad de adoptar precaución especial alguna, agua calentada hasta una temperatura de cuarenta grados centígrados (40°C).

Aditivos

Podrá autorizarse el empleo de todo tipo de aditivos siempre que se justifique, al Director de la Obra, que la sustancia agregada en las proporciones previstas produce el efecto deseado sin perturbar las demás características del hormigón, ni representar peligro para su durabilidad ni para la corrosión de armaduras.

En los hormigones destinados a la fabricación de elementos pretensados no podrán utilizarse, como aditivos, el cloruro cálcico, cualquier otro tipo de cloruro ni, en general, acelerantes en cuya composición intervengan dichos cloruros u otros compuestos químicos que puedan ocasionar o favorecer la corrosión de las armaduras.

Tipos de hormigón

De acuerdo con su resistencia característica y empleo se establecen los siguientes tipos de hormigones:

Resistencia

Tipo	Característica (N/mm2)	Clase	Empleo
HM-15	15	En masa	Rellenos. Regularización y limpieza de cimientos. Capas de nivelación.
HM-20	20	En masa	Soleras, rellenos, encauzamientos, cimientos de pequeñas obras de fábrica, protección de tubos de hormigón y de taludes de estructuras, cunetas revestidas, arquetas, pozos, rasanteo de tableros, hitos y cimentación de señales, valla de cerramiento, aceras. Alzados y bóvedas de pequeñas obras de fábrica. Cimientos de barreras de seguridad. Bordillos prefabricados.
HA-25	25	Armado	Cimentaciones, pilotes, pantallas y encepados, vigas de atado, bóveda de túnel entre pantallas. Defensas rígidas. Marcos, estribos, Embocaduras, aletas y Muros. Losas de compresión y aceras de estructuras. Impostas y defensas rígidas.
HA-30	30	Armado	Alzados de pilas, cabeceros y riostras. Tableros armados.
HP-40	40	Pretensado	Tableros “in situ” para pretensar.
HP-45	45	Pretensado	Vigas prefabricadas con canto 1,50 y 1,65 m.

Dosificación del hormigón

La dosificación de los diferentes materiales destinados a la fabricación del hormigón se hará siempre por peso.

Para establecer las dosificaciones se deberá recurrir a ensayos previos de laboratorio, con objeto de conseguir que el hormigón resultante satisfaga las condiciones exigidas.

Las operaciones a realizar para la determinación de estas cuantías serán las siguientes:

a) Áridos.- Con muestras representativas de los áridos que vayan a ser empleados en el hormigón se harán las siguientes operaciones:

1. Se determinará la curva granulométrica de las diferentes fracciones de áridos finos y gruesos.

2. Se mezclarán diversas proporciones de los distintos tipos de áridos que entran en cada tipo de hormigón, para obtener, por tanteos, las preparaciones de cada uno de ellos que den la máxima compacidad a la mezcla.

Con el fin de facilitar los tanteos se puede empezar con las proporciones, cuya curva granulométrica resultante se ajuste mejor a la curva de Fuller.

3. Con los resultados obtenidos se fijarán las proporciones de los distintos tipos de áridos que deben entrar a formar parte de cada hormigón y se tomará la curva granulométrica empleada como curva "inicial".

b) Agua cemento.

Su proporción exacta se determinará mediante la ejecución de diversas masas de hormigón de prueba y se elegirá aquella que proporcione a éste la máxima resistencia especificada sin perjudicar su facilidad de puesta en obra.

Se ejecutarán con ellas probetas de hormigón de las que se estudiarán las curvas de endurecimiento en función de la variación de sus componentes. Es aconsejable, dentro de los criterios señalados, reducir lo mas posible la cantidad de agua, lo cual puede obligar al uso de plastificantes para facilitar la puesta en obra del hormigón. Estos se ensayarán en las masas de prueba para asegurar que no alteren las demás condiciones del hormigón. Se prohíbe la utilización de aditivos que contengan cloruro cálcico y en general aquellos en cuya composición intervengan cloruros, sulfuros, sulfitos u otros productos químicos que pueden ocasionar o favorecer la corrosión de las armaduras.

Antes de hacer el hormigonado definitivo se deberán realizar ensayos adicionales que reproduzcan lo mas fielmente posible las condiciones de puesta en obra: empleo de aditivos, amasadas, condiciones de transporte y vertido.

Como resultado de los ensayos previos y característicos se elaborará un dossier que defina perfectamente las características fundamentales de cada hormigón. En particular, se deberán recoger los siguientes datos:

-Nombre del fabricante.

-Tipo y ubicación de la planta.

-Procedencia y tipo de cemento.

-Procedencia y tipo de los áridos.

-Tamaño máximo de áridos.

-Huso granulométrico de cada fracción de áridos y de la dosificación conjunta.

-Tipo y cantidad de los aditivos. En particular, caso de usarse fluidificante o superfluidificante, o cualquier otro producto similar, se definirán las cantidades a añadir en central y en obra, con su rango de tolerancias.

-Relación agua/cemento.

-Tiempo máximo de uso del hormigón fresco.

La central deberá disponer de control de humedad de los áridos, de forma que se compense para mantener la relación agua canto de la dosificación establecida.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

Hormigonado

El contratista ha de presentar al inicio de los trabajos un plan de hormigonado para cada estructura, que ha de ser aprobado por la D.O.

El plan de hormigonado consiste en la explicitación de la forma, medios y proceso que el contratista ha de seguir para la buena colocación del hormigón.

En el plan ha de constar:

-Descomposición de la obra en unidades de hormigonado, indicando el volumen de hormigón a utilizar en cada unidad.

-Forma de tratamiento de las juntas de hormigonado.

Para cada unidad ha de constar:

-Sistema de hormigonado (mediante bomba, con grúa y cubilote, canaleta, vertido directo, ...).

-Características de los medios mecánicos.

-Personal.

-Vibradores (características y nombre de éstos, indicando los de recambio por posible avería).

-Secuencia de relleno de los moldes.

-Medios por evitar defectos de hormigonado por efecto del movimiento de las personas (pasarelas, andamios, tablones u otros).

-Medidas que garanticen la seguridad de los operarios y personal de control.

-Sistema de curado del hormigón.

No se ha de hormigonar sin la conformidad de la D.O., un vez haya revisado la posición de las armaduras y demás elementos ya colocados, el encofrado, la limpieza de fondos y costeros, y haya aprobado la dosificación, método de transporte y puesta en obra del hormigón.

La compactación se ha de hacer por vibrado.

El vibrado ha de hacerse más intenso en las zonas de alta densidad de armaduras, en las esquinas y en los paramentos.

Curado

Durante el fraguado y hasta conseguir el 70% de la resistencia prevista, se han de mantener húmedas las superficies del hormigón. Este proceso ha de ser como mínimo de:

- 7 días en tiempo húmedo y condiciones normales.

- 15 días en tiempo caluroso y seco, o cuando la superficie del elemento esté en contacto con aguas o filtraciones agresivas.

El curado con agua no se ha de ejecutar con riegos esporádicos del hormigón, sino que se ha de garantizar la constante humedad del elemento con recintos que mantengan una lámina de agua, materiales tipo arpillera o geotextil permanentemente empapados con agua, sistema de riego continuo o cubrición completa mediante plásticos.

En el caso de que se utilicen productos filmógenos, autorizados por la D.O., se han de cumplir las especificaciones de su pliego de condiciones.

Durante el fraguado se han de evitar sobrecargas y vibraciones que puedan provocar la fisuración del elemento.

En todas las unidades de obra donde se utilice cemento puzolánico se cuidará especialmente el curado de los hormigones, atendiendo a evitar la desecación de los mismos durante el período de endurecimiento, para lo cual se tomarán las medidas oportunas en cada caso.

Control de calidad

El control de la calidad de los hormigones se llevará a cabo de acuerdo con los criterios que establece la Instrucción EHE, en sus artículos nos82 a 89.

En cuanto al control de la ejecución, en los planos se indica el nivel de control que debe aplicarse a cada elemento de obra.

En cuanto a la toma de muestras y fabricación de probetas de hormigón fresco queda prohibido el uso de morteros de azufre para refrentado de las probetas.

Cuando la resistencia característica estimada sea inferior a la resistencia característica prescrita, se procederá conforme se prescribe en el Apartado 88.5 de la EHE.

En caso de resultados desfavorables en los ensayos de información, podrá el Director de las Obras ordenar pruebas de carga, por cuenta del Contratista, antes de decidir la demolición o aceptación.

Si decidiera la aceptación, quedará a juicio del Director de las Obras una penalización consistente en la reducción del precio de abono en porcentaje doble de la disminución de resistencia del hormigón.

Cualquier reparación necesaria del elemento será realizada sin percibir el Contratista ningún abono por ello.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

NORMATIVA GENERAL:

EHE "Instrucción de Hormigón Estructural". (B.O.E. n° 11 de 13.1.99).

PG 3/75 "Pliego de Prescripciones Técnicas Generales para Obras de Carreteras y Puentes." con las enmiendas aprobadas por las Órdenes del MOPTMA: O.M. del 31.7.86 (BOE núm. 213 del 5.9), O.M. del 21.1.88 (BOE núm. 29 del 3.2), O.M. del 8.5.89 (BOE núm. 118 de118.51 y O.M. del 28.9.89 (BOE núm. 242 del 9.10).

ENCOFRADOS EN ESTRUCTURAS Y OBRAS DE FÁBRICA

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN:

Elementos destinados al moldeo de los hormigones en las estructuras y obras de fábrica.

La ejecución de la unidad de obra comprende las operaciones siguientes:

- Montaje del encofrado, con preparación de superficie de apoyo, si es preciso
- Preparado de las superficies interiores del encofrado con desencofrante
- Tapado de juntas entre piezas
- Apuntalamiento del encofrado
- Desmontaje y retirada del encofrado y todo el material auxiliar, un vez la pieza estructural esté en disposición de soportar los esfuerzos previstos

CONDICIONES GENERALES:

Los elementos que forman el encofrado y sus uniones han de ser suficientemente rígidos y resistentes para soportar, sin deformaciones superiores a las admisibles, las acciones estáticas y dinámicas que comporta su hormigonado. Adoptarán las formas, planas o curvas, de los elementos a hormigonar, de acuerdo con lo indicado en los Planos.

Cuando el acabado superficial es para dejar el hormigón visto:

Las superficies del encofrado en contacto con las caras que han de quedar vistas, han de ser lisas, sin rebabas ni irregularidades.

Se debe conseguir, mediante la colocación de angulares en las aristas exteriores del encofrado o cualquier otro procedimiento eficaz, que las aristas vivas del hormigón resulten bien acabadas.

En general, las superficies interiores habrán de ser suficientemente uniformes y lisas para conseguir que los paramentos de hormigón no presenten defectos,

abombamientos, resaltes o rebabas de más de 5 milímetros. No se aceptarán en los aplomos y alineaciones errores mayores de un centímetro (1 cm).

Los encofrados de madera estarán formados por tablas, bien montadas "in situ" o bien formando paneles, si éstos dan una calidad análoga a la tarima hecha "in situ". Deberán ser desecad as al aire, sin presentar signos de putrefacción, carcoma o ataque de hongos.

Antes de proceder al vertido del hormigón se regarán suficientemente para evitar la absorción de agua contenida en el hormigón, y se limpiarán, especialmente los fondos, dejándose aberturas provisionales para facilitar esta labor

En los encofrados metálicos se deberá cuidar que estén suficientemente arriostrados para impedir movimientos relativos entre distintos paneles de un elemento, que puedan ocasionar variaciones en los recubrimientos de las armaduras o desajustes en los espesores de paredes de las piezas a construir con los mismos.

Los enlaces entre los distintos elementos o paños de los moldes serán sólidos y sencillos de modo que su montaje y desmontaje se realice con facilidad, sin requerir golpes ni tirones. Los moldes ya usados que hayan de servir para unidades repetidas serán cuidadosamente rectificados y limpiados antes de cada empleo.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

Los encofrados, con sus ensambles, soportes o cimbras, tendrán la rigidez y resistencias necesarias para soportar el hormigonado sin movimientos de conjunto superiores a la milésima de la luz.

Los apoyos estarán dispuestos de modo que en ningún momento se produzcan sobre la parte de obra ya ejecutada esfuerzos superiores al tercio de su resistencia.

El Ingeniero Director podrá exigir del Constructor los croquis y cálculos de los encofrados y cimbras que aseguren el cumplimiento de estas condiciones.

El sistema de encofrado para pilas de viaductos y pasos superiores deberá ser previamente aprobado por la D.O.

Tanto las superficies de los encofrados, como los productos que a ellas se puedan aplicar, no deberán contener sustancias perjudiciales para el hormigón.

En el caso de hormigón pretensado, se pondrá especial cuidado en la rigidez de los encofrados junto a las zonas de anclaje, para que los ejes de los tendones sean exactamente normales a los anclajes.

Los encofrados de fondo de los elementos rectos o planos de más de seis metros (6 m) de luz libre, se dispondrán con la contraflecha necesaria para que, una vez desencofrado y cargado el elemento, éste conserve una ligera concavidad en el intradós.

Las juntas del encofrado no dejarán rendijas de más de dos milímetros (2 mm) para evitar la pérdida de lechada; pero deberán dejar el hueco necesario para evitar que por efecto de la humedad durante el hormigonado o durante el curado se compriman y deformen los tableros.

En el caso de las juntas verticales de construcción el cierre frontal de la misma se hará mediante un encofrado provisto de todos los taladros necesarios para el paso de las armaduras activas y pasivas.

El desencofrado deberá realizarse tan pronto como sea posible, sin peligro para el hormigón, y siempre informando al Director de las Obras.

Los productos utilizados para facilitar el desencofrado deberán estar aprobados por el Director de las Obras, sin que ello exima al Contratista de su responsabilidad.

Los dispositivos empleados para el anclaje del encofrado habrán de ser retirados inmediatamente después de efectuado el desencofrado.

Los alambres y anclajes del encofrado que no puedan quitarse fácilmente (será permitido únicamente en casos excepcionales y con la autorización del Director de las Obras) habrán
de cortarse a golpe de cincel. No está permitido el empleo de soplete para cortar los salientes de los anclajes. Los agujeros de anclaje habrán de cincelarse limpiamente,
o prever conos de material plástico o blando, que una vez efectuado el desencofrado, puedan quitarse fácilmente. Dichos agujeros se rellenarán con hormigón del mismo color que el empleado en la obra de fábrica. Es imprescindible, en todo caso, disponer los anclajes en líneas y equidistantes. Allí donde sea posible se emplearán apuntalamientos exteriores.

3. NORMATIVA DE OBLIGADO CUMPLIMIENTO

EHE "Instrucción de Hormigón Estructural" (B.O.E. 13.1.99).

PG 3/75 "Pliego de Prescripciones Técnicas Generales para Obras de Carreteras y Puentes. " con las enmiendas aprobadas por las Órdenes del MOPTMA: O.M. del 31.7.86 (BOE núm. 213 del 5.9), O.M. del 21.1.88 (BOE núm. 29 del 3.2), O.M. del 8.5.89 (BOE núm. 118 del 18.5) y O.M. del 28.9.89 (BOE núm. 242 del 9.10).

G305 ENCOFRADOS PERDIDOS PARA TABLEROS EN PUENTES DE VIGAS

1.-DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN

Piezas prefabricadas de hormigón o fibrocemento, para encofrados perdidos en tableros de puentes de vigas prefabricadas.

- La ejecución de la unidad de obra incluye las operaciones siguientes:
- Replanteo de los encofrados.
- Montaje del encofrado con limpieza y preparación de las superficies de apoyo, si es necesario.
- Tapado de juntas entre piezas.
- Nivelado del encofrado.
- Humectación del encofrado.
- Apuntalado del encofrado, si es preciso.
- Desmontaje y retirada de todos los materiales auxiliares, un vez la, pieza estructural haya alcanzado la resistencia prevista.

CONDICIONES GENERALES:

El tipo de encofrado y sistema de sujeción deberá tener la aprobación previa de la D.O.

El encofrado ha de ser suficientemente rígido y autorresistente para soportar, sin deformaciones superiores a las admisibles, las acciones estáticas y dinámicas que comporta el hormigonado.

Ha de ser suficientemente estanco para impedir una pérdida apreciable de pasta entre las juntas.

El encofrado perdido ha de tener un apoyo suficiente sobre las cabezas de viga, no inferior a 15 cm.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

En caso de piezas prefabricadas se han de seguir las instrucciones del fabricante para su montaje.

La superficie de apoyo sobre las vigas ha de estar limpia en el momento de su colocación.

La superficie del encofrado ha de estar limpia antes del hormigonado y se ha de comprobar la situación relativa de las armaduras, su nivelación y la solidez del conjunto.

Si el tipo de encofrado utilizado pudiera absorber agua del hormigón, se ha de humedecer previamente al hormigonado.

Antes de empezar el hormigonado, el Contratista ha de obtener por escrito la aprobación del encofrado, por parte de la D.O., sin que esto le exima de sus responsabilidades.

No se han de transmitir al encofrado vibraciones distintas de las propias del hormigonado, reduciendo éstas lo mínimo posible.

4.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

EHE "Instrucción de Hormigón Estructural" (B.O.E. 13.1.99).

PG 3/75 "Pliego de Prescripciones Técnicas Generales para Obras de Carreteras y Puentes." con las enmiendas aprobadas por las Órdenes del MOPTMA: O.M. del 31.7.86 (BOE núm. 213 del 5.9), O.M. del 21.1.88 (BOE núm. 29 del 3.2), O.M. del 8.5.89 (BOE núm. 118 del 18.5) y O.M. del 28.9.89 (BOE núm. 242 de19.1 O).

CIMBRAS PARA ENCOFRADOS DE LOSAS Y TABLEROS EN PUENTES

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN:

Se define como cimbra la estructura provisional que tiene por objeto sustentar el peso propio de los encofrados y del hormigón fresco y las sobrecargas de construcción, ajustándose a la forma principal de la estructura, hasta que el proceso de endurecimiento del hormigón se haya desarrollado de forma tal que la estructura descimbrada sea capaz de resistir por si misma las citadas acciones. También quedan incluidas en la definición las cimbras que actúen directamente de encofrados.

La ejecución de la unidad de obra comprende las operaciones siguientes:

- Proyecto de la cimbra y cálculos de su capacidad portante.
- Preparación y ejecución del cimiento de la cimbra.
- Montaje de apuntalamientos y cimbras.
- Pintado de las superficies interiores del encofrado, con un producto desencofrante, cuando la cimbra actúe de encofrado.

- Tapado de las juntas entre piezas, en su caso.
- Nivelación de la cimbra.

- Pruebas de carga de apuntalamientos y cimbras, cuando proceda.

- Descimbrado y retirada de todos los elementos de la cimbra y de los elementos de cimiento que puedan perjudicar al resto de la obra.

CONDICIONES GENERALES:

El proyecto de la cimbra ha de especificar la naturaleza, características, dimensiones y capacidad resistente de cada un de sus elementos y del conjunto.

La D.O. ha de aprobar el proyecto de la cimbra.

Los elementos que forman la cimbra han de ser suficientemente rígidos y resistentes para soportar, sin deformaciones superioras a las admisibles, las acciones estáticas y dinámicas que comporta el hormigonado.

En las obras de hormigón pretensado, la disposición de la cimbra ha de permitir las deformaciones que se derivan del tesado de las armaduras activas y ha de resistir la subsiguiente redistribución del peso propio del elemento hormigonado.

Cuando la estructura de la cimbra sea metálica, sus diferentes elementos han de estar sujetos con tornillos o bien soldados.

Las presiones transmitidas al terreno no han de producir asentamientos perjudiciales para el sistema de hormigonado previsto.

Los arriostrados han de tener la menor rigidez posible, compatible con la estabilidad de la cimbra, y se han de retirar los que se puedan antes del tesado de las armaduras, si la estructura se ha de pretensar.

La cimbra ha de tener una carrera suficiente para poder realizar las operaciones del descimbrado.

Tolerancias de deformaciones para el hormigonado:

- Movimientos locales de la cimbra
- Movimientos del conjunto (L = luz)

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

Si la estructura puede ser afectada por una corriente fluvial, se han de tomar las precauciones necesarias contra las avenidas.

El montaje de la cimbra se ha de efectuar por personal especializado. Una vez montada la cimbra, se ha de comprobar que los puntos de apoyo del encofrado de la cara inferior de la estructura se ajustan en cota a los cálculos con las tolerancias establecidas.

La D.O. puede ordenar, si lo considera necesario, una prueba de carga de la cimbra hasta un 20% superior al peso que habrá de soportar.

Las pruebas de sobrecarga de la cimbra se han de efectuar de manera uniforme y pausada.
Se ha de observar el comportamiento general de la cimbra siguiendo sus deformaciones.

El descimbrado se hará de forma suave y uniforme sin producir golpes ni sacudidas.

No se ha de descimbrar sin la autorización de la D.O.

En los elementos que se hayan de hormigonar a contraflecha, se ha de tener en cuenta ésta en la ejecución de la cimbra.

El desmontaje se ha de efectuar de conformidad con el programa previsto en el Proyecto

Si no lo contraindica el sistema estático de la estructura, el descenso de la cimbra se ha de empezar para el centro del tramo y continuar hacia a los extremos.

El orden, el recorrido del descenso de los apoyos en cada fase del descimbrado, la forma de ejecución y los medios a utilizar en cada caso, se han de ajustar a lo indicado por la D.O.

No se ha de descimbrar hasta que el hormigón haya adquirido la resistencia adecuada. Para conocer el momento de desenganchado de la cimbra se han de realizar los ensayos informativos correspondientes sobre probetas de hormigón.

Cuando los elementos sean de cierta importancia, al descimbrar la cimbra es recomendable utilizar cuñas, cajas de arena, gatos u otros dispositivos similares.

Si la estructura es de cierta importancia y cuando la D.O. lo estime conveniente las cimbras se han de mantener despegadas dos o tres centímetros durante 12 horas, antes de retirarlas completamente.

En el caso de elementos pretensados, el proceso de desmontaje de la cimbra ha de tener en cuenta el tesado del elemento, evitando que la estructura queda sometida, aunque sea temporalmente, a tensiones perjudiciales no previstas.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

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ARMADURAS PASIVAS

1.- DEFINICIÓN y CONDICIONES GENERALES

DEFINICIÓN:

Se definen como armaduras pasivas las utilizadas para armar el hormigón, formadas por barras de acero corrugadas y/o mallas electrosoldadas, cumpliendo lo especificado en el Pliego PG-3 y la Instrucción EHE.

La ejecución de la unidad de obra incluye las operaciones siguientes:

- Despiece de las armaduras.
- Cortado y doblado de las armaduras.
- Colocación de separadores.
- Colocación de las armaduras.
- Atado o soldado de las armaduras, en su caso.

CONDICIONES GENERALES:

Las armaduras se ajustarán a la designación y características mecánicas indicadas en los planos del Proyecto, y deben llevar grabadas las marcas de identificación definidas en la EHE.

El Contratista deberá aportar certificados del suministrador de cada partida que llegue a obra, en los que se garanticen las características del material.

Para el transporte de barras de diámetros hasta diez (10) milímetros, podrán utilizarse rollos de un diámetro mínimo interior igual a cincuenta (50) veces el diámetro de la barra.

Las barras de diámetros superiores, se suministrarán sin curvatura alguna, o bien dobladas ya en forma precisa para su colocación.

Para la puesta en obra, la forma y dimensiones de las armaduras serán las señaladas en los Planos. Cuando en éstos no aparezcan especificados los empalmes 0 solapes de algunas barras, su distribución se hará de forma que el número de empalmes o solapes sea mínimo, debiendo el Contratista, en cualquier caso, realizar y entregar al Director de las obras los correspondientes esquemas de despiece.

Se almacenarán de forma que no estén expuestas a una oxidación excesiva, separados del suelo y de forma que no se manchen de grasa, ligante, aceite o cualquier otro producto que pueda perjudicar la adherencia de las barras al hormigón.

El doblado se realizará según lo especificado en el Articulo 600 del PG-3, así como en la EHE.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

El contratista ha de presentar a la D.O. para su aprobación, y con suficiente antelación, una propuesta de despiece de las armaduras de todos los elementos a hormigonar.

El despiece ha de contener la forma y medidas exactas de las armaduras definidas en el Proyecto.

Ha de indicar claramente el lugar donde se producen los empalmes y el número y longitud de éstos.

Ha de detallar y despiezar todas las armaduras auxiliares.

Todas y cada una de las figuras han de estar numeradas en la hoja de despiece, en correspondencia con el Proyecto.

En la hoja de despiece han de ser expresados los pesos totales de cada figura.

Las armaduras se colocarán limpias y exentas de toda suciedad y óxido adherente. Se dispondrán de acuerdo con las indicaciones de los Planos y se fijarán entre sr mediante las oportunas sujeciones, manteniéndose mediante piezas adecuadas la distancia al encofrado, de modo que quede impedido todo movimiento de las armaduras durante el vertido y compactación del hormigón.

El control de calidad se realizará a nivel normal. Se realizarán dos (21 ensayos de doblado desdoblado cada veinte (20) t de acero colocado, verificándose asimismo la sección
equivalente. Cada cincuenta (50)t se realizarán ensayos para determinar las características mecánicas (límite elástico y rotura).

Salvo otras instrucciones que consten en los Planos, el recubrimiento mínimo de las armaduras será el siguiente:

- Paramentos expuestos a la intemperie: 2,5 cm

- Paramentos en contacto con tierras, impermeabilizados:
- 3,5 cm

- Paramentos en contacto con tierras, sin impermeabilizar: 4,0 cm

Caso de tratar las superficies vistas del hormigón por abujardado o cincelado, el recubrimiento de la armadura se aumentará en un centímetro (1 cm). Este aumento se realizará en él espesor de hormigón sin variar la disposición de la armadura.

Los espaciadores entre las armaduras y los encofrados 0 moldes serán de hormigón suficientemente resistente con alambre de atadura empotrado en él, o bien de otro material adecuado. Las muestras de los mismos se someterán al Director de las Obras antes de su utilización, y su coste se incluye en los precios unitarios de la armadura.

En los cruces de barras y zonas criticas se prepararán con antelación, planos exactos a escala de las armaduras, detallando los distintos redondos que se entrecruzan.

Las características mecánicas a utilizar serán las especificadas en cada plano.

Antes de comenzar las operaciones de hormigonado, el Contratista deberá obtener del Director de Obra o la persona en quien delegue la aprobación por escrito de las armaduras colocadas.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

EHE "Instrucción de Hormigón Estructural" (B.O.E. n° 11 de 13.1.99).

PG 3/75 "Pliego de Prescripciones Técnicas Generales para Obras de Carreteras y Puentes."
con las enmiendas aprobadas por las Órdenes del MOPTMA: O.M. del 31.7.86 (BOE núm. 213 del 5.9), O.M. del 21.1.88 (BOE núm. 29 del 3.2), O.M. del 8.5.89 (BOE núm. 118 del 18.5) y O.M. del 28.9.89 (BOE núm. 242 del 9.10).

APOYOS DE NEOPRENO ZUNCHADO

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN:

Se definen así los aparatos de apoyo constituidos por capas alternativas de material elastomérico y acero, capaces de absorber las deformaciones y giros impuestos por la estructura que soportan.

Sus formas y dimensiones varían según los esfuerzos que han de transmitir, tal como se define en los planos.

CONDICIONES GENERALES:

Material elastomérico

El material elastomérico estará constituido por caucho clorado completamente sintético (cloropreno, neopreno), cuyas caracterrsticas deberán cumplir las especificaciones siguientes:

- Dureza Shore a (ASTM D-676) 60 ∀ 3
- Resistencia mínima a tracción 170 kg/cm2
- Alargamiento en rotura 350 %

Las variaciones máximas admisibles de estos valores para probeta envejecida en estufa en setenta (70) horas ya cien (100 = grados centígrados con las siguientes):

- Cambio en dureza Shore a + 10%
- Cambio en resistencia a tracción +/- 15%
- Cambio en alargamiento - 40%
- Deforinación remanente 35%

El módulo de deformación transversal no será inferior a once Newton por milímetro cuadrado (11 N/mm2).

Zunchos de acero

Las placas de acero empleadas en zunchos tendrán un límite elástico mínimo de doscientos cuarenta Newton por milímetro cuadrado (240 N/mm2) y una carga en rotura mínima de cuatrocientos veinte Newton por milímetro cuadrado (420 N/mm2).

La carga tangencial mínima capaz de resistir la unión al material elastomérico será en servicio de ocho Newton por milímetro cuadrado (8 Nlmm2), siendo la deformación tangencial correspondiente de siete décimas (0,7).

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

La base de nivelación para asiento del apoyo de neopreno zunchado se ejecutará al mismo tiempo que el hormigonado del dintel de la pila o estribo del puente, y tendrá unas dimensiones superiores a las del propio apoyo elastomérico entre 5 y 10 cm.

Del mismo modo deberá ejecutarse la cuña de nivelación correspondiente al elemento estructural (viga o tablero) que ha de asentarse sobre el apoyo. Cuando este elemento sea prefabricado, la cuña de nivelación se podrá adherir al mismo con resina epoxy.

No se hormigonará o colocará el elemento estructural superior, sin la aprobación por la D.O. del replanteo y cotas de las bases de nivelación. No deberá haber restos del encofrado que sirvió para hormigonar estas bases, y la superficie deberá estar perfectamente limpia.

Deberá quedar altura libre suficiente para la inspección y sustitución del apoyo, si llega el caso.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

"Recomendaciones para el proyecto y puesta en obra de los apoyos elastoméricos para puentes de carretera".

PG 3-75 "Pliego de Prescripciones Técnicas Generales para Obras de Carreteras y Puentes" con las enmiendas aprobadas por las Órdenes del MOPTMA: O.M. del 31.7.86 (BOE núm. 213 del 5.9), O.M. del 21.1.88 (BOE núm. 29 del 3.2), O.M. del 8.5.89 (BOE núm. 118 del 18.5) y O.M. del 28.9.89 (BOE núm. 242 del 9.10).

UIC 772-1-R-87."Principios generales de empleo de los aparatos de apoyo en materiales diversos para los puentes de ferrocarril".

UIC 772-2-R-89. "Directrices para la utilización de los aparatos de apoyo de caucho en los puentes de ferrocarril".

JUNTAS DE DILATACIÓN EN PASOS SUPERIORES

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN:

Se definen como juntas de tablero los dispositivos que enlazan los bordes de los tableros contiguos, o de un tablero y un estribo, de forma que permitan los movimientos por cambios de temperatura, y deformaciones de la estructura. Al tiempo que presentan una superficie lo más continua posible a la rodadura.

La ejecución de la unidad de obra incluye las operaciones siguientes:

- Corte y demolición del pavimento en el ancho ocupado por la junta.
- Colocación y anclaje de los elementos de la junta.

- Sellado del perrmetro de la junta con resina epoxy, enrasando con el pavimento.

CONDICIONES GENERALES:

El Contratista someterá a fa Dirección de Obra las características precisas de la junta que propone utilizar.

Cumplirá lo especificado en el Artículo 694 del PG-3.

Las juntas estarán constituidas por bandas de materiales elastoméricos y en su caso perfiles metálicos y deberán ser capaces de absorber deformaciones en tres direcciones perpendiculares entre si, si bien su función principal es la de recoger los movimientos impuestos por la temperatura y las acciones reológicas, cuando éstas afectan a los tableros de los puentes.

Las características básicas que debe cumplir este tipo de juntas son:

- Elasticidad para seguir los movimientos sin agrietarse o introducir esfuerzos inadmisibles en los tableros. El movimiento total admisible será el indicado en los Planos.

- Estanqueidad en caso de lluvia, nieves, fuertes condensaciones, inundaciones, etc., evitando cualquier filtración.

- Posibilidad de deslizamiento de cualquiera de los bordes en las tres direcciones básicas fundamentales en relación con loS ejes de simetría de las juntas.

- Resistencia al desgaste producido por el paso de vehículos en número correspondiente a la intensidad media prevista ya los efectos accidentales de frenado y arranque de los mismos.
- Conservación de las características mecánico elásticas de los materiales de la junta y bordes, dentro de las temperaturas extremas a que van a ser sometidas.
- No ocasionar, en cualquier situación de trabajo, resaltes o hundimientos que se traduzcan en golpeteos molestos al paso de loS vehículos.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

La junta se montará de acuerdo con las instrucciones del fabricante, poniendo especial atención a su anclaje al tablero ya su enrase con la superficie del pavimento.

Antes de montar la junta, se ajustará su abertura inicial, en función de la temperatura media de la estructura en ese momento y de los acortamientos diferidos previstos.

3.- NORMATIVA DE CUMPLIMIENTO OBLIGATORIO

PG 3/75 "Pliego de Prescripciones Técnicas Generales para Obras de Carreteras Y Puentes." Con las modificaciones aprobadas por las Ordenes del MOPTMA: O.M. del 31.7.86 (BOE n° 213 del 5.9), O.M. deI21.1.88 (BOE n° 29 del 3.2), O.M. del 8.5.89 (BOE n° 118 del 18.51 V O.M. del 28.9.89 (BOE n° 242 del 9.10}.

IMPERMEABILIZACIÓN Y DRENAJE CON GEOTEXTIL DE TRASDÓS DE MUROS Y DE ESTRIBOS

1.- DEFINICIÓN Y CONDICIONES GENERALES

Consiste en la extensión y fijación al trasdós de los muros y estribos de una lámina drenante que, conectada a un sistema longitudinal constituido por un tubo también drenante, evacue las posibles aguas de filtración que puedan incidir sobre las obras a proteger.

La ejecución de unidad comprende las operaciones siguientes:

- Nivelación de la solera donde se colocará el tubo drenante.

- Colocación y sujeción del tubo drenante.
- Impermeabilización del muro.
- Colocación y fijación al muro de la lámina drenante.
- Relleno con material filtrante.
- Relleno y compactación trasdós del muro.

CONDICIONES GENERALES

La impermeabilización estará constituida por una capa de producto asfáltico aplicada sobre la cara de trasdós del muro, previamente tratada con una imprimación también asfáltica.

La lámina drenante estará compuesta de dos telas filtrantes que cubren al núcleo drenante intermedio. Éste esta formado por monofilamentos de poliamida con un índice de huecos del orden del noventa y cinco por ciento (95%1 (=1: 1 %). Las dos telas filtrantes son de geotextil no tejido a base de hilos de poliester recubiertos de poliamida unidos por soldadura.

Las telas filtrantes sobresalen por cada lado del núcleo drenante para poder solapar la unión de una pieza con la contigua, recubriendo el muro en su totalidad.

El Director de Obra podrá' autorizar la utilización de láminas filtrantes en la que una de las telas (la que queda adosada al muro) sea impermeable. En este caso podrá suprimirse la impermeabilización aplicada en el paramento del muro.

El espesor de la lámina filtrante será como mínimo de quince milímetros (15 mm) y su peso por metro cuadrado no será inferior 8, seiscientos gramos por metro cuadrado (600 gr/m2),

El geotextil en contacto con el terreno tendrá un peso mínimo de ciento cincuenta gramos por metro (150 gr/m2), La capacidad de evacuación de agua será superior a un litro por segundo y metro (1 I/s*m).

El Director de Obra podrá autorizar el empleo de láminas filtrantes que utilicen otros procedimientos diferentes para mantener la separación entre láminas, previa acreditación por parte del Contratista de que el producto ha sido empleado, con resultados satisfactorios en obras similares.

El sistema descrito es de aplicación a los estribos de puentes y muros de contención de terraplenes. En las pequeñas obras de fábrica cubiertas por los rellenos, se aplicará un pintado con emulsión asfáltica sobre el paramento en contacto con las tierras.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

La colocación de la lámina drenante y su fijación al muro se hará de acuerdo con instrucciones del fabricante del producto pero siguiendo las siguientes fases:

Nivelación de la solera donde se colocará el tubo drenante.

Colocación y sujeción del tubo drenante en la situación indicada en los planos.

Impermeabilización del muro.

Colocación y fijación al muro de la lámina drenante.

Relleno con material filtro, tal como se indica en los planos, de la zona donde va ubicado el dren.

Por último, relleno y compactaci6n con el material adecuado, del trasd6s del muro.

Las láminas de geotextil se protegerán del paso sobre ellas de personas, equipos o materiales.

3.- NORMATIVA DE CUMPLIMIENTO OBLIGATORIO

PG-3/75 "Pliego de Prescripciones Técnicas Generales para Obras de Carreteras y Puentes" con las modificaciones aprobadas por las Ordenes del MOPTMA: O.M. del 31-7-86 (B.O.E. n° 213 del 5.9), O.M. del 21-1-88/B.O.E. n° 29 del 3.2.), O.M. del 8.5.89 (B.O.E. n° 118 de118-51 y O.M. del 28-9-89 (B.O.E. n° 242 del 9.10).

5.1-IC 1965 "Instrucción de Carreteras. Drenaje".

5.2-IC 1990 "Instrucción de Carreteras. Drenaje superficial".

IMPERMEABILIZACIÓN DE TABLEROS EN PUENTES DE FERROCARRIL

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN

Impermeabilización de los tableros de hormigón en puentes y viaductos para ferrocarril, mediante una membrana que impida la filtración del agua a través de la superficie sobre la
que apoya el balasto.

CONDICIONES GENERALES:

La membrana de impermeabilización debe adherir perfectamente al tablero de hormigón y, por otro lado, contar con una protección eficaz frente al envejecimiento por la acción de los agentes atmosféricos y frente al punzonado y desgaste que produciría el contacto directo con el balasto.

Se utilizarán membranas prefabricadas a fin de asegurar una mayor garantra de regularidad y control de ejecución.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

La superficie del tablero debe ser objeto de una limpieza previa con chorro de arena a fin de eliminar cualquier elemento suelto o mal adherido. Las irregularidades superficiales de +/- 5 mm en 2 metros de longitud serán eliminadas de forma que se obtenga un soporte uniforme antes de la aplicación de un riego de imprimación con emulsión bituminosa o producto recomendado por el fabricante en la membrana.

A continuación se colocará la membrana principal de impermeabilización, de base bituminosa mejorada con elastómero y armada con un geotextil protegido exteriormente. La adherencia de esta membrana termosoldable al soporte debe ser perfecta a través del riego de imprimación.

Sobre la membrana de impermeabilización se soldarán dos membranas de protección también armadas con geotextil de gramaje no inferior a 250 recubierto finalmente con una capa adherida de arena gruesa de grano duro.

El espesor total de cada una de las membranas referidas debe ser próximo a 4 mm.

3.- NORMATIVA DE CUMPLIMIENTO OBLIGATORIO

UNE 104-402-90 "Membranas para la impermeabilización de cubiertas realizadas con materiales bituminosos y bituminosos modificados. Clasificación, designación y constitución".

NBE QB-90 "Norma Básica de la Edificación. Cubiertas con materiales bituminosos."

IMPERMEABILIZACIÓN DE TABLEROS DE PASOS SUPERIORES DE CARRETERA

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN

Ejecución de una capa de impermeabilización en los tableros de hormigón en los Pasos Superiores para carretera, a fin de evitar la penetración del agua infiltrada a través del pavimento.

CONDICIONES GENERALES

Se dispondrá una impermeabilización mediante mástic bituminoso, constituida por:

- Un riego de adherencia con emulsión ECR-1 y dotación de quinientos gramos por metro cuadrado (0,5 kg/m2) de betún residual.

- Mástic bituminoso de un centímetro (1,0 cm), con la composición siguiente:

  -Emulsión asfáltica 22-30%
  -Arena, contenido 20/25 de filler 72-80%
  -Polvo de amianto de fibra corta 2/4%

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

La superficie del hormigón del tablero estará limpia y perfectamente seca, sin ningún elemento suelto.

No presentará huecos ni resaltes de más de 20 mm. En caso contrario. Se corregirán las irregularidades utilizando mortero epoxy para rellenar las cavidades.

Sobre el riego de adherencia ejecutado, se aplicará el mástic bituminoso en dos capas hasta alcanzar su espesor total.

SUMIDERO EN TABLERO DE PUENTES

1.- DEFINICIÓN Y CONDICIONES GENERALES

Se define como sumidero la boca de desagüe, generalmente protegido por una rejilla, que sirve para vaciar el agua de lluvia de los tableros de las obras de fábrica, y que se dispone de forma que la entrada del agua sea en sentido sensiblemente vertical.

Los desagües de tableros de estructuras y los dispuestos en sus estribos tendrán la forma, dimensiones y características definidas en los Planos.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

Después de la terminación de cada unidad se procederá a su limpieza total, eliminando todas las acumulaciones de limo, residuos o materias extrañas de cualquier tipo, debiendo mantenerse libres de tales acumulaciones hasta la recepción definitiva de las obras.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO.

No existe normativa de obligado cumplimiento.

BARANDILLAS DE ACERO

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN:

Barandillas unidas mediante soldadura, a las placas de anclaje sobre tableros de puentes y viaductos.

La ejecución de la unidad de obra incluye las operaciones siguientes:

- Replanteo y alineación de los elementos que forman la barandilla.
- Suministro de la barandilla.
- Suministro de la placa de anclaje, en su caso.
- Ejecución de los dados de anclaje.
- Montaje y colocación de la barandilla.
- Limpieza y recogida de tierras y restos de obra.
- Pintura de la barandilla.

CONDICIONES GENERALES:

La barandilla tipo, que se representa en los Planos, está formada por montantes de perfiles laminados y elementos horizontales tubulares.

Los elementos que forman la barandilla cumplirán los Artículos 250.251 y 640 del PG-3.

Todas las secciones fijas de la barandilla se realizarán por soldadura continua, uniforme e impecable.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

A excepción de aquellas partes de los postes que queden empotradas las demás superficies de las barandillas se suministrarán provistas de dos manos de pintura antioxidante (minio o cianamida de plomo).

Una vez instalada la barandilla y antes de su fijación definitiva, se procederá a una minuciosa alineación de la misma y aprobación del replanteo por la D.O.

El hueco de los cajetines se rellenará con mortero de cemento. Alrededor de los postes y placas de sujeción, se formará una junta de masilla bituminosa de dos por tres (2 x 3) cm.

La barandilla irá pintada en el color que ordene el Director de las Obras, con doble capa de pintura de primera calidad. En las proximidades de las juntas de construcción del tablero se dispondrán también en las barandillas juntas de dilatación.

3.- NORMATIVA DE CUMPLIMIENTO OBLIGATORIO

Se aplicará la normativa vigente en el momento de ejecución de las obras.

PUESTA A TIERRA DE ELEMENTOS METÁLICOS Y ARMADURAS EN VIADUCTOS y PUENTES PARA FERROCARRIL

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN

La puesta a tierra de las armaduras, barandillas, postes y todos los elementos metálicos en viaductos y puentes de los ferrocarriles, tiene por objeto proteger a las personas e instalaciones de los efectos derivados de la diferencia de potencial causados por el propio sistema de tracción eléctrica en condiciones normales y en condiciones anormales (fallos, cortocircuitos, descargas atmosféricas etc.).

Esta unidad consiste en la puesta a tierra de las partes metálicas y armaduras de acero (salvo los cables de tesado) de todos los puentes y viaductos para ferrocarril, a fin de conseguir que estos elementos se encuentren unidos equipotencialmente.

Todos los elementos metálicos {incluido señales, barandillas, postes, etc.), deben ponerse a tierra a través del sistema global que se describe.

CONDICIONES GENERALES

Los cables para las conexiones a tierra deben ser, en todos los casos, resistentes a las intensidades de cortocircuito.

La colocación de los cables y conexiones de puesta a tierra se realizará según el detalle que figura en Planos.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

En todos los pilares y estribos se realizará una puesta a tierra de las armaduras. La continuidad eléctrica se obtendrá conectando la armadura del tablero con la armadura del pilar o estribo y con la de la cimentación, y ésta con una puesta a tierra, construida previamente mediante pletinas de acero galvanizado o malla de cables de cobre. Para poder realizar la medición de la tierra, se colocará 1 pica de acero-cobre unida al extremo del cable de toma de tierra, e irá alojada en una arqueta de 0,40 x 0,4 x 0,6 m. rellena de arena y registrable. En la cabeza de la pila o estribo se habrá dejado un terminal de conexión para su unión a la armadura del tablero.

Las puestas a tierra en la cimentación, tanto de pilares como de estribos, deberán tener una resistencia de difusión 10 Ohmios.

La armadura del tablero estará unida (salvo los cables de tesado), tanto transversal como longitudinalmente para conseguir la continuidad eléctrica, y se conexionará a los carriles exteriores en cada pila y estribo, con cable de cobre de 50 mm2 como mínimo.

Se dejarán terminales en el tablero (a ambos lados de las vías), a la altura de cada pila y estribo, para las siguientes conexiones:

- Con el carril exterior.
- Con el cable de retorno (a través del poste de electrificación).
- Con la armadura de la pila o estribo.

La conexión al cable de retorno se realizará a través del poste de electrificación más próximo a la pila o estribo.

En el caso particular del tablero solidarizado a los apoyos laterales (caso de pórticos o marcos cerrados), se dará continuidad al conjunto de toda la armadura hasta la puesta a tierra en la cimentación de los apoyos.

En caso que la armadura del tablero no esté unida de la forma indicada anteriormente, se colocará longitudinalmente en ambos lados de las vías, una pletina de acero galvanizado de 30 mm x 4 mm o preferentemente cable de cobre de 50 mm2 como mínimo, que se unirá a los redondos de la armadura ya los carriles exteriores en cada pila y estribo, debiéndose conectar al sistema de puesta a tierra descrito anteriormente.

En las juntas de dilatación del tablero deberán montarse las correspondientes conexiones de puenteo de las armaduras.

Cualquier otro elemento metálico situado en viaductos o puentes, se conectará al carril, bien directamente o a través del cable de retorno o poste de electrificación.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

EN 50122-1 " Aplicaciones ferroviarias. Instalaciones fijas. Parte 1. provisión de protecciones relacionadas con la seguridad eléctrica y la puesta a tierra".

MIE-RAT "Reglamento de Alta Tensión: Art.12-6 Conexión de los apoyos a tierra. Art.26 Resistencia de difusión máxima de puesta a tierra".

VALLA METÁLICA ANTIVANDALISMO EN PASOS SUPERIORES

1.- DEFINICIÓN Y CONDICIONES GENERALES.

DEFINICIÓN:

Enrejado de 2,5 m de altura, con malla y postes de tubo, o malla, bastidor y postes, colocados con soldadura sobre la placa de anclaje de la barandilla, en los lugares y forma que indiquen los planos o las instrucciones de la D.O.

La unidad de obra comprende las operaciones siguientes:

- Replanteo y alineación de los elementos que forman la valla.
- Suministro de la valla.
- Colocación de los elementos que forman el enrejado.

CONDICIONES GENERALES:

Los elementos de la valla serán de acero galvanizado y cumplirán las especificaciones del Articulo 620 y siguientes del PG-3.

La reja quedará bien fijada al soporte. Estará aplomada y con los ángulos y niveles previstos.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

La D.O. aprobará el replanteo antes de la fijación de la valla.

Durante todo el proceso constructivo, se garantizará la protección de la valla contra los empujes e impactos mediante los anclajes oportunos y se mantendrá el aplomado con ayuda de elementos auxiliares.

4.- NORMATIVA DE CUMPLIMIENTO OBLIGATORIO.

Se aplicará la normativa vigente en el momento de ejecución de las obras.

PRUEBAS DE CARGA EN PASOS SUPERIORES DE CARRETERA

1.- DEFINICIÓN Y CONDICIONES GENERALES

DEFINICIÓN

Se define como prueba de carga en puentes de carretera, al conjunto de operaciones de control, cuya realización es preceptiva antes de su apertura al tráfico, a fin de comprobar la adecuada concepción, la estabilidad y el buen comportamiento de la obra.

La ejecución de la unidad de obra comprende las operaciones siguientes:

- Inspección previa de todos los elementos de la estructura.
- Marcado de posiciones de los camiones.
- Colocación y nivelación de flexímetros y demás aparatos de medida.
- Ejecución de las fases de carga y medición de flechas.
- Informe de resultados.

CONDICIONES GENERALES

El Contratista deberá presentar a la D.O. el proyecto correspondiente pata la realización de la prueba de carga.

La prueba se realizará mediante camiones, según se describe en el Proyecto.

Se tendrán en cuenta las directrices generales incluidas en las "Recomendaciones para el Proyecto y Ejecución de Pruebas de Carga en Puentes de Carretera", MOPU 1988.

Los camiones a utilizar en la prueba de carga cumplirán los requisitos establecidos en las citadas Recomendaciones. de forma que las solicitaciones teóricas elegidas sean prácticamente idénticas a las producidas por los vehículos previstos.

Los equipos de medida cumplirán lo especificado en dicha Recomendación, y serán manipulados por personal adecuadamente formado, de manera que los datos y resultados respondan fehacientemente a la respuesta de la estructura en las diferentes fases de carga.

Se utilizarán, al menos, los siguientes aparatos de medida:

Flexímetros, para medida de deformaciones verticales: serán adecuados en cada puente a las posibilidades de observación existente, pero en ningún caso tendrán menos de 5 cm de recorrido y 0,01 m m de precisión. Si las condiciones físicas del puente, no permiten utilizar flexímetros se usarán picas o elementos topográficos que garanticen una sensibilidad de lectura adecuada.

lupas graduadas para observar y medir la formación de fisuras: permitirán observar décimas de milímetro

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN.

CARGAS DE LOS ENSAYOS

En ningún caso las acciones del tren de cargas a utilizar y las solicitaciones a que aquéllas den lugar, podrán ser más desfavorables que las del tren de cargas de la "Instrucción de Acciones", estimándose como suficiente si tales esfuerzos oscilan entre el70 y e180% de los máximos producidos por el citado tren de la Instrucción.

El tren de cargas estará compuesto por un conjunto de camiones con el peso total, por unidad, adoptado en el cálculo de la prueba, pesados los ejes de cada camión por separado, y colocados en sucesivas filas.

La carga de prueba será estática, es decir, una vez colocados los camiones como se indica en el apartado "Pruebas de carga" del Anejo de Estructuras y en el punto 2 siguiente, se harán las mediciones correspondientes. En el momento de iniciarse las pruebas, el hormigón de cualquier elemento resistente de la obra deberá tener una edad mínima de 90 días.

Se comprobará, asimismo, que los elementos auxiliares de acceso a las zonas de control y trabajo estén correctamente adaptados con el fin de no retrasar o entorpecer el proceso de ensayo.

Se controlarán especialmente las condiciones generales del ambiente, especialmente los cambios climatológicos y de las situaciones de soleamiento, previo y durante el proceso de ensayo, determinando claramente los aspectos específicos de estos cambios.

MEDICIONES MÍNIMAS A REALIZAR

1. Para cada estado de cargas se medirán, al menos, los siguientes datos de las secciones indicadas:

a. Sección central: Flecha en sus bordes y punto medio.
b. Secciones de apoyos: Deformaciones verticales.

2. En cada una de las secciones antes definidas, se harán las mediciones indicadas en cada uno de los siguientes estados:

a. Descargado el tablero.
b. Cargada la mitad del tablero longitudinalmente.

c. Cargado todo el tablero.

d. Después de retirar la mitad de la carga total.

3. Los camiones se colocarán en la posición de carga en cada caso, manteniéndolos en ella 10 minutos, descargando después el tablero y dejando otros 10 minutos antes de empezar un escalón de carga.

Las flechas se medirán:

a. Antes de empezar la prueba de carga.

b. A los 10 minutos de colocados los camiones de cada escalón de carga.

c. 10 minutos después de retirados los camiones en cada escalón de carga.

PREPARACIÓN DE LA PRUEBA DE CARGA

1. Cálculo.

El proyecto de la prueba de carga definirá, con los tipos de camiones y cargas elegidos, un croquis en planta de la situación exacta de cada camión y eje en el tablero.

Este croquis servirá para reflejar en el tablero mediante señales adecuadas para la correcta situación de cada camión.

Una vez definido el croquis de cargas y situaciones, se calcularán los esfuerzos y las flechas correspondientes en cada punto y sección antes indicados y para cada escalón de carga antes definido.

2. Referencias fijas y mediciones precisas.

Antes de proceder a la realización de las pruebas se nivelarán los puntos de medición ya indicados en el apartado 1, referidos a puntos de referencia fijos fuera del puente y no afectados por la prueba de carga de forma que sea lo más sencillo posible referir a éstos las deformaciones de un punto cualquiera de cada escalón de carga.

3. Observación previa del tablero.

Antes de comenzar las pruebas se recorrerán detenidamente las estructuras, observando concienzudamente las fisuras que existan, midiendo su tamaño con lupas y marcando los puntos en que se hagan estas medidas para realizar posteriores mediciones en cada escalón de carga.

4. Resultados y tolerancias.

En todo lo que sigue, ya efectos de flechas en centro de vano se considera como tal, la diferencia entre la lectura correspondiente a ese centro de vano y la media de las lecturas correspondientes a las secciones de apoyo del vano.

Las flechas estabilizadas obtenidas para cada escalón, se compararán con las teóricas obtenidas para esa misma fase.

Se considerarán aceptables estos resultados si la diferencia entre ambos valores es inferior, en valor absoluto, al1 0% de la flecha teórica. Del cálculo teórico de las flechas debidas a las sobrecargas y de las flechas medidas, se deducirá el coeficiente de elasticidad medio del hormigón, comprobándose si dicho coeficiente tiene un valor razonable, habida cuenta de las características del hormigón empleado.

Asimismo, se obtendrá la flecha remanente por diferencia entre las lecturas correspondientes a los estados anterior y posterior a la prueba. Como orden de magnitud para valores aceptables de las flechas remanentes, pueden indicarse los siguientes:

-Del orden del 20% de la flecha teórica máxima, si la edad de la obra es inferior a seis meses.

-Del orden del1 0% de la flecha teórica máxima, si la edad de la obra es superior a seis meses.

Si en la primera carga se obtienen flechas remanentes elevadas, se procederá a un segundo ciclo de carga y si tampoco se obtuviesen resultados satisfactorios, la D.O. suspenderá la prueba y adoptará las medidas convenientes.

DESARROLLO DE LA PRUEBA

1. Antes de comenzar la prueba de carga:

a) Se marcarán sobre el tablero las posiciones exactas que han de tener los ejes longitudinales de los camiones y los transversales de los ejes en estas posiciones, durante la prueba.

b) Se pesarán cada uno de los ejes de los camiones, comprobando su coincidencia con las teorías de la prueba.

c) Se habrán colocado y nivelado o tarado los flexímetros y demás aparatos de medida, en las secciones y puntos antes indicados.

d) Se harán las nivelaciones, observación y medición de fisuras previstas en la preparación de la prueba.

e) Medición de flechas en el tablero descargado.

2. Durante la realización de la prueba de carga.

a) Se colocará primero un camión en su posición exacta antes de entrar el siguiente de la misma fila y así sucesivamente hasta completar ésta.

Durante esta operación, se observarán en todo momento los aparatos de medida, anotando los resultados más importantes, aunque no figurarán en el informe, ni tengan valor para deducir el comportamiento de la estructura mientras se actúe con cargas parciales.

Una vez colocada toda la fila, se harán las medidas en las secciones y puntos previstos.

Se continuará cargando con las mismas precauciones antes citadas en cada uno de los escalones indicados.

b) Se deberá medir con especial cuidado los descensos de los apoyos.

c) Se anotarán siempre los datos siguientes:

-Hora exacta de las sucesivas operaciones efectuadas.
-Lista y matrícula de los vehículos utilizados, con sus pesos por ejes.
-Posiciones de los vehículos en cada escalón de carga.
-Resultados en cada medición de cada aparato.
-Comprobación de flechas calculadas y medidas.
-Datos que permitan el fácil reencuentro de las referencias de nivelación.
-Comienzo y progresión de fisuras.
-Cualquier otro dato que pueda parecer útil (vibraciones, etc.)

3. Una vez terminada la prueba se hará un informe, que constará como mínimo de:

a) Croquis de situación de camiones, indicando posiciones y cargas por eje.

b) Croquis de situación de todos los aparatos de medida.

c) Croquis de situación de puntos de referencias fijos.

d) Lecturas realizadas en todos los aparatos de medida en escalón o estado de carga.

e) Flechas que se deducen de las anteriores lecturas.

f) Diagrama de flechas reales (tanto longitudinalmente como transversales), descontando el descenso de los apoyos.

g) Diagrama de los descensos de los apoyos.

h) Porcentajes de recuperación registrados en flechas.

i) Registros de fisuras.

j) Incidencias que se presentaron durante la realización de la prueba.

k) Conclusiones.

En las conclusiones figurarán expresamente la aceptación o no del puente ensayado con las exigencias de nuevas pruebas de carga, puesta en servicio provisional o definitiva, refuerzo, etc.

3.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

Recomendaciones para la Realización de Pruebas de Carga en Puentes de Carretera (MOPU 1988).

PUESTA A TIERRA DE ELEMENTOS METÁLICOS y ARMADURAS EN PASOS SUPERIORES

1.- DEFINICIÓN y CONDICIONES GENERALES

DEFINICIÓN

La puesta a tierra de las armaduras, barandillas y todos los elementos metálicos en pasos superiores sobre ferrocarriles, tiene por objeto proteger a las personas e instalaciones de los efectos derivados de la diferencia de potencial causados por el propio sistema de tracción eléctrica en condiciones normales y en condiciones anormales (fallos, cortocircuitos, etc.).

Esta unidad consiste en la puesta a tierra de las partes metálicas y armaduras de acero (salvo los cables de tesado) de todos los pasos superiores, a fin de conseguir que dichos elementos se encuentren unidos equipotencialmente.

Todos los elementos metálicos {incluido elementos de protección, barandillas, etc), deben ponerse a tierra a través del sistema global que se describe.

CONDICIONES GENERALES

Los cables para las conexiones a tierra deben ser, en todos los casos, resistentes a las intensidades de cortocircuito.

La colocación de los cables y conexiones de puesta a tierra se realizará según el detalle que figura en planos.

2.- CONDICIONES DEL PROCESO DE EJECUCIÓN

La armadura del tablero estará unida (salvo los cables de tesado), tanto transversal como longitudinalmente para conseguir la continuidad eléctrica. En las juntas de dilatación del tablero, deberán montarse las correspondientes conexiones de puenteo de las armaduras.

Asimismo, en los estribos y en los pilares del paso elevado, la armadura también debe estar unida longitudinal y transversalmente, y conectada a la armadura de la cimentación, para darle continuidad eléctrica.

Para la puesta a tierra de las armaduras se unirá, mediante lazos de conexión, la armadura de los estribos a la del tablero y la de éste a la armadura de los pilares, estando finalmente éstos últimos conectados a los carriles exteriores de las vías, y debiéndose dejar preparados en la fase de construcción del paso superior los siguientes terminales:

- Armadura tablero -armadura estribos 4-4
- Armadura tablero -armadura pilar 2-2
- Armadura pilar -carriles exteriores 2

La conexión a los carriles se realizará en la fase de instalación de la catenaria.

Las barandillas, las biondas y los dispositivos metálicos de protección de los pasos elevados se pondrán a tierra, conectándose entre sí y, posteriormente, a la armadura de los pilares va través de éstos a los carriles exteriores.

Las barandillas y biondas deben estar eléctricamente seccionadas al final de la zona de afectación al ferrocarril para impedir que haya fugas del potencial de vía o se produzcan corrientes de retorno.

Todos los lazos de conexión se realizarán mediante cable de Cu desnudo de 50 mm2, con terminales para atornillar o soldar.

4.- NORMATIVA DE OBLIGADO CUMPLIMIENTO

EN 50122-1. " Aplicaciones ferroviarias Instalaciones fijas. Parte 1ª provisión de protecciones relacionadas con la seguridad eléctrica y la puesta a tierra".

MIE-RAT. "Reglamento de Alta Tensión: Art. 12-6 Conexión de los apoyos a tierra. Art. 26. Resistencia de difusión máxima de puesta a tierra",

6. Resumen del control de calidad (Empresa Constructora y Asistencia Técnica)

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-1 (313+106)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
24-may-01	Zap. estribo aleta 3	HA-30/b/20/IIb+H	271	260		**266**	328	347		**338**	**27,1%**	6
24-may-01	Zap. estribo aleta 3	HA-30/b/20/IIb+H	305	294		**300**	350	331		**341**	**13,7%**	5
25-may-01	Zap. Aleta 1	HA-30/b/20/IIb+H	285	285		**285**	314	300		**307**	**7,7%**	10
25-may-01	Zap. Aleta 1	HA-30/b/20/IIb+H	266	268		**267**	333	314		**324**	**21,2%**	9
28-may-01	Zap. Aleta 2	HA-30/b/20/IIb+H	277	283		**280**	322	333		**328**	**17,0%**	10
28-may-01	Zap. Aleta 2	HA-30/b/20/IIb+H	268	299		**284**	303	328		**316**	**11,3%**	9
31-may-01	Zapata Pórtico	HA-30/b/20/IIb+H	226	263		**245**	304	325		**315**	**28,6%**	6
31-may-01	Zapata Pórtico	HA-30/b/20/IIb+H	268	265		**267**	302	312		**307**	**15,2%**	7
4-jun-01	Zapata Aleta 2	HA-30/b/20/IIb+H	289	302		**296**	328	328		**328**	**11,0%**	7
4-jun-01	Zapata Aleta 1	HA-30/b/20/IIb+H	277	294		**286**	339	336		**338**	**18,2%**	6
13-jun-01	Alz. Estribo Zap. Central	HA-30/b/20/IIb+H	254	277		**266**	319	336		**328**	**23,4%**	9
13-jun-01	Alzado Estribo	HA-30/b/20/IIb+H	260	250		**255**	322	328		**325**	**27,5%**	9
13-jun-01	Alzado Estribo	HA-30/b/20/IIb+H	311	320		**316**	328	350		**339**	**7,4%**	7
13-jun-01	Alzado Estribo	HA-30/b/20/IIb+H	299	285		**292**	333	328		**331**	**13,2%**	9
13-jun-01	Alzado Estribo	HA-30/b/20/IIb+H	331	308		**320**	350	367		**359**	**12,2%**	6
21-jun-01	Alzado estribo 2	HA-25/b/20/IIa	188	183		**186**	258	250		**254**	**36,9%**	6
21-jun-01	Alzado estribo 2	HA-25/b/20/IIa	220	201		**211**	257	254		**256**	**21,4%**	6
28-jun-01	Alzado aleta 2 (2ª fase)	HA-25/b/20/IIa	254	260		**257**	271	294		**283**	**9,9%**	5
3-jul-01	Alzado aleta 2 dcha (2ª fase)	HA-25/b/20/IIa	203	178		**191**	265	273		**269**	**41,2%**	6
3-jul-01	Alzado aleta 2 izq (2ª fase)	HA-25/b/20/IIa	198	174		**186**	256	262		**259**	**39,2%**	7
6-jul-01	Aleta 1 (1ª fase)	HA-25/b/20/IIa	172	170		**171**	203	209		**206**	**20,5%**	8
17-jul-01	Aleta 1 (2ª fase)	HA-25/b/20/IIa	249	254		**252**	308	308		**308**	**22,5%**	6
17-jul-01	Alzado estribo 2	HA-25/b/20/IIa	288	283		**286**	345	347		**346**	**21,2%**	8
18-jul-01	Alzado aleta dcha 1 (2ªfase)	HA-25/b/20/IIa	268	246		**257**	308	305		**307**	**19,3%**	7
27-sep-01	Losa superior	HA-30/b/20/IIb	322	333		**328**	376	396		**386**	**17,9%**	8
27-sep-01	Losa superior	HA-30/b/20/IIb	314	319		**317**	350	336		**343**	**8,4%**	7
27-sep-01	Losa superior	HA-30/b/20/IIb	316	299		**308**	336	342		**339**	**10,2%**	9
27-sep-01	Losa superior	HA-30/b/20/IIb	328	342		**335**	367	353		**360**	**7,5%**	9
27-sep-01	Losa superior	HA-30/b/20/IIb	302	311		**307**	339	362		**351**	**14,4%**	7

E-1 (313+106)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
27-sep-01	Losa superior	HA-30/b/20/IIb	319	305		**312**	373	376		**375**	**20,0%**	8
27-sep-01	Losa superior	HA-30/b/20/IIb	305	311		**308**	353	359		**356**	**15,6%**	7
27-sep-01	Losa superior	HA-30/b/20/IIb	356	350		**353**	387	407		**397**	**12,5%**	7

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-2 (315+880)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
22-ago-01	Zapata estribo 2	HA-25/b/20/IIa	266	249		**258**	325	325		**325**	**26,2%**	9
7-sep-01	Alzado estribo 2	HA-25/b/20/IIa	263	240		**252**	350	364		**357**	**41,9%**	7
24-may-02	Zapata pila derecha	HA-30/b/20/IIa	305	316		**311**	381	373		**377**	**21,4%**	9
24-may-02	Zapata pila izquierda	HA-30/b/20/IIa	316	325		**321**	396	393		**395**	**23,1%**	8
27-may-02	Alzado pila izquierda (1 fase)	HA-30/b/20/IIa	347	353		**350**	401	396		**399**	**13,9%**	7
30-may-02	Alzado pila derecha (2 fase)	HA-30/b/20/IIa	325	311		**318**	393	384		**389**	**22,2%**	9
6-jun-02	Zapata estribo izq.	HA-30/b/20/IIa	336	319		**328**	401	407		**404**	**23,4%**	8
12-jun-02	Alzado estribo izq.	HA-30/b/20/IIa	308	297		**303**	396	390		**393**	**29,9%**	7
10-jul-02	Tablero	HA-30/b/20/Ilb	331	319		**325**	412	418		**415**	**27,7%**	7
10-jul-02	Tablero	HA-30/b/20/Ilb	294	305		**300**	410	418		**414**	**38,2%**	8
10-jul-02	Tablero	HA-30/b/20/Ilb	305	308		**307**	396	401		**399**	**30,0%**	9
10-jul-02	Tablero	HA-30/b/20/Ilb	359	362		**361**	444	452		**448**	**24,3%**	9
10-jul-02	Tablero	HA-30/b/20/Ilb	356	342		**349**	424	424		**424**	**21,5%**	8

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-3 (311+230)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
4-jun-01	Zap. Aleta Dcha Estribo 1	HA-30/b/20/IIb+H	308	308		**308**	364	367		**366**	**18,7%**	6
4-jun-01	Zap. Aleta Dcha Estribo 1	HA-30/b/20/IIb+H	320	308		**314**	367	356		**362**	**15,1%**	7
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	319	316		**318**	367	370		**369**	**16,1%**	8
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	297	297		**297**	328	339		**334**	**12,3%**	7,5
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	299	297		**298**	333	321		**327**	**9,7%**	8
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	299	297		**298**	331	311		**321**	**7,7%**	7,5
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	302	290		**296**	356	333		**345**	**16,4%**	7
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	288	280		**284**	373	352		**363**	**27,6%**	7
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	291	297		**294**	356	336		**346**	**17,7%**	8
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	294	283		**289**	320	316		**318**	**10,2%**	8
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	277	275		**276**	306	302		**304**	**10,1%**	7
6-jun-01	Zap. Estribo 1	HA-30/b/20/IIb+H	257	254		**256**	311	302		**307**	**20,0%**	8
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	257	232		**245**	311	304		**308**	**25,8%**	7
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	263	232		**248**	316	305		**311**	**25,5%**	8
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	249	229		**239**	314	306		**310**	**29,7%**	8
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	234	218		**226**	308	305		**307**	**35,6%**	7
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	229	260		**245**	305	305		**305**	**24,7%**	10
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	311	299		**305**	359	364		**362**	**18,5%**	9
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	294	314		**304**	352	344		**348**	**14,5%**	7
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	286	302		**294**	311	316		**314**	**6,6%**	9
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	240	209		**225**	342	316		**329**	**46,5%**	9
8-jun-01	Zap. Estribo 1 (2ª fase)	HA-30/b/20/IIb+H	263	305		**284**	363	353		**358**	**26,1%**	10
12-jun-01	Zap. Aleta Dcha Estribo 2	HA-30/b/20/IIb+H	283	268		**276**	367	336		**352**	**27,6%**	6
12-jun-01	Zap. Aleta Dcha Estribo 2	HA-30/b/20/IIb+H	339	314		**327**	393	376		**385**	**17,8%**	8
12-jun-01	Zap. Aleta Dcha Estribo 2	HA-30/b/20/IIb+H	271	268		**270**	308	308		**308**	**14,3%**	6
12-jun-01	Zap. Aleta Dcha Estribo 2	HA-30/b/20/IIb+H	305	267		**286**	306	322		**314**	**9,8%**	5
13-jun-01	Zapata Alero (2ª fase)	HA-30/b/20/IIb+H	283	299		**291**	311	302		**307**	**5,3%**	7
13-jun-01	Zapata Alero (2ª fase)	HA-30/b/20/IIb+H	274	297		**286**	356	339		**348**	**21,7%**	9

E-3 (311+230)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
13-jun-01	Zapata Alero (2ª fase)	HA-30/b/20/IIb+H	352	379		**366**	385	379		**382**	**4,5%**	10
13-jun-01	Zapata Alero (2ª fase)	HA-30/b/20/IIb+H	277	291		**284**	356	381		**369**	**29,8%**	9
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	274	242		**258**	305	294		**300**	**16,1%**	6
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	280	285		**283**	325	325		**325**	**15,0%**	6
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	266	257		**262**	325	319		**322**	**23,1%**	7
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	262	283		**273**	325	305		**315**	**15,6%**	10
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	243	237		**240**	328	328		**328**	**36,7%**	9
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	297	280		**289**	359	362		**361**	**25,0%**	10
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	288	268		**278**	336	356		**346**	**24,5%**	9
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	266	271		**269**	319	331		**325**	**21,0%**	9
14-jun-01	Zapata Estribo 2	HA-25/b/20/IIa	251	263		**257**	325	328		**327**	**27,0%**	7
15-jun-01	Zapata Alero (3ª fase)	HA-25/b/20/IIa	249	243		**246**	288	280		**284**	**15,4%**	5
15-jun-01	Zapata Alero (3ª fase)	HA-25/b/20/IIa	229	251		**240**	302	288		**295**	**22,9%**	8
18-jun-01	Zapata Aleta 2	HA-25/b/20/IIa	268	254		**261**	299	308		**304**	**16,3%**	7
18-jun-01	Zapata Aleta 2	HA-25/b/20/IIa	274	254		**264**	336	350		**343**	**29,9%**	8
18-jun-01	Zapata Aleta 2	HA-25/b/20/IIa	271	274		**273**	347	336		**342**	**25,3%**	8
18-jun-01	Zapata Aleta 2	HA-25/b/20/IIa	277	277		**277**	308	328		**318**	**14,8%**	9
19-jun-01	Alzado Aleta 1	HA-25/b/20/IIa	209	204		**207**	259	266		**263**	**27,1%**	8
19-jun-01	Alzado Aleta 1	HA-25/b/20/IIa	215	203		**209**	255	260		**258**	**23,2%**	6
4-jul-01	Alzado aleta dcha 1	HA-25/b/20/IIa	184	178		**181**	260	263		**262**	**44,5%**	10
4-jul-01	Alzado aleta dcha 1	HA-25/b/20/IIa	203	203		**203**	254	263		**259**	**27,3%**	7
9-jul-01	Alzado estribo 1 (1ªfase)	HA-25/b/20/IIa	209	212		**211**	257	268		**263**	**24,7%**	10
9-jul-01	Alzado estribo 1 (1ªfase)	HA-25/b/20/IIa	229	220		**225**	266	268		**267**	**18,9%**	8
9-jul-01	Alzado estribo 1 (1ªfase)	HA-25/b/20/IIa	234	226		**230**	299	297		**298**	**29,6%**	7
9-jul-01	Alzado estribo 1 (1ªfase)	HA-25/b/20/IIa	271	277		**274**	305	316		**311**	**13,3%**	8
9-jul-01	Alzado estribo 1 (1ªfase)	HA-25/b/20/IIa	271	268		**270**	316	314		**315**	**16,9%**	7
9-jul-01	Alzado estribo 1 (1ªfase)	HA-25/b/20/IIa	297	291		**294**	331	325		**328**	**11,6%**	7
11-jul-01	Alzado estribo 1 (2ªfase)	HA-25/b/20/IIa	237	240		**239**	280	285		**283**	**18,4%**	7
11-jul-01	Alzado estribo 1 (2ªfase)	HA-25/b/20/IIa	263	260		**262**	302	288		**295**	**12,8%**	8
11-jul-01	Alzado estribo 1 (2ªfase)	HA-25/b/20/IIa	229	226		**228**	288	297		**293**	**28,6%**	7
17-jul-01	Alzado estribo 2 (1ªfase)	HA-25/b/20/IIa	271	266		**269**	322	316		**319**	**18,8%**	7
17-jul-01	Alzado estribo 2 (1ªfase)	HA-25/b/20/IIa	254	254		**254**	294	296		**295**	**16,1%**	7
17-jul-01	Alzado estribo 2 (1ªfase)	HA-25/b/20/IIa	268	251		**260**	306	302		**304**	**17,1%**	7
17-jul-01	Alzado estribo 2 (1ªfase)	HA-25/b/20/IIa	280	260		**270**	311	308		**310**	**14,6%**	7

Resumen rotura hormigón

E-3 (311+230)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
17-jul-01	Alzado estribo 2 (1ªfase)	HA-25/b/20/IIa	249	260		**255**	297	302		**300**	**17,7%**	7
20-jul-01	Alzado estribo 2 (2ªfase)	HA-25/b/20/IIa	283	274		**279**	328	333		**331**	**18,7%**	7
20-jul-01	Alzado estribo 2 (2ªfase)	HA-25/b/20/IIa	285	283		**284**	350	347		**349**	**22,7%**	9
20-jul-01	Alzado estribo 2 (2ªfase)	HA-25/b/20/IIa	268	268		**268**	316	308		**312**	**16,4%**	8
25-jul-01	Alzado aleta izq. 2	HA-25/b/20/IIa	243	246		**245**	297	294		**296**	**20,9%**	10
25-jul-01	Alzado aleta izq. 2	HA-25/b/20/IIa	274	251		**263**	325	302		**314**	**19,4%**	7
25-jul-01	Alzado aleta izq. 2	HA-25/b/20/IIa	266	271		**269**	311	314		**313**	**16,4%**	6
2-ago-01	Alz. sección CC estribo 2 (1ª fase)	HA-25/b/20/IIa	243	257		**250**	322	314		**318**	**27,2%**	7
2-ago-01	Alz. sección CC estribo 2 (1ª fase)	HA-25/b/20/IIa	251	246		**249**	316	311		**314**	**26,2%**	6
2-ago-01	Alz. sección CC estribo 2 (1ª fase)	HA-25/b/20/IIa	229	243		**236**	325	305		**315**	**33,5%**	7
7-ago-01	Alz. sección CC estribo 2 (2ª fase)	HA-25/b/20/IIa	237	240		**239**	322	285		**304**	**27,3%**	7
14-ago-01	Alz. sección CC estribo 2 (3ª fase)	HA-25/b/20/IIa	240	234		**237**	294	285		**290**	**22,2%**	9
20-ago-01	Alzado aleta izq. 2 (2ªfase)	HA-25/b/20/IIa	271	243		**257**	319	314		**317**	**23,2%**	8
5-sep-01	Losa superior (1ª fase)	HA-35/b/20/IIb	319	316		**318**	384	393		**389**	**22,4%**	10
5-sep-01	Losa superior (1ª fase)	HA-35/b/20/IIb	308	314		**311**	373	353		**363**	**16,7%**	10
5-sep-01	Losa superior (1ª fase)	HA-35/b/20/IIb	342	328		**335**	396	398		**397**	**18,5%**	10
5-sep-01	Losa superior (1ª fase)	HA-35/b/20/IIb	311	325		**318**	367	390		**379**	**19,0%**	10
5-sep-01	Losa superior (1ª fase)	HA-35/b/20/IIb	319	314		**317**	398	384		**391**	**23,5%**	10
5-sep-01	Losa superior (1ª fase)	HA-35/b/20/IIb	311	302		**307**	407	390		**399**	**30,0%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	367	379		**373**	475	455		**465**	**24,7%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	345	342		**344**	429	429		**429**	**24,9%**	10
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	362	353		**358**	412	429		**421**	**17,6%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	376	396		**386**	469	458		**464**	**20,1%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	390	384		**387**	452	438		**445**	**15,0%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	418	415		**417**	486	472		**479**	**15,0%**	8
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	373	353		**363**	452	441		**447**	**23,0%**	10
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	418	427		**423**	483	486		**485**	**14,7%**	7
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	410	412		**411**	480	486		**483**	**17,5%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	393	393		**393**	455	452		**454**	**15,4%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	356	342		**349**	429	429		**429**	**22,9%**	10
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	345	342		**344**	407	410		**409**	**18,9%**	10
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	390	393		**392**	475	480		**478**	**22,0%**	8
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	379	376		**378**	458	444		**451**	**19,5%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	387	381		**384**	446	463		**455**	**18,4%**	9

Resumen rotura hormigón

E-3 (311+230)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	381	396		**389**	494	486		**490**	**26,1%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	407	404		**406**	480	469		**475**	**17,0%**	6
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	429	435		**432**	492	514		**503**	**16,4%**	6
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	410	407		**409**	469	469		**469**	**14,8%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	387	384		**386**	497	506		**502**	**30,1%**	9
20-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	401	412		**407**	455	463		**459**	**12,9%**	9
21-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	407	401		**404**	486	475		**481**	**18,9%**	6
21-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	376	390		**383**	480	475		**478**	**24,7%**	6
21-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	379	393		**386**	475	480		**478**	**23,7%**	8
21-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	367	362		**365**	435	446		**441**	**20,9%**	10
21-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	373	367		**370**	429	444		**437**	**18,0%**	8
21-sep-01	Losa superior (2ª fase)	HA-35/b/20/IIb	393	401		**397**	458	458		**458**	**15,4%**	5
8-nov-01	Zap. Aleta	HA-25/b/20/IIa	319	322		**321**	441	460		**451**	**40,6%**	7
8-nov-01	Zap. Aleta	HA-25/b/20/IIa	342	328		**335**	432	418		**425**	**26,9%**	7
20-nov-01	Aleta 1 (1ªfase)	HA-25/b/20/IIa	342	342		**342**	429	441		**435**	**27,2%**	9
20-nov-01	Aleta 1 (1ªfase)	HA-25/b/20/IIa	339	322		**331**	398	412		**405**	**22,5%**	8
23-nov-01	**HA-25/b/20/IIa (anticongelante)**		**339**	**347**		**343**	**429**	**418**		**424**	**23,5%**	**8**
23-nov-01	**HA-25/b/20/IIa (anticongelante)**		**367**	**359**		**363**	**418**	**407**		**413**	**13,6%**	**8**
23-nov-01	**HA-25/b/20/IIa (anticongelante)**		**347**	**353**		**350**	**401**	**412**		**407**	**16,1%**	**8**
23-nov-01	Alzado aleta izq.	HA-25/b/20/IIa	367	356		**362**	396	396		**396**	**9,5%**	8
28-nov-01	Zap. Aleta izq. 1	HA-25/b/20/IIa	387	376		**382**	424	424		**424**	**11,1%**	7
28-nov-01	Zap. Aleta izq. 1	HA-25/b/20/IIa	393	396		**395**	429	449		**439**	**11,3%**	7
12-dic-01	Alz. Aleta Izq. Mod. 2 (1ªfase)	HA-30/b/20/IIb	333	322		**328**	353	339		**346**	**5,6%**	8
12-dic-01	Alz. Aleta Izq. Mod. 2 (1ªfase)	HA-30/b/20/IIb	364	373		**369**	435	446		**441**	**19,5%**	8
10-ene-02	Alz. Aleta izq. Mod.2 (2ªfase)	HA-30/b/20/IIb	373	390		**382**	449	463		**456**	**19,5%**	6
16-ene-02	Alz. Aleta izq. Mod.3 (1ªfase)	HA-30/b/20/IIb	302	294		**298**	396	384		**390**	**30,9%**	8
16-ene-02	Alz. Aleta izq. Mod.3 (1ªfase)	HA-30/b/20/IIb	316	333		**325**	393	407		**400**	**23,3%**	7
16-ene-02	Alz. Aleta izq. Mod.3 (1ªfase)	HA-30/b/20/IIb	336	328		**332**	407	412		**410**	**23,3%**	9
18-ene-02	Alz. Aleta izq. Mod.3 (2ªfase)	HA-30/b/20/IIb	364	356		**360**	441	435		**438**	**21,7%**	6
11-feb-02	Cajetín 2	HA-30/b/20/IIb	285	291		**288**	328	336		**332**	**15,3%**	9
11-mar-02	Espaldón 1	HA-30/b/20/IIb	356	356		**356**	387	373		**380**	**6,7%**	7

Resumen rotura hormigón

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-4 (311+776)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
31-jul-01	Zapata	HA-25/b/20/IIa	254	271		**263**	305	322		**314**	**19,4%**	7
31-jul-01	Zapata	HA-25/b/20/IIa	288	294		**291**	362	347		**355**	**21,8%**	7
31-jul-01	Zapata	HA-25/b/20/IIa	266	285		**276**	325	347		**336**	**22,0%**	9
31-jul-01	Zapata	HA-25/b/20/IIa	291	280		**286**	328	336		**332**	**16,3%**	7
31-jul-01	Zapata	HA-25/b/20/IIa	305	305		**305**	373	379		**376**	**23,3%**	7
31-jul-01	Zapata	HA-25/b/20/IIa	260	274		**267**	367	367		**367**	**37,5%**	7
31-jul-01	Zapata	HA-25/b/20/IIa	294	302		**298**	345	339		**342**	**14,8%**	7
31-jul-01	Zapata	HA-25/b/20/IIa	277	294		**286**	345	353		**349**	**22,2%**	7
3-ago-01	Zapata aleta 1 (1ªfase)	HA-25/b/20/IIa	283	291		**287**	362	364		**363**	**26,5%**	7
9-ago-01	Zapata aleta 2 (2ªfase)	HA-25/b/20/IIa	246	243		**245**	308	294		**301**	**23,1%**	8
9-ago-01	Zapata aleta 3 (1ªfase)	HA-25/b/20/IIa	254	251		**253**	308	308		**308**	**22,0%**	7
10-ago-01	Zapata aleta 1 (2ªfase)	HA-25/b/20/IIa	288	280		**284**	336	322		**329**	**15,8%**	9
14-ago-01	Zapata aleta 4 (1ªfase)	HA-25/b/20/IIa	251	251		**251**	331	319		**325**	**29,5%**	7
17-ago-01	Alzado estribo 1	HA-25/b/20/IIa	257	257		**257**	322	319		**321**	**24,7%**	9
17-ago-01	Alzado estribo 1	HA-25/b/20/IIa	254	249		**252**	319	314		**317**	**25,8%**	7
17-ago-01	Alzado estribo 1	HA-25/b/20/IIa	243	260		**252**	308	302		**305**	**21,3%**	8
17-ago-01	Alzado estribo 1	HA-25/b/20/IIa	240	240		**240**	299	283		**291**	**21,3%**	7
17-ago-01	Alzado estribo 1	HA-25/b/20/IIa	288	299		**294**	345	359		**352**	**19,9%**	8
21-ago-01	Zapata aleta 4 (2ªfase)	HA-25/b/20/IIa	237	243		**240**	285	288		**287**	**19,4%**	7
22-ago-01	Zapata aleta 3 (2ªfase)	HA-25/b/20/IIa	325	319		**322**	401	408		**405**	**25,6%**	7
31-ago-01	Alzado estribo 2	HA-25/b/20/IIa	305	285		**295**	364	370		**367**	**24,4%**	8
31-ago-01	Alzado estribo 2	HA-25/b/20/IIa	342	328		**335**	427	418		**423**	**26,1%**	7
31-ago-01	Alzado estribo 2	HA-25/b/20/IIa	333	356		**345**	429	412		**421**	**22,1%**	9
31-ago-01	Alzado estribo 2	HA-25/b/20/IIa	353	359		**356**	444	429		**437**	**22,6%**	7
31-ago-01	Alzado estribo 2	HA-25/b/20/IIa	331	350		**341**	435	429		**432**	**26,9%**	7
13-sep-01	Zapata aleta 1 (1ªfase)	HA-25/b/20/IIa	274	274		**274**	396	410		**403**	**47,1%**	8
13-sep-01	Zapata aleta 2 (1ªfase)	HA-25/b/20/IIa	246	266		**256**	325	339		**332**	**29,7%**	8
26-sep-01	Alzado aleta 1. (1ªfase)	HA-25/b/20/IIa	336	336		**336**	429	438		**434**	**29,0%**	8

E-4 (311+776)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
26-sep-01	Alzado aleta 2. (1ªfase)	HA-25/b/20/IIa	345	336		**341**	412	401		**407**	**19,4%**	7
28-sep-01	Alzado aleta 1 (2ª fase)	HA-30/b/20/IIb	336	347		**342**	444	435		**440**	**28,7%**	7
5-oct-01	Alzado aleta 3 (1ªfase)	HA-25/b/20/IIa	322	325		**324**	387	401		**394**	**21,8%**	7
10-oct-01	Alzado aleta 4 (1ªfase)	HA-30/b/20/IIb	362	359		**361**	429	438		**434**	**20,2%**	7
16-oct-01	Alzado aleta 3 (2ªfase)	HA-30/b/20/IIb	356	381		**369**	429	424		**427**	**15,7%**	8
16-oct-01	Alzado aleta 4 (2ªfase)	HA-30/b/20/IIb	373	393		**383**	444	449		**447**	**16,6%**	8
19-oct-01	Alzado aleta 3 (3ªfase)	HA-30/b/20/IIb	311	308		**310**	376	393		**385**	**24,2%**	9
19-oct-01	Alzado aleta 4 (3ªfase)	HA-30/b/20/IIb	396	373		**385**	446	455		**451**	**17,2%**	8
9-nov-01	Losa superior	HA-30/b/20/IIb	339	339		**339**	407	412		**410**	**20,8%**	8
9-nov-01	Losa superior	HA-30/b/20/IIb	390	379		**385**	452	460		**456**	**18,6%**	9
9-nov-01	Losa superior	HA-30/b/20/IIb	379	390		**385**	438	446		**442**	**15,0%**	9
9-nov-01	Losa superior	HA-30/b/20/IIb	376	390		**383**	435	424		**430**	**12,1%**	10
9-nov-01	Losa superior	HA-30/b/20/IIb	398	412		**405**	455	446		**451**	**11,2%**	8
9-nov-01	Losa superior	HA-30/b/20/IIb	328	345		**337**	396	421		**409**	**21,4%**	6
9-nov-01	Losa superior	HA-30/b/20/IIb	362	342		**352**	398	398		**398**	**13,1%**	7
9-nov-01	Losa superior	HA-30/b/20/IIb	277	271		**274**	328	339		**334**	**21,7%**	7
30-nov-01	Zap. Aleta izq. 1	HA-30/b/20/IIb	260	243		**252**	424	424		**424**	**68,6%**	6
30-nov-01	Zap. Aleta izq. 1	HA-30/b/20/IIb	342	342		**342**	424	441		**433**	**26,5%**	8

Resumen rotura hormigón

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-5 (316+465)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
5-jul-01	Zapata estribo 1	HA-25/b/20/IIa	192	206		**199**	254	251		**253**	**26,9%**	7
6-jul-01	Zapata estribo 2	HA-25/b/20/IIa	234	226		**230**	294	299		**297**	**28,9%**	7
23-jul-01	Alzado estribo 2	HA-25/b/20/IIa	226	246		**236**	297	299		**298**	**26,3%**	7
1-ago-01	Alzado estribo 1	HA-25/b/20/IIa	263	264		**264**	339	325		**332**	**26,0%**	7
6-ago-01	Zapata pila 1	HA-25/b/20/IIa	268	266		**267**	319	333		**326**	**22,1%**	7
6-ago-01	Zapata pila 2	HA-25/b/20/IIa	285	274		**280**	347	331		**339**	**21,3%**	7
12-sep-01	Alzado Pila 1 (1ªfase)	HA-30/b/20/IIb	305	331		**318**	387	398		**393**	**23,4%**	8
13-sep-01	Alzado Pila 1 (2ªfase)	HA-30/b/20/IIb	237	254		**246**	333	342		**338**	**37,5%**	7
21-sep-01	Alzado Pila 2 (1ª fase)	HA-30/b/20/IIb	336	342		**339**	424	446		**435**	**28,3%**	7
22-sep-01	Alzado Pila 2 (2ª fase)	HA-30/b/20/IIb	359	359		**359**	435	424		**430**	**19,6%**	8
25-mar-02	Tablero	HA-30/b/20/IIb	370	364		**367**	418	418		**418**	**13,9%**	6
25-mar-02	Tablero	HA-30/b/20/IIb	359	359		**359**	396	404		**400**	**11,4%**	7
25-mar-02	Tablero	HA-30/b/20/IIb	314	331		**323**	376	387		**382**	**18,3%**	8
25-mar-02	Tablero	HA-30/b/20/IIb	328	336		**332**	396	401		**399**	**20,0%**	8
25-mar-02	Tablero	HA-30/b/20/IIb	339	350		**345**	384	376		**380**	**10,3%**	9

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-6 (311+151)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
7-sep-01	Zapata estribo 2	HA-30/b/20/IIb	271	274		**273**	359	339		**349**	**28,1%**	7
7-sep-01	Zapata estribo 2	HA-30/b/20/IIb	305	314		**310**	418	410		**414**	**33,8%**	9
7-sep-01	Zapata estribo 2	HA-30/b/20/IIb	331	319		**325**	449	435		**442**	**36,0%**	7
7-sep-01	Zapata estribo 2	HA-30/b/20/IIb	299	305		**302**	367	342		**355**	**17,4%**	8
7-sep-01	Zapata estribo 2	HA-30/b/20/IIb	302	314		**308**	356	379		**368**	**19,3%**	7
7-sep-01	Zapata estribo 2	HA-30/b/20/IIb	328	314		**321**	410	410		**410**	**27,7%**	8
7-sep-01	Zapata estribo 2	HA-30/b/20/IIb	314	316		**315**	381	384		**383**	**21,4%**	7
10-sep-01	Zapata 1 Estribo 2	HA-30/b/20/IIb	311	305		**308**	376	370		**373**	**21,1%**	8
10-sep-01	Zapata 1 Estribo 2	HA-30/b/20/IIb	302	311		**307**	384	373		**379**	**23,5%**	9
10-sep-01	Zapata 1 Estribo 2	HA-30/b/20/IIb	305	328		**317**	410	421		**416**	**31,3%**	7
10-sep-01	Zapata 1 Estribo 2	HA-30/b/20/IIb	342	333		**338**	438	421		**430**	**27,3%**	7
13-sep-01	Zapata 1 Estribo 1	HA-30/b/20/IIb	336	314		**325**	427	435		**431**	**32,6%**	7
13-sep-01	Zapata 1 Estribo 1	HA-30/b/20/IIb	322	316		**319**	404	412		**408**	**27,9%**	8
13-sep-01	Zapata 1 Estribo 1	HA-30/b/20/IIb	319	339		**329**	421	412		**417**	**26,6%**	8
13-sep-01	Zapata 1 Estribo 1	HA-30/b/20/IIb	336	322		**329**	412	407		**410**	**24,5%**	6
13-sep-01	Zapata 1 Estribo 1	HA-30/b/20/IIb	287	291		**289**	350	359		**355**	**22,7%**	8
13-sep-01	Zapata 1 Estribo 1	HA-30/b/20/IIb	257	263		**260**	345	339		**342**	**31,5%**	8
13-sep-01	Zapata 1 Estribo 1	HA-30/b/20/IIb	243	234		**239**	322	314		**318**	**33,3%**	9
21-sep-01	Zapata 2 Estribo 2	HA-30/b/20/IIb	367	370		**369**	424	424		**424**	**15,1%**	7
21-sep-01	Zapata 2 Estribo 2	HA-30/b/20/IIb	359	359		**359**	429	429		**429**	**19,5%**	9
21-sep-01	Zapata 2 Estribo 2	HA-30/b/20/IIb	373	362		**368**	429	441		**435**	**18,4%**	9
21-sep-01	Zapata 2 Estribo 2	HA-30/b/20/IIb	336	333		**335**	435	424		**430**	**28,4%**	7
21-sep-01	Zapata 2 Estribo 2	HA-30/b/20/IIb	342	356		**349**	429	444		**437**	**25,1%**	8
21-sep-01	Zapata 2 Estribo 2	HA-30/b/20/IIb	410	401		**406**	469	444		**457**	**12,6%**	7
21-sep-01	Zapata 2 Estribo 2	HA-30/b/20/IIb	376	373		**375**	427	438		**433**	**15,5%**	9
3-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	359	345		**352**	438	458		**448**	**27,3%**	7
3-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	356	367		**362**	455	458		**457**	**26,3%**	8
3-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	342	347		**345**	427	427		**427**	**23,9%**	9

E-6 (311+151)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
3-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	331	322		**327**	415	407		**411**	**25,9%**	9
3-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	319	314		**317**	379	376		**378**	**19,3%**	9
3-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	325	339		**332**	401	418		**410**	**23,3%**	9
3-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	311	325		**318**	373	376		**375**	**17,8%**	9
10-oct-01	Alzado estribo 1 (2ªfase)	HA-30/b/20/IIb	347	364		**356**	458	438		**448**	**26,0%**	8
10-oct-01	Alzado estribo 1 (2ªfase)	HA-30/b/20/IIb	342	350		**346**	429	421		**425**	**22,8%**	7
18-oct-01	Alzado estribo 2 (1ªfase)	HA-30/b/20/IIb	333	347		**340**	424	424		**424**	**24,7%**	9
18-oct-01	Alzado estribo 2 (1ªfase)	HA-30/b/20/IIb	350	362		**356**	396	393		**395**	**10,8%**	7
18-oct-01	Alzado estribo 2 (1ªfase)	HA-30/b/20/IIb	347	342		**345**	412	396		**404**	**17,3%**	8
18-oct-01	Alzado estribo 2 (1ªfase)	HA-30/b/20/IIb	319	319		**319**	384	387		**386**	**20,8%**	9
18-oct-01	Alzado estribo 2 (1ªfase)	HA-30/b/20/IIb	333	333		**333**	444	429		**437**	**31,1%**	9
18-oct-01	Alzado estribo 2 (1ªfase)	HA-30/b/20/IIb	376	381		**379**	438	449		**444**	**17,2%**	7
18-oct-01	Alzado estribo 2 (1ªfase)	HA-30/b/20/IIb	390	379		**385**	446	429		**438**	**13,8%**	6
24-oct-01	Alzado estribo 2 (2ªfase)	HA-30/b/20/IIb	362	367		**365**	458	444		**451**	**23,7%**	7
24-oct-01	Alzado estribo 2 (2ªfase)	HA-30/b/20/IIb	356	356		**356**	452	458		**455**	**27,8%**	8
24-oct-01	Alzado estribo 2 (2ªfase)	HA-30/b/20/IIb	373	362		**368**	469	458		**464**	**26,1%**	7
30-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	359	359		**359**	435	435		**435**	**21,2%**	8
30-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	353	362		**358**	418	412		**415**	**16,1%**	8
30-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	359	370		**365**	441	429		**435**	**19,3%**	8
30-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	370	364		**367**	435	418		**427**	**16,2%**	7
30-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	356	370		**363**	418	412		**415**	**14,3%**	9
30-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	362	364		**363**	407	424		**416**	**14,5%**	7
30-oct-01	Alzado estribo 1 (1ªfase)	HA-30/b/20/IIb	356	370		**363**	429	422		**426**	**17,2%**	8
8-nov-01	Alzado estribo 1 (2ªfase)	HA-30/b/20/IIb	381	393		**387**	477	469		**473**	**22,2%**	7
8-nov-01	Alzado estribo 1 (2ªfase)	HA-30/b/20/IIb	401	387		**394**	472	480		**476**	**20,8%**	7
8-nov-01	Alzado estribo 1 (2ªfase)	HA-30/b/20/IIb	364	345		**355**	418	425		**422**	**18,9%**	7
23-nov-01	Alzado estribo 1 mod. Izq.	HA-30/b/20/IIb	319	302		**311**	404	390		**397**	**27,9%**	9
23-nov-01	Alzado estribo 1 mod. Izq.	HA-30/b/20/IIb	302	328		**315**	367	379		**373**	**18,4%**	10
23-nov-01	Alzado estribo 1 mod. Izq.	HA-30/b/20/IIb	356	347		**352**	393	410		**402**	**14,2%**	7
23-nov-01	Alzado estribo 1 mod. Izq.	HA-30/b/20/IIb	362	362		**362**	412	412		**412**	**13,8%**	8
28-nov-01	Alz. Estribo 1 (2ªfase)	HA-30/b/20/IIb	384	384		**384**	438	460		**449**	**16,9%**	7
28-nov-01	Alz. Estribo 1 (2ªfase)	HA-30/b/20/IIb	376	390		**383**	444	452		**448**	**17,0%**	9

E-6 (311+151)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
28-nov-01	Alz. Estribo 1 (2ªfase)	HA-30/b/20/IIb	387	376		**382**	424	424		**424**	**11,1%**	9
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	384	393		**389**	497	469		**483**	**24,3%**	9
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	404	418		**411**	463	477		**470**	**14,4%**	8
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	407	381		**394**	489	472		**481**	**22,0%**	7
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	393	376		**385**	475	475		**475**	**23,5%**	7
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	350	339		**345**	441	429		**435**	**26,3%**	8
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	316	305		**311**	415	421		**418**	**34,6%**	9
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	319	325		**322**	418	429		**424**	**31,5%**	8
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	316	325		**321**	446	435		**441**	**37,4%**	9
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	280	271		**276**	353	367		**360**	**30,7%**	9
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	319	331		**325**	446	458		**452**	**39,1%**	8
18-ene-02	Tablero mod. Izq.	HA-30/b/20/IIb	251	260		**256**	370	359		**365**	**42,7%**	9
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	297	305		**301**	364	370		**367**	**21,9%**	8
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	333	325		**329**	373	373		**373**	**13,4%**	9
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	359	339		**349**	404	401		**403**	**15,3%**	7
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	370	342		**356**	412	404		**408**	**14,6%**	6
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	347	339		**343**	421	410		**416**	**21,1%**	7
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	345	342		**344**	387	393		**390**	**13,5%**	6
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	331	314		**323**	384	373		**379**	**17,4%**	8
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	314	308		**311**	398	387		**393**	**26,2%**	8
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	339	325		**332**	398	415		**407**	**22,4%**	7
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	390	376		**383**	407	390		**399**	**4,0%**	6
1-feb-02	Tablero mod. Dcho.	HA-30/b/20/IIb	328	314		**321**	396	412		**404**	**25,9%**	7
25-feb-02	Canalón izquierdo	HA-30/b/20/IIb	316	308		**312**	387	373		**380**	**21,8%**	7
1-mar-02	Alzado cuneta izq	HA-30/b/20/IIb	384	370		**377**	441	455		**448**	**18,8%**	6

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-7 (317+505)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
12-feb-02	Zapata pila dcha	HA-30/b/20/IIb	376	356		**366**	446	435		**441**	**20,4%**	7
12-feb-02	Zapata pila dcha	HA-30/b/20/IIb	319	305		**312**	401	407		**404**	**29,5%**	9
12-feb-02	Zapata pila dcha	HA-30/b/20/IIb	331	322		**327**	398	418		**408**	**25,0%**	8
12-feb-02	Zapata pila dcha	HA-30/b/20/IIb	339	353		**346**	429	441		**435**	**25,7%**	9
12-feb-02	Zapata pila dcha	HA-30/b/20/IIb	350	364		**357**	429	421		**425**	**19,0%**	9
12-feb-02	Zapata pila dcha	HA-30/b/20/IIb	347	339		**343**	407	398		**403**	**17,3%**	8
18-feb-02	Zapata pila izq.	HA-30/b/20/IIb	364	350		**357**	398	412		**405**	**13,4%**	8
18-feb-02	Zapata pila izq.	HA-30/b/20/IIb	373	387		**380**	396	404		**400**	**5,3%**	9
18-feb-02	Zapata pila izq.	HA-30/b/20/IIb	359	373		**366**	393	412		**403**	**10,0%**	9
18-feb-02	Zapata pila izq.	HA-30/b/20/IIb	336	356		**346**	429	412		**421**	**21,5%**	8
18-feb-02	Zapata pila izq.	HA-30/b/20/IIb	353	362		**358**	410	424		**417**	**16,6%**	9
18-feb-02	Zapata pila izq.	HA-30/b/20/IIb	367	373		**370**	418	401		**410**	**10,7%**	9
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	350	345		**348**	412	401		**407**	**17,0%**	7
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	280	277		**279**	319	333		**326**	**17,1%**	10
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	362	359		**361**	415	404		**410**	**13,6%**	7
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	345	331		**338**	401	407		**404**	**19,5%**	9
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	347	353		**350**	404	393		**399**	**13,9%**	8
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	370	362		**366**	429	427		**428**	**16,9%**	9
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	356	356		**356**	401	415		**408**	**14,6%**	7
20-feb-02	Zapata estribo izq	HA-30/b/20/IIb	356	364		**360**	438	446		**442**	**22,8%**	8
22-feb-02	Alzado pila dcha (1ªfase)	HA-30/b/20/IIb	331	342		**337**	398	412		**405**	**20,4%**	6
28-feb-02	Alzado pila izq (1ªfase)	HA-30/b/20/IIb	379	396		**388**	452	469		**461**	**18,8%**	5
28-feb-02	Alzado pila izq (1ªfase)	HA-30/b/20/IIb	370	364		**367**	424	407		**416**	**13,2%**	7
1-mar-02	Alzado pila izq (2ªfase)	HA-30/b/20/IIb	390	381		**386**	429	418		**424**	**9,9%**	7
7-mar-02	Zapata estribo dcho	HA-30/b/20/IIb	322	328		**325**	390	384		**387**	**19,1%**	9
7-mar-02	Zapata estribo dcho	HA-30/b/20/IIb	336	350		**343**	435	429		**432**	**25,9%**	10
7-mar-02	Zapata estribo dcho	HA-30/b/20/IIb	322	333		**328**	427	412		**420**	**28,1%**	10
7-mar-02	Zapata estribo dcho	HA-30/b/20/IIb	339	342		**341**	401	387		**394**	**15,7%**	8

E-7 (317+505)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
7-mar-02	Zapata estribo dcho	HA-30/b/20/IIb	325	328		**327**	398	401		**400**	**22,4%**	7
7-mar-02	Zapata estribo dcho	HA-30/b/20/IIb	311	297		**304**	367	376		**372**	**22,2%**	9
7-mar-02	Zapata estribo dcho	HA-30/b/20/IIb	347	353		**350**	424	429		**427**	**21,9%**	9
12-mar-02	Alzado estribo izq (1ªfase)	HA-30/b/20/IIb	339	333		**336**	429	412		**421**	**25,1%**	7
12-mar-02	Alzado estribo izq (1ªfase)	HA-30/b/20/IIb	305	319		**312**	429	415		**422**	**35,3%**	8
12-mar-02	Zapata aleta izq 1 mod 2	HA-30/b/20/IIb	325	316		**321**	412	421		**417**	**30,0%**	6
13-mar-02	Zapata aleta izq 1 mod 1	HA-30/b/20/IIb	322	322		**322**	412	429		**421**	**30,6%**	6
13-mar-02	Zapata aleta izq 1 mod 1	HA-30/b/20/IIb	311	322		**317**	418	407		**413**	**30,3%**	7
13-mar-02	Zapata aleta izq 1 mod 1	HA-30/b/20/IIb	331	319		**325**	412	393		**403**	**23,8%**	8
13-mar-02	Zapata aleta izq 1 mod 1	HA-30/b/20/IIb	305	299		**302**	412	418		**415**	**37,4%**	8
14-mar-02	Zapata aleta izq 1 mod 3	HA-30/b/20/IIb	373	364		**369**	452	444		**448**	**21,6%**	8
18-mar-02	Alzado estribo izq (2ªfase)	HA-30/b/20/IIb	356	356		**356**	475	472		**474**	**33,0%**	8
18-mar-02	Alzado estribo izq (2ªfase)	HA-30/b/20/IIb	311	319		**315**	407	418		**413**	**31,0%**	8
18-mar-02	Alzado estribo izq (2ªfase)	HA-30/b/20/IIb	328	314		**321**	390	407		**399**	**24,1%**	9
19-mar-02	Zapata aleta izq 2 mod 1	HA-30/b/20/IIb	370	370		**370**	469	460		**465**	**25,5%**	7
19-mar-02	Zapata aleta izq 2 mod 1	HA-30/b/20/IIb	328	336		**332**	469	458		**464**	**39,6%**	8
19-mar-02	Zapata aleta izq 2 mod 1	HA-30/b/20/IIb	339	350		**345**	407	424		**416**	**20,6%**	7
19-mar-02	Zapata aleta izq 2 mod 1	HA-30/b/20/IIb	359	373		**366**	458	463		**461**	**25,8%**	9
19-mar-02	Zapata aleta izq 2 mod 3	HA-30/b/20/IIb	367	359		**363**	463	472		**468**	**28,8%**	8
19-mar-02	Zapata aleta izq 2 mod 3	HA-30/b/20/IIb	367	367		**367**	446	455		**451**	**22,8%**	6
20-mar-02	Zapata aleta dcha 1 mod 1	HA-30/b/20/IIb	345	336		**341**	435	429		**432**	**26,9%**	8
20-mar-02	Zapata aleta dcha 1 mod 1	HA-30/b/20/IIb	356	359		**358**	438	424		**431**	**20,6%**	8
20-mar-02	Zapata aleta dcha 1 mod 1	HA-30/b/20/IIb	339	336		**338**	421	412		**417**	**23,4%**	9
20-mar-02	Zapata aleta dcha 1 mod 1	HA-30/b/20/IIb	359	342		**351**	463	458		**461**	**31,4%**	8
20-mar-02	Zapata aleta dcha 1 mod 1	HA-30/b/20/IIb	325	325		**325**	429	415		**422**	**29,8%**	8
21-mar-02	Zapata aleta dcha 1 mod 2	HA-30/b/20/IIb	283	280		**282**	345	336		**341**	**21,0%**	8
21-mar-02	Zapata aleta dcha 1 mod 2	HA-30/b/20/IIb	314	308		**311**	364	376		**370**	**19,0%**	7
25-mar-02	Alzado estribo dcho (1ªfase)	HA-30/b/20/IIb	342	339		**341**	379	384		**382**	**12,0%**	7
25-mar-02	Alzado estribo dcho (1ªfase)	HA-30/b/20/IIb	350	353		**352**	404	387		**396**	**12,5%**	6
26-mar-02	Zap. Aleta izq. 2 mod.2	HA-30/b/20/IIb	362	347		**355**	387	398		**393**	**10,7%**	6
26-mar-02	Zap. Aleta izq. 2 mod.2	HA-30/b/20/IIb	331	345		**338**	424	418		**421**	**24,6%**	7
26-mar-02	Zap. Aleta dcha. 2 mod.1	HA-30/b/20/IIb	328	345		**337**	376	364		**370**	**10,0%**	8
26-mar-02	Zap. Aleta dcha. 2 mod.1	HA-30/b/20/IIb	328	328		**328**	393	396		**395**	**20,3%**	7

E-7 (317+505)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
26-mar-02	Zap. Aleta dcha. 2 mod.1	HA-30/b/20/IIb	350	345		**348**	412	404		**408**	**17,4%**	7
26-mar-02	Zap. Aleta dcha. 2 mod.1	HA-30/b/20/IIb	356	364		**360**	412	404		**408**	**13,3%**	7
26-mar-02	Zap. Aleta dcha. 2 mod.3	HA-30/b/20/IIb	336	350		**343**	415	404		**410**	**19,4%**	8
26-mar-02	Alz. Estribo izq. (3ªfase)	HA-30/b/20/IIb	364	362		**363**	429	424		**427**	**17,5%**	9
26-mar-02	Alz. Estribo izq. (3ªfase)	HA-30/b/20/IIb	319	319		**319**	387	381		**384**	**20,4%**	9
26-mar-02	Alz. Estribo izq. (3ªfase)	HA-30/b/20/IIb	353	350		**352**	401	396		**399**	**13,4%**	8
27-mar-02	Zap. Aleta dcha 2 mod.2	HA-30/b/20/IIb	362	345		**354**	393	407		**400**	**13,2%**	7
27-mar-02	Zap. Aleta dcha 2 mod.2	HA-30/b/20/IIb	311	322		**317**	359	359		**359**	**13,4%**	9
2-abr-02	Alz. Aleta izq. 1 mod. 3 (1ª fase	HA-30/b/20/IIb	359	356		**358**	415	407		**411**	**15,0%**	7
10-abr-02	Alz. Estribo dcho (2ªfase)	HA-30/b/20/IIb	333	418		**376**	387	384		**386**	**2,7%**	8
10-abr-02	Alz. Estribo dcho (2ªfase)	HA-30/b/20/IIb	328	328		**328**	396	384		**390**	**18,9%**	7
10-abr-02	Alz. Estribo dcho (2ªfase)	HA-30/b/20/IIb	291	297		**294**	347	362		**355**	**20,6%**	9
10-abr-02	Alz. Estribo dcho (2ªfase)	HA-30/b/20/IIb	333	316		**325**	398	401		**400**	**23,1%**	9
10-abr-02	Alz. Aleta izq 2 mod.1 (1ªf)	HA-30/b/20/IIb	339	336		**338**	384	407		**396**	**17,2%**	9
12-abr-02	Alz. Aleta dcha 1 mod.3 (1ªf)	HA-30/b/20/IIb	294	291		**293**	384	376		**380**	**29,9%**	9
12-abr-02	Alz. Aleta izq 1 mod.4	HA-30/b/20/IIb	291	294		**293**	345	345		**345**	**17,9%**	9
16-abr-02	Alz. Aleta dhca 2 mod.3 (1ªf)	HA-30/b/20/IIb	396	384		**390**	469	469		**469**	**20,3%**	7
16-abr-02	Alz. Aleta izq 2 mod.2 (1ªf)	HA-30/b/20/IIb	359	359		**359**	398	404		**401**	**11,7%**	8
16-abr-02	Alz. Aleta izq 2 mod.2	HA-30/b/20/IIb	359	370		**365**	435	438		**437**	**19,8%**	7
17-abr-02	Alz. Aleta dcha 1 mod.4	HA-30/b/20/IIb	328	322		**325**	362	367		**365**	**12,2%**	8
17-abr-02	Alz. Aleta izq 1 mod.1 (1ªf)	HA-30/b/20/IIb	291	299		**295**	384	393		**389**	**31,7%**	7
19-abr-02	Alz. Estribo dcho (3ªfase)	HA-30/b/20/IIb	322	328		**325**	367	359		**363**	**11,7%**	7
19-abr-02	Alz. Estribo dcho (3ªfase)	HA-30/b/20/IIb	319	325		**322**	390	384		**387**	**20,2%**	8
19-abr-02	Alz. Estribo dcho (3ªfase)	HA-30/b/20/IIb	314	319		**317**	367	356		**362**	**14,2%**	8
19-abr-02	Alz. Aleta dcha 2 Mod.2 (1ªf)	HA-30/b/20/IIb	305	302		**304**	359	370		**365**	**20,1%**	7
19-abr-02	Alz. Aleta dcha 2 Mod.2 (1ªf)	HA-30/b/20/IIb	308	314		**311**	384	379		**382**	**22,7%**	9
22-abr-02	Alz. Aleta izq 2 Mod.3 (1ªf)	HA-30/b/20/IIb	285	283		**284**	350	353		**352**	**23,8%**	6
22-abr-02	Alz. Aleta dcha 1 Mod.2 (1ªf)	HA-30/b/20/IIb	254	266		**260**	347	353		**350**	**34,6%**	9
23-abr-02	Alz. Aleta izq 1 Mod.2 (1ªf)	HA-30/b/20/IIb	333	325		**329**	367	380		**374**	**13,5%**	8
23-abr-02	Alz. Aleta izq 1 Mod.2 (1ªf)	HA-30/b/20/IIb	336	328		**332**	371	379		**375**	**13,0%**	7
24-abr-02	Alz. Aleta dcha 2 Mod.1 (1ªf)	HA-30/b/20/IIb	345	339		**342**	429	421		**425**	**24,3%**	6
24-abr-02	Alz. Aleta dcha 2 Mod.4	HA-30/b/20/IIb	322	319		**321**	376	364		**370**	**15,4%**	7
25-abr-02	Alz. Aleta izq. 2 Mod.4	HA-30/b/20/IIb	316	314		**315**	342	345		**344**	**9,0%**	8

E-7 (317+505)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
26-abr-02	Alz. Aleta izq.1 Mod. 3 (2ªf)	HA-30/b/20/IIb	302	308		**305**	376	381		**379**	**24,1%**	8
26-abr-02	Alz. Aleta dcha 1 Mod.1 (1ªf)	HA-30/b/20/IIb	333	339		**336**	387	393		**390**	**16,1%**	7
26-abr-02	Alz. Aleta dcha 1 Mod.3 (2ªf)	HA-30/b/20/IIb	308	314		**311**	387	379		**383**	**23,2%**	8
29-abr-02	z. Aleta dcha e izq 2 Mod.3 (2ª	HA-30/b/20/IIb	283	288		**286**	404	410		**407**	**42,6%**	9
30-abr-02	Alz. Aleta izq.1 Mod.2 (2ªf)	HA-30/b/20/IIb	356	362		**359**	412	415		**414**	**15,2%**	8
3-may-02	Alz. Aleta dcha2 Mod.2 (2ªf)	HA-30/b/20/IIb	322	333		**328**	373	387		**380**	**16,0%**	7
3-may-02	Alz. Aleta izq 2 Mod.2 (2ªf)	HA-30/b/20/IIb	336	325		**331**	347	362		**355**	**7,3%**	6
13-may-02	Alz. Aleta izq 2 Mod.2 (3ªf)	HA-30/b/20/IIb	353	353		**353**	393	384		**389**	**10,1%**	8
14-may-02	Alz. Aleta dcha 1 Mod.2 (2ªf)	HA-30/b/20/IIb	288	280		**284**	412	396		**404**	**42,3%**	8
17-may-02	Alz. Aleta izq. 2 Mod.1 (2ªf)	HA-30/b/20/IIb	314	299		**307**	362	373		**368**	**19,9%**	8
20-may-02	Alz. Aleta izq. 1 Mod.1 (2ªf)	HA-30/b/20/IIb	308	305		**307**	396	384		**390**	**27,2%**	9
22-may-02	Alz. Aleta izq. 1 Mod.1 (3ªf)	HA-30/b/20/IIb	316	333		**325**	362	353		**358**	**10,2%**	6
28-may-02	Alz. Aleta dcha. 2 Mod.1 (2ªf)	HA-30/b/20/IIb	319	316		**318**	356	353		**355**	**11,7%**	7
7-jun-02	Alz. Aleta dcha. 1 Mod.1	HA-30/b/20/IIb	325	319		**322**	396	401		**399**	**23,8%**	7
14-jun-02	Alz. Aleta dcha. 1 Mod.1 (3a f)	HA-30/b/20/IIb	350	345		**348**	410	421		**416**	**19,6%**	7
8-ago-02	Tablero	HA-35/b/20/II b+h	429	429		**429**	500	497		**499**	**16,2%**	7
8-ago-02	Tablero	HA-35/b/20/II b+h	407	415		**411**	477	483		**480**	**16,8%**	10
8-ago-02	Tablero	HA-35/b/20/II b+h	475	486		**481**	520	514		**517**	**7,6%**	9
8-ago-02	Tablero	HA-35/b/20/II b+h	424	424		**424**	486	492		**489**	**15,3%**	6
8-ago-02	Tablero	HA-35/b/20/II b+h	421	407		**414**	460	458		**459**	**10,9%**	8
8-ago-02	Tablero	HA-35/b/20/II b+h	418	418		**418**	477	477		**477**	**14,1%**	8
8-ago-02	Tablero	HA-35/b/20/II b+h	419	441		**430**	486	483		**485**	**12,7%**	8
8-ago-02	Tablero	HA-35/b/20/II b+h	441	463		**452**	500	500		**500**	**10,6%**	7
8-ago-02	Tablero	HA-35/b/20/II b+h	367	375		**371**	452	458		**455**	**22,6%**	10
8-ago-02	Tablero	HA-35/b/20/II b+h	445	452		**449**	514	520		**517**	**15,3%**	8
8-ago-02	Tablero	HA-35/b/20/II b+h	469	466		**468**	520	520		**520**	**11,2%**	6
8-ago-02	Tablero	HA-35/b/20/II b+h	412	424		**418**	466	475		**471**	**12,6%**	8
8-ago-02	Tablero	HA-35/b/20/II b+h	444	452		**448**	520	520		**520**	**16,1%**	9
8-ago-02	Tablero	HA-35/b/20/II b+h	444	435		**440**	497	500		**499**	**13,4%**	8

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-10 (315+245)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
4-feb-02	Alzado estribo dcho	HA-30/b/20/IIb	345	364		**355**	418	429		**424**	**19,5%**	7
6-feb-02	Zapata pila dcha	HA-30/b/20/IIb	356	376		**366**	452	438		**445**	**21,6%**	6
15-feb-02	Zapata pila izq	HA-30/b/20/IIb	396	384		**390**	446	435		**441**	**12,9%**	8
19-feb-02	Alzado pila dcha (1ªfase)	HA-30/b/20/IIb	305	322		**314**	373	362		**368**	**17,2%**	7
25-feb-02	Alzado pila dcha (2ªfase)	HA-30/b/20/IIb	350	336		**343**	410	407		**409**	**19,1%**	7
26-feb-02	Zapata estribo izq	HA-30/b/20/IIb	339	339		**339**	407	387		**397**	**17,1%**	7
4-mar-02	Alzado pila izq (2ªfase)	HA-30/b/20/IIb	362	353		**358**	463	472		**468**	**30,8%**	7
12-mar-02	Alzado estribo izq	HA-30/b/20/IIb	325	342		**334**	424	418		**421**	**26,2%**	6
25-abr-02	Tablero	HA-30/b/20/IIb	274	260		**267**	350	353		**352**	**31,6%**	6
25-abr-02	Tablero	HA-30/b/20/IIb	291	283		**287**	328	319		**324**	**12,7%**	8
25-abr-02	Tablero	HA-30/b/20/IIb	294	280		**287**	342	353		**348**	**21,1%**	7
25-abr-02	Tablero	HA-30/b/20/IIb	280	274		**277**	353	350		**352**	**26,9%**	9
25-abr-02	Tablero	HA-30/b/20/IIb	328	325		**327**	362	347		**355**	**8,6%**	8

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-13 (316+080)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	333	339		**336**	367	361		**364**	**8,3%**	7
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	311	319		**315**	410	415		**413**	**31,0%**	8
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	342	350		**346**	397	412		**405**	**16,9%**	9
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	362	342		**352**	412	407		**410**	**16,3%**	7
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	359	364		**362**	407	435		**421**	**16,5%**	9
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	336	342		**339**	441	449		**445**	**31,3%**	7
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	333	316		**325**	418	424		**421**	**29,7%**	9
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	350	345		**348**	480	472		**476**	**37,0%**	8
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	333	339		**336**	463	463		**463**	**37,8%**	7
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	342	336		**339**	446	452		**449**	**32,4%**	8
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	402	396		**399**	444	452		**448**	**12,3%**	7
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	339	333		**336**	373	367		**370**	**10,1%**	9
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	359	353		**356**	407	404		**406**	**13,9%**	9
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	345	350		**348**	404	398		**401**	**15,4%**	9
9-ago-02	Alzado estrib izq.	HA-30/b/20/IIb	367	362		**365**	458	458		**458**	**25,7%**	8
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	319	339		**329**	379	373		**376**	**14,3%**	9
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	333	339		**336**	387	396		**392**	**16,5%**	8
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	328	325		**327**	387	391		**389**	**19,1%**	9
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	379	373		**376**	418	424		**421**	**12,0%**	6
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	401	393		**397**	452	463		**458**	**15,2%**	7
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	373	367		**370**	435	444		**440**	**18,8%**	7
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	396	390		**393**	444	441		**443**	**12,6%**	8
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	347	339		**343**	401	396		**399**	**16,2%**	9
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	345	353		**349**	387	373		**380**	**8,9%**	7
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	367	376		**372**	424	435		**430**	**15,6%**	8
30-ago-02	Tablero	HA-30/b/20/IIb	387	384		**386**	435	427		**431**	**11,8%**	9
30-ago-02	Tablero	HA-30/b/20/IIb	373	373		**373**	446	444		**445**	**19,3%**	9
30-ago-02	Tablero	HA-30/b/20/IIb	401	398		**400**	458	455		**457**	**14,3%**	9

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-13 (312+500)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
30-abr-02	Zapata Pila dcha	HA-30/b/20/IIb	299	316		**308**	401	410		**406**	**31,9%**	8
30-abr-02	Zapata Pila izq	HA-30/b/20/IIb	333	328		**331**	424	427		**426**	**28,7%**	6
13-may-02	Alzado pila derecha (1 fase)	HA-30/b/20/IIb	311	314		**313**	373	367		**370**	**18,4%**	7
14-may-02	Alzado pila derecha (2 fase)	HA-30/b/20/IIb	294	280		**287**	362	359		**361**	**25,6%**	9
15-may-02	Alzado pila derecha (3 fase)	HA-30/b/20/IIb	322	336		**329**	441	435		**438**	**33,1%**	6
17-may-02	Alzado pila izq. (1 fase)	HA-30/b/20/IIb	316	319		**318**	396	381		**389**	**22,4%**	7
20-may-02	Alzado pila izq. (2 fase)	HA-30/b/20/IIb	339	325		**332**	407	412		**410**	**23,3%**	7
21-may-02	Alzado pila izq. (3 fase)	HA-30/b/20/IIb	345	331		**338**	415	407		**411**	**21,6%**	8
24-may-02	Zapata estribo izq.	HA-30/b/20/IIb	328	325		**327**	398	407		**403**	**23,3%**	8
28-may-02	Alzado pila izq. (2 fase)	HA-30/b/20/IIb	325	316		**321**	370	364		**367**	**14,5%**	7
29-may-02	Alzado pila dcha. (1 fase)	HA-30/b/20/IIb	322	319		**321**	404	381		**393**	**22,5%**	7
30-may-02	Zapata estribo derecho	HA-30/b/20/IIb	339	322		**331**	384	390		**387**	**17,1%**	8
30-may-02	Zapata estribo derecho	HA-30/b/20/IIb	319	319		**319**	370	359		**365**	**14,3%**	7
5-ago-02	Tablero	HA-30/b/20/IIb	373	370		**372**	412	418		**415**	**11,7%**	7
5-ago-02	Tablero	HA-30/b/20/IIb	364	370		**367**	412	410		**411**	**12,0%**	8
5-ago-02	Tablero	HA-30/b/20/IIb	364	362		**363**	424	424		**424**	**16,8%**	8
5-ago-02	Tablero	HA-30/b/20/IIb	367	373		**370**	401	412		**407**	**9,9%**	7
5-ago-02	Tablero	HA-30/b/20/IIb	359	356		**358**	398	401		**400**	**11,7%**	7

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

E-14 (311+776)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
26-mar-02	Zap. Estribo izq.	HA-30/b/20/IIb	314	311		**313**	359	367		**363**	**16,2%**	8
27-mar-02	Zap. Estribo dcho	HA-30/b/20/IIb	347	339		**343**	373	381		**377**	**9,9%**	7
5-abr-02	Alz. Estribo dcho	HA-30/b/20/IIb	322	322		**322**	345	333		**339**	**5,3%**	8
9-abr-02	Alz. Estribo izq	HA-30/b/20/IIb	342	356		**349**	401	393		**397**	**13,8%**	8
16-abr-02	Zapatas pilas	HA-30/b/20/IIb	311	319		**315**	376	384		**380**	**20,6%**	9
18-abr-02	Alzado pila izq. (1ªfase)	HA-30/b/20/IIb	299	297		**298**	367	367		**367**	**23,2%**	7
18-abr-02	Alzado pila izq. (2ªfase)	HA-30/b/20/IIb	291	305		**298**	347	350		**349**	**16,9%**	7
19-abr-02	Alzado pila izq.	HA-30/b/20/IIb	291	305		**298**	347	350		**349**	**16,9%**	7
22-abr-02	Alzado pila dcha (1ªf)	HA-30/b/20/IIb	319	299		**309**	412	412		**412**	**33,3%**	7
23-abr-02	Alzado pila dcha (2ªf)	HA-30/b/20/IIb	291	280		**286**	368	373		**371**	**29,8%**	7
29-may-02	Tablero	HA-30/b/20/IIb	299	294		**297**	322	336		**329**	**11,0%**	8
29-may-02	Tablero	HA-30/b/20/IIb	339	342		**341**	393	410		**402**	**17,9%**	8
29-may-02	Tablero	HA-30/b/20/IIb	328	325		**327**	407	424		**416**	**27,3%**	7
29-may-02	Tablero	HA-30/b/20/IIb	291	297		**294**	356	373		**365**	**24,0%**	7
29-may-02	Tablero	HA-30/b/20/IIb	350	362		**356**	435	429		**432**	**21,3%**	9

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-14 (316+080)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
20-ago-01	Zapata estribo 1	HA-25/b/20/IIa	263	254		**259**	308	308		**308**	**19,1%**	8
21-ago-01	Zapata estribo 2	HA-25/b/20/IIa	266	266		**266**	311	311		**311**	**16,9%**	7
29-ago-01	Alzado estribo 2	HA-25/b/20/IIa	263	274		**269**	336	353		**345**	**28,3%**	8
31-ago-01	Alzado estribo 1	HA-25/b/20/IIa	297	285		**291**	356	373		**365**	**25,3%**	8
27-sep-01	Zapata 1B	HA-25/b/20/IIa	331	328		**330**	415	418		**417**	**26,4%**	8
1-oct-01	Zapata 3B	HA-25/b/20/IIa	336	322		**329**	384	373		**379**	**15,0%**	7
2-oct-01	Zapata 2B	HA-25/B/20/IIa	333	347		**340**	435	441		**438**	**28,8%**	6
3-oct-01	Zapata 1L	HA-25/B/20/IIa	336	322		**329**	384	401		**393**	**19,3%**	8
5-oct-01	Zapata 4B	HA-25/B/20/IIa	342	333		**338**	401	412		**407**	**20,4%**	8
5-oct-01	Zapata 3L	HA-25/B/20/IIa	339	336		**338**	407	401		**404**	**19,7%**	6
8-oct-01	Zapata 2L	HA-25/B/20/IIa	350	350		**350**	427	429		**428**	**22,3%**	8
11-oct-01	Zapata 5L	HA-25/B/20/IIa	316	305		**311**	396	407		**402**	**29,3%**	8
11-oct-01	Zapata 7L	HA-25/B/20/IIa	314	316		**315**	401	387		**394**	**25,1%**	9
17-oct-01	Zapata 4L	HA-25/B/20/IIa	283	297		**290**	322	331		**327**	**12,6%**	9
17-oct-01	Zapata 6L	HA-25/B/20/IIa	311	314		**313**	387	401		**394**	**26,1%**	9
23-oct-01	Zapata 7L	HA-25/B/20/IIa	328	350		**339**	424	412		**418**	**23,3%**	9
24-oct-01	Zapata 5B	HA-25/B/20/IIa	283	288		**286**	381	376		**379**	**32,6%**	9
26-oct-01	Zapata 6B	HA-25/B/20/IIa	283	271		**277**	364	353		**359**	**29,4%**	6
29-oct-01	Alzado 4B	HA-25/B/20/IIa	274	288		**281**	339	350		**345**	**22,6%**	9
30-oct-01	Alzado 2B	HA-30/B/20/IIb	339	333		**336**	418	412		**415**	**23,5%**	6
6-nov-01	Alzado 1L	HA-25/B/20/IIa	345	339		**342**	410	398		**404**	**18,1%**	6
12-nov-01	Alzado 3B	HA-25/B/20/IIa	331	333		**332**	410	401		**406**	**22,1%**	8
12-nov-01	Alzado 3L	HA-25/B/20/IIa	294	316		**305**	379	387		**383**	**25,6%**	9
13-nov-01	Alzado2L	HA-25/B/20/IIa	342	347		**345**	438	449		**444**	**28,7%**	6

ODT-14 (316+080)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
14-nov-01	Alzado1B	HA-25/B/20/IIa	302	328		**315**	429	438		**434**	**37,6%**	9
20-nov-01	Alzado 6B	HA-25/B/20/IIa	336	333		**335**	429	438		**434**	**29,6%**	6
21-nov-01	Alzado 7B	HA-25/B/20/IIa	345	331		**338**	424	424		**424**	**25,4%**	8
26-nov-01	Alzado 5L	HA-25/B/20/IIa	285	291		**288**	362	364		**363**	**26,0%**	8
26-nov-01	Alzado 7L	HA-25/B/20/IIa	297	297		**297**	398	412		**405**	**36,4%**	7
28-nov-01	Alzado 9L	HA-25/B/20/IIa	339	339		**339**	424	424		**424**	**25,1%**	6
30-nov-01	Alzado 8L	HA-25/B/20/IIa	322	314		**318**	427	438		**433**	**36,0%**	6
27-may-02	Zapata izq. Entronque	HA-25/B/20/IIa	285	288		**287**	331	339		**335**	**16,9%**	8
27-may-02	Zapata izq. Entronque	HA-25/B/20/IIa	283	297		**290**	359	342		**351**	**20,9%**	9
31-may-02	Zapata Entronque dcho.	HA-25/B/20/IIa	263	251		**257**	294	280		**287**	**11,7%**	9
31-may-02	Zapata Entronque dcho.	HA-25/B/20/IIa	263	254		**259**	297	311		**304**	**17,6%**	6
14-jun-02	Alzados Entronque izq.	HA-25/B/20/IIa	283	297		**290**	314	319		**317**	**9,1%**	7
19-jun-02	Alzado Muro Entronque izq.	HA-25/B/20/IIa	277	283		**280**	350	362		**356**	**27,1%**	7
27-jun-02	lzadoMuro Entronque dcho.	HA-25/B/20/IIa	277	283		**280**	350	362		**356**	**27,1%**	8
27-jun-02	Alzado Aleta Entronque dcho	HA-25/B/20/IIa	277	283		**280**	350	362		**356**	**27,1%**	9
16-jul-02	Zapata pila izq.	HA-30/B/20/IIb	350	356		**353**	418	444		**431**	**22,1%**	7
18-jul-02	Zapata pila dcha	HA-30/B/20/IIb	345	342		**344**	424	435		**430**	**25,0%**	6
19-jul-02	Alzado pila izq. 1f	HA-30/B/20/IIb	362	364		**363**	500	494		**497**	**36,9%**	7
22-jul-02	Alzado pila dcha. 2 f	HA-30/B/20/IIb	350	342		**346**	455	452		**454**	**31,1%**	8
24-jul-02	Alzado pila dcha. 2 f	HA-30/B/20/IIb	350	359		**355**	429	429		**429**	**21,0%**	7
23-oct-02	Alzado Tablero	HA-30/B/20/IIb	364	370		**367**	404	398		**401**	**9,3%**	9
14-oct-02	Tablero	HA-30/B/20/IIb	362	367		**365**	421	429		**425**	**16,6%**	9
14-oct-02	Tablero	HA-30/B/20/IIb	373	376		**375**	390	396		**393**	**4,9%**	7
14-oct-02	Tablero	HA-30/B/20/IIb	328	314		**321**	396	390		**393**	**22,4%**	8

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-1 (309+363)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)	
			7 DÍAS				28 DÍAS						
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA			
25-may-01	**Zapata**	**H 150/b/20**	**147**	**141**		**144**	**184**	**198**		**191**	**32,6%**	**8**	*C*
26-may-01	**Zapata**	**H 150/b/20**	**159**	**151**		**155**	**194**	**181**		**188**	**21,0%**	**8**	*C*
30-may-01	Zapata	HA-30/b/20/IIb+E	277	288		**283**	336	345		**341**	**20,5%**	9	
6-jun-01	**Zapata**	**HA-25/b/20/IIa**	**283**	**283**		**283**	**370**	**346**		**358**	**26,5%**	**8**	*C*
6-jun-01	**Zapata**	**HA-25/b/20/IIa**	**275**	**294**		**285**	**352**	**363**		**358**	**25,7%**	**8**	*C*
6-jun-01	**Zapata**	**HA-25/b/20/IIa**	**292**	**302**		**297**	**362**	**363**		**363**	**22,1%**	**8**	*C*
7-jun-01	**Zapata**	**HM-20/b/IIa**	**178**	**195**		**187**	**243**	**249**		**246**	**31,9%**	**8**	*C*
7-jun-01	**Zapata**	**HM-20/b/IIa**	**205**	**207**		**206**	**247**	**249**		**248**	**20,4%**	**8**	*C*
20-jun-01	Zapata	HA-25/b/20/IIa	229	218		**224**	263	274		**269**	**20,1%**	7	
12-jul-01	Alz. sección CC (1ª fase)	HA-25/b/20/IIa	226	232		**229**	288	305		**297**	**29,5%**	7	
25-jul-01	Alz. sección CC (2ª fase)	HA-25/b/20/IIa	266	271		**269**	274	283		**279**	**3,7%**	7	
10-ago-01	Losa superior	HA-25/b/20/IIa	257	268		**263**	339	328		**334**	**27,0%**	7	
20-ago-01	Zap. arqueta entronque	HA-25/b/20/IIa	251	234		**243**	277	283		**280**	**15,5%**	9	
26-sep-01	Alzado arqueta entronque	HA-25/b/20/IIa	302	280		**291**	393	404		**399**	**36,9%**	6	

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-2 (309+647)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
22-jun-01	Zapata (1ª fase)	HA-25/b/20/IIa	220	234		**227**	254	260		**257**	**13,2%**	7
22-jun-01	Zapata (1ª fase)	HA-25/b/20/IIa	249	226		**238**	266	271		**269**	**13,1%**	8
26-jun-01	Zapata (2ª fase)	HA-25/b/20/IIa	240	237		**239**	297	291		**294**	**23,3%**	8
29-jun-01	Zapata (3ª fase)	HA-25/b/20/IIa	226	240		**233**	268	285		**277**	**18,7%**	8
20-jul-01	Alz. sección BB (1ª fase)	HA-25/b/20/IIa	294	291		**293**	333	333		**333**	**13,8%**	7
26-jul-01	Alz. sección BB (2ªfase)	HA-25/b/20/IIa	251	251		**251**	291	305		**298**	**18,7%**	7
7-ago-01	Losa superior	HA-25/b/20/IIa	260	271		**266**	314	322		**318**	**19,8%**	7
10-ago-01	Alzado (3ªfase)	HA-25/b/20/IIa	237	234		**236**	274	280		**277**	**17,6%**	10
10-ago-01	Zapata entronque	HA-25/b/20/IIa	302	291		**297**	347	339		**343**	**15,7%**	9
11-mar-02	Alzado dcho zap. Entrq	HA-25/b/20/IIa	283	299		**291**	328	331		**330**	**13,2%**	9
18-mar-02	Alzado izq zap. Entrq	HA-25/b/20/IIa	353	342		**348**	424	424		**424**	**22,0%**	7
21-mar-02	Tablero (3ªfase)	HA-25/b/20/IIa	254	260		**257**	339	347		**343**	**33,5%**	7

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-3 (309+992)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
18-feb-02	Zapata entronque	HA-25/b/20/IIa	305	302		**304**	347	364		**356**	**17,1%**	9
22-feb-02	Alzado izq	HA-25/b/20/IIa	294	280		**287**	362	350		**356**	**24,0%**	8
29-abr-02	Muro curvo	HA-25/b/20/IIa	297	291		**294**	336	342		**339**	**15,3%**	8
9-sep-02	Zapata	HA-25/b/20/IIa	356	379		**368**	438	444		**441**	**20,0%**	9
9-sep-02	Zapata	HA-25/b/20/IIa	328	322		**325**	356	350		**353**	**8,6%**	8
24-sep-02	Alzado dcho	HA-25/b/20/IIa	333	339		**336**	398	396		**397**	**18,2%**	9
24-sep-02	Alzado dcho	HA-25/b/20/IIa	322	333		**328**	384	396		**390**	**19,1%**	9

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-4 (310+064)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
6-sep-01	Zapata entronque	HA-25/b/20/IIa	291	305		**298**	345	364		**355**	**19,0%**	7
12-sep-01	Alzado entronque dcho	HA-25/b/20/IIa	291	285		**288**	379	379		**379**	**31,6%**	9
14-sep-01	Alzado entronque izq	HA-25/b/20/IIa	319	314		**317**	396	387		**392**	**23,7%**	8

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-5 (310+230)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
20-nov-01	Zapata	HA-25/b/20/IIa	299	316		**308**	418	410		**414**	**34,6%**	8
26-nov-01	Alzado Dcho	HA-25/b/20/IIa	299	288		**294**	396	398		**397**	**35,3%**	9
26-nov-01	Alzado Izq.	HA-25/b/20/IIa	297	311		**304**	421	424		**423**	**39,0%**	7
28-ene-02	Zapata estribos (1ªfase)	HA-25/b/20/IIa	325	322		**324**	446	438		**442**	**36,6%**	8
29-ene-02	Zapata estribos (2ªfase)	HA-25/b/20/IIa	311	299		**305**	387	396		**392**	**28,4%**	5
4-feb-02	Alzado estribo 2 (1ªfase)	HA-25/b/20/IIa	283	299		**291**	342	356		**349**	**19,9%**	8
4-feb-02	Alzado estribo 1 (1ªfase)	HA-25/b/20/IIa	308	297		**303**	376	381		**379**	**25,1%**	6
12-feb-02	Alzado estribos (2ªfase)	HA-25/b/20/IIa	297	319		**308**	387	404		**396**	**28,4%**	8
21-feb-02	Tablero	HA-25/b/20/IIa	299	294		**297**	390	401		**396**	**33,4%**	8
11-mar-02	Zapata estribo (2ª fase)	HA-25/b/20/IIa	305	308		**307**	376	359		**368**	**19,9%**	7
18-mar-02	Alzado estribos (3ªfase)	HA-25/b/20/IIa	356	350		**353**	452	446		**449**	**27,2%**	6
21-mar-02	Tablero (2ªfase)	HA-25/b/20/IIa	294	280		**287**	328	333		**331**	**15,2%**	6
10-abr-02	Muro curvo	HA-25/b/20/IIa	297	285		**291**	350	353		**352**	**20,8%**	7

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-6 (311+100)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
22-jun-01	Zapata (1ª fase)	HA-25/b/20/IIa	220	234		**227**	254	260		**257**	**13,2%**	7
22-jun-01	Zapata (1ª fase)	HA-25/b/20/IIa	249	226		**238**	266	271		**269**	**13,1%**	8
26-jun-01	Zapata (2ª fase)	HA-25/b/20/IIa	240	237		**239**	297	291		**294**	**23,3%**	8
29-jun-01	Zapata (3ª fase)	HA-25/b/20/IIa	226	240		**233**	268	285		**277**	**18,7%**	8
20-jul-01	Alzado (1ª fase)	HA-25/b/20/IIa	294	291		**293**	333	333		**333**	**13,8%**	7
26-jul-01	Alzado (2ªfase)	HA-25/b/20/IIa	251	251		**251**	291	305		**298**	**18,7%**	7
7-ago-01	Losa superior	HA-25/b/20/IIa	260	271		**266**	314	322		**318**	**19,8%**	7
10-ago-01	Alzado (3ªfase)	HA-25/b/20/IIa	237	234		**236**	274	280		**277**	**17,6%**	10
16-ago-01	Zap. estribo (1ªfase)	HA-25/b/20/IIa	283	288		**286**	325	345		**335**	**17,3%**	9
16-ago-01	Zap. estribo (1ªfase)	HA-25/b/20/IIa	263	260		**262**	291	311		**301**	**15,1%**	6
16-ago-01	Zap. estribo (1ªfase)	HA-25/b/20/IIa	294	263		**279**	336	353		**345**	**23,7%**	7
16-ago-01	Zap. estribo (1ªfase)	HA-25/b/20/IIa	280	297		**289**	322	333		**328**	**13,5%**	7
16-ago-01	Zap. estribo (1ªfase)	HA-25/b/20/IIa	294	311		**303**	353	342		**348**	**14,9%**	7
23-ago-01	Zap. estribo (2ª fase)	HA-25/b/20/IIa	271	266		**269**	322	331		**327**	**21,6%**	8
23-ago-01	Zap. estribo (2ª fase)	HA-25/b/20/IIa	257	268		**263**	322	311		**317**	**20,6%**	7
23-ago-01	Zap. estribo (2ª fase)	HA-25/b/20/IIa	274	291		**283**	333	345		**339**	**20,0%**	7
23-ago-01	Zap. estribo (2ª fase)	HA-25/b/20/IIa	291	277		**284**	356	347		**352**	**23,8%**	8
23-ago-01	Zap. estribo (2ª fase)	HA-25/b/20/IIa	285	302		**294**	342	353		**348**	**18,4%**	7
28-ago-01	Rastrillo izq.	HA-25/b/20/IIa	268	268		**268**	339	333		**336**	**25,4%**	6
3-sep-01	Zap. estribo (3ª fase)	HA-25/b/20/IIa	274	294		**284**	356	328		**342**	**20,4%**	7
3-sep-01	Zap. estribo (3ª fase)	HA-25/b/20/IIa	266	283		**275**	356	342		**349**	**27,1%**	8
3-sep-01	Zap. estribo (3ª fase)	HA-25/b/20/IIa	294	283		**289**	359	345		**352**	**22,0%**	8
3-sep-01	Zap. estribo (3ª fase)	HA-25/b/20/IIa	297	299		**298**	362	342		**352**	**18,1%**	7
5-sep-01	Zapata estribo	HA-25/b/20/IIa	277	277		**277**	373	353		**363**	**31,0%**	9
6-sep-01	Alzado izq. (1ª fase)	HA-25/b/20/IIa	297	314		**306**	359	367		**363**	**18,8%**	9

ODT-6 (311+100)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
6-sep-01	Alzado central (1ª fase)	HA-25/b/20/IIa	254	260		**257**	356	350		**353**	**37,4%**	7
12-sep-01	Alzado izq. (2ª fase)	HA-25/b/20/IIa	249	260		**255**	328	314		**321**	**26,1%**	6
12-sep-01	Alzado central (2ª fase)	HA-25/b/20/IIa	249	254		**252**	299	305		**302**	**20,1%**	8
12-sep-01	Zapata aleta 1	HA-25/b/20/IIa	257	249		**253**	333	342		**338**	**33,4%**	9
14-sep-01	Alzado dcho (1ª fase)	HA-25/b/20/IIa	322	319		**321**	390	379		**385**	**20,0%**	6
17-sep-01	Alzado izq (3ª fase)	HA-25/b/20/IIa	274	254		**264**	387	407		**397**	**50,4%**	8
17-sep-01	Alzado central (3ª fase)	HA-25/b/20/IIa	314	305		**310**	429	412		**421**	**35,9%**	9
18-sep-01	Alz. Estribo 1	HA-25/b/20/IIa	364	379		**372**	460	469		**465**	**25,0%**	6
18-sep-01	Alzado dcho (2ª fase)	HA-25/b/20/IIa	364	379		**372**	460	469		**465**	**25,0%**	6
19-sep-01	Alzado dcho (3ª fase)	HA-25/b/20/IIa	319	336		**328**	401	396		**399**	**21,7%**	7
1-oct-01	Alzado aleta 2 (1ªfase)	HA-25/b/20/IIa	302	288		**295**	367	339		**353**	**19,7%**	8
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	319	322		**321**	393	401		**397**	**23,9%**	8
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	316	308		**312**	373	381		**377**	**20,8%**	7
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	325	325		**325**	387	404		**396**	**21,7%**	8
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	370	362		**366**	429	407		**418**	**14,2%**	9
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	322	325		**324**	407	418		**413**	**27,5%**	9
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	322	311		**317**	396	381		**389**	**22,7%**	9
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	319	322		**321**	393	401		**397**	**23,9%**	8
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	316	308		**312**	373	381		**377**	**20,8%**	7
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	325	325		**325**	387	404		**396**	**21,7%**	8
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	370	362		**366**	429	407		**418**	**14,2%**	9
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	322	325		**324**	407	418		**413**	**27,5%**	9
4-oct-01	Losa superior (1ªfase)	HA-25/b/20/IIa	322	311		**317**	396	381		**389**	**22,7%**	9
8-oct-01	Alzado aleta 2 (2ªfase)	HA-25/b/20/IIa	353	367		**360**	444	435		**440**	**22,1%**	7
16-oct-01	Losa sup. (2ªfase)	HA-25/b/20/IIa	305	299		**302**	379	362		**371**	**22,7%**	9
16-oct-01	Losa sup. (2ªfase)	HA-25/b/20/IIa	316	322		**319**	387	373		**380**	**19,1%**	8
16-oct-01	Losa sup. (2ªfase)	HA-25/b/20/IIa	302	316		**309**	384	373		**379**	**22,5%**	7
16-oct-01	Losa sup. (2ªfase)	HA-25/b/20/IIa	305	314		**310**	364	373		**369**	**19,1%**	9
16-oct-01	Losa sup. (2ªfase)	HA-25/b/20/IIa	336	347		**342**	390	407		**399**	**16,7%**	8
29-oct-01	Losa sup. (3ªfase)	HA-25/b/20/IIa	319	325		**322**	404	415		**410**	**27,2%**	6
29-oct-01	Losa sup. (3ªfase)	HA-25/b/20/IIa	336	328		**332**	407	415		**411**	**23,8%**	7

ODT-6 (311+100)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
29-oct-01	Losa sup. (3ªfase)	HA-25/b/20/IIa	319	308		**314**	404	390		**397**	**26,6%**	7
29-oct-01	Losa sup. (3ªfase)	HA-25/b/20/IIa	333	319		**326**	415	427		**421**	**29,1%**	8
29-oct-01	Losa sup. (3ªfase)	HA-25/b/20/IIa	314	339		**327**	412	421		**417**	**27,6%**	7
9-nov-01	Zapata estribo (4ªfase)	HA-25/b/20/IIa	240	234		**237**	318	277		**298**	**25,5%**	9
9-nov-01	Zapata estribo (4ªfase)	HA-25/b/20/IIa	291	288		**290**	396	410		**403**	**39,2%**	8
21-nov-01	Alzado estribo 3	HA-25/b/20/IIa	299	294		**297**	410	412		**411**	**38,6%**	8
21-nov-01	Alzado estribo 2	HA-25/b/20/IIa	283	294		**289**	446	438		**442**	**53,2%**	9
30-nov-01	Alz. Aleta Izq. 2	HA-25/b/20/IIa	370	362		**366**	452	472		**462**	**26,2%**	7
15-mar-02	Tablero (4ªfase)	HA-25/b/20/IIa	294	305		**300**	415	429		**422**	**40,9%**	7
22-mar-02	Aletas dchas	HA-25/b/20/IIa	288	288		**288**	390	384		**387**	**34,4%**	6

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-7 (311+535)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
6-sep-01	Alz. estribo 2 (1ª fase)	HA-25/b/20/IIa	254	260		**257**	356	350		**353**	**37,4%**	7
12-sep-01	Alz. estribo 3 (2ª fase)	HA-25/b/20/IIa	249	260		**255**	328	314		**321**	**26,1%**	6
12-sep-01	Alz. estribo 2 (2ª fase)	HA-25/b/20/IIa	249	254		**252**	299	305		**302**	**20,1%**	8
12-sep-01	Zap. Aleta izq. 1	HA-25/b/20/IIa	257	249		**253**	333	342		**338**	**33,4%**	9
18-sep-01	Alz. Estribo 1	HA-25/b/20/IIa	364	379		**372**	460	469		**465**	**25,0%**	6
14-sep-01	Alz. Estribo 1 (1ª fase)	HA-25/b/20/IIa	322	319		**321**	390	379		**385**	**20,0%**	6
17-sep-01	Alz. estribo 3 (3ª fase)	HA-25/b/20/IIa	274	254		**264**	387	407		**397**	**50,4%**	8
17-sep-01	Alz. estribo 2 (3ª fase)	HA-25/b/20/IIa	314	305		**310**	429	412		**421**	**35,9%**	9
18-sep-01	Alz. estribo 1 (2ª fase)	HA-25/b/20/IIa	364	379		**372**	460	469		**465**	**25,0%**	6
19-sep-01	Alz. Estribo1 (3ª fase)	HA-25/b/20/IIa	319	336		**328**	401	396		**399**	**21,7%**	7
1-oct-01	Alzado aleta izq.	HA-25/b/20/IIa	302	288		**295**	367	339		**353**	**19,7%**	8
4-oct-01	Zapata aletas	HA-25/b/20/IIa	328	319		**324**	373	362		**368**	**13,6%**	9
8-oct-01	Aleta 2	HA-25/b/20/IIa	359	364		**362**	404	418		**411**	**13,7%**	8

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-8 (311+995)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
9-oct-01	Zapata 3	HA-25/b/20/IIa	376	353		**365**	410	424		**417**	**14,4%**	9
9-oct-01	Zapata 3	HA-25/b/20/IIa	376	356		**366**	427	418		**423**	**15,4%**	8
9-oct-01	Zapata 3	HA-25/b/20/IIa	347	356		**352**	401	396		**399**	**13,4%**	6
9-oct-01	Zapata 3	HA-25/b/20/IIa	308	305		**307**	370	387		**379**	**23,5%**	8
9-oct-01	Zapata 3	HA-25/b/20/IIa	333	325		**329**	390	379		**385**	**16,9%**	7
9-oct-01	Zapata 3	HA-25/b/20/IIa	328	308		**318**	401	384		**393**	**23,4%**	8
9-oct-01	Zapata 3	HA-25/b/20/IIa	345	339		**342**	398	412		**405**	**18,4%**	8
9-oct-01	Zapata 3	HA-25/b/20/IIa	342	339		**341**	398	412		**405**	**18,9%**	7
9-oct-01	Zapata 3	HA-25/b/20/IIa	319	333		**326**	396	410		**403**	**23,6%**	8
9-oct-01	Zapata 3	HA-25/b/20/IIa	328	322		**325**	401	401		**401**	**23,4%**	7
9-oct-01	Zapata 3	HA-25/b/20/IIa	316	325		**321**	398	381		**390**	**21,5%**	7
15-oct-01	Zapata 1	HA-25/b/20/IIa	336	345		**341**	407	412		**410**	**20,3%**	8
15-oct-01	Zapata 1	HA-25/b/20/IIa	336	328		**332**	390	401		**396**	**19,1%**	7
15-oct-01	Zapata 1	HA-25/b/20/IIa	379	390		**385**	429	429		**429**	**11,6%**	10
15-oct-01	Zapata 1	HA-25/b/20/IIa	339	347		**343**	393	401		**397**	**15,7%**	9
15-oct-01	Zapata 1	HA-25/b/20/IIa	322	316		**319**	407	396		**402**	**25,9%**	9
15-oct-01	Zapata 1	HA-25/b/20/IIa	319	319		**319**	410	401		**406**	**27,1%**	8
15-oct-01	Zapata 1	HA-25/b/20/IIa	333	322		**328**	427	424		**426**	**29,9%**	8
15-oct-01	Zapata 1	HA-25/b/20/IIa	299	285		**292**	384	376		**380**	**30,1%**	9
15-oct-01	Zapata 1	HA-25/b/20/IIa	322	316		**319**	427	410		**419**	**31,2%**	9
15-oct-01	Zapata 1	HA-25/b/20/IIa	379	370		**375**	427	429		**428**	**14,3%**	9
15-oct-01	Zapata 1	HA-25/b/20/IIa	339	353		**346**	404	412		**408**	**17,9%**	9
19-oct-01	Zapata 2	HA-25/b/20/IIa	299	319		**309**	370	387		**379**	**22,5%**	8
19-oct-01	Zapata 2	HA-25/b/20/IIa	339	314		**327**	398	381		**390**	**19,3%**	7
19-oct-01	Zapata 2	HA-25/b/20/IIa	316	328		**322**	390	407		**399**	**23,8%**	7
19-oct-01	Zapata 2	HA-25/b/20/IIa	316	316		**316**	362	373		**368**	**16,3%**	8

ODT-8 (311+995)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
19-oct-01	Zapata 2	HA-25/b/20/IIa	314	316		**315**	401	309		**355**	**12,7%**	8
19-oct-01	Zapata 2	HA-25/b/20/IIa	316	308		**312**	364	384		**374**	**19,9%**	9
19-oct-01	Zapata 2	HA-25/b/20/IIa	305	305		**305**	367	373		**370**	**21,3%**	8
19-oct-01	Zapata 2	HA-25/b/20/IIa	302	311		**307**	367	384		**376**	**22,5%**	9
19-oct-01	Zapata 2	HA-25/b/20/IIa	297	299		**298**	359	367		**363**	**21,8%**	9
19-oct-01	Zapata 2	HA-25/b/20/IIa	322	305		**314**	356	367		**362**	**15,3%**	9
19-oct-01	Zapata 2	HA-25/b/20/IIa	311	308		**310**	376	379		**378**	**22,0%**	7
22-oct-01	Zapata 3	HA-25/b/20/IIa	331	328		**330**	410	418		**414**	**25,6%**	7
22-oct-01	Zapata 3	HA-25/b/20/IIa	308	316		**312**	396	410		**403**	**29,2%**	8
23-oct-01	Zapata 1	HA-25/b/20/IIa	288	297		**293**	370	362		**366**	**25,1%**	8
24-oct-01	Alzado 3	HA-25/b/20/IIa	331	331		**331**	424	429		**427**	**28,9%**	7
25-oct-01	Alzado 4	HA-25/b/20/IIa	311	297		**304**	415	396		**406**	**33,4%**	8
29-oct-01	Zap. Estribo 2	HA-25/b/20/IIa	314	319		**317**	384	367		**376**	**18,6%**	8
31-oct-01	Alzado 3 (2ªfase)	HA-25/b/20/IIa	345	333		**339**	424	435		**430**	**26,7%**	7
31-oct-01	Alzado 4 (2ª fase)	HA-25/b/20/IIa	299	322		**311**	379	367		**373**	**20,1%**	8
6-nov-01	Alz. Estribo 1	HA-25/b/20/IIa	316	333		**325**	373	407		**390**	**20,2%**	7
6-nov-01	Alz. Estribo 2	HA-25/b/20/IIa	328	311		**320**	342	362		**352**	**10,2%**	9
8-nov-01	Alzado estribo 4	HA-25/b/20/IIa	316	308		**312**	387	387		**387**	**24,0%**	9
12-nov-01	Alzado estribo 1 (2º mod)	HA-25/b/20/IIa	325	319		**322**	401	384		**393**	**21,9%**	6
22-nov-01	Tablero mod. Dcho	HA-25/b/20/IIa	271	277		**274**	367	370		**369**	**34,5%**	9
22-nov-01	Tablero mod. Dcho	HA-25/b/20/IIa	280	288		**284**	370	356		**363**	**27,8%**	9
22-nov-01	Tablero mod. Dcho	HA-25/b/20/IIa	283	274		**279**	387	390		**389**	**39,5%**	9
22-nov-01	Tablero mod. Dcho	HA-25/b/20/IIa	266	263		**265**	342	356		**349**	**31,9%**	10
22-nov-01	Tablero mod. Dcho	HA-25/b/20/IIa	251	260		**256**	339	328		**334**	**30,5%**	9
2-nov-01	Zapata aleta dcha.	HA-25/b/20/IIa	280	277		**279**	384	381		**383**	**37,3%**	10
28-nov-01	Zap. Aleta dcha 2	HA-25/b/20/IIa	302	328		**315**	396	407		**402**	**27,5%**	10
5-dic-01	Tablero módulo central	HA-25/b/20/IIa	316	328		**322**	410	398		**404**	**25,5%**	9
5-dic-01	Tablero módulo central	HA-25/b/20/IIa	356	362		**359**	396	384		**390**	**8,6%**	8
5-dic-01	Tablero módulo central	HA-25/b/20/IIa	328	345		**337**	401	424		**413**	**22,6%**	9
5-dic-01	Tablero módulo central	HA-25/b/20/IIa	350	356		**353**	401	421		**411**	**16,4%**	9
5-dic-01	Tablero módulo central	HA-25/b/20/IIa	322	322		**322**	381	387		**384**	**19,3%**	9

ODT-8 (311+995)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
10-dic-01	Alzado aleta dcha 1	HA-25/b/20/IIa	220	212		**216**	251	257		**254**	**17,6%**	8
11-ene-02	Tablero mod. Izq.	HA-25/b/20/IIa	316	302		**309**	421	404		**413**	**33,5%**	10
11-ene-02	Tablero mod. Izq.	HA-25/b/20/IIa	322	325		**324**	441	435		**438**	**35,4%**	9
11-ene-02	Tablero mod. Izq.	HA-25/b/20/IIa	331	319		**325**	427	412		**420**	**29,1%**	8
11-ene-02	Tablero mod. Izq.	HA-25/b/20/IIa	294	294		**294**	407	418		**413**	**40,3%**	8
11-ene-02	Tablero mod. Izq.	HA-25/b/20/IIa	246	263		**255**	384	370		**377**	**48,1%**	9
12-feb-02	Zapatas aletas izq	HA-25/b/20/IIa	294	288		**291**	393	384		**389**	**33,5%**	8
15-feb-02	Alzados aletas izq	HA-25/b/20/IIa	328	328		**328**	407	412		**410**	**24,8%**	9

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-9 (312+600)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
6-feb-02	Zapata aleta dcha	HA-25/b/20/IIa	319	311		**315**	398	390		**394**	**25,1%**	9
26-abr-02	Zapata entronque	HA-30/b/20/IIb	280	274		**277**	370	379		**375**	**35,2%**	6
29-abr-02	Zapata muros entronque	HA-30/b/20/IIb	308	319		**314**	384	370		**377**	**20,3%**	7
30-abr-02	Alzados pilas entronque	HA-25/b/20/IIa	299	302		**301**	373	387		**380**	**26,5%**	6
13-may-02	zados muros rampa entronq	HA-25/b/20/IIa	305	297		**301**	359	370		**365**	**21,1%**	8

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-10 (313+198)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
5-sep-01	Zapata	HA-25/b/20/IIa	291	277		**284**	353	331		**342**	**20,4%**	6
5-sep-01	Zapata	HA-25/b/20/IIa	280	271		**276**	362	347		**355**	**28,7%**	8
12-sep-01	Zapatas 1,2,3 y 4 aletas	HA-25/b/20/IIa	254	266		**260**	339	331		**335**	**28,8%**	6
17-sep-01	Alzado 1	HA-25/b/20/IIa	345	350		**348**	452	444		**448**	**28,9%**	8
17-sep-01	Alzado 2	HA-25/b/20/IIa	336	333		**335**	460	458		**459**	**37,2%**	7
8-oct-01	Alzado aleta 3	HA-25/b/20/IIa	336	328		**332**	429	415		**422**	**27,1%**	7
10-oct-01	Alzado aleta 1	HA-25/b/20/IIa	350	333		**342**	415	404		**410**	**19,9%**	8
10-oct-01	Alzado aleta 2	HA-25/b/20/IIa	325	350		**338**	427	441		**434**	**28,6%**	7
11-oct-01	Alzado aleta 4	HA-25/b/20/IIa	305	316		**311**	421	410		**416**	**33,8%**	9
22-oct-01	Losa superior	HA-25/b/20/IIa	308	299		**304**	404	398		**401**	**32,1%**	7
22-oct-01	Losa superior	HA-25/b/20/IIa	294	302		**298**	407	396		**402**	**34,7%**	8
22-oct-01	Losa superior	HA-25/b/20/IIa	333	319		**326**	441	429		**435**	**33,4%**	6
30-ene-02	Zap. Estribo dcho.	HA-30/b/20/IIb	359	356		**358**	435	429		**432**	**20,8%**	5

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-11 (314+300)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	311	302		**307**	415	404		**410**	**33,6%**	9
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	339	359		**349**	384	384		**384**	**10,0%**	8
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	314	319		**317**	415	412		**414**	**30,6%**	8
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	311	316		**314**	412	429		**421**	**34,1%**	7
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	316	322		**319**	410	418		**414**	**29,8%**	8
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	333	315		**324**	446	435		**441**	**36,0%**	6
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	294	308		**301**	429	429		**429**	**42,5%**	7
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	288	280		**284**	393	381		**387**	**36,3%**	9
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	350	345		**348**	446	441		**444**	**27,6%**	8
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	308	314		**311**	393	392		**393**	**26,2%**	8
25-oct-01	Zapata estribo 1 (1ªfase)	HA-25/b/20/IIa	268	294		**281**	379	387		**383**	**36,3%**	9
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	308	311		**310**	401	393		**397**	**28,3%**	8
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	283	286		**285**	384	373		**379**	**33,0%**	8
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	271	274		**273**	373	362		**368**	**34,9%**	9
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	277	288		**283**	370	362		**366**	**29,6%**	8
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	294	302		**298**	376	396		**386**	**29,5%**	7
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	285	294		**290**	370	376		**373**	**28,8%**	7
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	294	302		**298**	359	369		**364**	**22,1%**	9
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	268	274		**271**	347	336		**342**	**26,0%**	8
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	277	283		**280**	356	356		**356**	**27,1%**	9
26-oct-01	Zap. Estribo 1 (2ªfase)	HA-25/b/20/IIa	249	240		**245**	308	312		**310**	**26,8%**	9
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	345	325		**335**	379	384		**382**	**13,9%**	8
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	333	316		**325**	396	401		**399**	**22,8%**	8
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	294	305		**300**	367	353		**360**	**20,2%**	9

ODT-11 (314+300)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	316	333		**325**	401	401		**401**	**23,6%**	6
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	347	342		**345**	407	424		**416**	**20,6%**	8
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	319	331		**325**	396	404		**400**	**23,1%**	9
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	339	342		**341**	407	384		**396**	**16,2%**	7
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	325	311		**318**	362	373		**368**	**15,6%**	7
5-nov-01	Zapata Estribo 2 (1ªfase)	HA-25/b/20/IIa	302	311		**307**	390	379		**385**	**25,4%**	9
6-nov-01	Alz. Estribo 4	HA-25/b/20/IIa	333	339		**336**	379	410		**395**	**17,4%**	7
6-nov-01	Alz. Estribo 4	HA-25/b/20/IIa	333	342		**338**	404	412		**408**	**20,9%**	8
6-nov-01	Alz. Estribo 4	HA-25/b/20/IIa	305	297		**301**	350	362		**356**	**18,3%**	9
6-nov-01	Alz. Estribo 4	HA-25/b/20/IIa	319	314		**317**	367	373		**370**	**16,9%**	8
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	328	311		**320**	376	362		**369**	**15,5%**	7
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	322	342		**332**	379	367		**373**	**12,3%**	8
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	316	305		**311**	362	370		**366**	**17,9%**	8
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	311	302		**307**	367	364		**366**	**19,2%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	311	311		**311**	379	393		**386**	**24,1%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	288	308		**298**	376	364		**370**	**24,2%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	305	316		**311**	384	384		**384**	**23,7%**	7
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	311	311		**311**	362	384		**373**	**19,9%**	7
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	291	302		**297**	373	367		**370**	**24,8%**	8
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	291	294		**293**	347	333		**340**	**16,2%**	8
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	314	328		**321**	404	401		**403**	**25,4%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	322	302		**312**	373	393		**383**	**22,8%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	325	333		**329**	427	429		**428**	**30,1%**	8
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	322	333		**328**	390	387		**389**	**18,6%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	311	311		**311**	379	393		**386**	**24,1%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	288	308		**298**	376	364		**370**	**24,2%**	9
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	305	316		**311**	384	384		**384**	**23,7%**	7
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	311	311		**311**	362	384		**373**	**19,9%**	7
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	291	302		**297**	373	367		**370**	**24,8%**	8
7-nov-01	Zap. Estribo 2 (2ª fase)	HA-25/b/20/IIa	291	294		**293**	347	333		**340**	**16,2%**	8

ODT-11 (314+300)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
12-nov-01	Zap. Estribo 2 mod. Izq.	HA-25/b/20/IIa	308	305		**307**	367	362		**365**	**18,9%**	8
12-nov-01	Zap. Estribo 2 mod. Izq.	HA-25/b/20/IIa	316	319		**318**	370	387		**379**	**19,2%**	7
12-nov-01	Zap. Estribo 1 mod. Izq.	HA-25/b/20/IIa	316	311		**314**	359	373		**366**	**16,7%**	8
12-nov-01	Zap. Estribo 1 mod. Izq.	HA-25/b/20/IIa	322	322		**322**	373	384		**379**	**17,5%**	8
12-nov-01	Zap. Estribo 4 mod. Izq.	HA-25/b/20/IIa	308	305		**307**	367	362		**365**	**18,9%**	8
12-nov-01	Zap. Estribo 4 mod. Izq.	HA-25/b/20/IIa	325	325		**325**	379	373		**376**	**15,7%**	9
13-nov-01	Alzado estribo 5	HA-25/b/20/IIa	325	325		**325**	444	463		**454**	**39,5%**	9
13-nov-01	Alzado estribo 5	HA-25/b/20/IIa	345	345		**345**	441	429		**435**	**26,1%**	9
14-nov-01	Alzado estribo 3	HA-25/b/20/IIa	333	322		**328**	429	418		**424**	**29,3%**	9
14-nov-01	Alzado estribo 3	HA-25/b/20/IIa	319	325		**322**	435	424		**430**	**33,4%**	8
14-nov-01	Alzado estribo 2	HA-25/b/20/IIa	319	311		**315**	429	435		**432**	**37,1%**	9
14-nov-01	Alzado estribo 2	HA-25/b/20/IIa	297	297		**297**	412	396		**404**	**36,0%**	9
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	299	311		**305**	424	424		**424**	**39,0%**	9
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	316	311		**314**	421	421		**421**	**34,3%**	9
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	308	314		**311**	424	424		**424**	**36,3%**	10
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	311	305		**308**	407	424		**416**	**34,9%**	8
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	336	316		**326**	424	424		**424**	**30,1%**	7
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	311	322		**317**	418	407		**413**	**30,3%**	8
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	229	229		**229**	299	294		**297**	**29,5%**	10
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	249	251		**250**	438	446		**442**	**76,8%**	8
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	314	316		**315**	424	424		**424**	**34,6%**	9
27-nov-01	Tableto mod. Izq.	HA-25/b/20/IIa	328	356		**342**	424	452		**438**	**28,1%**	8
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	311	302		**307**	342	353		**348**	**13,4%**	8
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	291	283		**287**	336	350		**343**	**19,5%**	9
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	288	280		**284**	311	322		**317**	**11,4%**	9
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	192	189		**191**	215	220		**218**	**14,2%**	9
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	195	175		**185**	237	220		**229**	**23,5%**	8
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	161	178		**170**	218	203		**211**	**24,2%**	9
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	184	175		**180**	232	206		**219**	**22,0%**	10

ODT-11 (314+300)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	147	164		**156**	218	192		**205**	**31,8%**	7
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	206	192		**199**	257	266		**262**	**31,4%**	7
11-dic-01	Tableto mod. Dcho.	HA-25/b/20/IIa	186	192		**189**	237	212		**225**	**18,8%**	8
14-ene-02	Zapata aleta izq. 1	HA-25/b/20/IIa	339	322		**331**	387	376		**382**	**15,4%**	8
14-ene-02	Zapata aleta izq. 2	HA-25/b/20/IIa	291	302		**297**	356	367		**362**	**21,9%**	7
22-ene-02	Alzados aletas izqs.	HA-25/b/20/IIa	362	367		**365**	480	477		**479**	**31,3%**	7
4-feb-02	Zapata aleta dcha 2	HA-25/b/20/IIa	302	319		**311**	347	356		**352**	**13,2%**	8
7-feb-02	Alzado aleta dcha 2	HA-25/b/20/IIa	266	277		**272**	390	373		**382**	**40,5%**	8
8-feb-02	Zapata aleta dcha 1	HA-25/b/20/IIa	336	322		**329**	381	373		**377**	**14,6%**	9
11-feb-02	Alzado aleta dcha 1	HA-25/b/20/IIa	325	328		**327**	393	387		**390**	**19,4%**	9
12-feb-02	Alzado aleta dcha 1	HA-25/b/20/IIa	297	305		**301**	367	345		**356**	**18,3%**	8

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-12 (314+995)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
23-jun-01	Zapata	HA-25/b/20/IIa	184	172		**178**	262	278		**270**	51,7%	6
23-jun-01	Zapata	HA-25/b/20/IIa	207	201		**204**	280	270		**275**	**34,8%**	8
23-jun-01	Zapata	HA-25/b/20/IIa	178	198		**188**	256	254		**255**	**35,6%**	8
28-jun-01	Zapata	HA-25/b/20/IIa	266	232		**249**	316	314		**315**	**26,5%**	9
4-jul-01	Alzado estribo 1	HA-25/b/20/IIa	184	186		**185**	274	263		**269**	**45,1%**	7
4-jul-01	Alzado estribo 2	HA-25/b/20/IIa	195	186		**191**	263	257		**260**	**36,5%**	7
12-jul-01	Aleta (1ªfase)	HA-25/b/20/IIa	226	229		**228**	297	280		**289**	**26,8%**	7
13-jul-01	Alzado aleta (2ªfase)	HA-25/b/20/IIa	240	240		**240**	294	293		**294**	**22,3%**	7
24-jul-01	Tablero	HA-25/b/20/IIa	277	297		**287**	366	336		**351**	**22,3%**	7
24-jul-01	Tablero	HA-25/b/20/IIa	283	291		**287**	323	316		**320**	**11,3%**	7
24-jul-01	Tablero	HA-25/b/20/IIa	271	251		**261**	308	297		**303**	**15,9%**	9

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-13 (316+080)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	333	339		**336**	367	361		**364**	**8,3%**	7
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	311	319		**315**	410	415		**413**	**31,0%**	8
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	342	350		**346**	397	412		**405**	**16,9%**	9
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	362	342		**352**	412	407		**410**	**16,3%**	7
17-jul-02	Zapata estribo dcho	HA-30/b/20/IIb	359	364		**362**	407	435		**421**	**16,5%**	9
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	336	342		**339**	441	449		**445**	**31,3%**	7
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	333	316		**325**	418	424		**421**	**29,7%**	9
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	350	345		**348**	480	472		**476**	**37,0%**	8
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	333	339		**336**	463	463		**463**	**37,8%**	7
19-jul-02	Zapata estribo izq.	HA-30/b/20/IIb	342	336		**339**	446	452		**449**	**32,4%**	8
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	402	396		**399**	444	452		**448**	**12,3%**	7
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	339	333		**336**	373	367		**370**	**10,1%**	9
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	359	353		**356**	407	404		**406**	**13,9%**	9
1-ago-02	Zapata estribo dcho.	HA-30/b/20/IIb	345	350		**348**	404	398		**401**	**15,4%**	9
9-ago-02	Alzado estrib izq.	HA-30/b/20/IIb	367	362		**365**	458	458		**458**	**25,7%**	8
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	319	339		**329**	379	373		**376**	**14,3%**	9
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	333	339		**336**	387	396		**392**	**16,5%**	8
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	328	325		**327**	387	391		**389**	**19,1%**	9
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	379	373		**376**	418	424		**421**	**12,0%**	6
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	401	393		**397**	452	463		**458**	**15,2%**	7
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	373	367		**370**	435	444		**440**	**18,8%**	7
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	396	390		**393**	444	441		**443**	**12,6%**	8
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	347	339		**343**	401	396		**399**	**16,2%**	9
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	345	353		**349**	387	373		**380**	**8,9%**	7
19-ago-02	Alzado estrib. Dcho. 2f	HA-30/b/20/IIb	367	376		**372**	424	435		**430**	**15,6%**	8
30-ago-02	Tablero	HA-30/b/20/IIb	387	384		**386**	435	427		**431**	**11,8%**	9
30-ago-02	Tablero	HA-30/b/20/IIb	373	373		**373**	446	444		**445**	**19,3%**	9
30-ago-02	Tablero	HA-30/b/20/IIb	401	398		**400**	458	455		**457**	**14,3%**	9

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-14 (316+080)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
20-ago-01	Zapata estribo 1	HA-25/b/20/IIa	263	254		**259**	308	308		**308**	**19,1%**	8
21-ago-01	Zapata estribo 2	HA-25/b/20/IIa	266	266		**266**	311	311		**311**	**16,9%**	7
29-ago-01	Alzado estribo 2	HA-25/b/20/IIa	263	274		**269**	336	353		**345**	**28,3%**	8
31-ago-01	Alzado estribo 1	HA-25/b/20/IIa	297	285		**291**	356	373		**365**	**25,3%**	8
27-sep-01	Zapata 1B	HA-25/b/20/IIa	331	328		**330**	415	418		**417**	**26,4%**	8
1-oct-01	Zapata 3B	HA-25/b/20/IIa	336	322		**329**	384	373		**379**	**15,0%**	7
2-oct-01	Zapata 2B	HA-25/B/20/IIa	333	347		**340**	435	441		**438**	**28,8%**	6
3-oct-01	Zapata 1L	HA-25/B/20/IIa	336	322		**329**	384	401		**393**	**19,3%**	8
5-oct-01	Zapata 4B	HA-25/B/20/IIa	342	333		**338**	401	412		**407**	**20,4%**	8
5-oct-01	Zapata 3L	HA-25/B/20/IIa	339	336		**338**	407	401		**404**	**19,7%**	6
8-oct-01	Zapata 2L	HA-25/B/20/IIa	350	350		**350**	427	429		**428**	**22,3%**	8
11-oct-01	Zapata 5L	HA-25/B/20/IIa	316	305		**311**	396	407		**402**	**29,3%**	8
11-oct-01	Zapata 7L	HA-25/B/20/IIa	314	316		**315**	401	387		**394**	**25,1%**	9
17-oct-01	Zapata 4L	HA-25/B/20/IIa	283	297		**290**	322	331		**327**	**12,6%**	9
17-oct-01	Zapata 6L	HA-25/B/20/IIa	311	314		**313**	387	401		**394**	**26,1%**	9
23-oct-01	Zapata 7L	HA-25/B/20/IIa	328	350		**339**	424	412		**418**	**23,3%**	9
24-oct-01	Zapata 5B	HA-25/B/20/IIa	283	288		**286**	381	376		**379**	**32,6%**	9
26-oct-01	Zapata 6B	HA-25/B/20/IIa	283	271		**277**	364	353		**359**	**29,4%**	6
29-oct-01	Alzado 4B	HA-25/B/20/IIa	274	288		**281**	339	350		**345**	**22,6%**	9
30-oct-01	Alzado 2B	HA-30/B/20/IIb	339	333		**336**	418	412		**415**	**23,5%**	6
6-nov-01	Alzado 1L	HA-25/B/20/IIa	345	339		**342**	410	398		**404**	**18,1%**	6
12-nov-01	Alzado 3B	HA-25/B/20/IIa	331	333		**332**	410	401		**406**	**22,1%**	8
12-nov-01	Alzado 3L	HA-25/B/20/IIa	294	316		**305**	379	387		**383**	**25,6%**	9
13-nov-01	Alzado2L	HA-25/B/20/IIa	342	347		**345**	438	449		**444**	**28,7%**	6

ODT-14 (316+080)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
14-nov-01	Alzado1B	HA-25/B/20/IIa	302	328		**315**	429	438		**434**	**37,6%**	9
20-nov-01	Alzado 6B	HA-25/B/20/IIa	336	333		**335**	429	438		**434**	**29,6%**	6
21-nov-01	Alzado 7B	HA-25/B/20/IIa	345	331		**338**	424	424		**424**	**25,4%**	8
26-nov-01	Alzado 5L	HA-25/B/20/IIa	285	291		**288**	362	364		**363**	**26,0%**	8
26-nov-01	Alzado 7L	HA-25/B/20/IIa	297	297		**297**	398	412		**405**	**36,4%**	7
28-nov-01	Alzado 9L	HA-25/B/20/IIa	339	339		**339**	424	424		**424**	**25,1%**	6
30-nov-01	Alzado 8L	HA-25/B/20/IIa	322	314		**318**	427	438		**433**	**36,0%**	6
27-may-02	Zapata izq. Entronque	HA-25/B/20/IIa	285	288		**287**	331	339		**335**	**16,9%**	8
27-may-02	Zapata izq. Entronque	HA-25/B/20/IIa	283	297		**290**	359	342		**351**	**20,9%**	9
31-may-02	Zapata Entronque dcho.	HA-25/B/20/IIa	263	251		**257**	294	280		**287**	**11,7%**	9
31-may-02	Zapata Entronque dcho.	HA-25/B/20/IIa	263	254		**259**	297	311		**304**	**17,6%**	6
14-jun-02	Alzados Entronque izq.	HA-25/B/20/IIa	283	297		**290**	314	319		**317**	**9,1%**	7
19-jun-02	Alzado Muro Entronque izq.	HA-25/B/20/IIa	277	283		**280**	350	362		**356**	**27,1%**	7
27-jun-02	lzadoMuro Entronque dcho.	HA-25/B/20/IIa	277	283		**280**	350	362		**356**	**27,1%**	8
27-jun-02	Alzado Aleta Entronque dcho	HA-25/B/20/IIa	277	283		**280**	350	362		**356**	**27,1%**	9
16-jul-02	Zapata pila izq.	HA-30/B/20/IIb	350	356		**353**	418	444		**431**	**22,1%**	7
18-jul-02	Zapata pila dcha	HA-30/B/20/IIb	345	342		**344**	424	435		**430**	**25,0%**	6
19-jul-02	Alzado pila izq. 1f	HA-30/B/20/IIb	362	364		**363**	500	494		**497**	**36,9%**	7
22-jul-02	Alzado pila dcha. 2 f	HA-30/B/20/IIb	350	342		**346**	455	452		**454**	**31,1%**	8
24-jul-02	Alzado pila dcha. 2 f	HA-30/B/20/IIb	350	359		**355**	429	429		**429**	**21,0%**	7
23-oct-02	Alzado Tablero	HA-30/B/20/IIb	364	370		**367**	404	398		**401**	**9,3%**	9
14-oct-02	Tablero	HA-30/B/20/IIb	362	367		**365**	421	429		**425**	**16,6%**	9
14-oct-02	Tablero	HA-30/B/20/IIb	373	376		**375**	390	396		**393**	**4,9%**	7
14-oct-02	Tablero	HA-30/B/20/IIb	328	314		**321**	396	390		**393**	**22,4%**	8

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

ODT-15 (317+470)

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
9-ene-02	Zapata estribos	HA-25/b/20/IIa	356	336		**346**	398	407		**403**	**16,3%**	9
9-ene-02	Zapata estribos	HA-25/b/20/IIa	342	342		**342**	435	452		**444**	**29,7%**	7,5
9-ene-02	Zapata estribos	HA-25/b/20/IIa	322	322		**322**	412	429		**421**	**30,6%**	9
9-ene-02	Zapata estribos	HA-25/b/20/IIa	333	325		**329**	429	418		**424**	**28,7%**	7
9-ene-02	Zapata estribos	HA-25/b/20/IIa	339	316		**328**	421	412		**417**	**27,2%**	9
9-ene-02	Zapata estribos	HA-25/b/20/IIa	294	283		**289**	390	384		**387**	**34,1%**	9
9-ene-02	Zapata estribos	HA-25/b/20/IIa	345	331		**338**	421	424		**423**	**25,0%**	9
16-ene-02	Alzado estribo 2	HA-25/b/20/IIa	339	333		**336**	421	410		**416**	**23,7%**	8
16-ene-02	Alzado estribo 2	HA-25/b/20/IIa	274	285		**280**	356	347		**352**	**25,8%**	9
16-ene-02	Alzado estribo 1	HA-25/b/20/IIa	232	220		**226**	322	308		**315**	**39,4%**	9
16-ene-02	Alzado estribo 1	HA-25/b/20/IIa	209	206		**208**	271	263		**267**	**28,7%**	9
21-ene-02	Alzado estribo 3	HA-25/b/20/IIa	294	302		**298**	418	415		**417**	**39,8%**	9
21-ene-02	Alzado estribo 3	HA-25/b/20/IIa	302	297		**300**	418	421		**420**	**40,1%**	9
5-feb-02	Tablero	HA-25/b/20/IIa	308	319		**314**	379	367		**373**	**19,0%**	7
5-feb-02	Tablero	HA-25/b/20/IIa	311	328		**320**	373	390		**382**	**19,4%**	9
5-feb-02	Tablero	HA-25/b/20/IIa	297	305		**301**	370	376		**373**	**23,9%**	10
5-feb-02	Tablero	HA-25/b/20/IIa	325	322		**324**	376	384		**380**	**17,5%**	9
5-feb-02	Tablero	HA-25/b/20/IIa	314	299		**307**	398	387		**393**	**28,1%**	6
5-feb-02	Tablero	HA-25/b/20/IIa	333	333		**333**	407	412		**410**	**23,0%**	7
5-feb-02	Tablero	HA-25/b/20/IIa	308	314		**311**	390	387		**389**	**24,9%**	7
5-feb-02	Zapata aleta dcha	HA-25/b/20/IIa	316	299		**308**	401	412		**407**	**32,2%**	9
8-mar-02	Alzado aleta dcha 2	HA-25/b/20/IIa	302	299		**301**	387	401		**394**	**31,1%**	7
22-abr-02	Zap. Aleta izq. 1	HA-25/b/20/IIa	268	260		**264**	364	364		**364**	**37,9%**	8
25-abr-02	Alzado aleta izq. 1	HA-30/b/20/IIb	336	328		**332**	390	398		**394**	**18,7%**	7

SACYR

TRAMO: LLEIDA-MARTORELL
SUBTRAMO: III-B

RESUMEN ENSAYOS ROTURA A COMPRESIÓN DE PROBETAS DE HORMIGÓN

APARTADERO

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
25-feb-02	Zapata M.I. Mód.1	HA-25/b/20/IIa	263	263		**263**	353	345		**349**	**32,7%**	9
26-feb-02	Zapata M.I. Mód.3	HA-25/b/20/IIa	302	285		**294**	390	379		**385**	**31,0%**	8
27-feb-02	Zapata M.I. Mód.5	HA-25/b/20/IIa	263	254		**259**	319	316		**318**	**22,8%**	8
28-feb-02	Zapata M.I. Mód.1	HA-25/b/20/IIa	325	331		**328**	384	367		**376**	**14,5%**	6
28-feb-02	Zapata M.I. Mód.2	HA-25/b/20/IIa	308	328		**318**	379	396		**388**	**21,9%**	6
4-mar-02	Zapata M.I. Mód.4	HA-25/b/20/IIa	314	311		**313**	401	390		**396**	**26,6%**	6
4-mar-02	Zapata M.I. Mód.2	HA-25/b/20/IIa	297	285		**291**	328	336		**332**	**14,1%**	6
8-mar-02	Zapata M.I. Mód.3	HA-25/b/20/IIa	280	274		**277**	359	347		**353**	**27,4%**	9
8-mar-02	Zapata M.I. Mód.3	HA-25/b/20/IIa	291	280		**286**	353	331		**342**	**19,8%**	9
8-mar-02	Zapata M.I. Mód.6	HA-25/b/20/IIa	234	232		**233**	314	316		**315**	**35,2%**	9
11-mar-02	Zapata M.D. Mód.5	HA-25/b/20/IIa	283	299		**291**	384	401		**393**	**34,9%**	8
13-mar-02	Zapata M.I. Mód.4	HA-25/b/20/IIa	266	280		**273**	359	347		**353**	**29,3%**	8
14-mar-02	Zapata M.D. Mód.3	HA-25/b/20/IIa	291	302		**297**	373	359		**366**	**23,4%**	9
18-mar-02	Zapata M.I. Mód.5	HA-25/b/20/IIa	291	283		**287**	393	381		**387**	**34,8%**	9
20-mar-02	Zapata M.I. Mód.6	HA-25/b/20/IIa	314	305		**310**	396	407		**402**	**29,7%**	7
2-abr-02	Alzado andén 3 m dcha	HA-25/b/20/IIa	308	283		**296**	333	325		**329**	**11,3%**	8
5-abr-02	Alzado andén 4 m dcha	HA-25/b/20/IIa	299	280		**290**	350	342		**346**	**19,5%**	7
9-abr-02	Alzado andén 5 m dcha	HA-25/b/20/IIa	260	266		**263**	291	297		**294**	**11,8%**	10
15-abr-02	Zapata andén m.d. Mod.7	HA-25/b/20/IIa	246	249		**248**	294	299		**297**	**19,8%**	8
15-abr-02	Zapata andén m.d. Mod.6	HA-25/b/20/IIa	268	266		**267**	328	339		**334**	**24,9%**	8
17-abr-02	Zapata andén m.i. Mod.16	HA-25/b/20/IIa	268	271		**270**	336	333		**335**	**24,1%**	8
17-abr-02	Alzado andén m.d. Mod.6	HA-25/b/20/IIa	271	266		**269**	322	333		**328**	**22,0%**	7
18-abr-02	Alzado andén m.d. Mod.7	HA-25/b/20/IIa	274	285		**280**	319	325		**322**	**15,2%**	7
19-abr-02	Zapata andén m.d. Mod.16	HA-25/b/20/IIa	363	257		**310**	319	322		**321**	**3,4%**	8
22-abr-02	Alzado andén m.i. Mod.16	HA-25/b/20/IIa	280	280		**280**	373	364		**369**	**31,6%**	6
23-abr-02	Alzado andén m.d. Mod.16	HA-25/b/20/IIa	297	308		**303**	379	364		**372**	**22,8%**	7
6-may-02	Zapata andén m.d. Mod.2	HA-25/b/20/IIa	314	302		**308**	347	347		**347**	**12,7%**	7
13-may-02	Alzado andén m.d. Mod.2	HA-25/b/20/IIa	277	266		**272**	325	347		**336**	**23,8%**	7
13-may-02	Zapata andén m.d. Mod.2	HA-25/b/20/IIa	308	299		**304**	344	353		**349**	**14,8%**	8

APARTADERO

FECHA TOMA	LOCALIZACIÓN	HORMIGONES	RESULTADO DE ENSAYO ROTURA A COMPRESIÓN (Kg/cm2)								% REC. DE 7 A 28 DÍAS	CONO DE ABRAMS ASIENTO (cm)
			7 DÍAS				28 DÍAS					
			PROBETA 1	PROBETA 2	PROBETA 3	MEDIA	PROBETA 1	PROBETA 2	PROBETA 3	MEDIA		
14-may-02	Alzado andén 1 m.d.	HA-25/b/20/IIa	280	294		**287**	373	367		**370**	**28,9%**	9
15-may-02	Zapata andén 0 m.d.	HA-25/b/20/IIa	274	285		**280**	370	366		**368**	**31,7%**	9
16-may-02	Zapata andén 0 m.i.	HA-25/b/20/IIa	277	283		**280**	367	359		**363**	**29,6%**	8
16-may-02	Zapata andén 17 m.d.	HA-25/b/20/IIa	268	271		**270**	325	308		**317**	**17,4%**	7
16-may-02	Alzado andén m.d.	HA-25/b/20/IIa	305	302		**304**	353	347		**350**	**15,3%**	6
16-may-02	Zapata andén 17 m.i.	HA-25/b/20/IIa	297	285		**291**	362	353		**358**	**22,9%**	7
17-may-02	Alzado andén 0 m.i.	HA-25/b/20/IIa	263	266		**265**	367	353		**360**	**36,1%**	7
4-oct-02	Zapatas andén	HA-25/b/20/IIa	308	314		**311**	398	396		**397**	**27,7%**	8
15-oct-02	Zapatas andén	HA-25/b/20/IIa	328	333		**331**	384	379		**382**	**15,4%**	7
23-oct-02	Muro andén	HA-25/b/20/IIa	356	353		**355**	387	390		**389**	**9,6%**	7
28-oct-02	Muro andén	HA-25/b/20/IIa	339	345		**342**	396	401		**399**	**16,5%**	6

7. Accesos y elementos para mantenimiento

7. ACCESOS

El acceso a las estructuras se realiza tal y como se indica en el apartado 5.2. del Anejo nº 13.

8. Recomendaciones para la conservación y mantenimiento

8. RECOMENDACIONES PARA LA CONSERVACIÓN Y MANTENIMIENTO

No existen recomendaciones especiales para el mantenimiento y conservación de las estructuras. Se observará en todo momento las prescripciones del GIF.

Movimientos previstos en las estructuras

Los movimientos previstos en las estructuras están recogidos dentro de los cálculos de cada una de ellas.